2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER
INTERIM REMEDIAL ACTION

Defense Depot Memphis, Tennessee

Defense Logistics Agency

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Air Force Center for Engineering and the Environment
Contract No. FA8903-08-D-8771
Task Order No. 0019

Revision 0
December 2010

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LIST OF ACRONYMS AND ABBREVIATIONS

AFCEE	Air Force Center for Environmental Excellence
bgs	below ground surface
BRAC	Base Realignment and Closure
BCT	BRAC Cleanup Team
cDCE	cis-1,2-Dichloroethene
CF	Chloroform
CT	Carbon tetrachloride
CVOC	Chlorinated Volatile Organic Compound
DCE	1,1-Dichloroethene
DDMT	Defense Depot Memphis, Tennessee
DQE	Data quality evaluation
e^2M	engineering-environmental management
IRA	Interim Remedial Action
LCS	Laboratory Calibration Standard
LTM	Long-term Monitoring
MACTEC	MACTEC Engineering and Consulting, Inc.
MI	Main Installation
MLGW	Memphis, Light, Gas & Water
msl	mean seal level
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MW	Monitoring Well
NPL	National Priorities List
NTU	nephelometric turbidity units
O&M	Operation and maintenance
PCE	Tetrachloroethene
PDB	Passive diffusion bag
PVC	polyvinyl chloride
QA	Quality Assurance
QC	Quality Control
RA	Remedial Action
RA SAP	Remedial Action Sampling and Analysis Plan
RL	Reporting Limit
RW	Recovery Well

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

SVE	Soil Vapor Extraction
TC	Target Concentrations
TCA	1,1,2-Trichloethane
TCE	Trichloroethene
TeCA	1,1,2,2-Tetrachloroethane
tDCE	trans-1,2-Dichloroethene
TDEC	Tennessee Department of Environmental Conservation
U.S.	United States
USEPA	United States Environmental Protection Agency
µg/L	Micrograms per liter
VC	Vinyl Chloride
VOCs	Volatile organic compounds

1.0 INTRODUCTION

HDR has prepared this 2009 Operations and Closure Report for the Groundwater Interim Remedial Action (IRA) under Contract FA8903-08-D-8771, Task Order 19 to the Air Force Center for Engineering and the Environment (AFCEE). This report summarizes the final operations and closure activities for the groundwater recovery system and the results of system monitoring for 2009 on Dunn Field at the Defense Depot Memphis, Tennessee (DDMT).

1.1 SITE DESCRIPTION AND BACKGROUND

DDMT, which originated as a military facility in the early 1940s, received, warehoused, and distributed supplies common to all United States (U.S.) military services and some civil agencies located primarily in the southeastern U.S., Puerto Rico, and Panama. Stocked items included food, clothing, petroleum products, construction materials, and industrial, medical, and general supplies. In 1995, DDMT was placed on the list of the Department of Defense facilities to be closed under Base Realignment and Closure (BRAC). Storage and distribution of material continued until the facility closed in September 1997.

DDMT is located in southeastern Memphis, Shelby County, Tennessee approximately five miles east of the Mississippi River and just northeast of Interstate 240. The property consists of approximately 642 acres and includes the Main Installation (MI) and Dunn Field. The MI contains approximately 578 acres with open storage areas, warehouses, military family housing, and outdoor recreational areas. Dunn Field contains approximately 64 acres and includes former mineral storage and waste disposal areas. Dunn Field is located across Dunn Avenue from the north-northwest portion of the MI.

In 1992, DDMT was added to the National Priorities List (NPL). The lead agency for environmental restoration activities at DDMT is the Defense Logistics Agency. The regulatory oversight agencies are the United States Environmental Protection Agency (USEPA) Region 4 and the Tennessee Department of Environmental Conservation (TDEC). DDMT's USEPA Identification Number is TN4210020570.

1.2 GEOLOGY AND HYDROGEOLOGY

The geologic units of interest at Dunn Field are (from youngest to oldest): loess, including surface soil; fluvial deposits; Jackson Formation/Upper Claiborne Group; and Memphis Sand.

The loess consists of wind-blown and deposited, brown to reddish-brown, low plasticity clayey silt to silty clay. The loess deposits are about 20 to 30 feet thick and are continuous throughout the Dunn Field area.

The fluvial (terrace) deposits consist of two general layers. The upper layer is a silty, sandy clay that transitions to a clayey sand and ranges from about 10 to 36 feet thick. The lower layer is composed of interlayered sand, sandy gravel, and gravelly sand, and has an average thickness of approximately 40 feet. The uppermost aquifer is the unconfined fluvial aquifer, consisting of saturated sands and gravelly sands in the lower portion of the deposits. The saturated thickness of the fluvial aquifer ranges from 3 to 50 feet and is controlled by the configuration of the uppermost clay in the Jackson Formation/Upper Claiborne Group. The groundwater in the fluvial aquifer is not a drinking water source for area residents.

The Jackson Formation/Upper Claiborne Group consists of clays, silts, and sands. The uppermost clay unit appears to be continuous, except in the southwestern area of Dunn Field. Off site, to the west and northwest of Dunn Field, there are possible gaps in the clay. Where present, these gaps create connections to the underlying intermediate aquifer from the fluvial deposits. The intermediate aquifer is locally developed in deposits of the Jackson Formation/Upper Claiborne Group.

The Memphis Sand primarily consists of thick bedded, white to brown or gray, very fine grained to gravelly, partly argillaceous and micaceous sand. Lignitic clay beds constitute a small percentage of the total thickness. The Memphis Sand ranges from 500 to 890 feet in thickness, and begins at a depth below ground surface (bgs) of approximately 120 to 300 feet. The Memphis aquifer is confined by overlying clays and silts in the Cook Mountain Formation (part of the Jackson/Upper Claiborne Group) and contains groundwater under strong artesian (confined) conditions regionally. The City of Memphis obtains the majority of its drinking water from this unit. The Allen Well Field, which is operated by Memphis Light Gas & Water (MLGW), is located approximately two miles west of Dunn Field.

1.3 GROUNDWATER CONTAMINATION

Nine chlorinated volatile organic compounds (CVOCs) have been commonly detected in the fluvial aquifer during past sampling events: carbon tetrachloride (CT); chloroform (CF); 1,1-dichloroethene (DCE); cis-1,2-dichloroethene (cDCE); trans-1,2-dichloroethene (tDCE); 1,1,2-trichloroethane (TCA); trichloroethene (TCE); tetrachloroethene (PCE) and 1,1,1,2-tetrachloroethane (TeCA). The groundwater analytical results indicate three primary CVOC plumes on Dunn Field: a northern plume, a west-northwest (central) plume, and west-southwest (southern) plume. Mixing and intermingling of the plumes has occurred due to the active groundwater extraction system and natural groundwater flow; the

plumes appear to merge west of Dunn Field. CVOC concentrations have decreased significantly since the Source Areas remedial action (RA) was begun in 2007.

The primary constituents in the northern plume have been PCE, TCE, and DCE. There is an apparent offsite source(s) of these compounds northeast of Dunn Field; however, the disposal sites in the northwest corner of Dunn Field are also apparent source areas. The central plume contained high concentrations of TeCA and TCE and also PCE, cDCE, tDCE, TCA, CT, and CF. The southern plume was principally composed of TeCA, CT, TCA, and CF, although TCE, tDCE, PCE, and cDCE were also present. The central and southern plumes appear to result from disposal sites on Dunn Field.

1.4 IRA SUMMARY

The IRA Record of Decision for groundwater at Dunn Field was signed in April 1996 with the objectives of hydraulic containment to: (1) prevent further contaminant plume migration; and (2) reduce contaminant mass in groundwater. The final design for Phase 1 of this groundwater extraction system was completed in August 1997 and included the installation of seven groundwater recovery wells (RWs) (RW-3 through RW-9), one pre-cast concrete building, an underground conveyance system, and flow measurement and control systems. The system was constructed from January 1998 through October 1998 and began operation in November 1998.

The IRA was expanded through a Phase II design completed in January 2000 with four additional extraction wells and associated electrical, mechanical, and instrumentation/controls components. The system expansion was due to detection of additional groundwater contamination in the southern portion of Dunn Field. Installation of new recovery wells (RW-1, RW-1A, RW-1B and RW-2) south of recovery well RW-03 and construction of other components was completed by March 2001. The expanded system was in full operation in June 2001.

The *Memphis Depot Dunn Field Five Year Review* (CH2M HILL, 2003) concluded that over 300 pounds of volatile organic compounds (VOCs) had been removed by the IRA from 1998 to 2002. However, the extraction system did not adequately control groundwater flow and plume migration in the fluvial aquifer. The IRA was found to be protective in the short term, because there is no current or planned use of the fluvial aquifer as a drinking water supply and local ordinances restrict installation of private wells. The Five Year Review stated that monitoring data from the IRA and the remedial investigation suggested that aquifer restoration could be accomplished effectively by other technologies rather than expanding the groundwater extraction system. Fully protective remedies for all media were selected in the *Dunn Field*

Record of Decision (CH2M HILL, 2004). The *Second Five Year Review* (e^2M, 2008) completed in January 2008 did not alter the findings relative to protectiveness of the IRA.

The selected remedies were modified through the *Dunn Field Record of Decision Amendment* (e^2M, 2009a) approved in January 2009. The major changes were use air sparging with soil vapor extraction for the Off Depot groundwater plume and use of in situ thermal desorption to enhance soil vapor extraction (SVE) in the loess on Dunn Field. Implementation of the selected remedies has been completed. The *Source Areas Interim Remedial Action Completion Report, Revision 1* (HDR|e^2M, 2009) was approved by USEPA and TDEC in November 2009. The *Preliminary Close Out Report* (USEPA, 2010) was approved in May 2010 and the DDMT NPL site status was revised to Construction Complete.

1.5 SCOPE OF WORK

HDR assumed the operation and maintenance (O&M) activities for the Groundwater IRA system in October 2006. The goals for O&M are to:

- Maintain system operations through regular field inspections, maintenance, and repairs; and
- Monitor system effectiveness through the measurement of water levels and the collection and analysis of system effluent samples and groundwater samples from monitoring wells (MWs) and recovery wells.

The recovery wells were shutdown in two stages due to reduced CVOC concentrations in groundwater following implementation of the Source Areas RA in 2007. Five recovery wells in the northern portion of the IRA were shutdown in June 2008 and the remaining recovery wells were shutdown on 23 January 2009.

The scope for the Groundwater IRA was reduced in 2009 due to shutdown of the recovery wells. Activities were limited to: 1) bi-weekly to monthly inspections to maintain the IRA in operational condition until recovery well abandonment and system removal was approved and 2) semi-annual groundwater sampling from monitoring wells using passive diffusion bag (PDB) samplers or low flow sampling procedures and recovery wells using wellhead sampling ports.

2.0 SYSTEM OPERATIONS

All recovery wells are currently offline. Groundwater sample results from the April and October 2008 IRA semiannual monitoring events demonstrated that the Source Areas RA was having a significant impact in reducing CVOC concentrations in groundwater. CVOC concentrations in most monitoring wells on Dunn Field did not exceed 50 micrograms per liter (µg/L) for any single CVOC; this concentration limit is the objective for the Source Areas groundwater remedy, with further reduction to maximum contaminant levels to be achieved by the Off Depot remedy.

RW-5 through RW-9 were shutdown on 9 June 2008 and RW-1 through RW-4 were shutdown on 23 January 2009. Following review of analytical results for the semiannual samples collected in April 2009, the BRAC Cleanup Team (BCT) approved removal of the IRA system with proper abandonment of the recovery wells.

2.1 SYSTEM PERFORMANCE

The final operating recovery wells (RW-1, RW-1A, RW-1B, RW-2, RW-3, and RW-4) were shutdown on 23 January 2009 following approval from the BRAC Cleanup Team. System performance during January 2009 was described in *Annual Operations Report – 2008, Dunn Field Groundwater Interim Remedial Action – Year Ten* (e^2M, 2009b).

2.2 SYSTEM CLOSURE

System closure was performed as described in the *Work Plan for IRA System Removal, Dunn Field-Defense Depot Memphis, Tennessee* (HDR, 2010). The work plan was approved by USEPA on 25 May 2010 and by TDEC on 11 June 2010. IRA system removal included site preparation, demolition of structures, well abandonment and site restoration. Site preparation and oversight for all tasks was performed by HDR; demolition of structures and site restoration was performed by HEPACO of Memphis, and well abandonment was performed by M&W Drilling of Knoxville, TN. The IRA system layout is shown on Figure 1 and photographs are provided in Appendix A.

2.2.1 System Description

The IRA system includes the recovery wells, control building, underground piping for the groundwater discharge line and electrical conduit for power/system controls, and the connection to the sanitary sewer. Electrical power is provided through a utility connection and pole-mounted transformer located in the northwest corner of Dunn Field. The power line runs from the transformer to the IRA control building

located between RW-7 and RW-8; wiring for electrical power and pump controls are routed from the control building to each recovery well. Each recovery well has two stainless steel enclosures: the control enclosure contains a control panel, motor starter box, main breaker, control breaker and transducer box with desiccant; and the pump house contains the steel-cased recovery well with submersible pump and polyvinyl chloride (PVC) discharge line, water level transducer, water meter, pressure gauge, exhaust fan and space heater. The PVC discharge line from each recovery well connects to the main discharge line which runs to the connection in the northeast corner of Dunn Field. The sanitary sewer connection includes an aboveground, 6-inch diameter steel sewer inlet loop with insulation and heat trace wiring.

2.2.2 Preparation for System Removal

Site preparation consisted of shutting off electrical power, removing pumps and water level meters from the recovery wells, and placing temporary caps over the well casing to prevent material falling into the well during demolition. MLGW disconnected the power supply in October 2009. The pumps and transducers were removed from the recovery wells in June 2010; the pumps in RW-2 and RW-5 became wedged and could not be removed by hand. The pump in RW-5 was later pulled from the well using personnel and equipment brought to Dunn Field by HEPACO. The pump and a section of hose could not be pulled from RW-2; it was pushed to the bottom of the well and abandoned in place.

2.2.3 Demolition of Structures

Structure demolition included removal of electrical components and other recyclable materials from the well enclosures and control building; pulling electrical wiring from underground conduit where practical; demolition of the 22 stainless steel enclosures, 11 recovery well pads and the control building pad; and removal of the sewer connection. The recovery well steel well casing was cut 1 to 2 feet bgs and covered until abandonment. Underground piping for the groundwater discharge line and electrical conduit for power/system controls and underground junction boxes were left in place. Metal and electrical components were recycled by Sims Metal Management, and the concrete/debris was disposed by Waste Connections of TN. A new connection was installed on the west end of the existing piping for discharge of condensate and other waste water in accordance with the industrial discharge permit. The connection consists of a flange with a 2-inch male cam lock with a shut off valve and locking cap. Site restoration consisted of grading and placing grass seed and straw over disturbed areas.

Daily activities during demolition are listed below:

Date	Activity
30 June 2010	Conducted Health and Safety briefing. Began dismantling stainless steel RW well houses and staging scrap material on the asphalt pad.
1 July 2010	Completed removal of well houses and began demolition of concrete recovery well pads and bollards. Tore down control building. Concrete, metal/electronics and other debris were separated in different roll-off boxes.
2 July 2010	Completed demolition of concrete pads at recovery wells and control building. Discharge loop was removed and a blind flange with camlock fitting was installed for future discharges.
6 July 2010	Placed remaining debris in roll-offs.
26-28 July 2010	Roll-offs transported to recycling and disposal facilities
30 July 2010	Disturbed areas graded and covered with grass seed/straw

2.2.4 Recovery Well Abandonment

The 11 recovery wells were abandoned by, M&W Drilling, a licensed Tennessee Well driller in accordance with Memphis Shelby County Health Department Regulations. The recovery locations are shown on Figure 1 and well abandonment data are shown on Table 1.

One-half gallon of bleach was poured into each well, and bentonite chips were added to seal the screened section and absorb water to limit investigation derived waste. The wells were then filled with grout (Portland type II cement with 5 percent bentonite) from the bottom up using a tremie pipe. After all wells were abandoned, additional grout was added to completely fill the well casing.

Daily activities during recovery well abandonment are listed below:

Date	Activity
7 July 2010	Conducted Health and Safety briefing. Bleach was added to all wells and bentonite to the existing water level. Bentonite bridged at 18 to 25 feet bgs in RW-2. RW-1, RW-1A, RW-1B and RW-3 were abandoned.
8 July 2010	RW-2 RW-4, RW-5, and RW-6 were abandoned. Tremie pipe was pushed through bridged bentonite in RW-2; well grouted below and then above bridge.
9 July 2010	RW-7, RW-8 and RW-9 were abandoned. Grout was topped off in all wells.

3.0 SYSTEM MONITORING

System monitoring activities consist of water level measurements and analysis of groundwater samples from recovery wells and monitoring wells. Effluent samples from the recovery system discharge were not collected in 2009 since the recovery wells were shut down. When the IRA system was operating, groundwater samples were collected to evaluate system effectiveness in restricting plume migration and removing contaminant mass. In 2009, groundwater samples were collected to monitor plume migration and overall effectiveness of RAs in reducing groundwater concentration to below maximum contaminant levels.

The wells sampled in 2009 were revised to incorporate the Off Depot long term monitoring (LTM) wells, as recommended in the *Annual Operations Report-2008, Dunn Field Groundwater Interim Remedial Action-Year Ten* (e^2M, 2009b) and approved at the BCT meeting on 9 April 2009. The total number of wells to be sampled was 84 in April and 69 in October. The difference was due to wells abandoned in July 2009 during Off Depot RA and to wells omitted because they were being sampled for Off Depot performance monitoring. The wells in the IRA monitoring program for 2009 are listed in Table 2 and the wells sampled in April and October are shown on Figures 2 and 3, respectively. System monitoring was performed in accordance with past practice and the *Remedial Action Sampling and Analysis Plan* (RA SAP) (MACTEC Engineering and Consulting, Inc. [MACTEC], 2005).

3.1 WATER LEVEL MEASUREMENTS

Water level measurements were made on 3 April and 19 October 2009 during the two semiannual sample events using a Solinst Model 101 water level meter with an electronic sensor and tape graduated in 0.01-foot increments. The water level measurements are shown on Table 3.

In April, water levels were recorded in 129 monitoring wells, one piezometer and 11 recovery wells. Recovery wells RW-1 through RW-9 remained offline during water level measurements. Measurements were not made in four of the planned monitoring wells: MW-10 and and MW-134 were inaccessible, MW-229 was missed due to field oversight and MW-233 was dry.

In October, water levels were measured at 124 monitoring wells, encompassing both the IRA wells and the Off Depot performance monitoring wells. Measurements were made using Solinist Model 101 water level meters with electronic sensors and tapes graduated in 0.01-foot increments. Measurements were not made in two of the planned monitoring wells: MW-68 was inaccessible and MW-78 was damaged.

3.2 GROUNDWATER SAMPLING

3.2.1 Monitoring Wells

Groundwater samples from monitoring wells were collected using PDBs from October 2001 through October 2007. Prior to that time, the samples are believed to have been collected using low-flow sampling methods. Due to changes in the monitoring wells selected for IRA system monitoring in 2008 and 2009, samples were collected using PDBs and low-flow sampling methods. Sampling was performed in general accordance with the *User's Guide for Polyethylene-based Passive Diffusion Bag Samplers to Obtain Volatile Organic Compound Concentrations in Wells* (U.S. Geological Survey, 2001) and the RA SAP.

HDR measured water levels in the wells to be sampled approximately one month prior to sample collection. If saturated thickness of the well screen was greater than 5 feet, a PDB was installed, if not already present. Where necessary, PDBs already in the well were moved such that the midpoint depth was near the mid-point of the saturated screen. If the saturated thickness was less than 5 feet, the well was selected for low-flow sampling.

3.2.1.1 Passive Diffusion Bags

Upon removal from each monitoring well, a sample of water from the PDB was transferred to 40 milliliter vials preserved with hydrochloric acid. Following sample collection, a single, new PDB was filled with deionized water and placed near the middle of the saturated section of well screen.

3.2.1.2 Low Flow Sampling

Dedicated Teflon® bladders and Teflon®-lined polyethylene tubing were used for low flow sampling. Water quality parameters were measured at approximately 5 to 10 minute intervals during purging using a flow-through cell with either a Horiba U-22XD or an YSI 6500 Series. The units were calibrated daily prior to sampling. If necessary, the instruments were recalibrated in the field. All measurements were recorded on the field sampling forms.

Purging continued at each well for up to two hours in order to meet the stabilization criteria: three successive readings within 0.1 for pH, 10 millivolts for oxygen reduction potential, 3 percent for specific conductance, 10 percent for dissolved oxygen and less than 20 nephelometric turbidity units (NTU) for turbidity. Temperatures was also measured and recorded, but was not used as a stabilization parameter. Samples were collected when stabilization criteria were met or the field team leader approved the

variance from the criteria. Upon completion of purging at each monitoring well, water samples were transferred to 40-milliliter vials preserved with hydrochloric acid.

3.2.1.3 April 2009

HDR collected groundwater samples from 79 of 84 designated monitoring wells on 14 to 23 April 2009. Three monitoring wells (MW-5, MW-56 and MW-233) were dry at the time of sampling and one monitoring well (MW-175) was not usable due to damage during thermal SVE operations. Due to an error in preparing sampling forms, one well (MW-169) was omitted and another (MW-232) was added. The groundwater samples were sent to Microbac Laboratories in Marietta, Ohio for VOC analysis by USEPA Method SW8260B.

Samples were collected using PDBs in 32 of 33 designated wells on 14 to 15 April. A sample was to be collected from MW-169, but MW-232 was sampled instead. PDB depths were checked on 22 March; no PDBs were moved during the inspection. PDB sample depths are shown on Table 4. Water quality parameters were not measured prior to sampling wells with PDBs.

Groundwater samples were collected from 47 of 51 monitoring wells on 14 to 23 April using bladder pumps and low-flow purging methods. MW-5, MW-56, and MW-233 were dry at the time of sampling, and MW-175 was damaged and not accessible. The final stabilization measurements are shown on Table 5. The following samples were collected without meeting the stabilization criteria:

- Samples collected from MW-128 at a turbidity reading of 36.5 NTUs following purging for two hours.

3.2.1.4 October 2009

HDR collected groundwater samples from 68 of 69 designated monitoring wells on 13 to 15 October 2009. A sample could not be collected from MW-78. During the pre-sampling inspection in September 2009, MW-78 was covered by brush and debris. While removing the brush, City of Memphis personnel dislodged the well pad and the well cap. A new cap was installed and the well was surged and approximately 7 well volumes were removed by bailer on 21 September 2009; the well pad was replaced on 23 September. The well was not sampled in October 2009 due to concern for cross-contamination while the well cap was off. The groundwater samples were shipped to Microbac Laboratories in Marietta, Ohio for VOC analysis by USEPA Method SW8260B.

Samples were collected using PDBs in 56 designated wells on 13 to 15 October 2009. PDB depths were checked on 14 to 15 September 2009, and new PDBs were placed in 34 wells that had been sampled using

low flow techniques in the past and in 11 new monitoring wells. PDB sample depths are shown on Table 6. Water quality parameters were not measured prior to sampling wells with PDBs.

Groundwater samples were collected from 12 monitoring wells on 13 to 15 October 2009 using bladder pumps and low-flow purging methods. The final stabilization measurements are shown on Table 7. Stabilization criteria were met at all wells.

3.2.2 Recovery Wells

Groundwater samples were collected from recovery wells in April 2009 for comparison to monitoring well sample results. Groundwater samples were not collected from recovery wells in October because the wells had been shut down for 9 months, and based on April results, monitoring wells provided sufficient distribution.

Groundwater samples were collected from all 11 recovery wells on 14 April. All recovery wells, except RW-1A, were operated briefly to purge the well casing and piping. Samples were collected from the sample port on the recovery wellheads; the valve was slowly opened and the extracted groundwater was allowed to slowly fill 40-milliliter vials preserved with hydrochloric acid. The pump motor in RW-1A had been pulled for repairs and the sample was collected using low flow sampling; the final stabilization measurement is shown on Table 5. The groundwater samples were shipped to Microbac Laboratories in Marietta, Ohio for VOC analysis by USEPA Method SW8260B.

3.3 QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Field and laboratory quality control (QC) samples were collected during each sampling event. QC samples consisted of duplicates, and matrix spikes and matrix spike duplicates (MS/MSD). One duplicate was collected for approximately every 10 samples (10%) and 1 MS/MSD was collected for every 20 samples (5%). Trip blanks were included in coolers delivered from the laboratory. Laboratory Quality Assurance (QA)/QC samples included surrogate spikes, method blanks, laboratory control samples, in addition to MS/MSD analysis. The sampling and analytical methods are described in the RA SAP (MACTEC, 2005).

Documentation was completed in the field to ensure that the samples collected, labels, chain-of-custody, and request for analysis were in agreement. Custody seals were placed on each cooler before shipment by common carrier. Samples were shipped every other day when a full cooler could be shipped via for overnight delivery to the laboratory.

4.0 SUMMARY OF MONITORING RESULTS

4.1 WATER LEVEL MEASUREMENTS

Water level measurements collected on 3 April and 19 October 2009 are shown with resulting groundwater elevations on Table 3. Fluvial aquifer groundwater elevation contour maps for the April and October 2009 water level measurements are shown on Figures 4 and 5, respectively. Groundwater flow is generally to the west in the area of Dunn Field. The maps show a trough in groundwater elevations approximately 1,000 feet west of Dunn Field, with flow apparently diverging to the north and south.

Groundwater elevations in the fluvial aquifer are highest northeast of Dunn Field (MW-65: 261.1 feet mean seal level [msl] in April and 258.1 msl in October) and generally decrease toward the trough west of Dunn Field (MW-165: 213.3 feet msl in April and 215.7 feet msl in October). The spatial variation in water levels in the fluvial aquifer monitoring wells is primarily due to the elevation of the underlying clay of the Jackson Formation/Upper Claiborne Group.

The groundwater elevations in intermediate aquifer wells, away from the 'windows' providing connection with the fluvial aquifer, were approximately 164-165 feet msl in April and 160-161 feet msl in October. Groundwater elevation in MW-67, which is screened in the Memphis Sand, was 166.0 feet msl in April and 159.7 feet in October.

4.2 ANALYTICAL RESULTS

Complete analytical results for groundwater samples from monitoring wells and recovery wells collected in 2009 are presented in Appendix B. Analytical results summaries for groundwater samples are shown on Tables 8 (April 2009) and 9 (October 2009) for monitoring wells and on Table 10 (April 2009) for recovery wells.

4.2.1 Data Quality Evaluation

HDR performed data quality evaluation (DQE) of the laboratory data packages for the samples collected in 2009 to qualify the data relative to the data quality objectives described in the RA SAP. Data qualifiers are shown on the analytical results tables. Any result reported below the reporting limit (RL) but above the method detection limit was flagged "J" and considered an estimated result (unless overridden by other QC flags). A summary of the DQE for each event is provided in Appendix C.

4.2.1.1 April 2009 Monitoring Wells

Groundwater samples were collected from 79 monitoring wells in April 2009 and analyzed for VOCs by USEPA Method SW8260B. The data are usable with the following qualifications (refer to Tables 8 and B-1):

- Contamination was observed in some method blanks. Whenever methylene chloride is detected in associated samples at a level less than 10x the method blank or carbon disulfide is detected in associated samples at a level less than 5x the method blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the RL and, therefore, should not adversely impact data quality.
- Contamination was observed in some trip blanks. Whenever acetone is detected in associated samples at a level less than 10x the method blank or chloromethane, 1,4-dichlorobenzene or toluene is detected in associated samples at a level less than 5x the trip blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the RL and, therefore, should not adversely impact data quality.
- Contamination was observed in some rinse blanks. Whenever 1,4-dichlorobenzene or toluene is detected in associated samples at a level less than 5x the rinse blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the RL and, therefore, should not adversely impact data quality.
- The possibility of bias associated with calibration drift with respect to carbon disulfide was indicated in one sample (MW-239-IS-6), and where the discrepancy in %D was observed, the associated sample detect was qualified estimated J. However, this result was ultimately qualified UB as noted above.
- The possibility of low bias associated with calibration drift with respect to carbon disulfide and vinyl acetate was indicated in a number of samples. Where the discrepancy in %D was observed, the associated sample non-detects were qualified estimated UJ, and where the %D was greater than 40% (for vinyl acetate), the associated sample results were qualified as rejected (R).
- Based on MS/MSD performance with low recoveries of vinyl acetate, the non-detect in the parent sample MW-51-IS-6 is qualified as non-detect estimated "UJ".
- There were numerous analytes with Laboratory Calibration Standard (LCS) recoveries below control limits. Associated non-detect sample results were qualified as non-detect estimated "UJ" and detected results as estimated "J". This applies to vinyl acetate in lab batch WG299957; dichlorodifluoromethane and vinyl acetate in WG300057; dichlorodifluoromethane in WG300079; vinyl acetate in WG300495; chloromethane in WG300513; and bromomethane, chloromethane, dichlorodifluoromethane and vinyl chloride (VC) in WG300977.

4.2.1.2 October 2009 Monitoring Wells

Groundwater samples were collected from 68 monitoring wells in October 2009 and analyzed for VOCs by USEPA Method SW8260B. The data are usable with the following qualifications (refer to Tables 9 and B-2):

- Contamination was observed in one method blank. Whenever methylene chloride is detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the RL and, therefore, should not adversely impact data quality.

- Contamination was observed in some trip blanks. Whenever methylene chloride is detected in associated samples at a level less than 10x the method blank or chloromethane is detected in associated samples at a level less than 5x the trip blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the RL and, therefore, should not adversely impact data quality.

- Contamination was observed in some rinse blanks. Whenever acetone is detected in associated samples at a level less than 10x the method blank or 1,4-dichlorobenzene is detected in associated samples at a level less than 5x the rinse blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the RL and, therefore, should not adversely impact data quality.

- The possibility of low bias associated with calibration drift with respect to 2-hexanone, 4-chlorotoluene and vinyl acetate was indicated in a number of samples. Where the discrepancy in %D was observed, the associated sample non-detects were qualified estimated "UJ", and where the %D was greater than 40% (for vinyl acetate), the associated sample results were qualified as rejected "R".

- Based on MS/MSD performance with several low recoveries, non-detects in the parent sample are qualified as non-detect estimated "UJ" and detects are qualified as estimated J. This applies to 1,1,2,2-tetrachloroethane, carbon disulfide, CF, dichlorodifluoromethane and vinyl acetate in MW-15-IS-7 and DCE, TCE and PCE in MW-130-IS-7.

- There were several analytes with LCS recoveries below control limits. Associated non-detect sample results were qualified as non-detect estimated "UJ" and detected results as estimated "J". This applies to 1,2-dichloroethane, 1,2-dibromo-3-chloropropane, 2-hexanone, 4-chlorotoluene, acetone, carbon disulfide, chloromethane, dichlorodifluoromethane, 2-butanone, trans-1,3-dichloropropene and vinyl acetate in WG314734; 4-chlorotoluene and trans-1,3-dichloropropene in WG314985; and VC in WG315111.

4.2.1.3 April 2009 Recovery Wells

Groundwater samples were collected from all 11 recovery wells in April 2009 and analyzed for VOCs by USEPA Method SW8260B. The data are usable with the following qualifications (refer to Tables 8 and B-3):

- Contamination was observed in some method blanks. Whenever methylene chloride is detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the RL and, therefore, should not adversely impact data quality.

- Contamination was observed in one trip blank. Whenever chloromethane is detected in associated samples at a level less than 5x the trip blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the RL and, therefore, should not adversely impact data quality.

- The possibility of low bias associated with calibration drift with respect to carbon disulfide and vinyl acetate was indicated in a number of samples. Where the discrepancy in %D was observed, the associated sample non-detects were qualified estimated UJ, and where the %D was greater than 40% (for vinyl acetate), the associated sample results were qualified as rejected "R".
- Based on MS/MSD performance with low recoveries of vinyl acetate, the non-detect in the parent sample RW-2-IS-6 is qualified as non-detect estimated "UJ".
- There were several analytes with LCS recoveries below control limits. Associated non-detect sample results were qualified as non-detect estimated "UJ" and detected results as estimated "J". This applies to dichlorodifluoromethane and vinyl acetate in WG300057 and dichlorodifluoromethane in WG300079.

4.2.2 Groundwater Analyses

The review of groundwater analytical results focused on concentrations detected above the reporting limit for the nine primary CVOCs detected at Dunn Field: CT, CF, DCE, tDCE, cDCE, TeCA, PCE, TCA, and TCE. VC, a significant CVOC degradation product, was also considered. The analytical results were compared to the maximum contaminant levels and groundwater target concentrations from Table 2-21G of the *Dunn Field Record of Decision* (CH2M HILL, 2004). Total CVOC concentrations for the wells sampled in April and October 2009 are shown on Figures 6 and 7, respectively.

4.2.2.1 Monitoring Wells

Groundwater samples were collected from 79 monitoring wells in April 2009. Table 8 lists the analytical results for the primary CVOCs and all other analytes detected above the RL in one or more samples. A summary of analytical results for the primary CVOCs is provided on Table 11.

Groundwater samples were collected from 68 monitoring wells in in October 2009. Table 9 lists the analytical results for the primary CVOCs and all other analytes detected above the RL in one or more samples. A summary of analytical results for the primary CVOCs is provided on Table 12.

4.2.2.2 Recovery Wells

Groundwater samples were collected from all 11 recovery wells in April 2009. Table 10 lists the analytical results for the primary CVOCs and all other analytes detected above the RL in one or more samples. A summary of analytical results for the primary CVOCs is provided on Table 13.

5.0 CONCLUSIONS

5.1 SYSTEM OPERATIONS

IRA system operations ended in January 2009. System removal and abandonment of recovery wells was completed in July 2010.

5.2 SYSTEM MONITORING

The RAs on Dunn Field have resulted in significant reduction of CVOC concentrations in groundwater, as seen in total CVOC plume maps for April 2007, April 2008, April 2009 and October 2009 shown in Figure 8. Beginning in 2010, groundwater monitoring at Dunn Field will be performed in accordance with the *Long-Term Groundwater Monitoring Plan* (LTM Plan) in Appendix C of the *Off Depot Groundwater Final Remedial Design, Rev. 1* (CH2M HILL, 2008) and the *Off Depot Groundwater Remedial Action Work Plan, Rev.2* (e^2M, 2009c). Performance monitoring results will be used to assess the effectiveness of the Off Depot air sparging and soil vapor extraction system in cutting off the CVOC plume and LTM will be used to evaluate overall progress in meeting remediation goals.

6.0 REFERENCES

CH2M HILL, 2003. *Memphis Depot Dunn Field Five Year Review.* Prepared for the U.S. Army Engineering and Support Center, Huntsville, Alabama. January 2003.

CH2M HILL, 2004. *Final Dunn Field Record of Decision, Revision 2*. Prepared for the U.S. Army Engineering and Support Center, Huntsville, Alabama. March 2004.

CH2M HILL, 2008. *Off Depot Groundwater Final Remedial Design, Revision 1*. Prepared for the U.S. Army Engineering and Support Center, Huntsville, Alabama. September 2008.

engineering-environmental Management, Inc. (e^2M), 2008. *Second Five Year Review, Revision 1*. Prepared for Air Force Center for Engineering and the Environment. January 2008.

e^2M, 2009a. *Dunn Field Record of Decision Amendment, Revision 3.* Prepared for the Air Force Center for Engineering and the Environment. January 2009.

e^2M, 2009b. *Annual Operations Report – 2008, Dunn Field Groundwater Interim Remedial Action – Year Ten*. Prepared for Air Force Center for Engineering and the Environment. March 2009.

e^2M, 2009c. *Off Depot Groundwater Remedial Action Work Plan, Revision 2*. Prepared for Air Force Center for Engineering and the Environment. April 2009.

HDR, 2010. *Work Plan for IRA System Removal, Dunn Field Defense Depot, Memphis Tennessee.* Prepared for Air Force Center for Engineering and the Environment. May 13, 2010.

HDR|e^2M, 2009. *Source Areas Interim Remedial Action Completion Report, Revision 1*. Prepared for Air Force Center for Engineering and the Environment. September 2009

MACTEC, 2005. *Remedial Action Sampling and Analysis Plan, Revision 1*. Prepared for the Air Force Center for Environmental Excellence. November 2005.

USEPA, 2010. *Preliminary Close Out Report.* United States Environmental Protection Agency. February 2010.

U.S. Geological Survey, 2001. "Users Guide for Polyethylene-Based Diffusion Bag Samplers to Obtain Volatile Organic Compound Concentrations in Wells Part 1, Deployment, recovery, data interpretation, and quality control and assurance," USGS, Columbia, SC, 2001.

TABLES

TABLE 1
RECOVERY WELL ABANDONMENT
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Well	Northing	Easting	Ground Elevation (ft, msl)	Date Abandoned	Well Diameter (inches)	Total Depth (ft, btoc)
RW-01	280267.14	801973.88	294.1	7/7/2010	4	72
RW-01A	280386.26	801990.08	293.9	7/7/2010	4	73
RW-01B	280504.87	802009.37	287.9	7/7/2010	4	68
RW-02	280624.56	802003.32	288.5	7/8/2010	4	70
RW-03	280743.76	802012.69	297.7	7/7/2010	6	78
RW-04	280918.07	802027.11	303.7	7/8/2010	6	85
RW-05	281113.38	802041.97	305.8	7/8/2010	6	92
RW-06	281264.22	802067.17	303.2	7/8/2010	6	87
RW-07	281442.21	802079.19	296.1	7/9/2010	6	80
RW-08	281574.72	802088.53	291.6	7/9/2010	6	81
RW-09	281688.06	802232.41	289.3	7/9/2010	6	75

Notes:
ft, btoc: feet below top of casing
ft, msl: feet mean sea level

TABLE 2
WELL ACTIVITY SUMMARY
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

		April 2009		October 2009	
Well	Aquifer	Water Level Measurement	Groundwater Samples	Water Level Measurement	Groundwater Samples
MW-03	Fluvial	X	LF	X	LF
MW-04	Fluvial	X	LF	X	S
MW-05	Fluvial	X	NS	X	LF
MW-06	Fluvial	X	LF	X	S
MW-07	Fluvial	X	S	X	S
MW-08	Fluvial	X	--	X	--
MW-10	Fluvial	N	LF	X	LF
MW-12	Fluvial	X	--	--	AB
MW-13	Fluvial	X	LF	X	S
MW-14	Fluvial	X	LF	X	S
MW-15	Fluvial	X	LF	X	S
MW-19	Fluvial	X	--	X	--
MW-28	Fluvial	X	--	X	--
MW-29	Fluvial	X	--	--	AB
MW-30	Fluvial	X	--	--	AB
MW-31	Fluvial	X	S	X	S
MW-32	Fluvial	X	S	X	S
MW-33	Fluvial	X	S	X	S
MW-34	Intermediate	X	--	X	--
MW-35	Fluvial	X	--	--	AB
MW-37	Intermediate	X	S	X	S
MW-38	Intermediate	X	--	X	--
MW-40	Intermediate	X	--	--	AB
MW-42	Fluvial	X	--	X	--
MW-43	Intermediate	X	S	X	S
MW-44	Fluvial	X	S	X	S
MW-45	Fluvial	X	--	X	--
MW-51	Fluvial	X	LF	X	S
MW-53	Fluvial	X	--	X	--
MW-54	Fluvial	X	--	X	PM
MW-55	Fluvial	X	--	X	--
MW-56	Fluvial	X	NS	--	AB
MW-57	Fluvial	X	S	X	S
MW-58	Fluvial	X	--	X	LF
MW-59	Fluvial	X	--	--	AB
MW-60	Fluvial	X	--	--	AB
MW-61	Fluvial	X	--	--	AB
MW-62	Fluvial	X	--	X	--
MW-65	Fluvial	X	LF	X	S
MW-67	Memphis	X	S	X	S
MW-68	Fluvial	X	S	--	S
MW-69	Fluvial	X	S	X	S
MW-70	Fluvial	X	S		PM
MW-71	Fluvial	X	S	X	S
MW-74	Fluvial	X	LF	X	S
MW-75	Fluvial	X	LF	X	S
MW-76	Fluvial	X	S		PM
MW-77	Fluvial	X	S		PM
MW-78	Fluvial	X	LF	X	NS
MW-79	Fluvial	X	--		PM
MW-80	Fluvial	X	--	X	--
MW-87	Fluvial	X	LF	X	S
MW-89	Intermediate	X	--	X	--
MW-90	Intermediate	X	--	X	--
MW-91	Fluvial	X	LF	X	LF
MW-95	Fluvial	X	--	--	AB
MW-126	Fluvial	X	--	X	--
MW-127	Fluvial	X	--	X	--
MW-128	Fluvial	X	LF	X	S
MW-129	Fluvial	X	--	X	--

TABLE 2
WELL ACTIVITY SUMMARY
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

		April 2009		October 2009	
Well	Aquifer	Water Level Measurement	Groundwater Samples	Water Level Measurement	Groundwater Samples
MW-130	Fluvial	X	S	X	S
MW-132	Fluvial	X	LF	X	LF
MW-134	Fluvial	N	LF	X	LF
MW-144	Fluvial	X	S	X	S
MW-145	Fluvial	X	S	X	S
MW-147	Fluvial	X	S	X	S
MW-148	Fluvial	X	--	X	PM
MW-149	Fluvial	X	--	X	PM
MW-150	Fluvial	X	--	X	PM
MW-151	Fluvial	X	--	X	PM
MW-152	Fluvial	X	--	X	PM
MW-153	Fluvial	X	S	X	S
MW-154	Fluvial	X	S	X	S
MW-155	Fluvial	X	--	X	PM
MW-156	Fluvial	X	S	--	AB
MW-157	Fluvial	X	S	X	PM
MW-158	Fluvial	X	--	X	PM
MW-158A	Fluvial	X	--	X	PM
MW-159	Fluvial	X	--	X	PM
MW-160	Fluvial	X	--	X	PM
MW-161	Fluvial	X	S	X	PM
MW-162	Fluvial	X	S	X	PM
MW-163	Fluvial	X	S	X	PM
MW-164	Fluvial	X	S	X	PM
MW-165	Fluvial	X	--	X	PM
MW-165A	Fluvial	X	--	X	PM
MW-166	Fluvial	X	--	X	PM
MW-166A	Fluvial	X	--	X	PM
MW-167	Fluvial	X	S	X	S
MW-168	Fluvial	X	S	--	AB
MW-168A	Fluvial	X	S	--	AB
MW-169	Fluvial/Intermediate	X	NS	X	S
MW-170	Fluvial	X	S	X	S
MW-171	Fluvial	X	S	X	S
MW-172	Fluvial	X	LF	X	LF
MW-174	Fluvial	X	LF	X	S
MW-175	Fluvial	X	NS	X	--
MW-176	Fluvial	X	LF	X	S
MW-178	Fluvial	X	LF	X	S
MW-179	Fluvial	X	LF	X	S
MW-180	Fluvial	X	LF	X	S
MW-182	Fluvial	X	LF	X	S
MW-183	Fluvial/Intermediate	X	--	--	AB
MW-184	Fluvial	X	LF	X	LF
MW-185	Fluvial	X	LF	X	S
MW-186	Fluvial	X	LF	X	S
MW-187	Fluvial	X	LF	X	S
MW-190	Fluvial	X	LF	X	S
MW-193	Fluvial	X	--	--	AB
MW-194	Fluvial	X	--	--	AB
MW-220	Fluvial	X	LF	X	LF
MW-221	Fluvial	X	LF	X	S
MW-222	Fluvial	X	LF	X	S
MW-223	Fluvial	X	LF	X	S
MW-224	Fluvial	X	LF	X	S
MW-225	Fluvial	X	LF	X	S
MW-226	Fluvial	X	LF	X	S
MW-227	Fluvial	X	LF	X	S
MW-228	Fluvial	X	LF	X	LF
MW-229	Intermediate	N	--	X	--

TABLE 2
WELL ACTIVITY SUMMARY
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

		April 2009		October 2009	
Well	Aquifer	Water Level Measurement	Groundwater Samples	Water Level Measurement	Groundwater Samples
MW-230	Fluvial	X	LF	X	LF
MW-231	Intermediate	X	LF	X	S
MW-232	Intermediate	X	XS	X	PM
MW-233	Fluvial	N	NS	--	AB
MW-234	Intermediate	X	LF	X	S
MW-235	Fluvial	X	LF	X	S
MW-236	Fluvial	X	LF	--	AB
MW-237	Intermediate	X	LF	X	S
MW-238	Intermediate	X	LF	--	AB
MW-239	Intermediate	X	LF	X	S
MW-240	Intermediate	X	LF	X	S
MW-241	Fluvial	NI	--	X	PM
MW-242	Fluvial	NI	--	X	PM
MW-243	Fluvial	NI	--	X	PM
MW-244	Fluvial	NI	--	X	PM
MW-245	Fluvial	NI	--	X	PM
MW-246	Fluvial	NI	--	X	PM
MW-247	Fluvial	NI	--	X	PM
MW-248	Fluvial	NI	--	X	PM
MW-249	Fluvial	NI	--	X	PM
MW-250	Intermediate	NI	--	X	PM
MW-251	Intermediate	NI	--	X	PM
PZ-02	Fluvial	X	--	--	AB
RW-01	Fluvial	X	G	--	--
RW-01A	Fluvial	X	LF	--	--
RW-01B	Fluvial	X	G	--	--
RW-02	Fluvial	X	G	--	--
RW-03	Fluvial	X	G	--	--
RW-04	Fluvial	X	G	--	--
RW-05	Fluvial	X	G	--	--
RW-06	Fluvial	X	G	--	--
RW-07	Fluvial	X	G	--	--
RW-08	Fluvial	X	G	--	--
RW-09	Fluvial	X	G	--	--
MW-1 TDEC	Fluvial	N	--	X	--
MW-2 TDEC	Fluvial	X	--	X	--
MW-3 TDEC	Fluvial	X	--	X	--
MW-4 TDEC	Fluvial	N	--	--	--

Notes:
- AB: Well abandoned.
- G: Grab sample collected from recovery well.
- LF: Sample collected using low-flow purging methods.
- N: Water level measurement planned but not made.
- NI: Well not installed
- NS: Sample planned but not collected.
- PM: Well sampled for October 2009 Off Depot performance monitroing
- S: Single PDB sample at mid-point of saturated screened interval.
- X: Water level measured.
- XS: Sample not planned but collected
- --: No Action

TABLE 3
WATER LEVEL MEASUREMENTS
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Well	Aquifer	Top of Casing Elevation (ft, msl)	Top of Screen Elevation (ft, msl)	3-Apr-2009 Depth to Water (ft, btoc)	3-Apr-2009 Groundwater Elevation (ft, msl)	19-Oct-2009 Depth to Water (ft, btoc)	19-Oct-2009 Groundwater Elevation (ft, msl)
MW-03	Fluvial	292.35	226.85	66.18	226.17	64.72	227.63
MW-04	Fluvial	301.61	241.61	73.98	227.63	72.34	229.27
MW-05	Fluvial	304.64	244.64	78.39	226.25	76.90	227.74
MW-06	Fluvial	289.11	238.11	62.59	226.52	60.78	228.33
MW-07	Fluvial	295.10	228.10	65.78	229.32	64.37	230.73
MW-08	Fluvial	292.59	236.09	61.51	231.08	60.29	232.30
MW-10	Fluvial	288.79	230.19	--	--	59.80	228.99
MW-12	Fluvial	301.30	231.90	75.00	226.30	--	--
MW-13	Fluvial	300.01	234.01	72.52	227.49	70.80	229.21
MW-14	Fluvial	302.22	237.22	74.43	227.79	73.39	228.83
MW-15	Fluvial	295.12	231.72	68.41	226.71	66.64	228.48
MW-19	Fluvial	290.57	207.47	87.09	203.48	86.65	203.92
MW-28	Fluvial	294.79	240.49	56.02	238.77	54.66	240.13
MW-29	Fluvial	273.22	239.02	38.00	235.22	--	--
MW-30	Fluvial	275.14	236.14	44.95	230.19	--	--
MW-31	Fluvial	290.37	226.27	69.06	221.31	67.38	222.99
MW-32	Fluvial	285.38	232.68	62.91	222.47	61.51	223.87
MW-33	Fluvial	280.71	236.11	55.85	224.86	54.18	226.53
MW-34	Intermediate	299.97	163.37	131.63	168.34	134.95	165.02
MW-35	Fluvial	300.46	230.86	75.60	224.86	--	--
MW-37	Intermediate	284.91	119.21	119.81	165.10	125.36	159.55
MW-38	Intermediate	307.45	167.55	129.09	178.36	130.49	176.96
MW-40	Fluvial/Intermediate	262.23	177.23	81.29	180.94	--	--
MW-42	Fluvial	274.83	225.83	56.36	218.47	55.00	219.83
MW-43	Intermediate	284.99	123.49	119.45	165.54	124.07	160.92
MW-44	Fluvial	269.07	205.07	55.50	213.57	53.62	215.45
MW-45	Fluvial	293.22	235.22	54.97	238.25	54.24	238.98
MW-51	Fluvial	275.23	220.23	40.25	234.98	39.22	236.01
MW-53	Fluvial	306.38	233.88	73.28	233.10	73.03	233.35
MW-54	Fluvial	295.35	210.85	81.07	214.28	78.85	216.50
MW-55	Fluvial	292.08	228.08	70.29	221.79	70.22	221.86
MW-56	Fluvial	293.60	234.60	67.55	226.05	--	--
MW-57	Fluvial	290.77	230.77	63.61	227.16	62.24	228.53
MW-58	Fluvial	290.51	233.51	63.61	226.90	62.63	227.88
MW-59	Fluvial	300.13	227.63	73.09	227.04	--	--
MW-60	Fluvial	296.86	224.36	69.51	227.35	--	--
MW-61	Fluvial	294.04	225.54	66.10	227.94	--	--
MW-62	Fluvial	293.65	207.65	93.85	199.80	93.92	199.73
MW-65	Fluvial	263.22	222.42	2.07	261.15	5.10	258.12
MW-67	Memphis	278.21	18.21	112.22	165.99	118.48	159.73
MW-68	Fluvial	291.69	219.19	66.10	225.59	--	--
MW-69	Fluvial	307.02	224.94	81.40	225.62	79.85	227.17
MW-70	Fluvial	304.99	224.18	79.31	225.68	77.66	227.33
MW-71	Fluvial	294.40	228.90	69.11	225.29	67.38	227.02
MW-74	Fluvial	303.68	233.68	77.56	226.12	75.88	227.80
MW-75	Fluvial	303.61	232.61	77.57	226.04	75.95	227.66
MW-76	Fluvial	302.71	229.71	83.58	219.13	81.59	221.12
MW-77	Fluvial	304.42	236.42	80.72	223.70	81.23	223.19
MW-78	Fluvial	275.00	230.50	47.33	227.67	--	--
MW-79	Fluvial	285.03	202.53	71.60	213.43	69.82	215.21
MW-80	Fluvial	273.81	220.81	60.45	213.36	58.64	215.17
MW-87	Fluvial	294.93	231.93	68.70	226.23	66.86	228.07
MW-89	Intermediate	303.98	156.98	113.95	190.03	114.44	189.54
MW-90	Intermediate	304.19	189.19	114.44	189.75	114.84	189.35
MW-91	Fluvial	291.99	236.99	65.57	226.42	63.75	228.24
MW-95	Fluvial	259.23	219.43	25.72	233.51	--	--

TABLE 3
WATER LEVEL MEASUREMENTS
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Well	Aquifer	Top of Casing Elevation (ft, msl)	Top of Screen Elevation (ft, msl)	3-Apr-2009 Depth to Water (ft, btoc)	3-Apr-2009 Groundwater Elevation (ft, msl)	19-Oct-2009 Depth to Water (ft, btoc)	19-Oct-2009 Groundwater Elevation (ft, msl)
MW-126	Fluvial	252.22	236.22	13.77	238.45	14.78	237.44
MW-127	Fluvial	268.71	208.71	59.74	208.97	58.80	209.91
MW-128	Fluvial	284.14	229.39	39.28	244.86	39.30	244.84
MW-129	Fluvial	293.01	228.01	55.60	237.41	54.45	238.56
MW-130	Fluvial	293.20	233.70	55.11	238.09	53.84	239.36
MW-132	Fluvial	300.73	227.23	74.72	226.01	73.04	227.69
MW-134	Fluvial	300.81	225.81	--	--	72.72	228.09
MW-144	Fluvial	291.60	235.10	74.05	217.55	71.95	219.65
MW-145	Fluvial	284.72	204.72	70.84	213.88	69.81	214.91
MW-147	Fluvial	289.72	229.72	70.30	219.42	68.33	221.39
MW-148	Fluvial	294.71	224.71	78.55	216.16	76.33	218.38
MW-149	Fluvial	287.18	205.78	73.22	213.96	71.14	216.04
MW-150	Fluvial	296.81	225.61	88.15	208.66	79.89	216.92
MW-151	Fluvial	284.27	207.27	70.35	213.92	68.35	215.92
MW-152	Fluvial	289.59	198.59	75.88	213.71	74.01	215.58
MW-153	Fluvial	279.17	203.17	65.66	213.51	64.12	215.05
MW-154	Fluvial	273.81	220.81	57.82	215.99	57.58	216.23
MW-155	Fluvial	291.65	214.65	77.29	214.36	75.17	216.48
MW-156	Fluvial	269.15	213.71	57.12	212.03	--	--
MW-157	Fluvial	286.78	229.78	71.11	215.67	68.84	217.94
MW-158	Fluvial	294.07	203.06	80.24	213.83	78.24	215.83
MW-158A	Fluvial	293.95	216.03	80.14	213.81	78.18	215.77
MW-159	Fluvial	286.33	205.89	72.55	213.78	70.39	215.94
MW-160	Fluvial	294.00	228.13	79.21	214.79	76.11	217.89
MW-161	Fluvial	296.40	234.60	77.59	218.81	75.61	220.79
MW-162	Fluvial	299.70	233.39	81.22	218.48	79.19	220.51
MW-163	Fluvial	290.63	234.42	73.66	216.97	71.46	219.17
MW-164	Fluvial	287.48	231.86	69.73	217.75	67.72	219.76
MW-165	Fluvial	287.06	198.43	73.72	213.34	71.40	215.66
MW-165A	Fluvial	287.26	215.96	73.55	213.71	71.58	215.68
MW-166	Fluvial	283.44	199.59	69.60	213.84	66.90	216.54
MW-166A	Fluvial	283.45	215.15	69.61	213.84	67.07	216.38
MW-167	Fluvial	284.82	214.68	71.54	213.28	69.60	215.22
MW-168	Fluvial	283.95	177.75	70.22	213.73	--	--
MW-168A	Fluvial	283.20	204.42	69.50	213.70	--	--
MW-169	Fluvial/Intermediate	261.90	194.12	79.89	182.01	75.60	186.30
MW-170	Fluvial	273.75	214.14	58.48	215.27	56.71	217.04
MW-171	Fluvial	270.69	217.72	56.15	214.54	54.44	216.25
MW-172	Fluvial	300.28	232.28	72.89	227.39	71.33	228.95
MW-174	Fluvial	296.56	229.56	69.63	226.93	67.92	228.64
MW-175	Fluvial	291.63	224.13	64.70	226.93	72.85	218.78
MW-176	Fluvial	299.68	223.68	73.44	226.24	71.65	228.03
MW-178	Fluvial	300.26	224.26	75.51	224.75	71.74	228.52
MW-179	Fluvial	301.16	224.16	75.64	225.52	72.93	228.23
MW-180	Fluvial	296.14	224.14	69.74	226.40	68.24	227.90
MW-182	Fluvial	275.40	213.40	64.15	211.25	63.62	211.78
MW-183	Fluvial/Intermediate	275.59	114.59	110.62	164.97	--	--
MW-184	Fluvial	283.12	225.12	65.64	217.48	63.65	219.47
MW-185	Fluvial	256.71	171.71	76.15	180.56	75.49	181.22
MW-186	Fluvial	256.31	108.31	79.85	176.46	82.18	174.13
MW-187	Fluvial	302.74	226.74	75.21	227.53	72.43	230.31
MW-190	Fluvial	297.32	219.32	78.71	218.61	76.74	220.58
MW-193	Fluvial	293.28	222.28	78.71	214.57	--	--
MW-194	Fluvial	293.26	219.26	75.75	217.51	--	--
MW-220	Fluvial	293.29	228.35	74.42	218.87	64.92	228.37
MW-221	Fluvial	301.52	228.40	66.43	235.09	73.91	227.61

TABLE 3
WATER LEVEL MEASUREMENTS
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Well	Aquifer	Top of Casing Elevation (ft, msl)	Top of Screen Elevation (ft, msl)	3-Apr-2009 Depth to Water (ft, btoc)	3-Apr-2009 Groundwater Elevation (ft, msl)	19-Oct-2009 Depth to Water (ft, btoc)	19-Oct-2009 Groundwater Elevation (ft, msl)
MW-222	Fluvial	303.82	229.64	75.33	228.49	75.50	228.32
MW-223	Fluvial	303.00	229.13	--	--	74.51	228.49
MW-224	Fluvial	304.13	230.42	76.51	227.62	75.74	228.39
MW-225	Fluvial	304.52	229.54	77.41	227.11	76.46	228.06
MW-226	Fluvial	303.19	228.97	78.75	224.44	70.70	232.49
MW-227	Fluvial	299.70	236.06	76.34	223.36	70.84	228.86
MW-228	Fluvial	301.65	237.56	72.56	229.09	72.74	228.91
MW-229	Fluvial	311.77	123.34	74.37	237.40	151.76	160.01
MW-230	Fluvial	286.57	227.32	54.81	231.76	53.27	233.30
MW-231	Intermediate	289.18	121.43	125.25	163.93	129.47	159.71
MW-232	Intermediate	285.18	135.13	119.71	165.47	124.90	160.28
MW-233	Fluvial	289.53	231.88	--	--	--	--
MW-234	Intermediate	291.50	124.91	126.31	165.19	131.70	159.80
MW-235	Fluvial	264.00	213.41	56.22	207.78	56.64	207.36
MW-236	Fluvial	261.38	236.73	17.62	243.76	--	--
MW-237	Intermediate	289.18	122.73	124.90	164.28	128.93	160.25
MW-238	Intermediate	300.45	119.90	134.80	165.65	--	--
MW-239	Intermediate	288.44	122.97	123.58	164.86	127.81	160.63
MW-240	Intermediate	259.28	172.71	76.89	182.39	76.32	182.96
MW-241	Fluvial	292.82	219.57	NI	--	75.25	217.57
MW-242	Fluvial	295.40	222.20	NI	--	78.85	216.55
MW-243	Fluvial	292.26	211.56	NI	--	76.27	215.99
MW-244	Fluvial	288.72	212.39	NI	--	72.68	216.04
MW-245	Fluvial	290.13	205.40	NI	--	74.40	215.73
MW-246	Fluvial	288.17	202.97	NI	--	72.51	215.66
MW-247	Fluvial	285.70	205.70	NI	--	70.02	215.68
MW-248	Fluvial	275.45	207.94	NI	--	59.87	215.58
MW-249	Fluvial	285.53	207.49	NI	--	69.73	215.80
MW-250	Intermediate	289.66	120.96	NI	--	130.03	159.63
MW-251	Intermediate	285.83	125.63	NI	--	126.00	159.83
PZ-02	Fluvial	284.39	240.39	39.09	245.30	--	--
RW-01	Fluvial	295.71	229.57	68.45	227.26	--	--
RW-01A	Fluvial	295.42	228.43	68.83	226.59	--	--
RW-01B	Fluvial	289.17	227.48	62.70	226.47	--	--
RW-02	Fluvial	289.92	225.93	63.70	226.22	--	--
RW-03	Fluvial	299.34	231.40	73.10	226.24	--	--
RW-04	Fluvial	305.11	230.48	79.01	226.10	--	--
RW-05	Fluvial	307.13	226.09	81.28	225.85	--	--
RW-06	Fluvial	304.56	227.94	78.64	225.92	--	--
RW-07	Fluvial	297.44	228.33	71.55	225.89	--	--
RW-08	Fluvial	292.99	222.84	67.03	225.96	--	--
RW-09	Fluvial	290.67	225.98	63.23	227.44	--	--
MW-1-TDEC	Fluvial	275.83	--	--	--	27.19	248.64
MW-2-TDEC	Fluvial	272.13	--	24.31	247.82	24.50	247.63
MW-3-TDEC	Fluvial	265.28	--	7.90	257.38	9.53	255.75
MW-4-TDEC	Fluvial	263.81	--	--	--	--	--

Notes:
ft, btoc feet below top of casing
ft, msl: feet mean seal level
NA: Not Available
NI: Not Installed
--: Not Measured

TABLE 4
PDB SAMPLE INTERVALS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Monitoring Well	Date Collected	Measured Well Depth (ft, bgs)	Depth to Water (ft, btoc)	Sample Depth (ft, btoc)
MW-07	4/15/2009	73.2	65.85	72.7
MW-31	4/14/2009	83.3	69.30	77.3
MW-32	4/15/2009	68.1	62.96	65.9
MW-33	4/15/2009	62.7	57.03	58.8
MW-37	4/15/2009	184.7	120.55	172.3
MW-43	4/14/2009	171.7	119.63	164.0
MW-44	4/14/2009	74.4	55.71	69.4
MW-57	4/15/2009	70.2	53.73	67.1
MW-67	4/14/2009	277.7	112.82	267.9
MW-68	4/14/2009	81.6	66.28	78.2
MW-69	4/15/2009	95.6	81.54	88.6
MW-70	4/15/2009	93.7	79.45	86.2
MW-71	4/15/2009	78.1	69.25	74.3
MW-76	4/14/2009	94.0	83.68	90.0
MW-77	4/15/2009	89.2	80.73	85.6
MW-130	4/15/2009	81.0	55.25	69.3
MW-144	4/15/2009	76.3	75.19	75.7
MW-145	4/14/2009	96.7	71.08	91.0
MW-147	4/14/2009	77.9	70.41	77.3
MW-153	4/14/2009	96.0	65.92	86.8
MW-154	4/14/2009	66.8	57.94	61.0
MW-156	4/14/2009	69.4	57.22	66.4
MW-157	4/14/2009	77.1	71.31	74.9
MW-161	4/14/2009	81.4	77.67	81.0
MW-162	4/14/2009	86.7	81.30	85.9
MW-163	4/14/2009	76.8	73.76	75.8
MW-164	4/14/2009	75.3	69.73	74.3
MW-167	4/14/2009	82.7	71.50	80.3
MW-168	4/15/2009	120.5	70.57	114.0
MW-168A	4/15/2009	88.2	69.82	81.3
MW-170	4/14/2009	79.8	58.82	69.7
MW-171	4/14/2009	68.3	56.42	63.0
MW-232	4/15/2009	170.6	120.35	162.4

Notes:
ft, bgs: feet below ground surface
ft, btoc: feet below top of casing
PDB: passive diffision bag
>: greater than

TABLE 5
FINAL MONITORING WELL STABILIZATION MEASUREMENTS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Well ID	Sample Date	Method	Time	Sample Pump Depth (ft, btoc)	Water Depth (ft, btoc)	Purge Rate (mL/min)	Volume Purged (Liters)	pH	Temp (˚C)	Specific Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTUs)
MW-3	4/17/2009	low flow	13:45	73.2	66.2	240	4.6	6.0	25.1	0.339	0.0	163.8	7.2
MW-4	4/21/2009	low flow	11:35	70.5	74.0	140	9.0	6.2	16.5	0.245	10.3	147.7	19.7
MW-6	4/22/2009	low flow	14:50	68.8	62.6	210	5.8	5.5	18.8	3.372	5.2	186.7	1.2
MW-10	4/15/2009	low flow	11:56	66.0	61.1	120	7.4	6.6	26.4	0.397	11.0	152.4	6.4
MW-13	4/21/2009	low flow	10:25	78.4	72.5	230	14.1	6.1	16.9	0.278	10.9	114.6	17.3
MW-14	4/21/2009	low flow	15:05	75.0	74.6	160	6.6	5.9	19.0	0.184	4.4	149.5	20.0
MW-15	4/20/2009	low flow	9:25	77.0	65.5	230	11.8	5.9	16.5	0.201	2.1	154.1	13.2
MW-51	4/20/2009	low flow	13:10	60.0	40.2	260	7.9	5.8	18.5	0.284	6.1	142.1	19.4
MW-65	4/20/2009	low flow	11:15	45.8	1.7	350	14.0	6.3	19.4	0.462	1.9	117.6	15.3
MW-74	4/22/2009	low flow	9:10	85.0	77.6	230	10.0	6.2	22.1	0.434	5.2	142.5	14.8
MW-75	4/22/2009	low flow	11:55	86.0	77.6	220	22.5	5.9	19.0	0.247	3.3	150.8	20.0
MW-78	4/21/2009	low flow	8:45	55.0	47.2	300	10.6	6.0	17.1	0.516	1.3	68.3	16.9
MW-87	4/23/2009	low flow	9:50	70.0	68.6	260	27.9	6.1	18.3	0.199	8.5	155.2	19.8
MW-91	4/22/2009	low flow	14:02	62.0	66.5	240	4.9	5.9	18.5	0.205	4.1	157.2	11.6
MW-128	4/20/2009	low flow	15:45	70.3	39.3	350	42.0	6.3	19.2	0.450	5.6	116.4	36.5
MW-132	4/23/2009	low flow	12:15	84.0	74.7	200	4.8	5.8	29.0	0.240	0.0	147.2	9.5
MW-134	4/17/2009	low flow	8:40	84.0	74.4	100	3.1	6.1	20.3	0.235	0.0	144.6	0.0
MW-172	4/16/2009	low flow	9:55	76.1	73.2	200	20.4	5.9	22.0	0.204	4.1	168.4	13.9
MW-174	4/16/2009	low flow	14:35	75.0	69.7	200	13.5	5.9	20.2	0.190	4.3	177.5	5.0
MW-176	4/23/2009	low flow	10:55	91.0	73.4	200	9.2	5.9	19.1	0.228	5.2	171.3	16.6
MW-178	4/20/2009	low flow	13:40	83.0	73.5	230	8.6	6.1	26.0	0.296	4.4	144.9	19.6
MW-179	4/17/2009	low flow	12:50	82.0	74.6	210	6.6	5.7	20.9	0.220	0.0	159.7	19.9
MW-180	4/15/2009	low flow	10:10	78.6	70.0	220	9.3	6.1	19.6	0.277	2.8	151.3	2.1
MW-182	4/20/2009	low flow	9:48	71.0	64.2	210	22.0	6.0	15.5	0.293	9.8	158.4	20.0
MW-184	4/23/2009	low flow	9:18	bow	65.4	200	10.0	6.0	16.1	0.365	5.8	115.9	9.1
MW-185	4/21/2009	low flow	13:53	90.0	75.9	300	10.9	6.3	18.3	0.403	11.8	1.7	16.1
MW-186	4/21/2009	low flow	16:15	153.0	79.9	290	29.0	6.2	18.2	0.502	8.7	3.6	19.7
MW-187	4/21/2009	low flow	8:40	83.6	75.2	200	11.0	5.8	20.7	0.192	3.3	148.8	19.5
MW-190	4/23/2009	low flow	12:57	83.0	78.7	290	14.5	6.1	18.8	0.286	8.8	137.4	9.9
MW-220	4/23/2009	low flow	13:00	77.6	66.4	250	4.3	6.1	34.1	0.347	0.0	103.3	0.5
MW-221	4/16/2009	low flow	12:55	85.0	74.4	160	4.0	6.0	31.5	0.265	0.0	86.7	10.0
MW-222	4/16/2009	low flow	12:00	80.7	77.1	170	6.0	6.2	31.9	0.302	0.0	15.0	15.2
MW-223	4/17/2009	low flow	11:50	88.0	76.8	240	6.7	6.0	27.5	0.262	0.0	121.7	7.0
MW-224	4/15/2009	low flow	8:55	84.0	77.5	250	10.7	6.0	26.1	0.241	5.2	144.1	7.2
MW-225	4/20/2009	low flow	11:35	85.0	78.1	190	19.1	6.1	29.6	0.294	0.0	67.9	20.0
MW-226	4/17/2009	low flow	9:45	84.0	76.5	150	4.4	6.0	33.4	0.269	0.0	148.3	15.1
MW-227	4/21/2009	low flow	13:43	76.0	72.5	200	4.2	5.7	32.3	0.510	0.0	175.2	0.1

TABLE 5
FINAL MONITORING WELL STABILIZATION MEASUREMENTS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Well ID	Sample Date	Method	Time	Sample Pump Depth (ft, btoc)	Water Depth (ft, btoc)	Purge Rate (mL/min)	Volume Purged (Liters)	pH	Temp (˚C)	Specific Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTUs)
MW-228	4/16/2009	low flow	10:55	77.0	74.6	210	7.9	5.9	31.7	0.214	2.0	159.5	0.0
MW-230	4/15/2009	low flow	15:00	82.5	54.7	240	13.1	5.8	17.4	0.292	2.1	174.8	19.9
MW-231	4/17/2009	low flow	13:18	185.3	125.4	220	6.7	6.4	18.6	0.798	1.9	-44.7	9.0
MW-234	4/17/2009	low flow	12:18	172.0	125.2	250	10.2	6.4	18.8	0.340	2.2	-20.1	4.2
MW-235	4/17/2009	low flow	9:09	59.0	55.9	200	14.1	5.8	16.2	0.296	6.7	109.4	19.9
MW-236	4/17/2009	low flow	10:23	30.0	11.1	230	10.5	6.8	19.8	0.530	5.8	85.9	18.4
MW-237	4/16/2009	low flow	14:45	171.9	123.6	240	7.4	6.2	18.3	0.336	3.8	57.3	14.0
MW-238	4/23/2009	low flow	15:18	186.0	132.1	200	20.4	6.6	29.6	0.382	1.0	-68.6	19.9
MW-239	4/16/2009	low flow	13:50	170.9	119.9	80	5.5	9.0	19.2	0.230	15.0	58.4	14.6
MW-240	4/17/2009	low flow	14:28	91.4	77.1	300	8.8	6.7	19.8	0.768	5.0	88.9	14.4
RW-1A	4/14/2009	low flow	14:05	74.5	69.0	200	4.4	6.0	17.9	0.194	10.2	139.1	0.0

Notes:

˚C:	degrees Celsius	mL/min:	milliliters per minute
DO:	Dissolved Oxygen	mS/cm:	milliSiemens per centimeter
ft, btoc:	feet below top of casing	mV:	millivolts
L:	liters	NTUs:	nephelometric turbidity units
mg/L:	milligrams per liter	ORP:	Oxidation Reduction Potential

TABLE 6
PDB SAMPLE INTERVALS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Monitoring Well	Date Collected	Top of Screen Depth (ft, btoc)	Screen Length (ft)	Depth to Water (ft, btoc)	Sample Depth[1] (ft, btoc)
MW-04	10/14/2009	60.0	20.0	72.38	76.5
MW-06	10/13/2009	51.0	20.0	60.69	66.4
MW-07	10/13/2009	67.0	10.0	64.38	75.1
MW-13	10/14/2009	66.0	15.0	70.81	76.3
MW-14	10/13/2009	65.0	15.0	73.42	76.5
MW-15	10/13/2009	63.4	15.0	66.66	73.1
MW-31	10/14/2009	64.1	15.0	67.25	77.0
MW-32	10/14/2009	52.7	15.0	61.50	66.8
MW-33	10/14/2009	44.6	15.0	54.07	59.2
MW-37	10/14/2009	165.7	15.0	125.12	173.3
MW-43	10/15/2009	161.5	10.0	123.66	167.3
MW-44	10/15/2009	64.0	10.0	53.42	69.8
MW-51	10/15/2009	55.0	10.0	39.13	60.0
MW-57	10/13/2009	60.0	10.0	62.26	68.3
MW-65	10/15/2009	40.8	10.0	3.83	43.0
MW-67	10/15/2009	260.0	15.0	117.96	268.3
MW-68	10/14/2009	72.5	10.0	64.59	78.3
MW-69	10/14/2009	82.1	10.0	79.91	89.6
MW-71	10/14/2009	65.5	10.0	67.29	74.3
MW-74	10/14/2009	70.0	20.0	75.81	83.2
MW-75	10/14/2009	71.0	20.0	75.95	83.8
MW-87	10/13/2009	63.0	15.0	66.81	73.1
MW-128	10/15/2009	54.8	20.0	39.03	64.5
MW-130	10/15/2009	59.5	20.0	53.70	70.3
MW-144	10/14/2009	56.8	20.0	71.86	75.7
MW-145	10/15/2009	80.1	20.0	68.69	90.8
MW-147	10/14/2009	60.3	20.0	68.24	79.4
MW-153	10/14/2009	76.1	20.0	63.93	86.8
MW-154	10/15/2009	53.3	10.0	57.54	61.5
MW-167	10/15/2009	70.5	15.0	69.58	80.1
MW-169	10/14/2009	68.1	20.0	75.31	87.1
MW-170	10/14/2009	59.8	20.0	56.55	70.9
MW-171	10/14/2009	53.3	15.0	54.23	63.8
MW-174	10/13/2009	67.0	10.0	68.91	72.8
MW-176	10/13/2009	76.0	10.0	71.60	81.0
MW-178	10/14/2009	76.0	10.0	71.72	81.0
MW-179	10/14/2009	77.0	10.0	73.00	82.0
MW-180	10/13/2009	72.0	10.0	69.31	77.0
MW-182	10/15/2009	62.0	10.0	63.46	68.0
MW-185	10/14/2009	85.0	10.0	75.33	90.0
MW-186	10/14/2009	148.0	10.0	82.09	153.0
MW-187	10/14/2009	76.0	10.0	73.34	81.0
MW-190	10/14/2009	78.0	10.0	76.66	83.2
MW-221	10/13/2009	73.1	15.0	73.85	81.2
MW-222	10/14/2009	74.2	15.0	75.55	82.5
MW-223	10/14/2009	73.9	15.0	74.40	82.0
MW-224	10/14/2009	73.7	15.0	75.74	82.5
MW-225	10/13/2009	75.0	15.0	76.40	83.5

TABLE 6
PDB SAMPLE INTERVALS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Monitoring Well	Date Collected	Top of Screen Depth (ft, btoc)	Screen Length (ft)	Depth to Water (ft, btoc)	Sample Depth[1] (ft, btoc)
MW-226	10/14/2009	74.2	15.0	74.69	82.2
MW-227	10/13/2009	63.6	15.0	70.84	75.0
MW-231	10/14/2009	167.8	25.5	129.29	190.0
MW-234	10/14/2009	166.6	10.2	131.70	172.0
MW-235	10/15/2009	50.6	10.2	54.60	58.0
MW-237	10/15/2009	166.5	10.2	128.59	177.0
MW-239	10/15/2009	165.5	10.2	128.09	171.0
MW-240	10/14/2009	86.6	10.2	76.03	92.0

Notes:
ft, bgs: feet below ground surface
ft, btoc: feet below top of casing
PDB: passive diffision bag
1) Sample depth is to PDB mid-point

TABLE 7
FINAL MONITORING WELL STABILIZATION MEASUREMENTS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Well ID	Sample Date	Method	Time	Sample Pump Depth (ft, btoc)	Water Depth (ft, btoc)	Purge Rate (mL/min)	Volume Purged (Liters)	pH	Temp (°C)	Specific Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTUs)
MW-3	10/13/2009	low flow	13:07	73.2	64.8	140	3.5	6.0	23.8	0.411	2.9	121.6	9.2
MW-5	10/13/2009	low flow	11:36	83.1	77.0	60	4.0	6.8	18.4	0.370	9.8	116.2	15.6
MW-10	10/15/2009	low flow	10:40	66.0	60.5	100	5.0	6.3	24.1	0.343	8.9	84.7	17.0
MW-58	10/15/2009	low flow	13:09	67.3	62.7	280	25.6	5.8	18.0	0.202	8.3	166.8	19.5
MW-91	10/14/2009	low flow	10:50	62.0	63.8	280	3.6	5.9	17.6	0.279	6.6	120.8	8.5
MW-132	10/14/2009	low flow	14:21	84.0	73.0	160	5.6	5.6	28.8	0.239	4.1	143.0	4.7
MW-134	10/15/2009	low flow	9:09	78.2	72.7	80	4.0	5.8	22.1	0.263	1.9	120.7	18.1
MW-172	10/14/2009	low flow	8:44	76.1	71.3	60	3.0	6.1	21.6	0.271	8.2	104.7	10.9
MW-184	10/14/2009	low flow	16:12	85.8	64.0	200	4.0	5.9	16.6	0.352	9.2	152.7	11.0
MW-220	10/13/2009	low flow	15:07	77.6	65.0	180	5.4	6.0	27.8	0.423	1.2	139.2	0.9
MW-228	10/14/2009	low flow	10:00	77.0	72.8	200	4.0	5.8	29.3	0.250	4.4	113.9	15.0
MW-230	10/14/2009	low flow	15:15	82.5	53.4	160	3.2	5.9	17.5	0.297	4.8	143.9	15.2

Notes:

˚C:	degrees Celsius	mL/min:	milliliters per minute
DO:	Dissolved Oxygen	mS/cm:	milliSiemens per centimeter
ft, btoc:	feet below top of casing	mV:	millivolts
L :	liters	NTUs:	nephelometric turbidity units
mg/L:	milligrams per liter	ORP:	Oxidation Reduction Potential

TABLE 8
ANALYTICAL RESULTS SUMMARY, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID			MW-03	MW-04	MW-06	MW-07	MW-10	MW-13	MW-14
	Lab ID			L09040457-17	L09040532-12	L09040624-01	L09040408-10	L09040408-01	L09040532-13	L09040532-14
	Date			4/17/2009	4/21/2009	4/22/2009	4/15/2009	4/15/2009	4/21/2009	4/21/2009
Analyte	**units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	**3.23**	<0.5	**29**	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	**10.7**	<1	<1	**35.6**	0.769 J	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	0.447 J	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	<1	0.463 J	<1	<1	<1	0.743 J
Chloroform	µg/L	80	12	0.14 J	**0.328**	**6.17**	**0.357**	**0.72**	0.142 J	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	**4.91**	0.472 J	**1.04**	<1	<1
Tetrachloroethene	µg/L	5	2.5	**9.13**	<1	0.254 J	**70.6**	**1.41**	<1	0.507 J
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	0.327 J	<1	<1
Trichloroethene	µg/L	5	5	**9.26**	<1	**2.53**	**40.9**	**7.11**	<1	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				29.2	0.328	17.6	148	40.4	0.142	1.25
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	0.893 J	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	0.34 J	<1	<1	**1.67**	<1	<1	<1
Acetone	µg/L	--	--	<10	3.62 UB	<10	**15.8**	<10	<10	<10
Carbon disulfide	µg/L	--	--	<1	<1	<1	<1 UJ	<1 UJ	<1	<1

Notes:
µg/L: micrograms per liter
-- : Not Listed
MCL: Maximum Contaminant Level
MDL: Method Detection Limit
RL: Reporting Limit
TC: Target Concentration
Results detected at or above RL shown in bold.

DQE Flags:
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UJ: non-detect, estimated
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Methods:
8260B: Volatile Organic Compounds

TABLE 8
ANALYTICAL RESULTS SUMMARY, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Lab ID / Date / units	MCL	TC	MW-15 L09040532-08 4/20/2009	MW-31 L09040369-09 4/14/2009	MW-32 L09040408-12 4/15/2009	MW-33 L09040408-13 4/15/2009	MW-37 L09040408-14 4/15/2009	MW-43 L09040369-11 4/14/2009	MW-44 L09040369-12 4/14/2009
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	**0.963**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	**35**	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	0.345 J	0.346 J	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	0.513 J	<1	<1	0.474 J	<1	<1	0.5 J
Chloroform	µg/L	80	12	**0.524**	0.186 J	**0.593**	0.184 J	<0.3	<0.3	0.266 J
cis-1,2-Dichloroethene	µg/L	70	35	<1	0.26 J	**3.03**	<1	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	0.612 J	**43.5**	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	0.289 J	**33.4**	**4.41**	<1	<1	<1	0.252 J
Vinyl chloride	µg/L	2	--	<1	<1	0.495 J	<1	<1	<1	<1
Total Primary CVOCs				2.90	112	8.53	0.658	0	0	1.02
1,1,1-Trichloroethane	µg/L	200	--	<1	0.769 J	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	**1.11**	<1	<1	<1	<1	<1
Acetone	µg/L	--	--	<10	**38.9**	**17.8**	**14.9**	**17**	**20.8**	**19.7**
Carbon disulfide	µg/L	--	--	<1	<1	<1 UJ	<1 UJ	<1 UJ	<1	<1

Notes:
µg/L: micrograms per liter
-- : Not Listed
MCL: Maximum Contaminant Level
MDL: Method Detection Limit
RL: Reporting Limit
TC: Target Concentration
Results detected at or above RL shown in bold.

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Methods:
8260B: Volatile Organic Compounds

TABLE 8
ANALYTICAL RESULTS SUMMARY, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID			MW-51	MW-57	MW-65	MW-67	MW-68	MW-69	MW-70
	Lab ID			L09040532-02	L09040408-15	L09040532-05	L09040369-13	L09040369-14	L09040408-16	L09040408-17
	Date			4/20/2009	4/15/2009	4/20/2009	4/14/2009	4/14/2009	4/15/2009	4/15/2009
Analyte	**units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**1.98**
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	**20.3**	0.538 J	<1	<1	**1.82**	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	**1.82**	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	**0.449**	**73**	<0.3	<0.3	0.147 J	0.206 J	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	**1.44**	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	**1.01**	1.17	<1	<1	**1.75**	0.308 J	0.58 J
trans-1,2-Dichloroethene	µg/L	100	50	<1	0.567 J	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	**6.32**	**28.7**	<1	<1	**1.41**	**1.74**	**4.95**
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				28.1	107	0	0	5.13	2.25	7.51
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1
Acetone	µg/L	--	--	<10	5.44 J	<10	**21.3**	**22.8**	**13.3**	**11.4**
Carbon disulfide	µg/L	--	--	<1	<1 UJ	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
-- : Not Listed
MCL: Maximum Contaminant Level
MDL: Method Detection Limit
RL: Reporting Limit
TC: Target Concentration
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8260B: Volatile Organic Compounds

TABLE 8
ANALYTICAL RESULTS SUMMARY, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID			MW-71	MW-74	MW-75	MW-76	MW-77	MW-78	MW-87
	Lab ID			L09040408-18	L09040624-03	L09040624-04	L09040369-15	L09040408-19	L09040532-18	L09040624-10
	Date			4/15/2009	4/22/2009	4/22/2009	4/14/2009	4/15/2009	4/21/2009	4/23/2009
Analyte	**units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	**4.42**	**19.8**	0.356 J	**0.864**	**28.3**	<0.5	**0.939**
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	0.683 J	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	**8.79**	<0.3	0.129 J	0.152 J	0.13 J	<0.3	0.148 J
cis-1,2-Dichloroethene	µg/L	70	35	0.262 J	<1	<1	<1	0.447 J	<1	<1
Tetrachloroethene	µg/L	5	2.5	0.265 J	0.521 J	0.46 J	0.444 J	**1.49**	<1	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	**3.93**	**4.05**	<1	**2.74**	**21.9**	<1	<1
Vinyl chloride	µg/L	2	--	<1	<1 UJ	<1 UJ	<1	<1	<1	<1
Total Primary CVOCs				18.4	24.4	0.945	4.2	52.3	0	1.09
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1
Acetone	µg/L	--	--	**19.6**	3.67 J	<10	**19.4**	**16.1**	2.52 UB	<10
Carbon disulfide	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
-- : Not Listed
MCL: Maximum Contaminant Level
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TABLE 8
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2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	**Well ID** **Lab ID** **Date** **units**	MCL	TC	MW-91 L09040624-05 4/22/2009	MW-128 L09040532-06 4/20/2009	MW-130 L09040408-20 4/15/2009	MW-132 L09040624-11 4/23/2009	MW-134 L09040457-19 4/17/2009	MW-144 L09040408-21 4/15/2009	MW-145 L09040369-16 4/14/2009
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	**0.92**	<0.5	<0.5	<0.5	<0.5	**403**	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	**1.06**	<1
1,1-Dichloroethene	µg/L	7	7	<1	**24.9**	**60.3**	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	**0.701**	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	0.449 J	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	**0.538**	<0.3	0.237 J	<0.3	<0.3	**1.19**	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	0.925 J	<1	<1	**12.9**	<1
Tetrachloroethene	µg/L	5	2.5	0.677 J	<1	**127**	0.553 J	0.328 J	**1.56**	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	**2.61**	<1
Trichloroethene	µg/L	5	5	<1	**4.12**	**75.1**	0.749 J	**2.13**	**179**	<1
Vinyl chloride	µg/L	2	--	<1 UJ	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				2.58	29.0	264	1.30	2.46	601	0
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	**2.48**	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	**3.11**	<1	<1	<1	<1
Acetone	µg/L	--	--	3.83 J	<10	**13.4**	<10	3.35 UB	**11.5**	**23**
Carbon disulfide	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
-- : Not Listed
MCL: Maximum Contaminant Level
MDL: Method Detection Limit
RL: Reporting Limit
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2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	**Well ID** **Lab ID** **Date** **units**	MCL	TC	MW-147 L09040369-17 4/14/2009	MW-153 L09040369-18 4/14/2009	MW-154 L09040369-19 4/14/2009	MW-156 L09040369-20 4/14/2009	MW-157 L09040369-21 4/14/2009	MW-161 L09040369-01 4/14/2009	MW-162 L09040369-02 4/14/2009
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5	<0.5	**9.47**	**181**	**107**
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	0.288 J	0.365 J	<2
1,1-Dichloroethene	µg/L	7	7	<1	**5.16**	<1	<1	<1	<1	<2
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	**6.25**	<1	<2
Chloroform	µg/L	80	12	<0.3	<0.3	<0.3	<0.3	**17.1**	0.222 J	<0.6
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	<1	**14.8**	**2.1**	0.579 J
Tetrachloroethene	µg/L	5	2.5	<1	<1	<1	<1	**2.68**	**1.08**	1.99 J
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	**2.75**	<1	<2
Trichloroethene	µg/L	5	5	<1	<1	<1	<1	**286**	**97.4**	**74.6**
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<2
Total Primary CVOCs				0	5.16	0	0	339	282	184
1,1,1-Trichloroethane	µg/L	200	--	<1	0.868 J	<1	<1	<1	<1	<2
1,1-Dichloroethane	µg/L	--	--	<1	0.377 J	<1	<1	<1	<1	<2
Acetone	µg/L	--	--	**14.1**	**10.8**	**23**	**11.5**	<10	**17.7**	15.3 J
Carbon disulfide	µg/L	--	--	<1	<1	<1	<1	<1	<1	<2

Notes:
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DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	**Well ID** **Lab ID** **Date** **units**	MCL	TC	MW-163 L09040369-03 4/14/2009	MW-164 L09040369-04 4/14/2009	MW-167 L09040369-05 4/14/2009	MW-168 L09040408-22 4/15/2009	MW-168A L09040408-23 4/15/2009	MW-170 L09040369-06 4/14/2009	MW-171 L09040369-07 4/14/2009
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	**233**	**20.8**	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<2	**1.07**	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<2	<1	<1	0.637 J	**6.8**	<1	<1
1,2-Dichloroethane	µg/L	5	--	<1	0.299 J	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<2	**10.4**	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	**0.769**	**76.1**	<0.3	<0.3	**0.434**	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	**2.15**	**17.4**	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	0.802 J	**1.89**	<1	<1	0.431 J	<1	<1
trans-1,2-Dichloroethene	µg/L	100	50	<2	**1.61**	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	**85.7**	**93.3**	<1	0.347 J	<1	<1	<1
Vinyl chloride	µg/L	2	--	<2	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				322	223	0	0.984	7.67	0	0
1,1,1-Trichloroethane	µg/L	200	--	<2	<1	<1	<1	**1.57**	<1	<1
1,1-Dichloroethane	µg/L	--	--	<2	<1	<1	<1	0.835 J	<1	<1
Acetone	µg/L	--	--	**22.1**	**27.2**	**23.7**	**21**	**13.5**	**20.5**	**26.8**
Carbon disulfide	µg/L	--	--	<2	<1	<1	<1	<1	<1	<1

Notes:
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TABLE 8
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2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID			MW-172	MW-174	MW-176	MW-178	MW-179	MW-180	MW-182
	Lab ID			L09040457-06	L09040457-07	L09040624-12	L09040532-10	L09040457-20	L09040408-05	L09040532-07
	Date			4/16/2009	4/16/2009	4/23/2009	4/20/2009	4/17/2009	4/15/2009	4/20/2009
Analyte	**units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	**2.08**	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	0.766 J	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	0.607 J	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	<0.3	**1.47**	0.166 J	0.291 J	<0.3	0.136 J	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	<1	0.347 J	<1	<1	<1	0.948 J	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	0.658 J	0.579 J	<1	<1	0.893 J	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				0	5.16	0.745	0.291	0	2.74	0
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1
Acetone	µg/L	--	--	<10	3.37 UB	<10	<10	<10	2.93 J	<10
Carbon disulfide	µg/L	--	--	<1	<1	<1	<1	<1	<1 UJ	<1

Notes:
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Defense Depot Memphis, Tennessee

	Well ID			MW-184	MW-185	MW-186	MW-187	MW-190	MW-220	MW-221
	Lab ID			L09040624-07	L09040532-21	L09040532-22	L09040532-16	L09040624-08	L09040624-13	L09040457-08
	Date			4/23/2009	4/21/2009	4/21/2009	4/21/2009	4/23/2009	4/23/2009	4/16/2009
Analyte	**units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5	<0.5	**276**	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	0.45 J	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	**45.9**	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5	0.308 J	<0.5
Carbon tetrachloride	µg/L	5	3	**4.52**	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	**2.94**	<0.3	<0.3	<0.3	**0.562**	0.238 J	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	0.424 J	0.334 J	<1	<1	**3.4**	<1	<1
Tetrachloroethene	µg/L	5	2.5	0.393 J	<1	<1	<1	**1.37**	**19.8**	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	0.416 J	<1	<1
Trichloroethene	µg/L	5	5	**2.27**	0.649 J	**4.92**	<1	**109**	**20.2**	<1
Vinyl chloride	µg/L	2	--	<1 UJ	<1	<1	<1	<1 UJ	<1	<1
Total Primary CVOCs				10.5	0.983	4.92	0	391	86.1	0
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1	0.556 J	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	**1.13**	<1
Acetone	µg/L	--	--	2.88 J	<10	<10	3.58 UB	<10	2.65 J	<10
Carbon disulfide	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1

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2009 OPERATIONS AND CLOSURE REPORT
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Defense Depot Memphis, Tennessee

	Well ID			MW-222	MW-223	MW-224	MW-225	MW-226	MW-227	MW-228
	Lab ID			L09040457-09	L09040457-21	L09040408-08	L09040532-11	L09040457-22	L09040532-17	L09040457-10
	Date			4/16/2009	4/17/2009	4/15/2009	4/20/2009	4/17/2009	4/21/2009	4/16/2009
Analyte	**units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	**1.19**	**0.778**	<0.5	**4.03**	<0.5	**15.1**	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	<1	0.524 J	<1
Chloroform	µg/L	80	12	<0.3	0.177 J	<0.3	<0.3	0.133 J	**7.5**	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	<1	<1	0.328 J	<1
Tetrachloroethene	µg/L	5	2.5	0.377 J	0.813 J	0.436 J	0.727 J	0.794 J	0.345 J	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	**1.87**	**7.38**	<1	**9.46**	<1	**3.56**	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				3.44	9.15	0.436	14.2	0.927	27.4	0
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1
Acetone	µg/L	--	--	3.91 UB	<10	2.65 J	<10	<10	3.33 UB	<10
Carbon disulfide	µg/L	--	--	<1	<1	<1 UJ	<1	<1	<1	<1

Notes:
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2009 OPERATIONS AND CLOSURE REPORT
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Defense Depot Memphis, Tennessee

	Well ID			MW-230	MW-231	MW-232	MW-234	MW-235	MW-236	MW-237
	Lab ID			L09040408-09	L09040457-12	L09040408-24	L09040457-13	L09040457-14	L09040457-15	L09040457-01
	Date			4/15/2009	4/17/2009	4/15/2009	4/17/2009	4/17/2009	4/17/2009	4/16/2009
Analyte	**units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	**30.3**	<1	<1	<1	<1	<1	**2.17**
1,2-Dichloroethane	µg/L	5	--	**0.645**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	0.236 J	<0.3	<0.3	<0.3	<0.3	<0.3	0.129 J
cis-1,2-Dichloroethene	µg/L	70	35	**1.09**	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	**89.9**	<1	<1	<1	<1	<1	0.286 J
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	**98.2**	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	2	--	<1	<1	**4.14**	<1	<1	<1	<1
Total Primary CVOCs				220	0	**4.14**	0	0	0	2.59
1,1,1-Trichloroethane	µg/L	200	--	**1.4**	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	**2.01**	<1	<1	<1	<1	<1	0.257 J
Acetone	µg/L	--	--	3.03 J	<10	**26.1**	3.47 UB	<10	3.65 UB	3.86 UB
Carbon disulfide	µg/L	--	--	<1 UJ	<1	<1	<1	<1	<1	<1

Notes:
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2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID			MW-238	MW-239	MW-240
	Lab ID			L09040624-09	L09040457-02	L09040457-16
	Date			4/23/2009	4/16/2009	4/17/2009
Analyte	**units**	MCL	TC			
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	0.536 J	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	<1	<1
Chloroform	µg/L	80	12	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	0.922 J
Tetrachloroethene	µg/L	5	2.5	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	<1	**1.56**
Vinyl chloride	µg/L	2	--	<1	<1 UJ	<1
Total Primary CVOCs				0	0.536	2.48
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1
Acetone	µg/L	--	--	<10	3.84 UB	<10
Carbon disulfide	µg/L	--	--	<1	**1.35 UB**	<1

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TABLE 9
ANALYTICAL RESULTS SUMMARY, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID			MW-03	MW-04	MW-05	MW-06	MW-07	MW-10	MW-13
	Lab ID			L09100378-18	L09100378-24	L09100378-19	L09100378-01	L09100378-02	L09100412-18	L09100378-25
	Date			10/13/2009	10/14/2009	10/13/2009	10/13/2009	10/13/2009	10/15/2009	10/14/2009
Analyte	**Units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5	**3.96**	<0.5	**14.6**	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	**13.4**	<1	<1	<1	**24**	**1.07**	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5 UJ	0.28 J	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	<0.3	0.294 J	0.227 J	**5.48**	0.263 J	**1.15**	0.187 J
cis-1,2-Dichloroethene	µg/L	70	35	0.47 J	<1	<1	**3.78**	0.441 J	0.733 J	<1
Tetrachloroethene	µg/L	5	2.5	**10.1**	<1	<1	<1	**62.8**	**3.19**	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	**10.4**	<1	<1	**2.44**	**40.4**	**6.79**	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				34.4	0.294	0.227	15.7	128	27.5	0.187
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	0.715 J	<1	<1
1,1-Dichloroethane	µg/L	--	--	0.317 J	<1	<1	<1	**1.24**	<1	<1
1,4-Dichlorobenzene	µg/L	75	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	µg/L	--	--	<10	5.95 J	<10	3.57 UB	**16.7 UB**	3.25 J	5.86 J
Chlorobenzene	µg/L	100	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

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Defense Depot Memphis, Tennessee

	Well ID			MW-14	MW-15	MW-31	MW-32	MW-33	MW-37	MW-43
	Lab ID			L09100378-03	L09100378-04	L09100378-26	L09100378-27	L09100378-28	L09100378-29	L09100412-01
	Date			10/13/2009	10/13/2009	10/14/2009	10/14/2009	10/14/2009	10/14/2009	10/15/2009
Analyte	**Units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	**24.5 J**	<0.5	**16.2**	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	0.905 J	<1	0.873 J	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	**28.8**	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5 UJ	**0.861 J**	<0.5	**0.925**	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	0.939 J	**2.97**	<1	**20.2**	<1	<1	<1
Chloroform	µg/L	80	12	<0.3	**31.1 J**	0.161 J	**176**	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	**1.69**	0.273 J	**10.3**	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	<1	**1.13**	**41.2**	**5.41**	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	0.332 J	<1	**1.97**	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	**27**	**29**	**113**	<1	<1	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				0.939	90.5	99.4	345	0	0	0
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	0.547 J	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	**1.13**	<1	<1	<1	<1
1,4-Dichlorobenzene	µg/L	75	--	<0.5	<0.5	<0.5	0.157 UB	<0.5	<0.5	<0.5
Acetone	µg/L	--	--	2.54 UB	3.05 UB	**16.7**	**25.4**	**18.6**	**16.5**	**19.1**
Chlorobenzene	µg/L	100	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

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Method:
8260B: Volatile Organic Compounds

TABLE 9
ANALYTICAL RESULTS SUMMARY, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID			MW-44	MW-51	MW-57	MW-58	MW-65	MW-67	MW-68
	Lab ID			L09100412-02	L09100412-03	L09100378-07	L09100412-39	L09100412-04	L09100412-05	L09100378-30
	Date			10/15/2009	10/15/2009	10/13/2009	10/15/2009	10/15/2009	10/15/2009	10/14/2009
Analyte	**Units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	**15**	<1	<1	<1	<1	**1.16**
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5 UJ	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	0.822 J	<1	0.9 J	0.81 J	<1	<1	<1
Chloroform	µg/L	80	12	0.213 J	0.231 J	**67.4**	0.149 J	<0.3	<0.3	0.159 J
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	**1.48**	<1	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	<1	**2.3**	0.841 J	0.309 J	<1	<1	**1.55**
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	0.31 J	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	**10.4**	**20.3**	<1	<1	<1	**1.16**
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				1.04	27.9	91.2	1.27	0	0	4.03
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	µg/L	75	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	µg/L	--	--	**17**	5.29 J	**15.9 UB**	3.17 J	4.65 J	**17**	**18.6**
Chlorobenzene	µg/L	100	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:
µg/L: micrograms per liter
-- : Not Listed
MCL: Maximum Contaminant Level
TC: Target Concentration
MDL: Method Detection Limit
RL: Reporting Limit
Results detected at or above RL shown in bold

DQE Flags:
J: Analyte positively identified, but quantitation estimated.
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	Well ID			MW-69	MW-71	MW-74	MW-75	MW-87	MW-91	MW-128
	Lab ID			L09100378-31	L09100378-32	L09100378-33	L09100378-34	L09100378-08	L09100378-58	L09100412-06
	Date			10/14/2009	10/14/2009	10/14/2009	10/14/2009	10/13/2009	10/14/2009	10/15/2009
Analyte	**Units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	**7.97**	0.364 J	<0.5	**7.09**	**0.678**	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5 UJ	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	0.301 J	<1	<1	<1	0.479 J	<1
Chloroform	µg/L	80	12	<0.3	**3.79**	**0.628**	**0.383**	**0.471**	**1.83**	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	<1	0.391 J	<1	<1
Tetrachloroethene	µg/L	5	2.5	0.271 J	<1	0.495 J	0.526 J	<1	0.494 J	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	**2.23**	**2.34**	<1	0.778 J	0.567 J	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				0.271	14.3	3.83	0.909	8.73	4.05	0
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	µg/L	75	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	µg/L	--	--	**21**	**19.2**	9.11 J	5.92 J	2.92 UB	<10	4.46 J
Chlorobenzene	µg/L	100	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:
µg/L: micrograms per liter
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MCL: Maximum Contaminant Level
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Defense Depot Memphis, Tennessee

	Well ID			MW-130	MW-132	MW-134	MW-144	MW-145	MW-147	MW-153
	Lab ID			L09100412-07	L09100378-59	L09100412-19	L09100378-35	L09100412-10	L09100378-36	L09100378-37
	Date			10/15/2009	10/14/2009	10/15/2009	10/14/2009	10/15/2009	10/14/2009	10/14/2009
Analyte	**Units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5	**301**	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	0.661 J	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	**29 J**	<1	<1	<1	<1	<1	**2.99**
1,2-Dichloroethane	µg/L	5	--	0.362 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	0.206 J	<0.3	0.128 J	**0.501**	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	0.856 J	<1	<1	**6.81**	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	**68.5 J**	0.303 J	0.501 J	**1.4**	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	0.676 J	<1	<1	<1
Trichloroethene	µg/L	5	5	**61.7 J**	<1	0.262 J	**173**	<1	0.313 J	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				161	0.303	0.891	484	0	0.313	2.99
1,1,1-Trichloroethane	µg/L	200	--	**2.95**	<1	<1	<1	<1	<1	0.416 J
1,1-Dichloroethane	µg/L	--	--	**1.41**	<1	<1	<1	<1	<1	0.309 J
1,4-Dichlorobenzene	µg/L	75	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	µg/L	--	--	**16.7**	<10	2.7 J	**17.9**	**17.5**	**18.1**	**15.2**
Chlorobenzene	µg/L	100	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:
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Defense Depot Memphis, Tennessee

	Well ID			MW-154	MW-167	MW-169	MW-170	MW-171	MW-172	MW-174
	Lab ID			L09100412-11	L09100412-12	L09100378-38	L09100378-39	L09100378-40	L09100378-60	L09100378-09
	Date			10/15/2009	10/15/2009	10/14/2009	10/14/2009	10/14/2009	10/14/2009	10/13/2009
Analyte	**Units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.315 J
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5 UJ
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	<1	0.674 J	0.988 J
Chloroform	µg/L	80	12	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	**1.54**
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	0.547 J	<1	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	<1	<1	<1	<1	<1	0.296 J	0.591 J
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	<1	<1	<1	<1	<1	0.485 J
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				0	0	0.547	0	0	0.97	3.92
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	µg/L	75	--	<0.5	0.346 J	**0.762 UB**	<0.5	<0.5	<0.5	<0.5
Acetone	µg/L	--	--	**19.4**	**18.3**	6.46 J	**14**	**19.5**	<10	2.66 UB
Chlorobenzene	µg/L	100	--	<0.5	<0.5	**3.04**	<0.5	<0.5	<0.5	<0.5

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	Well ID			MW-176	MW-178	MW-179	MW-180	MW-182	MW-184	MW-185
	Lab ID			L09100378-10	L09100378-41	L09100378-42	L09100378-11	L09100412-13	L09100378-61	L09100378-43
	Date			10/13/2009	10/14/2009	10/14/2009	10/13/2009	10/15/2009	10/14/2009	10/14/2009
Analyte	**Units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	**5.06**	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5 UJ	<0.5	<0.5	<0.5 UJ	<0.5	0.484 J	<0.5
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	<1	**13.4**	<1
Chloroform	µg/L	80	12	<0.3	**0.602**	<0.3	0.154 J	<0.3	**117**	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	<1	<1	**5.61**	<1
Tetrachloroethene	µg/L	5	2.5	<1	0.263 J	0.281 J	<1	<1	**4.98**	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	**1.63**	<1
Trichloroethene	µg/L	5	5	<1	<1	<1	<1	<1	**84**	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				0	0.865	0.281	0.154	0	232	0
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	µg/L	75	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	µg/L	--	--	2.65 UB	5.15 J	6.96 J	4.31 UB	6.57 J	<10	4.01 J
Chlorobenzene	µg/L	100	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

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µg/L: micrograms per liter
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Defense Depot Memphis, Tennessee

	Well ID			MW-186	MW-187	MW-190	MW-220	MW-221	MW-222	MW-223
	Lab ID			L09100378-44	L09100412-14	L09100378-45	L09100378-20	L09100378-12	L09100378-48	L09100378-49
	Date			10/14/2009	10/15/2009	10/14/2009	10/13/2009	10/13/2009	10/14/2009	10/14/2009
Analyte	**Units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	**28.1**	<0.5	<0.5	<0.5	0.227 J
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	**33.1**	<1	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5 UJ	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	<0.3	0.162 J	0.135 J	0.184 J	<0.3	0.269 J	**0.551**
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	0.547 J	<1	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	<1	0.253 J	0.588 J	**19**	<1	<1	0.319 J
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	**1.83**	<1	**27.6**	**18.7**	<1	**1.04**	**4.01**
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				1.83	0.415	57.0	71.0	0	1.31	5.11
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	0.438 J	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	0.868 J	<1	<1	<1
1,4-Dichlorobenzene	µg/L	75	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	µg/L	--	--	3.55 J	3.91 J	4.19 J	<10	5.13 UB	7.27 J	7.69 J
Chlorobenzene	µg/L	100	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:
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	Well ID			MW-224	MW-225	MW-226	MW-227	MW-228	MW-230	MW-231
	Lab ID			L09100378-50	L09100378-13	L09100378-51	L09100378-14	L09100378-62	L09100378-63	L09100378-52
	Date			10/14/2009	10/13/2009	10/14/2009	10/13/2009	10/14/2009	10/14/2009	10/14/2009
Analyte	**Units**	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	**2.47**	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	**28.1**	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5 UJ	<0.5	<0.5 UJ	<0.5	0.428 J	<0.5
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	0.627 J	<1	<1
Chloroform	µg/L	80	12	<0.3	0.198 J	0.184 J	**0.322**	<0.3	0.188 J	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	<1	<1	0.886 J	<1
Tetrachloroethene	µg/L	5	2.5	0.451 J	0.566 J	0.75 J	0.267 J	0.399 J	**88.4**	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	**11**	<1	<1	<1	**83.5**	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				0.451	14.2	0.934	0.589	1.03	202	0
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1	0.994 J	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	**1.68**	<1
1,4-Dichlorobenzene	µg/L	75	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	µg/L	--	--	5.18 J	6.18 UB	8.38 J	<10 UJ	<10	<10	4.05 J
Chlorobenzene	µg/L	100	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:
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Defense Depot Memphis, Tennessee

	Well ID			MW-234	MW-235	MW-237	MW-239	MW-240
	Lab ID			L09100378-53	L09100412-15	L09100412-16	L09100412-17	L09100378-54
	Date			10/14/2009	10/15/2009	10/15/2009	10/15/2009	10/14/2009
Analyte	**Units**	MCL	TC					
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	<0.5	**0.605**	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	**1.77**	0.899 J	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	<0.3	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	0.278 J	0.86 J
Tetrachloroethene	µg/L	5	2.5	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	<1	<1	<1	**1.73**
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1 UJ	<1
Total Primary CVOCs				0	0	1.77	1.78	2.59
1,1,1-Trichloroethane	µg/L	200	--	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	--	--	<1	<1	0.283 J	<1	<1
1,4-Dichlorobenzene	µg/L	75	--	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	µg/L	--	--	<10	5.37 J	4.56 J	3.96 J	<10
Chlorobenzene	µg/L	100	--	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:
µg/L: micrograms per liter
-- : Not Listed
MCL: Maximum Contaminant Level
TC: Target Concentration
MDL: Method Detection Limit
RL: Reporting Limit
Results detected at or above RL shown in bold

DQE Flags:
J: Analyte positively identified, but quantitation estimated.
UB: non-detect, method blank contamination
UJ: non-detect, estimated
<: Analyte not detected above RL

Method:
8260B: Volatile Organic Compounds

TABLE 10
ANALYTICAL RESULTS SUMMARY, RECOVERY WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	**Well ID** **Lab ID** **Date** **units**	MCL	TC	RW-01 L09040369-29 4/14/2009	RW-1A L09040369-30 4/14/2009	RW-1B L09040369-31 4/14/2009	RW-02 L09040369-32 4/14/2009	RW-03 L09040369-35 4/14/2009	RW-04 L09040369-22 4/14/2009	RW-05 L09040369-23 4/14/2009
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	**0.97**	**0.824**	**2.01**	<0.5	**2.95**	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	µg/L	5	3	**2.31**	<1	0.53 J	0.647 J	<1	<1	<1
Chloroform	µg/L	80	12	**15.4**	**1.45**	**9.79**	**3.22**	0.21 J	**0.319**	<0.3
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	**2.4**	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	0.509 J	<1	0.542 J	0.347 J	<1	0.7 J	0.327 J
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	**8.54**	0.717 J	**1.72**	**2.21**	0.349 J	**13.2**	<1
Vinyl Chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				26.8	3.14	13.4	10.8	0.559	17.2	0.327
1,1-Dichloroethane	µg/L	--	--	<1	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
-- : Not Listed
MCL: Maximum Contaminant Level
MDL: Method Detection Limit
RL: Reporting Limit
TC: Target Concentration
Results detected at or above RL shown in bold

DQE Flags:
J: Analyte positively identified, quantitation estimated.
<: Analyte not detected above RL

Methods:
8260B: Volatile Organic Compounds

TABLE 10
ANALYTICAL RESULTS SUMMARY, RECOVERY WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	**Well ID** **Lab ID** **Date** **units**	MCL	TC	RW-06 L09040369-24 4/14/2009	RW-07 L09040369-25 4/14/2009	RW-08 L09040369-26 4/14/2009	RW-09 L09040369-27 4/14/2009
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	**0.568**	**0.601**	<0.5	**0.86**
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	**15.7**	**24**
1,2-Dichloroethane	µg/L	5	--	<0.5	<0.5	<0.5	0.309 J
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1
Chloroform	µg/L	80	12	0.186 J	0.135 J	0.152 J	0.205 J
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	0.427 J
Tetrachloroethene	µg/L	5	2.5	0.26 J	<1	**6.97**	**46.9**
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	0.884 J	**9.04**	**33**
Vinyl Chloride	µg/L	2	--	<1	<1	<1	<1
Total Primary CVOCs				1.01	1.62	31.9	105
1,1-Dichloroethane	µg/L	--	--	<1	<1	0.326 J	**1.05**

Notes:
µg/L: micrograms per liter
-- : Not Listed
MCL: Maximum Contaminant Level
MDL: Method Detection Limit
RL: Reporting Limit
TC: Target Concentration
Results detected at or above RL shown in bold

DQE Flags:
J: Analyte positively identified, quantitation estimated.
<: Analyte not detected above RL

Methods:
8260B: Volatile Organic Compounds

TABLE 11
PRIMARY CVOC RESULTS, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

VOC Analyte	MCL (µg/L)	TC (µg/L)	Number of Locations with VOC Analyte Above RL	Maximum Concentrations (µg/L)	Location of Maximum Concentration	Number of Locations with VOC Analyte Above MCL	Number of Locations with VOC Analyte Above TC
1,1,2,2-Tetrachloroethane	--	2.2	25	403	MW-144	--	18
1,1,2-Trichloroethane	5	1.9	2	1.07	MW-164	0	0
1,1-Dichloroethene	7	7	13	60.3	MW-130	9	9
1,2-Dichloroethane	5	--	2	0.701	MW-130	0	--
Carbon Tetrachloride	5	3	4	10.4	MW-164	3	2
Chloroform	80	12	20	76.1	MW-164	0	3
cis-1,2-Dichloroethene	70	35	13	17.4	MW-164	0	0
Tetrachloroethene	5	2.5	18	127	MW-130	6	7
trans-1,2-Dichloroethene	100	50	3	2.75	MW-157	0	0
Trichloroethene	5	5	39	286	MW-157	21	21
Vinyl Chloride	2	--	1	4.14	MW-232	1	--

Notes:
µg/L: micrograms per liter
--: not listed
MCL: maximum contaminant level
RL: reporting limit
TC: target concentration

TABLE 12
PRIMARY CVOC RESULTS, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

VOC Analyte	MCL (µg/L)	TC (µg/L)	Number of Locations with Analyte Above RL	Maximum Concentrations (µg/L)	Location of Maximum Concentration	Number of Locations with Analyte Above MCL	Number of Locations with Analyte Above TC
1,1,2,2-Tetrachloroethane	--	2.2	12	301	MW-144	--	10
1,1,2-Trichloroethane	5	1.9	0	--	--	--	--
1,1-Dichloroethene	7	7	10	33.1	MW-220	7	7
1,2-Dichloroethane	5	--	2	0.925	MW-32	0	--
Carbon tetrachloride	5	3	3	20.2	MW-32	2	2
Chloroform	80	12	16	176	MW-32	2	3
cis-1,2-Dichloroethene	70	35	6	10.3	MW-32	0	0
Tetrachloroethene	5	2.5	13	88.4	MW-230	7	9
trans-1,2-Dichloroethene	100	50	2	1.97	MW-32	0	0
Trichloroethene	5	5	23	173	MW-144	14	14
Vinyl chloride	2	--	0	--	--	--	--

Notes:
µg/L: micrograms per liter
--: not listed
MCL: maximum contaminant level
RL: reporting limit
TC: target concentration

TABLE 13
PRIMARY CVOC RESULTS, RECOVERY WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

VOC Analyte	MCL (µg/L)	TC (µg/L)	Number of Locations with VOC Analyte Above RL	Maximum Concentrations (µg/L)	Location of Maximum Concentration	Number of Locations with VOC Analyte Above MCL	Number of Locations with VOC Analyte Above TC
1,1,2,2-Tetrachloroethane	-	2.2	7	2.95	RW-4	--	0
1,1,2-Trichloroethane	5	1.9	0	<1	NA	0	0
1,1-Dichloroethene	7	7	2	24	RW-9	2	2
1,2-Dichloroethane	5	--	0	0.309	RW-9	0	--
Carbon tetrachloride	5	3	1	2.31	RW-1	0	0
Chloroform	80	12	5	15.4	RW-1	0	1
cis-1,2-Dichloroethene	70	35	1	2.4	RW-2	0	0
Tetrachloroethene	5	2.5	2	46.9	RW-9	2	2
trans-1,2-Dichloroethene	100	50	0	<1	NA	0	0
Trichloroethene	5	5	6	33	RW-9	4	4
Vinyl Chloride	2	-	0	<1	NA	0	-

Notes:
µg/L: micrograms per liter
--: not listed
MCL: maximum contaminant level
NA: not applicable
RL: reporting limit
TC: target concentration

FIGURES

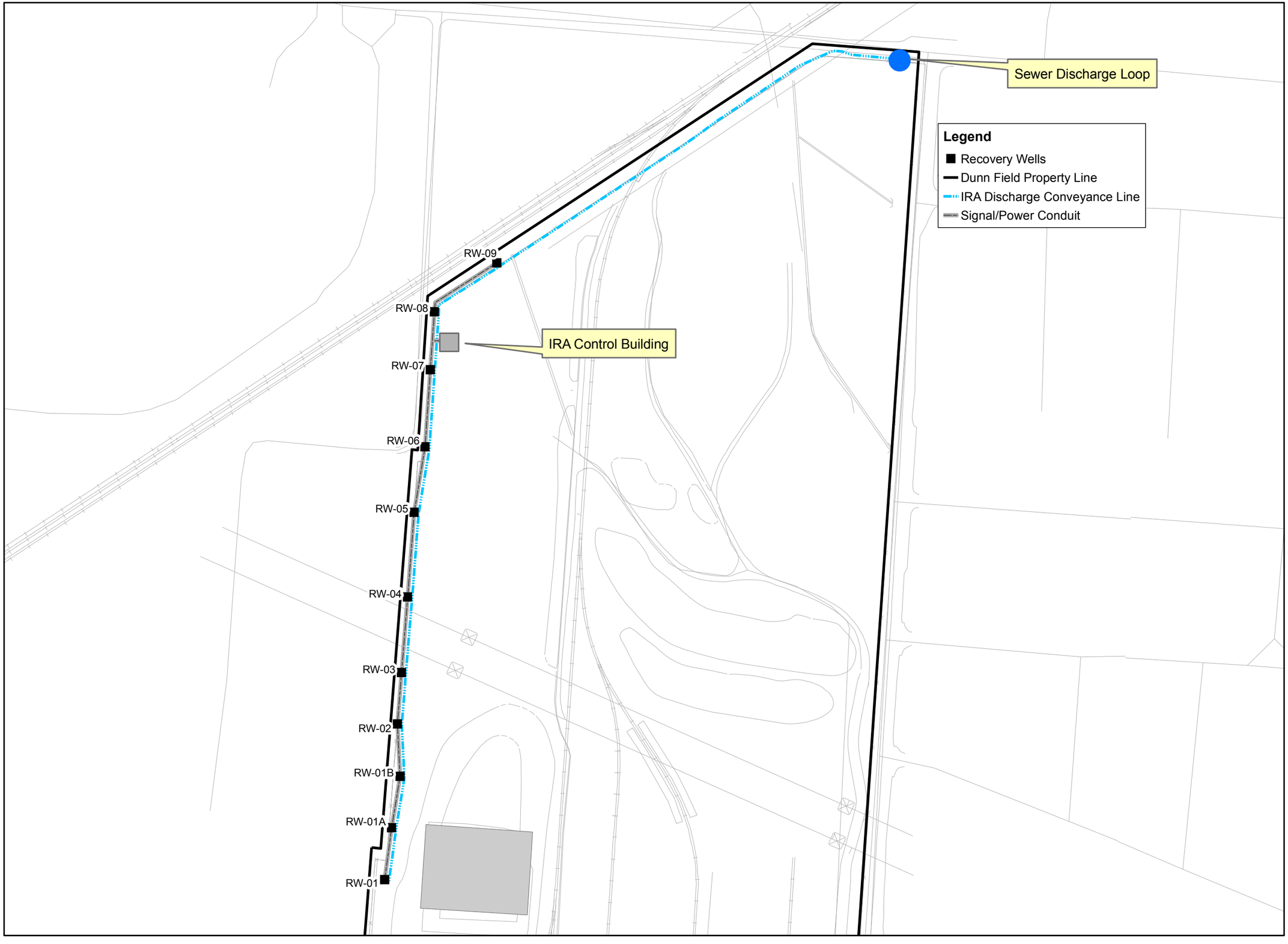

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Figure 1

IRA SYSTEM LAYOUT

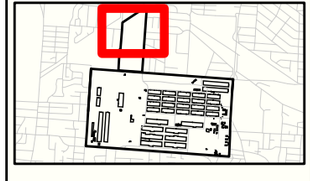
2009 OPERATIONS
AND CLOSURE REPORT
DUNN FIELD GROUNDWATER
INTERIM REMEDIAL ACTION

DEFENSE DEPOT
MEMPHIS, TENNESSEE

Projection: NAD 1927 StatePlane Tennessee
Datum : WGS 84
Units: Feet

0 50100 200 300
Feet

Installation Location
Memphis, Tennessee



Date: December 2010
Edition: Rev 0

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INSERT 1

MW-162
MW-196
MW-192
MW-196B
MW-193
MW-163
MW-144
MW-190
MW-191
MW-161
MW-195
MW-194
MW-189

MW-236
MW-65
MW-240
MW-4-TDEC
MW-186
MW-185
MW-95
PZ-02
MW-128
MW-3-TDEC
MW-169
MW-40
MW-170
MW-2-TDEC
MW-126
MW-51
MW-171
MW-129
MW-1-TDEC
MW-30
MW-153
MW-78
MW-29
MW-130
MW-08
MW-42
Rayner
MW-168A
MW-168
MW-07
MW-230
MW-79
Boyle
MW-220
MW-02
MW-31
RW-09
MW-10
MW-03
RW-08
MW-61
MW-28
Line
Line
MW-147
MW-68
MW-180
MW-152
Rozelle
MW-158A
MW-158
RW-07
MW-221
MW-60
Menager
MW-80
MW-167
MW-165
MW-237
MW-160
MW-148
MW-59
MW-165A
MW-239
MW-159
MW-155
MW-76
MW-04
MW-151
MW-232
RW-06
MW-05
MW-166
MW-150
MW-166A
MW-69
MW-156
MW-54
MW-77
MW-149
RW-05
MW-44
MW-157
MW-13
MW-234
MW-164
MW-233
MW-145
MW-231
MW-184
MW-32
MW-37
MW-176
MW-127
Meadowhill
MW-235
RW-03
MW-87
RW-02
MW-175
Casing Melted
MW-71
MW-06
MW-187
MW-183
MW-182
MW-154
MW-67
RW-01B
MW-91
MW-33
RW-01A
MW-15
MW-174
MW-227
MW-43
RW-01
MW-228
MW-172
MW-57
MW-14
MW-58
MW-56

SEE INSERT 1

SEE INSERT 2

Carver
Hearst

INSERT 2

MW-69
MW-179
RW-05
MW-75
MW-35
MW-132
MW-12
MW-134
MW-224
MW-70
MW-178
MW-74
MW-225
RW-04
MW-222
MW-238
MW-226
MW-176
MW-223

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Figure 2

WELL LOCATION MAP, APRIL 2009

2009 OPERATIONS
AND CLOSURE REPORT
DUNN FIELD GROUNDWATER
INTERIM REMEDIAL ACTION

DEFENSE DEPOT
MEMPHIS, TENNESSEE

Legend

- Monitoring Well Screened in the Fluvial Aquifer
- Recovery Well Screened in the Fluvial Aquifer
- Monitoring Well Screened in the Intermediate Aquifer
- Monitoring Well Screened in the Transition Zone
- Monitoring Well Screened in the Memphis Aquifer
- MW-33 IRA Sample Location April 2009
- Dunn Field Boundary

0 150 300 450 600
Feet

Installation Location
Memphis, Tennessee

Date: December 2010
Edition: Rev 0

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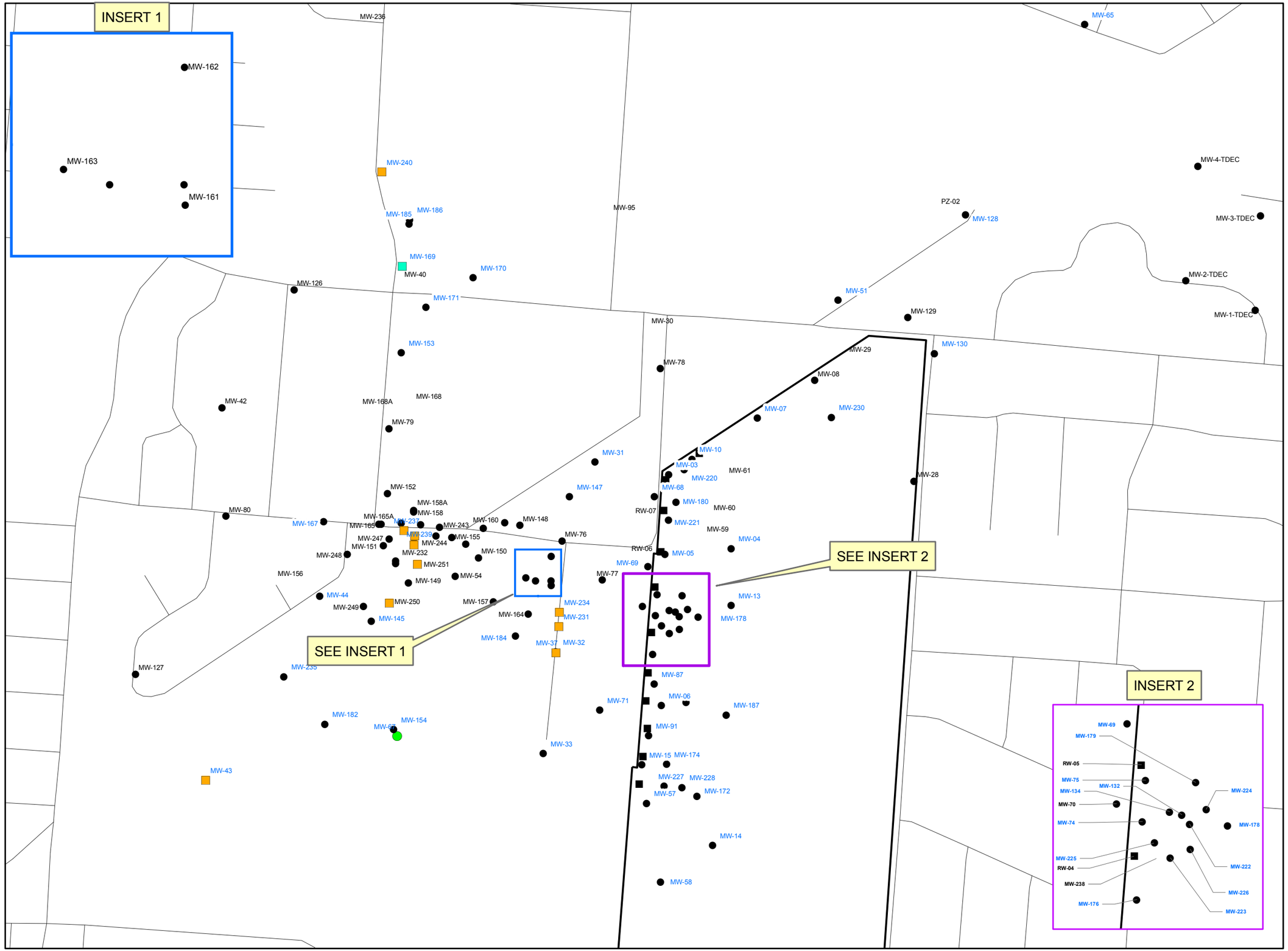

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Figure 3

WELL LOCATION MAP.
OCTOBER 2009

2009 OPERATIONS
AND CLOSURE REPORT
DUNN FIELD GROUNDWATER
INTERIM REMEDIAL ACTION

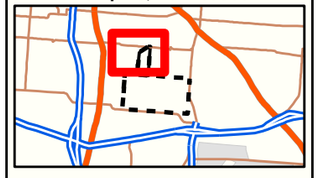
DEFENSE DEPOT
MEMPHIS, TENNESSEE

Legend

- Monitoring Well Screened in the Fluvial Aquifer
- Recovery Well Screened in the Fluvial Aquifer
- Monitoring Well Screened in the Intermediate Aquifer
- Monitoring Well Screened in the Transition Zone
- Monitoring Well Screened in the Memphis Aquifer
- MW-33 IRA Sample Location October 2009
- Dunn Field Boundary

0 150 300 450 600
Feet

Installation Location
Memphis, Tennessee



Date: December 2010
Edition: Rev 0

HDR

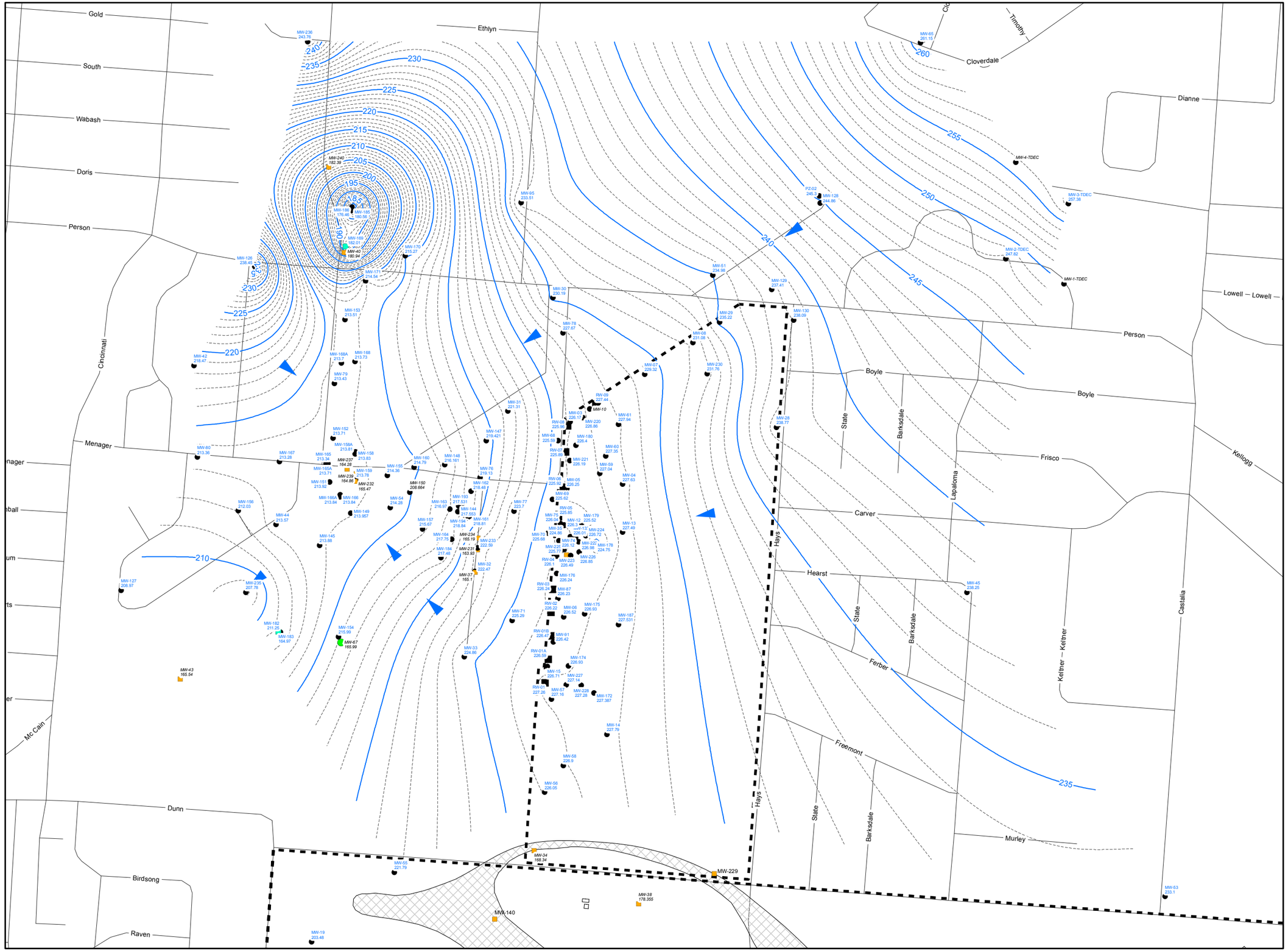


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Figure 4

GROUNDWATER ELEVATION CONTOUR MAP APRIL 2009

2009 OPERATIONS
AND CLOSURE REPORT
DUNN FIELD GROUNDWATER
INTERIM REMEDIAL ACTION

DEFENSE DEPOT
MEMPHIS, TENNESSEE

Legend

- Monitoring Well Screened in the Fluvial Aquifer
- Recovery Well Screened in the Fluvial Aquifer
- Monitoring Well Screened in the Intermediate Aquifer
- Monitoring Well Screened in the Transition Zone
- Monitoring Well Screened in the Memphis Aquifer
- Dunn Field Boundary
- ClayArea *Clay Elevation Exceeds Groundwater Elevation*

MW-03 Blue non-italics: value used for groundwater contours
100.12

MW-237 Black Italics: value not used for groundwater contours
100.15 (non-fluvial well or anomolous reading)

Groundwater Contours

- 1-ft Contour
- 5-ft Contour
- Groundwater Flow Direction

0 200 400 600 800
Feet

Installation Location
Memphis, Tennessee

Date: December 2010
Edition: Rev 0

HDR

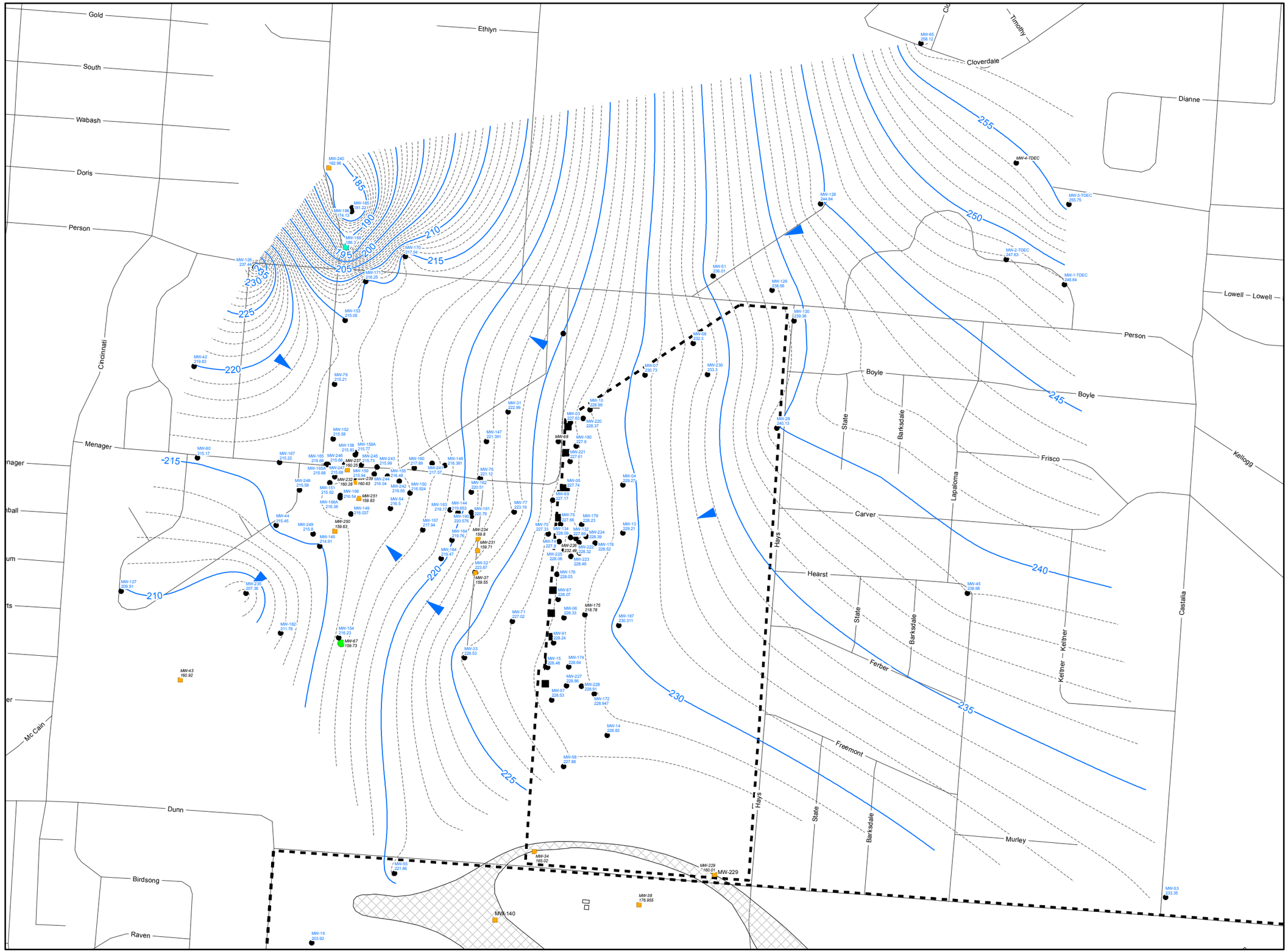

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Figure 5

GROUNDWATER ELEVATION CONTOUR MAP OCTOBER 2009

2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION

DEFENSE DEPOT
MEMPHIS, TENNESSEE

Legend

- Monitoring Well Screened in the Fluvial Aquifer
- Recovery Well Screened in the Fluvial Aquifer
- Monitoring Well Screened in the Intermediate Aquifer
- Monitoring Well Screened in the Transition Zone
- Monitoring Well Screened in the Memphis Aquifer
- Dunn Field Boundary
- ClayArea *Clay Elevation Exceeds Groundwater Elevation*

MW-03 Blue non-italics: value used for groundwater contours
100.12

MW-237 *Black Italics: value not used for groundwater contours*
100.15 *(non-fluvial well or anomolous reading)*

Groundwater Contours

- 1-ft Contour
- 5-ft Contour
- Groundwater Flow Direction

0 200 400 600 800
Feet

Installation Location
Memphis, Tennessee

Date: December 2010
Edition: Rev 0

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MW-171 ND
MW-153 5.16
MW-168A 7.67
MW-168 0.984
MW-79 2.21
MW-78 ND
MW-130 264
MW-07 148
MW-230 220
RW-09 106
MW-10 40.4
MW-31 113
MW-03 29.2
MW-220 86.4
RW-08 31.9
MW-147 ND
MW-68 5.13
MW-180 2.74
RW-07 1.62
MW-221 ND
MW-04 0.328
MW-134 2.46
RW-06 1.0
MW-132 1.30
MW-69 2.25
MW-224 0.436
RW-05 0.327
MW-75 0.945
MW-179 ND
MW-13 0.142
MW-74 24.4
MW-178 0.291
MW-225 14.2
RW-04 17.2
MW-222 3.44
MW-223 9.15
MW-226 0.927
MW-176 0.745
RW-03 0.559
MW-87 1.09
RW-02 10.8
MW-71 18.4
MW-06 17.6
MW-187 ND
RW-01B 13.4
MW-91 2.58
RW-01A 3.14
MW-174 5.16
MW-15 2.90
MW-227 27.4
MW-228 ND
RW-01 26.8
MW-172 ND
MW-57 107
MW-158A 636
MW-246 2604
MW-245 863
MW-159 2014
MW-152 306
MW-158 164
MW-243 257
MW-244 2051
MW-241 20.5
MW-165 151
MW-148 2.54
MW-167 ND
MW-165A 102
MW-155 2281
MW-160 144
MW-76 4.96
MW-247 382
MW-242 1387
MW-232 0.72
MW-251 6
MW-248 ND
MW-162 40
MW-150 942
MW-151 7.68
MW-163 224
MW-77 52.1
MW-144 601
MW-54 1629
MW-190 391
MW-149 73.3
MW-156 ND
MW-166 199
MW-161 124
MW-44 1.02
MW-157 239
MW-166A 48
MW-70 3.84
MW-250 ND
MW-249 ND
MW-164 238
MW-145 ND
MW-184 10.5
MW-32 8.87
MW-235 ND
MW-182 ND
MW-154 ND
MW-33 0.658

Notes:
1. Total CVOCs include: CT, CF, DCA, DCE, cDCE, tDCE, TCA, 111TCA, TCE, PCE, PCA and VC.
2. Total CVOC concentration ranges shown for performance monitoring samples (6/8/09 – 7/30/09) and IRA semiannual samples (4/14/09 – 4/23/09).

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Figure 6

TOTAL CVOC CONCENTRATIONS, APRIL 2009

2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION

DEFENSE DEPOT MEMPHIS, TENNESSEE

Legend

CVOCs Fluvial Wells
ug/L
- 0 - 50
- 50 - 100
- 100 - 500
- 500 - 1000
- 1000 - 5000

Total CVOC Isopleth (ug/L)
- 50
- 100
- 500
- 1000

CVOCs Non-Fluvial Wells
ug/L
- 0 - 50

AS-SVE Area

Original Dunn Field Property Boundary

MW-05 100 Blue: IRA Sample Event

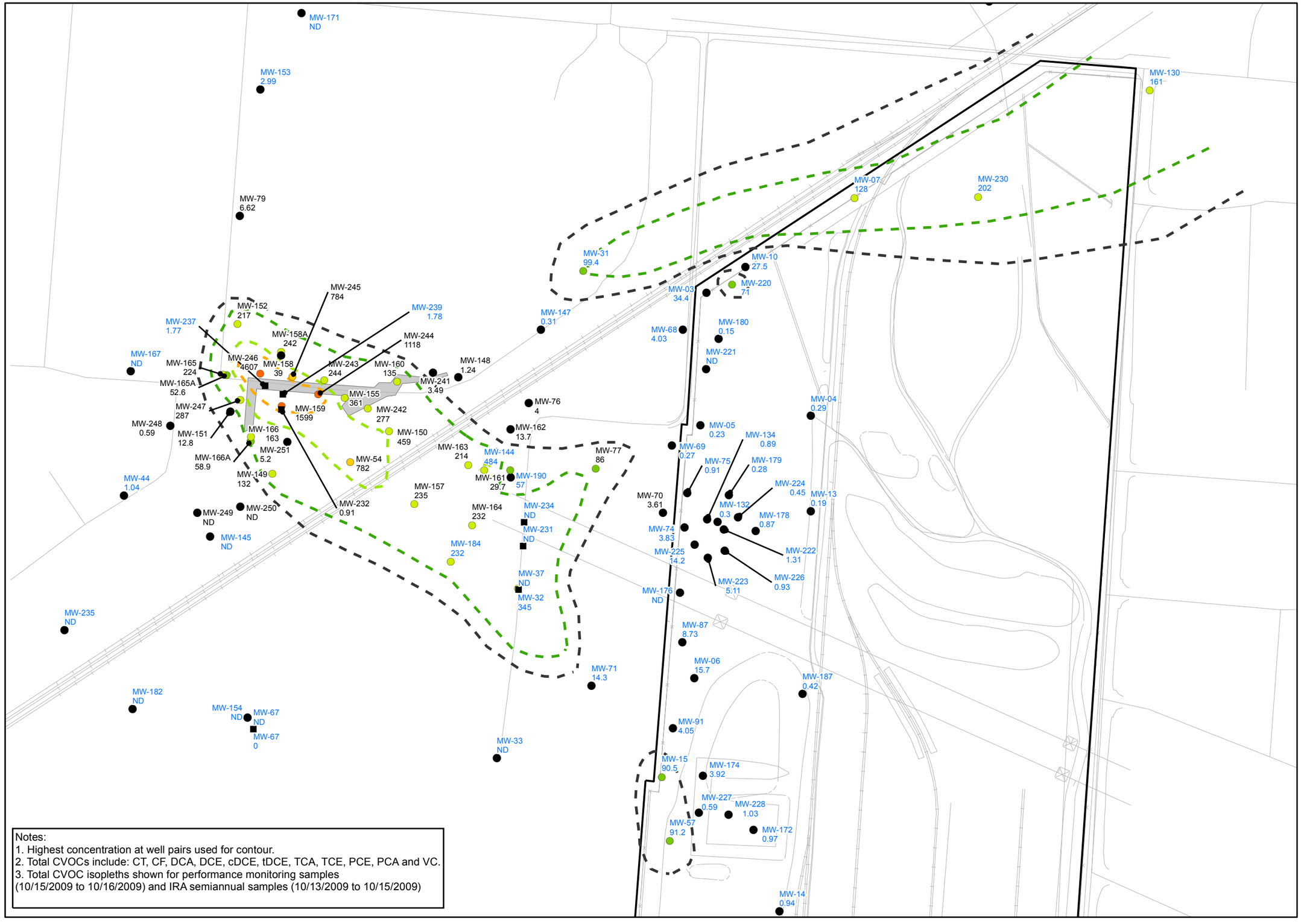
MW-249 100 Black: Off Depot Performance Monitoring Sample Event

0 100 200 300 400
Feet

Installation Location
Memphis, Tennessee

Date: December 2010
Edition: Rev 0

HDR



Notes:
1. Highest concentration at well pairs used for contour.
2. Total CVOCs include: CT, CF, DCA, DCE, cDCE, tDCE, TCA, TCE, PCE, PCA and VC.
3. Total CVOC isopleths shown for performance monitoring samples (10/15/2009 to 10/16/2009) and IRA semiannual samples (10/13/2009 to 10/15/2009)

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Figure 7

TOTAL CVOC CONCENTRATIONS, OCTOBER 2009

2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION

DEFENSE DEPOT
MEMPHIS, TENNESSEE

Legend

CVOCs Fluvial Wells
ug/L
- 0 - 50
- 50 - 100
- 100 - 500
- 500 - 1000
- 1000 - 5000

Total CVOC Isopleth (ug/L)
- 50
- 100
- 500
- 1000

CVOCs Non-Fluvial Wells
ug/L
- 0 - 50

AS-SVE Area

Original Dunn Field Property Boundary

MW-05 100 Blue: IRA Sample Event

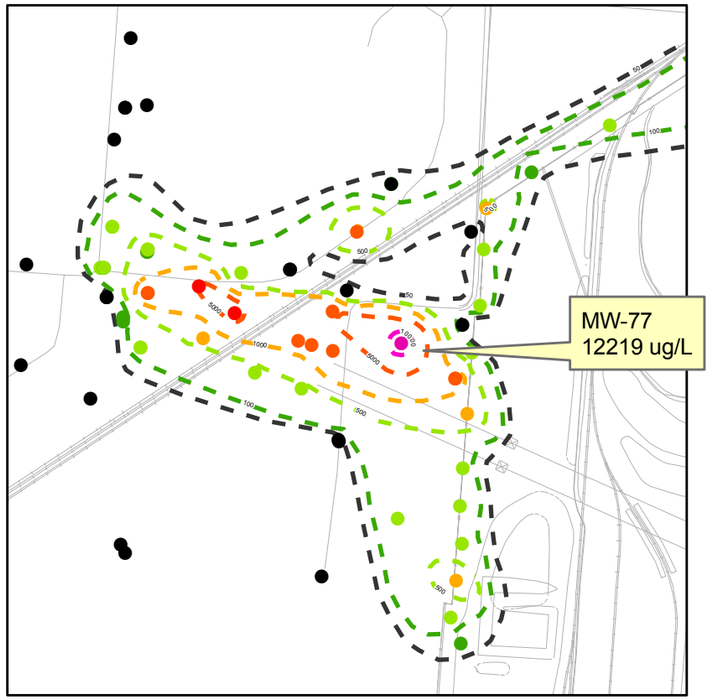
MW-249 100 Black: Off Depot Performance Monitoring Sample Event

0 100 200 300 400
Feet

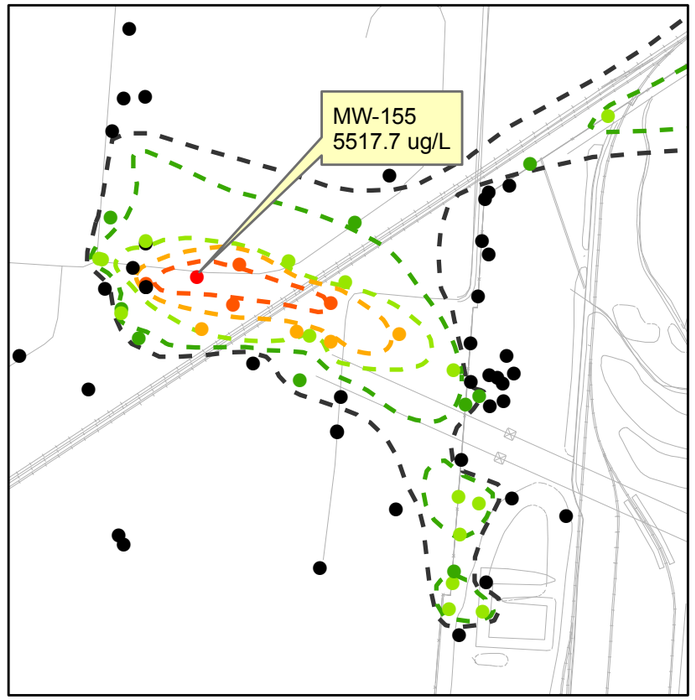
Installation Location
Memphis, Tennessee

Date: December 2010
Edition: Rev 0

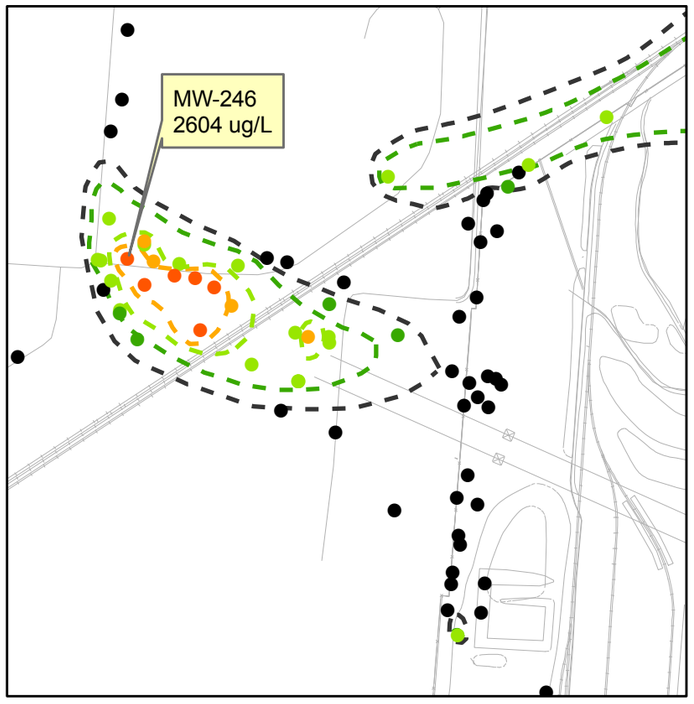
HDR



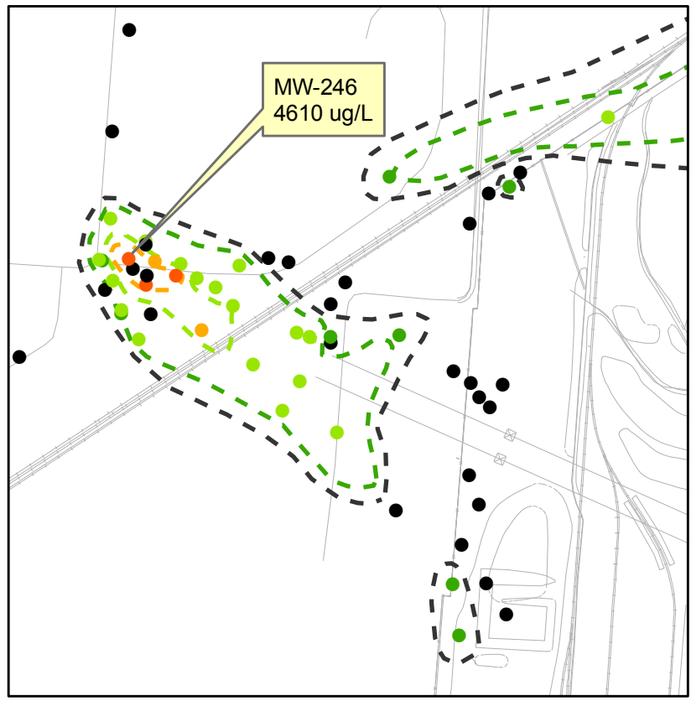
APRIL 2007



APRIL 2008



APRIL 2009



OCTOBER 2009

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Figure 8

TOTAL CVOC CONCENTRATIONS, 2007 - 2009

2009 OPERATIONS
AND CLOSURE REPORT
DUNN FIELD GROUNDWATER
INTERIM REMEDIAL ACTION

DEFENSE DEPOT
MEMPHIS, TENNESSEE

Legend

Total CVOC Isopleth (ug/L)
- 50
- 100
- 500
- 1000
- 5000
- 10000

Total CVOC Ranges (ug/L)
- 0 - 50
- 50 - 100
- 100 - 500
- 500 - 1000
- 1000 - 5000
- 5000 - 10000
- 10000 - 50000

0 200 400 600 800
Feet

Installation Location
Memphis, Tennessee

Date: December 2010
Edition: Rev 0

HDR

G:\121803\005 IRA Closure

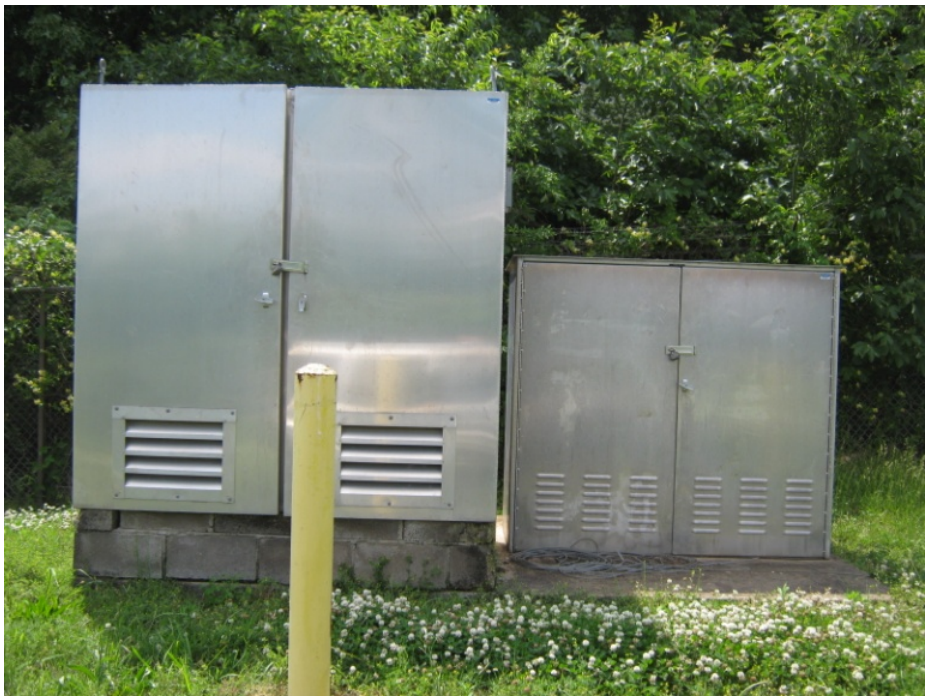
APPENDIX A

SYSTEM REMOVAL PHOTOGRAPHS

Pre-Removal Photographs

Photograph 1 – IRA Control Building

Photograph 2 – IRA Control Building Interior, Control Panel



Photograph 3 – Recovery Well (RW) Enclosures

Photograph 4 – RW Control Enclosure

Photograph 5 – RW Pump House

Photograph 6 – Sanitary Sewer Discharge Loop

System Removal Photographs

Photograph 7 - Contractors started by removing well housings and staged them on the asphalt pad at Dunn Field.

Photograph 8 - After IRA housings were removed, the bumper posts and the pads were removed.

Photograph 9 - The control building was demolished; the electrical components were removed for recycling.

Photograph 10 - The discharge loop was removed from its pad.

Photograph 11 - A cam-lock was added the sewer discharge to facilitate disposal of waste water generated during remedial action operations and monitoring.

Photograph 12 - After well houses and pads were removed, the soil was excavated and the steel well casing was cut off about 1 foot below ground surface. The casing was covered with duct tape until abandonment. The excavated soil was replaced during site restoration.

Photograph 13 - Bentonite chips were added to seal the screened section and minimize waste water generated during grouting.

Photograph 14 - The wells were grouted to the top of casing.

Photograph 15 - Disturbed areas were graded and re-seeded.

APPENDIX B

RESULTS OF LABORATORY ANALYSIS

TABLE B-1
ANALYTICAL RESULTS, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID	MW-03	MW-04	MW-06	MW-07	MW-10	MW-13
	Sample ID	MW-3	MW-4	MW-6	MW-07-74.15	MW-10	MW-13
	Lab ID	L09040457-17	L09040532-12	L09040624-01	L09040408-10	L09040408-01	L09040532-13
	Date	4/17/2009	4/21/2009	4/22/2009	4/15/2009	4/15/2009	4/21/2009
Analyte	**Units**						
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	0.893 J	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	3.23	<0.5	29	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	0.34 J	<1	<1	1.67	<1	<1
1,1-Dichloroethene	µg/L	10.7	<1	<1	35.6	0.769 J	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	<0.5	<0.5	0.447 J	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
Acetone	µg/L	<10	3.62 UB	<10	15.8	<10	<10
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	0.579 J	<1	<1	<1
Bromomethane	µg/L	<1	<1	<1 UJ	<1	<1	<1
Carbon disulfide	µg/L	<1	<1	<1	<1 UJ	<1 UJ	<1
Carbon tetrachloride	µg/L	<1	<1	0.463 J	<1	<1	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	0.14 J	0.328	6.17	0.357	0.72	0.142 J
Chloromethane	µg/L	<1	<1	<1 UJ	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	4.91	0.472 J	1.04	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1 UJ	<1 UJ	<1 UJ	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	9.13	<1	0.254 J	70.6	1.41	<1
Toluene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	0.327 J	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	9.26	<1	2.53	40.9	7.11	<1
Trichlorofluoromethane	µg/L	<1	<1	<1 UJ	<1	<1	<1
Vinyl acetate	µg/L	<5	<5	<5	<5 R	<5 R	<5
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-1
ANALYTICAL RESULTS, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-14 / MW-14 / L09040532-14 / 4/21/2009	MW-14 / MW-14DUP-1 / L09040532-15 / 4/21/2009	MW-15 / MW-15 / L09040532-08 / 4/20/2009	MW-31 / MW-31-76.95 / L09040369-09 / 4/14/2009	MW-32 / MW-32-66.84 / L09040408-12 / 4/15/2009	MW-33 / MW-33-59.15 / L09040408-13 / 4/15/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	0.769 J	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	0.963	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	1.11	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	35	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	0.345 J	0.346 J	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	0.498 J	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	<10	<10	<10	38.9	17.8	14.9
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1 UJ	<1 UJ
Carbon tetrachloride		µg/L	0.743 J	0.675 J	0.513 J	<1	<1	0.474 J
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	<0.3	0.524	0.186 J	0.593	0.184 J
Chloromethane		µg/L	<1 UJ	<1 UJ	<1	<1	<1	<1
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	0.26 J	3.03	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1	<1	<1 UJ	<1 UJ
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	0.382 J	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	0.507 J	0.352 J	0.612 J	43.5	<1	<1
Toluene		µg/L	<1	<1	<1	<1	0.521 J	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	<1	<1	0.289 J	33.4	4.41	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5	<5 UJ	<5 UJ	<5 R	<5 R
Vinyl chloride		µg/L	<1	<1	<1	<1	0.495 J	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

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ANALYTICAL RESULTS, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-37 MW-37-173.25 L09040408-14 4/15/2009	MW-37 MW-37DUP-2 L09040408-11 4/15/2009	MW-43 MW-43-167.25 L09040369-11 4/14/2009	MW-44 MW-44-69.75 L09040369-12 4/14/2009	MW-51 MW-51 L09040532-02 4/20/2009	MW-57 MW-57-68.32 L09040408-15 4/15/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	20.3	0.538 J
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	17	16.5	20.8	19.7	<10	5.44 J
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1 UJ	<1 UJ	<1	<1	<1	<1 UJ
Carbon tetrachloride		µg/L	<1	<1	<1	0.5 J	<1	1.82
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	<0.3	<0.3	0.266 J	0.449	73
Chloromethane		µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	1.44
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1	<1 UJ
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	<1	<1	<1	<1	1.01	1.17
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	0.567 J
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	<1	<1	<1	0.252 J	6.32	28.7
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 R	<5 R	<5 UJ	<5 UJ	<5 UJ	<5 R
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-1
ANALYTICAL RESULTS, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-65 MW-65 L09040532-05 4/20/2009	MW-67 MW-67-268.25 L09040369-13 4/14/2009	MW-68 MW-68-78.25 L09040369-14 4/14/2009	MW-69 MW-69-89.64 L09040408-16 4/15/2009	MW-70 MW-70-87.67 L09040408-17 4/15/2009	MW-71 MW-71-74.28 L09040408-18 4/15/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	1.98	4.42
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	1.82	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1 UJ	<1 UJ	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	<10	21.3	22.8	13.3	11.4	19.6
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	0.683 J
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	<0.3	0.147 J	0.206 J	<0.3	8.79
Chloromethane		µg/L	<1	<1	<1	<1	<1	0.426 UB
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	0.262 J
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1 UJ	<1 UJ	<1	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	<1	<1	1.75	0.308 J	0.58 J	0.265 J
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	<1	<1	1.41	1.74	4.95	3.93
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
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2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-74 MW-74 L09040624-03 4/22/2009	MW-74 MW-74DUP-3 L09040624-02 4/22/2009	MW-75 MW-75 L09040624-04 4/22/2009	MW-76 MW-76-90.75 L09040369-15 4/14/2009	MW-77 MW-77-85.55 L09040408-19 4/15/2009	MW-78 MW-78 L09040532-18 4/21/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	19.8	21	0.356 J	0.864	28.3	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	3.67 J	<10	<10	19.4	16.1	2.52 UB
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1 UJ	<1 UJ	<1 UJ	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	0.151 J	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	<0.3	0.129 J	0.152 J	0.13 J	<0.3
Chloromethane		µg/L	<1 UJ	<1 UJ	<1 UJ	<1	<1	<1 UJ
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	0.447 J	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	0.288 J	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	0.521 J	0.488 J	0.46 J	0.444 J	1.49	<1
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	4.05	3.87	<1	2.74	21.9	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 R	<5 R	<5 R	<5 UJ	<5	<5
Vinyl chloride		µg/L	<1 UJ	<1 UJ	<1 UJ	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
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Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-87 / MW-87 / L09040624-10 / 4/23/2009	MW-91 / MW-91 / L09040624-05 / 4/22/2009	MW-128 / MW-128 / L09040532-06 / 4/20/2009	MW-128 / MW-128DUP-4 / L09040532-01 / 4/20/2009	MW-130 / MW-130-70.25 / L09040408-20 / 4/15/2009	MW-132 / MW-132 / L09040624-11 / 4/23/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	2.48	<1
1,1,2,2-Tetrachloroethane		µg/L	0.939	0.92	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	3.11	<1
1,1-Dichloroethene		µg/L	<1	<1	24.9	23.7	60.3	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1 UJ	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	0.701	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	<10	3.83 J	<10	<10	13.4	<10
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1 UJ	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	0.449 J	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	0.148 J	0.538	<0.3	<0.3	0.237 J	<0.3
Chloromethane		µg/L	<1	<1 UJ	<1	<1	<1	0.259 UB
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	0.925 J	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1 UJ	<1	<1	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	<1	0.677 J	<1	0.264 J	127	0.553 J
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	<1	<1	4.12	4.01	75.1	0.749 J
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5 R	<5 UJ	<5 UJ	<5 UJ	<5
Vinyl chloride		µg/L	<1	<1 UJ	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

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2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-134 / MW-134 / L09040457-19 / 4/17/2009	MW-144 / MW-144-75.68 / L09040408-21 / 4/15/2009	MW-145 / MW-145-90.75 / L09040369-16 / 4/14/2009	MW-147 / MW-147-78.81 / L09040369-17 / 4/14/2009	MW-153 / MW-153-86.75 / L09040369-18 / 4/14/2009	MW-154 / MW-154-61.45 / L09040369-19 / 4/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	0.868 J	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	403	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	1.06	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	0.377 J	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	5.16	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1 UJ	<1	<1	<1 UJ	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	3.35 UB	11.5	23	14.1	10.8	23
Benzene		µg/L	<0.4	0.203 J	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	1.19	<0.3	<0.3	<0.3	<0.3
Chloromethane		µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene		µg/L	<1	12.9	<1	<1	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1 UJ	<1 UJ	<1	<1 UJ
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	0.328 J	1.56	<1	<1	<1	<1
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	2.61	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	2.13	179	<1	<1	<1	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

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2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-156 MW-156-67.75 L09040369-20 4/14/2009	MW-157 MW-157-75.95 L09040369-21 4/14/2009	MW-161 MW-161-82 L09040369-01 4/14/2009	MW-161 MW-161DUP-5 L09040369-08 4/14/2009	MW-162 MW-162-86.08 L09040369-02 4/14/2009	MW-163 MW-163-77.03 L09040369-03 4/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<1	<1
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<2	<2
1,1,2,2-Tetrachloroethane		µg/L	<0.5	9.47	181	186	107	233
1,1,2-Trichloroethane		µg/L	<1	0.288 J	0.365 J	0.401 J	<2	<2
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<2	<2
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	<2	<2
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<2	<2
1,2,3-Trichlorobenzene		µg/L	<1 UJ	<1	<1	<1	<2	<2
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<2	<2
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<2	<2
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<2	<2
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<4	<4
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<2	<2
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<2	<2
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<1	<1
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<2	<2
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<2	<2
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<2	<2
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.8	<0.8
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<1	<1
1-Chlorohexane		µg/L	<1	<1	<1	<1	<2	<2
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<2	<2
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<2	<2
2-Hexanone		µg/L	<10	<10	<10	<10	<20	<20
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<2	<2
Acetone		µg/L	11.5	<10	17.7	11.7	15.3 J	22.1
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.8	<0.8
Bromobenzene		µg/L	<1	<1	<1	<1	<2	<2
Bromochloromethane		µg/L	<1	<1	<1	<1	<2	<2
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<1	<1
Bromoform		µg/L	<1	<1	<1	<1	<2	<2
Bromomethane		µg/L	<1	<1	<1	<1	<2	<2
Carbon disulfide		µg/L	<1	<1	<1	<1	<2	<2
Carbon tetrachloride		µg/L	<1	6.25	<1	<1	<2	<2
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<1	<1
Chloroethane		µg/L	<1	<1	<1	<1	<2	<2
Chloroform		µg/L	<0.3	17.1	0.222 J	0.292 J	<0.6	0.769
Chloromethane		µg/L	<1	0.351 UB	<1	<1	<2	<2
cis-1,2-Dichloroethene		µg/L	<1	14.8	2.1	2.26	0.579 J	2.15
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<1	<1
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<1	<1
Dibromomethane		µg/L	<1	<1	<1	<1	<2	<2
Dichlorodifluoromethane		µg/L	<1	<1 UJ	<1 UJ	<1 UJ	<2 UJ	<2 UJ
Ethylbenzene		µg/L	<1	<1	<1	<1	<2	<2
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<1.2	<1.2
Isopropylbenzene		µg/L	<1	<1	<1	<1	<2	<2
m-,p-Xylene		µg/L	<2	<2	<2	<2	<4	<4
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<20	<20
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<10	<10
Methylene chloride		µg/L	<1	<1	<1	<1	1.18 J	1.19 J
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<20	<20
Naphthalene		µg/L	<1	<1	<1	<1	<2	<2
n-Butylbenzene		µg/L	<1	<1	<1	<1	<2	<2
n-Propylbenzene		µg/L	<1	<1	<1	<1	<2	<2
o-Xylene		µg/L	<1	<1	<1	<1	<2	<2
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<2	<2
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<2	<2
Styrene		µg/L	<1	<1	<1	<1	<2	<2
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<2	<2
Tetrachloroethene		µg/L	<1	2.68	1.08	1.4	1.99 J	0.802 J
Toluene		µg/L	<1	<1	<1	<1	<2	<2
trans-1,2-Dichloroethene		µg/L	<1	2.75	<1	<1	<2	<2
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<2	<2
Trichloroethene		µg/L	<1	286	97.4	115	74.6	85.7
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<2	<2
Vinyl acetate		µg/L	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<10 UJ	<10 UJ
Vinyl chloride		µg/L	<1	<1	<1	<1	<2	<2

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
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Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-164 MW-164-74.59 L09040369-04 4/14/2009	MW-167 MW-167-80.07 L09040369-05 4/14/2009	MW-168 MW-168-114.45 L09040408-22 4/15/2009	MW-168A MW-168A-82.03 L09040408-23 4/15/2009	MW-170 MW-170-70.91 L09040369-06 4/14/2009	MW-171 MW-171-63.75 L09040369-07 4/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	1.57	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	20.8	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	1.07	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	0.835 J	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	0.637 J	6.8	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1 UJ	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	0.299 J	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	0.23 J	0.276 J	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	27.2	23.7	21	13.5	20.5	26.8
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	10.4	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	76.1	<0.3	<0.3	0.434	<0.3	<0.3
Chloromethane		µg/L	0.274 UB	<1	0.492 UB	<1	<1	<1
cis-1,2-Dichloroethene		µg/L	17.4	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	0.327 J	<1	0.304 J	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	1.89	<1	<1	0.431 J	<1	<1
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	1.61	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	93.3	<1	0.347 J	<1	<1	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 UJ	<5 UJ	<5	<5 UJ	<5 UJ	<5 UJ
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-1
ANALYTICAL RESULTS, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-172 / MW-172 / L09040457-06 / 4/16/2009	MW-172 / MW-172DUP-6 / L09040457-03 / 4/16/2009	MW-174 / MW-174 / L09040457-07 / 4/16/2009	MW-176 / MW-176 / L09040624-12 / 4/23/2009	MW-178 / MW-178 / L09040532-10 / 4/20/2009	MW-179 / MW-179 / L09040457-20 / 4/17/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	2.08	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	<10	<10	3.37 UB	<10	<10	<10
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	0.607 J	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	<0.3	1.47	0.166 J	0.291 J	<0.3
Chloromethane		µg/L	<1	<1	<1	0.26 UB	<1	<1
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	<1	0.319 J	0.347 J	<1	<1	<1
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	<1	<1	0.658 J	0.579 J	<1	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5	<5	<5	<5 UJ	<5
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-1
ANALYTICAL RESULTS, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-180 / MW-180 / L09040408-05 / 4/15/2009	MW-182 / MW-182 / L09040532-07 / 4/20/2009	MW-184 / MW-184 / L09040624-07 / 4/23/2009	MW-185 / MW-185 / L09040532-21 / 4/21/2009	MW-186 / MW-186 / L09040532-22 / 4/21/2009	MW-187 / MW-187 / L09040532-16 / 4/21/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	0.766 J	<1	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	0.135 UB	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	2.93 J	<10	2.88 J	<10	<10	3.58 UB
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1 UJ	<1	<1 UJ	<1
Carbon disulfide		µg/L	<1 UJ	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	4.52	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	0.136 J	<0.3	2.94	<0.3	<0.3	<0.3
Chloromethane		µg/L	<1	<1	<1 UJ	<1	<1 UJ	<1 UJ
cis-1,2-Dichloroethene		µg/L	<1	<1	0.424 J	0.334 J	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1 UJ	<1	<1 UJ	<1	<1 UJ	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	0.948 J	<1	0.393 J	<1	<1	<1
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	0.893 J	<1	2.27	0.649 J	4.92	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1 UJ	<1
Vinyl acetate		µg/L	<5 R	<5 UJ	<5 R	<5	<5	<5
Vinyl chloride		µg/L	<1	<1	<1 UJ	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-1
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2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-190 / MW-190 / L09040624-08 / 4/23/2009	MW-190 / MW-190DUP-7 / L09040624-06 / 4/23/2009	MW-220 / MW-220 / L09040624-13 / 4/23/2009	MW-221 / MW-221 / L09040457-08 / 4/16/2009	MW-222 / MW-222 / L09040457-09 / 4/16/2009	MW-223 / MW-223 / L09040457-21 / 4/17/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	0.556 J	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	276	265	<0.5	<0.5	1.19	0.778
1,1,2-Trichloroethane		µg/L	0.45 J	0.554 J	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	1.13	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	45.9	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	0.308 J	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	<10	<10	2.65 J	<10	3.91 UB	<10
Benzene		µg/L	0.238 J	0.185 J	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1 UJ	<1 UJ	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	0.562	0.576	0.238 J	<0.3	<0.3	0.177 J
Chloromethane		µg/L	<1 UJ	<1 UJ	<1	<1	0.344 UB	<1
cis-1,2-Dichloroethene		µg/L	3.4	3.45	<1	<1	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1 UJ	<1 UJ	<1	<1	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	1.37	1.5	19.8	<1	0.377 J	0.813 J
Toluene		µg/L	0.309 UB	0.251 UB	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	0.416 J	0.413 J	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	109	112	20.2	<1	1.87	7.38
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 R	<5 R	<5	<5	<5	<5
Vinyl chloride		µg/L	<1 UJ	<1 UJ	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-1
ANALYTICAL RESULTS, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-224 MW-224 L09040408-08 4/15/2009	MW-225 MW-225 L09040532-11 4/20/2009	MW-226 MW-226 L09040457-22 4/17/2009	MW-227 MW-227 L09040532-17 4/21/2009	MW-228 MW-228 L09040457-10 4/16/2009	MW-228 MW-228DUP-8 L09040457-04 4/16/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	4.03	<0.5	15.1	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	0.213 J	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	0.184 UB	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	2.65 J	<10	<10	3.33 UB	<10	<10
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1 UJ	<1	<1
Carbon disulfide		µg/L	<1 UJ	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	<1	0.524 J	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	<0.3	0.133 J	7.5	<0.3	<0.3
Chloromethane		µg/L	<1	<1	<1	<1 UJ	<1	<1
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	0.328 J	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1 UJ	<1	<1	<1 UJ	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	0.436 J	0.727 J	0.794 J	0.345 J	<1	0.283 J
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	<1	9.46	<1	3.56	<1	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1 UJ	<1	<1
Vinyl acetate		µg/L	<5 R	<5 UJ	<5	<5	<5	<5
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-1
ANALYTICAL RESULTS, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-230 / MW-230 / L09040408-09 / 4/15/2009	MW-231 / MW-231 / L09040457-12 / 4/17/2009	MW-232 / MW-232 / L09040408-24 / 4/15/2009	MW-234 / MW-234 / L09040457-13 / 4/17/2009	MW-235 / MW-235 / L09040457-14 / 4/17/2009	MW-236 / MW-236 / L09040457-15 / 4/17/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	1.4	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	2.01	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	30.3	<1	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	0.645	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	3.03 J	<10	26.1	3.47 UB	<10	3.65 UB
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1 UJ	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	0.236 J	<0.3	<0.3	<0.3	<0.3	<0.3
Chloromethane		µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene		µg/L	1.09	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1 UJ	<1	<1	<1	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	0.288 UB	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	0.326 J	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	89.9	<1	<1	<1	<1	<1
Toluene		µg/L	<1	0.308 UB	0.302 J	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	98.2	<1	<1	<1	<1	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 R	<5	<5	<5	<5	<5
Vinyl chloride		µg/L	<1	<1	4.14	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-1
ANALYTICAL RESULTS, MONITORING WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID	MW-237	MW-238	MW-239	MW-240	MW-240
	Sample ID	MW-237	MW-238	MW-239	MW-240	MW-240DUP-9
	Lab ID	L09040457-01	L09040624-09	L09040457-02	L09040457-16	L09040457-11
	Date	4/16/2009	4/23/2009	4/16/2009	4/17/2009	4/17/2009
Analyte	**Units**					
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	0.257 J	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	2.17	<1	0.536 J	<1	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	0.398 UB	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1	<1	<1
Acetone	µg/L	3.86 UB	<10	3.84 UB	<10	<10
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1	<1	<1	<1	<1
Carbon disulfide	µg/L	<1	<1	1.35 UB	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1 UJ	<1	<1
Chloroform	µg/L	0.129 J	<0.3	<0.3	<0.3	<0.3
Chloromethane	µg/L	<1	0.253 UB	0.272 UB	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	0.922 J	0.97 J
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.286 J	<1	<1	<1	<1
Toluene	µg/L	<1	<1	0.684 UB	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	1.56	1.54
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1
Vinyl acetate	µg/L	<5	<5	<5 UJ	<5	<5
Vinyl chloride	µg/L	<1	<1	<1 UJ	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimatec
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-2
ANALYTICAL RESULTS, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-03 MW-03-IS-7 L09100378-18 10/13/2009	MW-03 MW-03 DUP-1-IS-7 L09100378-22 10/13/2009	MW-04 MW-04-IS-7 L09100378-24 10/14/2009	MW-05 MW-05-IS-7 L09100378-19 10/13/2009	MW-06 MW-06-IS-7 L09100378-01 10/13/2009	MW-07 MW-07-IS-7 L09100378-02 10/13/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	0.715 J
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	3.96	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	0.317 J	<1	<1	<1	<1	1.24
1,1-Dichloroethene		µg/L	13.4	13.3	<1	<1	<1	24
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2 UJ	<2 UJ
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5 UJ	0.28 J
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10 UJ	<10 UJ
4-Chlorotoluene		µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
Acetone		µg/L	<10	<10	5.95 J	<10	3.57 UB	16.7 UB
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1 UJ	<1 UJ
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	<0.3	0.294 J	0.227 J	5.48	0.263 J
Chloromethane		µg/L	<1	<1	<1	<1	0.281 UB	<1 UJ
cis-1,2-Dichloroethene		µg/L	0.47 J	0.519 J	<1	<1	3.78	0.441 J
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1	<1	<1 UJ	<1 UJ
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10 UJ	<10 UJ
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	10.1	9.58	<1	<1	<1	62.8
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
Trichloroethene		µg/L	10.4	10.3	<1	<1	2.44	40.4
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5	<5 R	<5	<5 UJ	<5 UJ
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-2
ANALYTICAL RESULTS, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-10 MW-10-IS-7 L09100412-18 10/15/2009	MW-13 MW-13-IS-7 L09100378-25 10/14/2009	MW-14 MW-14-IS-7 L09100378-03 10/13/2009	MW-14 MW-14 DUP-2-IS- L09100378-15 10/13/2009	MW-15 MW-15-IS-7 L09100378-04 10/13/2009	MW-31 MW-31-IS-7 L09100378-26 10/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	0.547 J
1,1,2,2-Tetrachloroethane		µg/L	14.6	<0.5	<0.5	<0.5	24.5 J	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	0.905 J	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	1.13
1,1-Dichloroethene		µg/L	1.07	<1	<1	<1	<1	28.8
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2 UJ	<2	<2 UJ	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5 UJ	<0.5	0.861 J	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10 UJ	<10	<10 UJ	<10
4-Chlorotoluene		µg/L	<1	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
Acetone		µg/L	3.25 J	5.86 J	2.54 UB	2.55 UB	3.05 UB	16.7
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1 UJ	<1	<1 UJ	<1
Carbon tetrachloride		µg/L	<1	<1	0.939 J	0.764 J	2.97	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	1.15	0.187 J	<0.3	<0.3	31.1 J	0.161 J
Chloromethane		µg/L	<1	<1	<1 UJ	<1	<1 UJ	<1
cis-1,2-Dichloroethene		µg/L	0.733 J	<1	<1	<1	1.69	0.273 J
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1 UJ	<1	<1 UJ	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10 UJ	<10	<10 UJ	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	0.258 UB	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	3.19	<1	<1	<1	1.13	41.2
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	0.332 J	<1
trans-1,3-Dichloropropene		µg/L	<1	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
Trichloroethene		µg/L	6.79	<1	<1	<1	27	29
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5	<5 UJ	<5	<5 UJ	<5
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

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2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID	MW-32	MW-33	MW-37	MW-43	MW-44	MW-51
	Sample ID	MW-32-IS-7	MW-33-IS-7	MW-37-IS-7	MW-43-IS-7	MW-44-IS-7	MW-51-IS-7
	Lab ID	L09100378-27	L09100378-28	L09100378-29	L09100412-01	L09100412-02	L09100412-03
	Date	10/14/2009	10/14/2009	10/14/2009	10/15/2009	10/15/2009	10/15/2009
Analyte	**Units**						
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	16.2	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	0.873 J	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	15
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	0.925	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	0.157 UB	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1 UJ	<1 UJ	<1 UJ	<1	<1	<1
Acetone	µg/L	25.4	18.6	16.5	19.1	17	5.29 J
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	20.2	<1	<1	<1	0.822 J	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	176	<0.3	<0.3	<0.3	0.213 J	0.231 J
Chloromethane	µg/L	<1	<1	0.464 UB	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	10.3	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	5.41	<1	<1	<1	<1	2.3
Toluene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	1.97	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L	<1 UJ	<1 UJ	<1 UJ	<1	<1	<1
Trichloroethene	µg/L	113	<1	<1	<1	<1	10.4
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate	µg/L	<5	<5	<5	<5	<5	<5
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

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2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID	MW-57	MW-58	MW-65	MW-67	MW-68	MW-69
	Sample ID	MW-57-IS-7	MW-58-IS-7	MW-65-IS-7	MW-67-IS-7	MW-68-IS-7	MW-69-IS-7
	Lab ID	L09100378-07	L09100412-39	L09100412-04	L09100412-05	L09100378-30	L09100378-31
	Date	10/13/2009	10/15/2009	10/15/2009	10/15/2009	10/14/2009	10/14/2009
Analyte	**Units**						
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	1.16	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2 UJ	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5 UJ	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10 UJ	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1 UJ	<1	<1	<1	<1 UJ	<1 UJ
Acetone	µg/L	15.9 UB	3.17 J	4.65 J	17	18.6	21
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide	µg/L	<1 UJ	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	0.9 J	0.81 J	<1	<1	<1	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	67.4	0.149 J	<0.3	<0.3	0.159 J	<0.3
Chloromethane	µg/L	<1 UJ	<1	<1	<1	<1	0.517 UB
cis-1,2-Dichloroethene	µg/L	1.48	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1 UJ	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10 UJ	<10	<10	<10	<10	3.17 J
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.841 J	0.309 J	<1	<1	1.55	0.271 J
Toluene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	0.31 J	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L	<1 UJ	<1	<1	<1	<1 UJ	<1 UJ
Trichloroethene	µg/L	20.3	<1	<1	<1	1.16	<1
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate	µg/L	<5 UJ	<5	<5 R	<5 R	<5	<5
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-2
ANALYTICAL RESULTS, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-71 MW-71-IS-7 L09100378-32 10/14/2009	MW-71 MW-71 DUP-3-IS-7 L09100378-55 10/14/2009	MW-74 MW-74-IS-7 L09100378-33 10/14/2009	MW-75 MW-75-IS-7 L09100378-34 10/14/2009	MW-87 MW-87-IS-7 L09100378-08 10/13/2009	MW-91 MW-91-IS-7 L09100378-58 10/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	7.97	8.08	0.364 J	<0.5	7.09	0.678
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2 UJ	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5 UJ	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10 UJ	<10
4-Chlorotoluene		µg/L	<1 UJ	<1	<1 UJ	<1	<1 UJ	<1
Acetone		µg/L	19.2	18.4	9.11 J	5.92 J	2.92 UB	<10
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1 UJ	<1
Carbon tetrachloride		µg/L	0.301 J	0.468 J	<1	<1	<1	0.479 J
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	3.79	3.98	0.628	0.383	0.471	1.83
Chloromethane		µg/L	0.436 UB	<1	<1	<1	<1 UJ	<1
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	0.391 J	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1	<1	<1 UJ	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10 UJ	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	0.268 UB	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	<1	<1	0.495 J	0.526 J	<1	0.494 J
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1 UJ	<1	<1 UJ	<1	<1 UJ	<1
Trichloroethene		µg/L	2.23	2.25	2.34	<1	0.778 J	0.567 J
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 R	<5 R	<5	<5	<5 UJ	<5 R
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-2
ANALYTICAL RESULTS, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-128 MW-128-IS-7 L09100412-06 10/15/2009	MW-130 MW-130-IS-7 L09100412-07 10/15/2009	MW-132 MW-132-IS-7 L09100378-59 10/14/2009	MW-134 MW-134-IS-7 L09100412-19 10/15/2009	MW-144 MW-144-IS-7 L09100378-35 10/14/2009	MW-145 MW-145-IS-7 L09100412-10 10/15/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	2.95	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	301	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	0.661 J	<1
1,1-Dichloroethane		µg/L	<1	1.41	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	29 J	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	0.362 J	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	4.46 J	16.7	<10	2.7 J	17.9	17.5
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	0.18 J	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	0.206 J	<0.3	0.128 J	0.501	<0.3
Chloromethane		µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene		µg/L	<1	0.856 J	<1	<1	6.81	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	<1	68.5 J	0.303 J	0.501 J	1.4	<1
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	0.676 J	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	<1	61.7 J	<1	0.262 J	173	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 R	<5	<5 R	<5	<5	<5 R
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

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Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-147 MW-147-IS-7 L09100378-36 10/14/2009	MW-147 IW-147 DUP-4-IS- L09100378-56 10/14/2009	MW-153 MW-153-IS-7 L09100378-37 10/14/2009	MW-154 MW-154-IS-7 L09100412-11 10/15/2009	MW-167 MW-167-IS-7 L09100412-12 10/15/2009	MW-169 MW-169-IS-7 L09100378-38 10/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	0.416 J	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	0.309 J	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	2.99	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	0.346 J	0.762 UB
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	18.1	16.4	15.2	19.4	18.3	6.46 J
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	3.04
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chloromethane		µg/L	<1	<1	0.437 UB	<1	<1	<1
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	0.547 J
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	<1	<1	<1	<1	<1	<1
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	0.313 J	<1	<1	<1	<1	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5 R	<5	<5 R	<5 R	<5
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-2
ANALYTICAL RESULTS, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-170 MW-170-IS-7 L09100378-39 10/14/2009	MW-171 MW-171-IS-7 L09100378-40 10/14/2009	MW-172 MW-172-IS-7 L09100378-60 10/14/2009	MW-174 MW-174-IS-7 L09100378-09 10/13/2009	MW-176 MW-176-IS-7 L09100378-10 10/13/2009	MW-178 MW-178-IS-7 L09100378-41 10/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	0.315 J	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2 UJ	<2 UJ	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5 UJ	<0.5 UJ	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10 UJ	<10 UJ	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1 UJ	<1 UJ	<1
Acetone		µg/L	14	19.5	<10	2.66 UB	2.65 UB	5.15 J
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1 UJ	<1 UJ	<1
Carbon tetrachloride		µg/L	<1	<1	0.674 J	0.988 J	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	<0.3	<0.3	1.54	<0.3	0.602
Chloromethane		µg/L	0.364 UB	<1	<1	<1 UJ	<1 UJ	<1
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1	<1 UJ	<1 UJ	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	2.5 J	<10	<10 UJ	<10 UJ	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	<1	<1	0.296 J	0.591 J	<1	0.263 J
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1 UJ	<1 UJ	<1
Trichloroethene		µg/L	<1	<1	<1	0.485 J	<1	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5	<5 R	<5 UJ	<5 UJ	<5
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-2
ANALYTICAL RESULTS, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-179 MW-179-IS-7 L09100378-42 10/14/2009	MW-180 MW-180-IS-7 L09100378-11 10/13/2009	MW-180 IW-180 DUP-5-IS- L09100378-16 10/13/2009	MW-182 MW-182-IS-7 L09100412-13 10/15/2009	MW-184 MW-184-IS-7 L09100378-61 10/14/2009	MW-185 MW-185-IS-7 L09100378-43 10/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	5.06	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2 UJ	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5 UJ	<0.5	<0.5	0.484 J	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10 UJ	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1 UJ	<1 UJ	<1	<1	<1
Acetone		µg/L	6.96 J	4.31 UB	5.04 UB	6.57 J	<10	4.01 J
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1 UJ	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	<1	<1	13.4	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	0.154 J	0.161 J	<0.3	117	<0.3
Chloromethane		µg/L	<1	<1 UJ	<1	0.286 J	<1	<1
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	5.61	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1 UJ	<1	<1	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10 UJ	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	0.26 UB	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	0.281 J	<1	<1	<1	4.98	<1
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	1.63	<1
trans-1,3-Dichloropropene		µg/L	<1	<1 UJ	<1 UJ	<1	<1	<1
Trichloroethene		µg/L	<1	<1	<1	<1	84	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5 UJ	<5	<5	<5 R	<5
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

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Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-186 MW-186-IS-7 L09100378-44 10/14/2009	MW-187 MW-187-IS-7 L09100412-14 10/15/2009	MW-190 MW-190-IS-7 L09100378-45 10/14/2009	MW-220 MW-220-IS-7 L09100378-20 10/13/2009	MW-221 MW-221-IS-7 L09100378-12 10/13/2009	MW-222 MW-222-IS-7 L09100378-48 10/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	0.438 J	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	28.1	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	0.868 J	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	33.1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2 UJ	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5 UJ	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10 UJ	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1 UJ	<1 UJ	<1
Acetone		µg/L	3.55 J	3.91 J	4.19 J	<10	5.13 UB	7.27 J
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1 UJ	<1
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	0.162 J	0.135 J	0.184 J	<0.3	0.269 J
Chloromethane		µg/L	0.298 UB	<1	<1	<1	<1 UJ	<1
cis-1,2-Dichloroethene		µg/L	<1	<1	0.547 J	<1	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1	<1	<1 UJ	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10 UJ	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	<1	0.253 J	0.588 J	19	<1	<1
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1 UJ	<1 UJ	<1
Trichloroethene		µg/L	1.83	<1	27.6	18.7	<1	1.04
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5	<5	<5	<5 UJ	<5
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-2
ANALYTICAL RESULTS, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-223 MW-223-IS-7 L09100378-49 10/14/2009	MW-224 MW-224-IS-7 L09100378-50 10/14/2009	MW-225 MW-225-IS-7 L09100378-13 10/13/2009	MW-225 MW-225 DUP-6-IS- L09100378-17 10/13/2009	MW-226 MW-226-IS-7 L09100378-51 10/14/2009	MW-227 MW-227-IS-7 L09100378-14 10/13/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	0.227 J	<0.5	2.47	1.98	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2 UJ	<2	<2	<2 UJ
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5 UJ	<0.5	<0.5	<0.5 UJ
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10 UJ	<10	<10	<10 UJ
4-Chlorotoluene		µg/L	<1	<1	<1 UJ	<1 UJ	<1	<1 UJ
Acetone		µg/L	7.69 J	5.18 J	6.18 UB	6.09 UB	8.38 J	<10 UJ
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1 UJ	<1	<1	<1 UJ
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	0.551	<0.3	0.198 J	0.255 J	0.184 J	0.322
Chloromethane		µg/L	<1	<1	0.255 UB	0.442 UB	<1	0.329 UB
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1 UJ	<1	<1	<1 UJ
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10 UJ	<10	<10	<10 UJ
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	0.319 J	0.451 J	0.566 J	0.649 J	0.75 J	0.267 J
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1 UJ	<1 UJ	<1	<1 UJ
Trichloroethene		µg/L	4.01	<1	11	10.7	<1	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5	<5	<5 UJ	<5	<5	<5 UJ
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-2
ANALYTICAL RESULTS, MONITORING WELLS - OCTOBER 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	MW-228 MW-228-IS-7 L09100378-62 10/14/2009	MW-230 MW-230-IS-7 L09100378-63 10/14/2009	MW-231 MW-231-IS-7 L09100378-52 10/14/2009	MW-234 MW-234-IS-7 L09100378-53 10/14/2009	MW-235 MW-235-IS-7 L09100412-15 10/15/2009	MW-237 MW-237-IS-7 L09100412-16 10/15/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	0.994 J	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	1.68	<1	<1	<1	0.283 J
1,1-Dichloroethene		µg/L	<1	28.1	<1	<1	<1	1.77
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	0.428 J	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	<10	<10	4.05 J	<10	5.37 J	4.56 J
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	0.527 J	<1	<1	<1
Carbon tetrachloride		µg/L	0.627 J	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	0.188 J	<0.3	<0.3	<0.3	<0.3
Chloromethane		µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene		µg/L	<1	0.886 J	<1	<1	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	0.399 J	88.4	<1	<1	<1	<1
Toluene		µg/L	<1	<1	<1	<1	<1	0.255 J
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	<1	83.5	<1	<1	<1	<1
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 R	<5 R	<5	<5 R	<5	<5
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

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DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

	Well ID	MW-239	MW-240	MW-240
	Sample ID	MW-239-IS-7	MW-240-IS-7	IW-240 DUP-7-IS-
	Lab ID	L09100412-17	L09100378-54	L09100378-57
	Date	10/15/2009	10/14/2009	10/14/2009
Analyte	**Units**			
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	0.605	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1
1,1-Dichloroethene	µg/L	0.899 J	<1	<1
1,1-Dichloropropene	µg/L	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1
Acetone	µg/L	3.96 J	<10	3.79 J
Benzene	µg/L	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1
Bromomethane	µg/L	<1	<1	<1
Carbon disulfide	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3
Chloromethane	µg/L	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	0.278 J	0.86 J	0.9 J
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1
Styrene	µg/L	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	1.73	1.64
Trichlorofluoromethane	µg/L	<1	<1	<1
Vinyl acetate	µg/L	<5	<5 R	<5
Vinyl chloride	µg/L	<1 UJ	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estim
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-3
ANALYTICAL RESULTS RECOVERY WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	RW-01 RW-1-IS-6 L09040369-29 4/14/2009	RW-01A RW-1A-IS-6 L09040369-30 4/14/2009	RW-01B RW-1B-IS-6 L09040369-31 4/14/2009	RW-02 RW-2-IS-6 L09040369-32 4/14/2009	RW-03 RW-3-IS-6 L09040369-35 4/14/2009	RW-04 RW-4-IS-6 L09040369-22 4/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane		µg/L	<0.5	0.97	0.824	2.01	<0.5	2.95
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1 UJ	<1	<1	<1	<1	<1 UJ
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	<10 UJ	5.93 J	2.52 J	<10	<10	<10
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1 UJ	<1 UJ	<1	<1 UJ	<1
Carbon tetrachloride		µg/L	2.31	<1	0.53 J	0.647 J	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	15.4	1.45	9.79	3.22	0.21 J	0.319
Chloromethane		µg/L	<1	<1	<1	<1	<1	0.256 UB
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	2.4	<1	<1
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	<1	0.394 UB	0.254 UB	<1	<1	0.385 J
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1 UJ	<1	<1	<1	<1	<1
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	0.509 J	<1	0.542 J	0.347 J	<1	0.7 J
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	8.54	0.717 J	1.72	2.21	0.349 J	13.2
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 UJ	<5 R	<5 R	<5 UJ	<5 R	<5 UJ
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, but concentration estimated.
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-3
ANALYTICAL RESULTS RECOVERY WELLS - APRIL 2009
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	Well ID / Sample ID / Lab ID / Date	Units	RW-05 RW-5-IS-6 L09040369-23 4/14/2009	RW-05 RW-05DUP-10-IS- L09040369-28 4/14/2009	RW-06 RW-6-IS-6 L09040369-24 4/14/2009	RW-07 RW-7-IS-6 L09040369-25 4/14/2009	RW-08 RW-8-IS-6 L09040369-26 4/14/2009	RW-09 RW-9-IS-6 L09040369-27 4/14/2009
1,1,1,2-Tetrachloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane		µg/L	<1	<1	<1	<1	<1	0.474 J
1,1,2,2-Tetrachloroethane		µg/L	<0.5	<0.5	0.568	0.601	<0.5	0.86
1,1,2-Trichloroethane		µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane		µg/L	<1	<1	<1	<1	0.326 J	1.05
1,1-Dichloroethene		µg/L	<1	<1	<1	<1	15.7	24
1,1-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene		µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
1,2,3-Trichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane		µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.309 J
1,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene		µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane		µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane		µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone		µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene		µg/L	<1	<1	<1	<1	<1	<1
Acetone		µg/L	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ	<10 UJ
Benzene		µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene		µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane		µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform		µg/L	<1	<1	<1	<1	<1	<1
Bromomethane		µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide		µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride		µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane		µg/L	<1	<1	<1	<1	<1	<1
Chloroform		µg/L	<0.3	<0.3	0.186 J	0.135 J	0.152 J	0.205 J
Chloromethane		µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	0.427 J
cis-1,3-Dichloropropene		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane		µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane		µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane		µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
Ethylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene		µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene		µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene		µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)		µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)		µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride		µg/L	0.744 J	0.412 J	<1	<1	<1	0.517 J
MIBK (methyl isobutyl ketone)		µg/L	<10	<10	<10	<10	<10	<10
Naphthalene		µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
n-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene		µg/L	<1	<1	<1	<1	<1	<1
o-Xylene		µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene		µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Styrene		µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene		µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene		µg/L	0.327 J	0.41 J	0.26 J	<1	6.97	46.9
Toluene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene		µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene		µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene		µg/L	<1	<1	<1	0.884 J	9.04	33
Trichlorofluoromethane		µg/L	<1	<1	<1	<1	<1	<1
Vinyl acetate		µg/L	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ	<5 UJ
Vinyl chloride		µg/L	<1	<1	<1	<1	<1	<1

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, but concentration e
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-4
QA/QC ANALYTICAL RESULTS
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	**Sample ID** **Lab ID** **Date** **units**	TB-041409-IS-6 L09040369-10 4/14/2009	TB-041509-IS-6 L09040408-04 4/15/2009	TB-041609-IS-6 L09040457-05 4/16/2009	TB-041709-IS-6 L09040457-18 4/17/2009	TB-041309-IS-6 L09040532-09 4/20/2009	TB-42109-IS-6 L09040532-24 4/21/2009	TB-42209-IS-6 L09040624-14 4/22/2009
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.293 J	0.269 J
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1	<1
Acetone	µg/L	<10	<10	2.58 J	<10	5.03 J	3.36 J	<10
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1	<1	<1	<1	<1	<1	<1 UJ
Carbon disulfide	µg/L	<1	<1 UJ	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chloromethane	µg/L	0.592 J	0.352 J	0.276 J	0.619 J	0.991 J	<1	<1 UJ
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1 UJ	<1 UJ	<1	<1	<1	<1	<1 UJ
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	0.25 UB	0.389 J	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1	<1	0.327 J
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	µg/L	<5 UJ	<5 R	<5	<5	<5 UJ	<5	<5 R
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1 UJ

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estimated.
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

TABLE B-4
QA/QC ANALYTICAL RESULTS
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

Analyte	**Sample ID** **Lab ID** **Date** **units**	TB-42309-IS-6 L09040624-15 4/23/2009	RB-1-IS-6 L09040457-23 4/17/2009	RB-2-IS-6 L09040532-23 4/20/2009	RB-1-IS-7 L09100378-21 10/13/2009	TB-101309-IS-7 L09100378-23 10/13/2009	TB-101409-IS-7 L09100378-64 10/14/2009	TB-101509-IS-7 L09100412-20 10/15/2009
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	0.179 J	1.02	1.48	0.673	<0.5	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1	<1 UJ	<1 UJ	<1	<1
Acetone	µg/L	<10	24.6 UB	22.9 UB	4.2 UB	<10	<10	<10
Benzene	µg/L	<0.4	<0.4	0.161 J	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon disulfide	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chloromethane	µg/L	0.278 J	<1	<1	<1	0.319 J	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	4.8 J	6.67 J	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	0.534 J	0.342 J	0.51 UB
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/L	<1	0.268 J	0.437 J	0.315 J	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1	<1 UJ	<1 UJ	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1	<1	<1
Vinyl acetate	µg/L	<5	<5	<5	<5	<5	<5 R	<5
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1 UJ

Notes:
µg/L: micrograms per liter
DQE Flags:
J: Analyte positively identified, concentration estima
UB: non-detect, method blank contamination
UJ: non-detect, estimated
R: Rejected
<: Analyte not detected above RL
Methods:
8260B: Volatile Organic Compounds

APPENDIX C

DATA QUALITY EVALUATION

DATA QUALITY EVALUATION

System monitoring activities by engineering-environmental Management, Inc (e^2M), now HDR, Inc. (HDR), included sampling and analysis of groundwater from recovery wells and monitoring wells. The activities were performed in accordance with past practice and the *Remedial Action Sampling and Analysis Plan* (RA SAP) (MACTEC, 2004). Monitoring wells were sampled in April and October 2009, and recovery wells were sampled in April 2009 only. Samples from monitoring wells were collected using either passive diffusion bags (PDBs) or low-flow sampling methods. Sampling was performed in general accordance with the *User's Guide for Polyethylene-based Passive Diffusion Bag Samplers to Obtain Volatile Organic Compound Concentrations in Wells* (U.S. Geological Survey, 2001) and the RA SAP. Samples were submitted to Microbac Laboratories, Inc. (Microbac) in Marietta, Ohio for analysis.

The data quality evaluation (DQE) process involves assessment of field and laboratory procedures per the guidelines in the RA SAP, with independent data validation completed by Diane Short and Associates, Inc (DSA). The data validation reports are included in this appendix. This assessment is designed to evaluate problems with the quality assurance (QA)/quality control (QC) associated with the laboratory data and potential impact to the data quality objectives (DQOs). The DQE findings are summarized in the following sections.

C.1 FIELD ACTIVITIES and FIELD QUALITY CONTROL

In April of 2009, 80 groundwater samples were collected from 80 monitoring wells using PDBs in 33 wells and low-flow bladder pump in 47 wells. In October of 2009, 68 groundwater samples were collected from 68 monitoring wells using PDBs in 56 wells and low-flow bladder pump in 12 wells. Groundwater samples were collected from all 11 recovery wells in April.

The field QC program for Dunn Field IRA sampling includes specific procedures for collection of groundwater samples, as described in the PDB User's Guide (USGS, 2001) and the RA SAP. Sample bottles met USEPA requirements for environmentally clean containers. Sample labels were pre-printed to facilitate sample tracking from the field through the laboratory to the final report.

Field QC samples were collected to evaluate sampling technique and decontamination procedures. These samples included field duplicates, matrix spike/matrix spike duplicates (MS/MSD), trip blanks, and field equipment blanks. Documentation of sampling was performed in the field to ensure that the sample collected, labeling, chain-of-custody, and request for analysis were in agreement. Custody seals were placed on each cooler before being sent to the laboratory.

C.2 ANALYTICAL METHODS

The groundwater samples collected from the monitoring wells and the recovery wells were analyzed for VOCs by method 8260B.

C.3 LABORATORY QUALITY CONTROL

The laboratory QC program, including sample handling, laboratory control, and reporting, is documented in the RA SAP. Sample handling includes documentation of sample receipt, placement in storage, lab personnel using the sample, and disposal. The laboratory control consists of instrument calibration and maintenance, laboratory control samples (LCS), method blanks and matrix spikes. Reporting of the laboratory control data was planned prior to the collection of the data, allowing the laboratory to place the appropriate information into the data package so that the DQE could be performed in a timely manner.

C.4 DATA QUALITY EVALUATION

The objective of the DQE was to provide a review of the chemical data reports submitted by the laboratory and to assess the data in relation to the data quality objectives stated in the RA SAP. The DQE consisted of review of laboratory QC data and field QC parameters, and flagging of the data as usable, usable with qualification, or unusable in accordance with the DQE standard operating procedures (SOPs) using the criteria stated in the RA SAP for each analytical method performed. The following information was reviewed:

- Sample Integrity (Deliverables)
- Sample Completeness
- Sample Holding Times
- Laboratory Methods for Extraction and Analysis (Calibration, Internal Standards)
- Method Accuracy and Precision (Surrogates, Matrix Spike/Matrix Spike Duplicate, LCS Recoveries)
- Laboratory Performance Criteria (Blanks, Instrument Performance Checks)

Field QC parameters were evaluated through field duplicates, field blanks, field documentation, and shipping criteria.

The DQE was summarized by use of flags that indicate to the reviewer that the data being considered has been qualified using the established criteria. Sample delivery group (SDG) narratives detailing the evaluation of the laboratory data by DSA are included in this appendix. The SDGs and associated samples are listed on Table C-1. The following sections discuss only those deficiencies encountered during the evaluation that resulted in qualified and/or unusable data.

C.4.1 Data Quality Evaluation Summary

The DQE was completed on the data reported for the IRA groundwater sampling events conducted at Dunn Field in April and October 2009. The following sections provide summary discussions of the required data qualifications for each event and analytical method for the groundwater samples collected. A Level III DQE was performed and the data quality indicators (DQIs) evaluated included sample integrity, holding times, trip blanks, field blanks, method blanks, internal standards, calibrations, surrogate recoveries, matrix spike/matrix spike duplicate (MS/MSD) recoveries, LCSs, and field duplicate precision. These DQIs are expressed in terms of precision, accuracy, representativeness, completeness, comparability, and sensitivity. The results of the DQE are summarized below.

Precision

Field duplicates were collected to assess sampling precision. They consisted of replicate grab samples collected concurrently with the associated field samples. Precision is best expressed in terms of relative percent difference (RPD). All duplicate samples met precision goals. No analytes required qualification based on field precision.

Accuracy

Accuracy was measured through the analyses of LCSs and MS/MSDs. Sample specific accuracy is measured through surrogate recovery. Accuracy is expressed as percent recovery (%R).

In the April event, there was one target (carbon disulfide) out low in the LCS associated with the samples reported. These are qualified as estimated J. In the October event, 1,2-dichloroethane (1,2-DCA) and 1,1,2-trichloroethane (1,1,2-TCA) were out high indicating a high bias. Qualifiers were added to one sample based on LCS.

Based on MS/MSD performance in the VOC analyses for the April and October events with low recoveries, both non-detects and detects in the parent sample are qualified as estimated J. Four targets in one April

sample and two targets in two October samples were so qualified. Based on these results, data met accuracy goals.

Representativeness

Representativeness refers to the degree sample data accurately and precisely describes the population of samples at a sampling point or under certain environmental conditions. Samples that are not properly preserved or are analyzed beyond holding times may not be considered representative. Review of sampling procedures, laboratory preparation, analysis holding times, trip blank and field blank analysis help in providing this assessment.

Sampling procedures followed the work plan and were considered representative of the matrices collected. Laboratory preparation and analysis followed method guidelines. Trip blanks, field blanks, and some method blanks contained VOCs that resulted in the qualification of data as possible false positives or biased high values based on the blank data. This resulted in the "B" qualification of some of the chloroform and methylene chloride results in the water samples. The "B"-qualified data were reported at levels below MCLs and therefore should not adversely impact data quality.

Completeness

Completeness is determined for both field and analytical objectives. Field completeness is calculated from the number of samples proposed versus the actual number of samples collected. Analytical completeness is expressed in terms of usable data. The project completeness goal for DDMT is 90% as stated in the RA SAP.

Thirty-eight of 165 vinyl acetate results were qualified as rejected R due to continuing calibration drift, for a vinyl acetate completeness of 77%. Total completeness for the 2009 IRA groundwater sampling events was greater than 99.6%, which meets the completeness DQO. With the exception of the 38 rejected vinyl acetate results, the groundwater data were usable with the qualifications discussed in the sections below and the attached DQE narratives.

Comparability

The selection of standardized methods aids in the comparison of past data to recent studies. Past investigation data are comparable to recent studies.

Sensitivity

Analytical sensitivity is the concentration at which the measurement system can quantitate target analytes in the environmental matrices of concern. Analytical sensitivity is expressed in terms of the reporting (RL), which is provided by the respective laboratories as their reasonable and defensible quantitation limit for environmental samples above the method detection limit (MDL) which is established by each laboratory using pure water or clean matrix. It varies among laboratories dependent upon their SOPs and expertise. The analytical method RLs and MDLs were compared to groundwater protection standards and were determined to meet the overall project objectives.

C.4.1.1 Semi-Annual Event – April 2009

Monitoring Well Samples - During the April 2009 semi-annual sampling event, 80 groundwater samples were collected from 80 monitoring wells in April 2009 and analyzed for Target Compound List (TCL) VOCs by EPA Method SW8260B. The data are usable with qualifications as described below:

- Contamination was observed in some method blanks. Whenever methylene chloride is detected in associated samples at a level less than 10x the method blank or carbon disulfide is detected in associated samples at a level less than 5x the method blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the reporting limit and, therefore, should not adversely impact data quality.
- Contamination was observed in some trip blanks. Whenever acetone is detected in associated samples at a level less than 10x the method blank or chloromethane, 1,4-dichlorobenzene or toluene is detected in associated samples at a level less than 5x the trip blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the reporting limit and, therefore, should not adversely impact data quality.
- Contamination was observed in some rinse blanks. Whenever 1,4-dichlorobenzene or toluene is detected in associated samples at a level less than 5x the rinse blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the reporting limit and, therefore, should not adversely impact data quality.

- The possibility of bias associated with calibration drift with respect to carbon disulfide was indicated in one sample (MW-239-IS-6), and where the discrepancy in %D was observed, the associated sample detect was qualified estimated J. However, this result was ultimately qualified UB as noted above.

- The possibility of low bias associated with calibration drift with respect to carbon disulfide and vinyl acetate was indicated in a number of samples. Where the discrepancy in %D was observed, the associated sample non-detects were qualified estimated UJ, and where the %D was greater than 40% (for vinyl acetate), the associated sample results were qualified as rejected (R).

- Based on MS/MSD performance with low recoveries of vinyl acetate, the non-detect in the parent sample MW-51-IS-6 is qualified as non-detect estimated "UJ".

- There were numerous analytes with LCS recoveries below control limits. Associated non-detect sample results were qualified as non-detect estimated "UJ" and detected results as estimated "J". This applies to vinyl acetate in lab batch WG299957; dichlorodifluoromethane and vinyl acetate in WG300057; dichlorodifluoromethane in WG300079; vinyl acetate in WG300495; chloromethane in WG300513; and bromomethane, chloromethane, dichlorodifluoromethane and vinyl chloride in WG300977.

- Any result reported below the reporting limit (RL) but above the method detection limit (MDL) was flagged "J" and considered an estimated result (unless overridden by other QC flags).

Recovery Well Samples - Eleven groundwater samples were collected from 11 recovery wells in April 2009 and analyzed for TCL VOCs by EPA Method SW8260B. The data are usable with the following qualifications:

- Contamination was observed in some method blanks. Whenever methylene chloride is detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"-qualified data were reported at levels below the reporting limit and, therefore, should not adversely impact data quality.

- Contamination was observed in one trip blank. Whenever chloromethane is detected in associated samples at a level less than 5x the trip blank (corrected for dilution), the result

is qualified as UB. Such results are usable as non-detects. The "B"- qualified data were reported at levels below the reporting limit and, therefore, should not adversely impact data quality.

- The possibility of low bias associated with calibration drift with respect to carbon disulfide and vinyl acetate was indicated in a number of samples. Where the discrepancy in %D was observed, the associated sample non-detects were qualified estimated UJ, and where the %D was greater than 40% (for vinyl acetate), the associated sample results were qualified as rejected "R".
- Based on MS/MSD performance with low recoveries of vinyl acetate, the non-detect in the parent sample RW-2-IS-6 is qualified as non-detect estimated "UJ".
- There were several analytes with LCS recoveries below control limits. Associated non-detect sample results were qualified as non-detect estimated "UJ" and detected results as estimated "J". This applies to dichlorodifluoromethane and vinyl acetate in WG300057 and dichlorodifluoromethane in WG300079.
- Any result reported below RL but above MDL was flagged "J" and considered an estimated result (unless overridden by other QC flags).

C.4.1.2 Semi-Annual Event – October 2009

Monitoring Well Samples - During the October 2009 semiannual sampling event, 68 groundwater samples were collected from 68 monitoring wells. Samples were analyzed for TCL VOCs by EPA Method SW8260B. The October 2009 data are usable with qualifications as described below:

- Contamination was observed in one method blank. Whenever methylene chloride is detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"-qualified data were reported at levels below the reporting limit and, therefore, should not adversely impact data quality.
- Contamination was observed in some trip blanks. Whenever methylene chloride is detected in associated samples at a level less than 10x the method blank or chloromethane is detected in associated samples at a level less than 5x the trip blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"-qualified data were reported at levels below the reporting limit and, therefore, should not adversely impact data quality.

- Contamination was observed in some rinse blanks. Whenever acetone is detected in associated samples at a level less than 10x the method blank or 1,4-dichlorobenzene is detected in associated samples at a level less than 5x the rinse blank (corrected for dilution), the result is qualified as UB. Such results are usable as non-detects. The "B"-qualified data were reported at levels below the reporting limit and, therefore, should not adversely impact data quality.

- The possibility of low bias associated with calibration drift with respect to 2-hexanone, 4-chlorotoluene and vinyl acetate was indicated in a number of samples. Where the discrepancy in %D was observed, the associated sample non-detects were qualified estimated "UJ", and where the %D was greater than 40% (for vinyl acetate), the associated sample results were qualified as rejected "R".

- Based on MS/MSD performance with several low recoveries, non-detects in the parent sample are qualified as non-detect estimated "UJ" and detects are qualified as estimated J. This applies to 1,1,2,2-tetrachloroethane, carbon disulfide, chloroform, dichlorodifluoromethane and vinyl acetate in MW-15-IS-7 and 1,1-dichloroethene, trichloroethene and tetrachloroethene in MW-130-IS-7.

- There were several analytes with LCS recoveries below control limits. Associated non-detect sample results were qualified as non-detect estimated "UJ" and detected results as estimated "J". This applies to 1,2-dichloroethane, 1,2-dibromo-3-chloropropane, 2-hexanone, 4-chlorotoluene, acetone, carbon disulfide, chloromethane, dichlorodifluoromethane, 2-butanone (MEK), trans-1,3-dichloropropene and vinyl acetate in WG314734; 4-chlorotoluene and trans-1,3-dichloropropene in WG314985; and vinyl chloride in WG315111.

- Any result reported below the RL but above the MDL was flagged "J" and considered an estimated result (unless overridden by other QC flags).

C.5 SUMMARY

With the exception of the rejected vinyl acetate results, data obtained in 2009 from the monitoring wells and the recovery wells at the Dunn Field IRA were determined to have met the DQOs and be sufficient and valid for remedial decisions regarding monitoring system effectiveness.

TABLE C-1
SDG SUMMARY TABLE
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

SDG	Groundwater Samples			Quality Control Samples
April 2009 Semi-Annual Event				
L09040369	MW-31-76.95	MW-156-67.75	RW-1A	TB-041409
	MW-43-167.25	MW-157-75.95	RW-1B	MW-161-82-DUP-5
	MW-44-69.75	MW-161-82	RW-2	RW-5-DUP-10
	MW-67-268.25	MW-162-86.08	RW-3	RW-2-MS
	MW-68-78.25	MW-163-77.03	RW-4	RW-2-MSD
	MW-76-90.75	MW-164-74.59	RW-5	
	MW-145-90.75	MW-167-80.07	RW-6	
	MW-147-78.81	MW-170-70.91	RW-7	
	MW-153-86.75	MW-171-63.75	RW-8	
	MW-154-61.45	RW-1	RW-9	
L09040408	MW-07-74.15	MW-69-89.64	MW-168-114.45	TB-041509
	MW-10	MW-70-87.67	MW-168A-82.03	MW-37-173.25-DUP-2
	MW-32-66.84	MW-71-74.28	MW-180	MW-10-MS
	MW-33-59.15	MW-77-85.55	MW-224	MW-10-MSD
	MW-37-173.25	MW-130-70.25	MW-230	MW-180-MS
	MW-57-68.32	MW-144-75.68	MW-232	MW-180-MSD
L09040457	MW-3	MW-221	MW-234	TB-041609
	MW-134	MW-222	MW-235	TB-041709
	MW-172	MW-223	MW-236	RB-1
	MW-174	MW-226	MW-237	MW-172-DUP-6
	MW-179	MW-228	MW-239	MW-228-DUP-8
		MW-231	MW-240	MW-240-DUP-9
L09040532	MW-4	MW-65	MW-185	TB-041309
	MW-13	MW-78	MW-186	TB-42109
	MW-14	MW-128	MW-187	RB-2
	MW-15	MW-178	MW-225	MW-14-DUP-1
	MW-51	MW-182	MW-227	MW-128-DUP-4
				MW-51-MS
				MW-51-MSD
				MW-78-MS
				MW-78-MSD
L09040624	MW-6	MW-87	MW-184	TB-42209
	MW-74	MW-91	MW-190	TB-42309
	MW-75	MW-132	MW-220	MW-74-DUP-3
		MW-176	MW-238	MW-190-DUP-7

TABLE C-1
SDG SUMMARY TABLE
2009 OPERATIONS AND CLOSURE REPORT
DUNN FIELD GROUNDWATER INTERIM REMEDIAL ACTION
Defense Depot Memphis, Tennessee

SDG	Groundwater Samples			Quality Control Samples
October 2009 Semi-Annual Event				
L09100378	MW-03	MW-75	MW-185	TB-101309
	MW-04	MW-87	MW-186	TB-101409
	MW-05	MW-91	MW-190	RB-1
	MW-06	MW-132	MW-220	MW-03-DUP-1
	MW-07	MW-144	MW-221	MW-14-DUP-2
	MW-13	MW-147	MW-222	MW-71-DUP-3
	MW-14	MW-153	MW-223	MW-147-DUP-4
	MW-15	MW-169	MW-224	MW-180-DUP-5
	MW-31	MW-170	MW-225	MW-225-DUP-6
	MW-32	MW-171	MW-226	MW-240-DUP-7
	MW-33	MW-172	MW-227	MW-15-MS
	MW-37	MW-174	MW-228	MW-190-MS
	MW-57	MW-176	MW-230	MW-190-MSD
	MW-68	MW-178	MW-231	
	MW-69	MW-179	MW-234	
	MW-71	MW-180	MW-240	
	MW-74	MW-184		
L09100412	MW-10	MW-67	MW-167	TB-101509
	MW-43	MW-128	MW-182	MW-130-MS
	MW-44	MW-130	MW-187	MW-130-MSD
	MW-51	MW-134	MW-235	
	MW-58	MW-145	MW-237	
	MW-65	MW-154	MW-239	

ORGANIC DATA QUALITY REVIEW REPORT
VOLATILE ORGANICS SW-846 METHOD 8260B

8260B/5030B
SDG: L09040369, L09040408, L09040457, L09040532, L09040624

PROJECT: Memphis Defense Depot, IRA-6 for e2m, Texas

LABORATORY: Microbac Laboratories, Inc., Marietta, OH

SAMPLE MATRIX: Water

NO. OF SAMPLES: 8260B: 111 aqueous samples; including 8 trip blanks and 2 rinse blanks

ANALYSES REQUESTED: SW-846 8260B

SAMPLE NO.: See attached result forms and Table at end of report

DATA REVIEWER: Sammy Huntington and John Huntington

QA REVIEWER: Diane Short and Associates Inc. INITIALS/DATE: _____

Telephone Logs included Yes____ No _X__

Contractual Violations Yes____ No _X___

The project QAPP (11/05), the EPA Contract Laboratory Program National Functional Guidelines for Organic Review, 1999 and 2001, and the SW-846 Method 8260B and 8270C have been referenced by the reviewer to perform this data validation review. The EPA qualifiers have been expanded to include a descriptor code and value to define QC violations and their values, per the approval of the Project Manager. Per the Scope of Work, the review of these samples includes Level III validation of all chains of custody, calibrations and QC forms referencing the QC limits in the above documents.

I. DELIVERABLES

A. All deliverables were present as specified in the Statement of Work (SOW), SW-846, or in the project contract.
Yes __X_ No _____
This report has been requested to include the following review: Holding times and sample integrity (chains of custody, sample log in), Calibrations, Summary QC.

B. Chain of Custody Documentation was complete and accurate.
Yes ___X___ No ___
No qualifiers have been added for chain of custody issues and the project manager will update chains per the following notes to complete the project record.

Sample Receiving Checklist stated "NA" for cooler seals, all other SDGs said "Yes".
SDG L09040457 had changes to the received time without initials on the manual chain of custody for sample RB-1-IS-6. The time appears to be the same as for the other samples, which is 0836.

C. Samples were received at the required temperature, preservation and intact with no bubbles.
Yes ___X___ No ____

EPA regulations (See Federal Register, March 12, 2007, 40CFR Part 122) require only that the temperature of samples delivered to the laboratory be equal to or less than 6^{o} C. The sample receipt conditions are fully compliant with applicable regulations.

II. ANALYTICAL REPORT FORMS

A. The Analytical Report or Data Sheets are present and complete for all requested analyses.
Yes _X_ No ____

B. Holding Times
1. The contract holding times were met for all analyses (Time of sample receipt to time of analysis (VOA) or extraction and from extraction to analysis).
Yes __X___ No_____

2. The Clean Water Act (40 CFR 136) or method holding times were met for all analyses (14 days from time of sample collection to analysis or extraction).
Yes _X__ No ____
All holding times were 7 days or less.

III. INSTRUMENT CALIBRATION – GC/MS

A. Initial Calibration
1. The Response (RF) and Relative Response Factors (RRF) and average RRF for all compounds for all analyses met the contract criteria of >0.01 for volatiles and 0.05 for semi-volatiles.
Yes __X__ No ____ NA____
Method 8260: Per the project manager, the 2001 EPA CLP validation guidance has been applied to the common "poor responders". Acetone, 2-butanone, and 4-methyl-2-pentanone are the compounds for which any calibration response factors below 0.05 have been observed. The validation guidance used for this project allows for a response of 0.01 for these compounds if spectral integrity can be verified at low concentrations. These spectra are not commonly provided and are not part of the deliverable for these data sets. The laboratory has been tasked with providing to the client verification that the 0.01 RF is valid. Given the spectral verification is available, the data are not qualified for response >0.01 < 0.05. No data have been qualified.

Most of the low-responding compounds are highly water-soluble and capable of hydrogen bonding with water. This decreases their purge efficiency and results in the relatively low response. The implication of this low purge efficiency is that a relatively low absolute recovery of such compounds is achieved in the purge step of the analysis. If this recovery is consistent, reasonable accuracy and precision can be achieved in a given matrix, which is indicated for the lab matrix by acceptable recoveries in LCS and calibration checks. However, this causes these targets to be more sensitive to matrix variations that impact purge efficiency (such as ionic strength or the presence of varying levels of soluble non-target organic material) than are the more hydrophobic compounds typically analyzed by this method, and as a result they are more likely to exhibit matrix bias.

2a.The relative standard deviation (RSD) for the five point calibration was within the 30% limit for the CCCs.
Yes _X__ No____ NA____
This is a method requirement and indicates that the analytical system is in control.

2b.The relative standard deviation (RSD) for the five point calibration was within the 30% limit for all other compounds, the average %RSD was <15%, or a linear curve was used.
Yes __X___ No ____ NA____

3. The 12 hour system Performance Check was performed as required in SW-846.
Yes __X__ No_____ NA____

B. Continuing Calibrations

1. The midpoint standard was analyzed for each analysis at the required frequency and the QC criteria of > 0.05 (.01 for CLP 2001 VOA) were met.
Yes ___X__ No ____ NA____

2. The percent difference (%D) limits of ± 25% were met. The 2001 NFG also allow for 40% D for the poor responders (pr). For other compounds the QAPP notes rejection of detected compounds with %D > 40%.
Yes _____ No __X__ NA___
See the tables below. When there are no detections, unless the %D is biased low and so large as to indicate a significant probability of false negatives, no qualifiers are added for %D outliers when targets are not detected or for a high recovery for undetected compounds. Data are qualified JC#, where # is the %D. There could be variability to the data as there is variability to the response.

The QAPP indicates that compounds in a run should be rejected if the %D is > 40%. We interpret this to mean that non-detects should be rejected and that detected targets should be J-qualified, which is the normal validation process for rejection. Note that in the cases below where %Ds are above 40%, the bias of the CCV is high. Professional judgment is that high bias CCVs with a %D above 40% should not be rejected for non-detects, but the QAPP procedure has been applied. Rejected results are qualified RC#.

[Final validation note, per Project Chemist: Non-detect vinyl acetate results will be rejected when the %D is greater than 40%. Non-detect results for other analytes will be qualified as undetected estimated (UJ) when the %D is between 20% and 40% and the CCV is biased low. Detected results will be qualified as estimated (J) when the %D is between 20% and 40%. Non-detect results will not be qualified when the %D is between 20% and 40% and the CCV is biased high, as the greater sensitivity suggests a low likelihood of false negatives.]

Method 8260 Outliers: The table below shows the outliers observed in CCVs for this method.

SDG	BATCH	Analysis Date	Analyte	Bias	%D	Qualifier	Final Qualifier per Project Chemist
L09040408	WG300079	4/17/2009 10:43	Carbon Disulfide	Low	29	OK	UJ
			Vinyl Acetate	High	62.4	RC62	R
L09040457	WG300303	4/21/2009 9:25	Carbon Disulfide	High	37.8	JC37 detect	J
L09040532	WG300495	4/23/2009 9;26	Vinyl Acetate	Low	29	OK	UJ
	WG300513	4/23/2009 13:46	Bromomethane	High	31.1	OK	NONE
	WG300623	4/24/2009 10:01	Vinyl Acetate	High	35.2	OK	NONE
	WG300714	4/27/2009 9;21	Vinyl Acetate	High	32.9	OK	NONE
L09040624	WG300714	4/27/2009 9:21	Vinyl Acetate	High	32.9	OK	NONE
	WG300977	4/29/2009 8:11	Vinyl Acetate	High	56.2	RC56	R
L09040369	WG299957	4/16/2009 9:38	Bromomethane	High	27.7	OK	NONE
	WG300057	4/17/2009 9:41	Bromomethane	High	25.7	OK	NONE

IV. GC/MS INSTRUMENT PERFORMANCE CHECK
The BFB (VOA) performance check was injected once at the beginning of each 12-hour period and relative abundance criteria for the ions were met.
Yes __X___ No ____ NA____

V. INTERNAL STANDARDS
The Internal Standards met the 100% upper and -50% lower limits criteria and the Retention times were within the required windows.
Yes _X__ No ____ NA____

VI. SURROGATE
1. Surrogate spikes were analyzed with every sample.
Yes __X__ No ____

2. And met the recovery limits defined in the QAPP of 70 – 130% for VOA and 45-135% for SVOA base/neutral fraction or 35-140% for the acid fraction. For SVOA, one surrogate per fraction is allowed to be at 15 – 150%.
Yes __X___ No ____

VII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE
A. Matrix spike (MS) and matrix spike duplicates (MSD) were analyzed for every analysis performed and for every 20 samples or for every matrix whichever is more frequent.
Yes __X___ No _____
There are 5 MS/MSDs, which meets the 1:20 ratio specification

SDG	Client Sample ID	Lab Sample ID
L09040369	RW-2-IS-6	L09040369-32
L09040408	MW-10-IS-6	L09040408-01
	MW-180-IS-6	L09040408-05
L09040532	MW-51-IS-6	L09040532-02
	MW-78-IS-6	L09040532-18

B. The MS and MSD percent recoveries were within the limits defined in the QAPP of VOA at 70 – 130% with 5 compounds allowed to be within 60 – 140%; SVOA at 45- 135%, 5 compounds allowed to be at 15 – 150%. Reject non-detects at < 15% for SVOA.
Yes _____ No __X__NA___
The full target list has been spiked.

All data having recovery outliers out of QAPP limits have been qualified and the project manager will make the decision regarding which qualifiers can be removed per the 5 compound allowances. In this case, both qualifiers could be removed.

Method 8260 MS/MSD Outliers: Outliers observed per the QAPP limits for Method 8260 MS/MSD runs are shown in the table below.

SDG	Parent ID	Analyte	MSRec	MSDRec	Qualifier
L09040369	L09040369-32	Vinyl acetate	39.6	39.8	JMS40
L09040532	L09040532-02	Vinyl acetate	67.1	67.9	JMS67

C. The MSD relative percent differences (RPD) were within the defined contract limits for VOA of 30% water, 40 soil, with 5 compounds allowed to be < 40%.RPD; for SVOA of 50% for water and 60% for soil and 5 compounds allowed to be > 60% RPD.
Yes _X__ No ____NA____
Qualifiers are added only when the MS or MSD recovery is also out of limits. Data would be qualified JD#, where # is the RPD. As the RPD increases, the matrix precision decreases. No qualifiers are added for precision.

D. The MS/MSD were client samples.
Yes _X__ No ____NA____

VIII. LABORATORY CONTROL SAMPLE
A. Laboratory Control Samples (LCS) was analyzed for every analysis performed and for every 20 samples.
Yes __X__ No ____

B. The LCS percent recoveries were within the limits defined in the QAPP for VOA of 80-120% for water and 75 – 125% for soil. Five compounds are allowed to be 60 – 140%. For SVOA 60 -120 for PAH and phthalates, 20 – 150% for phenols and amines. All other compounds 45 – 135% with 5 compounds allowed to be 15 – 150%. No soil limits are defined in the QAPP and laboratory limits will be applied. If an LCS and LCSD are analyzed, both samples must have the same compounds out for data to be qualified.
Yes _____ No __X____
The full target list has been spiked. When a high LCS recovery is associated with a non-detect in samples, no qualifier is added since the indicated bias is high. When the target is detected, the result is qualified as JL#, where # is the elevated recovery. Data could be biased high proportional to the LCS %R. All results associated with low recoveries are qualified.

8260B: The table below shows the outliers and the limits applied per the QAPP. The limits are specified per matrix. Qualifiers are added for all outliers as described here but the project manager may consider reversing some of these when the limits fall within the contingency limits. This would allow all qualifiers to be removed except for the JL53.

8260B LCS Outliers:

SDG	BATCH	Analytes	LCS Recovery	Qualifiers
L09040369	WG299957	Vinyl acetate	53.1	JL53.1
L09040369	WG300057	Dichlorodifluoromethane	76.9	JL76.9
L09040369	WG300057	Vinyl acetate	56.2	JL56.2
L09040369	WG300079	Dichlorodifluoromethane	79.4	JL79.4
L09040408	WG300079	Dichlorodifluoromethane	79.4	JL79.4
L09040532	WG300495	n-Butylbenzene	122	OK
L09040532	WG300495	Vinyl acetate	79.6	JL79.6
L09040532	WG300513	Carbon disulfide	127	OK
L09040532	WG300513	Chloromethane	77.9	JL77.9
L09040532	WG300613	Carbon disulfide	139	OK
L09040624	WG300977	Bromomethane	71.3	JL71.3
L09040624	WG300977	Chloromethane	71.9	JL71.9
L09040624	WG300977	Dichlorodifluoromethane	72.8	JL72.8
L09040624	WG300977	Vinyl chloride	77.9	JL77.9

8260 LCS/LCSD Recoveries: In some cases, the laboratory analyzed both an LCS and an LCSD. In such cases, per the QAPP only results in which both recoveries are out of limits are qualified. Outliers are shown in the table below for LCS/LCSDs.

8260B LCSD Outliers:

SDG	BATCH	Analytes	LCS Rec	LCSD Rec	Qualifiers
L09040369	WG300055	1,2,3-Trichlorobenzene	75.2	78.2	JL75.2
L09040369	WG300293	1,2,3-Trichlorobenzene	79.9	77.5	JL77.5
L09040369	WG300055	Acetone	63.9	73.8	JL63.9
L09040369	WG300055	Dichlorodifluoromethane	75.8	73.5	JL73.5
L09040369	WG300055	Naphthalene	75.9	79.8	JL75.9
L09040369	WG300293	Vinyl acetate	67.6	62.4	JL62.4
L09040369	WG300055	Vinyl acetate	71.3	72.1	JL71.3
L09040369	WG300293	Vinyl chloride	127	131	OK
L09040408	WG300293	1,2,3-Trichlorobenzene	79.9	77.5	JL77.5
L09040408	WG300424	Carbon disulfide	131	130	OK
L09040408	WG300293	Vinyl acetate	67.6	62.4	JL62.4
L09040408	WG300424	Vinyl acetate	125	127	OK
L09040408	WG300293	Vinyl chloride	127	131	OK
L09040457	WG300303	Carbon disulfide	130	129	OK
L09040457	WG300424	Carbon disulfide	131	130	OK

SDG	BATCH	Analytes	LCS Rec	LCSD Rec	Qualifiers
L09040457	WG300303	Chloroethane	77.1	79.3	JL77.1
L09040457	WG300303	Vinyl acetate	58.2	58.9	JL58.2
L09040457	WG300424	Vinyl acetate	125	127	OK
L09040457	WG300303	Vinyl chloride	79.8	77	JL77
L09040532	WG300714	Bromomethane	79.7	77.6	JL77.6
L09040532	WG300714	Carbon disulfide	131	123	OK
L09040532	WG300714	Chloromethane	79.4	73.9	JL73.9
L09040532	WG300714	Dichlorodifluoromethane	79.9	74.7	JL74.7
L09040532	WG300714	Trichlorofluoromethane	79.3	75.9	JL75.9
L09040624	WG300993	1,1,2-Trichloroethane	122	123	OK
L09040624	WG300714	Bromomethane	79.7	77.6	JL77.6
L09040624	WG300714	Carbon disulfide	131	123	OK
L09040624	WG300993	Carbon disulfide	156	159	OK
L09040624	WG300714	Chloromethane	79.4	73.9	JL73.9
L09040624	WG300714	Dichlorodifluoromethane	79.9	74.7	JL74.7
L09040624	WG300993	MEK (2-Butanone)	126	127	OK
L09040624	WG300993	Naphthalene	126	127	OK
L09040624	WG300714	Trichlorofluoromethane	79.3	75.9	JL75.9

IX. BLANKS

A. Method Blanks were analyzed at the required frequency and for each matrix and analysis.
Yes __X__ No____

B. No blank contamination was found in the Method Blank.
Yes____ No __X__
Contamination was observed in some method blanks. Whenever methylene chloride, acetone, 2-butanone or phthalate esters are detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as UMB#, where # is the corrected method blank level. Such results are usable as nondetects. For other targets, the factor used is 5x.

Method 8260: There are a few qualifiers due to method blank outliers, as shown in the table below.

SDG	Batch	Analytes	MB Level	DVAL
L09040369	WG300079	Methylene Chloride	0.252 F	UMB.25 Samples < 10x MB
	WG300057	1,2,3-Trichlorobenzene	0.196 F	OK, samples ND
		Hexachlorobutadiene	0.409 F	OK, samples ND
L09040624	WG300714	1,2,3-Trichlorobenzene	0.161 F	OK, samples ND
L09040532	WG300513	Methylene chloride	0.295 F	OK, samples ND
	WG300714	1,2,3-Trichlorobenzene	0.161	OK, samples ND
L09040457	WG300303	Carbon disulfide	1.11	UMB1.1 detection
	WG300424	Naphthalene	0.228 F	OK, samples ND
L09040408	WG300079	Methylene chloride	0.252 F	UMB.25 Samples < 10x MB
	WG300424	Naphthalene	0.228 F	OK, samples ND

C. If Field Blanks were identified, no blank contamination was found.
Yes____ No __X__
There are 8 trip blanks for 8260, and 2 rinse blanks for 8260. There are detections observed below the reporting limit in the field and trip blanks. When analytes are present in both the field blank and the associated samples, the results in the samples are qualified in the same manner as for method blanks. For clarity, the qualifiers used in this case are UTB# for trip blanks and UFB# for rinse blanks, where # is the associated blank value. Qualifiers added are shown in the table below. Results so qualified are usable as non-detects.

SDG	Sample ID	Sample Date	Analyte	Result	Qualifier
L09040369	TB-041409-IS-6	4/14/2009	Chloromethane	0.592F	UTB.59 detects
L09040408	TB-041509-IS-6	4/15/2009	Chloromethane	0.352F	UTB.35 detects
L09040408	TB-041509-IS-6	4/15/2009	Methylene chloride	0.25F	None, qualified from MB
L09040457	RB-1-IS-6	4/17/2009	1,4-Dichlorobenzene	1.02	UFB1 detect
L09040457	RB-1-IS-6	4/17/2009	Acetone	24.6	None, from TB
L09040457	RB-1-IS-6	4/17/2009	MEK (2-Butanone)	4.8F	OK, samples ND
L09040457	RB-1-IS-6	4/17/2009	Toluene	0.268F	UFB.27 detects
L09040457	TB-041609-IS-6	4/16/2009	Acetone	2.58F	UTB2.6 detects
L09040457	TB-041609-IS-6	4/16/2009	Chloromethane	0.276F	UTB.28 detects
L09040457	TB-041609-IS-6	4/16/2009	Methylene chloride	0.389F	OK, samples ND
L09040457	TB-041709-IS-6	4/17/2009	Chloromethane	0.619F	From first TB
L09040532	RB-2-IS-6	4/20/2009	1,4-Dichlorobenzene	1.48	None, from TB
L09040532	RB-2-IS-6	4/20/2009	Acetone	22.9	None, from TB
L09040532	RB-2-IS-6	4/20/2009	Benzene	0.161F	OK, samples ND
L09040532	RB-2-IS-6	4/20/2009	MEK (2-Butanone)	6.67F	OK, samples ND
L09040532	RB-2-IS-6	4/20/2009	Toluene	0.437F	OK, samples ND
L09040532	TB-041309-IS-6	4/20/2009	Acetone	5.03F	UTB5 detects
L09040532	TB-041309-IS-6	4/20/2009	Chloromethane	0.991F	OK, samples ND
L09040532	TB-42109-IS-6	4/21/2009	1,4-Dichlorobenzene	0.293F	UTB.29 detects
L09040532	TB-42109-IS-6	4/21/2009	Acetone	3.36F	None, from first TB
L09040624	TB-42209-IS-6	4/22/2009	1,4-Dichlorobenzene	0.269F	OK, samples ND
L09040624	TB-42209-IS-6	4/22/2009	Toluene	0.327F	UTB.33 detects
L09040624	TB-42309-IS-6	4/23/2009	1,4-Dichlorobenzene	0.179F	OK, samples ND
L09040624	TB-42309-IS-6	4/23/2009	Chloromethane	0.278F	UTB.28 detects

X. FIELD QC

If Field duplicates were identified, they met guidance for VOA of RPD of < 35% for water or < 50% for soils. For SVOA < 50% RPD for water, no soils RPD is defined in the QAPP. For values reported at < 5 x the reporting limit (RL), a difference of 2 x RL is used as guidance (4 x RL for soils). Data are not qualified for field duplicates as these are evaluated for the total project by the client.

Yes _X__ No ___ NA____

There are 10 identified field duplicates, all in control.

SDG	Matrix	Field Dup	Parent Sample	Observations
	Water	DUP-1	MW-14-IS-6	OK
	Water	DUP-2	W-37-173.25-IS-6	OK
	Water	DUP-3	MW-74-IS-6	OK
	Water	DUP-4	MW-128-IS-6	OK
	Water	DUP-5	MW-161-82-IS-6	OK
	Water	DUP-6	MW-172-IS-6	OK
	Water	DUP-7	MW-190-IS-6	OK
	Water	DUP-8	MW-228-IS-6	OK
	Water	DUP-9	MW-240-IS-6	OK
	Water	DUP-10	RW-5-IS-6	OK

XI. SYSTEM PERFORMANCE

A. The RICs, chromatograms, tunes and general system performance were acceptable for all instruments and analytical systems.

Yes ____ No____ NA__X__

Not part of this review level

B. The suggested EQLs for the sample matrices in this set were met.
Yes __X__ No____ NA____

XII. TCL COMPOUNDS
A. The identification is accurate and all retention times, library spectra and reconstructed ion chromatograms (RIC) were evaluated for all detected compounds.
Yes ____ No____ NA__X__
Not part of this review level

B. Quantitation was checked to determine the accuracy of calculations for representative compounds in each internal standards quantitation set.
Yes ____ No____ NA__X__
Not part of this review level

XIII. TENTATIVELY IDENTIFIED COMPOUNDS
TICs were properly identified and met the library identification criteria.
Yes ____ No____ NA__X__
Not part of this review level

XIV. OVERALL ASSESSMENT OF THE CASE
The laboratory has complied with the requested method. Data are fully usable after consideration of qualifiers.
The following is noted:

Chain of Custody:
No qualifiers have been added for chain of custody issues and the project manager will update chains per the following notes to complete the project record.

Sample Receiving Checklist stated "NA" for cooler seals, all other SDGs said "Yes".
SDG L09040457 had changes to the received time without initials on the manual chain of custody for sample RB-1-IS-6. The time appears to be the same as for the other samples, which is 0836.
Continuing Calibrations:
There are some %D outliers. When there are no detections, unless the %D is biased low and so large as to indicate a significant probability of false negatives, no qualifiers are added for %D outliers when targets are not detected or for a high recovery for undetected compounds. Data are qualified JC#, where # is the %D. There could be variability to the data as there is variability to the response.

The QAPP indicates that compounds in a run should be rejected if the %D is > 40%. We interpret this to mean that non-detects should be rejected and that detected targets should be J-qualified, which is the normal validation process for rejection. Note that in the instances in this data set where %Ds are above 40%, the bias of the CCV is high. Professional judgment is that high bias CCVs with a %D above 40% should not be rejected for non-detects, but the QAPP procedure has been applied.

Method 8260 Outliers: The table within the body of this report shows the outliers observed in CCVs for this method.

Matrix Spikes:
There are 5 MS/MSDs, which meets the 1:20 ratio specification. All data having recovery outliers out of QAPP limits have been qualified and the project manager will make the decision regarding which qualifiers can be removed per the 5 compound allowances.

Outliers observed per the QAPP limits for Method 8260 MS/MSD runs are observed for vinyl acetate and are qualified as described above.

Method Blanks:
Contamination was observed in some method blanks. Whenever methylene chloride, acetone, 2-butanone or phthalate esters are detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as UMB#, where # is the corrected method blank level. Such results are usable as nondetects. For other targets, the factor used is 5x.

Method 8260: There are a few qualifiers due to method blank outliers, as shown in the table within the body of this report.

Field Blanks:
There are 8 trip blanks for 8260, and 2 rinse blanks for 8260. There are detections observed below the reporting limit in the field and trip blanks. When analytes are present in both the field blank and the associated samples, the results in the samples are qualified in the same manner as for method blanks. For clarity, the qualifiers used in this case are UTB# for trip blanks and UFB# for rinse blanks, where # is the associated blank value. Qualifiers added are shown in the table below. Results so qualified are usable as non-detects.

LCS Recoveries:
The full target list has been spiked. When a high LCS recovery is associated with a non-detect in samples, no qualifier is added since the indicated bias is high. When the target is detected, the result is qualified as JL#, where # is the elevated recovery. Data could be biased high proportional to the LCS %R. All results associated with low recoveries are qualified.

There are some recovery outliers. The table within the report body shows the outliers and the limits applied per the QAPP. The limits are specified per matrix. Qualifiers are added for all outliers as described here but the project manager may consider reversing some of these when the limits fall within the contingency limits. For the LCS, this would allow all qualifiers to be removed except for the one JL53.
There are a higher number of LCSD recoveries that are out of limits and the project manager will determine which 5 are to be removed.

Field QC:
There are 10 identified field duplicates, all in control.

Samples Associated With this Report

Sample ID		
DUP-10-IS-6	MW-184-IS-6	MW-75-IS-6
DUP-1-IS-6	MW-185-IS-6	MW-76-90.75-IS-6
DUP-2-IS-6	MW-186-IS-6	MW-77-85.55-IS-6
DUP-3-IS-6	MW-187-IS-6	MW-78-IS-6
DUP-4-IS-6	MW-190-IS-6	MW-87-IS-6
DUP-5-IS-6	MW-220-IS-6	MW-91-IS-6
DUP-6-IS-6	MW-221-IS-6	RB-1-IS-6
DUP-7-IS-6	MW-222-IS-6	RB-2-IS-6
DUP-8-IS-6	MW-223-IS-6	RW-1A-IS-6
DUP-9-IS-6	MW-224-IS-6	RW-1B-IS-6
MW-07-74.15-IS-6	MW-225-IS-6	RW-1-IS-6

Sample ID		
MW-10-IS-6	MW-226-IS-6	RW-2-IS-6
MW-128-IS-6	MW-227-IS-6	RW-3-IS-6
MW-130-70.25-IS-6	MW-228-IS-6	RW-4-IS-6
MW-132-IS-6	MW-230-IS-6	RW-5-IS-6
MW-134-IS-6	MW-231-IS-6	RW-6-IS-6
MW-13-IS-6	MW-232-IS-6	RW-7-IS-6
MW-144-75.68-IS-6	MW-234-IS-6	RW-8-IS-6
MW-145-90.75-IS-6	MW-235-IS-6	RW-9-IS-6
MW-147-78.81-IS-6	MW-236-IS-6	TB-041309-IS-6
MW-14-IS-6	MW-237-IS-6	TB-041409-IS-6
MW-153-86.75-IS-6	MW-238-IS-6	TB-041509-IS-6
MW-154-61.45-IS-6	MW-239-IS-6	TB-041609-IS-6
MW-156-67.75-IS-6	MW-240-IS-6	TB-041709-IS-6
MW-157-75.95-IS-6	MW-31-76.95-IS-6	TB-42109-IS-6
MW-15-IS-6	MW-32-66.84-IS-6	TB-42209-IS-6
MW-161-82-IS-6	MW-33-59.15-IS-6	TB-42309-IS-6
MW-162-86.08-IS-6	MW-37-173.25-IS-6	
MW-163-77.03-IS-6	MW-3-IS-6	
MW-164-74.59-IS-6	MW-43-167.25-IS-6	
MW-167-80.07-IS-6	MW-44-69.75-IS-6	
MW-168-114.45-IS-6	MW-4-IS-6	
MW-168A-82.03-IS-6	MW-51-IS-6	
MW-170-70.91-IS-6	MW-57-68.32-IS-6	
MW-171-63.75-IS-6	MW-65-IS-6	
MW-172-IS-6	MW-67-268.25-IS-6	
MW-174-IS-6	MW-68-78.25-IS-6	
MW-176-IS-6	MW-69-89.64-IS-6	
MW-178-IS-6	MW-6-IS-6	
MW-179-IS-6	MW-70-87.67-IS-6	
MW-180-IS-6	MW-71-74.28-IS-6	
MW-182-IS-6	MW-74-IS-6	

ORGANIC DATA QUALITY REVIEW REPORT
VOLATILE ORGANICS SW-846 METHOD 8260B
8260B/5030B

SDG: L09100378, L09100412

PROJECT: Memphis Defense Depot, Interim Remedial Action IS-7 for e2m, Texas; 3300-019-01-05

LABORATORY: Microbac Laboratories, Inc., Marietta, OH

SAMPLE MATRIX: Water

SAMPLING DATE (Month/Year): October 2009

NO. OF SAMPLES: 8260B: 79 aqueous samples; including 3 trip blanks and 1 rinse blank, 7 field duplicates

ANALYSES REQUESTED: SW-846 8260B

SAMPLE NO.: See attached result forms and associated EDD

DATA REVIEWER: Sammy Huntington and John Huntington

QA REVIEWER: Diane Short and Associates Inc. INITIALS/DATE: _____

Telephone Logs included Yes____ No _X__

Contractual Violations Yes____ No _X___

The project QAPP (11/05), the EPA Contract Laboratory Program National Functional Guidelines for Organic Review, 1999 and 2001, and the SW-846 Method 8260B and 8270C have been referenced by the reviewer to perform this data validation review. The EPA qualifiers have been expanded to include a descriptor code and value to define QC violations and their values, per the approval of the Project Manager. Per the Scope of Work, the review of these samples includes Level III validation of all chains of custody, calibrations and QC forms referencing the QC limits in the above documents.

I. DELIVERABLES

A. All deliverables were present as specified in the Statement of Work (SOW), SW-846, or in the project contract.
Yes __X_ No _____
This report has been requested to include the following review: Holding times and sample integrity (chains of custody, sample log in), Calibrations, Summary QC.

Note: In the pdf version of the report for SDG L09100412, method blank results and initial calibration summaries were missing. These were present in the hard copy version.

B. Chain of Custody Documentation was complete and accurate.
Yes __X__ No ___
No qualifiers have been added for chain of custody issues and the project manager will update chains per the following notes to complete the project record.

For both the projects, only the first page of the chain of custody documents were signed and dated by the laboratory. These are electronically-generated chain of custody documents, and there may be electronic signatures for these which we are not able to review. In addition, there are sample receipt acknowledgements from the laboratory. However, the hardcopy documents should be properly signed and dated by the laboratory on each page.

C. Samples were received at the required temperature, preservation and intact with no bubbles.
Yes ___X___ No ____
EPA regulations (See Federal Register, March 12, 2007, 40CFR Part 122) require only that the temperature of samples delivered to the laboratory be equal to or less than 6^{o} C. The sample receipt conditions are fully compliant with applicable regulations.

II. ANALYTICAL REPORT FORMS
A. The Analytical Report or Data Sheets are present and complete for all requested analyses.
Yes _X_ No ____

B. Holding Times
1. The contract holding times were met for all analyses (Time of sample receipt to time of analysis (VOA) or extraction and from extraction to analysis).
Yes __X___ No_____

2. The Clean Water Act (40 CFR 136) or method holding times were met for all analyses (14 days from time of sample collection to analysis or extraction).
Yes _X__ No ____

III. INSTRUMENT CALIBRATION – GC/MS
A. Initial Calibration
1. The Response (RF) and Relative Response Factors (RRF) and average RRF for all compounds for all analyses met the contract criteria of >0.01 for volatiles and 0.05 for semi-volatiles.
Yes __X__ No ____ NA____

Method 8260: Per the project manager, the 2001 EPA CLP validation guidance has been applied to the common "poor responders". Acetone, 2-butanone, and 4-methyl-2-pentanone are the compounds for which any calibration response factors below 0.05 have been observed. The validation guidance used for this project allows for a response of 0.01 for these compounds if spectral integrity can be verified at low concentrations. These spectra are not commonly provided and are not part of the deliverable for these data sets. The laboratory has been tasked with providing to the client verification that the 0.01 RF is valid. Given the spectral verification is available, the data are not qualified for response >0.01 < 0.05. No data have been qualified.

Most of the low-responding compounds are highly water-soluble and capable of hydrogen bonding with water. This decreases their purge efficiency and results in the relatively low response. The implication of this low purge efficiency is that a relatively low absolute recovery of such compounds is achieved in the purge step of the analysis. If this recovery is consistent, reasonable accuracy and precision can be achieved in a given matrix, which is indicated for the lab matrix by acceptable recoveries in LCS and calibration checks. However, this causes these targets to be more sensitive to matrix variations that impact purge efficiency (such as ionic strength or the presence of varying levels of soluble non-target organic material) than are the more hydrophobic compounds typically analyzed by this method, and as a result they are more likely to exhibit matrix bias.

2a.The relative standard deviation (RSD) for the five point calibration was within the 30% limit for the CCCs.
Yes _X__ No____ NA____
This is a method requirement and indicates that the analytical system is in control.

2b.The relative standard deviation (RSD) for the five point calibration was within the 30% limit for all other compounds, the average %RSD was <15%, or a linear curve was used.
Yes __X___ No ____ NA____

3. The 12 hour system Performance Check was performed as required in SW-846.
Yes __X__ No_____ NA____

B. Continuing Calibrations
1. The midpoint standard was analyzed for each analysis at the required frequency and the QC criteria of > 0.05 (.01 for CLP 2001 VOA) were met.
Yes __X___ No ____ NA____

2. The percent difference (%D) limits of ± 25% were met. The 2001 NFG also allow for 40% D for the poor responders (pr). For other compounds the QAPP notes rejection of detected compounds with %D > 40%.
Yes _____ No __X__ NA___
See the tables below. When there are no detections, unless the %D is biased low and so large as to indicate a significant probability of false negatives, no qualifiers are added for %D outliers when targets are not detected or for a high recovery for undetected compounds. Data are qualified JC#, where # is the %D. There could be variability to the data as there is variability to the response. This requires that the RF is acceptable to verify the non-detect status, which is the case here.

The QAPP indicates that compounds in a run should be rejected if the %D is > 40%. We interpret this to mean that non-detects should be rejected and that detected targets should be J-qualified, which is the normal validation process for rejection. Note that in the cases below where %Ds are above 40%, the bias of the CCV is high. Professional judgment is that high bias CCVs with a %D above 40% should not be rejected for non-detects.

[Final validation note, per Project Chemist: Non-detect vinyl acetate results will be rejected when the %D is greater than 40%. Non-detect results for other analytes will be qualified as undetected estimated (UJ) when the %D is between 20% and 40% and the CCV is biased low. Detected results will be qualified as estimated (J) when the %D is between 20% and 40%. Non-detect results will not be qualified when the %D is between 20% and 40% and the CCV is biased high, as the greater sensitivity suggests a low likelihood of false negatives.]

Method 8260 Outliers: The table below shows the outliers observed in CCVs for this method. No qualifiers have been required.

SDG	Batch	Analyte	%D	Bias	Qualifier	Final Qualifier per Project Chemist
L09100378	WG314734	2-Hexanone	22.8	low	OK, ND	UJ
L09100378	WG314734	Bromomethane	27.6	high	OK, ND	NONE
L09100378	WG314734	Vinyl Acetate	37.5	low	OK, ND	UJ
L09100378	WG314734	4-Chlorotoluene	20.1	low	OK, ND	UJ
L09100378	WG314738	4-Chlorotoluene	20.1	low	OK, ND	UJ
L09100378	WG314742	4-Chlorotoluene	20.1	low	OK, ND	UJ
L09100378	WG314889	Vinyl Acetate	52.2	high	OK, ND	R
L09100378	WG314985	Vinyl Acetate	45.5	high	OK, ND	R
L09100378	WG314988	Bromomethane	20.7	high	OK, ND	NONE
L09100412	WG315097	Vinyl Acetate	41.8	high	OK, ND	R
L09100412	WG315391	Dichlorodifluoromethane	23.3	high	OK, ND	NONE

SDG	Batch	Analyte	%D	Bias	Qualifier	Final Qualifier per Project Chemist
L09100412	WG315404	Vinyl Acetate	20.7	low	OK, ND	UJ

IV. GC/MS INSTRUMENT PERFORMANCE CHECK
The BFB (VOA) and DFTPP (SVOA) performance check was injected once at the beginning of each 12-hour period and relative abundance criteria for the ions were met.
Yes __X___ No ____ NA____

V. INTERNAL STANDARDS
The Internal Standards met the 100% upper and -50% lower limits criteria and the Retention times were within the required windows.
Yes _X__ No ____ NA____

VI. SURROGATE
Surrogate spikes were analyzed with every sample.
Yes __X__ No ____

And met the recovery limits defined in the QAPP of 70 – 130% for VOA and 45-135% for SVOA base/neutral fraction or 35-140% for the acid fraction. For SVOA, one surrogate per fraction is allowed to be at 15 – 150%.
Yes __X___ No ____

VII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE
A. Matrix spike (MS) and matrix spike duplicates (MSD) were analyzed for every analysis performed and for every 20 samples or for every matrix whichever is more frequent.
Yes _____ No ___X__
There are 3 MS/MSDs for 68 non-QC client samples. This does not meet the recommendation of 1 per 20 field samples. As this is an ongoing project an overall adherence to the 1:20 frequency is monitored by the project manager.

The laboratory does run other MS/MSDs that are not associated with this project in some of the run batches to fulfill the method QC criteria.

SDG	Client Sample ID	Lab Sample ID
L09100378	MW-15-IS-7	L09100378-04
	MW-190-IS-7	L09100378-45
L09100412	MW-130-IS-7	L09100412-07

B. The MS and MSD percent recoveries were within the limits defined in the QAPP of VOA at 70 – 130% with 5 compounds allowed to be within 60 – 140%; SVOA at 45- 135%, 5 compounds allowed to be at 15 – 150%. Reject non-detects at < 15% for SVOA.
Yes _____ No __X__NA___
The full target list has been spiked.

All data having recovery outliers out of QAPP limits have been qualified and the project manager will make the decision regarding which qualifiers can be removed per the 5 compound allowances.

Outliers observed per the QAPP limits for Method 8260 MS/MSD runs are shown in the table below. Note that for some of these apparent outliers, the parent sample is significantly higher in concentration than is the spike level. The validation “rule of thumb” is to consider the spike recovery calculation meaningless when

the ratio of parent to spike is > 4. In these cases, the ratio is < 4 but not by a very large factor. The variation required to produce an outlier is not very great, and these results should not be considered greatly biased even though they are qualified.

SDG	Parent	Analyte	Sample Result ug/l	%MS	%MSD	MS bias	MSD bias	Qualifiers
L09100378	MW-15-IS-7	1,1,2,2-Tetrachloroethane	24.5	69.2	78.8	LOW		JMS69
L09100378	MW-15-IS-7	2-Hexanone	U	69.6	72.3	LOW		None, rounds to 70
L09100378	MW-15-IS-7	Carbon disulfide	U	69	66.7	LOW	LOW	JMS67
L09100378	MW-15-IS-7	Chloroform	31.1	68.2	67.7	LOW	LOW	JMS68
L09100378	MW-15-IS-7	Dichlorodifluoromethane	U	71.3	67.9		LOW	JMS68
L09100378	MW-15-IS-7	Vinyl acetate	U	57.3	55.4	LOW	LOW	JMS55
L09100412	MW-130-IS-7	1,1-Dichloroethene	29.0	64.2	38.4	LOW	LOW	JMS38
L09100412	MW-130-IS-7	Trichloroethene	61.7	48.8	6.41	LOW	LOW	JMS6
L09100412	MW-130-IS-7	Tetrachloroethene	68.5	33.4	-10.5	LOW	LOW	JMS0

C. The MSD relative percent differences (RPD) were within the defined contract limits for VOA of 30% water, 40 soil, with 5 compounds allowed to be < 40%.RPD; for SVOA of 50% for water and 60% for soil and 5 compounds allowed to be > 60% RPD.
Yes __X__ No ____NA____
Qualifiers are added only when the MS or MSD recovery is also out of limits. Data are qualified JD#, where # is the RPD. As the RPD increases, the matrix precision decreases. Although there are 2 low recoveries, the actual RPD has been re-calculated and the laboratory has correctly reported in control RPDs.

D. The MS/MSD were client samples.
Yes _X__ No ____NA____

VIII. LABORATORY CONTROL SAMPLE
A. Laboratory Control Samples (LCS) was analyzed for every analysis performed and for every 20 samples.
Yes __X__ No ____

B. The LCS percent recoveries were within the limits defined in the QAPP for VOA of 80-120% for water and 75 – 125% for soil. Five compounds are allowed to be 60 – 140%. For SVOA 60 -120 for PAH and phthalates, 20 – 150% for phenols and amines. All other compounds 45 – 135% with 5 compounds allowed to be 15 – 150%. No soil limits are defined in the QAPP and laboratory limits will be applied. If an LCS and LCSD are analyzed, both samples must have the same compounds out for data to be qualified.
Yes _____ No __X____
The full target list has been spiked. When a high LCS recovery is associated with a non-detect in samples, no qualifier is added since the indicated bias is high. When the target is detected, the result is qualified as JL#, where # is the elevated recovery. Data could be biased high proportional to the LCS %R. All results associated with low recoveries are qualified.

The table below shows the outliers and the limits applied per the QAPP. The limits are specified per matrix. Only one recovery is outside of the marginal exceedance limits (60-140). Qualifiers are added for all outliers as described here but the project manager may consider reversing some of these when the limits fall within the marginal exceedance limits. Please see the project EDD for a detailed list of qualifiers added.

8260B LCS Outliers:

SDG	BATCH	Analyte	Recovery	Bias	Qualifiers Required
L09100378	WG314988	Bromomethane	121	HIGH	OK, ND
L09100378	WG314734	1,2-Dichloroethane	79.2	LOW	JL79
L09100378	WG314734	1,2-Dibromo-3-chloropropane	71.9	LOW	JL72
L09100378	WG314734	2-Hexanone	69.4	LOW	JL69
L09100378	WG314734	4-Chlorotoluene	78.7	LOW	JL79
L09100378	WG314734	Acetone	78.7	LOW	JL79
L09100378	WG314734	Carbon disulfide	76.5	LOW	JL77
L09100378	WG314734	Chloromethane	76.5	LOW	JL77
L09100378	WG314734	Dichlorodifluoromethane	74.5	LOW	JL75
L09100378	WG314734	MEK (2-Butanone)	79.7	LOW	JL80
L09100378	WG314734	trans-1,3-Dichloropropene	72.6	LOW	JL73
L09100378	WG314734	Vinyl acetate	53.0	LOW	JL53
L09100378	WG314985	4-Chlorotoluene	75.2	LOW	JL75
L09100378	WG314985	trans-1,3-Dichloropropene	77.9	LOW	JL78
L09100378	WG314985	Vinyl acetate	126	HIGH	OK, ND
L09100412	WG315111	Vinyl acetate	130	HIGH	OK, ND
L09100412	WG315111	Vinyl chloride	79.1	LOW	JL79
L09100412	WG315212	Vinyl acetate	148	HIGH	OK, ND

In some cases, the laboratory analyzed both an LCS and an LCSD. In such cases, per the QAPP only results in which both recoveries are out of limits are qualified. Outliers are shown in the table below for LCS/LCSDs. Again, see the project EDD for detailed lists of qualifiers added.

8260B LCSD Outliers:

SDG	Batch	Analytes	% REC	% REC	LCS Bias	LCSD Bias	Qualifiers Required
L09100378	WG314889	Carbon disulfide	85.3	79.9		LOW	OK, only one out
L09100378	WG314889	Vinyl acetate	131	132	HIGH	HIGH	
L09100378	WG314742	4-Chlorotoluene	86.0	77.5		LOW	OK, only one out
L09100378	WG314742	trans-1,3-Dichloropropene	79.1	76.3	LOW	LOW	
L09100378	WG314742	Vinyl acetate	132	131	HIGH	HIGH	
L09100378	WG314738	4-Chlorotoluene	73.4	74.7	LOW	LOW	
L09100378	WG314738	trans-1,3-Dichloropropene	76.6	76.2	LOW	LOW	
L09100378	WG314738	Vinyl acetate	127	127	HIGH	HIGH	
L09100412	WG315097	Carbon disulfide	85.3	76.4		LOW	OK, only one out
L09100412	WG315097	Vinyl acetate	122	123	HIGH	HIGH	
L09100412	WG315391	Vinyl acetate	136	139	HIGH	HIGH	
L09100412	WG315391	Vinyl chloride	79.0	81.0	LOW		OK, only one out

IX. BLANKS

A. Method Blanks were analyzed at the required frequency and for each matrix and analysis.
Yes __X__ No____

B. No blank contamination was found in the Method Blank.
Yes____ No _X___
Methylene chloride was detected in some method blanks. Whenever methylene chloride, acetone, 2-butanone or phthalate esters are detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as UMB#, where # is the corrected method blank level. Such results are usable as nondetects. For other targets, the factor used is 5x.

Method 8260 Method Blank Detections:

SDG	Batch	Analytes	Conc	Qualifier
L09100378	WG314988	Methylene chloride	0.270 F	OK, ND
L09100378	WG315117	Methylene chloride	0.332 F	OK, ND
L09100412	WG315404	Methylene chloride	0.316 F	OK, ND
L09100412	WG315039	Methylene chloride	0.404 F	OK, ND
L09100412	WG315111	Methylene chloride	0.287 F	UMB.29 detect
L09100412	WG315212	Methylene chloride	0.351 F	OK, ND
L09100412	WG315391	Methylene chloride	0.29 F	OK, ND

C. If Field Blanks were identified, no blank contamination was found.
Yes____ No __X__
There are 3 trip blanks for 8260, and 1 rinse blank. There are detections observed below the reporting limit in the field and trip blanks. When analytes are present in both the field blank and the associated samples, the results in the samples are qualified in the same manner as for method blanks. For clarity, the qualifiers used in this case are UTB# for trip blanks and UFB# for rinse blanks, where # is the associated blank value. Qualifiers added are shown in the table below. Results so qualified are usable as non-detects.

SDG	Field Blank	Analyte	Result	Qualifiers
L09100378	RB-1-IS-7	1,4-Dichlorobenzene	0.673	UFB.67 detects
L09100378		Acetone	4.2F	UFB4.2 detects
L09100378		Toluene	0.315F	OK, ND
L09100378	TB-101309-IS-7	Chloromethane	0.319F	UTB.32 detects
L09100378		Methylene chloride	0.534F	UTB.53 detect
L09100378	TB-101409-IS-7	Methylene chloride	0.342F	UTB.34 detect
L09100412	TB-101509-IS-7	Methylene chloride	0.51F	None, ND from MB

X. FIELD QC
If Field duplicates were identified, they met guidance for VOA of RPD of < 35% for water or < 50% for soils. For SVOA < 50% RPD for water, no soils RPD is defined in the QAPP. For values reported at < 5 x the reporting limit (RL), a difference of 2 x RL is used as guidance (4 x RL for soils). Data are not qualified for field duplicates as these are evaluated for the total project by the client.
Yes _X_ No ___ NA____

There are 7 identified field duplicates, in control.

SDG	Parent	Field Dup	Observations
L09100378	MW-03-IS-7	DUP-1	OK
L09100378	MW-14-IS-7	DUP-2	OK
L09100378	MW-71-IS-7	DUP-3	OK
L09100378	MW-147-IS-7	DUP-4	OK
L09100378	MW-180-IS-7	DUP-5	OK
L09100378	MW-225-IS-7	DUP-6	OK
L09100378	MW-240-IS-7	DUP-7	OK

XI. SYSTEM PERFORMANCE

A. The RICs, chromatograms, tunes and general system performance were acceptable for all instruments and analytical systems.
Yes ____ No____ NA__X__
Not part of this review level

B. The suggested EQLs for the sample matrices in this set were met.
Yes __X__ No____ NA____

XII. TCL COMPOUNDS

A. The identification is accurate and all retention times, library spectra and reconstructed ion chromatograms (RIC) were evaluated for all detected compounds.
Yes ____ No____ NA__X__
Not part of this review level

B. Quantitation was checked to determine the accuracy of calculations for representative compounds in each internal standards quantitation set.
Yes ____ No____ NA__X__
Not part of this review level

XIII. TENTATIVELY IDENTIFIED COMPOUNDS

TICs were properly identified and met the library identification criteria.
Yes ____ No____ NA__X__
Not part of this review level

XIV. OVERALL ASSESSMENT OF THE CASE

The laboratory has complied with the requested method. Data are fully usable after consideration of qualifiers.
The following is noted:

<u>Chain of Custody:</u>
No qualifiers have been added for chain of custody issues and the project manager will update chains per the following notes to complete the project record.

For both the projects, only the first page of the chain of custody documents were signed and dated by the laboratory. These are electronically-generated chain of custody documents, and there may be electronic signatures for these which we are not able to review. In addition, there are sample receipt acknowledgements from the laboratory. However, the hardcopy documents should be properly signed and dated by the laboratory on each page.

Continuing Calibrations:
There are a few %D outliers, but none have required qualifiers to be added to the data.

Matrix Spikes:
There are 3 MS/MSDs for 68 non-QC client samples. This does not meet the recommendation of 1 per 20 field samples. As this is an ongoing project , an overall adherence to the 1:20 frequency is monitored by the project manager.

The laboratory does run other MS/MSDs that are not associated with this project in some of the run batches to fulfill the method QC criteria. The full target list has been spiked. All data having recovery outliers out of QAPP limits have been qualified and the project manager will make the decision regarding which qualifiers can be removed per the 5 compound allowances.

Outliers observed per the QAPP limits for Method 8260 MS/MSD runs are shown in the table within the body of this report. Note that for some of these apparent outliers, the parent sample is significantly higher in concentration than is the spike level. The validation "rule of thumb" is to consider the spike recovery calculation meaningless when the ratio of parent to spike is > 4. In these cases, the ratio is < 4 but not by a very large factor. The relative variation required to produce an outlier in such cases is not very great, and these results should not be considered strongly biased even though they are qualified.

Method Blanks:
Methylene chloride was detected in some method blanks. Whenever methylene chloride, acetone, 2-butanone or phthalate esters are detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as UMB#, where # is the corrected method blank level. Such results are usable as nondetects. For other targets, the factor used is 5x.

Field Blanks:
There are 3 trip blanks for 8260, and 1 rinse blank. There are detections observed below the reporting limit in the field and trip blanks. When analytes are present in both the field blank and the associated samples, the results in the samples are qualified in the same manner as for method blanks. For clarity, the qualifiers used in this case are UTB# for trip blanks and UFB# for rinse blanks, where # is the associated blank value. Qualifiers added are shown in the table within the body of this report. Results so qualified are usable as non-detects.

LCS Recoveries:
The full target list has been spiked. When a high LCS recovery is associated with a non-detect in samples, no qualifier is added since the indicated bias is high. When the target is detected, the result is qualified as JL#, where # is the elevated recovery. Data could be biased high proportional to the LCS %R. All results associated with low recoveries are qualified.

The table within the body of this report shows the outliers and the limits applied per the QAPP. The limits are specified per matrix. Only one recovery is outside of the marginal exceedance limits (60-140). Qualifiers are added for all outliers as described here but the project manager may consider reversing some of these when the limits fall within the marginal exceedance limits.

In some cases, the laboratory analyzed both an LCS and an LCSD. In such cases, per the QAPP only results in which both recoveries are out of limits are qualified. Outliers are shown in a second table within this report for LCS/LCSDs.

Field QC:
There are 7 identified field duplicates, in control.