FINAL

2012 ANNUAL GROUNDWATER MONITORING REPORT

Joliet Army Ammunition Plant
Will County, Illinois

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ACRONYMS AND ABBREVIATIONS

ACSIM	Assistant Chief of Staff for Installation Management
Army	United States Army
2-AT	2-aminotoluene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm/sec	centimeters per second
CO_2	carbon dioxide
COC	contaminant of concern
1,1-DCA	1,1-dichloroethane
cis-1,2-DCE	cis-1,2-dichloroethene
2,4-DNT	2,4-dinitrotoluene
2,6-DNT	2,6-dinitrotoluene
2-A-4,6-DNT	2-amino-4,6-dinitrotoluene
4-A-2,6-DNT	4-amino-2,6-dinitrotoluene
DO	dissolved oxygen
ft	foot/feet
ft/day	feet per day
ft/ft	feet per foot
ft/yr	feet per year
GMZ	Groundwater Management Zone
GOU	Groundwater Operable Unit
GRU	Groundwater Remedial Unit
H_2O	water
HMX	high melting-point explosive
IAC	Illinois Administrative Code
IC	institutional control
ID/IQ	Indefinite Delivery/Indefinite Quantity
IEPA	Illinois Environmental Protection Agency
in.	inch
J	estimated concentration

JOAAP	Joliet Army Ammunition Plant
LAP	Load-Assemble-Package Area
LTM	long-term monitoring
LTM Plan	Final Long-term Monitoring Plan for Environmental Remediation Services, TolTest/MWH, March 2010
MDL	method detection limit
MFG	Manufacturing Area
mg/L	milligrams per liter
ml/min	milliliters per minute
MNA	monitored natural attenuation
MRL	method reporting limit
MS/MSD	matrix spike/matrix spike duplicate
MWH	MWH Americas, Inc.
NB	nitrobenzene
ND	not detected
NPL	National Priority List
2-NT	2-nitrotoluene
OD	outside diameter
ORP	oxidation-reduction potential
OUs	operable units
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
RA	remedial action
RDX	royal demolition explosive
RG	remediation goal
RI	Remedial Investigation
1998 ROD	Record of Decision for the Soil and Groundwater Operable Units on the Manufacturing and Load-Assemble-Package Areas, National Priorities List Sites (U.S. Army, October 1998)
SOU	Soil Operable Unit
SpC	specific conductivity
SRU	Soil Remedial Unit

SRU2	metals contaminated soil
SVOC	semivolatile organic compound
TAL	target analyte list
TAT	2,4,6-triaminotoluene
TCE	trichloroethene
1,3,5-TNB or TNB	1,3,5-trinitrobenzene
2,4,6-TNT or TNT	2,4,6-trinitrotoluene
TOC	top of casing
TolTest	TolTest, Inc.
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Command
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
UXO	unexploded ordnance
VOC	volatile organic compound

1.0 INTRODUCTION

This report has been prepared by TolTest, Inc. (TolTest) in conjunction with teaming partner MWH Americas, Inc. (MWH), for environmental remediation services at the former Joliet Army Ammunition Plant (JOAAP) on behalf of the United States Army Environmental Command (USAEC) under Assistant Chief of Staff for Installation Management (ACSIM) Indefinite Delivery/Indefinite Quantity (ID/IQ) Contract No. W91ZLK-05-D0012, Delivery Order 0001.

This report presents 2012 groundwater quality data for the long-term monitoring (LTM) program of the Groundwater Operable Unit (GOU) and landfill inspection documentation for the Soil Operable Unit (SOU) at the former JOAAP in response to the *Record of Decision for the Soil and Groundwater Operable Units on the Manufacturing and Load-Assemble-Package Areas* (U.S. Army, 1998), (1998 ROD) for the JOAAP facility. The remedy that was selected for the GOU Sites at JOAAP was monitored natural attenuation (MNA). As a function of the MNA remedy for the Groundwater Remedial Units (GRU), LTM is required. This requirement is intended to satisfy three primary objectives:

1. Monitor contaminant concentration reductions and plume migration;

2. Verify containment of contaminant concentrations greater than the Remediation Goal (RG) within the Groundwater Management Zones (GMZ); and

3. Evaluate the effectiveness of SOU remedial action (RA) and MNA for the GOU remedy.

These objectives are being met through implementation of the LTM program.

In addition to the GOU, SOU remedial actions included the construction of three landfills at Sites L3, M11, and M13. Landfill inspections are required quarterly to determine if the remedy continues to function as designed. Post-closure inspection reports for July and October for landfills L3, M11, and M13 are included in Appendices A1 and A2, respectively. Reports for the March and April 2012 landfill inspections were included in the *Final 2012 Semi-annual Groundwater Monitoring Report* (TolTest/MWH, April 2013).

The objective of this report is to provide a data submittal of the groundwater quality sampling results, provide a review of the data collected during 2012, and provide documentation of landfill inspections. Analytical data for historic and 2012 data have been included in tables presented in this report. Additionally, water table and potentiometric surface maps for the July quarterly (Landfill M13) and October annual sampling event are included. Water table and potentiometric surface maps for the February quarterly (Landfill M13) and April semi-annual sampling event were included in the *Final 2012 Semi-annual Groundwater Monitoring Report* (TolTest/MWH, April 2013).

1.1 FACILITY DESCRIPTION AND BACKGROUND

Joliet Army Ammunition Plant is a former United States Army (Army) munitions production facility located on approximately 36 square miles (23,542 acres) of land in Will County, Illinois (Figure 1-1). The former facility is located approximately 60 miles southwest of Chicago and 14 miles south of Joliet, Illinois. As shown on the Groundwater Study Areas and Landfill Sites Map (Figure 1-2), the JOAAP property is divided into two main functional areas: the Manufacturing Area (MFG), west of Route 53, and the Load-Assemble-Package Area (LAP), east of Route 53. The facility has been described in detail in Section 1.1 of the *Final Long-term Monitoring Plan for Environmental Remediation Services* (LTM Plan [TolTest/MWH, March 2010]) at JOAAP.

The MFG Area, covering approximately 14 square miles (9,159 acres), is where the chemical constituents of munitions, propellants, and explosives were produced. The production facilities were generally located in the northern half of the MFG Area. In the southern half of the MFG Area, there was an extensive explosives storage facility. The LAP Area, covering approximately 22 square miles (14,383 acres), is where munitions were loaded, assembled, and packaged for shipping. The LAP Area contained munitions filling and assembly lines, storage areas, and a demilitarization area.

Joliet Army Ammunition Plant was constructed during World War II. The production output varied with the demand for munitions. Although the plant was used extensively during World War II, all production of explosives halted in 1945. At that time, the sulfuric acid and ammonium nitrate plants were leased out, and the remaining production facilities were put in layaway status. The installation was reactivated during the Korean War, and again during the Vietnam War. Production gradually decreased until it was stopped completely in 1977.

Hazardous wastes were generated and released into the environment in several ways. Process waters used in the production and handling of 2,4,6-trinitrotoluene (TNT) and other compounds were discharged into drainage systems. Buildings and equipment were periodically washed to remove explosive residues. Most of these wastewaters leached into the ground or flowed into local surface water and creeks. Later, process water incineration or industrial wastewater treatment produced ash or explosives residue that accumulated over time. Ash from the incineration of production by-products was stored in landfills on-site. Equipment and demolition materials were flashed (burned) to remove residues. Fire training areas, used to keep fire and safety personnel suitably prepared, introduced contaminants to soil and groundwater. Leaks and spills occasionally occurred in the storage and handling of oils and other liquids. Wastes and unusable explosives and munitions were burned or detonated. In addition, munitions were tested, leaving some residuals in soil at the test sites. Vehicle and equipment maintenance, transformer leaks, and the handling of pesticides introduced further contamination to the soil.

Wastes generated during production activities resulted in environmental contamination at various sites around JOAAP. Because of this contamination, the United States Environmental Protection Agency (USEPA) placed the MFG Area on the National Priority List (NPL) on 21 July 1987 and the LAP Area on the NPL on 31 March 1989.

The contaminated media identified at JOAAP were divided into two operable units (OUs) to aid in the development and evaluation of remedies. The SOU consists of sites where contaminated soils, sediments, and debris were identified. The GOU consists of sites where contaminated groundwater was identified. Surface water was determined to pose no risk to health and the environment and therefore is not addressed further as a contaminated media. However, surface water discharge is a major component of the shallow groundwater system, and localized detections of explosives may occur near contaminated groundwater sites. For this reason, surface water is relevant to the GOU.

Substantial land area at JOAAP is not contaminated. Transfer activities for that land have occurred and some are still underway. After remaining potential hazards to human health and the environment are addressed under the SOU and these properties are found suitable for transfer under Public Law 104-106 and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), the Army will prepare documentation for transfer.

The Illinois Land Conservation Act of 1995, PL 104-106, Div. B, Title 2901-2932, 10 February 1996, states that the Army will transfer JOAAP land to various federal, local, and state jurisdictions. Transfer of land is occurring incrementally as it is remediated and is deemed appropriate. As of 2012, the distribution of JOAAP land through these incremental transfers is approximately 17,726 acres to the United States Department of Agriculture (USDA) for establishing the Midewin National Tallgrass Prairie; 982 acres to the Department of Veterans Affairs to establish a Veterans Cemetery; 455 acres to Will County, Illinois to establish the Will County Landfill; and 2,885 acres to the State of Illinois to establish two industrial parks.

Where groundwater contamination is present within areas to be transferred, the Army has included institutional controls (IC) in the transfer documents to prevent exposure to contaminants, limit groundwater pumping, and to prevent manipulation of the natural groundwater flow patterns through any means. These controls will help to limit the spread of the remaining contamination in groundwater and will remain in effect with the land until removed by mutual agreement of the Army, USEPA, Illinois Environmental Protection Agency (IEPA), and the current landowner.

1.2 NATURAL ATTENUATION MECHANISMS

The selected remedial action for the GOU is remediation by natural attenuation. The following discussion provides a brief overview of the physical, chemical, and biological criteria, which are most directly linked to natural attenuation mechanisms. A more detailed

assessment of the site-specific criteria used to evaluate natural attenuation at JOAAP is provided in the LTM Plan.

Aerobic and anaerobic biodegradation of explosive compounds has been previously demonstrated. There has been a significant amount of information developed on the breakdown pathways for TNT in particular. The electrophilic nature of this compound has favored reductive reactions over oxidation. Aerobic degradation pathways typically yield partially reduced nitroso and hydroxylamino compounds that form recalcitrant azoxy compounds through oxidative coupling. Anaerobic reduction of TNT follows one of two sequential pathways from either 4-amino-2,6-dinitrotoluene (4-A-2,6-DNT) or 2-amino-4,6-dinitrotoluene (2-A-4,6-DNT) to 2,6-dinitrotoluene (2,6-DNT) to 2-amino-6-nitrotoluene to 2-nitrotoluene (2-NT) to 2-aminotoluene (2-AT) to toluene. Ultimately, toluene is mineralized to carbon dioxide (CO_2) and water (H_2O). Some researchers report the end product for anaerobic degradation to be 2,4,6-triaminotoluene (TAT). The compound TAT has been reported to be highly unstable and is also irreversibly bound to soil under anaerobic and subsequent aerobic conditions.

Mineralization of toluene can occur under both aerobic and anaerobic conditions. In an aerobic environment, toluene is oxidized resulting in ring fission and subsequent rapid degradation through a series of steps where aldehydes and acids are formed. These by-products are quickly mineralized. There are at least four pathways through which toluene can be mineralized under anaerobic conditions. The anaerobic degradation of toluene typically proceeds through a series of steps resulting in the formation of alcohols, aldehydes, and acids prior to mineralization. Evidence of toluene production and subsequent mineralization is often undetected at sites because the biologically mediated reactions occur rapidly without the accumulation of by-products (Cookson, 1995).

High melting-point explosive (HMX) has been demonstrated to degrade by abiotic, anaerobic, and aerobic mechanisms. Abiotic degradation by photolysis has led to the formation of nitrate, nitrite, and formaldehyde (Gorontzy, 1994). Anaerobic degradation of HMX has led to the formation of mono-nitroso and di-nitroso derivatives and potentially can yield a small concentration of methanol. These breakdown products can be difficult if not impossible to analyze in field samples, especially in the low concentrations one would expect to find at JOAAP. Aerobic degradation of HMX can be achieved with similar breakdown products resulting (Kaplan, 1993).

Royal demolition explosive (RDX) has been demonstrated to degrade by abiotic, anaerobic, and aerobic mechanisms. Abiotic degradation by photolysis has led to the formation of a mono-nitroso derivative, nitrate, nitrite, ammonium, formaldehyde, and various amides, amines, and acids. Aerobic degradation of RDX has led to the formation of mono-nitroso and di-nitroso derivatives. Anaerobic degradation of RDX can be achieved with similar breakdown products as well as tri-nitroso triazines, hydrazine, dimethylhydrazine, formaldehyde, and methanol (Gorontzy, 1994). These breakdown products can be difficult if not impossible to analyze in field samples, especially in the low concentrations one would expect to find at JOAAP.

Tri-, di-, and nitrobenzene (NB) have been demonstrated to degrade by anaerobic mechanisms. The degradation pathway can involve the formation of a nitrosobenzene compound, a hydroxylaminobenzene, and 2-aminophenol. If the system becomes aerobic, the 2-aminophenol is transformed to 2-aminomuconic semialdehyde, which can be further degraded (Haigler, 1996).

The processes affecting the natural attenuation of contaminants in groundwater are advection, dispersion, diffusion, sorption, and biodegradation. Physical attenuation processes reduce the contaminant concentrations and their overall toxicity in groundwater. Bioattenuation includes biological and chemical processes that destroy contaminant mass. Reduction in contaminant mass will eventually result in an overall decrease in concentrations and plume extent.

Proving that bioattenuation is occurring at a site is typically based on collection of site-specific information related to geologic and hydrogeologic characterization, the extent and distribution of contaminants, and the collection and analysis of specific chemical and physical attributes of the aquifer matrix and groundwater. Several investigators have developed lines of evidence which they believe can adequately demonstrate that bioattenuation is occurring at a site (Rifai et al., 1995, Wiedemeier et al., 1995, 1996).

Rifai et al. (1995) states that three indicators of MNA should be developed from the site characterization data. The three indicators are: (1) compound disappearance demonstrating the decrease in contaminant concentrations as a function of time and distance from the source; (2) loss of electron donors; and (3) presence of degradation products and the accumulation of other indicator parameters of biodegradation.

The key geologic variables with the greatest potential to impact natural attenuation are the lateral and vertical heterogeneity of each aquifer. A high degree of lateral and vertical heterogeneity within an aquifer causes varying hydraulic conductivity and hydraulic gradients. As groundwater velocities change, contaminant transport rates change; this complicates the evaluation of natural attenuation mechanisms.

Changes in contaminant concentration with time will be used to evaluate the effectiveness of natural attenuation mechanisms. If contaminant reduction does not proceed at a suitable rate, contingency options may be required. These options will be discussed on a site-specific basis.

1.3 RECORD OF DECISION REQUIREMENTS

The ROD specified general groundwater monitoring requirements. These requirements were based on information presented in the Remedial Investigation (RI) Report and did not have the additional information provided by the predesign investigation completed in 1998 or subsequent remedial actions completed at JOAAP. As such, the Army applied

subsequent site data as well as historic data to arrive at site-specific LTM locations and analytes, which were included in the LTM Plan.

Based on the objectives presented in Section 1.2 of the LTM Plan and as an extension of the ROD, several types of monitoring are required for each site. These include:

- Collection of groundwater samples to evaluate contaminant concentrations;
- Collection of surface water samples where groundwater discharges to surface features to evaluate surface water contaminant concentrations;
- Collection of depth to water measurements to evaluate groundwater flow;
- Documentation and evaluation of source removal or surface disturbing activities;
- Documentation of changes in surface water features, impoundments, or conveyances; and
- Evaluation of evidence concerning illicit water withdrawal affecting contaminant migration.

1.4 LONG-TERM MONITORING PLAN

Monitoring activities are required pursuant to the decision documents developed for the various contaminated sites found at JOAAP. The LTM Plan was written to present LTM activities for the GOU and required SOU maintenance activities. The LTM Plan includes activities associated with long-term maintenance of the remedies selected for JOAAP. The objective of the LTM Plan was to provide a sufficiently detailed description of the monitoring strategy and process and to establish realistic expectations for execution of the program on the part of all stakeholders. With respect to the latter objective, it is the intent of the plan to establish both the actions to be taken in the event of various sampling outcomes and the set of conditions required to reduce and eventually discontinue long-term monitoring efforts where practicable. As such, it includes sample collection and analysis of ground and surface water, surveillance of cap maintenance and access restrictions at landfills, and surveillance of land use restrictions and other ICs implemented on an installation-wide basis.

Section 3.1 of the LTM Plan summarizes the groundwater management zones and monitoring well designations and discusses the decision tree for interpretation of groundwater quality results and the logic for optimizing site monitoring programs. Section 3.2 of the LTM Plan discusses institutional controls monitoring required as part of the MNA remedy.

The LTM program is presented in Section 4.0 of the LTM Plan which includes a discussion of site-specific monitoring programs for the GMZs and landfills, monitoring well

installations, abandonments, monitoring schedules, requirements for IC monitoring, and reporting schedules. Tables A1-1 through A1-9 of Appendix A (Field Sampling Plan) of the LTM Plan provide specific information about the monitoring requirements at each site. However, it is expressly presented that the LTM program will likely change with changing conditions. Therefore, the LTM Plan tables were consolidated into a single table that is continually updated based on groundwater monitoring results and periodic reviews. The sampling completed for July and October 2012 is presented as Table 1-1 in this report and summarizes the monitoring locations and requisite analyses for those sample locations. Additionally, the changes to the monitoring program based on results and the conditions set in the LTM Plan are summarized in Section 4 – Recommendations.

The LTM Plan provides a site-specific evaluation of the natural attenuation remedial option that is being applied to all GOU sites. The purpose of the LTM Plan is to:

- describe the process by which data will be collected and analyzed,
- determine if remedies in place at JOAAP are protective of human health and the environment,
- describe the nature of monitoring results that, if observed, would indicate further action be taken because the remedy does not appear to be sufficiently protective,
- prescribe the conditions under which certain monitoring activities may be terminated, and
- provide a detailed description of activities to monitor the GOU natural attenuation RA.

Section 5 of the LTM Plan describes reporting requirements for LTM activities. The LTM Plan reporting schedule requires the submittal of a semi-annual report which is a presentation of the results of the winter and spring sampling events with minimal analysis and an annual report that presents the results of the summer and fall sampling event with detailed evaluation of trends in the groundwater data. The semi-annual sampling schedule identified in the LTM Plan indicates that the sampling periods will generally be April and October of each year at all sites except Landfill M13 which is sampled quarterly, generally in January, April, July, and October of each year. In 2012, the winter quarterly sampling event at Landfill M13 was conducted during February and the spring semi-annual sampling event was conducted in April. The summer quarterly sampling event at Landfill M13 was conducted during July and the fall annual sampling event was conducted in October. Annual groundwater monitoring reports are the venue in which data are analyzed and proposed changes to the LTM Plan are presented. Acceptance of the final annual groundwater monitoring report by regulators will constitute approval of recommended changes in the monitoring program.

The LTM Plan also provides for a five-year review of the GOU natural attenuation remedy and SOU remedy, as required by the ROD. Natural attenuation data were collected during the Fall 2003 sampling event to facilitate the first five-year review. The First Five-Year Review Report was completed following the Fall 2003 sampling event. The Final Second Five-Year Review Reports for the GOU and SOU were submitted in August 2009. Subsequent five-year reviews will be completed to evaluate the effectiveness of the GOU and SOU remedies and, if necessary, provide recommendations to modify the remedy to make it more effective. The Third Five-Year Review Report will have the GOU and SOU remedy protectiveness evaluated in one consolidated document. Furthermore, if the third five-year review suggests that natural attenuation may not result in reasonable agreement with ROD requirements, evaluation of available contingency remedies will be presented as part of the five-year review process.

1.5 HISTORIC DATA RESULTS

Historic groundwater quality sampling results from 2002 (where available) through 2012 are presented in tabulated form in Appendix B of this Report. Specifically, Appendix B1 contains explosive compound results, Appendix B2 contains target analyte list (TAL) metals results, Appendix B3 contains inorganic indicator parameter (nitrate and sulfate) results, Appendix B4 contains volatile organic compound (VOC) results, and Appendix B5 contains semivolatile organic compound (SVOC) results. The historic tables contain data for monitoring wells that are included in the current LTM program for compounds that have been detected during groundwater monitoring activities conducted at JOAAP. These data provide the basis for evaluating concentration trends in the data and are incorporated into time vs. concentration plots to assist in the evaluation of the natural attenuation of contamination at JOAAP.

2.0 SITE ACTIVITIES

This section provides a summary of the LTM Plan requirements, the groundwater monitoring activities at each of the GOUs, and the SOU RA landfill inspections.

2.1 GROUNDWATER MONITORING

This section provides a summary of the field activities undertaken to perform July quarterly and October semi-annual groundwater monitoring at Landfill M13, and October annual groundwater and surface water monitoring at remaining GOU and SOU sites. Field activities undertaken during the February quarterly and April semi-annual sampling were summarized in the *Final 2012 Semi-annual Groundwater Monitoring Report* (Toltest/MWH, April 2013).

The gauging of the monitoring well groundwater elevations was accomplished using an electronic water level indicator. Depth to water was measured from a datum mark on the top of casing (TOC) of each monitoring well. All gauging measurements were taken to an accuracy of +/- 0.01 foot (ft).

In accordance with the standard operating procedure for low-flow sampling, monitoring wells were purged and sampled using low flow sampling techniques at a flow rate of approximately 100 to 250 milliliters per minute (ml/min). Dedicated ¼-inch (in.) outside diameter (OD) Teflon™ lined polyethylene tubing is installed in each monitoring well. The Teflon™ lined polyethylene tubing was connected with dedicated silicon tubing to a variable speed peristaltic pump. During purging, the pump discharge tube was attached to a Horiba™ (or equivalent) multi-probe water quality meter equipped with a flow-through cell. The water quality meters were equipped with probes for measuring field parameters including temperature, pH, specific conductivity (SpC), oxidation/reduction potential (ORP), and dissolved oxygen (DO). The water quality meters were calibrated daily in accordance with Appendix A (Field Sampling Plan) of the LTM Plan and the manufacturer's instructions.

Measurements of field parameters were taken at two-minute intervals and recorded on Groundwater/Surface Water Sampling Forms. Purging of each monitoring well was considered complete when field parameters stabilized over three successive measurements to within 10%. The last stabilization water quality readings through the flow-thru cell were used to report field parameters which are summarized in Table 2-1. Upon stabilization of the field parameters, the required samples were collected from the discharge tube of the pump into laboratory-supplied containers after disconnecting the flow-thru cell. For some monitoring wells exhibiting >0.5 ft of drawdown during stabilization, micropurge sampling techniques were applied.

Samples were collected in laboratory supplied preserved containers for explosive compounds in unpreserved one-liter amber glass bottles; TAL metals in one-liter, nitric acid preserved polyethylene bottles; inorganic parameters nitrate and sulfate in 250

milliliter unpreserved polyethylene bottles; VOCs in 40 milliliter, hydrochloric acid preserved glass vials; and SVOCs in one-liter unpreserved amber glass bottles. Samples were analyzed by Test America, University Park, Illinois in accordance with Appendix B - Quality Assurance Project Plan (QAPP) of the LTM Plan. Samples collected for inorganic parameters TAL metals, nitrate, and sulfate were field filtered using high capacity 0.45 micron in-line cartridge filters.

2.1.1 July 2012 Groundwater Monitoring

TolTest/MWH measured water levels at eleven monitoring wells and sampled six monitoring wells as summarized in Table 1-1. The third quarterly monitoring event in 2012 at Landfill M13 was conducted on 17 and 18 July 2012.

The gauging of the monitoring well water levels was accomplished using techniques discussed in Section 2.1. Groundwater elevations are summarized in Table 2-2 for the MFG.

Groundwater monitoring was conducted in accordance with Appendix A (Field Sampling Plan) of the LTM Plan, as described above.

Blind duplicate samples were collected at a rate of 10% (1 per 10) for each analyte sample total. Blind duplicate M13-MW999 was collected at parent location M13-MW808 at Landfill M13 for VOCs, SVOCs, explosives, TAL metals, nitrate, and sulfate.

A matrix spike/matrix spike duplicate (MS/MSD) sample was not collected in July.

Level III data validation was completed for groundwater samples. Based on the results of the validation, data evaluation reports are included in Appendix C1 and a data usability report is included in Appendix C2.

2.1.2 October 2012 Groundwater Monitoring

TolTest/MWH measured water levels at a total of 130 monitoring wells and 5 surface water locations at JOAAP. A total of 38 monitoring wells and 1 surface water location were sampled at the MFG Area and 16 monitoring wells and 4 surface water locations (SW558 was dry) were sampled at the LAP Area as summarized in Table 1-1. Field activities were conducted from 23 through 30 October 2012.

The gauging of the monitoring well water levels was accomplished using techniques discussed in Section 2.1. Surface water elevations are determined by referencing to the known elevations of nearby benchmarks using a level and rod and from marks on existing structures (bridges) for some locations; where at others a direct measurement with a water level indicator was completed. All gauging and surveying measurements were taken to an accuracy of +/- 0.01 ft. All surface water locations contained water during gauging and sampling activities except SW558 at Site L3/Landfill L3. Monitoring wells MW171, MW175, and MW176 were dry at Site L1 at the time water levels were measured.

Groundwater elevations are summarized in Table 2-2 for the MFG and Table 2-3 for the LAP. Surface water elevations are summarized in Table 2-4. Gauging and surveying activities for individual sites were completed within a 24-hour period.

Groundwater sampling was conducted in accordance with Appendix A (Field Sampling Plan) of the LTM Plan, as described above. Surface water samples were collected by directly immersing the sample container into the surface water body to fill the bottle without losing any preservative if filtration for TAL metals was not required. If filtration for TAL metals was required, a peristaltic pump with tubing placed directly in the surface water body was used for sample collection.

Blind duplicate samples were collected at a rate of 10% (1 per 10) for each analyte sample total. The majority of the duplicate samples were collected from monitoring wells that had previous analyte detections. Duplicate samples were collected from six monitoring wells in the LAP and MFG areas in October 2012. Details concerning field duplicates for October 2012 are as follows:

Duplicate Sample Number	Monitoring Point Sampled	Site	Sample Date	Analyte
MW994	MW631	L3	10/30/2012	Explosives and TAL Metals
MW995	MW173	L1	10/29/2012	Explosives
MW996	MW642	M1	10/25/2012	Sulfate
MW997	MW809	M13	10/25/2012	VOCs, SVOCs, Explosives, TAL Metals, Nitrate, and Sulfate
MW998	MW336	M11	10/24/2012	VOCs, SVOCs, Explosives, TAL Metals, Nitrate, and Sulfate
MW999	MW212R	M6	10/23/2012	Explosives

Matrix spike/matrix spike duplicate samples were collected at a rate of 5% (1 per 20) for each analyte sample total.

Level III data validation was completed for groundwater samples. Based on the results of the validation, data evaluation reports are included in Appendix C1 and a data usability report is included in Appendix C2.

Repair activities completed during the October 2012 sampling activities included the following:

- Hinge repaired on monitoring well L3-MW411
- Weep hole drilled in monitoring well M8-MW121 casing

- New lock added to monitoring well M8-MW121

2.2 LANDFILL INSPECTIONS

Post-closure monitoring requirements for Landfills L3, L11, and M13 are mandated by Illinois Administrative Code (IAC) Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for 15 years at Landfill M13 and 30 years at Landfills L3 and M11. The LTM Plan states that the L3 Landfill cover will be inspected quarterly; the M11 Landfill cover will be inspected quarterly for the first five years and annually for 25 years; and the M13 Landfill cover will be inspected quarterly. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future.
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed.
- Keep survey points protected and visible to facilitate identification in the future.
- At M13 ensure the fence and signage installed to restrict site access remain in place and serviceable.
- At M13 certify that institutional controls remain in place.

According to IAC and the LTM Plan, Landfills L3, M11, and M13 covers will be inspected on a quarterly basis for:

- Depressions indicating subsidence or other deformations that could breach the cover.
- Erosion features.
- Growth of deep rooted vegetation or invasive species that would adversely affect evapotranspiration and/or erosion armoring.
- Debris or blockage of drainage structure.

In addition, land use restrictions have been imposed across the area within the fence. Annual certification is required to document that none of the following are occurring within the fence:

- Development
- Intrusive work

- Excavation that could mobilize contaminants of concern (COC)
- Alteration of surface water flow
- Vehicle use other than that associated with maintenance of the cover/cap.

Landfill inspections have been conducted on a quarterly basis at Landfills L3, M11, and M13 since October 2008 in accordance with the LTM Plan. Landfill inspection reports for March and April 2012 are included as appendices in the *Final 2012 Semi-annual Groundwater Monitoring Report* (Toltest/MWH, April 2013). Landfill inspection reports for July and October 2012 are included as Appendices A1 and A2 of this report, respectively.

2.2.1 July 2012 Landfill Inspections

Site inspections of Landfills L3, M11, and M13 were conducted on 17 July 2012 in accordance with the LTM Plan. The vegetative cover at all three landfills appears to be dormant due to severe drought conditions. The vegetative cover is still green and no loss of cover was observed. The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable. Woody growth is present within the rip rap along Prairie creek which needs to be removed. The gas vents at M11 and M13 appear to be in working condition and don't require maintenance. The July Inspection Report is included in Appendix A1.

2.2.2 October 2012 Landfill Inspections

Site inspections of Landfills L3, M11, and M13 were conducted on 30 October 2012 in accordance with the LTM Plan. Due to the severe drought conditions the landfills were not mowed this summer. The vegetative cover is still green and no dead areas were encountered during the inspection. The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable. Woody growth continues to be a problem within the riprap located along Prairie creek. The gas vents at M11 and M13 appear to be in working condition and don't require maintenance. The low-lying ditch directly south of Landfill M13 is collecting surface water and cannot drain. Therefore, ponded water is typically present. The October Inspection Report is included in Appendix A2.

2.3 INSTITUTIONAL CONTROLS MONITORING

The remedies selected for all areas of JOAAP do not allow unrestricted use of the property or underlying groundwater. Restrictions on use of groundwater are limited to the GMZs and annual certification that the restrictions are being maintained for each GMZ is required. Land use restrictions over and above those associated with groundwater use apply wherever waste or contamination has been left in place at levels that pose an unacceptable risk without some form of ICs. Some of those areas include the three landfills (L3, M11, and M13) with associated restrictions with annual certification. For all other areas with institutional controls there is a need for similar annual certification that the deed restrictions remain in place and are effective. Annual certifications are completed separate from this report. However, during groundwater monitoring and landfill inspections conducted quarterly at Landfill M13 and site-wide sampling conducted semi-annually in 2012, there were no observations of intrusive soil activities, construction, or improper use of groundwater which would affect the GOU or SOU remedies.

3.0 RESULTS AND RECOMMENDATIONS

Groundwater management zones are three-dimensional areas containing groundwater being managed to mitigate impairment according to IAC. The GMZs comprise both the glacial drift and shallow bedrock (Silurian Dolomite) aquifer and are bounded at depth by a confining shale unit (Maquoketa Shale). The GMZs were established with acceptance of the ROD. Any future modification of GMZ boundaries will have to be mutually agreed upon by the Army, USEPA, and IEPA. Groundwater monitoring wells and surface water collection points located inside and/or near the borders will be used to monitor contaminant plumes. Site-specific plans for GMZs for GOU sites are discussed in Sections 3.1 through 3.8.

Groundwater and surface water samples collected in February, April, July, and October 2012 were analyzed for one of more of the following parameters: explosive compounds, TAL metals, indicator parameters (nitrate and sulfate), VOCs, and SVOCs. Analytical results from 2012 sampling events for explosive compounds, TAL metals, indicator parameters (nitrate and sulfate), VOCs, and SVOCs are summarized in Tables 3-1 through 3-5, respectively. This section provides a site-specific presentation of the well gauging and groundwater and surface water quality sampling results. The discussions are arranged by the GMZs into which each of the sites is grouped. This provides an ability to discuss the contaminant detections in relation to each of the GMZ boundaries.

Each site in Section 3 is organized into the following subsections:

General Site Introduction: General site-specific background information is presented.

Groundwater Hydraulics: Site monitoring wells, surface water sampling locations, and water elevation measurements are presented for the water table and potentiometric surface (generally in the bedrock). For groundwater hydraulic purposes, monitoring wells are designated as overburden wells, combination overburden/bedrock wells, or bedrock wells. This designation indicates in which aquifer(s) the well is screened. When possible, discussions include the relationship between groundwater flow direction, hydraulic gradients, and contaminant migration.

Analytical Results: Figures are presented for contaminant detections observed during the February (M13), April, July (M13), and October 2012 sampling rounds. For groundwater quality discussions, monitoring wells and surface water sampling points are designated as in-plume, early warning, or compliance points and at Landfill sites as upgradient or downgradient. These designations are included in the LTM Plan and are based on where the sampling point is located relative to historic groundwater detections, site GMZ, and/or site features.

Analytical data from 2012 sampling are included in the discussion of analytical results. Contaminant concentrations that are greater than site RGs are included in the discussion even if there is not a notable change in the analytical data for that constituent.

Method reporting limits (MRL) are less than site RGs. MRLs are provided for each compound in the Data Evaluation Report presented in Appendix C1. Analytical results, 'not detected' (ND) are for contaminant concentrations less than the MRL. If there were detections between the method detection limit (MDL) and the MRL, the concentration was qualified "J" as an estimated concentration (J).

Groundwater Trend Evaluation: Each annual report includes figures that show selected contaminant concentrations versus time plots to evaluate temporal trends in groundwater quality while assessing the effectiveness of natural attenuation mechanisms at each of the sites. Where possible, wells with established groundwater quality trends are displayed in chart format. Well(s) with the highest contaminant concentration greater than RGs are preferentially selected for this analysis if more than one well is available at a given site. Furthermore, within the selected wells, compounds with the greatest concentrations relative to RGs provide conservative data sets from which reduction rates are used to estimate site clean-up times. To provide as realistic as possible estimation relative to conditions since completion of the RA, data are included from the previous ten years only, where available. This conservative measure is intended to lessen the degree the trend line is affected from historic data, as site conditions have changed due to the completion of the RAs. First order rate decay trend analyses for selected monitoring wells have been included in Appendix D. Specifically, trend plots are included in Appendix D1 and an example of the calculations completed is included as Appendix D2.

Where practical, selected compounds and monitoring wells at a particular site are used to predict contaminant reduction timeframes. The target concentration used to estimate the timeframe is the compound-specific RG. To provide an estimate of the time required for the selected explosive compounds to naturally degrade to less than site RGs, estimates of future contamination reduction are achieved by including an exponential curve to available concentration versus time data to predict likely contaminant reduction rates (Appendix D1). The exponential curve is used to best represent trends in contaminant concentration where variations in data show no distinct trend. Presented timeframes are very approximate and assume constant contamination reduction rates for a specific compound at a specific point within the aquifer. Groundwater trend analysis results have been included in Table 3-6. Contaminant reduction likely represents all physical, chemical, and biological attenuation mechanisms active within the aquifer.

The R^2 values displayed on the plots are used for the estimated clean-up time analyses. The R^2 value is an indicator of how well the equation resulting from the regression analysis explains the relationship among the variables. An R^2 value equal to 1.0 is an exact fit, and values which approach zero suggest a very poor fit. For this analysis, R^2 values generally range between approximately 0.1 and 0.5. However, there are some R^2 values that are less than 0.1. In these cases the clean-up time analyses is unreliable. The primary cause for the

low R^2 values is the seasonal variability of the concentrations. Based on the variability of the data the calculated cleanup times are only an estimate based on the data available. For additional information regarding this analysis and an example calculation for estimated clean-up times, refer to the example estimated clean-up time calculation included in Appendix D2.

Recommendations: Recommendations for each site are presented specific to the conditions of the LTM Plan. A thorough summary of recommendations is presented in Section 4.

3.1 SITE L1

Site L1 is one of six GMZs created to manage risk arising from groundwater contamination and to monitor performance of the selected remedy. Site L1 comprises 80 acres on which munitions production facilities were constructed in 1941. It is centrally located in the northern portion of the LAP Area (Figures 1-2 and 3-1). Historically, Site L1 was used for demilitarization and reclamation of various munitions starting with crystallization of ammonium nitrate, but then was converted for shell renovation and 1,3,5-trinitrobenzene (TNB) recovery up until 1945. By April of 1946, it had been reactivated to reclaim TNT.

In the TNT operation, hot water was used to wash the TNT out of shells. The water was discharged to a sump where solid explosives were removed for burning and the overflow (pink water) was routed to a 4.3-acre ridge and furrow evaporation/percolation pond. By 1952, two additional evaporation ponds had been constructed southeast of the ridge and furrow unit on either side of a drainage ditch flowing from it to Prairie Creek. Prairie Creek, the surface water body draining the area, is incised into the bedrock and appears to transmit groundwater that discharges directly or emerges into the streambed by virtue of the head relief available in the open channel.

Explosive residues in soil were observed in the ridge and furrow impoundment, the western most of the two newer ponds, the area south of the washout building, and the soil around the sump. The underlying groundwater contains TNT, TNB, 2,6-DNT, and RDX both in the alluvium and in the shallow weathered bedrock, as well as degradation products from those parent compounds, as a result of the infiltration of pink water and possibly continued leaching of explosives in soil. The footprint of RG exceedances currently extends to the southeast of the source area (in the proximity of MW131, MW173, and WES1) to monitoring well MW173. Soil source control measures at the ridge and furrow pond were conducted in 2005 to 2006. The contamination is now a legacy groundwater plume continuing to migrate to the southeast towards Prairie Creek, where it is believed to largely discharge into the creek through upwelling. Given these observations, the contaminant footprint is expected to separate from the source area over time and migrate in the alluvium and shallow bedrock until it discharges to Prairie Creek.

The overburden aquifer generally consists of a complex stratification of clay and silt, with some silty gravel observed in the eastern portion of the site near MW174. Overburden

generally thins from approximately 20 ft in the north to less than 5 ft in the south and from approximately 15 ft in the east to 5 ft in the west.

3.1.1 Groundwater Hydraulics

The groundwater monitoring network at Site L1 consists of 16 wells: 8 overburden wells, 1 combined overburden/bedrock well, and 7 bedrock wells. Water levels are measured at the groundwater/surface water locations that are sampled (listed below), and at monitoring wells MW171, MW172, MW175, MW176, MW177, MW178, MW401, MW610, MW611 and WES2. Monitoring well information and water levels for October are summarized in Table 2-3. The groundwater flow direction in the overburden aquifer is typically toward the southeast. However, due to drought conditions in 2012, groundwater flow is away from Prairie Creek as shown on Figure 3-1.

The horizontal gradient in the northern part of Site L1 was calculated to be 0.0118 feet per foot (ft/ft) in April and could not be calculated in October due to monitoring well MW176 being dry and in the southern part of Site L1 was calculated to be 0.0126 ft/ft in April and 0.0036 ft/ft in October (Table 3-7). The annual average horizontal hydraulic gradient for Site L1 could not be calculated in the northern part of the site in October due to monitoring well MW176 being dry and was 0.0081 ft/ft in the southern part of the site. Using the reported average of 9.2E-06 centimeters per second (cm/sec) for hydraulic conductivity and an assumed porosity of 0.30, the calculated flow velocity in the overburden at Site L1 was approximately 0.0011 feet per day (ft/day) or 0.387 feet per year (ft/yr) in April. In October flow velocities only in the southern part of the site could be calculated and were 0.0007 ft/day or 0.257 ft/yr (Table 3-8). As stated in the Final LTM Plan, a value of 16 ft/yr will be used to evaluate data from groundwater early warning sample points, which will accommodate heterogeneities present in the overburden aquifer.

Bedrock wells are installed at shallow depths (<10 ft below top of bedrock). The groundwater flow direction in the bedrock aquifer is generally toward the southeast as shown on Figure 3-2. Vertical gradients observed were upward at well nests MW171/MW177 in April and at MW172/MW173 and MW401/MW610 in April and October. Vertical gradients observed were downward at well nest MW178/MW176 in April and monitoring well MW176 was dry in October (Table 3-9).

The overburden and bedrock aquifer flow directions are not consistent with flow directions observed historically, likely due to drought conditions experienced during 2012. Groundwater flow is expected to return to the historically observed groundwater flow direction once the drought has ended. Based on historic groundwater flow data, Prairie Creek is the likely discharge point for all shallow groundwater in the vicinity of Site L1.

3.1.2 Analytical Results

Groundwater and surface water sampling completed for Site L1 during October are summarized in Table 1-1. The following monitoring wells and the surface water sampling location at L1 are sampled for explosives:

- In-Plume – MW131, MW173, and WES1
- Early Warning – MW174 and WES3
- Compliance – surface water sampling point SW550

Early Warning monitoring well MW172 and compliance monitoring well MW401 were removed from the sampling program beginning in spring 2012.

According to the LTM Plan SW550 is to be collected at a point along Prairie Creek where the creek leaves the GMZ boundary for the overburden aquifer. However, the GMZ boundary is approximately 1500 ft downstream from where groundwater emanating from the Site L1 source area would typically be discharging to the surface water. Therefore, the sample has been being collected at the location shown on Figure 3-1 to provide an indication if the groundwater discharging to Prairie Creek exceeds the surface water RG. If concentrations are detected in excess of the RG at this current sampling location the sampling location will be moved downstream to the GMZ boundary to determine if surface water is leaving the GMZ in excess of the RG.

Groundwater and surface water samples collected at Site L1 in 2012 were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compound detections for 2012 sampling events conducted at Site L1 are summarized in Table 3-1 and shown on Figure 3-3. Historic explosive compound data for Site L1 are summarized in Table B1, included in Appendix B. A brief discussion of analytical results by well type follows.

In-Plume Wells (MW131, MW173, and WES1): At overburden well MW131, 2,4,6-TNT exceeded the RG in April at a concentration of 2,200 micrograms per liter (µg/L) and in October at a concentration of 1,000 µg/L, 1,3-DNB was detected below the RG at a concentration of 5.4 µg/L and not detected in October, and 2-A-4,6-DNT and 4-A-2,6-DNT were detected in April and 4-A-2,6-DNT was detected in October. There are no RGs for 2-A-2,6-DNT and 4-A-2,6-DNT.

At overburden well MW173, RDX exceeded the RG in April at a concentration of 10 µg/L and was not detected in October, 2,4,6-TNT exceeded the RG in April at a concentration of 12 µg/L and was not detected in October, HMX was detected below the RG at a concentration of 1.4 µg/L in April, and 2-A-4,6-DNT and 4-A-2,6-DNT were detected in April. There are no RGs for 2-A-2,6-DNT and 4-A-2,6-DNT.

At bedrock well WES1, 1,3,5-TNB exceeded the RG in April at a concentration of 40 µg/L and was not detected in October, 2,4,6-TNT exceeded the RG in April at a concentration of

38 µg/L and was detected below the RG at a concentration of 6.4 µg/L in October, NB was detected below the RG at a concentration of 3.9 µg/L in April, and 2-A-4,6-DNT and 4-A-2,6-DNT were detected in April and October. There are no RGs for 2-A-4,6-DNT and 4-A-2,6-DNT.

Early Warning Wells (MW174 and WES3): At overburden well MW174, there were no detections for explosive compounds in April and October.

At bedrock well WES3, there were no RG exceedances for explosive compounds in 2012. RDX was detected below the RG at concentrations of 0.74 µg/L in April and 0.43 µg/L in October, 1,3,5-TNB was detected below the RG at a concentration of 0.2 µg/L April and was not detected in October, and 2,4,6-TNT was detected below the RG at concentrations of 1.2 µg/L April 0.76 µg/L in October.

Compliance Points (SW550): At surface water sampling location SW550, there were no detections for explosive compounds in 2012.

3.1.3 Groundwater Trend Evaluation

Information included in the 1998 ROD estimated the timeframe for concentrations to reach the RG at Site L1 to be 340 years, or 2338.

Data from the previous 10 years only are used for this evaluation to provide a representation of site conditions since the soil source control measures completed in 2005 while maintaining a sufficient dataset. With time, the pre- soil source control measures data will continue to be removed from the dataset and an increasingly accurate representation of groundwater conditions post- soil source control measures will be presented.

As stated in Section 4.1.1.5 (Monitoring Frequency) of the LTM Plan, *"Historical data suggest concentrations are always higher in the spring."* and *"Should the first few years of monitoring indicate concentrations are consistently highest at a given season of the year, a change to annual monitoring during that season will be requested*." There do not appear to be consistent seasonal trends at L1.

In-Plume Wells (MW131, MW173, and WES1): Groundwater trend graphs included in Appendix D1 were completed for TNT and TNB (Figures D1-1 and D1-2, respectively) at well MW131 and were completed for RDX and TNT (Figures D1-3 and D1-4, respectively) at well MW173. Trend graphs were not completed for well WES1 due to concentrations at MW131 and MW173 being significantly higher. Therefore, their cleanup times would exceed that of well WES1.

At overburden well MW131, an increasing trend is shown for TNT on Figure D1-1, while a decreasing trend is shown for TNB on Figure D1-2. Due to the increasing trend of TNT, cleanup time estimates could not be completed. Decreasing concentrations should

eventually be observed for TNT as time from the soil source control measures completed in 2005 increases. The estimated time at which TNB will naturally degrade to less than the RG is 11 years (2023) representing a reduction in the estimation in the 2011 Annual Report of 2025. Table 3-6 summarizes the results of this analysis. The reduction in timeframe is mainly due to the historic dataset not including data beyond 10 years in age. Therefore, the trend is less affected by the early data from before the remedial actions were completed in 2005. However, based on the variability of the data, primarily due to seasonal fluctuations, the calculated cleanup times are only an estimate based on the data available.

At overburden well MW173, decreasing trends are shown for RDX on Figure D1-3 and for TNT on Figure D1-4. The estimated time at which RDX will naturally degrade to less than the RG is 4 years (2016) representing a reduction in the estimation in the 2011 Annual Report of 2030. The reduction in timeframe is mainly due to the historic dataset not including data beyond 10 years in age. Therefore, the trend is less affected by the early data from before the remedial actions were completed in 2005. The estimated time at which TNT should have naturally degraded to less than the RG is 2009 representing a reduction in the estimation in the 2011 Annual Report. Table 3-6 summarizes the results of this analysis. The reduction in timeframe is mainly due to the historic dataset not including data beyond 10 years in age and that concentrations have been fluctuating near the RG since 2009. Therefore, the trend is less affected by the early data from before the remedial actions were completed in 2005. Consistent concentrations below the RG should be observed for TNT in the near future as time from the soil source control measures completed in 2005 increases, unless the legacy plume observed upgradient migrates to the location of MW173. However, based on the variability of the data, primarily due to seasonal fluctuations, the calculated cleanup times are only an estimate based on the data available.

At bedrock well WES1, from October 2010 through April 2012 TNB exceeded the RG and was detected below the RG in October 2012. In October 2010, April 2011, and April 2012 concentrations of TNT exceeded the RG and were detected below the RG in October 2011 and October 2012. Concentrations appear to be fluctuating and should continue to decrease as time from the soil source control measures completed in 2005 increases.

According to the LTM Plan, for an in-plume point, *"if the best fit trend line for an exponential relationship for all monitoring data since the completion of source control measures has not had a rate constant < 0 for three or more sampling events and concentrations for COCs are above their respective RGs, then additional source control measures need to be evaluated."* Concentrations of TNT at MW131 indicate an increasing trend (>0). However, at the assumed groundwater flow rate of 16 ft/yr, there has been time for 112 ft of migration since the source control was completed in 2005. As stated below, detection of degradation compounds indicates there is reduction occurring in the groundwater. Therefore there is no additional source control evaluation required at this time.

Early Warning Wells (MW174 and WES3): At overburden well MW174, there were no detections in 2012. Therefore, there are no trends established.

At bedrock well WES3, there were no RG exceedances but low level fluctuations in 2012.

According to the LTM Plan, for an early warning point, *"if the attenuation rate constant for the best fit exponential trend line of all historic data yields a value of C > RG for three or more sequential sampling events, then there is a risk that the compliance wells will receive concentrations of COC in excess of the RG and either a better estimate of pore water velocity (i.e., a value < 16 ft/yr) is needed or additional corrective measures may need to be evaluated."* Review of the data does not indicate an increasing trend of any detected compounds in WES3, but rather low-level fluctuations. Therefore, there is no additional corrective measure evaluation required at this time.

Compliance Point (SW550): There were no detections for explosives at surface water sampling location SW550 in 2012. Therefore, there are no trends established.

According to the LTM Plan, for a compliance point, *"if Cx > RG, then additional corrective measures may be required."* There were no detections at the compliance monitoring point. Therefore, there is no additional corrective measure evaluation required at this time.

The completion of soil source control measures in 2005 is expected to minimize contaminant loading to groundwater allowing natural attenuation mechanisms to contain and diminish groundwater RG exceedances within the GMZ. The remaining groundwater contamination at Site L1 is now a legacy plume traveling to the southeast toward Prairie Creek. The presence of explosive breakdown products 2-A-4,6-DNT and 4-A-2,6-DNT detected in samples from in-plume monitoring wells MW131, MW173, and WES1 indicates that anaerobic degradation is likely occurring within the plume. These compounds are byproducts of the biodegradation of TNT. Natural attenuation mechanisms appear to be limiting the areal extent of groundwater contamination within the GMZ boundary. The estimated timeframe for TNT to reach the RG is 2023, far less time than estimated for Site L1 in the 1998 ROD of 2338.

3.1.4 Recommendations

There are no recommended changes to the monitoring program at Site L1.

3.2 SITE L2

Site L2 is the second of six GMZs created to manage risk arising from groundwater contamination and to monitor performance of the selected remedy. Site L2 comprises 5 acres consisting of six east-west oriented pads that are 650-ft long and 50-ft wide on which explosives and associated wastes from other production areas were burned. It is

located in the central part of the LAP Area, adjacent to Prairie Creek and Kemery Lake (Figures 1-2 and 3-4). Aerial photographs from 1952 also contain three north-south oriented pads to the east. The latter three pads were subsequently reconfigured into a single pad and the south oil pits were installed at their southern end. Unexploded ordnance (UXO) such as fuses and other items have been observed on the pads.

Three popping furnaces for burning small arms ammunition were located in the southwest corner of the site (Figure 3-4). Metal residues from site burning were hauled to another location. Soil removal action at the former popping furnaces was conducted in 2007. A total of 7,092 cubic yards of metals contaminated soil (soil remedial unit [SRU] number 2 [SRU2]) were removed from Site L2. There were also three oil and solvent pits adjacent to the pads, covering less than a quarter acre each, in which oil was occasionally burned. The pits were remediated in 1996 as part of a removal action. At that time, UXO was encountered to the north of the pads and was also disposed.

The site is drained by Prairie Creek, two drainage ditches flowing from the north to Kemery Lake, and a gulley in the southwest corner that catches runoff from the area of the popping furnaces. While the soil around the popping furnaces was contaminated with arsenic, cadmium, and lead, those metals have not been found in the underlying groundwater and the soil has been remediated. In addition to lead and arsenic, soil around the pads contained 2,6-DNT and RDX, both of which were present in concentrations in excess of their respective RGs, and all of which were remediated in 2007.

Of the soil contaminants, only RDX has been found in the underlying groundwater at concentrations exceeding the RG. High melting-point explosive has also been observed in groundwater, but the concentrations are below the RG for HMX. Surface water samples from Prairie Creek, into which the groundwater discharges, do not contain RDX or HMX at detectable levels.

It is most likely the RDX and HMX from waste disposal activities in the northwestern corner of Site L2 were dissolved by natural precipitation and percolated into site groundwater. From there, they are being transported to Prairie Creek where they will likely emerge if they have not degraded to levels that are not detectable once dissolved in the creek water. Given the soil source control measures that have taken place, the historic reduction of RDX concentrations in groundwater over the period 1991 to 2006, and the amount of time that has passed since operations ceased, it is likely that the groundwater contamination is detaching from the source area soils in the vicinity of MW404 and will move as a legacy plume.

The overburden aquifer generally consists of clay, sandy/silty clay, sand, and gravel. Gravel layers were predominantly identified near Prairie Creek (i.e. wells MW133, MW404, and MW405). The overburden thickness is irregular and generally varies between 5 and 25 ft across Site L2.

3.2.1 Groundwater Hydraulics

Site L2 was not sampled in April 2012. Therefore, water levels were not measured and there is no hydraulic information for April.

The groundwater monitoring network at Site L2 consists of 12 wells: 5 overburden wells, 6 combined overburden/bedrock wells, and 1 bedrock well. Water levels are measured at the groundwater/surface water locations that are sampled (listed below) and at monitoring wells MW132, MW133, MW134, MW135, MW405, MW406, and MW810. Surface water (SW555) is monitored at a point along Prairie Creek near where the creek leaves the GMZ boundary. Monitoring well information and water levels for October are summarized in Table 2-3. Groundwater flow direction in the overburden aquifer is generally toward the northwest as shown on Figure 3-4.

The horizontal gradient in the overburden aquifer at Site L2 was calculated to be 0.0099 ft/ft in October (Table 3-7). Using an average hydraulic conductivity value of 1.6E-03 cm/sec and an assumed porosity of 0.30, the flow velocity in the overburden aquifer at Site L2 was approximately 0.1496 ft/day or 54 ft/yr in October (Table 3-8). At that rate, the leading edge of the plume would have already reached Prairie Creek. Royal demolition explosive has not been detected in samples from downgradient wells MW620 and MW621 or surface water sampling location SW555. Given the time frame of approximately 60 years, that would mean the transport rate is less than 150 ft divided by 60 years, or 2.5 ft/yr, a rate less than one tenth that calculated from slug tests conducted at the site and more comparable to the rate estimated from data at Site L1.

The groundwater flow direction in the bedrock aquifer is generally to the northwest as shown on Figure 3-5. Prairie Creek, the surface water body draining the area to the northwest, is incised into the bedrock and appears to transmit groundwater that discharges directly or upwells into the streambed by virtue of the head relief available in the open channel. A upward vertical gradient was observed at well nest MW620/MW621 in October (Table 3-9).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically. Based on groundwater flow data, Prairie Creek is the likely discharge point for all shallow groundwater in the vicinity of Site L2.

3.2.2 Analytical Results

Site L2 is no longer sampled in spring. Therefore, there are no analytical results for April. The previous recommendation to remove well MW810 from the monitoring program was initiated in October. Groundwater and surface water sampling points for Site L2 during October are summarized in Table 1-1. The following monitoring wells and surface water sampling point at L2 are sampled for explosives:

- In-Plume – MW404

- Early Warning – MW620
- Compliance – MW621 for the bedrock aquifer and surface water sampling point SW555 at a point along Prairie Creek where the creek leaves the GMZ boundary for the overburden aquifer.

Compliance monitoring well MW810 was removed from the sampling program beginning in fall 2012.

Groundwater and surface water samples collected at Site L2 in October were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compound detections for 2012 the October sampling event conducted at Site L2 are summarized in Table 3-1 and shown on Figure 3-6. Historic explosives data for Site L2 are summarized in Table B1, included in Appendix B. A brief discussion of analytical results by well type follows:

In-Plume Well (MW404): At combination well MW404 in October, RDX exceeded the RG at a concentration of 130 µg/L, 2,4-dinitrotoluene (2,4-DNT) was detected below the RG at a concentration of 0.21 ug/L, HMX was detected below the RG at a concentration of 33 ug/L, 2-NT was detected below the RG at a concentration of 0.54 ug/L, and 4-NT was detected below the RG at a concentration of 0.65 ug/L.

Early Warning Well (MW620): At overburden well MW620, there were no RG exceedances for explosive compounds in October. 2,4-DNT (0.29 ug/L), 2,6-DNT (0.13 ug/L), 2-NT (0.28 ug/L), and 4-NT (1.5 ug/L) were detected below the RG.

Compliance Points (SW555 and MW621): At surface water sampling location SW555 in Prairie Creek, which is the likely point of groundwater discharge at Site L2, there were no detections for explosive compounds in October.

At bedrock well MW621, there were no RG exceedances for explosive compounds in October. 2,4-DNT (0.42 ug/L), 2-NT (0.24 ug/L), and 4-NT (0.4 ug/L) were detected below the RG.

3.2.3 Groundwater Trend Evaluation

Information included in the 1998 ROD estimated the timeframe for concentrations to reach the RG at Site L2 to be 20 years, or 2018.

Data from the previous 10 years only are used for this evaluation to provide a representation of site conditions since the soil source control measures completed in 2006 while maintaining a sufficient dataset. Additionally, since Site L2 is only sampled in the fall round due to historic data indicating that is the round with the highest concentration, only results from the fall sampling rounds are included to provide a more accurate representation of the timeframe for concentrations to reach the RG. With time, the pre- soil source control measures data will continue to be removed from the dataset and an

increasingly accurate representation of groundwater conditions post- soil source control measures will be presented.

As stated in Section 4.1.2.6 (Monitoring Frequency) of the LTM Plan, *"If one season is found to be consistently higher than all others, a recommendation will be made to move to annual monitoring during that season."* and *"If groundwater samples collected from monitoring well MW501 do not exhibit RG exceedances for heavy metals for four consecutive quarters, the recommendation to cease monitoring will be included in the applicable semi-annual or annual groundwater monitoring report."* A change to annual monitoring in the fall was recommended in the 2010 Semi-annual Report (TolTest/MWH, 2011) which was initiated during Spring 2012.

In-Plume Well (MW404): A groundwater trend graph, included in Appendix D1, was completed for RDX (Figure D1-5) at well MW404 using fall analytical results only.

At combination well MW404, a decreasing trend is shown for RDX on Figure D1-5. However, the concentration of RDX has been increasing since 2009. The estimated time at which RDX will naturally degrade to less than the RG is 14 years (2026) which is a decrease from the estimated time in the 2011 Annual Report of 2038. Table 3-6 summarizes the results of this analysis. The reduction in timeframe is mainly due to the historic dataset not including data beyond 10 years in age and removal of the spring data from the dataset. Therefore, the trend is less affected by the early data from before the remedial actions were completed in 2006 and spring data. However, the calculated cleanup times are only an estimate based on the data available.

According to the LTM Plan, for an in-plume point, *"If the best fit trend line for an exponential relationship for all monitoring data since the completion of soil source control measures has not had a rate constant < 0 for three or more sampling events and concentrations for COCs are above their respective RGs, then additional source control measures may need to be evaluated."* The concentration of RDX at monitoring well MW404 has been increasing since 2009. The location of MW404 relative to the source area, the timeframe in which concentrations began to increase, and a groundwater flow velocity of approximately 55 ft/yr, suggest the increasing concentrations since 2009 may be the result of a spike in concentration due to soil disturbance during source control activities completed in 2006. Therefore, the concentration is expected to begin to decrease again in the near future. If the concentration of RDX does not show an indication of stabilizing by October 2013 additional source control evaluation may be required.

Early Warning Well (MW620): At overburden well MW620, there were no RG exceedances but low level detections for explosive compounds in October. There have been no other recent past detections. Therefore, there are no trends established.

According to the LTM Plan, for an early warning point, *"If the attenuation rate constant for the best fit exponential trend line of all historic data yields a value of C > RG for three or more sequential sampling events, then there is a risk that the compliance wells will*

receive concentrations of COC in excess of the RG and either a better estimate of pore water velocity (i.e., a value < 2.8 ft/yr) is needed or additional corrective measures may need to be evaluated." There have been no RG exceedances at MW620, only low level detections in October 2012. Therefore, there is no additional corrective measure evaluation required at this time.

Compliance Points (MW621 and SW555): At bedrock well MW621, there were no RG exceedances but low level detections for explosive compounds in October. There have been no other recent past detections. Therefore, there are no trends established.

At surface water sampling location SW555, there were no detections for explosive compounds in October. Therefore, there are no trends established.

According to the LTM Plan, for a compliance point, *"if Cx > RG, then additional corrective measures may be required."* There were no RG exceedances at compliance monitoring points. Therefore, there is no additional corrective measure evaluation required at this time.

The completion of soil source control measures in 2006 is expected to minimize contaminant loading to groundwater allowing natural attenuation mechanisms to contain and diminish groundwater RG exceedances within the GMZ. The remaining groundwater contamination at Site L2 is now a legacy plume traveling to the northwest toward Prairie Creek. The estimated timeframe for RDX to reach the RG is 2026, 12 years longer than estimated in the 1998 ROD of 2018.

3.2.4 Recommendations

If the concentration of RDX at monitoring well MW404 does not show an indication of stabilization by October 2013, which would be showing a rate constant < 0 for three or more sampling events, additional evaluation may be necessary as required by the LTM Plan, as stated in Section 3.2.3.

There are no recommended changes to the monitoring program at Site L2.

3.3 SITE L3/ LANDFILL L3

Site L3 is the third of six GMZs created to manage risk arising from groundwater contamination and to monitor performance of the selected remedy. Site L3 comprises approximately 50 acres used as a demolition area directly southwest of Site L2. Landfill L3 (described below) occupies 3.32 acres of the Site L3 area (Figures 1-2 and 3-7). Site L3 is bounded on the west by Prairie Creek, the south by an unnamed tributary of Prairie Creek, and the east by Star Grove Cemetery. Predominant use of the area was for open burning of combustibles and munitions crates, including some materials with low level explosive contamination. An air curtain destructor was constructed at the site to reduce

emissions, but was never put into use. There was also a one-acre fire training area at the site, which consisted of a small depression surrounded by an earthen berm.

Specific burning units included "U" and "L" shaped burn pads and a burn cage on a concrete slab. Geophysical surveys noted a number of metallic anomalies buried around the burn pads. The soil was also found to contain lead and RDX contamination at levels requiring remediation. Berms along Prairie Creek were found to contain lead, chlordane, 2,6-DNT, and phosphate exceeding their respective RGs. It has been posited that the contamination in these berms arises from filling activity in the area when the berms were constructed. Unexploded ordnance may also be present in this area. The remedy selected for the area along Prairie Creek was consolidation and capping into what is now called Landfill L3.

Landfill L3 is located on the western edge of the Site L3 GMZ on the east bank of Prairie Creek (Figure 3-7). The area of Landfill L3 was originally contaminated through import of contaminated fill. However, other waste and contaminated soil have been moved to the Site L3 Landfill as a part of the L3 RA in order to consolidate residual contamination into a smaller footprint. Implementation of the remedy began in 2007 and was completed in 2008.

Landfill L3 is believed to contain metals and explosive residues that could continue to contaminate the underlying groundwater and migrate to Prairie Creek. Because the landfill is bordered by Prairie Creek, any contamination that infiltrates from the filled area would be expected to migrate to Prairie Creek and discharge as the groundwater flows upward into the surface water body.

Monitoring at Landfill L3 is mandated by IAC Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed; and
- Keep survey points protected and visible to facilitate identification in the future.

The overburden aquifer primarily consists of silt and clay with some silty clay and sand. The overburden thickness is irregular and generally varies between approximately 5 ft and greater than 30 ft across Site L3 with limited saturated overburden in the southern part of the site.

3.3.1 Groundwater Hydraulics

The groundwater monitoring network at Site L3/Landfill L3 consists of 11 wells: 4 overburden wells, 2 combined overburden/bedrock wells, and 5 bedrock wells. Water levels are measured at the groundwater/surface water locations that are sampled (listed below), and at monitoring wells MW1, MW3, MW136, MW137, MW411, and MW632. Monitoring well information and water levels for October are summarized in Table 2-3. Surface water elevation in the northern portion of the site is dictated by the dam located on Prairie Creek just north of Central Road (Figure 3-7). The groundwater flow direction in the overburden aquifer is generally toward the west/southwest as shown on Figure 3-7.

The average horizontal gradient in the overburden aquifer at Site L3 was calculated to be 0.0257 ft/ft in 2012 (Table 3-7). Using an average hydraulic conductivity value of 1.6E-03 cm/sec and an assumed porosity of 0.3, the flow velocity in the overburden aquifer at Site L3 ranged from approximately 0.4172 ft/day or 152 ft/yr in April to 0.3884 ft/day or 141 ft/yr in October (Table 3-8). There are no wells directly downgradient of MW410 or MW412 from which apparent travel times could be estimated. RDX has been observed in Prairie Creek, indicating it has migrated the intervening distance over the last 50 to 60 years but, because the contamination appears to arise from fill activity in the area, the presence of RDX in Prairie Creek water may represent contamination that started much closer to the stream bank than either of the in-plume monitoring wells. Empirical data at Sites L1 and L2 have suggested transport rates more on the order of 2.5 to 11 ft/yr, but hydraulic conductivity may be higher in the disturbed soil of Site L3 and higher gradients found proximate to the discharge line along Prairie Creek. Accordingly, the larger of the two velocities, 11 ft/yr, is assumed for Site L3.

The groundwater flow direction in the bedrock aquifer is generally toward the west as shown on Figure 3-8. Prairie Creek, the surface water body draining the area, is incised into the bedrock in the southern and central parts of the site and appears to transmit groundwater that discharges directly or upwells into the streambed by virtue of the head relief available in the open channel. There is no evidence that contamination flows beneath Prairie Creek as it has not appeared in monitoring wells to the west. The groundwater elevation at monitoring well MW632 was greater than the elevation of Prairie Creek, indicating a gaining stream scenario. Upward vertical gradients were observed at well nest MW630/MW631 at Site L3 in April and October (Table 3-9), further supporting a gaining stream scenario.

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically. Based on groundwater flow data, Prairie Creek is the likely discharge point for all shallow groundwater in the vicinity of Site L3/Landfill L3.

3.3.2 Analytical Results

Groundwater and surface water sampling points for Site L3/Landfill L3 during October are summarized in Table 1-1. The following monitoring wells and surface water sampling points at L3 are sampled for explosives and TAL metals:

- Upgradient – SW004 is only sampled in spring when SW555 at Site L2 is not sampled
- In-Plume/Downgradient – MW410 (explosives only) and MW412
- Early Warning/Downgradient – MW630, MW631, and MW633
- Compliance/Downgradient – surface water sampling point SW777 for the overburden aquifer where the creek leaves the GMZ boundary
- Downgradient - Surface water sampling points SW557, upstream of the landfill drainage swale discharge, and SW558, at the constructed drainage swale along the southwest side of the landfill.

Upgradient monitoring well M03 and compliance monitoring well MW632 were removed from the sampling program beginning in spring 2012.

Groundwater and surface water samples collected at Site L3/Landfill L3 in 2012 were analyzed for explosive compounds and TAL metals in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compound detections for 2012 sampling events conducted at Site L3/Landfill L3 are summarized in Table 3-1 and shown on Figure 3-9. Metals detections for 2012 sampling events conducted at Site L3/Landfill L3 are summarized in Table 3-2. Historic explosives data for Site L3/Landfill L3 are summarized in Table B1 and for TAL metals in Table B2, included in Appendix B. For Landfill L3, the monitoring well locations are classified as upgradient or downgradient. Therefore, the same well can represent two separate classifications at Site L3/Landfill L3. A brief discussion of analytical results by well type follows:

Upgradient Point (SW004): At surface water sampling location SW004, there were no explosive compound detections in April. SW004 is not sampled in the fall when SW555 at upstream Site L2 is sampled.

In-Plume Wells (MW410 and MW412 {downgradient}): At overburden well MW410, there were no explosive compound detections in April and October.

At bedrock well MW412, RDX exceeded the RG in both April and October at a concentration of 120 µg/L. There were no RG exceedances for TAL metals in April and October.

Early Warning (downgradient) Wells (MW630, MW631 and MW633): At bedrock well MW630, RDX exceeded the RG in April at concentrations of 8.7 µg/L and was detected below the RG at a concentration of 0.36 µg/L in October, HMX was detected below the RG at concentrations of 4.7 µg/L in April and 0.35 µg/L in October, and 2-A-4,6-DNT and 4-A-2,6-DNT were detected in April. There are no RGs for 2-A-2,6-DNT and 4-A-2,6-DNT. There were no TAL metals RG exceedances in 2012.

At bedrock well MW631, there were no explosive compound detections or TAL metals RG exceedances in 2012.

At bedrock well MW633, RDX exceeded the RG in April at a concentration of 6.7 µg/L and in October at a concentration of 10 µg/L, 2,6-DNT was detected below the RG at a concentration of 0.13 µg/L in October, and HMX was detected below the RG at concentrations of 2 µg/L in April and 2.7 µg/L in October. There were no TAL metals RG exceedances in 2012.

Compliance (downgradient) Point (SW777): At surface water sampling location SW777, there were no RG exceedances for explosive compounds in 2012. RDX was detected below the RG at a concentration of 0.25 µg/L in April and was not detected in October. There were no TAL metals RG exceedances in 2012.

Additional Downgradient Points (SW557 and SW558): At surface water sampling location SW557 there were no RG exceedances for explosive compounds in 2012. 2,6-DNT was detected below the RG at concentration of 0.44 µg/L in October, HMX was detected below the RG at concentration of 1.1 µg/L in April, and RDX was detected below the RG at concentration of 3.2 µg/L in April. There were no TAL metals RG exceedances in 2012.

At surface water sampling location SW558, there were no explosive compound detections or TAL metals RG exceedances in April. Surface water sampling point SW558 was dry when sampling occurred in October.

3.3.3 Groundwater Trend Evaluation

Information included in the 1998 ROD estimated the timeframe for concentrations to reach the RG at Site L3 to be 50 years, or 2048.

Data from the previous 10 years only are used for this evaluation to provide a representation of site conditions since the soil source control measures completed in 2006 while maintaining a sufficient dataset. With time, the pre- soil source control measures data will continue to be removed from the dataset and an increasingly accurate representation of groundwater conditions post- soil source control measures will be presented.

As stated in Section 4.1.3.5 (Monitoring Frequency) of the LTM Plan, *"Historical data suggest concentrations are always higher in the spring."* and *"Should the first few years of monitoring indicate concentrations are consistently highest at a given season of year, a changeover to annual monitoring during that season will be requested."* Additionally, Section 4.2.1.5 (Monitoring Frequency) of the LTM Plan states, *"Landfill L3 monitoring will be conducted on an semi-annual basis for a period of 30 years or until data support a successful petition to reduce frequency or terminate monitoring based on results showing no statistical difference from background conditions."* Continued semi-annual groundwater monitoring at Site L3 should provide further indication if there are seasonal trends which will allow a reduction to annual monitoring.

Upgradient Point (SW004): At surface water sampling location SW004, there were no explosive compounds detections or TAL metal RG exceedances in April 2012. Therefore, no trend has been established.

In-Plume Wells (MW410 and MW412 {downgradient}): At overburden well MW410, there were no explosives detections or TAL metals RG exceedances in 2012. Therefore, no trends have been established.

At bedrock well MW412, a groundwater trend graph included in AppendixD1 was completed for RDX (Figure D1-6). An increasing trend is shown for RDX on Figure D1-6. Due to the increasing trend of RDX, cleanup time estimates could not be completed. Table 3-6 summarizes the results of this analysis. The RDX concentration at monitoring well MW412 has decreased from a high near the time of completion of landfill capping in 2008. A spike in concentration was expected after soil remediation activities were conducted due to soil disturbance. A decreasing trend should eventually be observed for RDX as time from the soil source control measures completed in 2006 increases.

According to the LTM Plan, for an in-plume point, *"If the best fit trend line for an exponential relationship for all monitoring data since the completion of source control measures has not had a rate constant < 0 for three or more sampling events and concentrations for COCs are above their respective RGs, then additional source control measures need to be evaluated."* Explosive compounds at well MW412 (downgradient) indicate an increasing trend. However, the recent increases in concentration are believed to be a result of a spike in concentration after soil remediation activities were conducted in 2006. Recent data from well MW412 indicate that concentrations are beginning to decline. There has been only 4 years since landfill capping in 2008, not likely allowing sufficient time for the effects from those measures to become apparent. Therefore there is no additional source control evaluation required at this time.

Early Warning (downgradient) Wells (MW630, MW631, and MW633): Groundwater trend graphs included in Appendix D1 were completed for RDX at wells MW630 (Figure D1-7) and MW633 (Figure D1-8).

At bedrock well MW630, an increasing trend is shown for RDX on Figure D1-7. Due to the increasing trend of RDX, cleanup time estimates could not be completed. Table 3-6 summarizes the results of this analysis. The first exceedance of RDX was in April 2010, increased in April 2011, and decreased in April 2012. Prior to April 2010, RDX concentrations were below the RG. However, concentrations appear to have peaked in April 2011. As stated above, a spike in concentration was expected after soil remediation activities were conducted in 2006 due to soil disturbance. The location of MW630, relative to the source area, the timeframe in which concentrations began to increase, and a groundwater flow velocity of approximately 141 ft/yr, suggest the RG exceedances from April 2010 through April 2012 may be the result of a spike in concentration due to soil disturbance during source control activities conducted in 2006. A decreasing trend should

eventually be observed for RDX as time from the soil source control measures completed in 2006 increases. There were no TAL metals RG exceedances in 2012.

At bedrock well MW631, there were no explosive compound detections or TAL metals RG exceedances in 2012. Therefore, no trends have been established.

At bedrock well MW633, an increasing trend is shown for RDX on Figure D1-8. Due to the increasing trend of RDX, cleanup time estimates could not be completed. Table 3-6 summarizes the results of this analysis. A large spike in concentration was observed in October 2007 and April 2008. However, concentrations of RDX decreased dramatically by October 2008, fluctuated through October 2010, and have stabilized since. A decreasing trend should eventually be observed for RDX as time from the soil source control measures completed in 2006 increases. As stated above, a spike in concentration was expected after soil remediation activities were conducted in 2006 due to soil disturbance. The location of MW633 relative to the source area, the timeframe in which concentrations began to increase, and a groundwater flow velocity of approximately 141 ft/yr, suggest the observed spike in concentration may be a result of soil disturbance during source control activities conducted in 2006. However, the calculated cleanup times are only an estimate based on the data available. There were no TAL metals RG exceedances in 2012.

According to the LTM Plan, for an early warning point, *"If the attenuation rate constant for the best fit exponential trend line of all historic data yields a value of C > RG for three or more sequential sampling events, then there is a risk that the compliance wells will receive concentrations of COC in excess of the RG and either a better estimate of pore water velocity (i.e., a value < 16 ft/yr) is needed or additional corrective measures may need to be evaluated."* Explosive compounds at wells MW630 and MW633 indicate an increasing trend. However, the recent increases in concentration are believed to be a result of a spike in concentration after soil remediation activities were conducted in 2006. Recent data from wells MW630 and MW633 indicate that concentrations are beginning to decline.

Compliance (downgradient) Point (SW777): At surface water sampling location SW777, there were no explosive compound detections or TAL metals RG exceedances in 2012. Therefore, no trends have been established.

According to the LTM Plan, for a compliance point, *"if Cx > Background and the best fit trend line for the historic data displays no decrease for >3 years, then additional landfill measures may need to be evaluated.*" There were no RG exceedances at compliance monitoring point and SW777. Therefore, there is no additional corrective measure evaluation required at this time.

Additional Downgradient Points (SW557 and SW558): At surface water sampling location SW557, there were no explosive compound detections or TAL metals RG exceedances in 2012. Therefore, no trends have been established.

At surface water sampling location SW558, there were no explosive compound detections or TAL metals RG exceedances in April and was dry in October. Therefore, no trends have been established.

According to the LTM Plan, for a compliance point, *"if Cx > Background and the best fit trend line for the historic data displays no decrease for >3 years, then additional landfill measures may need to be evaluated."* There were no RG exceedances at downgradient monitoring points SW557 or SW558. Therefore, there is no additional corrective measure evaluation required at this time.

Site L3 soil source control measures and landfill capping were completed in 2008 and are expected to minimize contaminant loading to groundwater allowing natural attenuation mechanisms to contain and diminish groundwater RG exceedances within the GMZ. Continued semi-annual groundwater monitoring at Site L3 should determine if the soil remedy (landfill capping) will diminish contaminant loading to groundwater. Prairie Creek is the likely groundwater discharge point.

3.3.4 Recommendations

There are no recommended changes to the monitoring program at Site L3/Landfill L3. Although there are increasing trends for RDX at monitoring wells MW412, MW630, and MW633, the recent increases in concentration are believed to be a result of a spike in concentration following soil remediation activities. Recent data from wells MW630 and MW633 indicate that concentrations are beginning to decline and the RDX concentration at monitoring well MW412 has decreased from a high near the time of completion of landfill capping in 2008.

Consideration is being given by AEC that additional RA activities may be required at Landfill L3 to address MEC issues that have been identified. Therefore, until a determination about the implementation of additional RA activities is decided, changes or further evaluation of the monitoring program should be withheld.

3.4 SITE L14

Site L14 is the fourth of the six GMZs and comprises 33 acres in the southwestern part of the LAP area where production and storage activities were conducted (Figures 1-2 and 3-10). Initially, fuses were produced at Site L14 by charging them with mercury fulminate at Building 4-14. After 1945, Building 4-14 was modified for the repackaging of smokeless powder. Based on interviews with personnel working in that area, the sump servicing Building 4-5 overflowed periodically, thereby contaminating the surrounding soil. Building 4-5 and the location of the sump are shown on Figure 3-10.

Surface soil sample results from soil samples collected near the large sump north of Building 4-5 contained both 2,4,6-TNT and RDX exceeding their respective RGs at

combined levels of up to 55,000 micrograms per kilogram (µg/kg). The presence of RDX in groundwater at Site L14 resulted from percolation of the sump overflows, but additional inputs may also be the product of subsequent leaching of soil residues by natural precipitation. Concentrations declined with depth, but were measured as deep as 5 ft in the soil. A total of approximately 420 cubic yards or 546 tons of contaminated soil were removed during RA activities in 2002 and 2003. Of the two explosive compounds detected in Site L14 soil, only RDX has been observed in groundwater at concentrations in excess of its RG. The primary source is now gone, leaving only a legacy plume in the groundwater migrating to the southwest.

The overburden aquifer primarily consists of silt, clay, and silty clay, with a thin layer of silty gravel at the bedrock contact. Small pockets of sand are present in the higher, unsaturated, parts of the site. The overburden thickness is greater in the south and east (approximately 20 ft) and thins toward the north and west (approximately 10 ft).

3.4.1 Groundwater Hydraulics

Site L14 is no longer sampled in spring. Therefore, water levels were not measured and there is no hydraulic information for April.

The groundwater monitoring network at this site consists of 11 wells: 8 overburden wells, 1 combined overburden/bedrock well, and 2 bedrock wells. Water levels are measured at the groundwater locations that are sampled (listed below), and at monitoring wells H8, MW140, MW508, MW600, MW601, MW602, MW603, and MW604. Monitoring well information and water levels for October are summarized in Table 2-3. The groundwater flow direction in the overburden aquifer is generally to the west-southwest as shown on Figure 3-10.

The average horizontal gradient in the overburden aquifer at Site L14 was calculated to be 0.0090 ft/ft in October 2012 (Table 3-7). Using an average hydraulic conductivity value of 1.6E-03 cm/sec and an assumed porosity of 0.30, the flow velocity in the overburden aquifer at Site L14 was approximately 0.1360 ft/day or 50 ft/yr in October (Table 3-8). Given the time frame for the smokeless powder operations, the RDX would have traveled in 60 years a distance of over 3,000 ft, using the measured groundwater transport rate. A review of site analytical data indicates traces of RDX just below the RG arrived at monitoring well H7 by 1999, a distance of only 460 feet. That suggests the flow velocity for RDX is more likely 10 ft/yr. A transport rate of 10 ft/yr would be consistent with the rates similarly calculated for Sites L1 and L2.

The groundwater flow direction in the bedrock aquifer is to the northwest as shown on Figure 3-11. A downward vertical gradient was observed at early warning well nest H7/MW602 and upward vertical gradients were observed at downgradient compliance well nest MW603/MW604 in October 2012 (Table 3-9).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.4.2 Analytical Results

Site L14 is no longer sampled in spring. Therefore, there are no analytical results for April. Groundwater sampling points for Site L14 during October are summarized in Table 1-1. The following monitoring wells at L14 are sampled for explosives:

- In-Plume –MW511 and MW512
- Early Warning – H7

In-Plume monitoring well MW508 and compliance monitoring wells MW603 and MW604 were removed from the sampling program beginning in spring 2012.

Groundwater samples collected at Site L14 in October were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compound detections for the October sampling event conducted at Site L14 are summarized in Table 3-1 and shown on Figure 3-12. Historic explosives compound data for Site L14 are summarized in Table B1, included in Appendix B. A brief discussion of analytical results by well type follows:

In-Plume Wells (MW511 and MW512): At overburden well MW511, RDX exceeded the RG in at a concentration of 76 µg/L, 2,4-DNT (0.41 ug/L), 2,6-DNT (0.17 ug/L), HMX (11 ug/L), 2-NT (0.32 ug/L), and 4-NT (0.5 ug/L) were detected below the RG.

At overburden well MW512, RDX exceeded the RG at a concentration of 220 µg/L, 2,4-DNT (0.39 ug/L), 2,6-DNT (0.18 ug/L), HMX (58 ug/L), 2-NT (0.33 ug/L), 4-NT (0.5 ug/L) were detected below the RG, and 2-A-4,6-DNT and 4-A-2,6-DNT were detected. There are no RGs for 2-A-4,6-DNT and 4-A-2,6-DNT.

Early Warning Well (H7): At overburden well H7, 2,4-DNT exceeded the RG at a concentration of 1.5 µg/L, 2,6-DNT exceeded the RG at a concentration of 1.5 µg/L, 2-NT (0.1.4 ug/L), 4-NT (1.5 ug/L), and RDX (0.97 ug/L) were detected below the RG. There have been no previous detections for 2,4-DNT and 2,6-DNT and are suspect due to detections for these same compounds at other JOAAP monitoring wells during October 2012 when there had been no previous detections.

3.4.3 Groundwater Trend Evaluation

Information included in the 1998 ROD estimated the timeframe for concentrations to reach the RG at Site L14 to be 80 years, or 2078.

Data from the previous 10 years only are used for this evaluation to provide a representation of site conditions since the soil source control measures completed in 2005

while maintaining a sufficient dataset. Additionally, since Site L14 is only sampled in the fall round due to historic data indicating that is the round with the highest concentration, only results from the fall sampling rounds are included to provide a more accurate representation of the timeframe for concentrations to reach the RG. With time, the pre- soil source control measures data will continue to be removed from the dataset and an increasingly accurate representation of groundwater conditions post- soil source control measures will be presented.

As stated in Section 4.1.4.5 (Monitoring Frequency) of the LTM Plan, "*Historical data suggest concentrations are always higher in the fall.*" and "*Should the first few years of monitoring indicate concentrations are consistently highest at a given season of year, a changeover to annual monitoring during that season will be requested*." A change to annual monitoring in the fall was recommended in the 2010 Semi-annual Report (TolTest/MWH, 2011) and was initiated during April 2012.

In-Plume Wells (MW511 and MW512): Groundwater trend graphs included in Appendix D1 were completed for RDX at monitoring wells MW511 (Figure D1-9) and MW512 (Figure D1-10) using fall analytical results only.

At overburden well MW511, a decreasing trend is shown for RDX on Figure D1-9. The estimated time at which RDX will naturally degrade to less than the RG is 52 years (2064) which is an increase from the estimated time in the 2011 Annual Report of 2026. Table 3-6 summarizes the results of this analysis. The increase in timeframe is mainly due to using only the higher concentrations detected during the fall. However, the calculated cleanup times are only an estimate based on the data available.

At overburden well MW512, a decreasing trend is shown for RDX on Figure D1-10. The estimated time at which RDX will naturally degrade to less than the RG is 1724 years (3736) compared to the estimation in the 2011 Annual Report of 46 years (2057). Table 3-6 summarizes the results of this analysis. The dramatic increase in timeframe is mainly due to RDX concentrations widely fluctuating since October 2005. However, the calculated cleanup times are only an estimate based on the data available.

According to the LTM Plan, for an in-plume point, "*if the best fit trend line for an exponential relationship for all monitoring data since the completion of source control measures has not had a rate constant < 0 for three or more sampling events and concentrations for COCs are above their respective RGs, then additional source control measures need to be evaluated*." Both MW511 and MW512 indicate a decreasing trend in concentration. Therefore there is no additional source control evaluation required at this time. Estimated cleanup times no longer include spring data. Historically the fall round has had the higher concentrations and Site L14 is only sampled during the fall rounds hereafter. The elimination of the spring data should provide a more accurate estimation of the cleanup timeframe.

Early Warning Well (H7): At overburden well H7 in October, there were first time detections with exceedances for 2,4-DNT and 2,6-DNT. However, there have been no past detections and therefore there are no trends established.

According to the LTM Plan, for an early warning point, *"if the attenuation rate constant for the best fit exponential trend line of all historic data yields a value of C > RG for three or more sequential sampling events, then there is a risk that the compliance wells will receive concentrations of COC in excess of the RG and either a better estimate of pore water velocity (i.e., a value < 10 ft/yr) is needed or additional corrective measures may need to be evaluated."* At overburden well H7 in October, 2,4-DNT and 2,6-DNT exceeded the RG. There have been no recent detections for these compounds. Future sampling will indicate if these exceedances represent an increasing trend or are short-term occurrences. Therefore, there is no additional corrective measure evaluation required at this time.

The completion of soil source control measures in 2005 is expected to minimize contaminant loading to groundwater allowing natural attenuation mechanisms to contain and diminish groundwater RG exceedances within the GMZ. The remaining groundwater contamination at Site L14 is now a legacy plume traveling to the southwest. The presence of explosive breakdown products 2-A-4,6-DNT and 4-A-2,6-DNT detected in samples from well MW512 indicate that anaerobic degradation is likely occurring within the plume. These compounds are byproducts of the biodegradation of TNT. Natural attenuation mechanisms appear to be limiting the areal extent of groundwater contamination within the GMZ boundary. Upward vertical gradients (Table 3-9) in the western part of the site also likely limit the vertical migration of contaminants in the shallow bedrock aquifer. The estimated timeframe for RDX to reach the RG at well MW512 is 3736, far greater time that estimated for Site L14 in the 1998 ROD of 2078. The dramatic increase in timeframe is mainly due to RDX concentrations widely fluctuating since October 2005.

3.4.4 Recommendations

There are no recommended changes to the monitoring program at Site L14.

Future sampling will confirm/refute the exceedances for 2,4-DNT and 2,6-DNT at early warning monitoring well H7. Until the exceedances at H7 are confirmed by follow-up sampling, there will be no recommendation for resuming sampling at compliance wells MW603 and MW604.

3.5 SITE M1

Site M1, the southern ash pile, is part of the MFG facility (Figures 1-2 and 3-13), but contains unique contaminants not present at actionable levels in any other GMZ. As such, it is singled out as the fifth of the six GMZs. Site M1 comprises 68 acres in the southwestern part of the MFG facility where, from 1965 to 1974, ash residues from the

incineration of "red water" (TNT production waste water) were landfilled and piled on unlined soil. At various times (1985, 1993, and 1996) after closure, polyvinyl chloride (PVC) and clay were used to repair erosion damage to the cover.

Groundwater beneath and downgradient of the pile was observed to contain elevated levels of sulfate, 2,6-DNT, and antimony. The latter two exceeded their respective RGs on a single sample event only, but the sulfate has exceeded its RG continuously in groundwater and occasionally in surface water. In February 2003, the United States Army Corps of Engineers (USACE) submitted E*xplanation of Significance Difference Site M1 – Southern Ash Pile* (USACE, 2003), which expanded the northern boundary of the GMZ for Site M1 to encompass concentrations of sulfate in excess of the RG that had migrated beyond the original boundary.

The elevated sulfate is believed to originate in leachate from the Site M1 ash pile that infiltrated through the soil and entered the shallow groundwater. Dissolved sulfate then migrated to the northwest. Sulfate-containing groundwater flows into Prairie Creek, which is located northwest of the former ash pile. Concentrations of sulfate have been measured as high as 46,000 milligrams per liter (mg/L), or over 100 times the RG of 400 mg/L. As recently as 2000, surface water samples were collected that exceeded the RG of 500 mg/L. The ash piles were removed in 2006-2007 eliminating the primary source of sulfate. Consequently, dissolved sulfate in groundwater is now a legacy plume migrating to the northwest.

The overburden aquifer primarily consists of silt and clay, with scarce amounts of sand and silty gravel at the bedrock contact. Sand is abundant in the higher, unsaturated, parts of the site. Over most of Site M1, the overburden thickness is fairly consistent between 15 and 20 ft thick. At the northern end of the site, near MW642/MW641, the overburden consists entirely of silty gravel and the depth to bedrock is greater than 40 ft. The presence of Prairie Creek in the western part of M1 suggests that Prairie Creek is the discharge point for shallow groundwater.

3.5.1 Groundwater Hydraulics

The groundwater monitoring network within this site consists of 18 wells: 10 overburden wells, 4 combined overburden/bedrock wells, and 4 bedrock wells. Water levels are measured at the groundwater/surface water locations that are sampled (listed below), and at monitoring wells MW104, MW105, MW106, MW201, MW347, MW351, and MW647. Monitoring well information and water levels for October 2012 are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer is generally to the northwest, as shown on Figure 3-13.

The average horizontal gradient at Site M1 was 0.0304 ft/ft in 2012 (Table 3-7). Using an average hydraulic conductivity value of 6.6E-05 cm/sec and an assumed porosity of 0.3, the flow velocity in the overburden aquifer at Site M1 ranged from approximately 0.0189 ft/day or nearly 7 ft/yr in April to 0.0190 ft/day or 7 ft/yr in October (Table 3-8).

However, that would indicate that the plume should be on the order of 528 ft from the ash pile after 40 years of travel time (1965 to 2005). In fact, by 2005, the elevated sulfate levels were observed out to MW645, a distance of 2,060 ft, which suggests a pore water velocity of approximately 50 ft/yr.

The groundwater flow direction in the bedrock aquifer is generally toward the northwest, as shown on Figure 3-14. An upward vertical gradient was observed at well nest MW351/MW640 in April and a downward gradient was observed in October. Downward vertical gradients were observed at well nest MW641/MW642 in April and October (Table 3-9).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically. Based on groundwater flow data, Prairie Creek is the likely discharge point for all shallow groundwater in the vicinity of Site M1.

3.5.2 Analytical Results

Groundwater sampling points for Site M1 during October 2012 are summarized in Table 1-1. The following monitoring wells and the surface water sampling point at M1 are sampled for sulfate:

- In-Plume – MW107, MW231, MW640, MW641, and MW642,
- Early Warning –MW643 and MW644
- Compliance – MW646 for the bedrock aquifer and MW645, MW648, and MW649 and surface water sampling point SW709 where the creek leaves the GMZ boundary for the overburden aquifer.

Groundwater and surface water samples collected at Site M1 in 2012 were analyzed for sulfate in accordance with Appendix B (QAPP) of the LTM Plan. Sulfate detections for 2012 sampling events conducted at Site M1 are summarized in Table 3-3 and shown on Figure 3-15. Historic sulfate data for Site M1 are summarized in Table B3, included in Appendix B. A brief discussion of analytical results by well type follows:

In-Plume Wells (MW107, MW231, MW640, MW641, and MW642): At combination well MW107, sulfate exceeded the RG in April and October at concentrations of 26,000 mg/L and 22,000 mg/L, respectively.

At overburden well MW231, sulfate exceeded the RG in April and October at concentrations of 35,000 mg/L and 36,000 mg/L, respectively.

At bedrock well MW640, sulfate exceeded the RG in April and October at concentrations of 5,200 mg/L and 4,300 mg/L, respectively.

At overburden well MW641, sulfate exceeded the RG in April and October at concentrations of 640 mg/L and 1,100 mg/L, respectively.

At overburden well MW642, sulfate exceeded the RG in April at a concentration of 420 mg/L and was detected below the RG at a concentration of 390 mg/L in October.

Early Warning Wells (MW643 and MW644): At overburden well MW643, sulfate was detected below the RG in April and October at concentrations of 58 mg/L and 160 mg/L, respectively.

At bedrock well MW644, sulfate was detected below the RG in April and October at concentrations of 160 mg/L and 86 mg/L, respectively.

Compliance Points (MW645, MW646, MW648, MW649, and SW709): At overburden well MW645, sulfate was detected below the RG in April and October at concentrations of 67 mg/L and 90 mg/L, respectively.

At bedrock well MW646, sulfate was detected below the RG in both April and October at a concentration of 110 mg/L.

At overburden well MW648, sulfate was detected below the RG in April and October at concentrations of 34 mg/L and 14 mg/L, respectively.

At overburden well MW649, sulfate was detected below the RG in April and October at concentrations of 64 mg/L and 120 mg/L, respectively.

At surface water sampling point SW709, sulfate was detected below the RG in April and October at concentrations of 60 mg/L and 180 mg/L, respectively.

3.5.3 Groundwater Trend Evaluation

Information included in the 1998 ROD estimated the timeframe for concentrations to reach the RG at Site M1 to be 50 years, or 2048.

Data from the previous 10 years only are used for this evaluation to provide a representation of site conditions since the soil source control measures completed in 2007 while maintaining a sufficient dataset. With time, the pre- soil source control measures data will continue to be removed from the dataset and an increasingly accurate representation of groundwater conditions post- soil source control measures will be presented.

As stated in Section 4.1.5.5 (Monitoring Frequency) of the LTM Plan, *"If one season is found to be consistently higher than all others, a recommendation will be made to move to annual monitoring during that season."* At this point there does not appear to be any strong indication of seasonal variations. Continued monitoring will provide additional data regarding seasonal variations.

In-Plume Wells (MW107, MW231, MW640, MW641, and MW642): Groundwater trend graphs included in Appendix D1 were completed for sulfate at wells MW107 (Figure D1-11), MW231 (Figure D1-12), MW640 (Figure D1-13), MW641 (Figure D1-14), and MW642 (Figure D1-15).

At combination well MW107, a decreasing trend is shown for sulfate on Figure D1-11. The estimated time at which sulfate will naturally degrade to less than the RG is 128 years (2140) which is consistent with the estimation in the 2011 Annual Report. Table 3-6 summarizes the results of this analysis. The sulfate concentration at well MW107 has been declining since Spring 2009 sampling which may indicate the effect from the source control measures completed in 2007. Since dilution and dispersion are the primary attenuation mechanisms for sulfate at M1, the concentrations will likely continue to decrease with time. However, based on the variability of the data, primarily due to seasonal fluctuations, the calculated cleanup times are only an estimate based on the data available.

At overburden well MW231, an increasing trend is shown for sulfate on Figure D1-12. Due to the increasing trend of sulfate, cleanup time estimates could not be completed. Table 3-6 summarizes the results of this analysis. Recent concentrations of sulfate have been relatively constant. Since dilution and dispersion are the primary attenuation mechanisms for sulfate at M1, the concentrations will likely decrease as time from the soil source control measures completed in 2007 increases, as observed in well MW107.

At bedrock well MW640, an increasing trend is shown for sulfate on Figure D1-13. Due to the increasing trend of sulfate, cleanup time estimates for could not be completed. Table 3-6 summarizes the results of this analysis. The concentration of sulfate has been relatively constant since April 2009 and decreased in October 2012. Since dilution and dispersion are the primary attenuation mechanisms for sulfate at M1, the concentrations will likely decrease as time from the soil source control measures completed in 2007 increases, as observed in well MW107.

At overburden well MW641, a decreasing trend is shown for sulfate on Figure D1-14. The estimated time at which sulfate will naturally degrade to less than the RG is 172 years (2184) representing an increase in the estimation in the 2011 Annual Report of 2071. Table 3-6 summarizes the results of this analysis. Since dilution and dispersion are the primary attenuation mechanisms for sulfate at M1, the distance from the source area and the groundwater velocity of approximately 7 ft/yr would suggest that the results of the source control measures completed in 2007 have not had an effect at well MW641. However, based on the variability of the data, primarily due to seasonal fluctuations, the calculated cleanup times are only an estimate based on the data available.

At overburden well MW642, a decreasing trend is shown for sulfate on Figure D1-15. The estimated time at which sulfate will naturally degrade to less than the RG is 6 years (2018) representing an increase in the estimation in the 2011 Annual Report of 2014. Table 3-6 summarizes the results of this analysis. Since dilution and dispersion are the primary

attenuation mechanisms for sulfate at M1, the distance from the source area and the groundwater velocity of approximately 7 ft/yr would suggest that the results of the source control measures completed in 2007 have not had an effect at well MW642. However, sulfate was below the RG in October 2012 for the first time since April 2008.

According to the LTM Plan, for an in-plume point, *"if the best fit trend line for an exponential relationship for all monitoring data since the completion of source control measures has not had a rate constant < 0 for three or more sampling events and concentrations for COCs are above their respective RGs, then additional source control measures need to be evaluated."* Well MW107 indicates decreasing concentrations and although well MW231 indicates increasing concentrations, recent concentrations have been relatively stable, are lower than they have been historically, and will likely begin to decline as time from source control measures increases. Based on the location of wells MW640, MW641, and MW642 (Figure 3-15), the observed concentrations are likely the effect of migration of releases predating source control measure implementation. Based on the slow attenuation of sulfate due to dilution and dispersion being the primary attenuation mechanisms for sulfate at M1, the downgradient extent of groundwater exceeding the RG will likely continue to increase in the near future. Based on the probability that these observed concentrations are the result of a legacy plume, no additional source control evaluation is recommended at this time.

Early Warning Wells (MW643 and MW644): At overburden well MW643, there were no RG exceedances and concentrations have been generally declining.

At bedrock well MW644, there were no RG exceedances and concentrations have been fluctuating.

Section 4.1.5.6 and Table 4-6 of the LTM Plan provide maximum allowable target concentrations for sulfate at each early warning well based on a determined attenuation rate that can be used to determine if results indicate a potential future exceedance at compliance wells MW645/MW646. Although wells MW640, MW641, and MW642 were re-designated as in-plume wells, these same target concentrations are evaluated for those wells. The following table summarizes the well number, April and October 2012 analytical results in mg/L, and target concentration in mg/L. Historic analytical results are summarized in Table B3 in Appendix B.

Well Number	April Result (mg/L)	October Result (mg/L)	Target Concentration (mg/L)
MW640	5,200	4,300	6,439
MW641	640	1,100	1,754
MW642	420	390	1,728
MW643	58	160	438
MW644	160	86	427

This analysis shows there are no sulfate concentrations from samples collected in 2012 that exceed the LTM Plan target concentration. Historic sulfate concentrations are summarized on Table B3 in Appendix B. Therefore, this suggests, based on the determined attenuation rate at Site M1, that sulfate concentrations detected at in-plume wells MW640, MW641, and MW642 and early warning wells MW643 and MW644 are not expected to exceed the RG at the compliance points in the future.

According to the LTM Plan, for an early warning point, "*if the attenuation rate constant for the best fit exponential trend line of all historic data yields a value of C > RG for three or more sequential sampling events, then there is a risk that the compliance wells will receive concentrations of COC in excess of the RG and either a better estimate of pore water velocity (i.e., a value < 10 ft/yr) is needed or additional corrective measures may need to be evaluated*." Concentrations detected are fluctuating at low levels. Therefore, there is no additional corrective measure evaluation required at this time.

Compliance Points (MW645, MW646, MW648, MW649, and SW709): There were no RG exceedances for monitoring points overburden well MW645, bedrock well MW646, overburden well MW648, overburden well MW649, or surface water sampling location SW709 in 2012. Sulfate concentrations at all locations are fluctuating at low levels.

According to the LTM Plan, for a compliance point, "*if Cx > RG, then additional corrective measures may be required.*" Concentrations detected are fluctuating at low levels. Therefore, there is no additional corrective measure evaluation required at this time.

The completion of soil source control measures in 2007 is expected to minimize contaminant loading to groundwater allowing natural attenuation mechanisms to contain and diminish groundwater RG exceedances within the GMZ. The remaining groundwater contamination at Site M1 is now a legacy plume traveling to the northwest toward Prairie Creek. While sulfate can be reduced to sulfides biologically under anaerobic conditions, the process requires organic substrate to sustain the anaerobic conditions. Moreover, nitrates are reduced before sulfates. There is no evidence that sulfate reduction is occurring to any extent at Site M1. Therefore, dispersion and dilution are the primary attenuation mechanisms for sulfate at M1. Concentrations will likely continue to decrease with time. However, the migration of the legacy plume will continue to be observed to determine if dispersion and dilution are sufficient in decreasing concentrations prior to discharging to Prairie Creek. The greatest estimated timeframe for sulfate to reach the RG is 2184 at MW641, greater than estimated for Site M1 in the 1998 ROD of 2048.

3.5.4 Recommendations

There are no recommended changes to the monitoring program at Site M1.

3.6 MFG GMZ

The MFG Area is the sixth GMZ, lies in the northwestern part of JOAAP, and was created by the consolidation of several discrete sites including M5, M6, M7, M8, and M13. The MFG Area GMZ is illustrated on Figures 1-2 and 3-16. Each of these areas hosted unique operations that led to the release of different contaminants now present in site groundwater. Groundwater contamination consisting of explosive compounds, excluding contamination from Landfill M13, is being managed collectively and is included as Section 3.8. Of the five areas, only Sites M6 and M13 continue to have groundwater contamination with COCs in excess of RGs. Each site comprising the MFG GMZ will be independently closed before the MFG GMZ can be eliminated.

Additionally, monitoring wells from "other areas" (MW117, MW118, and MW119) have been included in the MFG groundwater sampling. Numerous monitoring wells are also measured as water level control points at these other sites. Results from the MFG monitoring wells at these other MFG sites are discussed in Section 3.6.1 – M6.

3.6.1 Site M6

Site M6, the TNT Ditch Complex, covers 271 acres to the northwest of Site M5 in the central part of the MFG Area (Figures 1-2 and 3-16) and was largely used for TNT and DNT production during World War II, and then again in the Korean and Vietnam Wars. In between the wars, the facilities were used for research and development of different explosives like nitroxylenes. Production of TNT was terminated in 1977.

Production of TNT was conducted in 12 parallel lines, each containing a full sequence of production steps from the "mono-house" to the "bi-house" and then the "tri-house" buildings. Waste water ("red water") from each "tri-house" and the wash houses was discharged from wooden tanks to clay-lined ditches feeding into the TNT Ditch. In 1965, the original drainage system was replaced by wooden flumes completed in the TNT Ditch and the red water was diverted to Site M7 for treatment. Dintrotoluene production waste water was discharged from wooden tanks into open troughs and ditches that flowed to the storm water sewer system and the TNT Ditch, ultimately flowing untreated into Grant Creek. In addition to normal processing water, the TNT Ditch received drench water used to kill a production run when reactions ran out of control and posed an explosive threat. Between 1972 and 1974, there were more than 30 recorded instances of drenching with the associated discharge of "bi-oil" and concentrated nitric and sulfuric acid.

The full range of nitroaromatic compounds have been found in soil at Site M6, with concentrations of TNT, 2,4-DNT, lead, arsenic, and beryllium exceeding their respective RGs. Seven explosive compounds have been historically observed in the underlying groundwater at concentrations that exceed their respective RGs: TNT, 2,4-DNT, 2,6-DNT, 2-NT, TNB, NB, and RDX.

The overburden aquifer primarily consists of silt and clay, with variable amounts of sand and silty gravel. The overburden thickness ranges from 5 to 30 ft across the site. Based on available information, screens for overburden wells at Site M6 are set in silt and/or clay layers with the exception of monitoring wells MW650 and MW652; which have screens set in a silty gravel layer.

3.6.1.1 Groundwater Hydraulics

The groundwater monitoring network within Site M6 consists of 39 wells: 14 overburden wells, 2 combined overburden/bedrock wells, and 23 bedrock wells. Water levels are measured at the groundwater locations that are sampled (listed below), and at numerous monitoring wells at M6 and sites including M4, M8, and "Other Areas". Monitoring well information and water levels for October are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer is generally toward the west as shown on Figure 3-16.

The average horizontal gradient in the northern part of Site M6 was calculated to be 0.0198 ft/ft. The average horizontal gradient in the southern part of Site M6 was calculated to be 0.0235 ft/ft (Table 3-7). Using an average hydraulic conductivity value of 8.6E-04 cm/sec and an assumed porosity of 0.30, the flow velocity at Site M6 ranged from approximately 0.1674 ft/day or 61 ft/yr in April to 0.1844 ft/day or 67 ft/yr in October (Table 3-8). However, at Site M6, COCs have not been detected at wells 600 ft directly downgradient (MW212R to MW123R and MW162R). Given the 60 years that have passed since releases began at Site M6, this suggests the transport time for RDX and TNT is less than 600/60 = 10 ft/yr. A rate of 10 ft/yr is comparable to transport rates calculated for other areas of JOAAP.

The groundwater flow direction in the bedrock aquifer is generally toward the west as shown on Figure 3-17. Screens for bedrock monitoring wells MW123, MW314, MW316, MW318, and MW654 are set at shallow depths (<10 ft below top of bedrock), while screens for monitoring wells MW118, MW119, MW213R, MW215R, MW310R, MW311, MW313, and MW653 are set at intermediate depths within the bedrock aquifer (10 to 20 ft below top of bedrock). Screens for monitoring wells MW312, MW315, MW317, MW320, MW651, and MW655 are set deeper within the bedrock aquifer (>20 ft below top of bedrock). Vertical gradients were generally downward for well nests located along the escarpment, where the former TNT load lines were oriented at Site M6, and were upward in the wetland immediately to the west in 2012 (Table 3-9).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.6.1.2 Analytical Results

Groundwater sampling points for Site M6 during October are summarized in Table 1-1. The following monitoring wells at M6 and other sites included in the MFG GMZ are sampled for explosives:

- In-Plume – MW212R, MW652, and MW330 (M8)
- Early Warning – MW123R, MW162R, MW313, MW318, MW319, and MW654
- Compliance – MW117 and MW118 and MW119 (Other Areas).

In-plume monitoring well MW148RR and compliance monitoring wells MW112, MW113, MW115, and MW116 were removed from the sampling program beginning in spring 2012.

Groundwater samples collected at Site M6 in 2012 were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Monitoring well MW330 was sampled for sulfate. Explosive compound detections for 2012 sampling events conducted at Site M6 are summarized in Table 3-1 and shown on Figure 3-18. Sulfate detections for 2012 sampling events conducted at Site M6 are summarized in Table 3-3. Historic explosives and sulfate data for Site M6 are summarized in Tables B1 and B3, respectively, included in Appendix B. A brief discussion of analytical results by well type follows:

In-Plume Wells (MW212R, MW652, and MW330): At overburden well MW212R, 2,4-DNT exceeded the RG in April (620 µg/L) and October (2,500 µg/L), 2,6-DNT exceeded the RG in April (260 µg/L) and October (640 µg/L), 2-NT was detected below the RG in April at a concentration of 4,100 µg/L and exceeded the RG in October at a concentration of 12,000 µg/L, 2,4,6-TNT exceeded the RG in April and October at concentrations of 39 µg/L and 200 µg/L, respectively, and 1,3-DNB (1.1 µg/L) and NB (1.9 µg/L) were detected below the RG in April. 4-NT, 2-A-4,6-DNT, and 4-A-2,6-DNT were detected in April and October. There are no RGs for 4-NT, 2-A-4,6-DNT, and 4-A-2,6-DNT.

At overburden well MW652, 2,4-DNT exceeded the RG in April (8,400 µg/L) and October (5,100 µg/L), 2,6-DNT exceeded the RG in April (3,300 µg/L) and October (2,000 µg/L), 2-NT exceeded the RG in April (44,000 µg/L) and October (23,000) µg/L), and 2,4,6-TNT exceeded the RG in April (1,600 µg/L) and October (950 µg/L), 1,3-DNB (9.5 µg/L) was detected below the RG in April, and 4-NT, 2-A-4,6-DNT, and 4-A-2,6-DNT were detected in April and October. There are no RGs for 4-NT, 2-A-4,6-DNT, and 4-A-2,6-DNT

At overburden well MW330, sulfate exceeded the RG in April and October at concentrations of 430 µg/L and 440 µg/L, respectively.

Early Warning Wells (MW123R, MW162R, MW313, MW318, MW319, and MW654): At bedrock well MW123R, there were no detections of explosive compounds in 2012.

At overburden well MW162R, 2,4-DNT (0.27 µg/L), 2,6-DNT (0.14 µg/L), and 2-NT (0.7 µg/L) were detected below the RG in April and were not detected in October.

At bedrock well MW313, 2,4-DNT was not detected in April and exceeded the RG in October at a concentration of 5 µg/L, 2,6-DNT was not detected in April and exceeded the RG in October at a concentration of 3.3 µg/L, and 2-NT (44 µg/L) and 4-NT (28 µg/L) were not detected in April and were detected below the RG in October. There have been no previous detections for 2,4-DNT and 2,6-DNT and are suspect due to detections for these same compounds at other JOAAP monitoring wells during October 2012 when there had been no previous detections.

At bedrock well MW318, 2,6-DNT exceeded the RG in April at a concentration of 0.45 µg/L and was not detected in October and 2,4-DNT was detected below the RG in April at a concentration of 0.21 µg/L and not detected in October.

At bedrock well MW319, 2,4,6-TNT was detected below the RG in April at a concentration of 0.29 µg/L was not detected in October.

At bedrock well MW654, 2,4-DNT exceeded the RG in April (1.7 µg/L) and October (8.9 µg/L), 2,6-DNT exceeded the RG in April (0.97 µg/L) and October (4.8 µg/L), 2-NT was detected below the RG in April (18 µg/L) and October (86 µg/L), RDX was detected below the RG in April (0.31 µg/L) and not detected in October, 2,4,6-TNT was detected below the RG in April (0.18 µg/L) and not detected in October, and 2-A-4,6-DNT, 4-A-2,6-DNT, 3-NT were detected in April and not detected in October and 4-NT was detected in April and October. There are no RGs for 2-A-4,6-DNT, 4-A-2,6-DNT, 3-NT, or 4-NT.

Compliance Wells (MW117 and, MW118 and MW119 (other areas): At combination well MW117, 2,4-DNT was not detected in April and exceeded the RG in October at a concentration of 2.6 µg/L, 2-NT was not detected in April and was detected below the RG in October at a concentration of 24 µg/L, and 4-NT was not detected in April and was detected in October. There is no RG for 4-NT. There have been no previous detections for 2,4-DNT and is suspect due to detections for this same compound at other JOAAP monitoring wells during October 2012 when there had been no previous detections.

At bedrock well MW118, 2,4-DNT was not detected in April and exceeded the RG in October at a concentration of 2.3 µg/L, 2-NT was not detected in April and was detected below the RG in October at a concentration of 20 µg/L, and 4-NT was not detected in April and was detected in October. There is no RG for 4-NT. There have been no previous detections for 2,4-DNT and is suspect due to detections for this same compound at other JOAAP monitoring wells during October 2012 when there had been no previous detections.

At bedrock well MW119, there were no detections of explosive compounds in April and October.

3.6.1.3 Groundwater Trend Evaluation

Information included in the 1998 ROD estimated the timeframe for concentrations to reach the RG at Site M6 to be 50 years, or 2048.

Data from the previous 10 years only are used for this evaluation to provide a representation of site conditions since the soil source control measures completed in 2004 while maintaining a sufficient dataset. With time, the pre- soil source control measures data will continue to be removed from the dataset and an increasingly accurate representation of groundwater conditions post- soil source control measures will be presented.

As stated in Section 4.1.7.5 (Monitoring Frequency) of the LTM Plan, *"If one season is found to be consistently higher than all other, a recommendation will be made to move to annual monitoring during that season."* Results do not indicate concentrations are consistently higher during a given season.

In-Plume Wells (MW212R, MW652, and MW330): Groundwater trend graphs included in Appendix D1 were completed for TNT (Figure D1-16) at well MW212R, for TNT, 2,4-DNT, 2,6-DNT, and 2-NT (Figures D1-17 through D1-20, respectively) at well MW652, and for sulfate at well MW330 (Figure D1-21).

At overburden well MW212R, decreasing trends are shown for TNT on Figure D1-16. The estimated time at which TNT will naturally degrade to less than the RG is 36 years (2048) which is consistent with the estimation in the 1998 ROD and the 2011 Annual Report. Table 3-6 summarizes the results of this analysis.

At overburden well MW652, decreasing trends are shown for TNT (Figure D1-17), 2,4-DNT (Figure D1-18), 2,6-DNT (Figure D1-19), and 2-NT (Figure D1-20). The estimated time at which TNT will naturally degrade to less than the RG is 74 years (2086) representing an increase of the estimation in the 2011 Annual Report of 2059. The increase in timeframe is mainly due to the historic dataset used not including data beyond 10 years in age. Therefore, the trend is less affected by the early data from before the remedial actions were completed in 2004. The estimated time at which 2,4-DNT will naturally degrade to less than the RG is 5514 years (7526) representing a significant increase of the estimation in the 2011 Annual Report of 2142. However, this timeframe is mainly due to variability of the data, primarily due to seasonal fluctuations, that show little correlation as evidenced by the low R2 value of 0.0001. The estimated time at which 2,6-DNT will naturally degrade to less than the RG is 317 years (2329) representing an increase of the estimation in the 2011 Annual Report of 2135. However, this timeframe is mainly due to variability of the data, primarily due to seasonal fluctuations, that show little correlation as evidenced by the low R2 value of 0.0235. The estimated time at which 2-NT will naturally degrade to less than the RG is 83 years (2095) representing an increase of the estimation in the 2011 Annual Report of 2045. However, this timeframe is mainly due to variability of

the data, primarily due to seasonal fluctuations, that show little correlation as evidenced by the low R2 value of 0.0205. Table 3-6 summarizes the results of this analysis.

At overburden well MW330, decreasing trends are shown for sulfate (Figure D1-21). The estimated time at which sulfate will naturally degrade to less than the RG is 11 years (2023) representing a reduction in the estimation in the 2011 Annual Report of 2251. The reduction in timeframe is mainly due to the historic dataset not including data beyond 10 years in age. Therefore, the trend is less affected by the early data from before the remedial actions were completed in 2004. Table 3-6 summarizes the results of this analysis.

According to the LTM Plan, for an in-plume point, *"If the best fit trend line for an exponential relationship for all monitoring data since the completion of source control measures has not had a rate constant < 0 for three or more sampling events and concentrations for COCs are above their respective RGs, then additional source control measures need to be evaluated."* Results indicate that concentrations are declining at in-plume monitoring points. Therefore there is no additional source control evaluation required at this time.

Early Warning Wells (MW123R, MW162R, MW313, MW318, MW319, and MW654): At bedrock well MW123R there were no detections of explosive compounds in 2012. Therefore, there are no trends established.

At overburden well MW162R, there were low level detections of explosive compounds in October only. Therefore, there are no trends established.

At bedrock well MW313, there were first time detections with exceedances for 2,4-DNT and 2,6-DNT in October. However, there have been no other historic detections. Therefore, there are no trends established.

At bedrock well MW318, detections of explosive compounds have been low level fluctuations. The RG was exceeded for 2,6-DNT in October 2011 and April 2012 with no detection in October 2012. Therefore, there are no trends established.

At bedrock well MW319, detections of explosive compounds have been low level fluctuations. Therefore, there are no trends established.

At bedrock well MW654, 2,4-DNT and 2,6-DNT exceeded the RG in April and October. However, there have been no detections since 2010 with fluctuation prior to that. Therefore, there are no trends established.

According to the LTM Plan, for an early warning point, *"If the attenuation rate constant for the best fit exponential trend line of all historic data yields a value of C > RG for three or more sequential sampling events, then there is a risk that the compliance wells will receive concentrations of COC in excess of the RG and either a better estimate of pore*

water velocity (i.e., a value < 10 ft/yr) is needed or additional corrective measures may need to be evaluated." Detections are inconsistent and additional data should indicate if there appears to be an increase in concentration from migration, or simply sporadic detections from legacy plume migration.

Compliance Wells (MW117 and MW118 and MW119 (other areas)): At combination well MW117, there was a first time detection with an exceedance for 2,4-DNT, and 2-NT was detected in October. However, there have been no other historic detections. Therefore, there are no trends established.

At bedrock well MW118, there was a first time detection with an exceedance for 2,4-DNT and 2-NT was detected in October. However, there have been no other historic detections. Therefore, there are no trends established.

At bedrock well MW119, there were no detections of explosive compounds in 2012. Therefore, there are no trends established.

According to the LTM Plan, for a compliance point, *"if Cx > RG, then additional corrective measures may be required."* Detections are inconsistent and additional data should indicate if there appears to be an increase in concentration from migration, or simply sporadic detections from legacy plume migration. Therefore, there is no additional corrective measure evaluation required at this time.

The completion of soil source control measures in 2004 is expected to minimize contaminant loading to groundwater, allowing natural attenuation mechanisms to contain and diminish groundwater RG exceedances within the GMZ. The remaining groundwater contamination at Site M6 is now a legacy plume traveling to the west. The presence of explosive breakdown products 2-A-4,6-DNT and 4-A-2,6-DNT, detected in samples from monitoring wells MW212R, MW652, and MW654, indicate that anaerobic degradation is likely occurring within the plume. These compounds are byproducts of the biodegradation of TNT. Natural attenuation mechanisms appear to be limiting the areal extent of groundwater contamination within the GMZ boundary.

3.6.1.4 Recommendations

There are no recommended changes to the monitoring program at the MFG GMZ.

Future sampling will confirm the exceedances for 2,4-DNT and/or 2,6-DNT at monitoring wells MW313, MW117, and MW118.

3.6.2 Site M7

Site M7, the Red Water Area, comprises 49 acres in the central part of the MFG Area between Site M6 and Site M7 on the west bank of the TNT Ditch (Figures 1-2 and 3-16). Facilities in Site M7 included storage tanks, pump stations, evaporators, and incinerators

used to destroy the red water from Site M6 after construction in 1965. Overflows of untreated red water were stored in the Red Water Lagoon, a 3.3 acre impoundment that was remediated in 1985.

Contaminants of concern in soil included TNT, 2,4- and 2,6-DNT, TNB, and RDX. Source areas in soil included the drainage areas in the northwest part of Site M7. Soil RA activities were completed in 2001 at Site M7. Contaminants of concern in groundwater include TNT, 2,4-DNT, 2,6-DNT, and RDX.

The overburden aquifer primarily consists of silt and clay, with some sand and gravel in the upper, unsaturated, part of the aquifer. The overburden thickness ranges from less than 5 to more than 10 ft across Site M7. Based on available information, samples from overburden wells are obtained from discontinuous sand and gravel layers.

3.6.2.1 Groundwater Hydraulics

The groundwater monitoring network at Site M7 consists of 9 wells: 4 overburden wells, 1 combined overburden/bedrock well, and 4 bedrock wells. Water levels are measured at the groundwater location that is sampled (listed below), and at monitoring wells MW156, MW216, MW660, and MW661. Monitoring well information and water levels for October are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer in the immediate vicinity of Site M7 is generally toward the west/southwest as shown on Figure 3-16.

The average horizontal gradient at Site M7 was calculated to be 0.0115 ft/ft in 2012 (Table 2-6). Using an average hydraulic conductivity value of 6.7E-04 cm/sec and an assumed porosity of 0.30, the flow velocity at Site M7 ranged from approximately 0.0665 ft/day or 24 ft/yr in April to 0.0728 ft/day or 27 ft/yr in October (Table 3-8).

The groundwater flow direction in the bedrock aquifer in the immediate vicinity of Site M7 is generally toward the west/northwest as shown on Figure 3-17. With the exception of well MW124R, bedrock wells are screened at intermediate depths within the bedrock aquifer (10 to 20 ft below top of bedrock). Bedrock well MW124R and combination well MW157 are screened at a shallow depth within bedrock (<10 ft below top of bedrock). Vertical gradients were calculated for well nests MW216/MW217, MW660/MW661, MW321/MW322, and MW157/MW158 (M4) located in the vicinity of Site M7. Calculated vertical gradients were downward at well nests MW321/MW322 and MW660/MW661, upward at well nests MW216/MW217 and no gradient at well nest MW157/MW158 in April. Calculated vertical gradients were downward at well nest MW157/MW158 and upward at well nest MW660/MW661 in October (Table 3-9).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.6.2.2 Analytical Results

Monitoring well MW124R was sampled during 2012 as an early warning bedrock well as part of the MFG monitoring network (Table 1-1). The groundwater samples collected at Site M7 in 2012 were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compound detections for 2012 sampling events conducted at Site M7 are summarized in Table 3-1 and shown on Figure 3-18. Historic explosives compound data for Site M7 are summarized in Table B1, included in Appendix B. A brief discussion of analytical results by well type follows.

Early Warning Well (MW124R): At bedrock well MW124R, there were no detections for explosive compounds in April and October.

3.6.2.3 Groundwater Trend Evaluation

Information included in the 1998 ROD estimated the timeframe for concentrations to reach the RG at Site M7 to be 50 years, or 2048.

Data from the previous 10 years only are used for this evaluation to provide a representation of site conditions since the soil source control measures completed in 2001.

As stated in Section 4.1.7.5 (Monitoring Frequency) of the LTM Plan, *"If one season is found to be consistently higher than all other, a recommendation will be made to move to annual monitoring during that season."* Results do not indicate concentrations are consistently higher during a given season.

Early Warning Well (MW124R): At bedrock well MW124R, there were no explosive compounds detected in April or October. Detections of explosives observed previously were sporadic. Therefore, there is no trend established.

According to the LTM Plan, for an early warning point, *"If the attenuation rate constant for the best fit exponential trend line of all historic data yields a value of C > RG for three or more sequential sampling events, then there is a risk that the compliance wells will receive concentrations of COC in excess of the RG and either a better estimate of pore water velocity (i.e., a value < 10 ft/yr) is needed or additional corrective measures may need to be evaluated."* No explosive compounds detected in April or October. Detections of explosives observed previously were sporadic. Therefore, there is no additional corrective measure evaluation required at this time.

3.6.2.4 Recommendations

There are no recommended changes to the monitoring program at Site M7.

3.7 LANDFILL M11

Landfill M11 is located in the southwestern part of the manufacturing side of JOAAP as illustrated on Figures 1-2 and 3-19. The landfill monitoring area comprises approximately 133 acres. Site M11 was divided into two sections by School House Road and bordered on the west by West Patrol Road. M11 north encompassed approximately 10.5 acres of former gravel pits that were mined and filled with waste. M11 south, a former gravel pit, encompassed approximately 5.6 acres that was also mined and filled with waste. The remedy chosen for M11 was waste consolidation and capping. Implementation of the remedy began in 2006 and was completed in 2008.

The current conceptual site model is that M11 is believed to contain manganese and sulfate containing waste that could potentially contaminate underlying groundwater and migrate beyond the GMZ.

With the implementation of the RA at Site M11, it is anticipated that the landfill cap will prevent percolation of precipitation through waste consolidated in the landfill, thus preventing groundwater contamination.

Monitoring at Landfill M11 is mandated by IAC Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Long-term monitoring of the landfill cap will include quarterly inspections of the cap, vegetation, and drainage structures for the first five years, then annually for 25 years. Objectives include:

- Confirm that the cap has controlled leaching at the landfill so that water quality will not be threatened in the future
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed
- Keep survey points protected and visible to facilitate identification in the future.

3.7.1 Groundwater Hydraulics

The groundwater monitoring well network at Landfill M11 consists of 13 wells: 3 combination overburden/bedrock wells and 10 bedrock wells. Water levels are measured at the groundwater locations that are sampled (listed below). Monitoring well information and water levels for October are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer is generally toward the west as shown on Figure 3-19.

The average horizontal gradient at Landfill M11 was 0.0063 ft/ft in 2012 (Table 3-7). Using a hydraulic conductivity of 6.7E-04 cm/sec from nearby Site M7 and an assumed porosity of 0.30, the calculated flow velocity at Landfill M11 ranged from approximately 0.0329 ft/day or 12 ft/yr in April to 0.0399 ft/day or approximately 15 ft/yr in October (Table 3-8).

Bedrock is shallow at Landfill M11, ranging from 2.5 to 9 ft below ground surface. The groundwater flow direction in the bedrock aquifer is generally toward the northwest as shown on Figure 3-20. The calculated vertical gradients were upward at upgradient well nest MW802/MW803 in April and October and downgradient well nest MW804/MW805 in October and downward at downgradient well nest MW804/MW805 in April (Table 3-9).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.7.2 Analytical Results

Groundwater sampling points for Landfill M11 during October 2012 are summarized in Table 1-1. The following monitoring wells at Landfill M11 are sampled for VOCs, SVOCs, TAL metals, explosives, nitrate, and sulfate:

- Upgradient – MW802 and MW803 (October only)
- Downgradient – MW333 (October only), MW334 (October only), MW335, MW336, MW804 (October only), and MW805

Groundwater sampling will no longer be completed during spring. However, during spring 2012 upgradient monitoring well MW803 and downgradient monitoring wells MW333, MW334,and MW804 were not sampled.

Groundwater samples collected at Landfill M11 in 2012 and were analyzed for explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs in accordance with Appendix B (QAPP) of the LTM Plan. Detections for explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs for the sampling events conducted at Site M11 in 2012 are summarized in Tables 3-1, 3-2, 3-3, 3-4, and 3-5, respectively. Explosive compound detections are shown on Figure 3-21. Historic analytical data for Landfill M11 are summarized in Tables B1 through B5, included in Appendix B. Site M11 monitoring well locations are classified as upgradient or downgradient locations. A brief discussion of analytical results by well type follows:

Upgradient Wells (MW802 and MW803): At combination well MW802, there were no detections for explosive compounds, no RG exceedances for TAL metals, detections but no RG exceedances for nitrate and sulfate, no detections of VOCs, and no detections of SVOCs in April and October.

At bedrock well MW803, there were no detections for explosive compounds, no RG exceedances for TAL metals, detections but no RG exceedances for nitrate and sulfate, no detections of VOCs, and no detections of SVOCs in October.

Downgradient Wells (MW333, MW334, MW335, MW336, MW804, and MW805): At bedrock well MW333 in October, there were no explosive compounds detected, no RG

exceedances for TAL metals, detections but no RG exceedances for nitrate and sulfate, no detections of VOCs, and no detections of SVOCs.

At bedrock well MW334 in October, there were no explosive compounds detected, no RG exceedances for TAL metals, no detection for nitrate, detection but no RG exceedance for sulfate, no detections of VOCs, and no detections of SVOCs.

At bedrock well MW335 in April and October, there were no explosive compounds detected, no RG exceedances for TAL metals, nitrate was detected below the RG in April and not detected in October, sulfate exceeded the RG in April (660 mg/L) and October (580 mg/L), no detections of VOCs, and no detections of SVOCs.

At bedrock well MW336 in April and October, there were no explosive compounds detected, no RG exceedances for TAL metals, detections but no RG exceedances for nitrate, sulfate exceeded the RG in April (410 mg/L) and October (510 mg/L), acetone was not detected in April and was detected below the RG in October at a concentration of 5.1 µg/L, and no detections of SVOCs.

At combination well MW804 in October, there were no explosive compounds detected, no RG exceedances for TAL metals, detection but no RG exceedance for nitrate, sulfate exceeded the RG in at a concentration of 490 mg/L, no detections of VOCs, and no detections of SVOCs.

At bedrock well MW805 in April and October, there were no explosive compounds detected, no RG exceedances for TAL metals, detections but no RG exceedances for nitrate, sulfate exceeded the RG in April (470 mg/L) and October (450 mg/L), acetone was not detected in April and was detected below the RG in October at a concentration of 5.5 µg/L, and no detections of SVOCs.

3.7.3 Groundwater Trend Evaluation

Data from the previous 10 years only are used for this evaluation to provide a representation of site conditions since the soil source control measures completed in 2008 while maintaining a sufficient dataset. With time, the pre- soil source control measures data will continue to be removed from the dataset and an increasingly accurate representation of groundwater conditions post- soil source control measures will be presented.

As stated in Section 4.2.2.5 (Monitoring Frequency) of the LTM Plan, *"Sampling of monitoring wells at Landfill M11 is required on a semi-annual basis for a period of 30 years. If monitoring results prove to be stable and highly predictable, the installation may request a change to annual monitoring."* Concentrations at Landfill M11 appear to be stable and predictable and sulfate is consistently declining. Therefore, a recommendation was made prior to spring 2012 sampling to only sample M11 monitoring wells in fall. At

the time of the sampling concurrence of the recommendation had not been granted, therefore four of the monitoring wells were sampled in spring.

Upgradient Wells (MW802 and MW803): At combination well MW802 and bedrock MW803, there were no detections for explosive compounds, no RG exceedances for TAL metals, detections but no RG exceedances for nitrate and sulfate, no detections of VOCs, and no detections of SVOCs in April and October. Therefore, there are no trends established.

Downgradient Wells (MW333, MW334, MW335, MW336, MW804, and MW805): Groundwater trend graphs included in Appendix D1 were completed for sulfate at monitoring wells MW335 (Figure D1-22), MW336 (Figure D1-23), and MW805 (Figure D1-24).

At bedrock well MW335, a decreasing trend is shown for sulfate on Figure E1-22. The estimated time at which sulfate will naturally degrade to less than the RG is 7 years (2019) representing an increase in the estimation in the 2011 Annual Report of 2016. Table 3-6 summarizes the results of this analysis. A limited dataset is available since source control measures were completed in 2008. Although the dataset is limited, a definite declining trend is indicated since Fall 2008 sampling, which may indicate the effect from the source control measures completed in 2008.

At bedrock well MW336, a decreasing trend is shown for sulfate on Figure E1-23. The estimated time at which sulfate will naturally degrade to less than the RG is 29 years (2041) representing an increase in the estimation in the 2011 Annual Report of 2016. However, this timeframe is mainly due to variability of the data, primarily due to seasonal fluctuations, that show little correlation as evidenced by the low R2 value of 0.0078. Table 3-6 summarizes the results of this analysis. A limited dataset is available since source control measures were completed in 2008.

At bedrock well MW805, a decreasing trend is shown for sulfate on Figure E1-24. The estimated time at which sulfate will naturally degrade to less than the RG is 7 years (2019) which is consistent with the estimation in the 2011 Annual Report. Table 3-6 summarizes the results of this analysis. A limited dataset is available since source control measures were completed in 2008. Although the dataset is limited, a definite declining trend is indicated since October 2008 sampling, which may indicate the effect from the source control measures completed in 2008.

For the in-plume sampling point, the decision rule is:

If Cx > upgradient and the best fit trend line for the historic data displays no decrease for >3 years, then additional landfill measures may need to be evaluated. Sulfate in downgradient wells are declining. Therefore, additional landfill measures do not need to be evaluated at this time.

With respect to the landfill in-plume monitoring wells, the operative decision rules are the same for the early warning and compliance sample points for the landfill monitoring area in which they reside. The wells with sulfate RG exceedances at downgradient monitoring locations have not been determined to be either in-plume, early warning, or compliance points. Therefore, there is no decision rule to apply to those locations with exceedances. However, the sulfate concentrations detected are declining.

The completion of soil source control measures in 2008 is expected to minimize contaminant loading to groundwater, allowing natural attenuation mechanisms to contain and diminish groundwater RG exceedances. While sulfate can be reduced to sulfides biologically under anaerobic conditions, the process requires organic substrate to sustain the anaerobic conditions. Moreover, nitrates are reduced before sulfates. There is no evidence that sulfate reduction is occurring to any extent at Site M11. Therefore, dispersion and dilution are the primary attenuation mechanisms for sulfate at M11. Concentrations will likely continue to decrease with time.

3.7.4 Recommendations

There are no recommended changes to the monitoring program at M11.

3.8 LANDFILL M13

Site M13 comprises approximately 106 acres of the central part of the MFG area known as the gravel pits. It lies north of the Tetryl Production Area, east of the TNT Ditch Complex, and west of the Acid Area (Figure 1-2 and 3-16).

Landfill M13 is located in the northern part of Site M13 and comprises approximately 10.5 acres. Site features at Landfill M13 and surrounding areas are illustrated on Figure 3-22. Disposal activities were confined to four discrete areas of the site, none of which extended beyond 12 acres in size. Historical records indicate landfilling took place in the Northern Gravel Pit during the period 1966 to 1984 and involved scrap metals, creosote-treated railroad ties, telephone poles, and construction/demolition debris. Other waste management activities at Site M13 involved explosives. Explosive compounds observed in the groundwater at Site M13 include: TNT, TNB, 2,4-DNT, and 2,6-DNT.

Soil in the vicinity of the Northern Gravel Pit had been found to contain beryllium, lead, and benzo(a)pyrene as COCs. On a single occasion in 1991, antimony and cadmium were reported to be present in groundwater samples at concentrations in excess of their respective RGs, but they have not exceeded the RGs since. It is difficult to determine if the original findings could have resulted from turbid samples since low flow sampling and micro purging techniques are now employed to obtain more representative samples.

The current conceptual site model is that metal and benzo(a)pyrene in groundwater may be present as a result of leaching of waste materials in the Northern Gravel Pit. The

explosives present in groundwater are far more likely to be present due to infiltration of wastewater in the TNT Ditch. There is no evidence to suggest explosive compounds were ever present in waste materials put into the pit.

The Northern Gravel Pit was consolidated and capped (Landfill M13) in 2007 to 2008. The three other pits received waste materials that do not appear to pose a threat to human health and the environment.

With the implementation of the RA on the TNT Ditch and the capping of the Northern Gravel Pit, it is anticipated that contaminants in site groundwater will detach from the source areas and migrate as legacy plumes to the west. As such, concentrations are expected to decline with time.

Monitoring at Landfill M13 is mandated by IAC Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 15 years. Long-term monitoring of the landfill cap will include quarterly inspections of the cap, vegetation, and drainage structures. Objectives include:

- Confirm that the cap has controlled leaching at the landfill so that water quality will not be threatened in the future
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed
- Keep survey points protected and visible to facilitate identification in the future
- Ensure the fence and signage installed to restrict site access remain in place and serviceable, and
- Certify that institutional controls remain in place.

The overburden aquifer primarily consists of silt and clay, with abundant sand and gravel in the upper, unsaturated, portion of the aquifer. The overburden thickness is approximately 25 ft and is fairly consistent across Site M13. Samples from overburden wells are obtained from silt and/or clay layers.

3.8.1 Groundwater Hydraulics

The groundwater monitoring network at Landfill M13 consists of 11 wells: 6 overburden wells, 1 combined overburden/bedrock well and 4 bedrock wells. Water levels are measured at the groundwater locations that are sampled (listed below), and at monitoring wells AEHA14R, AEHA15, MW363, and MW364. Monitoring well information and water levels for October are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer for the July and October quarterly sampling events is to the south/southeast as shown on Figures 3-22 and 3-23, respectively. Figure 3-23 includes the

surrounding groundwater flow taken from the semi-annual sampling event, as shown on Figure 3-16.

The average horizontal gradient at Site M13 was calculated to be 0.0031 ft/ft in 2012. Using an average hydraulic conductivity value of 8.0E-02 cm/sec and an assumed porosity of 0.30, the calculated flow velocity at Site M13 ranged from approximately 3.6 ft/day or 1,296 ft/yr in April to 2.3 ft/day or 855 ft/yr in October (Table 3-8). Chemical data do not support this high of a flow velocity and landfill capping should decrease percolation, thereby diminishing horizontal gradients in the vicinity of the landfill. Linear flow velocities are likely on the order of 10 ft/yr based on data from other sites at JOAAP.

The groundwater flow direction in the bedrock aquifer in the immediate vicinity of Landfill M13 for July and October quarterly sampling events was generally toward the southwest as shown on Figures 3-24 and 3-25. Figure 3-25 includes the surrounding groundwater flow taken from the October semi-annual sampling event, as shown on Figure 3-17. The screens for combination well MW350 and nearby bedrock well MW321 are set at a shallow depth within the bedrock aquifer (<10 ft below top of bedrock), while the well screen for nearby well MW322 is set at an intermediate depth within the bedrock aquifer (10 to 20 ft below top of bedrock). Downward vertical gradients were observed at upgradient well nest MW806/MW807 and downgradient well nest MW808/MW809 in February, April, July and October. An upward vertical gradient was observed at downgradient well nest MW126R/MW362 in February, April, July and October. The vertical gradient was upward in April and October and downward in February and July at well nest MW363/MW364 (Table 3-9).

Although well MW362 has historically been considered a bedrock well, the well installation geometry included on Table 2-2 indicates the top of the screen is installed approximately1.5 ft above the top of bedrock. Any filter sand material installed above the top of the well screen during installation would increase the exposure of the well to receiving groundwater from the overburden aquifer. The hydraulic conductivity of the overburden is greater than that of the bedrock. Therefore, groundwater drawn during sampling and resulting detections from the monitoring well are likely predominantly from the overburden and do not indicate that explosive compounds have migrated into the bedrock. Removing MW362 as a bedrock well would not greatly affect the potentiometric surface flow direction shown on Figures 3-24 and 3-25. Therefore, the overburden monitoring well proposed to be installed along the midpoint of the southern landfill boundary would provide additional groundwater information relative to detections from MW362.

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.8.2 Analytical Results

Groundwater sampling points for Landfill M13 within the MFG GMZ for the 2012 sampling events (quarterly) are summarized in Table 1-1. The following monitoring wells at Landfill M13 are sampled for VOCs, SVOCs, TAL metals, explosives, nitrate, and sulfate:

- Upgradient – MW806 and MW807
- Downgradient – AEHA14R (February only), AEHA15 (February only), MW126R, MW362, MW808, and MW809

Groundwater samples were collected at Landfill M13 in January, April, July and October 2012 and were analyzed for explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs in accordance with Appendix B (QAPP) of the LTM Plan. Detections of explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs for the sampling events conducted at Landfill M13 in 2012 are summarized in Tables 3-1, 3-2, 3-3, 3-4, and 3-5, respectively. Explosive compound detections are shown on Figure 3-26. Historic analytical data for Landfill M13 are summarized in Tables B1 though B5, respectively, included in Appendix B. For Landfill M13 the monitoring well locations are classified as upgradient or downgradient locations. A brief discussion of analytical results by well type follows:

Upgradient Wells (MW806 and MW807): At overburden well MW806 in 2012, 2,4-DNT (1.4 µg/L) and 2,6-DNT (0.96 µg/L) exceeded the RG, 2-NT was detected below the RG at a concentration of 5.5 µg/L, and 4-NT was detected in October (there is no RG for 4-NT), no RG exceedances for TAL metals, detections but no RG exceedances for nitrate and sulfate, no detections of VOCs, and no detections of SVOCs. There have been no previous detections for 2,4-DNT and 2,6-DNT and are suspect due to detections for these same compounds at other JOAAP monitoring wells during October 2012 when there had been no previous detections.

At bedrock well MW807 in 2012, there were no detections of explosive compounds, no RG exceedances for TAL metals, there were no detections of nitrate, detections but no RG exceedances of sulfate, carbon disulfide was detected below the RG in February, 1,1-dichloroethane (1,1-DCA) was detected below the RG in February, July, and October, cis-1,2-dichloroethene (cis-1,2-DCE) was detected below the RG in February, July, and October, trichloroethene (TCE) was detected below the RG in October, and no detections of SVOCs.

Downgradient Wells (AEHA14R, AEHA15, MW126R, MW362, MW808, and MW809): Overburden monitoring well AEHA14R was sampled in February only and has subsequently been removed from sampling. At well AEHA14R in February, 2-A-4,6-DNT, and 4-A-2,6-DNT were detected (there are no RGs for 2-A-2,6-DNT and 4-A-2,6-DNT), there were no RG exceedances for TAL metals, nitrate and sulfate were detected but

did not exceed the RGs, no detections of VOCs, and naphthalene was detected (there is no RG for naphthalene).

Overburden well AEHA15 was sampled in February only and has subsequently been removed from sampling. At well AEHA15 in February, there were no detections of explosive compounds, iron exceeded the RG at a concentration of 15 mg/L, nitrate and sulfate were detected but did not exceed the RGs, no detections of VOCs, and no detections of SVOCs.

At overburden well MW126R in 2012, in October 2,4-DNT (1.1 µg/L) and 2,6-DNT (0.62 µg/L) exceeded the RG, 2-NT was detected below the RG at a concentration of 2.1 µg/L, 1,3,5-TNB was detected below the RG at a concentration of 0.22 µg/L, 3-NT and 4-NT were detected (there are no RGs for 3-NT and 4-NT), there were no RG exceedances for TAL metals, nitrate and sulfate were detected but did not exceed the RGs, in April TCE was detected below the RG at a concentration of 0.23 µg/L, and no detections of SVOCs. There have been no previous detections for 2,4-DNT and 2,6-DNT and are suspect due to detections for these same compounds at other JOAAP monitoring wells during October 2012 when there had been no previous detections.

At bedrock well MW362 in 2012, 2,4-DNT exceeded the RG in February (1.5 µg/L), April (4.9 µg/L), July (3.6 µg/L), and October (6.7 µg/L); 2,6-DNT was not detected in February and April and exceeded the RG in July (0.68 µg/L) and October (1 µg/L); RDX was not detected in February, April, and July and exceeded the RG in October at a concentration of 13 µg/L; 2-NT was detected below the RG in April (0.24 µg/L) and October (0.16 µg/L), 2,4,6-TNT was detected below the RG in April (0.073 µg/L) and October (0.08 µg/L), 2-A-4,6-DNT and 4-A-2,6-DNT were detected in all quarters, and 3-NT and 4-NT were detected in October (there are no RGs for 2-A-2,6-DNT, 4-A-2,6-DNT, 3-NT, and 4-NT), there were no RG exceedances for TAL metals, nitrate was not detected, sulfate was detected but there were no RG exceedances, no detections of VOCs, and in the SVOC samples 2,4-DNT was not detected in February and October but exceeded the RG in April (3.3 µg/L) and July (2.8 µg/L), 2,6-DNT was detected below the RG April (0.25 µg/L) and July (0.29 µg/L).

At overburden well MW808 in 2012, there were no detections of explosive compounds, no RG exceedances for TAL metals, nitrate was not detected, sulfate was detected but there were no RG exceedances, no detections of VOCs, and no detections of SVOCs.

At bedrock well MW809 in 2012, there were no detections of explosive compounds, no RG exceedances for TAL metals, in April, July, and October nitrate was detected but there were no RG exceedances, sulfate was detected but there were no RG exceedances, no detections of VOCs, and no detections of SVOCs.

3.8.3 Groundwater Trend Evaluation

Data from the previous 10 years only are used for this evaluation to provide a representation of site conditions since the soil source control measures completed in 2008 while maintaining a sufficient dataset. With time, the pre- soil source control measures data will continue to be removed from the dataset and an increasingly accurate representation of groundwater conditions post- soil source control measures will be presented.

As stated in Section 4.2.3.5 (Monitoring Frequency) of the LTM Plan, "*Monitoring is required on a quarterly basis for five years, followed by ten years of semi-annual sample collection.*" Quarterly sampling through 2012 represents completion of four years of sampling.

Upgradient Wells (MW806 and MW807): At overburden well MW806 in October, there were first time detections with exceedances for 2,4-DNT and 2,6-DNT, no RG exceedances for TAL metals, detections but no RG exceedances for nitrate and sulfate, no detections of VOCs, and no detections of SVOCs. Therefore, there are no trends established.

At bedrock well MW807, there were no detections of explosive compounds, no RG exceedances for TAL metals, there were no detections of nitrate, detections but no RG exceedances of sulfate, VOCs were detected below the RG, and no detections of SVOCs. Therefore, there are no trends established.

Downgradient Wells (AEHA14R, AEHA15, MW126R, MW362, MW808, and MW809): A groundwater trend graph included in Appendix D1 was completed for 2,4-DNT at well MW362 (Figure D1-25).

At bedrock well MW362, an increasing trend is shown for 2,4-DNT on Figure D1-25. Due to the increasing trend of 2,4-DNT, cleanup time estimates could not be completed. Table 3-6 summarizes the results of this analysis. Decreasing concentrations should eventually be observed for 2,4-DNT as time from the source control measures completed in 2008 increases.

For the in-plume sample point, the decision rule is:

If Cx > upgradient and the best fit trend line for the historic data displays no decrease for >3 years, then additional landfill measures may need to be evaluated. Figure D1-26 has been completed showing that for the last three years (2010, 2011, and 2012) there has been a decreasing trend in 2,4-DNT concentrations. Therefore, additional landfill measures are not required to be evaluated at this time.

With respect to the landfill in-plume monitoring wells, the operative decision rules are the same for the early warning and compliance sampling points for the landfill monitoring area

in which they reside. The 2,4-DNT RG exceedance at downgradient well MW362 has not been determined to be either in-plume, early warning, or compliance points. Therefore, there is no decision rule to apply to this location with exceedances. Well MW362 indicates increasing concentrations, which will likely begin to decline as time from source control measures increases.

The completion of soil source control measures in 2008 is expected to minimize contaminant loading to groundwater allowing natural attenuation mechanisms to contain and diminish groundwater RG exceedances within the GMZ by preventing precipitation from percolating through waste in the future. The presence of explosive breakdown products 2-A-4,6-DNT and 4-A-2,6-DNT detected in samples from monitoring well MW362 indicates that anaerobic degradation is likely occurring within the plume. These compounds are byproducts of the biodegradation of TNT. Natural attenuation mechanisms appear to be limiting the areal extent of groundwater contamination within the GMZ boundary.

3.8.4 Recommendations

Monitoring wells AHEA14R and AEHA15 have been removed from the monitoring program and have been recommended to be abandoned. A replacement downgradient well will be installed along the southern edge of M13 near the midpoint of the landfill boundary.

Future sampling will confirm/refute the suspect exceedances for 2,4-DNT and 2,6-DNT at monitoring wells MW806 and MW126R.

4.0 SUMMARY OF RECOMMENDATIONS

The following sections present a summary of recommendations made in this report that are relevant to the Long-Term Monitoring Program. A summary of the recommendations to the monitoring program, the reasoning for the recommendation, and the status of those recommendations are included in Table 4-1.

The following is a summary of recommendations:

- The monitoring program, as outlined in Table 3-10, should be implemented for the spring 2013 sampling event.

- At Landfill L3 the rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair.

- If the concentration of RDX at monitoring well MW404 does not show an indication of stabilization by October 2013, which would be showing a rate constant < 0 for three or more sampling events, additional evaluation may be necessary as required by the LTM Plan, as stated in Section 3.2.3.

- Monitoring wells AHEA14R and AEHA15 have been removed from the monitoring program and have been recommended to be abandoned. A replacement downgradient monitoring well will be installed along the southern edge of M13 near the midpoint of the landfill boundary.

- Future sampling will confirm/refute the suspect exceedances for 2,4-DNT and 2,6-DNT at several monitoring wells which have had no previous detections for these compounds. Monitoring wells with suspect detections include H7 (L14), MW313 (M6), MW117 and MW118 (other areas), and MW806 and MW126R (M13).

5.0 REFERENCES

Aerostar Environmental Services, Inc. 2009. *Second Five-Year Review Report for the Soil Operable Unit, Joliet Army Ammunition Plant*, prepared for the U.S. Army Corps of Engineers, Louisville District, Louisville, Kentucky, August 2009.

Cookson, John T., 1995. Bioremediation Engineering: Design and Application, McGraw-Hill, Inc.

Gorontzy, T., O. Drzyzga, M.W. Kahl, D. Bruns-Nagel, J. Breitung, E. von Loew, and K.H. Blotevogel, 1994. Microbial Degradation of Explosives and Related Compounds in Critical Reviews in Microbiology, 20(4), CRC Press, Boca Raton, FL.

Haigler, B.E. and J.C. Spain, 1996. Degradation of Nitroaromatic Compounds by Microbes in the Society for Industrial Microbiology News, 46(2), Society for Industrial Microbiology, Fairfax, VA.

Kaplan, D.L., 1993. Biotechnology and Bioremediation in Organic Energetic Compounds, ed. Paul L. Marinkas, Nova Science Publishers, NY, NY.

Rifai, H.S., Borden, R.C., Wilson, J.T. and C.H. Ward. 1995. *Intrinsic Bioattenuation for Subsurface Restoration.* In: Intrinsic Bioremediation, ed. R.E. Hinchee, J.T. Wilson, and D.C. Downey, 1-29. Columbus, OH: Battelle Press.

TolTest/MWH, 2010. *Final Long-term Monitoring Plan for Environmental Remediation Services, Joliet Army Ammunition Plant, Wilmington, IL*, prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, March 2010.

TolTest/MWH, 2011. *Final 2009 Semi-annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL*, prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, September 2011.

TolTest/MWH, 2011. *Final 2009 Annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL*, prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, September 2011.

TolTest/MWH, 2011. *Final 2010 Semi-annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL*, prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, December 2011.

TolTest/MWH, 2012. *Final 2010 Annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL*, prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, May 2012.

TolTest/MWH, 2012. *Final 2011 Semi-annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL*, prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, June 2012.

TolTest/MWH, 2013. *Final 2011 Annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL,* prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, January 2013.

TolTest/MWH, 2013. *Final 2012 Semi-annual Groundwater Monitoring Report, Joliet Army Ammunition Plant, Wilmington, IL,* prepared for United States Army Environmental Command, Aberdeen Proving Ground, MD, April 2013.

U.S. Army, 1998. *Final Record of Decision for the Soil and Groundwater Operable Units on the Manufacturing and Load-Assemble-Package Areas, National Priority List Sites, Joliet Army Ammunition Plant, Wilmington, Will County, Illinois,* October 1998.

Wiedemeier, T.H., 1995. *Technical Protocol for Implementing Intrinsic Remediation with Long-term Monitoring for Natural Attenuation of Fuel Contamination Dissolved in Groundwater,* Vol. I and II, prepared for Air Force Center for Environmental Excellence, Technology Transfer Division, Brooks Air Force Base, San Antonio, Texas.

Wiedemeier, T.H., Swanson, M.A., Moutoux, D.E., Wilson, J.T. Kampbell, D.H., Hansen, J.E., and P. Haas, 1996. *Overview of the Technical Protocol for Natural Attenuation of Chlorinated Aliphatic Hydrocarbons in Ground Water Under Development for the U.S. Air Force Center for Environmental Excellence.* In: U.S. EPA Symposium on Natural Attenuation of Chlorinated Organics in Ground Water. EPA/540/R-96/509. Washington, DC.

TABLES

TABLE 1-1

Fall 2012 Sample Parameters
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Site	Type	Well ID	Parameter
L1	In-plume	MW131	E
		MW173	E
		WES1	E
	Early Warning	WES3	E
		MW174	E
	Compliance	SW550	E
L2	In-plume	MW404	E
	Early Warning	MW620	E
	Compliance	MW621	E
		SW555	E
L3/ Landfill L3	In-plume/Downgradient	MW410	E
		MW412	E, M
	Early Warning/Downgradient	MW630	E, M
		MW631	E, M
		MW633	E, M
	Compliance/Downgradient	SW777	E, M
	Downgradient	SW557	E, M
		SW558	E, M
L14	In-plume	MW511	E
		MW512	E
	Early Warning	H7	E
M1	In-plume	MW107	S
		MW231	S
		MW640	S
		MW641	S
		MW642	S
	Early Warning	MW643	S
		MW644	S
	Compliance	MW645	S
		MW646	S
		MW648	S
		MW649	S
		SW709	S
MFG	In-plume	MW212R	E
		MW330	S
		MW652	E
	Early Warning	MW123R	E
		MW124R	E
		MW162R	E
		MW313	E
		MW318	E
		MW319	E
		MW654	E
	Compliance	MW117	E
		MW118	E
		MW119	E

TABLE 1-1

Fall 2012 Sample Parameters
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Site	Type	Well ID	Parameter
Landfill M11	Upgradient	MW802	E, I, M, SVOC & V
		MW803	E, I, M, SVOC & V
	Downgradient	MW333	E, I, M, SVOC & V
		MW334	E, I, M, SVOC & V
		MW335	E, I, M, SVOC & V
		MW336	E, I, M, SVOC & V
		MW804	E, I, M, SVOC & V
		MW805	E, I, M, SVOC & V
Landfill M13[(1)]	Upgradient	MW806	E, I, M, SVOC & V
		MW807	E, I, M, SVOC & V
	Downgradient	MW126R	E, I, M, SVOC & V
		MW362	E, I, M, SVOC & V
		MW808	E, I, M, SVOC & V
		MW809	E, I, M, SVOC & V

General Notes:
E - Explosives
M - Target Analyte List Metals
S - Sulfate
MFG = Manufacturing Area
I - Indicator parameters (Nitrate-N and Sulfate)
SVOC - Semivolatile organic compounds
V - Volatile Organic Compounds (VOCs)

Footnotes:
(1) Site M13 Landfill monitoring wells were also sampled quarterly in July for these parameters in compliance with Illinois Administrative Code.

Table 2-1

Summary of Final Field Parameters
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Joliet Army Ammunition Plant
Will County, Illinois

Site	Well ID	Sample Date	pH (SU)	Specific Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)
L1	**In-plume**							
	MW131	4/12/2012	7.06	1160	0.2	8.03	9.7	190
		10/29/2012	7.20	1680	4.2	9.86	12.0	117
	MW173	4/11/2012	7.34	811	0.4	4.58	9.0	89
		10/29/2012	7.33	887	31.6	1.18	11.8	-169
	MW174	4/11/2012	7.32	823	0.4	2.77	8.4	-18
		10/29/2012	7.45	840	22.6	1.29	12.9	-34
	WES1	4/12/2012	7.31	839	0.0	6.77	12.8	179
		10/29/2012	7.45	1180	19.3	4.51	11.1	67
	Early Warning							
	WES3	4/11/2012	7.20	775	0.0	0.39	13.2	140
		10/29/2012	7.44	1120	18.1	4.45	11.4	83
	Compliance							
	SW550	4/14/2012	7.67	899	Moderate	15.61	10.4	12.3
		10/30/2012	8.24	619	26.8	6.12	6.1	106
L2	**In-plume**							
	MW404	10/26/2012	7.36	1000	11.0	4.35	13.3	44
	Early Warning							
	MW620	10/26/2012	7.45	910	13.9	4.20	14.3	-101
	Compliance							
	MW621	10/26/2012	7.50	950	4.3	5.13	13.3	14
	SW555	10/26/2012	7.67	899	22.1	--	10.4	123
L3	**Upgradient**							
	SW004	4/10/2012	8.00	720	Moderate	10.39	14.5	176
	In-plume/Downgradient							
	MW410	4/11/2012	7.57	940	12.8	2.31	11.2	115
		10/30/2012	7.30	1450	31.1	4.85	13.5	-131
	MW412	4/11/2012	7.41	819	10.4	6.14	8.4	139
		10/30/2012	7.56	1230	32.1	5.48	12.8	104
	Early wWarning/Downgradient							
	MW630	4/11/2012	7.42	766	3.6	6.90	8.8	113
		10/30/2012	7.53	734	34.9	0.97	13.5	-47
	MW631	4/11/2012	7.53	692	7.1	0.95	9.6	157
		10/30/2012	7.63	701	17.1	0.95	10.9	-76
	MW633	4/11/2012	7.53	677	9.2	3.54	8.8	135
		10/30/2012	7.55	1020	20.1	6.55	12.5	101
	Compliance/Downgradient							
	SW777	4/11/2012	8.31	692	Moderate	11.14	13.7	124
		10/30/2012	8.40	500	19.2	9.17	7.9	28
	Downgradient							
	SW557	4/10/2012	8.34	710	Moderate	10.05	14.5	149
		10/30/2012	7.52	504	17.9	13.32	7.5	8
	SW558	4/10/2012	8.67	682	Slight to Clear	10.97	9.5	148
L14	**In-plume**							
	MW511	10/26/2012	7.50	1110	4.4	10.26	14.0	90
	MW512	10/26/2012	7.45	999	14.8	10.00	16.1	70
	Early Warning							
	H7	10/26/2012	7.50	1200	17.6	9.06	12.0	130
M1	**In-plume**							
	MW107	4/12/2012	9.76	4790	3.3	0.59	11.4	-122
		10/25/2012	9.94	4700	5.2	4.51	15.0	-78
	MW231	4/12/2012	9.40	5940	0.0	0.38	10.3	-158
		10/25/2012	9.60	7300	18.0	2.79	15.6	-325
	MW640	4/12/2012	6.90	9360	6.1	2.54	11.4	-63
		10/25/2012	7.17	9900	29.3	3.83	12.6	-110
	MW641	4/12/2012	7.37	2300	6.9	2.92	9.8	-100
		10/25/2012	7.37	3180	15.0	1.06	15.6	-131
	MW642	4/12/2012	7.47	1500	2.6	1.96	10.4	28
		10/25/2012	7.58	1510	10.0	1.51	15.7	107
	Early Warning							
	MW643	4/13/2012	7.65	839	5.5	8.70	10.1	-47
		10/26/2012	7.38	852	18.4	1.59	13.2	-110
	MW644	4/13/2012	7.70	1090	0.0	3.41	10.0	130
		10/26/2012	7.60	1010	11.8	0.78	12.7	-102
	Compliance							
	MW645	4/13/2012	7.44	839	1.3	2.22	9.5	108
		10/25/2012	7.34	1410	9.3	9.47	15.6	70
	MW646	4/13/2012	7.76	903	0.8	4.13	9.9	115
		10/25/2012	7.61	898	11.9	0.98	14.6	-116
	MW648	4/12/2012	7.62	643	25.9	0.75	9.7	-122
		10/25/2012	7.65	580	19.2	6.41	15.0	104
	MW649	4/13/2012	7.60	684	0.4	1.54	10.0	85
		10/25/2012	7.41	908	10.3	1.87	15.5	-8
	SW709	4/13/2012	7.01	750	Moderate	11.11	12.0	14.1
		10/26/2012	7.79	793	Slight	2.70	13.0	4

Table 2-1

Summary of Final Field Parameters
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Will County, Illinois

Site	Well ID	Sample Date	pH (SU)	Specific Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (°C)	Redox (mV)
MFG	**In-plume**							
	MW212R	4/15/2012	7.51	753	2.1	6.90	10.8	83
		10/23/2012	7.60	757	9.3	1.26	14.2	-71
	MW330	4/17/2012	7.30	1370	13.5	5.39	12.6	125
		10/23/2012	7.23	1420	6.9	4.56	14.0	65
	MW652	4/14/2012	7.23	1290	0.0	0.95	9.8	43
		10/23/2012	7.33	1620	10.9	2.96	14.4	-19
	Early Warning							
	MW123R	4/14/2012	6.97	1240	2.3	0.23	11.2	-60
		10/23/2012	7.13	1870	11.1	3.01	14.0	-153
	MW124R	4/14/2012	7.07	713	9.1	0.00	9.9	-70
		10/23/2012	7.37	689	18.3	0.81	15.7	-136
	MW162R	4/14/2012	7.07	1140	0.0	2.00	11.1	0
		10/23/2012	7.25	1720	10.5	3.69	15.4	-54
	MW313	4/15/2012	7.77	1020	0.0	0.34	14.5	55
		10/23/2012	7.71	2030	4.0	3.62	13.3	-180
	MW318	4/14/2012	7.36	1230	0.1	0.00	10.4	-107
		10/23/2012	7.36	1180	9.0	1.15	13.3	-196
	MW319	4/14/2012	7.55	1330	0.7	1.94	11.5	-45
		10/23/2012	7.43	1280	21.3	0.97	12.7	-192
	MW654	4/15/2012	7.54	1980	0.0	1.79	11.0	60
		10/23/2012	7.65	3080	1.3	3.97	14.7	-201
	Compliance							
	MW117	4/13/2012	7.08	950	1.7	7.11	10.3	-113
		10/23/2012	7.67	1130	16.7	3.58	14.3	-192
	MW118	4/13/2012	7.58	742	1.2	1.75	9.8	97
		10/23/2012	7.77	1240	17.5	6.02	14.8	20
	MW119	4/13/2012	7.28	1910	4.6	0.00	9.8	70
		10/23/2012	7.56	2530	15.1	4.53	15.3	32
Landfill M11	**Upgradient**							
	MW802	4/16/2012	7.51	741	2.6	0.84	10.0	-6
		10/24/2012	7.37	793	32.7	2.39	15.9	-32
	MW803	10/24/2012	7.98	771	9.0	1.89	14.3	-44
	Downgradient							
	MW333	10/24/2012	7.89	675	6.7	0.77	13.6	-1
	MW334	10/24/2012	7.64	1140	7.2	0.77	13.9	-168
	MW335	4/16/2012	7.61	1890	1.1	4.35	9.1	121
		10/24/2012	7.34	1770	11.5	1.01	15.8	-3
	MW336	4/16/2012	7.60	1400	4.2	2.31	9.3	88
		10/24/2012	7.41	1800	10.9	1.21	12.9	-93
	MW804	10/24/2012	7.44	1500	24.2	1.11	14.6	-182
	MW805	4/16/2012	7.77	1510	10.3	3.95	10.3	95
		10/24/2012	7.65	1480	14.1	1.17	13.2	-97
Landfill M13	**Upgradient**							
	MW806	2/29/2012	7.71	751	21.1	5.23	11.7	-43
		4/16/2012	7.66	838	0.0	0.99	11.9	61
		7/17/2012	7.45	1060	3.5	0.19	14.0	-38
		10/24/2012	7.74	1120	9.9	6.22	14.7	-73
	MW807	2/29/2012	7.53	3610	0.0.	0.93	11.9	-163
		4/16/2012	7.27	3790	0.0	0.38	13.4	-104
		7/17/2012	7.27	4950	6.3	0.08	13.8	-154
		10/24/2012	7.43	4960	12.9	4.10	14.2	-111
	Downgradient							
	MW126R	2/29/2012	7.50	1111	18.3	4.11	10.6	37
		4/16/2012	7.41	792	0.0	0.67	12.2	29
		7/17/2012	6.88	1050	7.3	1.37	13.5	115
		10/25/2012	7.11	1110	9.8	6.36	15.5	76
	MW362	2/29/2012	7.60	3028	12.0	3.16	11.8	67
		4/16/2012	7.35	2860	0.7	3.81	12.4	108
		7/17/2012	7.33	3890	2.7	0.76	13.7	147
		10/25/2012	7.39	4420	9.7	5.88	14.0	35
	MW808	2/29/2012	7.00	1635	10.6	2.11	11.6	-78
		4/16/2012	7.16	1430	3.2	4.09	10.4	-52
		7/17/2012	6.88	2160	4.6	0.06	13.2	-84
		10/25/2012	6.84	1590	30.4	1.25	14.1	-53
	MW809	2/29/2012	7.95	623	10.0	5.00	11.8	-165
		4/16/2012	7.83	536	1.3	5.36	12.0	-59
		7/17/2012	7.67	983	6.2	2.22	13.9	-39
		10/25/2012	8.01	520	6.7	1.36	13.9	-40

Notes:
ID = identification
SU = standard units
mS/cm = microsiemens per centimeter
NTU = nephelometric turbidity unit
mg/L = milligrams per liter
°C = degrees Centigrade
mV = millivolt
R = Replacement well
Redox = reduction/oxidation potential

TABLE 2-2

Monitoring Well Information Table - Manufacturing Area
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Area/Well ID	Site	Northing (Feet)	Easting (Feet)	TOC Elevation (MSL)	Ground Elevation (MSL)	Depth to Top of Screen (BGS)	Depth to Bottom of Screen (BGS)	Total Borehole Depth (BGS)	Depth to Water February 2012 (TOC)	Water Elevation February 2012 (MSL)	Depth to Water April 2012 (TOC)	Water Elevation April 2012 (MSL)	Depth to Water July 2012 (TOC)	Water Elevation July 2012 (MSL)	Depth to Water October 2012 (TOC)	Water Elevation October 2012 (MSL)	Depth to Bedrock From Log (BGS)	Bedrock Elevation from Log (MSL)	Year Installed	Formation Designation	Screen Length (Feet)	Casing & Screen Diameter (Inches)
MW104	M1	15019989.44	1318790.51	549.10	546.20	7.0	27.0	30.0	NM	NM	6.05	543.05	NM	NM	11.27	537.83	27.00	519.20	1981	OVB	20.0	4.0
MW105		15020111.69	1320854.13	555.00	552.50	7.0	27.0	29.9	NM	NM	6.01	548.99	NM	NM	11.10	543.90	24.00	528.50	1981	COMBO	20.0	4.0
MW106		15020948.76	1318761.26	542.00	539.70	10.0	30.0	32.0	NM	NM	3.60	538.40	NM	NM	NM	NM	21.00	518.70	1981	COMBO	20.0	4.0
MW107		15021094.20	1320422.28	552.40	549.10	5.5	25.5	27.4	NM	NM	6.06	546.34	NM	NM	11.23	541.17	17.00	532.10	1981	COMBO	20.0	4.0
MW201		15020020.57	1318931.61	546.15	544.01	46.5	66.5	70.5	NM	NM	2.88	543.27	NM	NM	8.48	537.67	24.00	520.01	1988	BRK	20.0	4.0
MW231		15020828.13	1319861.02	550.33	548.47	6.0	16.0	15.7	NM	NM	3.99	546.34	NM	NM	6.35	543.98	16.00	532.47	1988	OVB	10.0	4.0
MW347		15020481.00	1319594.96	551.73	549.84	14.4	24.4	27.0	NM	NM	4.81	546.92	NM	NM	NM	NM	18.50	531.34	1991	COMBO	10.0	4.0
MW351		15021257.77	1319798.88	548.38	545.68	9.5	19.5	22.7	NM	NM	4.91	543.47	NM	NM	8.49	539.89	22.50	523.18	1991	OVB	10.0	4.0
MW640		15021244.24	1319804.02	548.12	545.40	29.0	39.0	40.0	NM	NM	3.95	544.17	NM	NM	8.30	539.82	23.00	522.40	1999	BRK	10.0	4.0
MW641		15021873.45	1319350.19	544.50	541.98	7.0	17.0	17.2	NM	NM	2.22	542.28	NM	NM	5.53	538.97	29.00	516.08	1999	OVB	10.0	4.0
MW642		15021874.37	1319339.91	544.47	541.95	29.0	39.0	40.0	NM	NM	2.75	541.72	NM	NM	6.04	538.43	29.00	516.08	1999	OVB	10.0	4.0
MW643		15022117.67	1318719.85	540.03	537.55	4.3	7.2	7.8	NM	NM	6.73	533.30	NM	NM	8.03	532.00	7.25	530.30	2001	OVB	2.9	4.0
MW644		15022128.91	1318718.61	540.23	537.55	10.8	20.4	21.0	NM	NM	6.22	534.01	NM	NM	8.16	532.07	7.25	530.30	2001	BRK	9.6	4.0
MW645		15022269.11	1318648.69	541.47	538.90	7.5	11.5	12.0	NM	NM	8.53	532.94	NM	NM	9.68	531.79	10.50	528.40	2001	OVB	4.0	4.0
MW646		15022257.26	1318650.53	541.48	539.09	12.3	21.9	22.5	NM	NM	8.49	532.99	NM	NM	9.45	532.03	10.50	528.59	2001	BRK	9.6	4.0
MW647		15022572.85	1318012.98	538.40	535.96	7.3	16.9	17.5	NM	NM	5.69	532.71	NM	NM	11.34	527.06	6.00	529.96	2001	OVB	9.6	4.0
MW648		15022428.25	1319438.13	546.77	544.17	7.3	16.8	17.4	NM	NM	6.03	540.74	NM	NM	9.06	537.71	13.50	530.67	2001	OVB	9.6	4.0
MW649		15021299.49	1318723.15	543.10	540.49	7.0	16.6	17.2	NM	NM	7.24	535.86	NM	NM	13.03	530.07	7.50	532.99	2001	OVB	9.6	4.0
MW111	M3	15028902.95	1318551.57	531.80	529.40	10.5	54.0	UNKNOWN	NM	NM	NM	NM	NM	NM	NM	NM	10.00	519.40	1981	BRK	43.5	4.0
MW112		15030353.67	1318557.88	534.10	531.70	7.2	27.2	UNKNOWN	NM	NM	NM	NM	NM	NM	12.46	521.64	8.00	523.70	1981	BRK	20.0	4.0
MW113		15030379.46	1319676.13	536.32	533.70	7.2	27.2	UNKNOWN	NM	NM	6.0	530.30	NM	NM	11.90	524.42	5.00	528.70	1981	BRK	20.0	4.0
MW154		15027749.55	1318572.52	533.06	529.15	5.5	9.1	UNKNOWN	NM	NM	NM	NM	NM	NM	NM	NM	8.00	521.15	1982	BRK	3.6	UNKNOWN
MW203		15029235.44	1318551.15	534.23	532.02	10.5	25.5	UNKNOWN	NM	NM	NM	NM	NM	NM	NM	NM	5.50	526.52	1988	BRK	15.0	4.0
MW232		15030123.95	1318974.36	535.79	533.38	20.0	35.0	UNKNOWN	NM	NM	NM	NM	NM	NM	NM	NM	7.00	526.38	1988	BRK	15.0	4.0
MW233		15029737.88	1319024.94	535.58	532.96	10.0	25.0	UNKNOWN	NM	NM	NM	NM	NM	NM	9.18	526.40	2.50	530.46	1988	BRK	15.0	4.0
MW348		15029911.26	1318978.02	535.71	532.61	16.5	31.5	UNKNOWN	NM	NM	NM	NM	NM	NM	NM	NM	3.00	529.61	1991	BRK	15.0	4.0
MW352		15029602.85	1318617.32	534.89	532.33	19.0	34.0	UNKNOWN	NM	NM	NM	NM	NM	NM	NM	NM	6.00	526.33	1991	BRK	15.0	4.0
MW353		15030120.63	1318562.29	534.64	531.86	17.0	32.0	UNKNOWN	NM	NM	NM	NM	NM	NM	NM	NM	2.00	529.86	1991	BRK	15.0	4.0
MW115	MFG	15032589.49	1318485.27	533.40	530.80	7.2	27.2	UNKNOWN	NM	NM	4.59	528.81	NM	NM	14.03	519.37	2.00	528.80	1981	BRK	20.0	4.0
MW157	(M4)	15032947.33	1319827.02	535.02	531.37	3.7	10.2	UNKNOWN	NM	NM	4.68	530.34	NM	NM	8.29	526.73	11.00	520.37	1982	COMBO	6.5	2.0
MW158		15032970.89	1319820.01	534.40	531.58	9.0	29.5	31.9	NM	NM	4.06	530.34	NM	NM	7.89	526.51	5.00	526.58	1982	BRK	20.5	3.0
MW114R	MFG	15031315.26	1323651.56	556.80	554.9	6.5	21.5	22.0	NM	NM	NM	NM	NM	NM	NM	NM	15.00	539.90	2001	COMBO	15.0	4.0
MW127R	(M5)	15032537.25	1326273.84	596.04	592.9	30.0	45.0	46.0	NM	NM	42.29	553.75	NM	NM	43.01	553.03	40.00	552.90	2001	COMBO	15.0	4.0
MW207R		15032188.92	1323779.72	560.21	557.5	7.0	17.0	18.0	NM	NM	NM	NM	NM	NM	11.74	548.47	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW354R		15031780.18	1323424.19	559.61	557.6	7.0	17.0	18.0	NM	NM	13.69	545.92	NM	NM	NM	NM	19.00	538.60	2001	COMBO	10.0	4.0
MW355R		15030827.10	1323676.76	558.12	555.7	10.0	20.0	22.0	NM	NM	NM	NM	NM	NM	NM	NM	15.00	540.70	2001	COMBO	10.0	4.0
MW356R		15031372.45	1322053.98	558.08	556.1	24.5	34.5	35.0	NM	NM	16.05	542.03	NM	NM	13.33	544.75	20.00	536.10	2001	BRK	10.0	4.0
MW117	MFG	15036450.18	1318407.67	529.10	526.90	7.7	27.7	UNKNOWN	NM	NM	4.75	524.35	NM	NM	7.53	521.57	12.00	514.90	1981	COMBO	20.0	4.0
MW122	(M6)	15038443.33	1321304.96	540.10	537.40	7.0	27.0	UNKNOWN	NM	NM	4.60	535.50	NM	NM	NM	NM	6.50	530.90	1981	BRK	20.0	4.0
MW123R		15035314.93	1320626.07	537.22	534.9	15.0	30.0	32.0	NM	NM	5.48	531.74	NM	NM	7.30	529.92	10.00	524.90	2001	BRK	15.0	4.0
MW125R		15037201.55	1322981.58	567.69	565.1	12.0	32.0	33.0	NM	NM	14.27	553.42	NM	NM	NM	NM	26.00	539.10	2001	COMBO	20.0	4.0
MW160		15034274.88	1321203.86	542.29	538.20	3.3	6.3	10.4	NM	NM	6.83	535.46	NM	NM	8.74	533.55	6.00	532.20	1982	OVB	3.0	2.0
MW162R		15035325.72	1320625.78	540.19	537.7	4.5	9.5	10.0	NM	NM	5.41	534.78	NM	NM	7.15	533.04	UNKNOWN	UNKNOWN	2001	OVB	5.0	4.0
MW164		15037035.66	1321868.53	545.21	541.69	3.0	6.0	9.7	NM	NM	6.49	538.72	NM	NM	NM	NM	6.00	535.69	1982	OVB	3.0	4.0
MW165		15037644.18	1321700.33	544.01	540.31	2.8	5.3	9.0	NM	NM	5.80	538.21	NM	NM	9.13	534.88	5.00	535.31	1982	OVB	2.5	4.0
MW166R		15039129.45	1322674.99	558.21	555.6	10.0	20.0	21.0	NM	NM	13.70	544.51	NM	NM	14.25	543.96	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW208		15035028.45	1320126.91	538.38	535.10	12.0	27.0	30.1	NM	NM	5.91	532.47	NM	NM	NM	NM	4.00	531.10	1988	BRK	15.0	4.0
MW209		15037473.35	1320271.28	537.75	534.89	19.5	34.5	UNKNOWN	NM	NM	4.37	533.38	NM	NM	NM	NM	11.10	523.79	1988	BRK	15.0	4.0
MW210R		15035465.00	1322154.00	565.83	564.30	10.7	20.0	20.0	NM	NM	10.74	555.09	NM	NM	16.80	549.03	UNKNOWN	UNKNOWN	1998	OVB	10.0	4.0
MW212R		15035415.00	1321862.00	567.74	565.30	9.5	19.5	21.0	NM	NM	14.74	553.00	NM	NM	16.04	551.70	UNKNOWN	UNKNOWN	1998	OVB	10.0	4.0
MW213R		15035462.00	1322159.00	566.49	564.30	38.0	53.0	54.0	NM	NM	19.47	547.02	NM	NM	20.39	546.10	30.50	533.80	1998	BRK	15.0	4.0

TABLE 2-2

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Will County, Illinois

Area/Well ID	Site	Northing (Feet)	Easting (Feet)	TOC Elevation (MSL)	Ground Elevation (MSL)	Depth to Top of Screen (BGS)	Depth to Bottom of Screen (BGS)	Total Borehole Depth (BGS)	Depth to Water February 2012 (TOC)	Water Elevation February 2012 (MSL)	Depth to Water April 2012 (TOC)	Water Elevation April 2012 (MSL)	Depth to Water July 2012 (TOC)	Water Elevation July 2012 (MSL)	Depth to Water October 2012 (TOC)	Water Elevation October 2012 (MSL)	Depth to Bedrock From Log (BGS)	Bedrock Elevation from Log (MSL)	Year Installed	Formation Designation	Screen Length (Feet)	Casing & Screen Diameter (Inches)
MW215R	MFG	15035410.00	1321863.00	567.27	565.30	38.5	53.5	54.5	NM	NM	21.12	546.15	NM	NM	22.17	545.10	30.00	535.30	1998	BRK	15.0	4.0
MW307	(M6)	15033821.00	1321855.79	563.56	561.45	17.0	27.0	31.7	NM	NM	19.55	544.01	NM	NM	20.06	543.50	UNKNOWN	UNKNOWN	1991	OVB	10.0	4.0
MW308		15033810.75	1321837.62	563.84	561.38	50.5	65.5	71.8	NM	NM	21.58	542.26	NM	NM	22.55	541.29	35.00	526.38	1991	BRK	15.0	4.0
MW309		15034826.80	1321825.25	565.59	563.43	12.7	27.7	30.6	NM	NM	11.26	554.33	NM	NM	12.92	552.67	30.00	533.43	1991	OVB	15.0	4.0
MW310R		15034823.00	1321824.00	565.17	563.00	44.5	59.5	60.0	NM	NM	22.06	543.11	NM	NM	NM	NM	31.00	532.00	1998	BRK	15.0	4.0
MW311		15038100.41	1322342.54	548.85	546.36	14.0	24.0	26.4	NM	NM	1.31	547.54	NM	NM	NM	NM	7.00	539.36	1991	BRK	10.0	4.0
MW312	MFG	15038100.56	1322332.55	548.59	545.96	40.0	55.0	58.1	NM	NM	1.04	547.55	NM	NM	NM	NM	7.00	538.96	1991	BRK	15.0	4.0
MW313	(M6)	15037051.68	1321933.96	551.07	549.20	25.0	40.0	40.9	NM	NM	12.03	539.04	NM	NM	16.18	534.89	12.00	537.20	1991	BRK	15.0	4.0
MW314		15034383.61	1321451.49	542.32	539.53	9.7	14.7	17.8	NM	NM	6.90	535.42	NM	NM	9.13	533.19	7.20	532.33	1991	BRK	5.0	4.0
MW315		15034394.61	1321451.65	541.60	538.91	29.7	44.7	47.9	NM	NM	6.19	535.41	NM	NM	NM	NM	6.50	532.41	1991	BRK	15.0	4.0
MW316		15036232.25	1321257.09	542.89	540.49	13.0	18.0	20.9	NM	NM	6.15	536.74	NM	NM	NM	NM	7.50	532.99	1991	BRK	5.0	4.0
MW317		15036222.43	1321257.70	542.96	540.71	34.0	49.0	UNKNOWN	NM	NM	6.68	536.28	NM	NM	9.32	533.64	8.00	532.71	1991	BRK	15.0	4.0
MW318		15037189.67	1321488.64	547.67	545.23	11.8	21.8	24.2	NM	NM	10.12	537.55	NM	NM	13.86	533.81	11.50	533.73	1991	BRK	10.0	4.0
MW319		15037202.65	1321489.84	548.10	545.49	40.0	55.0	57.0	NM	NM	10.43	537.67	NM	NM	14.11	533.99	12.00	533.49	1991	BRK	15.0	4.0
MW320R		15039129.65	1322656.01	557.09	554.6	30.5	45.5	46.0	NM	NM	12.46	544.63	NM	NM	NM	NM	UNKNOWN	UNKNOWN	2001	OVB	15.0	4.0
MW650		15037950.23	1322587.98	566.45	563.83	12.0	22.0	22.5	NM	NM	10.84	555.61	NM	NM	12.06	554.39	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW651		15037939.17	1322583.70	566.88	563.83	36.0	46.0	47.0	NM	NM	18.29	548.59	NM	NM	18.98	547.90	23.00	560.83	1999	BRK	10.0	4.0
MW652		15037004.90	1322243.13	565.03	561.93	11.0	21.0	22.0	NM	NM	11.31	553.72	NM	NM	13.30	551.73	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW653		15036994.58	1322239.14	564.60	561.93	36.0	46.0	47.0	NM	NM	17.69	546.91	NM	NM	18.37	546.23	25.00	536.93	1999	BRK	10.0	4.0
MW654		15037070.77	1321976.938.79	551.15	548.49	13.0	23.0	24.0	NM	NM	12.55	538.60	NM	NM	16.55	534.60	10.50	539.00	1999	BRK	10.0	4.0
MW655		15034232.30	1320633.23	540.19	537.71	UNKNOWN	UNKNOWN	UNKNOWN	NM	NM	7.46	532.73	NM	NM	NM	NM	5.00	532.70	1999	BRK	UNKNOWN	4.0
MW662		15039862.64	1321841.47	547.56	UNKNOWN	6.0	16.0	18.0	NM	NM	9.15	538.41	NM	NM	8.38	539.18	20.00	UNKNOWN	2001	OVB	10.0	4.0
MW663		15039854.92	1321841.41	547.86	UNKNOWN	30.0	40.0	41.0	NM	NM	9.31	538.55	NM	NM	8.77	539.09	20.00	UNKNOWN	2001	BRK	10.0	4.0
MW664		15040136.57	1322326.42	547.43	UNKNOWN	5.0	10.0	10.5	NM	NM	8.62	538.81	NM	NM	NM	NM	10.00	UNKNOWN	2001	OVB	5.0	4.0
MW665		15040145.71	1322327.45	546.98	UNKNOWN	28.0	38.0	40.0	NM	NM	4.94	542.04	NM	NM	5.20	541.78	10.00	UNKNOWN	2001	BRK	10.0	4.0
MW124R	MFG	15033133.00	1320756.00	537.25	534.70	6.0	16.0	16.0	NM	NM	2.90	534.35	NM	NM	4.94	532.31	5.00	UNKNOWN	1998	BRK	10.0	4.0
MW156	(M7)	15032408.65	1321713.49	541.35	537.45	1.7	5.2	UNKNOWN	NM	NM	5.84	535.51	NM	NM	5.93	535.42	5.30	532.15	1982	OVB	3.5	4.0
MW159		15033457.92	1320537.11	537.80	533.54	4.4	9.4	12.8	NM	NM	6.62	531.18	NM	NM	NM	NM	5.70	527.84	1982	COMBO	5.0	4.0
MW216		15033525.60	1320650.62	538.03	536.51	5.0	10.0	36.7	NM	NM	6.60	531.43	NM	NM	9.93	528.10	11.00	525.51	1988	OVB	5.0	4.0
MW217		15033449.66	1320652.62	538.97	536.90	19.5	34.5	12.0	NM	NM	7.03	531.94	NM	NM	NM	NM	13.40	523.50	1988	BRK	15.0	4.0
MW321		15033167.53	1321626.52	545.55	542.93	13.5	23.5	26.6	NM	NM	7.82	537.73	NM	NM	NM	NM	9.50	533.43	1991	BRK	10.0	4.0
MW322		15033161.04	1321640.23	544.54	542.26	34.5	49.5	51.5	NM	NM	10.75	533.79	NM	NM	NM	NM	9.00	533.26	1991	BRK	15.0	4.0
MW660		15032597.24	1320677.38	539.73	537.08	7.0	12.0	12.6	NM	NM	5.85	533.88	NM	NM	8.07	531.66	UNKNOWN	UNKNOWN	1999	OVB	5.0	4.0
MW661		15032587.16	1320679.22	539.57	537.09	20.0	30.0	30.0	NM	NM	6.75	532.82	NM	NM	7.48	532.09	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW147R	MFG	15037926.87	1323318.04	567.82	564.0	6.5	21.5	22.0	NM	NM	11.42	556.40	NM	NM	NM	NM	UNKNOWN	UNKNOWN	2001	OVB	15.0	4.0
MW148R	(M8)	15038954.52	1323542.19	561.59	560.7	8.0	23.0	23.5	NM	NM	15.90	545.69	NM	NM	NM	NM	18.00	542.70	2001	COMBO	15.0	4.0
MW323R		15036514.75	1323739.67	566.00	563.5	8.0	18.0	18.5	NM	NM	1.88	564.12	NM	NM	11.19	554.81	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW324R		15038125.44	1323502.88	566.23	562.7	9.5	19.5	20.0	NM	NM	15.78	550.45	NM	NM	16.76	549.47	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW325R		15036105.38	1322633.31	569.62	566.9	7.0	17.0	18.0	NM	NM	13.77	555.85	NM	NM	14.57	555.05	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW327R		15035974.93	1324366.55	565.27	562.57	13.5	18.5	19.0	NM	NM	12.31	552.96	NM	NM	12.86	552.41	17.00	UNKNOWN	2001	COMBO	5.0	4.0
MW121		15040140.83	1323725.54	575.75	572.50	10.0	30.0	14.2	NM	NM	18.92	556.83	NM	NM	19.36	556.39	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW328		15040352.78	1323793.00	582.93	580.72	18.0	28.0	19.7	NM	NM	24.68	558.25	NM	NM	NM	NM	UNKNOWN	UNKNOWN	1991	OVB	10.0	4.0
MW330		15040218.36	1323970.19	580.33	578.20	15.0	25.0	17.0	NM	NM	22.35	557.98	NM	NM	22.88	557.45	UNKNOWN	UNKNOWN	1991	OVB	10.0	4.0
MW116	MFG	15034538.62	1318460.26	535.20	532.60	7.0	27.0	UNKNOWN	NM	NM	6.33	528.87	NM	NM	12.28	522.92	5.00	527.60	1981	BRK	20.0	4.0
MW118	(Other Areas)	15039343.51	1318362.19	534.00	531.20	8.0	23.0	UNKNOWN	NM	NM	3.71	530.29	NM	NM	3.53	530.47	2.50	528.70	1981	BRK	15.0	4.0
MW119		15040962.12	1320127.86	538.90	535.50	3.3	23.3	UNKNOWN	NM	NM	6.21	532.69	NM	NM	5.78	533.12	6.00	529.50	1981	BRK	20.0	4.0
MW108	M11	15025248.13	1320261.16	543.60	540.80	7.0	27.0	UNKNOWN	NM	NM	7.97	535.63	NM	NM	NM	NM	9.00	531.80	1981	BRK	20.0	4.0
MW333		15026529.41	1319776.92	536.41	533.63	17.9	32.9	UNKNOWN	NM	NM	2.78	533.63	NM	NM	5.63	530.78	5.00	528.63	1991	BRK	15.0	4.0
MW334		15025998.41	1319521.79	536.22	533.40	19.0	34.0	UNKNOWN	NM	NM	3.41	532.81	NM	NM	5.77	530.45	5.00	528.40	1991	BRK	15.0	4.0
MW335		15025671.86	1319364.79	538.36	535.66	9.4	19.4	UNKNOWN	NM	NM	6.11	532.25	NM	NM	9.60	528.76	6.00	529.66	1991	BRK	10.0	4.0
MW336		15025322.08	1319223.43	537.28	534.79	12.0	22.0	UNKNOWN	NM	NM	7.65	529.63	NM	NM	13.51	523.77	7.50	527.29	1991	BRK	10.0	4.0
MW337		15024991.97	1319103.37	536.96	534.32	21.1	36.1	UNKNOWN	NM	NM	5.71	531.25	NM	NM	NM	NM	6.50	527.82	1991	BRK	15.0	4.0

TABLE 2-2

Monitoring Well Information Table - Manufacturing Area
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Area/Well ID	Site	Northing (Feet)	Easting (Feet)	TOC Elevation (MSL)	Ground Elevation (MSL)	Depth to Top of Screen (BGS)	Depth to Bottom of Screen (BGS)	Total Borehole Depth (BGS)	Depth to Water February 2012 (TOC)	Water Elevation February 2012 (MSL)	Depth to Water April 2012 (TOC)	Water Elevation April 2012 (MSL)	Depth to Water July 2012 (TOC)	Water Elevation July 2012 (MSL)	Depth to Water October 2012 (TOC)	Water Elevation October 2012 (MSL)	Depth to Bedrock From Log (BGS)	Bedrock Elevation from Log (MSL)	Year Installed	Formation Designation	Screen Length (Feet)	Casing & Screen Diameter (Inches)
MW338	M11	15024414.06	1318777.52	537.73	534.70	13.5	28.5	UNKNOWN	NM	NM	5.28	532.45	NM	NM	NM	NM	3.00	531.70	1991	BRK	15.0	4.0
MW339		15023897.93	1318660.60	541.27	538.41	9.7	19.7	UNKNOWN	NM	NM	8.44	532.83	NM	NM	NM	NM	9.00	529.41	1991	BRK	10.0	4.0
MW340		15023157.68	1318683.22	542.47	539.83	7.0	17.0	UNKNOWN	NM	NM	8.70	533.77	NM	NM	NM	NM	10.00	529.83	1991	COMBO	10.0	4.0
MW802		15025690.00	1320235.70	543.42	541.62	5.0	15.0	15.0	NM	NM	6.69	536.73	NM	NM	11.95	531.47	9.50	532.12	2008	COMBO	10.0	4.0
MW803		15025697.70	1320237.50	543.66	541.56	26.5	36.5	36.5	NM	NM	3.39	540.27	NM	NM	5.68	537.98	9.50	532.06	2008	BRK	10.0	4.0
MW804		15025916.10	1319219.30	536.48	533.78	5.0	15.0	15.0	NM	NM	5.07	531.41	NM	NM	12.58	523.90	3.50	530.28	2008	COMBO	10.0	4.0
MW805		15025913.60	1319229.60	536.27	533.62	25.0	35.0	35.0	NM	NM	5.18	531.09	NM	NM	12.35	523.92	3.50	530.12	2008	BRK	10.0	4.0
AEHA 14R	M13	15034927.28	1322519.89	569.73	567.03	16.5	26.5	27.0	17.76	551.97	17.83	551.90	18.23	551.50	19.95	549.78	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
AEHA 15		15034695.41	1322493.87	570.38	567.32	UNKNOWN	UNKNOWN	36.5	20.17	550.21	21.07	549.31	20.55	549.83	20.75	549.63	UNKNOWN	UNKNOWN	UNKNOWN	OVB	UNKNOWN	2.0
MW126R		15034092.63	1323332.31	562.41	563.00	11.0	21.0	22.0	16.03	546.38	15.95	546.46	15.46	546.95	15.80	546.61	UNKNOWN	UNKNOWN	2004	OVB	10.0	4.0
MW350		15032810.11	1321811.02	554.34	552.34	12.5	22.5	24.8	NM	NM	15.58	538.76	15.97	538.37	NM	NM	19.00	533.34	1991	COMBO	10.0	4.0
MW362		15034100.64	1323339.44	562.46	562.78	28.0	33.0	34.0	13.11	549.35	13.25	549.21	13.32	549.14	13.52	548.94	29.50	533.28	2004	BRK	5.0	4.0
MW363		15032768.31	1322536.05	570.03	567.66	21.0	31.0	32.0	27.85	542.18	27.90	542.13	28.12	541.91	28.08	541.95	31.50	536.16	2004	OVB	10.0	4.0
MW364		15032775.38	1322527.16	569.82	567.69	37.0	42.0	42.5	27.72	542.10	27.68	542.14	27.98	541.84	27.77	542.05	31.50	536.19	2004	BRK	5.0	4.0
MW806		15034807.20	1323337.90	565.53	UNKNOWN	15.0	25.0	25.0	13.98	551.55	14.09	551.44	13.93	551.60	14.19	551.34	29.00	UNKNOWN	2008	OVB	10.0	4.0
MW807		15034817.40	1323338.10	565.79	UNKNOWN	35.0	45.0	45.0	15.41	550.38	15.63	550.16	15.78	550.01	15.92	549.87	29.00	UNKNOWN	2008	BRK	10.0	4.0
MW808		15034539.90	1322493.10	569.23	UNKNOWN	15.0	25.0	25.0	17.38	551.85	17.09	552.14	17.63	551.60	19.87	549.36	30.00	UNKNOWN	2008	OVB	10.0	4.0
MW809		15034530.20	1322492.90	569.18	UNKNOWN	35.0	45.0	45.0	20.11	549.07	20.32	548.86	19.93	549.25	20.11	549.07	30.00	UNKNOWN	2008	BRK	10.0	4.0

Notes:

Coordinates are Universal Transverse Mercator (UTM), Zone 16 East, North American Datum 1983 (NAD83)

UNKOWN = indicate data not presented on borelogs or provided in RI/FS documentation.

NM = Water level not measured.

BRK = Bedrock

OVB = Overburden

COMBO = Combination Overburden and Bedrock Well

MSL = Feet relative to mean seal level

BGS = Feet below ground surface

ID = identification

TOC = Top of Casing

TABLE 2-3

Monitoring Well Information Table - LAP Area
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Area/Well ID	Site	Northing (Feet)	Easting (Feet)	TOC Elevation (MSL)	Ground Elevation (MSL)	Depth to Top of Screen (BGS)	Depth to Bottom of Screen (BGS)	Total Borehole Depth (BGS)	Depth to Water April 2012 (TOC)	Water Elevation April 2012 (MSL)	Depth to Water October 2012 (TOC)	Water Elevation October 2012 (MSL)	Depth to Bedrock From Log (BGS)	Bedrock Elevation from Log (MSL)	Year Installed	Formation Designation	Screen Length (Feet)	Casing & Screen Diameter (Inches)
MW131	L1	15029483.20	1344039.100	625.01	622.29	2.5	22.5	24.0	18.02	606.99	23.12	601.89	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW171		15028774.67	1343406.032	618.24	615.03	2.9	7.9	11.1	10.75	607.49	DRY	DRY	8.00	607.03	1982	OVB	5.0	4.0
MW172		15028836.84	1344094.147	615.87	613.19	14.5	34.5	37.5	12.52	603.35	10.93	604.94	11.00	602.19	1982	BRK	20.0	4.0
MW173		15028827.26	1344123.204	615.56	612.56	2.8	11.8	15.2	12.25	603.31	10.70	604.86	12.00	600.56	1982	OVB	9.0	3.6
MW174		15028974.94	1344649.467	615.32	612.40	3.5	14.5	18.1	12.03	603.29	10.40	604.92	15.00	597.40	1982	OVB	11.0	3.6
MW175		15029420.69	1343046.596	634.45	630.96	3.7	19.7	23.2	15.14	619.31	DRY	DRY	20.00	610.96	1982	OVB	16.0	3.6
MW176		15030320.57	1343491.565	646.77	643.49	4.8	20.8	23.6	24.42	622.35	DRY	DRY	20.80	622.69	1982	OVB	16.0	3.6
MW177		15028773.31	1343380.183	616.29	613.84	11.8	31.0	33.4	7.99	608.30	10.94	605.35	6.50	607.34	1983	BRK	19.2	3.0
MW178		15030330.01	1343512.024	643.83	640.39	27.3	46.5	50.1	28.01	615.82	37.20	606.63	20.00	620.39	1983	BRK	19.2	3.0
MW400		15030872.22	1344840.211	655.17	652.56	16.2	26.2	28.6	NM	NM	NM	NM	21.00	631.56	1991	COMBO	10.0	4.0
MW401		15028228.22	1344007.476	611.96	610.20	28.5	43.5	46.1	10.46	601.50	7.28	604.68	16.00	594.20	1991	BRK	15.0	4.0
WES1		15029404.21	1343978.508	623.13	621.43	20.0	40.0	40.0	16.76	606.37	17.72	605.41	20.00	601.43	1997	BRK	20.0	4.0
WES2		15029874.92	1343699.213	637.69	635.98	22.0	42.0	42.0	26.11	611.58	31.62	606.07	22.00	613.98	1997	BRK	20.0	4.0
WES3		15028686.71	1344093.581	611.69	610.33	20.0	40.0	40.0	4.63	607.06	6.73	604.96	20.00	590.33	1997	BRK	20.0	4.0
MW610		15028213.06	1344005.102	612.63	609.62	4.0	14.0	14.0	11.22	601.41	9.01	603.62	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW611		15027976.15	1344327.569	620.45	617.83	10.0	20.0	21.0	14.01	606.44	15.31	605.14	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW132	L2	15026868.16	1339653.570	612.30	609.84	7.5	27.5	29.4	NM	NM	10.32	601.98	18.00	591.84	1981	COMBO	20.0	4.0
MW133		15026726.48	1338362.506	605.88	603.51	7.2	27.2	28.7	NM	NM	6.14	599.74	19.50	584.01	1981	COMBO	20.0	4.0
MW134		15025646.63	1338233.841	613.30	609.70	6.7	26.7	27.1	6.82	606.48	10.42	602.88	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW135		15025761.10	1339631.781	637.35	634.18	6.0	26.0	27.0	NM	NM	22.89	614.46	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW404		15026798.76	1338548.502	605.88	604.09	7.7	17.7	20.5	NM	NM	6.29	599.59	12.00	592.09	1991	COMBO	10.0	4.0
MW405		15027072.91	1338771.791	607.21	605.16	10.8	20.8	23.5	NM	NM	7.52	599.69	16.00	589.16	1991	COMBO	10.0	4.0
MW406		15026560.78	1339282.341	623.13	620.72	23.8	33.8	35.7	NM	NM	21.31	601.82	29.00	591.72	1991	COMBO	10.0	4.0
MW407		15026676.15	1339269.053	620.05	618.30	20.5	30.5	33.9	NM	NM	NM	NM	25.50	592.80	1991	COMBO	10.0	4.0
MW501		15025985.85	1338411.03	617.05	614.72	12.7	22.7	NA	NM	NM	NM	NM	25.00	589.72	1991	OVB	10.0	4.0
MW620		15027048.61	1338602.438	605.07	602.41	7.0	17.0	18.0	NM	NM	5.37	599.70	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW621		15027058.70	1338599.038	604.96	602.41	22.0	32.0	32.8	NM	NM	5.11	599.85	20.00	582.41	1999	BRK	10.0	4.0
MW810		15027142.71	1338476.770	604.58	601.91	7.0	17.3	18.0	NM	NM	5.38	599.20	UNKNOWN	UNKNOWN	2009	OVB	10.0	4.0
MW1	L3	15025237.01	1338193.456	630.63	628.68	16.5	26.5	27.8	16.77	613.86	20.70	609.93	UNKNOWN	UNKNOWN	1986	OVB	10.0	2.0
MW136		15024523.06	1337305.702	602.70	600.8	7.2	27.2	NA	8.22	594.48	10.63	592.07	11.00	589.80	1981	COMBO	20.0	4.0
MW137		15024661.00	1338608.636	632.90	631.40	7.0	27.0	28.7	4.55	628.35	24.35	608.55	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW3		15025504.29	1337801.715	610.34	608.50	9.0	19.0	20.9	4.87	605.47	7.21	603.13	19.00	589.50	1986	OVB	10.0	2.0
MW410		15025282.41	1337409.613	604.38	NA	8.0	18.0	20.3	12.06	592.32	12.98	591.40	UNKNOWN	UNKNOWN	1993	OVB	10.0	4.0
MW411		15024977.88	1337383.946	616.71	NA	13.0	23.0	25.1	19.10	597.61	22.20	594.51	18.00	594.54	1991	COMBO	10.0	4.0
MW412		15024596.02	1337101.399	599.14	597.41	7.4	17.4	19.2	6.48	592.66	9.78	589.36	3.00	594.41	1991	BRK	10.0	4.0

TABLE 2-3

Monitoring Well Information Table - LAP Area
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Area/Well ID	Site	Northing (Feet)	Easting (Feet)	TOC Elevation (MSL)	Ground Elevation (MSL)	Depth to Top of Screen (BGS)	Depth to Bottom of Screen (BGS)	Total Borehole Depth (BGS)	Depth to Water April 2012 (TOC)	Water Elevation April 2012 (MSL)	Depth to Water October 2012 (TOC)	Water Elevation October 2012 (MSL)	Depth to Bedrock From Log (BGS)	Bedrock Elevation from Log (MSL)	Year Installed	Formation Designation	Screen Length (Feet)	Casing & Screen Diameter (Inches)
MW630	L3	15024770.15	1337013.674	595.06	592.23	7.0	12.0	12.7	6.73	588.33	7.48	587.58	4.00	588.20	1999	BRK	5.0	4.0
MW631		15024764.63	1337010.736	595.09	592.23	16.0	26.0	27.0	4.76	590.33	6.29	588.80	4.00	588.20	1999	BRK	10.0	4.0
MW632		15024828.58	1336912.350	606.25	603.75	12.0	27.2	27.5	15.89	590.36	16.87	589.38	UNKNOWN	UNKNOWN	2009	BRK	15.0	4.0
MW633		15024474.50	1336978.448	600.37	597.90	7.0	17.0	18.0	8.89	591.48	11.91	588.46	5.00	592.90	1999	BRK	10.0	4.0
H-7	L14	15019448.58	1332662.795	584.62	581.45	4.0	14.0	15.5	NM	NM	12.11	572.51	12.00	569.45	1982	OVB	10.0	2.0
H-8		15019409.64	1333457.292	591.40	588.14	7.0	22.0	22.9	NM	NM	14.19	577.21	20.00	568.14	1982	OVB	15.0	2.0
MW140		15018819.68	1332901.750	584.59	581.68	7.0	27.0	30.3	NM	NM	10.94	573.65	22.00	559.68	1981	COMBO	20.0	4.0
MW508		15019632.37	1333106.169	587.44	585.34	10.0	20.0	22.9	NM	NM	10.71	576.73	UNKNOWN	UNKNOWN	1993	OVB	10.0	4.0
MW511		15019645.92	1333029.631	587.45	584.98	4.0	14.0	17.0	NM	NM	11.11	576.34	16.00	568.98	1997	OVB	10.0	4.0
MW512		15019541.13	1333111.131	588.04	585.98	5.0	15.0	18.2	NM	NM	11.26	576.78	16.00	569.98	1997	OVB	10.0	4.0
MW600		15019920.13	1332928.643	587.22	584.75	6.0	11.0	11.0	NM	NM	10.65	576.57	11.00	573.75	1998	OVB	5.0	2.0
MW601		15019196.31	1333121.302	586.72	584.29	9.0	19.0	20.0	NM	NM	11.08	575.64	19.60	564.69	1998	OVB	10.0	2.0
MW602		15019432.73	1332663.469	583.83	581.22	21.0	31.0	31.0	NM	NM	13.13	570.70	12.00	569.20	1999	BRK	10.0	4.0
MW603		15019323.75	1332379.579	580.77	578.27	6.0	16.0	16.0	NM	NM	11.09	569.68	13.00	565.30	1999	OVB	10.0	4.0
MW604		15019335.87	1332379.437	581.12	578.27	20.0	30.0	31.0	NM	NM	11.31	569.81	13.00	565.30	1999	BRK	10.0	4.0

General Notes

Coordinates are Universal Transverse Mercator (UTM), Zone 16 East, North American Datum 1983 (NAD83)

UNKOWN = indicate data not presented on borelogs or provided in RI/FS documentation.

NM = Water level not measured.

BRK = Bedrock

OVB = Overburden

COMBO = Combination Overburden and Bedrock Well

MSL = Feet relative to mean seal level

BGS = Feet below ground surface

ID = identification

TOC = Top of Casing

TABLE 2-4

Surface Water Elevations
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Site	Surface Water Location	Surface Water Elevation			
		Date	ft (MSL)	Date	ft (MSL)
L1	SW550	4/10/2012	603.85	10/29/2012	604.11
L2	SW555	NM	NM	10/29/2012	600.24
L3	SW558	4/10/2012	595.56	DRY	**DRY**
	SW777	4/10/2012	588.07	10/29/2012	587.80
	SW004	4/10/2012	589.43	10/29/2012	589.72
M1	SW709	4/13/2012	532.71	10/25/2012	532.64

Notes:
ft = feet
MSL = Mean Sea Level

Table 3-1

Summary of Analytical Results - Explosives
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**1,3-DNB**		**2,4-DNT**		**2,6-DNT**		**2-A-4,6-DNT**		**4-A-2,6-DNT**		**HMX**		**NB**		**2-NT**		**3-NT**		**4-NT**		**RDX**		**Tetryl**		**1,3,5-TNB**		**2,4,6-TNT**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[(1)]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L1	***In-Plume***																													
	MW131	4/12/2012	5.4	/ J	<3.1		<3.1		65		70		<3.1		<1.6		<3.1		<3.1		<3.1		<1.6		<3.9		<1.6		**2200**	
	MW131	10/29/2012	<16		<31		<31		<31		35		<31		<16		<31		<31		<31		<16		<39		<16		**1000**	
	WES1	4/12/2012	<1.6		<3.1		<3.1		13		21	/ J	<3.1		3.9		<3.1		<3.1		<3.1		<1.6		<3.9		**40**	/ J	**38**	
	WES1	10/29/2012	<0.8		<1.6		<1.6		8.1	/ J	9.1		<1.6		<0.8		<1.6		<1.6		<1.6		<0.8		<2		<0.8		6.4	
	MW173	4/11/2012	<0.16		<0.31		<0.31		4.8		5.4		1.4	/ J	<0.16		<0.31		<0.31		<0.31		**10**		<0.39		<0.16		**12**	
	MW173	10/29/2012	<0.8		<1.6		<1.6		<1.6	U / J	<1.6	U / J	<1.6		<0.8	U / J	<1.6		<1.6	U / J	<1.6	U / J	<0.8	U / J	<2	U / J	<0.8		<0.8	U / J
	MW173(DUP)	10/29/2012	<0.8		<1.6		<1.6		4.3		4.3		<1.6		<0.8		<1.6		<1.6		<1.6		**6.2**	/ J	<2		<0.8		2.8	
	Early Warning																													
	MW174	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW174	10/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	WES3	4/11/2012	<0.16		<0.31		<0.31		0.67		1		<0.31		<0.16		<0.31		<0.31		<0.31		0.74		<0.39		0.2		1.2	
	WES3	10/29/2012	<0.16		<0.31		<0.31		0.82		0.95		<0.31		<0.16		<0.31		<0.31		<0.31		0.43		<0.39		<0.16		0.76	
	Compliance																													
	SW550	4/12/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	SW550	10/30/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
L2	***In-Plume***																													
	MW404	10/26/2012	<0.16		0.21	F /	<0.31		<0.31		<0.31		33		<0.16		0.54	/ J	<0.31		0.65	/ J	**130**		<0.39		<0.16		<0.16	
	Early Warning																													
	MW620	10/26/2012	<0.16		0.29	F /	0.13	F /	<0.31		<0.31		<0.31		<0.16		0.28	F /	<0.31		1.5	/ J	<0.16		<0.39		<0.16		<0.16	
	Compliance																													
	MW621	10/26/2012	<0.16		0.42		<0.31		<0.31		<0.31		<0.31		<0.16		0.24	F /	<0.31		0.4		<0.16		<0.39		<0.16		<0.16	
	SW555	10/26/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
L3	***Upgradient***																													
	SW004	4/12/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	In-Plume/Downgradient																													
	MW410	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW410	10/30/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW412	4/11/2012	<0.16		<0.31		<0.31		0.89		1.7		28	/ J	0.24		<0.31		<0.31		<0.31		**120**		<0.39		0.11	F / J	<0.16	
	MW412	10/30/2012	<0.16		<0.31		<0.31		<0.31		1.9		26		<0.16		<0.31		<0.31		<0.31		**120**		<0.39		<0.16		<0.16	
	Early Warning/Downgradient																													
	MW630	4/11/2012	<0.16		<0.31		<0.31		0.077	F / J	0.18	F / J	4.7	/ J	<0.16		<0.31		<0.31		<0.31		**8.7**		<0.39		<0.16		<0.16	
	MW630(DUP)	4/11/2012	<0.16		<0.31		<0.31		0.072	F / J	0.15	F / J	4.7	/ J	<0.16		<0.31		<0.31		<0.31		**8.7**		<0.39		<0.16		<0.16	
	MW630	10/30/2012	<0.16		<0.31		<0.31		<0.31		<0.31		0.35		<0.16		<0.31		<0.31		<0.31		0.36		<0.39		<0.16		<0.16	
	MW631	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW631	10/30/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW631(DUP)	10/30/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW633	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		2	/ J	<0.16		<0.31		<0.31		<0.31		**6.7**		<0.39		<0.16		<0.16	
	MW633	10/30/2012	<0.16		<0.31		0.13	F / J	<0.31		<0.31		2.7		<0.16		<0.31		<0.31		<0.31		**10**		<0.39		<0.16		<0.16	
	Compliance/Downgradient																													
	SW777	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		0.25		<0.39		<0.16		<0.16	
	SW777	10/30/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	Downgradient																													
	SW557	4/10/2012	<0.16		<0.31		<0.31		<0.31		<0.31		1.1	/ J	<0.16		<0.31		<0.31		<0.31		3.2		<0.39		<0.16		<0.16	
	SW557	10/30/2012	<0.16		<0.31		0.44	/ J	<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	SW558	4/10/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

Table 3-1

Summary of Analytical Results - Explosives
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Will County, Illinois

		Compound	**1,3-DNB**		**2,4-DNT**		**2,6-DNT**		**2-A-4,6-DNT**		**4-A-2,6-DNT**		**HMX**		**NB**		**2-NT**		**3-NT**		**4-NT**		**RDX**		**Tetryl**		**1,3,5-TNB**		**2,4,6-TNT**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[(1)]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L14	***In-Plume***																													
	MW511	10/26/2012	<0.16		0.41		0.17	F / J	<0.31		<0.31		11		<0.16		0.32		<0.31		0.5		**76**		<0.39		<0.16		<0.16	
	MW512	10/26/2012	<0.16		0.39		0.18	F / J	1.5		2.1		58		<0.16		0.33		<0.31		0.5		**220**		<0.39		<0.16		<0.16	
	Early Warning																													
	H7	10/26/2012	<0.16		**1.5**		**0.58**		<0.31		<0.31		<0.31		<0.16		1.4		<0.31		1.5		0.97		<0.39		<0.16		<0.16	
MFG	***In-Plume***																													
(M6)	MW212R	4/15/2012	1.1	F /	**620**		**260**		64	/ J	51	/ J	<3.1		1.9		4100		<3.1		2100		<1.6		<3.9		<1.6		**39**	
	MW212R	10/23/2012	<16		**2500**		**640**		270	/ J	160	/ J	<31		<16		**12000**		<31		6700		<16		<39		<16		**200**	
	MW212R(DUP)	10/23/2012	<16		**3200**		**920**		290	/ J	170	/ J	<31		<16		**15000**		<31		7900		<16		<39		<16		**340**	
	MW652	4/14/2012	9.5	F /	**8400**		**3300**		360		380	/ J	<31		<16		**44000**		<31		28000		<16		<39		<16		**1600**	
	MW652(DUP)	4/14/2012	7.9	F /	**6800**		**2700**		320		320	/ J	<31		<16		**35000**		<31		22000	/ J	<16		<39		<16		**1300**	
	MW652	10/23/2012	<16		**5100**		**2000**		280	/ J	230	/ J	<31		<16		**23000**		<31		14000		<16		<39		<16		**950**	
(M6)	***Early Warning***																													
	MW123R	4/14/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW123R(DUP)	4/14/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW123R	10/23/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW162R	4/14/2012	<0.16		0.27	F / J	0.14	F /	<0.31		<0.31		<0.31		<0.16		0.7		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW162R	10/23/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW313	4/15/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW313	10/23/2012	<1.6		**5**		**3.3**	/ J	<3.1		<3.1		<3.1		<1.6		44		<3.1		28		<1.6		<3.9		<1.6		<1.6	
	MW318	4/14/2012	<0.32		0.21	F / J	**0.45**	F / J	<0.62		<0.62		<0.62		<0.32		<0.62		<0.62		<0.62		<0.32		<0.78		<0.32		<0.32	
	MW318	10/23/2012	<0.8		<1.6		<1.6		<1.6		<1.6		<1.6		<0.8		<1.6		<1.6		<1.6		<0.8		<2		<0.8		<0.8	
	MW319	4/14/2012	<0.32		<0.62		<0.62		<0.62		<0.62		<0.62		<0.32		<0.62		<0.62		<0.62		<0.32		<0.78		<0.32		0.29	F / J
	MW319	10/23/2012	<0.8		<1.6		<1.6		<1.6		<1.6		<1.6		<0.8		<1.6		<1.6		<1.6		<0.8		<2		<0.8		<0.8	
	MW654	4/15/2012	<0.16		**1.7**		**0.97**		0.7		2.2		<0.31		<0.16		18		0.23	F / J	11		0.31	/ J	<0.39		<0.16		0.18	/ J
	MW654	10/23/2012	<1.6		**8.9**		**4.8**		<3.1		<3.1		<3.1		<1.6		86		<3.1		52		<1.6		<3.9		<1.6		<1.6	
(M7)	MW124R	4/14/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW124R	10/23/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
(M6)	***Compliance***																													
(Other Areas)	MW117	4/13/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / UJ	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW117	10/23/2012	<1.6	U / UJ	**2.6**	F / J	<3.1	U / UJ	<3.1	U / UJ	<3.1	U / UJ	<3.1	U / UJ	<1.6	U / UJ	24	/ J	<3.1	U / UJ	16	/ J	<1.6	U / UJ	<3.9	U / UJ	<1.6	U / UJ	<1.6	U / UJ
	MW118	4/13/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / UJ	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW118	10/23/2012	<1.6	U / UJ	**2.3**	F / J	<3.1	U / UJ	<3.1	U / UJ	<3.1	U / UJ	<3.1	U / UJ	<1.6	U / UJ	20	/ J	<3.1	U / UJ	15	/ J	<1.6	U / UJ	<3.9	U / UJ	<1.6	U / UJ	<1.6	U / UJ
	MW119	4/13/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / UJ	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW119	10/23/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
M11	***Upgradient***																													
	MW802	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW802	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW803	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	Downgradient																													
	MW333	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW334	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW335	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW335	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW336	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW336	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / J	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW336(DUP)	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW804	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW805	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW805	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

Table 3-1

Summary of Analytical Results - Explosives
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**1,3-DNB**		**2,4-DNT**		**2,6-DNT**		**2-A-4,6-DNT**		**4-A-2,6-DNT**		**HMX**		**NB**		**2-NT**		**3-NT**		**4-NT**		**RDX**		**Tetryl**		**1,3,5-TNB**		**2,4,6-TNT**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[(1)]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Upgradient***																													
	MW806	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW806	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW806	7/17/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW806	10/24/2012	<0.16		**1.4**		**0.96**		<0.31		<0.31		<0.31		<0.16		5.5		<0.31		5		<0.16		<0.39		<0.16		<0.16	
	MW807	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW807	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW807	7/17/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW807	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	Downgradient																													
	AEHA14R	3/1/2012	<0.16		<0.31		<0.31		0.79		1.1		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	AEHA15	3/1/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	Downgradient																													
	MW126R	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW126R	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		0.35		<0.31		0.3	F /	<0.16		<0.39		<0.16		<0.16	
	MW126R	7/17/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW126R	10/25/2012	<0.16		**1.1**		**0.62**		<0.31		<0.31		<0.31		<0.16		2.1		0.17	F / J	2.4		<0.16		<0.39		0.22		<0.16	
	MW362	2/29/2012	<0.16		**1.5**		<0.31		0.83		0.78		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW362	4/16/2012	<0.16		**4.9**		<0.31		1.2		1.1		<0.31		<0.16		0.24	F / J	<0.31		<0.31	U / UJ	<0.16		<0.39		<0.16		0.073	F /
	MW362(DUP)	4/16/2012	<0.16		**5.4**		<0.31		1.2		1		<0.31		<0.16		2	/ J	0.19	F /	1.9	/ J	<0.16		<0.39		<0.16		0.097	F /
	MW362	7/17/2012	<0.16		**3.6**		**0.68**		1.6		1.3		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW362	10/25/2012	<0.16		**6.7**		**1**		1.4		0.97		<0.31		<0.16		1.6		0.16	F /	1.9		**13**		<0.39		<0.16		0.08	F /
	MW808	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	7/18/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808(DUP)	7/18/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	10/25/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809(DUP)	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	7/18/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	10/25/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809(DUP)	10/25/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

Footnotes:
(1) Project Action Limits (Remedial Goal{RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the *Long Term Monitoring Plan* (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:
Only data collected in 2012 are shown.
< = Result shows laboratory Method Reporting Limit for non-detected results
µg/L = microgram per liter
1,3,5-TNB = 1,3,5-Trinitrobenzene
1,3-DNB = 1,3-Dinitrobenzene
2,4,6-TNT = 2,4,6-Trinitrotoluene
2,4-DNT = 2,4-Dinitrotoluene
2,6-DNT = 2,6-Dinitrotoluene
2-A-4,6-DNT = 2-amino-4,6-Dinitrotoluene
2-NT = 2-Nitrotoluene
3-NT = 3 Nitrotoluene
4-A-2,6-DNT = 4-amino-2,6-Dinitrotoluene
4-NT = 4-Nitrotoluene

Bolded result indicates Project Action Limit (RG) exceedance
DUP = duplicate
F = Concentration below the reported detection limit
HMX = High melting explosive
J = Estimated concentration
LF/VF = Lab Flag/Validation Flag
NB = Nitrobenzene
NJ = presumptive evidence that compound concentration is estimated
NS = No standard
RDX = Royal demolition explosive
U = Not detected
UJ = Not detected, estimated detection limit

Table 3-2

Summary of Analytical Results - Target Analyte List Metals
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Analyte	Aluminum		Antimony		Arsenic		Barium		Cadmium		Calcium		Chromium		Cobalt		Copper		Iron		Lead		Magnesium		Manganese		Mercury		Nickel		Potassium		Silver		Sodium		Vanadium		Zinc	
		Units	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
		Project Action Limit[1]	100		0.024		0.2		NS		0.05		NS		1.0		NS		NS		5.0		0.1		NS		10		NS		NS		NS		0.511		NS		NS		10	
		Surface Water RG	NS		0.61		0.16		5		0.0023		NS		0.44		NS		0.026		1.0		0.064		NS		1.0		0.103		1.0		NS		0.005		NS		NS		1.0	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L3	***Upgradient***																																											
	SW004	4/10/2012	<0.20		<0.020		<0.010		0.039		0.0009	F /	73		<0.010		<0.0050		0.018	/ U	<0.20		<0.0050		38		0.09		<0.20		<0.010		1.4		<0.0050		15		<0.0050		<0.020	
	In-Plume/Downgradient																																											
	MW412	4/11/2012	<0.20		<0.020		<0.010		0.042		0.0011	F /	96		<0.010		<0.0050		0.026	/ U	<0.20		<0.0050		51		<0.010		<0.20		<0.010		1		<0.0050		7.7		<0.0050		<0.020	
	MW412	10/30/2012	<0.2		<0.02		<0.01		0.053		0.00093	F /	100		<0.01		<0.005		0.0018	F /	<0.2		0.0017	F /	52		<0.01		<0.2		<0.01		1.4		<0.005		11		<0.005		<0.02	
	Early Warning/Downgradient																																											
	MW630	4/11/2012	<0.20		<0.020		<0.010		0.011		0.00078	F /	83		<0.010		<0.0050		0.027	/ U	<0.20		<0.0050		43		0.033		<0.20		<0.010		4.4		<0.0050		22		<0.0050		0.0087	F /
	MW630(DUP)	4/11/2012	<0.20		<0.020		<0.010		0.011		0.00087	F /	84		<0.010		<0.0050		0.02	/ U	<0.20		<0.0050		44		0.032		<0.20		<0.010		4.4		<0.0050		22		<0.0050		<0.020	
	MW630	10/30/2012	<0.2		0.0026	F /	<0.01		0.012	/ F	0.00081	F /	78		<0.01		<0.005		0.0019	F /	<0.2		<0.005		40		0.019		<0.2		<0.01		5.5		<0.005		27		<0.005		<0.02	
	MW631	4/11/2012	<0.20		<0.020		<0.010		0.017		0.00082	F /	67		<0.010		<0.0050		0.015	/ U	<0.20		<0.0050		36		0.022		<0.20		<0.010		4.9		<0.0050		28		<0.0050		<0.020	
	MW631	10/30/2012	<0.2		<0.02		<0.01		0.017		0.0007	F /	67		<0.01		<0.005		0.0011	F /	0.17	F /	<0.005		35		0.029		<0.2		<0.01		5.3		<0.005		29		<0.005		<0.02	
	MW631(DUP)	10/30/2012	<0.2		<0.02		<0.01		0.017		0.00071	F /	67		<0.01		<0.005		0.0012	F /	0.14	F /	0.0017	F /	34		0.029		<0.2		<0.01		5.2		<0.005		29		<0.005		<0.02	
	MW633	4/11/2012	<0.20		<0.020		<0.010		0.047		0.00079	F /	83		<0.010		<0.0050		0.023	/ U	<0.20		<0.0050		37		<0.010		<0.20		<0.010		1		<0.0050		5.7		<0.0050		<0.020	
	MW633	10/30/2012	0.069	F /	<0.02		<0.01		0.062		0.0007	F /	93		0.0012	F /	<0.005		0.0027	F /	0.16	F /	<0.005		41		0.0016	F /	<0.2		<0.01		1.4		<0.005		7.9		0.00087	F /	<0.02	
	Compliance/Downgradient																																											
	SW777	4/11/2012	<0.20		<0.020		<0.010		0.039		0.00087	F /	73		<0.010		<0.0050		0.0041	F / U	<0.20		<0.0050		39		0.06		<0.20		<0.010		1.4		<0.0050		14		<0.0050		0.0087	F /
	SW777	10/30/2012	<0.2		<0.02		<0.01		0.026		0.00076	F /	42		<0.01		<0.005		0.0029	F /	<0.2		0.0019	F /	35		0.0046	F /	<0.2		<0.01		3		<0.005		8.6		<0.005		0.0053	F /
	Downgradient																																											
	SW557	4/10/2012	<0.20		<0.020		<0.010		0.039		0.00085	F /	75		<0.010		<0.0050		0.023	/ U	<0.20		<0.0050		39		0.072		<0.20		<0.010		1.4		<0.0050		15		<0.0050		<0.020	
	SW557	10/30/2012	<0.2		<0.02		<0.01		0.027		0.0008	F /	43		<0.01		<0.005		0.0025	F /	<0.2		<0.005		35		0.0013	F /	<0.2		<0.01		2.7		<0.005		8.7		<0.005		<0.02	
	SW558	4/10/2012	<0.20		<0.020		<0.010		0.042		0.00079	F /	80		<0.010		<0.0050		0.0066	F / U	<0.20		<0.0050		43		0.0027	F /	<0.20		<0.010		1		<0.0050		6.2		<0.0050		<0.020	
M11	***Upgradient***																																											
	MW802	4/16/2012	<0.20		<0.020		<0.010		0.026		<0.0020		75		<0.010		<0.0050		0.0012	F /	<0.20		<0.0050		34		0.75		<0.20		0.0023	F /	2		<0.0050		19		0.0025	F /	0.0078	F /
	MW802	10/24/2012	<0.2		<0.02		<0.01		0.099		0.00098	F /	120		<0.01		<0.005		0.0018	F /	<0.2		<0.005		55		0.58		<0.2		<0.01		3.2		<0.005		33		0.00067	F /	<0.02	
	MW803	10/24/2012	<0.2		<0.02		<0.01		0.028		0.0012	F /	47		<0.01		<0.005		<0.01		<0.2		<0.005		28		<0.01		<0.2		<0.01		7.3		<0.005		84		<0.005		<0.02	
	Downgradient																																											
	MW333	10/24/2012	<0.2		<0.02		<0.01		0.1		0.00073	F /	51		<0.01		<0.005		<0.01		<0.2		<0.005		34		0.011		<0.2		<0.01		6.4		<0.005		43		<0.005		<0.02	
	MW334	10/24/2012	<0.2		<0.02		<0.01		0.038		0.0011	F /	110		<0.01		0.0012	F /	<0.01		2		<0.005		71		0.52		<0.2		<0.01		5.2		<0.005		46		0.00073	F /	<0.02	
	MW335	4/16/2012	<0.20		<0.020		<0.010		0.021		<0.0020		210		<0.010		<0.0050		0.0051	F /	<0.20		<0.0050		140		<0.010		<0.20		0.0024	F /	6.4		<0.0050		48		0.0047	F /	0.0047	F /
	MW335	10/24/2012	<0.2		<0.02		<0.01		0.027		0.0012	F /	200		<0.01		<0.005		0.0081	F /	<0.2		<0.005		120		0.076		<0.2		0.0037	F /	6.6		<0.005		51		<0.005		0.0051	F /
	MW336	4/16/2012	<0.20		<0.020		<0.010		0.02		<0.0020		120		<0.010		<0.0050		0.0011	F /	0.15	F /	<0.0050		80		0.033		<0.20		<0.010		4.1		<0.0050		56		0.004	F /	0.0069	F /
	MW336	10/24/2012	<0.2		<0.02		<0.01		0.024		0.001	F /	150		<0.01		0.0015	F /	0.0016	F /	0.24		<0.005		110		0.15		<0.2		0.0036	F /	4.6		<0.005		77		<0.005		<0.02	
	MW336(DUP)	10/24/2012	<0.2		0.0046	F /	<0.01		0.025		0.001	F /	160		<0.01		0.0018	F /	0.0014	F /	0.29		<0.005		110		0.16		<0.2		0.0047	F /	4.8		<0.005		79		<0.005		0.0056	F /
	MW804	10/24/2012	<0.2		0.0056	F /	<0.01		0.076		0.00074	F /	150		<0.01		0.0028	F /	0.0016	F /	1.7		<0.005		110		0.53		<0.2		<0.01		5.3		0.0073		64		0.0063		<0.02	
	MW805	4/16/2012	<0.20		<0.020		<0.010		0.028		<0.0020		110		<0.010		<0.0050		0.0016	F /	<0.20		<0.0050		75		<0.010		<0.20		0.0059	F /	9.5		<0.0050		97		0.0037	F /	0.0078	F /
	MW805	10/24/2012	<0.2		<0.02		<0.01		0.029		0.00098	F /	110		<0.01		<0.005		0.0018	F /	0.099	F /	<0.005		79		0.0094	F /	<0.2		0.004	F /	8.1		<0.005		100		<0.005		<0.02	
M13	***Upgradient***																																											
	MW806	2/29/2012	<0.20		<0.020		<0.010		0.096		<0.0020		76		0.00096	F /	<0.0050		<0.010		<0.20		<0.0050		46		0.0017	F /	<0.20		<0.010		2.1	/ J	<0.0050		24		0.0031	F /	<0.020	
	MW806	4/16/2012	<0.20		<0.020		<0.010		0.082		0.00068	F /	68		<0.010		<0.0050		<0.010		<0.20		<0.0050		40	/ J	0.0024	F /	<0.20	U / UJ	<0.010		1.6		<0.0050		22	/ J	<0.0050		0.013	F /
	MW806	7/17/2012	<0.2		<0.02		<0.01		0.1		0.00078	F /	81		<0.01		<0.005		0.0014	F /	0.65		<0.005		46		0.025			U / R	<0.01		1.9		<0.005		24		<0.005		<0.02	
	MW806	10/24/2012	<0.2		<0.02		<0.01		0.097		0.00097	F /	79		<0.01		<0.005		0.0013	F /	0.089	F /	<0.005		45		0.021		<0.2		<0.01		1.9		<0.005		26		<0.005		<0.02	
	MW807	2/29/2012	0.026	F /	0.003	F / U	<0.010		0.097		<0.0020		180		<0.010		<0.0050		<0.010		0.82		0.0017	F / U	89		0.092		<0.20		0.0021	F /	14	/ J	<0.0050		400		0.004	F /	<0.020	
	MW807	4/16/2012	<0.20		<0.020		<0.010		0.088		0.00098	F /	160		<0.010		<0.0050		<0.010		0.59		<0.0050		79	/ J	0.11		<0.20	U / UJ	0.0025	F /	7.2		<0.0050		380	/ J	<0.0050		0.0095	F /
	MW807	7/17/2012	<0.2		0.0031	F /	<0.01		0.095		0.0012	F /	180		<0.01		<0.005		0.0022	F /	0.2		<0.005		89		0.15			U / R	0.0025	F /	7.6		<0.005		390		<0.005		<0.02	
	MW807	10/24/2012	<0.2		0.0033	F /	<0.01		0.094		0.0009	F /	180		<0.01		<0.005		0.0014	F /	0.5		<0.005		90		0.12		<0.2		0.0021	F /	7.6		<0.005		390		<0.005		<0.02	
	Downgradient																																											
	AEHA14R	3/1/2012	0.027	F /	<0.020		<0.010		0.089		<0.0020		110		<0.010		<0.0050		0.0012	F /	<0.20		<0.0050		50		0.0019	F /	<0.20		<0.010		12		<0.0050		50		0.0029	F /	<0.020	
	AEHA15	3/1/2012	5.7		<0.020		0.0076	F /	0.1		<0.0020		140		0.0088	F /	0.0066		0.013		**15**		0.012		77		0.54		<0.20		0.013		4.6		<0.0050		20		0.014		0.029	
	MW126R	2/29/2012	<0.20		<0.020		<0.010		0.055		<0.0020		67		<0.010		<0.0050		<0.010		<0.20		0.0016	F / U	43		0.0088	F /	<0.20		<0.010		2.4	/ J	<0.0050		26		0.0029	F /	<0.020	
	MW126R	4/16/2012	<0.20		<0.020		<0.010		0.048		0.00078	F /	61		<0.010		<0.0050		<0.010		<0.20		<0.0050		39	/ J	0.0032	F /	<0.20	U / UJ	0.0022	F /	2		<0.0050		25	/ J	<0.0050		0.009	F /
	MW126R	7/17/2012	<0.2		<0.02		<0.01		0.054		0.00079	F /	69		<0.01		<0.005		0.0014	F /	0.12	F /	<0.005		43		0.019			U / R	<0.01		2.2		<0.005		24		<0.005		<0.02	
	MW126R	10/25/2012	<0.2		0.0036	F / U	<0.01		0.058		<0.002		70		0.0011	F / U	<0.005		<0.01		0.88		<0.005		44		0.023		<0.2		<0.01		2.4		<0.005		24		0.004	F /	<0.02	
	MW362	2/29/2012	<0.20		0.0035	F / U	<0.010		0.044		<0.0020		160		0.001	F /	0.0011	F /	<0.010		<0.20		0.0016	F / U	100		0.043		<0.20		0.0044	F /	8.5	/ J	<0.0050		180		0.0047	F /	<0.020	
	MW362	4/16/2012	0.034	F /	<0.020		<0.010		0.041		0.00098	F /	150		<0.010		<0.0050		<0.010		0.14	F /	<0.0050		89	/ J	0.078		<0.20	U / UJ	0.0042	F /	5.8		<0.0050		200	/ J	<0.0050		<0.020	
	MW362(DUP)	4/16/2012	<0.20		<0.020		<0.010		0.042		0.001	F /	150		<0.010		<0.0050		<0.010		0.38		<0.0050		93	/ J	0.078		<0.20	U / UJ	0.0063	F /	6		<0.0050		210	/ J	<0.0050		0.011	F /
	MW362	7/17/2012	<0.2		0.0032	F /	<0.01		0.048		0.0011	F /	180		<0.01		<0.005		0.0022	F /	<0.2		<0.005		100		0.096			U / R	0.0035	F /	7		<0.005		270		<0.005		<0.02	
	MW362	10/25/2012	<0.2		<0.02		<0.01		0.05		<0.002		180		<0.01		0.0011	F /	<0.01		<0.2		<0.005		110		0.18		<0.2		0.0051	F /	7.1		<0.005		300		0.0046	F /	<0.02	
	MW808	2/29/2012	<0.20		0.0033	F / U	<0.010		0.16		<0.0020		120		<0.010		0.0082		<0.010		1.7		<0.0050		67		0.55		<0.20		0.022		11	/ J	<0.0050		61		0.004	F /	0.0066	F /
	MW808	4/16/2012	<0.20		<0.020		<0.010		0.14		0.00081	F /	100		<0.010		0.016		0.0011	F /	2.6		<0.0050		59	/ J	0.89		<0.20	U / UJ	0.026		8.3		<0.0050		56	/ J	<0.0050		0.0069	F /
	MW808	7/18/2012	<0.2		<0.02		<0.01		0.23		0.00099	F /	140		<0.01		0.022		0.0019	F /	4.2		<0.005		77		1.1			U / R	0.028		15		<0.005		85		<0.005		<0.02	
	MW808(DUP)	7/18/2012	<0.2		<0.02		<0.01		0.23		0.0011	F /	140		<0.01		0.021		0.0017	F /	3.9		<0.005		77		1.1			U / R	0.028		16		<0.005		85		<0.005		<0.02	
	MW808	10/25/2012	<0.2		0.0034	F / U	<0.01		0.22		<0.002		150		0.0010	F / U	0.021		<0.01		3		<0.005		86		1.4		<0.2		0.029		12		<0.005		80		0.0052		<0.02	

Table 3-2

Summary of Analytical Results - Target Analyte List Metals
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Analyte	**Aluminum**		**Antimony**		**Arsenic**		**Barium**		**Cadmium**		**Calcium**		**Chromium**		**Cobalt**		**Copper**		**Iron**		**Lead**		**Magnesium**		**Manganese**		**Mercury**		**Nickel**		**Potassium**		**Silver**		**Sodium**		**Vanadium**		**Zinc**	
		Units	mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
		Project Action Limit[(1)]	100		0.024		0.2		NS		0.05		NS		1.0		NS		NS		5.0		0.1		NS		10		NS		NS		NS		0.511		NS		NS		10	
		Surface Water RG	NS		0.61		0.16		5		0.0023		NS		0.44		NS		0.026		1.0		0.064		NS		1.0		0.103		1.0		NS		0.005		NS		NS		1.0	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
	MW809	2/29/2012	<0.20		0.0028	F / U	<0.010		0.031		<0.0020		41		<0.010		<0.0050		<0.010		<0.20		<0.0050		31		0.0055	F /	<0.20		<0.010		2.6	/ J	<0.0050		19		0.0022	F /	<0.020	
	MW809(DUP)	2/29/2012	<0.20		0.0031	F / U	<0.010		0.031		<0.0020		40		<0.010		<0.0050		<0.010		<0.20		0.0016	F / U	31		0.0059	F /	<0.20		<0.010		2.6	/ J	<0.0050		19		0.0024	F /	<0.020	
	MW809	4/16/2012	0.028	F /	<0.020		<0.010		0.028		0.00065	F /	38		<0.010		<0.0050		<0.010		0.094	F /	<0.0050		29	/ J	0.0024	F /	<0.20	U / UJ	0.0044	F /	2.4		<0.0050		19	/ J	<0.0050		0.0073	F /
	MW809	7/18/2012	<0.2		<0.02		<0.01		0.029		0.00075	F /	43		<0.01		<0.005		0.0014	F /	<0.2		<0.005		32		0.0018	F /		U / R	<0.01		2.6		<0.005		20		<0.005		<0.02	
	MW809	10/25/2012	<0.2		<0.02		<0.01		0.029		<0.002		43		<0.01		<0.005		<0.01		<0.2		<0.005		33		0.0038	F /	<0.2		<0.01		2.8		<0.005		19		0.0029	F /	<0.02	
	MW809(DUP)	10/25/2012	<0.2		0.0027	F / U	<0.01		0.029		<0.002		43		0.0019	F / U	<0.005		<0.01		<0.2		<0.005		33		0.0038	F /	<0.2		<0.01		2.8		<0.005		19		0.0029	F /	<0.02	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the *Long Term Monitoring Plan* (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of analytes is used for reporting based on historically detected and reported compounds.
< = Result shows laboratory Method Reporting Limit for non-detected results
Bolded result indicates Project Action Limit (RG) exceedance
DUP = duplicate
F = Concentration below the reported detection limit
J = Estimated concentration
LF/VF = Lab Flag/Validation Flag
mg/L = milligrams per liter
NS = No standard
U = Not detected
UJ = Not detected, estimated detection limit

Table 3-3

Summary of Analytical Results - Indicator Parameters
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**Nitrate**		**Sulfate**	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M1	***In-Plume***					
	MW107	4/12/2012	NA		**26,000**	
	MW107	10/25/2012	NA		**22,000**	
	MW231	4/12/2012	NA		**35,000**	
	MW231	10/25/2012	NA		**36,000**	
	MW640	4/12/2012	NA		**5,200**	
	MW640	10/25/2012	NA		**4,300**	
	MW641	4/12/2012	NA		**640**	
	MW641(DUP)	4/12/2012	NA		**640**	
	MW641	10/25/2012	NA		**1,100**	
	MW642	4/12/2012	NA		**420**	
	MW642(DUP)	4/12/2012	NA		**420**	
	MW642	10/25/2012	NA		390	
	MW642(DUP)	10/25/2012	NA		400	
	Early Warning					
	MW643	4/13/2012	NA		58	
	MW643	10/26/2012	NA		160	
	MW644	4/13/2012	NA		160	
	MW644	10/26/2012	NA		86	
	Compliance					
	MW645	4/13/2012	NA		67	
	MW645	10/25/2012	NA		90	
	MW646	4/13/2012	NA		110	
	MW646	10/25/2012	NA		110	
	MW648	4/12/2012	NA		34	
	MW648	10/25/2012	NA		14	
	MW649	4/13/2012	NA		64	
	MW649	10/25/2012	NA		120	
	SW709	4/13/2012	NA		60	
	SW709	10/26/2012	NA		180	
MFG (M8)	***In-Plume***					
	MW330	4/17/2012	NA		**430**	
	MW330	10/23/2012	NA		**440**	
M11	***Upgradient***					
	MW802	4/16/2012	0.11		85	
	MW802	10/24/2012	0.13	F /	260	
	MW803	10/24/2012	0.99		98	
	Downgradient					
	MW333	10/24/2012	0.14	F /	59	
	MW334	10/24/2012	<0.2		240	
	MW335	4/16/2012	0.31		**660**	
	MW335	10/24/2012	<0.2		**580**	
	MW336	4/16/2012	0.12		**410**	
	MW336	10/24/2012	0.37		**510**	
	MW336(DUP)	10/24/2012	0.37		**530**	
	MW804	10/24/2012	0.17	F /	**490**	
	MW805	4/16/2012	0.22		**470**	
	MW805	10/24/2012	0.21		**450**	

Table 3-3

Summary of Analytical Results - Indicator Parameters
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**Nitrate**		**Sulfate**	
		Units	mg/L		mg/L	
		Project Action Limit(1)	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Upgradient***					
	MW806	2/29/2012	0.39		79	
	MW806	4/16/2012	0.39	/ J	80	
	MW806	7/17/2012	0.19	/ J	76	
	MW806	10/24/2012	0.13	F /	71	
	MW807	2/29/2012	<1.0		230	
	MW807	4/16/2012	<1.0	U / UJ	230	
	MW807	7/17/2012	<1,0	/ J	230	
	MW807	10/24/2012	<2		230	
	Downgradient					
	AEHA14R	3/1/2012	1.7		140	
	AEHA15	3/1/2012	0.13		12	
	MW126R	2/29/2012	0.12		53	
	MW126R	4/16/2012	0.13		52	
	MW126R	7/17/2012	0.11	/ J	53	
	MW126R	10/25/2012	0.16	F /	55	
	MW362	2/29/2012	<1.0		280	
	MW362	4/16/2012	<1.0		270	
	MW362(DUP)	4/16/2012	<1.0	U / UJ	270	
	MW362	7/17/2012	<1.0	/ J	270	
	MW362	10/25/2012	<2		250	
	MW808	2/29/2012	<0.10		99	
	MW808	4/16/2012	<0.10		88	
	MW808	7/18/2012	<0.1		160	
	MW808(DUP)	7/18/2012	<0.1		160	
	MW808	10/25/2012	<2		140	
	MW809	2/29/2012	<0.10		5.9	
	MW809(DUP)	2/29/2012	<0.10		5.9	
	MW809	4/16/2012	0.13	/ J	5.4	
	MW809	7/18/2012	0.15		7.5	
	MW809	10/25/2012	0.14	F /	8.3	
	MW809(DUP)	10/25/2012	0.11	F /	8.1	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the *Long Term Monitoring Plan* (Toltest 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

mg/L = milligrams per liter
< = Result shows laboratory Method Reporting Limit for non-detected results
Bolded result indicates Project Action Limit (RG) exceedance
DUP = duplicate
F = Concentration below the reported detection limit
J = Estimated concentration
LF/VF = Lab Flag/Validation Flag
NA = not analyzed
NS = No standard
R = Rejected data, unusable
U = Not detected
UJ = Not detected, estimated detection limit

Table 3-4

Summary of Analytical Results - Volatile Organic Compounds
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	Acetone		Benzene		Carbon disulfide		Chlorobenzene		Chloromethane		1,1-DCA		1,2-DCA		cis-1,2-DCE		Ethyl Benzene		MethCl		MEK		Naphthalene		PCE		Toluene		1,1,1-TCA		TCE		VC		Xylenes (total)	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit(1)	NS		25		NS		500		NS		3500		25		200		1,000		NS		NS		NS		25		2,500		1,000		25		25		10,000	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M11	*Upgradient*																																					
	MW802	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW802	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW803	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	Downgradient																																					
	MW333	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW334	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW335	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW335	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW336	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW336	10/24/2012	5.1		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW336(DUP)	10/24/2012	5.4		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW804	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW805	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW805	10/24/2012	5.5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
M13	*Upgradient*																																					
	MW806	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW806	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW806	7/17/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW806	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW807	2/29/2012	<5.0		<1.0		2.4	F /	<1.0		<1.0	U / UJ	1.4		<1.0		0.79	F /	<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW807	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW807	7/17/2012		U / R	<1		<5		<1			U / R	1.5		<1		1.1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW807	10/24/2012	<5		<1		<5		<1		<1		1.5		<1		1		<1		<3		<5		<1		<1		<1		<1		0.23	F /	<1		<1	
	Downgradient																																					
	AEHA14R	3/1/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0	
	AEHA15	3/1/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0	
	MW126R	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW126R	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		0.23	F /	<1.0		<1.0	
	MW126R	7/17/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW126R	10/25/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW362	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362(DUP)	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362	7/17/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW362	10/25/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	Downgradient																																					
	MW808	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW808	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW808	7/18/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW808(DUP)	7/18/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW808	10/25/2012	22		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW809	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809(DUP)	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809	7/18/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW809	10/25/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW809(DUP)	10/25/2012	<5		<1		<5		<1		<1		<1		<1		<1		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the Long Term Monitoring Plan (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of compounds is used for reporting based on historically detected and reported compounds.
µg/L = micrograms per liter
< = Result shows laboratory method reporting limit for non-detected results
1,1,1-TCA = 1,1,1-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,2-DCA = 1,2-Dichloroethane
Bolded result indicates Project Action Limit (RG) exceedance
cis-1,2-DCE = cis-1,2-Dichloroethene
DUP = duplicate
F = Concentration below the reported detection limit

LF/VF = Lab Flag/Validation Flag
MEK = Methyl Ethyl Ketone (2-butanone)
MethCl = Methylene Chloride
NS = No standard
PCE = Tetrachloroethene
TCE = Trichloroethene
U = Not detected
UJ = Not detected, estimated detection limit
VC = Vinyl chloride

Table 3-5

Summary of Analytical Results - Semivolatile Organic Compounds
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**2,4-DNT**		**2,6-DNT**		**Naphthalene**		**NB**		**2-Methylnaphthalene**		**Phenol**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
	Project Action Limit[1]		0.42		0.42		NS		51		NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M11	***Upgradient***													
	MW802	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW802	10/24/2012	<1.4		<0.51		<1		<1		<0.51		<5.1	
	MW803	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	Downgradient													
	MW333	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW334	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW335	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW335	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW336	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW336	10/24/2012	<1.3	U / J	<0.47	U / J	<0.93	U / J	<0.93	U / J	<0.47	U / J	<4.7	U / J
	MW336(DUP)	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW804	10/24/2012	<4		<1.4		<2.9		<2.9		<1.4		<14	
	MW805	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW805	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
M13	***Upgradient***													
	MW806	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW806	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW806	7/17/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW806	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW807	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW807	7/17/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	Downgradient													
	AEHA14R	3/1/2012		U / R		U / R	0.32	F / J		U / R		U / R		U / R
	AEHA15	3/1/2012	<1.5		<0.53		<1.1		<1.1		<0.53	U / UJ	<5.3	
	MW126R	2/29/2012	<1.3		<0.48		<0.95		<0.95		<0.48	U / UJ	<4.8	
	MW126R	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW126R	7/17/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW126R	10/25/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW362	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW362	4/16/2012	**3.3**		0.25	F /	<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW362(DUP)	4/16/2012	**2.6**		0.29	F /	<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW362	7/17/2012	**2.8**		0.29	F /	<0.93		<0.93		<0.47		<4.7	
	MW362	10/25/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	Downgradient													
	MW808	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW808	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW808	7/18/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808(DUP)	7/18/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	10/25/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW809(DUP)	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW809	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW809	7/18/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809	10/25/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809(DUP)	10/25/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the Long Term Monitoring Plan (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of compounds analyzed is used for reporting based on historically detected and reported compounds.
< = Result shows laboratory method reporting limit for non-detected results
µg/L = micrograms per liter
2,4-DNT = 2,4-dinitrotoluene
2,6-DNT = 2,6-dinitrotoluene
Bolded result indicates Project Action Limit (RG) exceedance
DUP = duplicate
F = Concentration below the reported detection limit
LF/VF = Lab Flag/Validation Flag
NB = nitrobenzene
NS = No standard
R = Rejected data, unusable
U = Not detected
UJ = Not detected, estimated detection limit

Table 3-6

Summary of Groundwater Trends: Estimated Clean-Up Times
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Site	Critical Monitoring Well	Critical Compound	Initial [1] Concentration (µg/L)	Date of Initial Concentration	Final Concentration (µg/L) (Remediation Goal - RG)	Record of Decision Estimated Clean-Up time for Site (yrs)	R^2 Value[2]	Estimated Clean-Up Time (yrs)	Estimated Clean-Up Date (yr)	Source Removal Completion Date
LAP AREA										
L1	MW131	2,4,6-TNT	11,000	2009	9.5	340	0.0126	*	*	2005
		1,3,5-TNB	4,400	2004	5.1		0.1826	**11**	2023	2005
	MW173	RDX	17	2003	2.6		0.3547	**4**	2016	2005
		2,4,6-TNT	28	2004	9.5		0.1486	**-3**	2009	2005
L2	MW404	RDX	350	2004	2.6	20	0.5099	**14**	2026	2006
L3	MW412	RDX	440	2008	2.6	50	0.006	*	*	2006
	MW630	RDX	13	2011	2.6		0.2841	*	*	2006
	MW633	RDX	390	2008	2.6		0.1	*	*	2006
L14	MW511	RDX	170	2007	2.6	80	0.2091	**52**	2064	2005
	MW512	RDX	400	2011	2.6		0.0002	**1724**	3736	2005
MANUFACTURING AREA										
M1	MW107	Sulfate	53,000	2006	400	NC	0.202	**128**	2140	2007
	MW231	Sulfate	41,000	2006	400		0.2014	*	*	2007
	MW640	Sulfate	6,100	2006	400		0.1105	*	*	2007
	MW641	Sulfate	1,500	2003	400		0.0087	**172**	2184	2007
	MW642	Sulfate	660	2003	400		0.3754	**6**	2018	2007
MFG	MW212R	2,4,6-TNT	1,000	2005	9.5	50	0.0307	**36**	2048	2004
(M6)	MW652	2,4,6-TNT	3,400	2005	9.5		0.1499	**74**	2086	2004
		2,4-DNT	10,000	2004	0.42		0.0001	**5314**	7526	2004
		2,6-DNT	5,400	2005	0.42		0.0235	**317**	2329	2004
		2-NT	98,000	2005	5,100		0.0205	**83**	2095	2004
(M8)	MW330	Sulfate	570	2004	400		0.1117	**11**	2023	2004
M11	MW335	Sulfate	1,300	2008	400	NC	0.1145	**7**	2019	2008
	MW336	Sulfate	510	2008	400		0.0078	**29**	2041	2008
	MW805	Sulfate	590	2008	400		0.5771	**7**	2019	2008
M13	MW362	2,4-DNT	8.1	2004	0.42	NC	0.0598	*	*	2008

Note:

Bolded value represents the estimated cleanup time for the associated site.

Estimated clean-up times are approximate and based on constant contamination reduction rates for a specific compound at a specific point within the aquifer.

RG = Remediation Goal

µg/L = micrograms per liter (milligrams per liter {mg/L} for sulfate).

yr(s) = year(s)

* = Trend curve indicates increasing concentrations. An estimated clean-up time or corresponding date could not be calculated.

NC = Not calculated

2,4,6-TNT = 2,4,6-Trinitrotoluene

1,3,5-TNB = 1,3,5-Trinitrobenzene

RDX = Royal Demolition Explosive

2,4-DNT = 2,4-Dinitrotoluene

2,6-DNT = 2,6-Dinitrotoluene

2-NT = 2-Nitrotoluene

Footnote:

(1) Initial concentration is the maximum observed concentration during the timeframe included.

(2) The R^2 value represents an indicator of how well the equation resulting from the regression analysis explains the relationship among the variables. Shaded analysis results with and R^2 value less than 0.1 are unreliable.

RJR/rjr/BTB
J:\Madison Projects\209\1115\2012 Annual GW Report\Final\Tables\Table 3-6 JOAAP Calculated Clean-Up Times_2012

Table 3-7

Groundwater Horizontal Gradients
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

	April 2012					October 2012					
Site	**Well Number Groundwater Elevation (ft MSL)**	**Well Number Groundwater Elevation (ft MSL)**	**Head Difference (ft)**	**Horizontal Separation (ft)**	**Horizontal Gradient**	**Well Number Groundwater Elevation (ft MSL)**	**Well Number Groundwater Elevation (ft MSL)**	**Head Difference (ft)**	**Horizontal Separation (ft)**	**Horizontal Gradient**	**Annual Average**
LAP AREA											
L1	MW176	MW173			L1 (North)	MW176	MW173			L1 (North)	
	622.35	603.31	19.04	1620	0.0118	DRY	604.86	NA	1620	NA	NA(1)
	MW611	MW610			L1 (South)	MW611	MW610			L1 (South)	
	606.44	601.41	5.03	400	0.0126	605.14	603.62	1.52	420	0.0036	0.0081
L2	MW135	MW404				MW135	MW404				
	NM	NM	NA	1500	NA	614.46	599.59	14.87	1500	0.0099	NA(2)
L3/	MW1	MW410				MW1	MW410				
Landfill L3	613.86	592.32	21.54	780	0.0276	609.93	591.40	18.53	780	0.0238	0.0257
L14	MW508	MW603				MW508	MW603				
	NM	NM	NA	780	NA	576.73	569.68	7.05	780	0.0090	NA(3)
MANUFACTURING AREA											
M1	MW107	MW643				MW107	MW643				
	546.34	533.30	13.04	430	0.0303	541.17	532.00	9.17	300	0.0306	0.0304
MFG - M6	MW650	MW165			M6 (North)	MW650	MW165			M6 (North)	
	555.61	538.21	17.40	930	0.0187	554.39	534.88	19.51	937.5	0.0208	0.0198
	MW309	MW160			M6 (South)	MW309	MW160			M6 (South)	
	554.33	535.46	18.87	840	0.0225	552.67	533.55	19.12	780	0.0245	0.0235
MFG - M7	MW307	MW216				MW307	MW216				
	544.01	531.43	12.58	1200	0.0105	543.50	528.10	15.40	1237.5	0.0124	0.0115
MFG - M8	MW127R	MW323R				MW127R	MW323R				
	553.92	554.78	0.86	3960	0.0002	553.03	554.81	1.78	3960	0.0004	0.0003
MFG - M13	AEHA14R	MW126R				AEHA14R	MW126R				
	551.90	546.46	5.44	1160	0.0047	549.78	546.61	3.17	2025	0.0016	0.0031
Landfill M11	MW802	MW804				MW802	MW804				
	536.73	531.41	5.32	1030	0.0052	531.47	523.9	7.57	1030	0.0073	0.0063

General Notes:
ft = feet
MSL = mean sea level
NA = Not Applicable. Dry well or measurements not completed during spring sampling, gradient cannot be calculated.

Table 3-8

Groundwater Flow Velocities
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Site	Average K (cm/sec)	April Horizontal Gradient	October Horizontal Gradient	Effective Porosity	April			October		
					Velocity (cm/sec)	Velocity (ft/day)	Velocity (ft/year)	Velocity (cm/sec)	Velocity (ft/day)	Velocity (ft/year)
L1[1,2]	9.2E-06	0.0122	0.0081	0.3	0.0000	0.0011	0.387	0.0000	0.0007	0.257
L2[3]	1.6E-03	NM	0.0099	0.3	NM	NM	NM	0.0001	0.1496	54.615
L3/Landfill L3[4]	1.6E-03	0.0276	0.0257	0.3	0.0001	0.4172	152.261	0.0001	0.3884	141.779
L14[3,4]	1.6E-03	NM	0.0090	0.3	NM	NM	NM	0.0000	0.1360	49.650
M1	6.6E-05	0.0303	0.0304	0.3	0.0000	0.0189	6.895	0.0000	0.0190	6.918
MFG (M6)[5]	8.6E-04	0.0206	0.0227	0.3	0.0001	0.1674	61.084	0.0001	0.1844	67.311
MFG (M7)	6.7E-04	0.0105	0.0115	0.3	0.0000	0.0665	24.256	0.0000	0.0728	26.566
MFG (Landfill M13)	8.0E-02	0.0047	0.0031	0.3	0.0013	3.5518	1296.424	0.0008	2.3427	855.088
Average for MFG Sites M6, M7, and M13	2.7E-02	0.0119	0.0091	0.3	0.0011	3.0550	1115.071	0.0008	2.3362	852.701
Landfill M11[6]	6.7E-04	0.0052	0.0063	0.3	0.00001	0.0329	12.013	0.00001	0.0399	14.554

General Notes:

Hydraulic conductivity values are averages for the overburden aquifer.

Horizontal gradients are calculated using water table elevation data

K = Hydraulic Conductivity

NM = Water level not measurerd

MFG = Manufacturing Area Sites.

cm/sec = centimeters per second

ft = feet

Footnotes:

(1) Average of north and south gradients at L1 used for April measurements.

(2) Well MW176 dry in October. Therefore, velocities from the southern part of the site only could be calculated.

(3) Sites L2 and L14 are not sampled in spring. Therfore, only horizontal gradients from Fall sampling available.

(4) No hydraulic conductivity data were available for Site L3 or Site L14. Values used are from nearby Site L2.

(5) Average of north and south gradients at M6 used for measurements.

(6) No hydraulic conductivity data were available for Site M11 Landfill. Value used is from nearby Site M7.

Table 3-9

Vertical Gradient Calculations
2012 Annual Groundwater Monitoring Report
Joliet Army Ammuntion Plant
Will County, Illinois

Site	Area/Well ID	Ground Elevation (ft MSL)	Depth (ft) to top of screen (from ground)	Depth (ft) to bottom of screen (from ground)	Screen Length (feet)	Elevation of Screen Midpoint (ft MSL)	Groundwater Elevation 2/12 (ft MSL)	Vertical Gradient 2/12 (ft/ft)	Groundwater Elevation 4/12 (ft MSL)	Vertical Gradient 4/12 (ft/ft)	Groundwater Elevation 7/12 (ft MSL)	Vertical Gradient 7/12 (ft/ft)	Groundwater Elevation 10/12 (ft MSL)	Vertical Gradient 10/12 (ft/ft)
LOAD-ASSEMBLE-PACKAGE AREA														
L1	MW178	640.39	27.3	46.5	19.2	603.49	NM	NM	615.82	-0.3462	NM	NM	606.63	NA
	MW176	643.49	4.8	20.8	16.0	630.69	NM		622.35		NM		DRY	
	MW172	613.19	14.5	34.5	20.0	588.69	NM	NM	603.35	0.0027	NM	NM	604.94	0.0049
	MW173	612.56	2.8	11.8	9.0	605.26	NM		603.31		NM		604.86	
	MW177	613.84	11.8	31.0	19.2	592.44	NM	NM	608.30	0.0538	NM	NM	605.35	NA
	MW171	615.03	2.9	7.9	5.0	609.63	NM		607.49		NM		DRY	
	MW401	610.2	28.5	43.5	15.0	574.20	NM	NM	601.50	0.0033	NM	NM	604.68	0.0360
	MW610	609.62	4.0	14.0	10.0	600.62	NM		601.41		NM		603.62	
L2[1]	MW621	602.41	22.0	32.0	10.0	575.41	NM	NM	NM	NM	NM	NM	599.85	0.0062
	MW620	602.41	7.0	17.0	10.0	590.41	NM		NM		NM		599.70	
L3/	MW631	592.23	16.0	26.0	10.0	571.23	NM	NM	590.33	0.1170	NM	NM	588.80	0.0746
Landfill L3	MW630	592.23	7.0	12.0	5.0	582.73	NM		588.33		NM		587.58	
L14[1]	MW602	581.22	21.0	31.0	10.0	555.22	NM	NM	NM	NM	NM	NM	570.70	-0.1047
	H-7	581.45	4.0	14.0	10.0	572.45	NM		NM		NM		572.51	
	MW604	578.27	20.0	30.0	10.0	553.27	NM	NM	NM	NM	NM	NM	569.81	0.0079
	MW603	578.27	6.0	16.0	10.0	567.27	NM		NM		NM		569.68	
MANUFACTURING AREA														
M1	MW640	545.4	29.0	39.0	10.0	511.40	NM	NM	544.17	0.0218	NM	NM	539.82	-0.0025
	MW351	545.68	9.5	19.5	10.0	531.18	NM		543.47		NM		539.89	
	MW642	545.08	29.0	39.0	10.0	511.08	NM	NM	541.72	-0.0179	NM	NM	538.43	-0.0194
	MW641	545.08	7.0	17.0	10.0	533.08	NM		542.28		NM		538.97	
MFG (M4)	MW158	531.58	9.0	29.5	20.5	512.33	NM	NM	530.34	0.0000	NM	NM	526.51	-0.0153
	MW157	531.37	3.7	10.2	6.5	524.42	NM		530.34		NM		526.73	
MFG (M6)	MW312	545.96	40.0	55.0	15.0	498.46	NM	NM	547.55	0.0002	NM	NM	NM	NM
	MW311	546.36	14.0	24.0	10.0	527.36	NM		547.54		NM		NM	
	MW319	545.49	40.0	55.0	15.0	497.99	NM	NM	537.55	-0.0030	NM	NM	533.99	0.0050
	MW318	545.23	11.8	21.8	10.0	528.43	NM		537.67		NM		533.81	
	MW313	549.20	25.0	40.0	15.0	516.70	NM	NM	539.04	0.0201	NM	NM	534.89	0.0162
	MW654	548.49	13.0	23.0	10.0	530.49	NM		538.60		NM		534.60	
	MW317	540.71	34.0	49.0	15.0	499.21	NM	NM	536.28	-0.0123	NM	NM	533.64	NM
	MW316	540.49	13.0	18.0	5.0	524.99	NM		536.74		NM		NM	
	MW310R	563.00	44.5	59.5	15.0	511.00	NM	NM	543.11	-0.2589	NM	NM	NM	NM
	MW309	563.43	12.7	27.7	15.0	543.23	NM		554.33		NM		552.67	
	MW315	538.91	29.7	44.7	15.0	501.71	NM	NM	535.41	-0.0003	NM	NM	NM	NM
	MW314	539.53	9.7	14.7	5.0	527.33	NM		535.42		NM		533.19	

Table 3-9

Vertical Gradient Calculations
2012 Annual Groundwater Monitoring Report
Joliet Army Ammuntion Plant
Will County, Illinois

Site	Area/Well ID	Ground Elevation (ft MSL)	Depth (ft) to top of screen (from ground)	Depth (ft) to bottom of screen (from ground)	Screen Length (feet)	Elevation of Screen Midpoint (ft MSL)	Groundwater Elevation 2/12 (ft MSL)	Vertical Gradient 2/12 (ft/ft)	Groundwater Elevation 4/12 (ft MSL)	Vertical Gradient 4/12 (ft/ft)	Groundwater Elevation 7/12 (ft MSL)	Vertical Gradient 7/12 (ft/ft)	Groundwater Elevation 10/12 (ft MSL)	Vertical Gradient 10/12 (ft/ft)
MFG (M6)	MW308	561.38	50.5	65.5	15.0	503.38	NM	NM	542.26	-0.0431	NM	NM	541.29	-0.0551
	MW307	561.45	17.0	27.0	10.0	539.45	NM		544.01		NM		543.50	
	MW651	563.83	36.0	46.0	10.0	522.83	NM	NM	NM	NM	NM	NM	547.90	-0.2056
	MW650	563.83	12.0	22.0	10.0	546.83	NM		NM		NM		554.39	
	MW653	561.93	36.0	46.0	10.0	520.93	NM	NM	NM	NM	NM	NM	546.23	-0.1786
	MW652	561.93	11.0	21.0	10.0	545.93	NM		NM		NM		551.73	
MFG (M7)	MW217	536.90	19.5	34.5	15.0	509.90	NM	NM	531.94	0.0237	NM	NM	NM	NM
	MW216	536.51	5.0	10.0	5.0	529.01	NM		531.43		NM		528.10	
	MW322	542.26	34.5	49.5	15.0	500.26	NM	NM	533.79	-0.1052	NM	NM	NM	NM
	MW321	542.93	13.5	23.5	10.0	524.43	NM		537.73		NM		NM	
	MW661	537.09	20.0	30.0	10.0	512.09	NM	NM	532.82	-0.0486	NM	NM	532.09	0.0220
	MW660	537.08	7.0	12.0	5.0	527.58	NM		533.88		NM		531.66	
Landfill M11	MW803	541.56	26.5	36.5	10.0	510.06	NM	NM	540.27	0.1327	NM	NM	537.98	0.3041
	MW802	541.62	5.0	15.0	10.0	531.62	NM		536.73		NM		531.47	
	MW805	533.62	25.0	35.0	10.0	503.62	NM	NM	531.09	-0.0115	NM	NM	523.92	0.0010
	MW804	533.78	5.0	15.0	10.0	523.78	NM		531.41		NM		523.90	
Landfill M13	MW362	562.78	28.0	33.0	5.0	532.28	549.35	0.2106	549.21	0.1939	549.14	0.1493	548.94	0.1626
	MW126R	563.00	11.0	21.0	10.0	547.00	546.38		546.46		546.95		546.61	
	MW364	567.69	37.0	42.0	5.0	528.19	542.10	-0.0057	542.14	0.0007	541.84	-0.0051	542.05	0.0073
	MW363	567.66	21.0	31.0	10.0	541.66	542.18		542.13		541.91		541.95	
	MW807	563.79	35.0	45.0	10.0	523.79	550.38	-0.0421	550.16	-0.0463	550.01	-0.0572	549.87	-0.0534
	MW806	563.73	15.0	25.0	10.0	543.73	551.55		551.44		551.60		551.34	
	MW809	567.28	35.0	45.0	10.0	527.28	549.07	-0.1131	548.86	-0.1319	549.25	-0.0966	549.07	-0.0131
	MW808	567.33	15.0	25.0	10.0	547.33	551.85		552.14		551.60		549.36	

Notes:

$$\text{Vertical Gradient} = \frac{\text{Water Level in Deep Well - Water Level in Shallow Well}}{\text{ABS (Water Table Elevation - Screen Midpoint of Deep Well)}}$$

Negative vertical gradients indicate downward flow, positive indicates upward flow.
ft = feet
ft/ft = feet per foot
MSL = mean sea level
NA - well dry. Therfore, vertical gradient could not be calculated.
NM = not measured
ID = identification
MFG = Manufacturing Area Sites

Footnotes:
(1) Sites L2 and L14 not sampled in spring.

TABLE 3-10

Proposed Sample Plan - Spring 2013
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Wilmington, Illinois

Site	Type	Well ID	Parameter
L1	In-plume	MW131	E
		MW173	E
		WES1	E
	Early Warning	WES3	E
		MW174	E
	Compliance	SW550	E
L3/ Landfill L3	Upgradient	SW004	E, M
	In-plume/Downgradient	MW410	E
		MW412	E, M
	Early Warning/Downgradient	MW630	E, M
		MW631	E, M
		MW633	E, M
	Compliance/Downgradient	SW777	E, M
	Downgradient	SW557	E, M
		SW558	E, M
M1	In-plume	MW107	S
		MW231	S
		MW640	S
		MW641	S
		MW642	S
	Early Warning	MW643	S
		MW644	S
	Compliance	MW645	S
		MW646	S
		MW648	S
		MW649	S
		SW709	S
MFG	In-plume	MW212R	E
		MW330	S
		MW652	E
	Early Warning	MW123R	E
		MW124R	E
		MW162R	E
		MW313	E
		MW318	E
		MW319	E
		MW654	E
	Compliance	MW117	E
		MW118	E
		MW119	E
Landfill M13[1]	Upgradient	MW806	E, I, M, SVOC & V
		MW807	E, I, M, SVOC & V
	Downgradient	MW126R	E, I, M, SVOC & V
		MW362	E, I, M, SVOC & V
		MW808	E, I, M, SVOC & V
		MW809	E, I, M, SVOC & V

General Notes:
E - Explosives
M - Metals
S - Sulfate
MFG - Manufacturing Area
I - Indicator parameters (Nitrate-N and Sulfate)
SVOC - Semivolatile Organic Compounds
V - Volatile Organic Compounds (VOCs)

Footnotes:
(1) Site M13 Landfill monitoring wells will also be sampled quarterly in January for these parameters in compliance with Illinois Administrative Code.

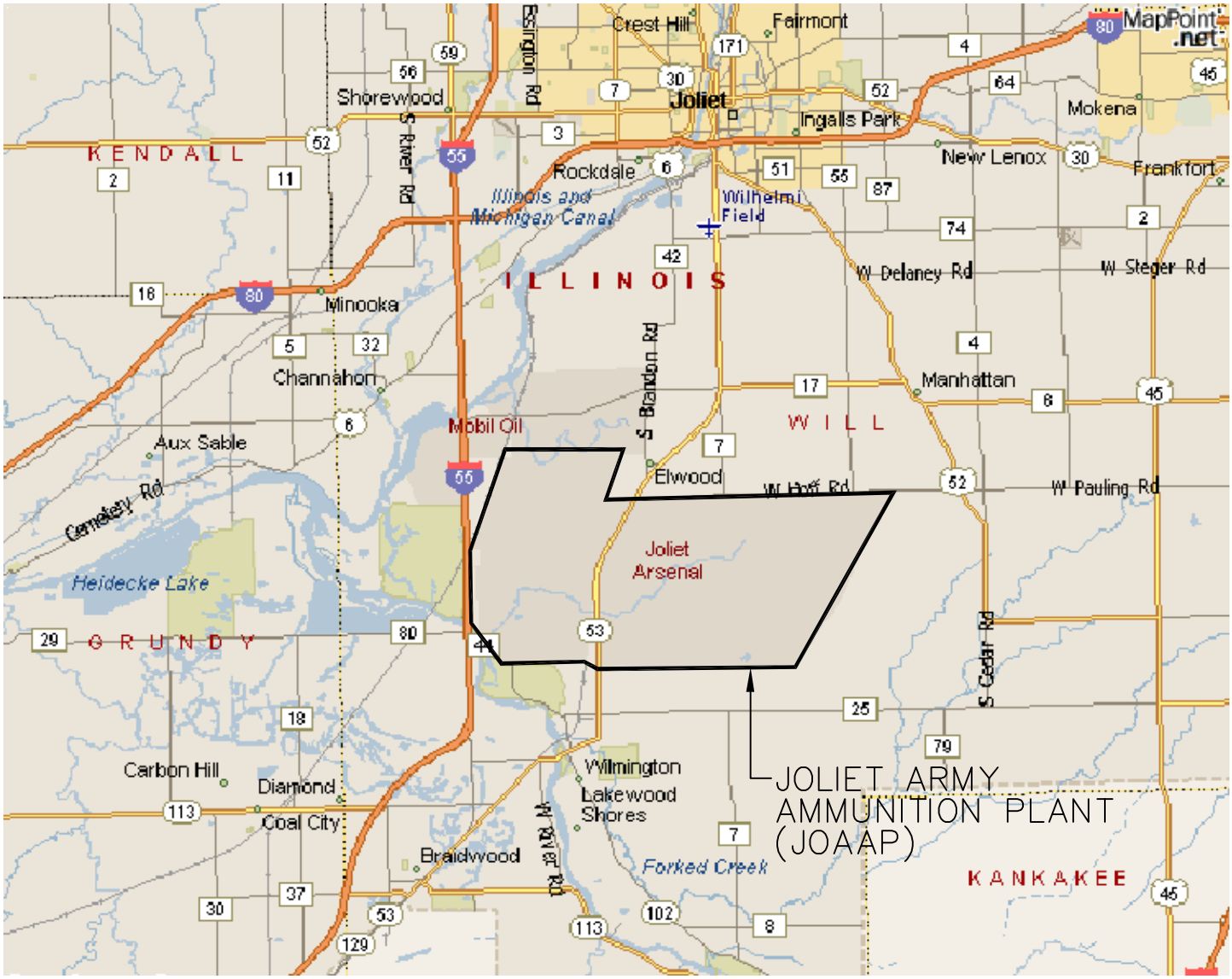
TABLE 4-1

Summary of Recommendations
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Report	Recommendation	Reasoning	Status Initiated/Pending
2009 Semi-annual			
	No recommendations regarding the monitoring program		
2009 Annual			
	Fall Sampling only at L2	Section 4.1.2.5 of LTM Plan, round with highest concentration	Initiated, Site L2 will not be sampled spring 2012
	Remove TAL metals analysis from Site L3 well MW410	No metals exceedances since sampling re-initiated in spring 2008	Initiated, metals at well MW410 were not sampled beginning fall 2011
	Remove Site M5 well MW207R from monitoring program	Section 4.1.7.4 of LTM Plan, no RG exceedances for 4 rounds	Initiated, well MW207R was not sampled beginning fall 2011
	Remove Site M3 wells MW233 and MW352 from monitoring program	Section 4.1.6.5 of LTM Plan, no RG exceedances for 4 rounds	Initiated, wells MW233 and MW352 were not sampled beginning fall 2011
	Prepare closure report for Site M3	Section 4.1.6.6 of LTM Plan, no RG exceedances for 4 rounds	Closure Report will be prepared in 2013
2010 Semi-annual			
	Remove Site L2 well MW501 from monitoring program	Section 4.1.2.5 of LTM Plan, no RG exceedances for 4 rounds	Initiated, well MW501 was not sampled fall beginning 2011
	Fall Sampling only at L14	Section 4.1.4.5 of LTM Plan, round with highest concentration	Initiated, Site L14 will not be sampled spring 2012
	Prepare closure report for Site M5	Section 4.1.7.4 of LTM Plan, no RG exceedances for 4 rounds	Closure Report will be prepared in 2013
	Remove cadmium analysis from Site M6 well MW123R	Section 4.1.7.4 of LTM Plan, no cadmium detections	Initiated, cadmium at well MW123R was not analyzed beginning fall 2010
2010 Annual			
	Remove Site L1 compliance well MW401 from monitoring program	No explosives detections. Site has upgradient early warning wells with no detections	Initiated, well MW401 will not be sampled beginning spring 2012
	Remove Site L1 early warning well MW172 from monitoring program	Well MW172 redundant with well MW173, upward vertical gradients	Initiated, well MW172 will not be sampled beginning spring 2012
	Change designation of Site L1 well MW173 to in-plume	Migration of contaminants	Initiated in 2011 Annual Report
	Remove Site L2 compliance well MW810 from monitoring program	No explosives detections. Site had upgradient early warning wells with no detections	Initiated, L2 is no longer sampled in spring and well MW810 will not be sampled in fall 2012
	Remove Site L3 compliance well MW632 from monitoring program	No explosives detections. Hydraulics suggest well not within migration flowpath	Initiated, well MW632 will not be sampled beginning spring 2012
	Change designation of Site M1 wells MW640, MW641, and MW642 to in-plume	Migration of contaminants	Initiated in 2011 Annual Report
	Remove Site M8 in-plume well MW148RR from monitoring program	In-plume well with no sulfate exceedances since spring 2009	Initiated, well MW148RR will not be sampled beginning spring 2012
	Remove Site M13 wells AEHA14R and AEHA15 from monitoring program and abandon	Problematic wells	Initiated, wells AEHA14R and AEHA15 will not be sampled beginning spring 2012
2011 Semi-annual			
	No new recommendations		
2011 Annual			
	At Site L3/Landfill L3 sample SW004 in spring only	Upstream sample SW555 provides data for fall rounds	Initiated, SW004 wil no longer sampled in fall when Site L2 is sampled
	Remove Site Landfill L3/Landfill L3 upgradient well MW03 from monitoring program	No RG exceedances at Site L3 in-pume well MW410	Initiated, well MW03 will not be sampled beginning spring 2012
	Remove Site L14 in-plume well MW508 from monitoring program	No RG exceedances	Initiated, well MW508 will not be sampled beginning spring 2012
	Remove Site L14 compliance wells MW603 and MW604 from monitoring program	Redundant, no RG exceedances in early warning well H7	Initiated, wells MW603 and MW604 will not be sampled beginning spring 2012
	Remove MFG compliance wells MW115 and MW116 from monitoring program	Redundant, no RG exceedances in upgradient Site M6 early warning wells MW123R and MW162R or Site M7 early warning well MW124R	Initiated, wells MW115 and MW116 will not be sampled beginning spring 2012
	Remove MFG compliance wells MW112 and MW113 from monitoring program	Removal of upgradient Site M5 in-plume well MW207R from monitoring program and Site M5 closure	Initiated, wells MW112 and MW113 will not be sampled beginning spring 2012
	Prepare closure report for Site M8	Removal of in-plume well MW148RR from monitoring program	Closure Report will be prepared in 2013
	Fall Sampling only at M11	Section 4.2.2.5 of LTM Plan, stable and predictable results	Pending, recommendation has not been approved. However wells MW333, MW334, MW803, and MW804 will not be sampled in spring 2012
2012 Semi-annual			
	Remove water table and potentiometric figures from future semi-annual reports.	No changes in water table or potentiometric surface flow patterns over time.	Pending
2012 Annual			
	No new recommendations		

Notes:
Does not include minor maintenance activities such as replacing well locks.
Does not include recommendations repeated in subsequent reports.

FIGURES



NOTE

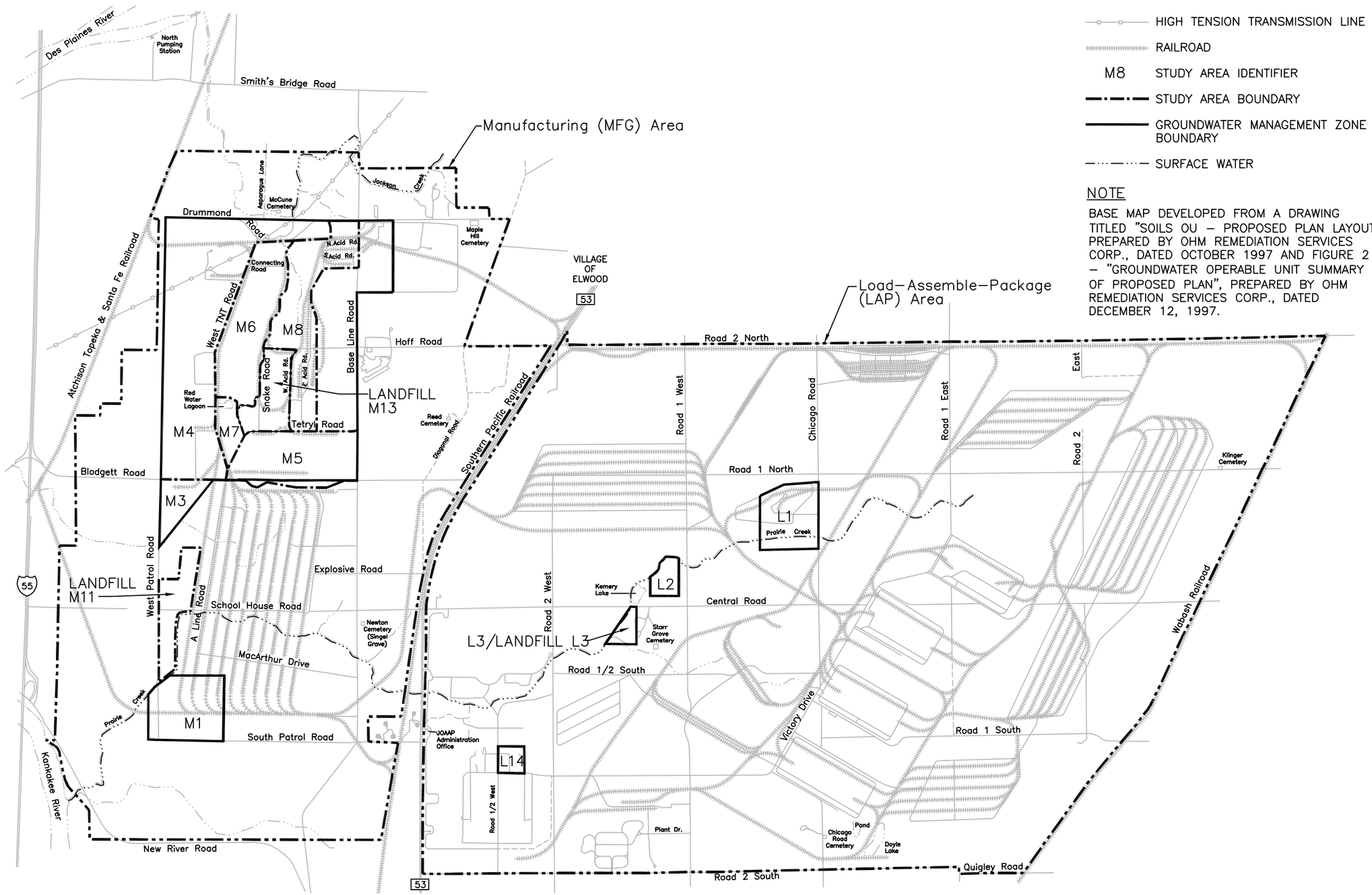
BASE MAP DEVELOPED FROM 2002 MICROSOFT CORPORATION, EXPEDIA.COM.

north

RJR DEVELOPED BY	TLP DRAWN BY	CONTRACT NO. W91ZLK-05-D-0012 DELIVERY ORDER NO. 0001	SITE LOCATION MAP	FIGURE 1-1
APPROVED	2/1/13 DATE	VERIFY SCALE 0 1/2 1 BAR REPRESENTS ONE INCH — SCALE 1"=4 Miles (Approx.)	2012 ANNUAL GROUNDWATER MONITORING REPORT JOLIET ARMY AMMUNITION PLANT WILL COUNTY, ILLINOIS	TOLTEST, INC.
REVISIONS	DATE			

Drawn By & Date: TLP 02/01/13 | Approved By & Date: RJR 02/01/13 | Revised By & Date: | Approved By & Date:

File: J:\Joliet AAP\Figure 1-1.dwg Feb 01, 2013 - 8:34am



LEGEND

- APPROXIMATE JOAAP BOUNDARY
- HIGH TENSION TRANSMISSION LINE
- RAILROAD
- M8 STUDY AREA IDENTIFIER
- STUDY AREA BOUNDARY
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- SURFACE WATER

NOTE

BASE MAP DEVELOPED FROM A DRAWING TITLED "SOILS OU – PROPOSED PLAN LAYOUT", PREPARED BY OHM REMEDIATION SERVICES CORP., DATED OCTOBER 1997 AND FIGURE 2 – "GROUNDWATER OPERABLE UNIT SUMMARY OF PROPOSED PLAN", PREPARED BY OHM REMEDIATION SERVICES CORP., DATED DECEMBER 12, 1997.

Drawn By & Date: TLP 02/01/13 | Approved By & Date: RJR 02/01/13 | Revised By & Date: | Approved By & Date:

RJR DEVELOPED BY | TLP DRAWN BY | 2/1/13 DATE | APPROVED BY

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 4000'

REV	DATE	BY	DESCRIPTION

GROUNDWATER STUDY AREAS AND LANDFILL SITES

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 1-2

DRAWING NUMBER
2091115
05010402

JOLIET INC.

LEGEND

MW175 (DRY)	OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
MW171 (DRY)	SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
MW178	DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
SW550 (604.11)	SURFACE WATER MONITORING LOCATION, NUMBER, AND WATER ELEVATION
602	WATER TABLE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF WATER TABLE FLOW
	DIRECTION OF FLOW IN PRAIRIE CREEK
	GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 29, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. MW171 IS A SHALLOW BEDROCK WELL USED AS A HORIZONTAL CONTROL POINT.

north

Drawn By & Date: TLP 1-10-13 | Approved By & Date: | Revised By & Date: RJR 2-1-13 | Approved By & Date:

RJR DEVELOPED BY | TLP DRAWN BY | 2/1/13 DATE | APPROVED BY

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – LAP AREA, SITE L1 (OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-1

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.

LEGEND

MW176	OVERBURDEN MONITORING WELL LOCATION AND NUMBER
MW171	SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
MW178 (606.63)	DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
SW550	SURFACE WATER MONITORING LOCATION AND NUMBER
606	POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF BEDROCK FLOW
	DIRECTION OF FLOW IN PRAIRIE CREEK
	GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 29, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.

north

Drawn By & Date: TLP 1-10-13 | Approved By & Date: RJR 2-1-13 | Revised By & Date: | Approved By & Date:

DEVELOPED BY: RJR | DRAWN BY: TLP
APPROVED BY: | DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – LAP AREA, SITE L1 (OCTOBER 2012)

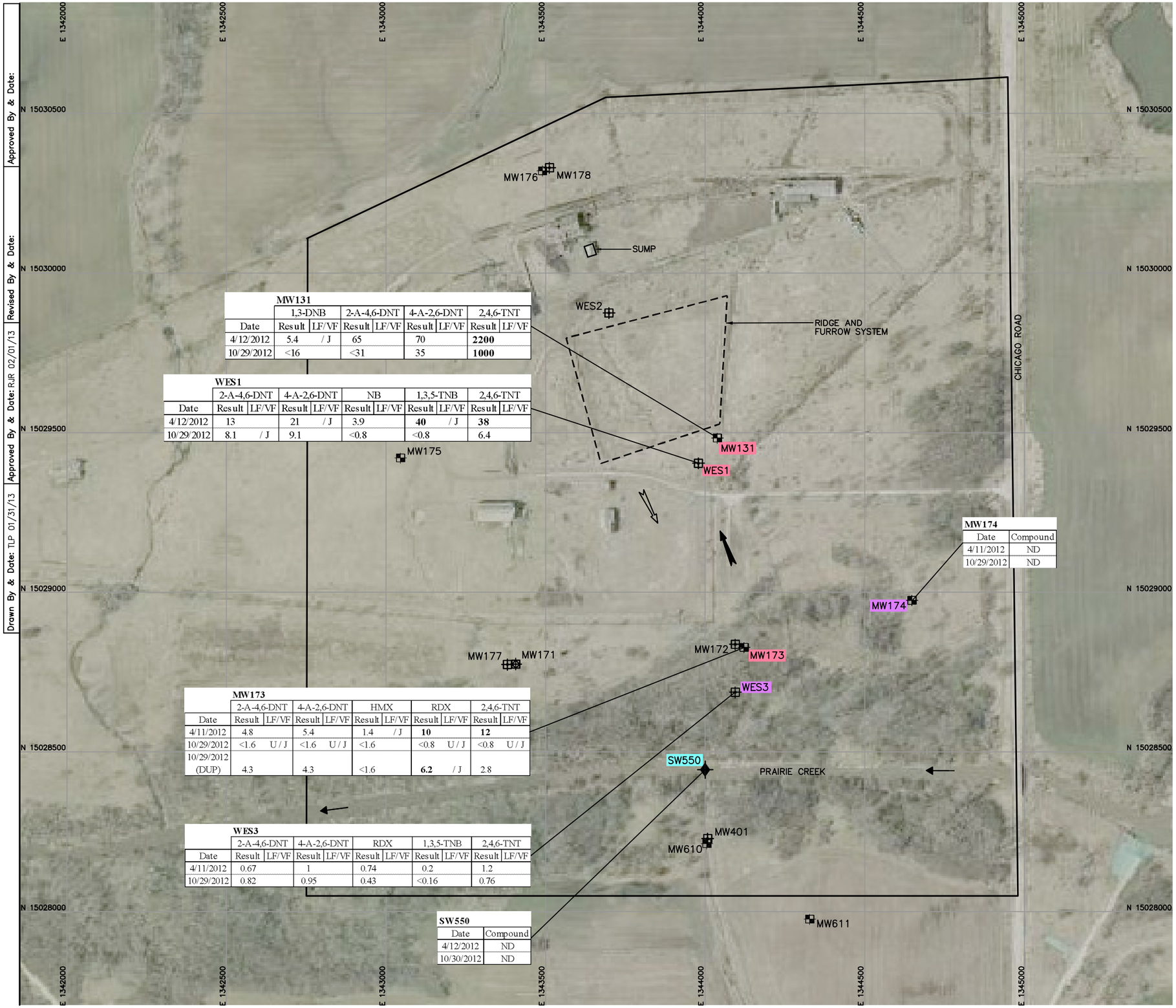
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
8/27/2012

FIGURE 3-2

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.



MW131	1,3-DNB		2-A-4,6-DNT		4-A-2,6-DNT		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/12/2012	5.4	/ J	65		70		**2200**	
10/29/2012	<16		<31		35		**1000**	

WES1	2-A-4,6-DNT		4-A-2,6-DNT		NB		1,3,5-TNB		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/12/2012	13		21	/ J	3.9		**40**	/ J	**38**	
10/29/2012	8.1	/ J	9.1		<0.8		<0.8		6.4	

MW174	
Date	Compound
4/11/2012	ND
10/29/2012	ND

MW173	2-A-4,6-DNT		4-A-2,6-DNT		HMX		RDX		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/11/2012	4.8		5.4		1.4	/ J	**10**		**12**	
10/29/2012	<1.6	U / J	<1.6	U / J	<1.6		<0.8	U / J	<0.8	U / J
10/29/2012 (DUP)	4.3		4.3		<1.6		**6.2**	/ J	2.8	

WES3	2-A-4,6-DNT		4-A-2,6-DNT		RDX		1,3,5-TNB		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/11/2012	0.67		1		0.74		0.2		1.2	
10/29/2012	0.82		0.95		0.43		<0.16		0.76	

SW550	
Date	Compound
4/12/2012	ND
10/30/2012	ND

LEGEND

- MW173 — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW171 — SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
- MW172 — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- SW550 — SURFACE WATER MONITORING LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- IN-PLUME MONITORING POINT
- EARLY WARNING MONITORING POINT
- COMPLIANCE MONITORING POINT
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- < — RESULT SHOWS LAB LIMIT FOR NON-DETECTED RESULTS
- 1,3,5-TNB — 1,3,5-TRINITROBENZENE
- 2,4,6-TNT — 2,4,6-TRINITROTOLUENE
- 2-A-4,6-DNT — 2-AMINO-4,6-DINITROTOLUENE
- 4-A-2,6-DNT — 4-AMINO-2,6-DINITROTOLUENE
- HMX — HIGH MELTING EXPLOSIVE
- RDX — ROYAL DEMOLITION EXPLOSIVE
- F/ — CONCENTRATION BELOW THE REPORTED DETECTION LIMIT
- /J — ESTIMATED CONCENTRATION
- LF/VF — LAB FLAG/VALIDATION FLAG
- ND — NOT DETECTED
- NS — NO STANDARD
- RG — REMEDIATION GOAL

Compound	Project Action Limit(1)	Surface Water RG
1,3-DNB	10	4
2-A-4,6-DNT	NS	NS
4-A-2,6-DNT	NS	NS
HMX	5100	260
RDX	2.6	500
1,3,5-TNB	5.1	15
2,4,6-TNT	9.5	75

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN APRIL AND OCTOBER 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.

Approved By & Date:
Revised By & Date:
Approved By & Date: RJR 02/01/13
Approved By & Date:
Drawn By & Date: TLP 01/31/13

RJR — DEVELOPED BY
TLP — DRAWN BY
2/1/13 — DATE
APPROVED BY

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 — 1/2 — 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES DETECTIONS – LAP AREA, SITE L1 (APRIL AND OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 2/1/2013

FIGURE 3-3

DRAWING NUMBER 2091115 05010402

TOLTEST INC.

LEGEND

- MW135 (614.46) — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW133 (599.74) — COMBINED MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW621 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- SW555 (600.24) — SURFACE WATER MONITORING LOCATION, NUMBER, AND WATER ELEVATION
- 600 — WATER TABLE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 29-30, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.

north

Drawn By & Date: TLP 1-10-13 | Approved By & Date: RJR 2-1-13 | Revised By & Date: | Approved By & Date:

DEVELOPED BY: RJR | DRAWN BY: TLP | APPROVED BY: | DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – LAP AREA,
SITE L2 (OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 2/1/2013

FIGURE 3-4

DRAWING NUMBER 2091115 05010402

TOLTEST, INC.

LEGEND

- MW135 — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW133 — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW621 (599.85) — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- SW555 — SURFACE WATER MONITORING LOCATION AND NUMBER
- 601 — POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 29, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
5. MW406 IS A COMBINATION OVERBURDEN/BEDROCK WELL USED AS A HORIZONTAL CONTROL POINT.

north

Drawn By & Date: TLP 1-11-13 | Approved By & Date: RJR 2-1-13 | Revised By & Date: | Approved By & Date:

DEVELOPED BY: RJR | DRAWN BY: TLP | APPROVED BY: | DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – LAP AREA, SITE L2 (OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 2/1/2013

FIGURE 3-5

DRAWING NUMBER 2091115 05010402

TOLTEST, INC.

SW555

Date	Compound
10/26/2012	ND

MW621

	2,4-DNT		2-NT		4-NT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF
10/26/2012	0.42		0.24	F /	0.4	

MW620

	2,4-DNT		2,6-DNT		2-NT		4-NT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
10/26/2012	0.29	F /	0.13	F /	0.28	F /	1.5	/ J

MW404

	2,4-DNT		HMX		2-NT		4-NT		RDX	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
10/26/2012	0.21	F /	33		0.54	/ J	0.65	/ J	**130**	

LEGEND

MW810	OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
MW404	COMBINED MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
MW621	DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
SW555	SURFACE WATER MONITORING LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
	IN-PLUME MONITORING POINT
	EARLY WARNING MONITORING POINT
	COMPLIANCE MONITORING POINT
	DIRECTION OF WATER TABLE FLOW
	DIRECTION OF BEDROCK FLOW
	DIRECTION OF FLOW IN PRAIRIE CREEK
	GROUNDWATER MANAGEMENT ZONE BOUNDARY
<	RESULT SHOWS LAB LIMIT FOR NON-DETECTED RESULTS
HMX	HIGH MELTING EXPLOSIVE
RDX	ROYAL DEMOLITION EXPLOSIVE
F/	CONCENTRATION BELOW THE REPORTED DETECTION LIMIT
LF/VF	LAB FLAG/VALIDATION FLAG
ND	NOT DETECTED
RG	REMEDIATION GOAL

Compound	Project Action Limit(1)	Surface Water RG
2,4-DNT	0.42	330
2.6-DNT	0.42	150
2-NT	5100	62
4-NT	NS	NS
HMX	5100	260
RDX	2.6	500

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN OCTOBER 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.

north

Approved By & Date:
Revised By & Date:
Approved By & Date: RJR 02/01/13
Drawn By & Date: TLP 01/31/13

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES DETECTIONS – LAP AREA, SITE L2 (APRIL AND OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-6

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.

LEGEND

- MW134 (602.88) — OVERBURDEN MONITORING WELL LOCATION, NUMBER AND WATER TABLE ELEVATION
- MW136 (592.07) — COMBINED MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW630 — SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
- MW412 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- SW777 (587.80) — SURFACE WATER MONITORING LOCATION, NUMBER, AND WATER ELEVATION
- 600 — WATER TABLE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM A PLAT OF TOPOGRAPHY PREPARED BY GEOTECH INC., CREST HILL, ILLINOIS, DATED MARCH 9, 2007, AND AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 29-30, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM SITE L3 CLOSURE REPORT, PREPARED BY MWH, DATED JUNE 25, 2010.
6. MW136 IS A COMBINATION OVERBURDEN/BEDROCK WELL USED AS A HORIZONTAL CONTROL POINT.

north

Drawn By & Date:	Approved By & Date:	Revised By & Date:	Approved By & Date:
TLP 1-11-13		2-1-13	RJR

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 200'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – LAP AREA,
SITE L3/LANDFILL L3 (OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-7

DRAWING NUMBER
2091115
05010402

TOLTEST INC.

LEGEND

- MW134 — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW136 (592.07) — COMBINED MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- MW630 (587.58) — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- MW412 (589.36) — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- SW777 — SURFACE WATER MONITORING LOCATION AND NUMBER
- 590 — POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM A PLAT OF TOPOGRAPHY PREPARED BY GEOTECH INC., CREST HILL, ILLINOIS, DATED MARCH 9, 2007, AND AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 30, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM SITE L3 CLOSURE REPORT, PREPARED BY MWH, DATED JUNE 25, 2010.
6. MW411 AND MW136 ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED FOR HORIZONTAL CONTROL POINTS.

north

Drawn By & Date: TLP 1-11-13 | Approved By & Date: | Revised By & Date: RJR 2-1-13 | Approved By & Date:

DEVELOPED BY: RJR | DRAWN BY: TLP | APPROVED BY: | DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 200'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – LAP AREA, SITE L3/LANDFILL L3 (OCTOBER 2012)

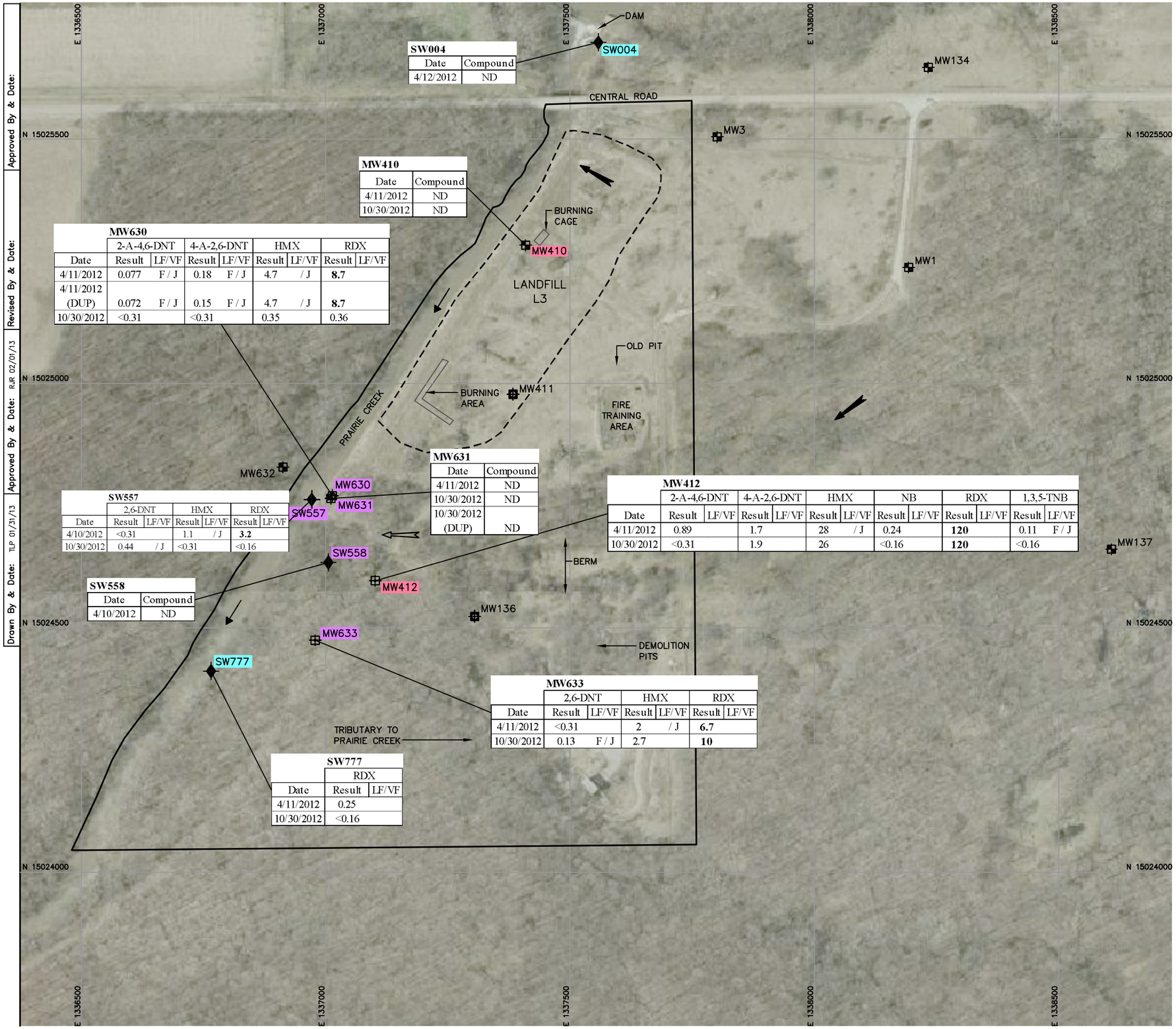
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-8

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.



SW004

Date	Compound
4/12/2012	ND

MW410

Date	Compound
4/11/2012	ND
10/30/2012	ND

MW630

	2-A-4,6-DNT		4-A-2,6-DNT		HMX		RDX	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/11/2012	0.077	F / J	0.18	F / J	4.7	/ J	**8.7**	
4/11/2012 (DUP)	0.072	F / J	0.15	F / J	4.7	/ J	**8.7**	
10/30/2012	<0.31		<0.31		0.35		0.36	

MW631

Date	Compound
4/11/2012	ND
10/30/2012	ND
10/30/2012 (DUP)	ND

SW557

	2,6-DNT		HMX		RDX	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/10/2012	<0.31		1.1	/ J	**3.2**	
10/30/2012	0.44	/ J	<0.31		<0.16	

MW412

	2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		RDX		1,3,5-TNB	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/11/2012	0.89		1.7		28	/ J	0.24		**120**		0.11	F / J
10/30/2012	<0.31		1.9		26		<0.16		**120**		<0.16	

SW558

Date	Compound
4/10/2012	ND

MW633

	2,6-DNT		HMX		RDX	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/11/2012	<0.31		2	/ J	**6.7**	
10/30/2012	0.13	F / J	2.7		**10**	

SW777

	RDX	
Date	Result	LF/VF
4/11/2012	0.25	
10/30/2012	<0.16	

LEGEND

- MW410 — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW411 — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW630 — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW412 — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- SW777 — SURFACE WATER MONITORING LOCATION, NUMBER, AND EXPLSOIVES DETECTIONS
- IN-PLUME/DOWNGRADIENT MONITORING POINT
- EARLY WARNING/DOWNGRADIENT MONITORING POINT
- COMPLIANCE/DOWNGRADIENT AND UPGRADIENT MONITORING POINT
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- APPROXIMATE LIMITS OF LANDFILL
- < — RESULT SHOWS LAB LIMIT FOR NON-DETECTED RESULTS
- 2-A-4,6-DNT — 2-AMINO-4,6-DINITROTOLUENE
- HMX — HIGH MELTING EXPLOSIVE
- RDX — ROYAL DEMOLITION EXPLOSIVE
- DUP — DUPLICATE
- LF/VF — LAB FLAG/VALIDATION FLAG
- ND — NOT DETECTED
- NS — NO STANDARD
- RG — REMEDIATION GOAL

Compound	Project Action Limit[1]	Surface Water RG
2,6-DNT	0.42	150
2-A-4,6-DNT	NS	NS
4-A-2,6-DNT	NS	NS
HMX	5100	260
NB	51	8000
RDX	2.6	500
1,3,5-TNB	5.1	15

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM A PLAT OF TOPOGRAPHY PREPARED BY GEOTECH INC., CREST HILL, ILLINOIS, DATED MARCH 9, 2007, AND AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN APRIL AND OCTOBER 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.
7. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM SITE L3 CLOSURE REPORT, PREPARED BY MWH, DATED JUNE 25, 2010.

Approved By & Date:
Revised By & Date: RJR 02/01/13
Approved By & Date: TLP 01/31/13
Drawn By & Date:

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 200'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES DETECTIONS – LAP AREA, SITE L3/LANDFILL L3 (APRIL AND OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 2/1/2013

FIGURE 3-9

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.

LEGEND

MW512 (576.78)	OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
MW140	COMBINED MONITORING WELL LOCATION AND NUMBER
MW602	DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
575	WATER TABLE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF WATER TABLE FLOW
	GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 26, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.

north

Drawn By & Date: TLP 01/11/13
Approved By & Date: RJR 02/01/13
Revised By & Date:
Approved By & Date:

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 200'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – LAP AREA, SITE L14 (OCTOBER 2012)

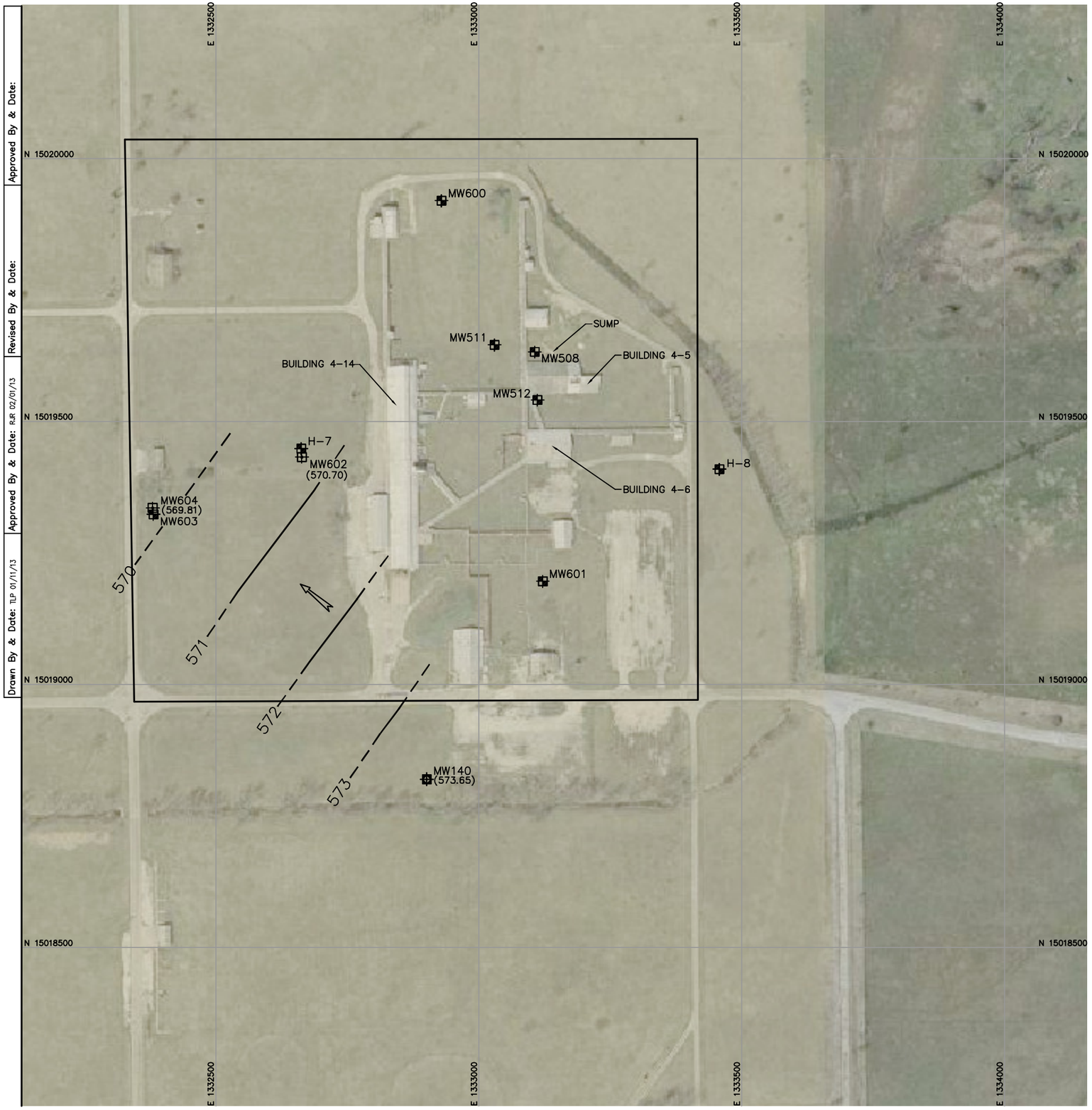
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-10

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.



LEGEND

MW512	OVERBURDEN MONITORING WELL LOCATION AND NUMBER
MW140 (573.65)	COMBINED MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
MW602 (570.70)	DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
573	POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF BEDROCK FLOW
	GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 26, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
5. MW140 IS A COMBINATION OVERBURDEN/BEDROCK WELL USED AS A HORIZONTAL CONTROL POINT.

north

Drawn By & Date: TLP 01/11/13 | Approved By & Date: | Revised By & Date: RJR 02/01/13 | Approved By & Date:

DEVELOPED BY: RJR | DRAWN BY: TLP | APPROVED BY: | DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 200'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP - LAP AREA, SITE L14 (OCTOBER 2012)

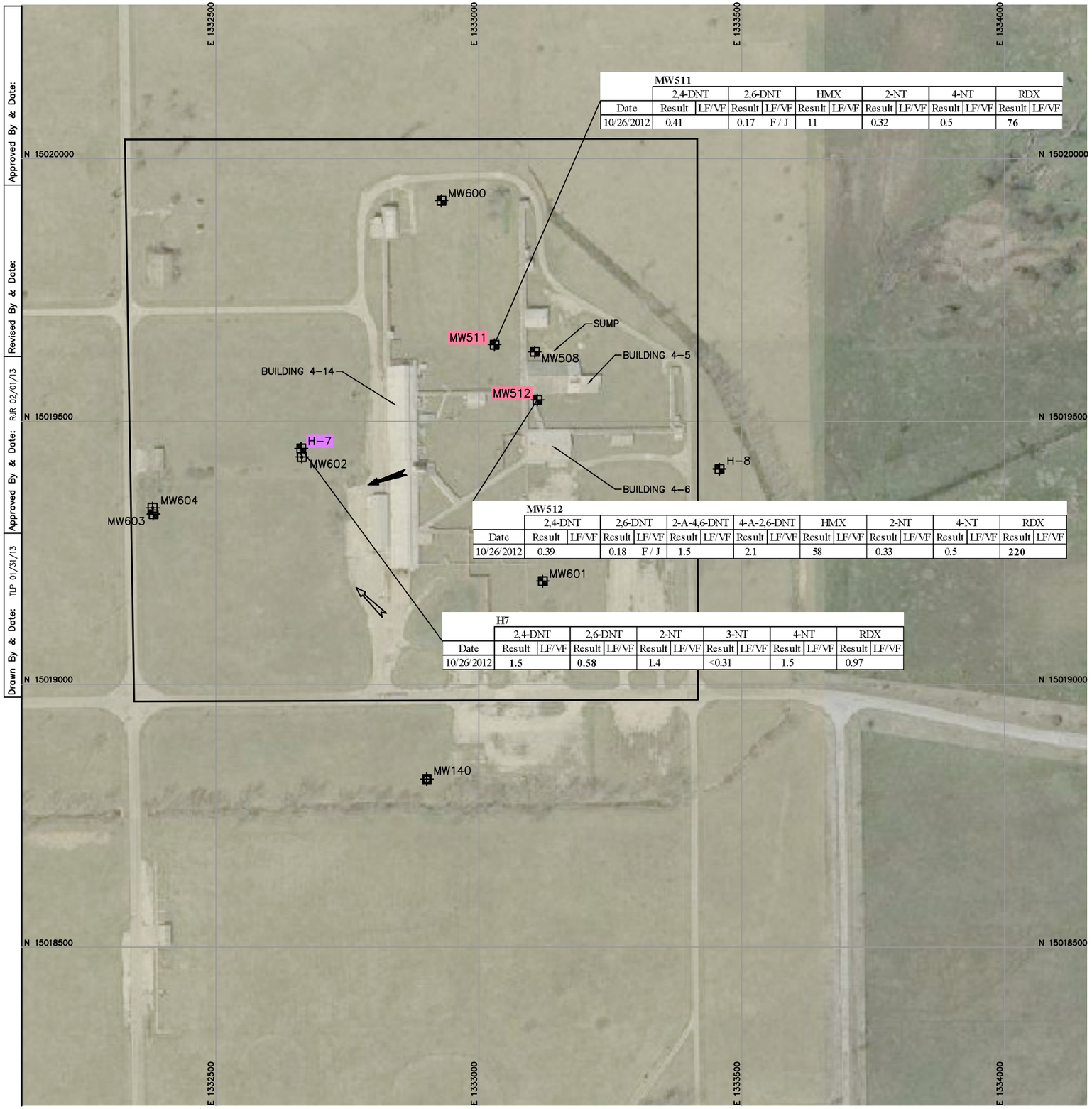
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-11

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.



MW511

Date	2,4-DNT Result	2,4-DNT LF/VF	2,6-DNT Result	2,6-DNT LF/VF	HMX Result	HMX LF/VF	2-NT Result	2-NT LF/VF	4-NT Result	4-NT LF/VF	RDX Result	RDX LF/VF
10/26/2012	0.41		0.17	F / J	11		0.32		0.5		**76**	

MW512

Date	2,4-DNT Result	2,4-DNT LF/VF	2,6-DNT Result	2,6-DNT LF/VF	2-A-4,6-DNT Result	2-A-4,6-DNT LF/VF	4-A-2,6-DNT Result	4-A-2,6-DNT LF/VF	HMX Result	HMX LF/VF	2-NT Result	2-NT LF/VF	4-NT Result	4-NT LF/VF	RDX Result	RDX LF/VF
10/26/2012	0.39		0.18	F / J	1.5		2.1		58		0.33		0.5		**220**	

H7

Date	2,4-DNT Result	2,4-DNT LF/VF	2,6-DNT Result	2,6-DNT LF/VF	2-NT Result	2-NT LF/VF	3-NT Result	3-NT LF/VF	4-NT Result	4-NT LF/VF	RDX Result	RDX LF/VF
10/26/2012	**1.5**		**0.58**		1.4		<0.31		1.5		0.97	

LEGEND

MW512	OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
MW140	COMBINED MONITORING WELL LOCATION AND NUMBER
MW604	DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
	IN–PLUME MONITORING POINT
	EARLY WARNING MONITORING POINT
	COMPLIANCE MONITORING POINT
	DIRECTION OF WATER TABLE FLOW
	DIRECTION OF BEDROCK FLOW
	GROUNDWATER MANAGEMENT ZONE BOUNDARY
<	RESULT SHOWS LAB LIMIT FOR NON–DETECTED RESULTS
2–A–4,6–DNT	2–AMINO–4,6–DINITROTOLUENE
4–A–2,6–DNT	4–AMINO–2,6–DINITROTOLUENE
HMX	HIGH MELTING EXPLOSIVE
RDX	ROYAL DEMOLITION EXPLOSIVE
F/	CONCENTRATION BELOW THE REPORTED DETECTION LIMIT
/J	ESTIMATED CONCENTRATION
LF/VF	LAB FLAG/VALIDATION FLAG
ND	NOT DETECTED
NS	NO STANDARD
RG	REMEDIATION GOAL

Compound	Project Action Limit(1)	Surface Water RG
2,4-DNT	0.42	330
2,6-DNT	0.42	150
2-A-4,6-DNT	NS	NS
2-NT	5100	62
3-NT	NS	NS
4-A-2,6-DNT	NS	NS
4-NT	NS	NS
HMX	5100	260
RDX	2.6	500

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER–USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN OCTOBER 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.

north

Drawn By & Date: TLP 01/31/13
Approved By & Date: RJR 02/01/13
Revised By & Date:
Approved By & Date:

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK–05–D–0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 200'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES DETECTIONS – LAP AREA, SITE L14 (APRIL AND OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3–12

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.

LEGEND

- MW104 (537.83) OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW105 (543.90) COMBINED MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW201 DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- SW709 (532.64) SURFACE WATER MONITORING LOCATION, NUMBER, AND WATER TABLE ELEVATION
- 540 WATER TABLE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 25–26, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. MW105 AND MW107 ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED AS HORIZONTAL CONTROL POINTS.

north

Approved By & Date:
Revised By & Date:
Approved By & Date: RJR 02/01/13
Drawn By & Date: TLP 01/11/13

RJR	TLP
DEVELOPED BY	DRAWN BY
	2/1/13
APPROVED BY	DATE

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – MANUFACTURING AREA, SITE M1 (OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3–13

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.

LEGEND

- MW104 — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW105 — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW640 (539.82) — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- SW709 — SURFACE WATER MONITORING LOCATION AND NUMBER
- 540 — POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 1 FT, DASHED WHERE INFERRED)
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 25–26, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.

north

Drawn By & Date: TLP 01/11/13
Approved By & Date: RJR 02/01/13
Revised By & Date:
Approved By & Date:

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

POTENITOMETRIC SURFACE MAP – MANUFACTURING AREA, SITE M1 (OCTOBER 2012)

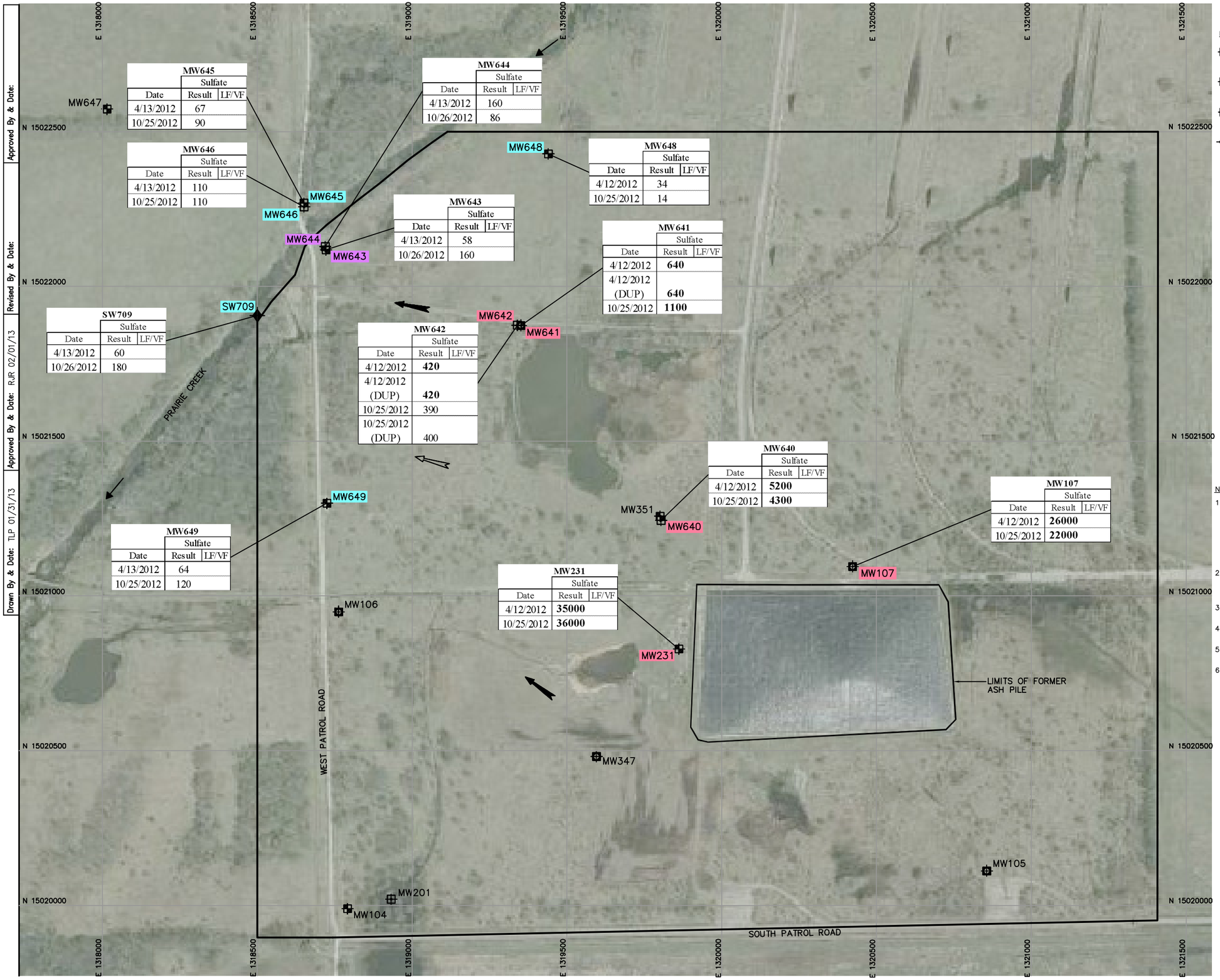
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-14

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.



MW645	Sulfate	
Date	Result	LF/VF
4/13/2012	67	
10/25/2012	90	

MW644	Sulfate	
Date	Result	LF/VF
4/13/2012	160	
10/26/2012	86	

MW646	Sulfate	
Date	Result	LF/VF
4/13/2012	110	
10/25/2012	110	

MW648	Sulfate	
Date	Result	LF/VF
4/12/2012	34	
10/25/2012	14	

MW643	Sulfate	
Date	Result	LF/VF
4/13/2012	58	
10/26/2012	160	

MW641	Sulfate	
Date	Result	LF/VF
4/12/2012	**640**	
4/12/2012 (DUP)	**640**	
10/25/2012	**1100**	

SW709	Sulfate	
Date	Result	LF/VF
4/13/2012	60	
10/26/2012	180	

MW642	Sulfate	
Date	Result	LF/VF
4/12/2012	**420**	
4/12/2012 (DUP)	**420**	
10/25/2012	390	
10/25/2012 (DUP)	400	

MW640	Sulfate	
Date	Result	LF/VF
4/12/2012	**5200**	
10/25/2012	**4300**	

MW107	Sulfate	
Date	Result	LF/VF
4/12/2012	**26000**	
10/25/2012	**22000**	

MW649	Sulfate	
Date	Result	LF/VF
4/13/2012	64	
10/25/2012	120	

MW231	Sulfate	
Date	Result	LF/VF
4/12/2012	**35000**	
10/25/2012	**36000**	

LEGEND

- MW648 — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND SULFATE DETECTIONS
- MW641 — COMBINED MONITORING WELL LOCATION, NUMBER, AND SULFATE DETECTIONS
- MW642 — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND SULFATE DETECTIONS
- SW709 — SURFACE WATER MONITORING LOCATION, NUMBER, AND SULFATE DETECTIONS
- IN-PLUME MONITORING POINT
- EARLY WARNING MONITORING POINT
- COMPLIANCE MONITORING POINT
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF BEDROCK FLOW
- DIRECTION OF FLOW IN PRAIRIE CREEK
- GROUNDWATER MANAGEMENT ZONE BOUNDARY

DUP	DUPLICATE
LF/VF	LAB FLAG/VALIDATION FLAG
mg/L	MILLIGRAMS PER LITER
NS	NO STANDARD
RG	REMEDIATION GOAL

	Sulfate
Units	mg/L
Project Action Limit[1]	400
Surface Water RG	NS

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN APRIL AND OCTOBER 2012.
5. CONCENTRATIONS REPORTED IN MILLIGRAMS PER LITER (mg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.

Approved By & Date:
Approved By & Date:
Revised By & Date: RJR 02/01/13
Drawn By & Date: TLP 01/31/13

RJR — DEVELOPED BY
TLP — DRAWN BY
2/1/13 — DATE
APPROVED BY

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 300'

REV	DATE	BY	DESCRIPTION

SULFATE DETECTIONS – MANUFACTURING AREA, SITE M1 (APRIL AND OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-15

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.

LEGEND

- MW325R (555.05) — OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW652 (551.73) — COMBINED MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- MW356 — SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
- MW308 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- 550 — WATER TABLE CONTOUR (CONTOUR INTERVAL: 2', DASHED WHERE INFERRED)
- DIRECTION OF WATER TABLE FLOW
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- STUDY AREA BOUNDARIES

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL OCTOBER 22-25, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. MW117, MW127R, AND MW327R ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED AS HORIZONTAL CONTROL POINTS.

north

Drawn By & Date: TLP 01/17/13 | Approved By & Date: | Revised By & Date: | Approved By & Date: RJR 02/01/13

DEVELOPED BY: RJR | DRAWN BY: TLP | APPROVED BY: | DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 1200'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – MANUFACTURING AREA, MFG – SITES M4, M5, M6, M7, M8, M9, M13, AND OTHER AREAS (OCTOBER 2012)

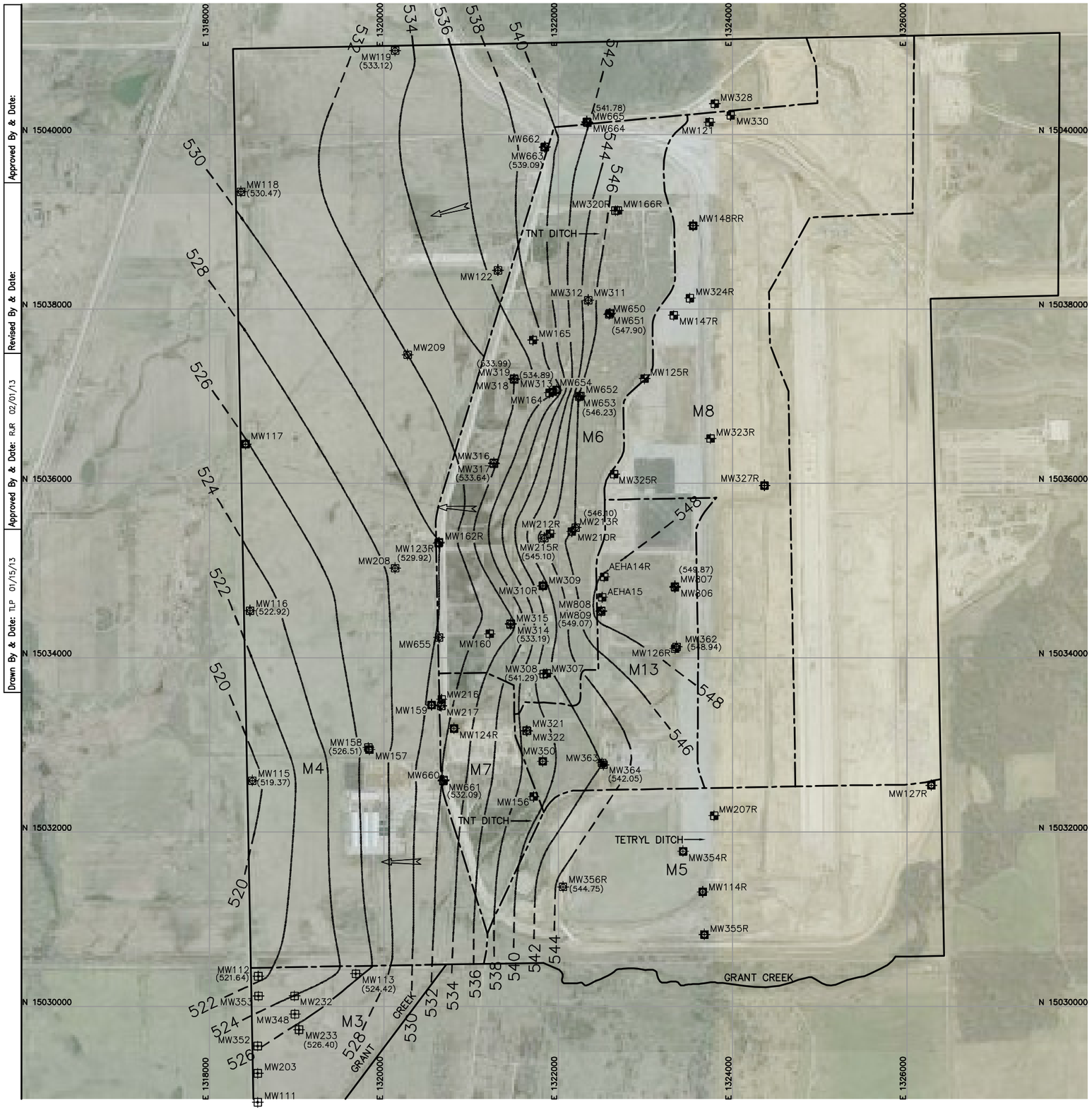
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 2/1/2013

FIGURE 3-16

DRAWING NUMBER 2091115 05010402

TOLTEST, INC.



LEGEND

- MW325R — OVERBURDEN MONITORING WELL LOCATION AND NUMBER
- MW350 — COMBINED MONITORING WELL LOCATION AND NUMBER
- MW356R (544.75) — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- MW308 (541.29) — DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
- 540 — POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 2 FT, DASHED WHERE INFERRED)
- DIRECTION OF BEDROCK FLOW
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- STUDY AREA BOUNDARIES

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL OCTOBER 22-25, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.

Drawn By & Date: TLP 01/15/13
Approved By & Date:
Revised By & Date: RJR 02/01/13
Approved By & Date:
Approved By & Date:

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 1200'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – MANUFACTURING AREA, MFG – SITES M4, M5, M6, M7, M8, M9, M13, AND OTHER AREAS (OCTOBER 2012)

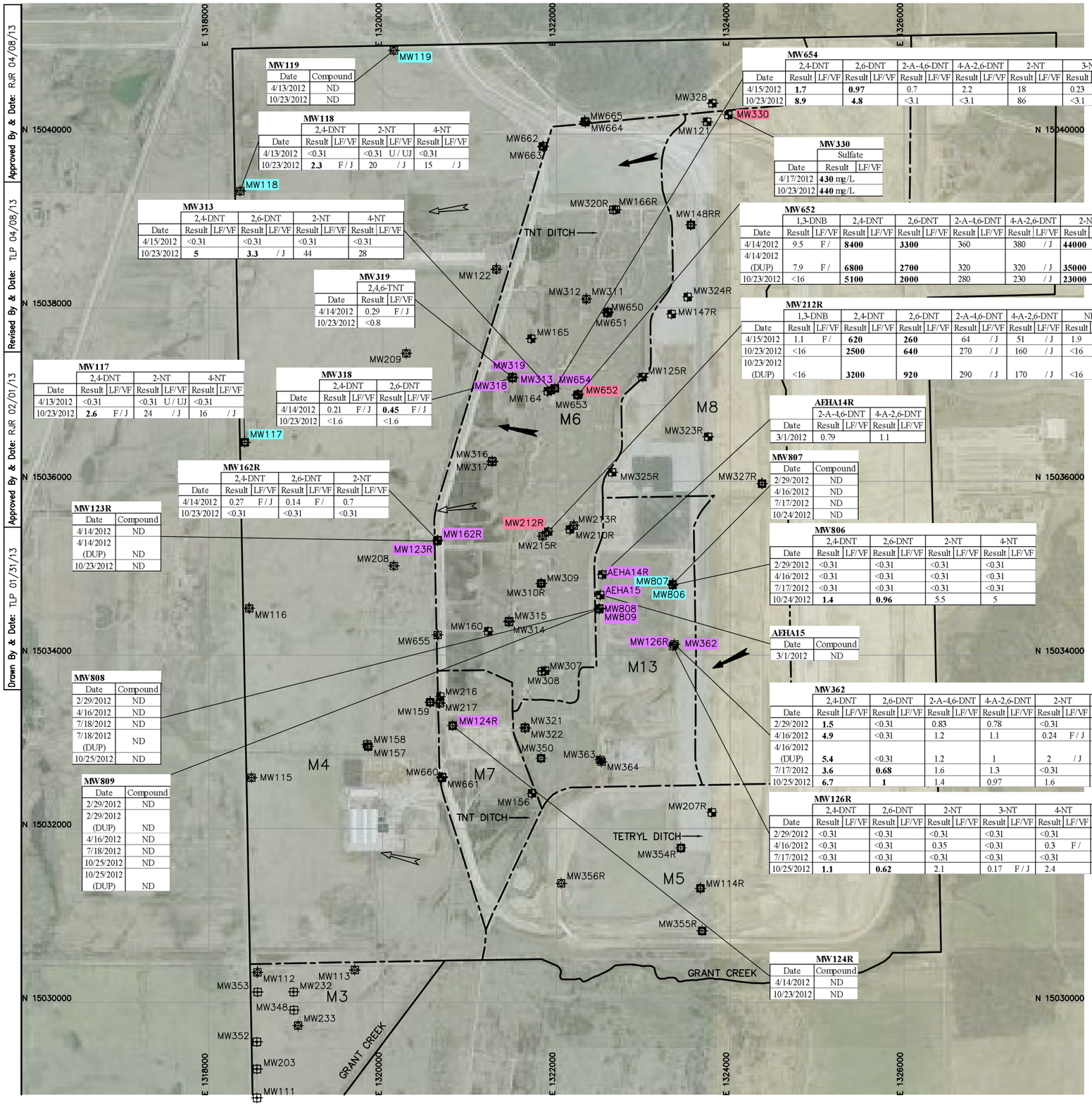
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-17

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.



MW119

Date	Compound
4/13/2012	ND
10/23/2012	ND

MW118

	2,4-DNT		2-NT		4-NT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/13/2012	<0.31		<0.31	U / UJ	<0.31	
10/23/2012	**2.3**	F / J	20	/ J	15	/ J

MW313

	2,4-DNT		2,6-DNT		2-NT		4-NT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/15/2012	<0.31		<0.31		<0.31		<0.31	
10/23/2012	**5**		**3.3**	/ J	44		28	

MW319

	2,4-TNT	
Date	Result	LF/VF
4/14/2012	0.29	F / J
10/23/2012	<0.8	

MW117

	2,4-DNT		2-NT		4-NT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/13/2012	<0.31		<0.31	U / UJ	<0.31	
10/23/2012	**2.6**	F / J	24	/ J	16	/ J

MW318

	2,4-DNT		2,6-DNT	
Date	Result	LF/VF	Result	LF/VF
4/14/2012	0.21	F / J	**0.45**	F / J
10/23/2012	<1.6		<1.6	

MW162R

	2,4-DNT		2,6-DNT		2-NT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/14/2012	0.27	F / J	0.14	F /	0.7	
10/23/2012	<0.31		<0.31		<0.31	

MW123R

Date	Compound
4/14/2012	ND
4/14/2012 (DUP)	ND
10/23/2012	ND

MW808

Date	Compound
2/29/2012	ND
4/16/2012	ND
7/18/2012	ND
7/18/2012 (DUP)	ND
10/25/2012	ND

MW809

Date	Compound
2/29/2012	ND
2/29/2012 (DUP)	ND
4/16/2012	ND
7/18/2012	ND
10/25/2012	ND
10/25/2012 (DUP)	ND

MW654

	2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		2-NT		3-NT		4-NT		RDX		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/15/2012	**1.7**		**0.97**		0.7		2.2		18		0.23	F / J	11		0.31	/ J	0.18	/ J
10/23/2012	**8.9**		**4.8**		<3.1		<3.1		86		<3.1		52		<1.6		<1.6	

MW330

	Sulfate	
Date	Result	LF/VF
4/17/2012	**430** mg/L	
10/23/2012	**440** mg/L	

MW652

	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		2-NT		4-NT		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/14/2012	9.5	F /	**8400**		**3300**		360		380	/ J	**44000**		28000		**1600**	
4/14/2012 (DUP)	7.9	F /	**6800**		**2700**		320		320	/ J	**35000**		22000	/ J	**1300**	
10/23/2012	<16		**5100**		**2000**		280		230	/ J	**23000**		14000		**950**	

MW212R

	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		NB		2-NT		4-NT		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
4/15/2012	1.1	F /	**620**		**260**		64	/ J	51	/ J	1.9		4100		2100		**39**	
10/23/2012	<16		**2500**		**640**		270	/ J	160	/ J	<16		**12000**		6700		**200**	
10/23/2012 (DUP)	<16		**3200**		**920**		290	/ J	170	/ J	<16		**15000**		7900		**340**	

AEHA14R

	2-A-4,6-DNT		4-A-2,6-DNT	
Date	Result	LF/VF	Result	LF/VF
3/1/2012	0.79		1.1	

MW807

Date	Compound
2/29/2012	ND
4/16/2012	ND
7/17/2012	ND
10/24/2012	ND

MW806

	2,4-DNT		2,6-DNT		2-NT		4-NT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
2/29/2012	<0.31		<0.31		<0.31		<0.31	
4/16/2012	<0.31		<0.31		<0.31		<0.31	
7/17/2012	<0.31		<0.31		<0.31		<0.31	
10/24/2012	**1.4**		**0.96**		5.5		5	

AEHA15

Date	Compound
3/1/2012	ND

MW362

	2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		2-NT		3-NT		4-NT		RDX		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
2/29/2012	**1.5**		<0.31		0.83		0.78		<0.31		<0.31		<0.31		<0.16		<0.16	
4/16/2012	**4.9**		<0.31		1.2		1.1		0.24	F / J	<0.31		<0.31	U / UJ	<0.16		0.073	F /
4/16/2012 (DUP)	**5.4**		<0.31		1.2		1		2	/ J	0.19	F /	1.9	/ J	<0.16		0.097	F /
7/17/2012	**3.6**		**0.68**		1.6		1.3		<0.31		<0.31		<0.31		<0.16		<0.16	
10/25/2012	**6.7**		**1**		1.4		0.97		1.6		0.16	F /	1.9		**13**		0.08	F /

MW126R

	2,4-DNT		2,6-DNT		2-NT		3-NT		4-NT		1,3,5-TNB	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
2/29/2012	<0.31		<0.31		<0.31		<0.31		<0.31		<0.16	
4/16/2012	<0.31		<0.31		0.35		<0.31		0.3	F /	<0.16	
7/17/2012	<0.31		<0.31		<0.31		<0.31		<0.31		<0.16	
10/25/2012	**1.1**		**0.62**		2.1		0.17	F / J	2.4		0.22	

MW124R

Date	Compound
4/14/2012	ND
10/23/2012	ND

LEGEND

- MW212R — OVERBURDEN MONITORING WELL LOCATION NUMBER, AND EXPLOSIVES DETECTIONS
- MW124R — COMBINED MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW115 — SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
- MW308 — DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
- IN-PLUME MONITORING POINT
- EARLY WARNING MONITORING POINT
- COMPLIANCE MONITORING POINT
- DIRECTION OF WATER TABLE FLOW
- DIRECTION OF BEDROCK FLOW
- GROUNDWATER MANAGEMENT ZONE BOUNDARY
- STUDY AREA BOUNDARIES
- < — RESULT SHOWS LAB LIMIT FOR NON-DETECTED RESULTS
- 1,3-DNB — 1,3-DINITROBENZENE
- 2,4,6-TNT — 2,4,6-TRINITROTOLUENE
- 2,4-DNT — 2,4-DINITROTOLUENE
- 2,6-DNT — 2,6-DINITROTOLUENE
- 2-A-4,6-DNT — 2-AMINO-4,6-DINITROTOLUENE
- 2-NT — 2-NITROTOLUENE
- 3-NT — 3-NITROTOLUENE
- 4-A-2,6-DNT — 4-AMINO-2,6-DINITROTOLUENE
- 4-NT — 4-NITROTOLUENE
- HMX — HIGH MELTING EXPLOSIVE
- RDX — ROYAL DEMOLITION EXPLOSIVE
- DUP — DUPLICATE
- F/ — CONCENTRATION BELOW THE REPORTED DETECTION LIMIT
- /J — ESTIMATED CONCENTRATION
- LF/VF — LAB FLAG/VALIDATION FLAG
- ND — NOT DETECTED
- NS — NO STANDARD
- RG — REMEDIATION GOAL

Compound	Project Action Limit[1]	Surface Water RG
1,3-DNB	10	4
2,4,6-TNT	9.5	75
2,4-DNT	0.42	330
2.6-DNT	0.42	150
2-A-4,6-DNT	NS	NS
2-NT	5100	62
3-NT	NS	NS
4-A-2,6-DNT	NS	NS
4-NT	NS	NS
HMX	5100	260
RDX	2.6	500

	Sulfate
Units	mg/L
Project Action Limit[1]	400
Surface Water RG	NS

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN FEBRUARY, MARCH, APRIL, JULY AND OCTOBER 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L) WITH THE EXCEPTION OF SULFATE, REPORTED IN MILLIGRAMS PER LITER (mg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.

north

Drawn By & Date: TLP 01/31/13 | Approved By & Date: RJR 02/01/13 | Revised By & Date: TLP 04/08/13 | Approved By & Date: RJR 04/08/13

DEVELOPED BY: RJR | DRAWN BY: TLP | DATE: 4/8/13 | APPROVED BY:

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE — 0 1/2 1 — BAR REPRESENTS ONE INCH ON ORIGINAL — SCALE 1" = 1200'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES AND SULFATE DETECTIONS
MANUFACTURING AREA – SITES M4, M5, M6, M7, M8, M9, M13 AND OTHER AREAS (2012)
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 4/8/2013

FIGURE 3-18

DRAWING NUMBER 2091115 05010402

TOLTEST, INC.

LEGEND

MW647	OVERBURDEN MONITORING WELL LOCATION AND NUMBER
MW802 (531.47)	COMBINED MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
MW334 (530.45)	SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
530	WATER TABLE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF WATER TABLE FLOW
	DIRECTION OF FLOW IN PRAIRIE CREEK
	STUDY AREA BOUNDARY
	APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 24, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M11 NEW WELL LOCATIONS", PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED JANUARY 2008.
6. MW334 AND MW335 ARE SHALLOW BEDROCK WELLS, AND MW802 AND MW804 ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED AS HORIZONTAL CONTROL POINTS.

north

Drawn By & Date: TLP 01/15/13
Approved By & Date: RJR 02/01/13
Revised By & Date:
Approved By & Date:

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 500'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – MANUFACTURING AREA, SITE M11 LANDFILL (OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-19

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.

LEGEND

MW647	OVERBURDEN MONITORING WELL LOCATION AND NUMBER
MW802	COMBINED MONITORING WELL LOCATION AND NUMBER
MW803 (537.98)	SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
535	POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF BEDROCK FLOW
	DIRECTION OF FLOW IN PRAIRIE CREEK
	STUDY AREA BOUNDARY
	APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 24, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M11 NEW WELL LOCATIONS", PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED JANUARY 2008.

north

Drawn By & Date: TLP 01/15/13
Approved By & Date: RJR 02/01/13
Revised By & Date:
Approved By & Date:

RJR DEVELOPED BY
TLP DRAWN BY
2/1/13 DATE
APPROVED BY

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 500'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – MANUFACTURING AREA, SITE M11 LANDFILL (OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-20

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.

MW333		
	Sulfate	
Date	Result	LF/VF
10/24/2012	59	

MW804		
	Sulfate	
Date	Result	LF/VF
10/24/2012	**490**	

MW805		
	Sulfate	
Date	Result	LF/VF
4/16/2012	**470**	
10/24/2012	**450**	

MW334		
	Sulfate	
Date	Result	LF/VF
10/24/2012	240	

MW335		
	Sulfate	
Date	Result	LF/VF
4/16/2012	**660**	
10/24/2012	**580**	

MW803		
	Sulfate	
Date	Result	LF/VF
10/24/2012	98	

MW802		
	Sulfate	
Date	Result	LF/VF
4/16/2012	85	
10/24/2012	260	

MW336		
	Sulfate	
Date	Result	LF/VF
4/16/2012	**410**	
10/24/2012	**510**	
10/24/2012 (DUP)	**530**	

LEGEND

MW647	OVERBURDEN MONITORING WELL LOCATION AND NUMBER
MW802	COMBINED MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
MW803	SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
	DOWNGRADIENT MONITORING POINT
	UPGRADIENT MONITORING POINT
	DIRECTION OF WATER TABLE FLOW
	DIRECTION OF BEDROCK FLOW
	DIRECTION OF FLOW IN PRAIRIE CREEK
	STUDY AREA BOUNDARY
	APPROXIMATE LIMITS OF LANDFILL
DUP	DUPLICATE
LF/VF	LAB FLAG/VALIDATION FLAG
NS	NO STANDARD
RG	REMEDIATION GOAL

	Sulfate
Units	mg/L
Project Action Limit[1]	400
Surface Water RG	NS

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN APRIL AND OCTOBER 2012.
5. CONCENTRATIONS REPORTED IN MILLIGRAMS PER LITER (mg/L).
6. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M11 NEW WELL LOCATIONS", PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED JANUARY 2008.

north

Drawn By & Date: TLP 01/31/13 | Approved By & Date: RJR 02/01/13 | Revised By & Date: TLP 04/08/13 | Approved By & Date: RJR 04/08/13

RJR DEVELOPED BY | TLP DRAWN BY | 4/8/13 DATE | APPROVED BY

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 500'

REV	DATE	BY	DESCRIPTION

SULFATE DETECTIONS – MANUFACTURING AREA, SITE M11 LANDFILL (APRIL AND OCTOBER 2012)

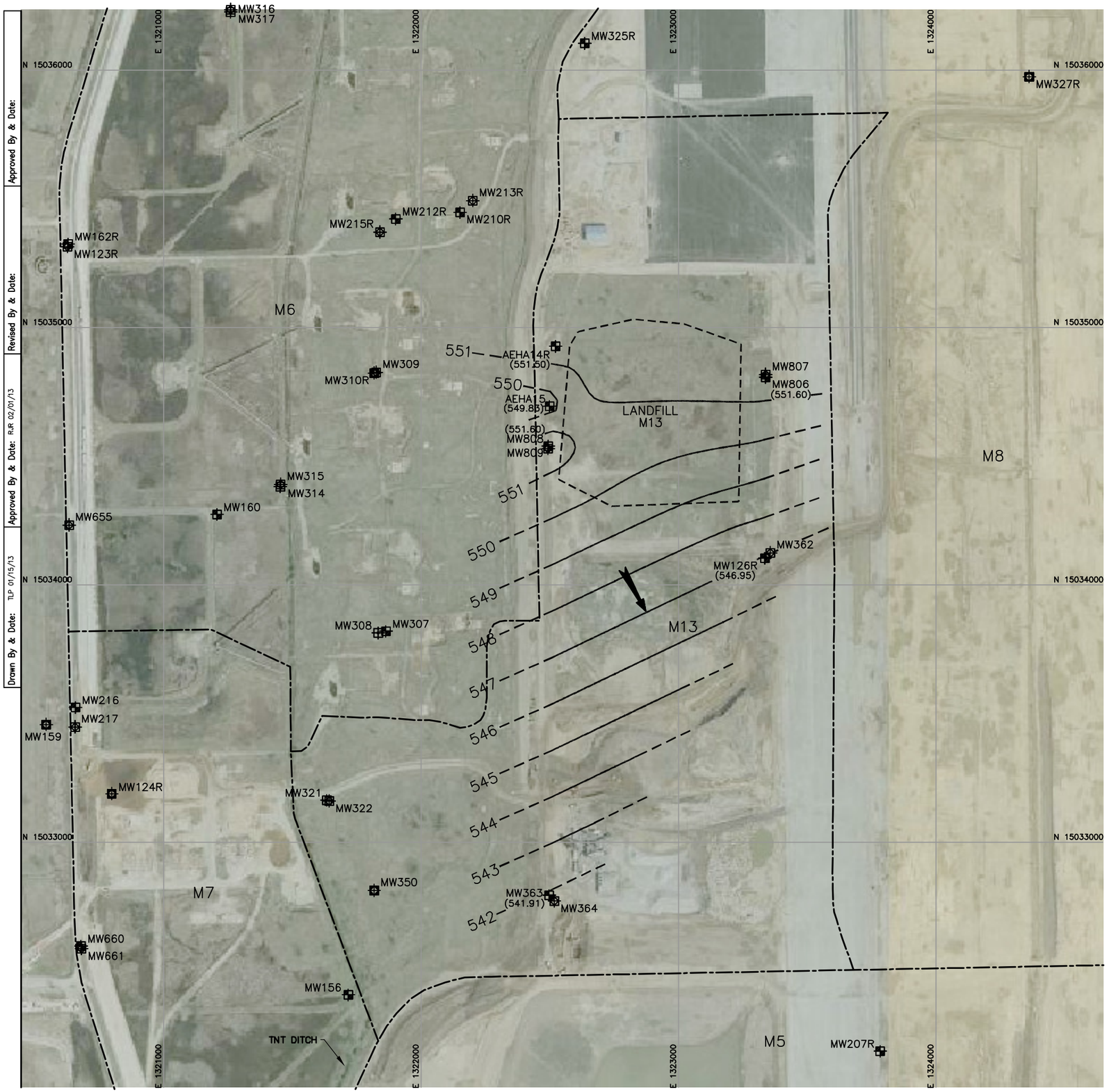
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 4/8/2013

FIGURE 3-21

DRAWING NUMBER 2091115 05010402

TOLTEST, INC.



LEGEND

MW126R (546.95)	OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
MW350	COMBINED MONITORING WELL LOCATION AND NUMBER
MW356	SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
MW308	DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
550	WATER TABLE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF WATER TABLE FLOW
	STUDY AREA BOUNDARIES
	APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON JULY 17, 2012.
4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

north

Drawn By & Date: TLP 01/15/13
Approved By & Date:
Revised By & Date: RJR 02/01/13
Approved By & Date:
Approved By & Date:

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 400'

REV	DATE	BY	DESCRIPTION

SITE FEATURES/WATER TABLE MAP – MANUFACTURING AREA, SITE M13 LANDFILL (JULY 2012)

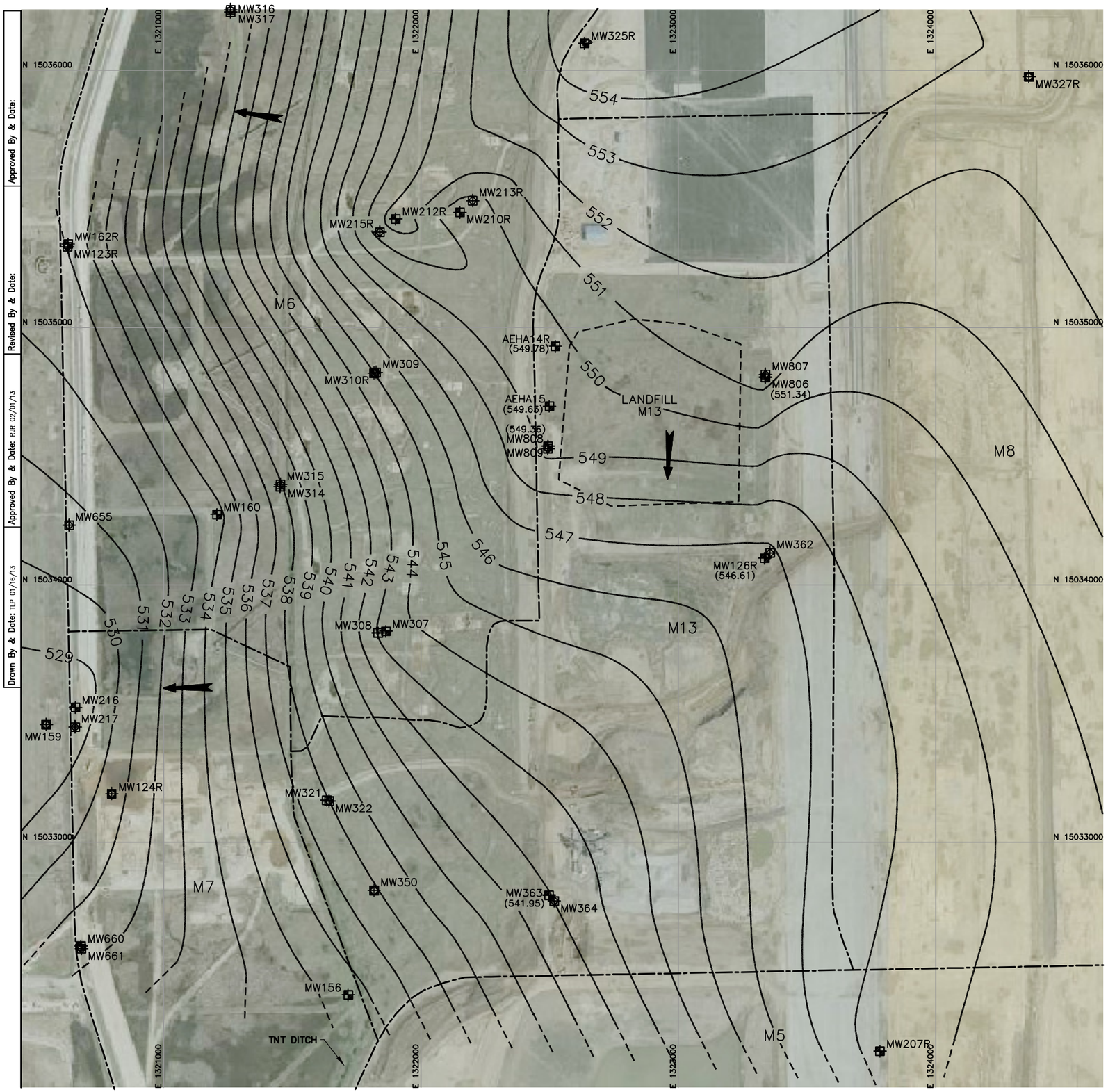
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-22

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.



LEGEND

MW126R (546.61)	OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
MW350	COMBINED MONITORING WELL LOCATION AND NUMBER
MW356	SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER
MW308	DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
550	WATER TABLE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF WATER TABLE FLOW
	STUDY AREA BOUNDARIES
	APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. SEE FIGURE 3-16 FOR WATER TABLE CONFIGURATION OF AREA SURROUNDING LANDFILL M13.
4. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 24-25, 2012.
5. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
6. SEE FIGURE 3-16 FOR GROUNDWATER ELEVATIONS OF MONITORING WELLS AT SITES ADJACENT TO M13.
7. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

north

Approved By & Date:
Revised By & Date:
Approved By & Date: RJR 02/01/13
Drawn By & Date: TLP 01/16/13

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 400'

REV	DATE	BY	DESCRIPTION

WATER TABLE MAP – MANUFACTURING AREA, SITE M13 LANDFILL (OCTOBER 2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

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2/1/2013

FIGURE 3-23

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.

LEGEND

MW126R	OVERBURDEN MONITORING WELL LOCATION AND NUMBER
MW350	COMBINED MONITORING WELL LOCATION AND NUMBER
MW362 (549.14)	SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
MW308	DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
550	POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF BEDROCK FLOW
	STUDY AREA BOUNDARIES
	APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON JULY 17, 2012.
4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

north

Drawn By & Date: TLP 01/16/13
Approved By & Date:
Revised By & Date:
Approved By & Date: RJR 02/01/13
Approved By & Date:

DEVELOPED BY: RJR
DRAWN BY: TLP
APPROVED BY:
DATE: 2/1/13

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 400'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – MANUFACTURING AREA, SITE M13 LANDFILL (JULY 2012)

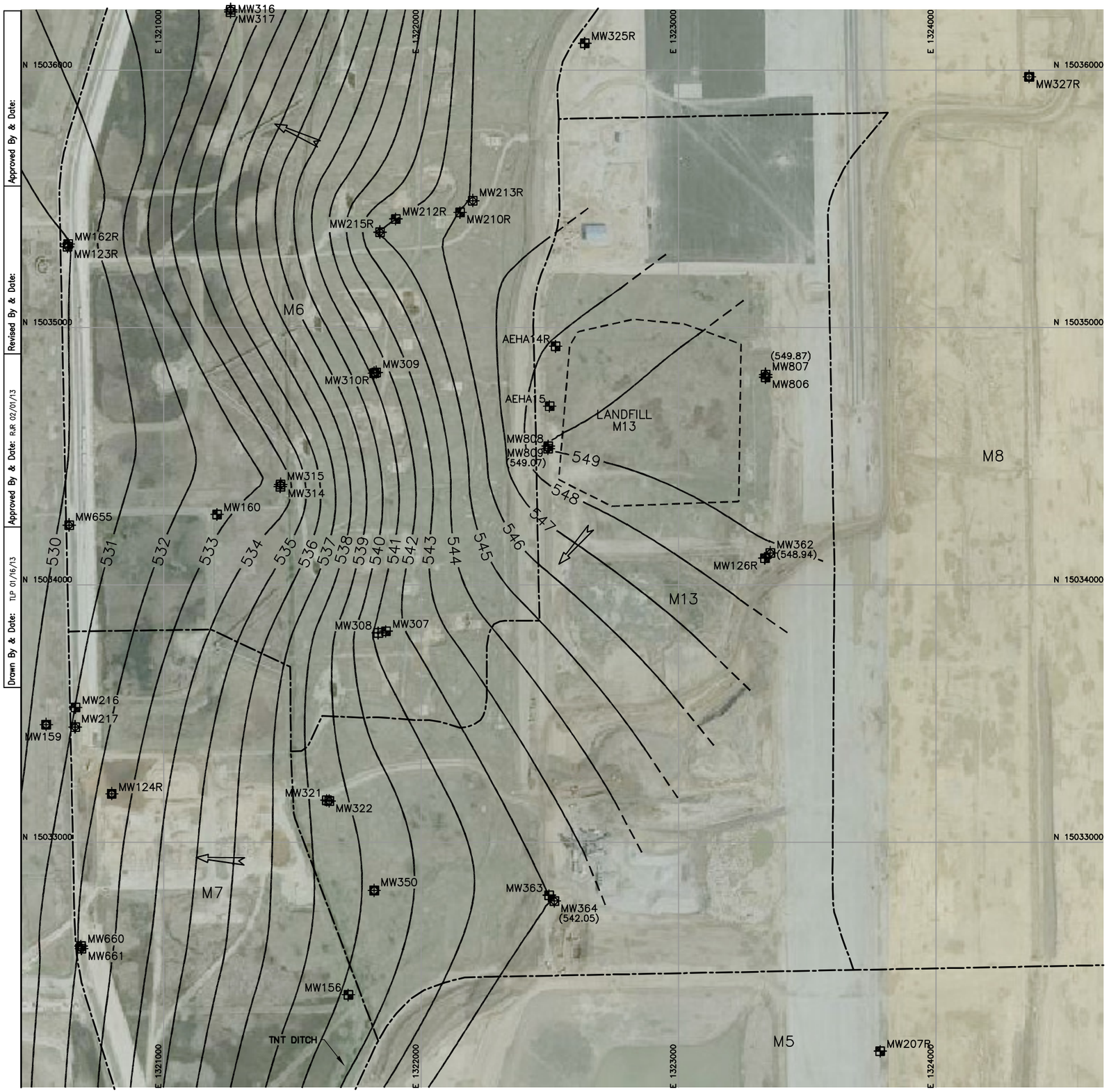
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-24

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.



LEGEND

MW126R	OVERBURDEN MONITORING WELL LOCATION AND NUMBER
MW350	COMBINED MONITORING WELL LOCATION AND NUMBER
MW362 (548.94)	SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
MW308	DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
545	POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)
	DIRECTION OF BEDROCK FLOW
	STUDY AREA BOUNDARIES
	APPROXIMATE LIMITS OF LANDFILL

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
3. SEE FIGURE 3-18 FOR POTENTIOMETRIC SURFACE CONFIGURATION OF AREA SURROUNDING LANDFILL M13.
4. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON OCTOBER 24-25, 2012.
5. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
6. SEE FIGURE 3-18 FOR GROUNDWATER ELEVATIONS OF MONITORING WELLS AT SITES ADJACENT TO M13.
7. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

north

Approved By & Date:
Approved By & Date: RJR 02/01/13
Revised By & Date:
Drawn By & Date: TLP 01/16/13

RJR — DEVELOPED BY
TLP — DRAWN BY
2/1/13 — DATE
APPROVED BY

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 400'

REV	DATE	BY	DESCRIPTION

POTENTIOMETRIC SURFACE MAP – MANUFACTURING AREA, SITE M13 LANDFILL (OCTOBER 2012)

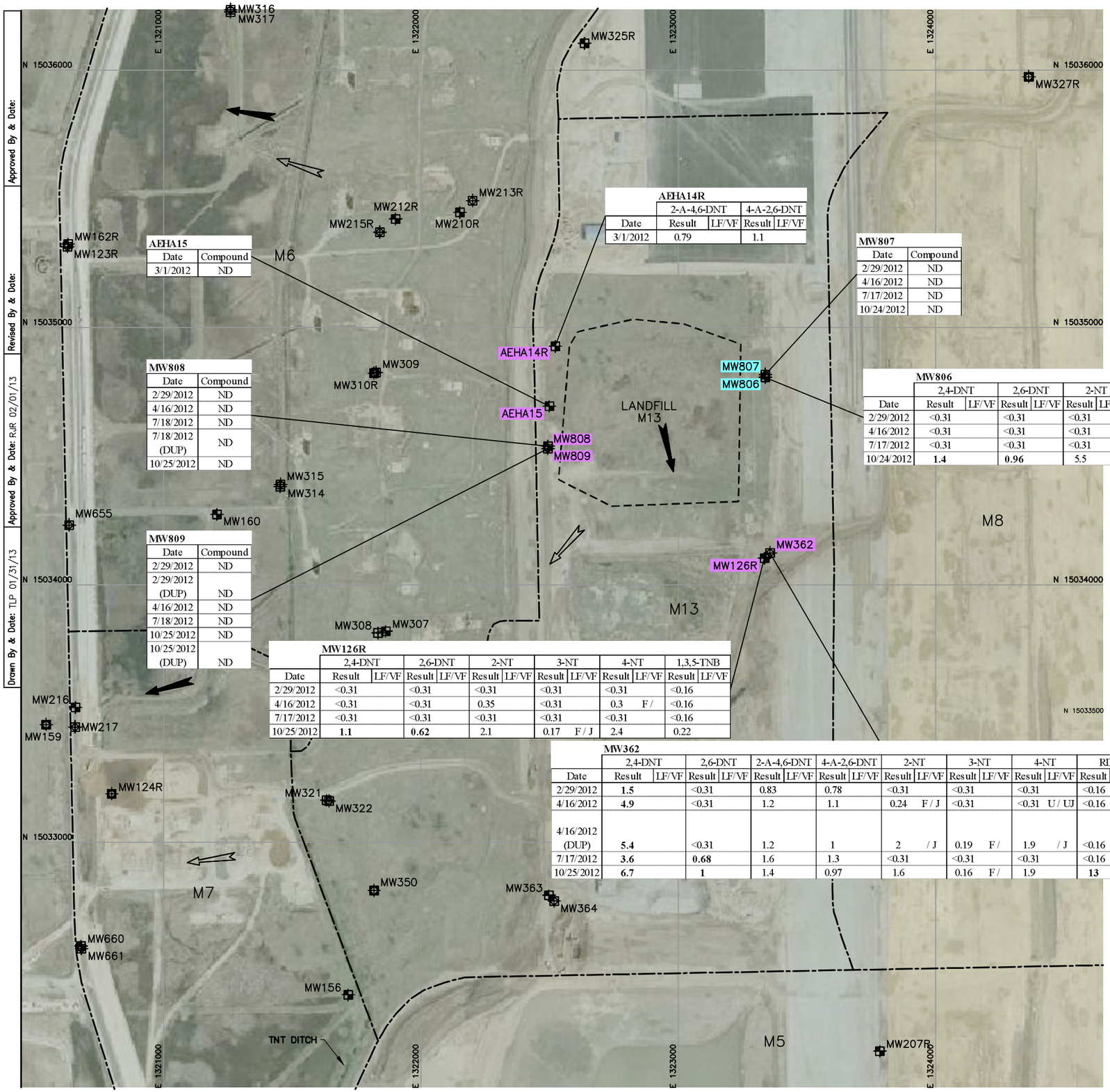
2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-25

DRAWING NUMBER
2091115
05010402

TOLTEST INC.



AEHA15	
Date	Compound
3/1/2012	ND

AEHA14R				
	2-A-4,6-DNT		4-A-2,6-DNT	
Date	Result	LF/VF	Result	LF/VF
3/1/2012	0.79		1.1	

MW807	
Date	Compound
2/29/2012	ND
4/16/2012	ND
7/17/2012	ND
10/24/2012	ND

MW808	
Date	Compound
2/29/2012	ND
4/16/2012	ND
7/18/2012	ND
7/18/2012 (DUP)	ND
10/25/2012	ND

MW806								
	2,4-DNT		2,6-DNT		2-NT		4-NT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
2/29/2012	<0.31		<0.31		<0.31		<0.31	
4/16/2012	<0.31		<0.31		<0.31		<0.31	
7/17/2012	<0.31		<0.31		<0.31		<0.31	
10/24/2012	**1.4**		**0.96**		5.5		5	

MW809	
Date	Compound
2/29/2012	ND
2/29/2012 (DUP)	ND
4/16/2012	ND
7/18/2012	ND
10/25/2012	ND
10/25/2012 (DUP)	ND

MW126R												
	2,4-DNT		2,6-DNT		2-NT		3-NT		4-NT		1,3,5-TNB	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
2/29/2012	<0.31		<0.31		<0.31		<0.31		<0.31		<0.16	
4/16/2012	<0.31		<0.31		0.35		<0.31		0.3	F /	<0.16	
7/17/2012	<0.31		<0.31		<0.31		<0.31		<0.31		<0.16	
10/25/2012	**1.1**		**0.62**		2.1		0.17	F / J	2.4		0.22	

MW362																					
	2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		2-NT		3-NT		4-NT		RDX		2,4,6-TNT	
Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
2/29/2012	**1.5**		<0.31		0.83		0.78		<0.31		<0.31		<0.31		<0.16		<0.16	
4/16/2012	**4.9**		<0.31		1.2		1.1		0.24	F / J	<0.31		<0.31	U / UJ	<0.16		0.073	F /
4/16/2012 (DUP)	**5.4**		<0.31		1.2		1		2	/ J	0.19	F /	1.9	/ J	<0.16		0.097	F /
7/17/2012	**3.6**		**0.68**		1.6		1.3		<0.31		<0.31		<0.31		<0.16		<0.16	
10/25/2012	**6.7**		**1**		1.4		0.97		1.6		0.16	F /	1.9		**13**		0.08	F /

LEGEND

MW126R	OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
MW327R	COMBINED MONITORING WELL LOCATION AND NUMBER
MW362	SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS
MW308	DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER
	DOWNGRADIENT MONITORING POINT
	UPGRADIENT MONITORING POINT
	DIRECTION OF WATER TABLE FLOW
	DIRECTION OF BEDROCK FLOW
	STUDY AREA BOUNDARIES
	APPROXIMATE LIMITS OF LANDFILL
<	RESULT SHOWS LAB LIMIT FOR NON-DETECTED RESULTS
2,4-DNT	2,4-DINITROTOLUENE
2,6-DNT	2,6-DINITROTOLUENE
2-A-4,6-DNT	2-AMINO-4,6-DINITROTOLUENE
4-A-2,6-DNT	4-AMINO-2,6-DINITROTOLUENE
RDX	ROYAL DEMOLITION EXPLOSIVE
DUP	DUPLICATE
LF/VF	LAB FLAG/VALIDATION FLAG
ND	NOT DETECTED
NS	NO STANDARD
RG	REMEDIATION GOAL

Compound	Project Action Limit(1)	Surface Water RG
2,4,6-TNT	9.5	75
2,4-DNT	0.42	330
2,6-DNT	0.42	150
2-A-4,6-DNT	NS	NS
2-NT	5100	62
3-NT	NS	NS
4-A-2,6-DNT	NS	NS
4-NT	NS	NS
RDX	2.6	500

NOTES

1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
2. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN FEBRUARY, MARCH, APRIL, JULY, AND OCTOBER 2012.
5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
6. BOLDED VALUE INDICATES RG EXCEEDANCE.
7. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

Approved By & Date:
Revised By & Date:
Approved By & Date: RJR 02/01/13
Drawn By & Date: TLP 01/31/13

RJR DEVELOPED BY
TLP DRAWN BY
2/1/13 DATE
APPROVED BY

CONTRACT NO. W91ZLK-05-D-0012
DELIVERY ORDER NO. 0001

VERIFY SCALE
0 1/2 1
BAR REPRESENTS ONE INCH ON ORIGINAL
SCALE 1" = 400'

REV	DATE	BY	DESCRIPTION

EXPLOSIVES DETECTIONS – MANUFACTURING AREA, SITE M13 LANDFILL (2012)

2012 ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED
2/1/2013

FIGURE 3-26

DRAWING NUMBER
2091115
05010402

TOLTEST, INC.

APPENDIX A

LANDFILL INSPECTION REPORTS

A1 – Landfill Inspection Report – July 2012
A2 - Landfill Inspection Report – October 2012

A1 – Landfill Inspection Report – July 2012

POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of
Environmental Remediation Services at
Joliet Army Ammunition Plant
Joliet, Illinois

July 2012

Submitted to:

US Army Contracting Agency
APG Directorate of Contracting - AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:

1480 Ford Street
Maumee, OH 43537
(419) 794-3500

REPORT DOCUMENTATION PAGE	Form Approved OMB No. 0704-0188

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1. REPORT DATE (DD-MM-YYYY)	2. REPORT TYPE	3. DATES COVERED (From – To)
07-17-2012	Technical	July to September 2012

4. TITLE AND SUBTITLE Post-Closure Inspection Report for Landfills L3, M11 and M13 for the 2008 Performance-Based Acquisition for Environmental Remediation, Joliet Army Ammunition Plant, Joliet, Illinois	**5a. CONTRACT NUMBER** W91ZLK-05-D-0012
	5b. GRANT NUMBER NA
	5c. PROGRAM ELEMENT NUMBER NA
6. AUTHOR(S) TolTest, Inc.	**5d. PROJECT NUMBER** Delivery Order 0001
	5e. TASK NUMBER NA
	5f. WORK UNIT NUMBER NA

PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) TolTest, Inc. 1480 Ford Street Maumee, OH 44087	**8. PERFORMING ORGANIZATION REPORT NUMBER**
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDESS(ES) USAEC - Louisville District Aberdeen Proving Ground – W91ZLK 4118 Susquehanna Ave Aberdeen Proving Ground, MD 21005-3013	**10. SPONSOR/MONITOR'S ACRONYM(S)** CELRL-ED-EE
	11. SPONSOR/MONITOR'S REPORT NUMBER NA

12. DISTRIBUTION/AVAILABILITY STATEMENT
Reference Distribution Page

13. SUPPLEMENTARY NOTES
None.

14. ABSTRACT
This Post-Closure Inspection report presents TolTest's findings for the conditions at landfills L3, M11 and M13 pursuant to the requirements of the Performance-Based Contract for Environmental Remediation at the Joliet Army Ammunition Plant.

15. SUBJECT TERMS
Landfill, Inspection Report, L3, M11, M13

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18 NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (*Include area code)*

Standard Form 298 (Rev. 8/98)
Prescribed by ANSI Std. Z39.18

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POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of
Environmental Remediation Services at
Joliet Army Ammunition Plant
Joliet, Illinois

Submitted to:

US Army Contracting Agency
APG Directorate of Contracting - AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:

1480 Ford Street
Maumee, OH 43537
(419) 794-3500

July 2012

DOCUMENT DISTRIBUTION
for the
Post-Closure Inspection Report for Landfills
L3, M11, and M13
for the Performance-Based Acquisition of
Environmental Remediation
Joliet Army Ammunition Plant
Joliet, Illinois

Organization	Distribution	
	Paper	Electronic
Joliet Army Ammunition Plant	2	2
Joliet Environmental Information Management System	0	1
United States Army Environmental Command	1	2
United States Army Corps of Engineers - Louisville District	0	2

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2.1.1 Monitoring Locations 2
2.2 Landfill M11 2
2.2.1 Monitoring Locations 2
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List of Attachments

Attachment A ..... Post-Closure Inspection Checklists
Attachment B ..... Inspection Photographs

LIST OF ACRONYMS

GMZ	Ground Water Monitoring Zone
IAC	Illinois Administrative Code
JOAAP	Joliet Army Ammunition Plant
L3	JOAAP Landfill L3
M11	JOAAP Landfill M11
M13	JOAAP Landfill M13
RA	Remedial Action
RG	Remedial Goal
USAEC	United States Army Environmental Command

POST-CLOSURE INSPECTION REPORT

1.0 Introduction

This document has been prepared for the United States Army Environmental Command to provide documentation of the conditions of three landfills (L3, M11, and M13) located at the former Joliet Army Ammunition Plant (JOAAP).

Post-closure monitoring requirements for Landfills L3, M11 and M13 are mandated by Illinois Administrative Code (IAC) Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed; and
- Keep survey points protected and visible to facilitate identification in the future.

1.1 Landfill Cover Maintenance

According to IAC, the Landfills L3, M11 and M13 covers will be inspected on a quarterly basis for:

- Depressions indicating subsidence or other deformations that could breach the cover;
- Erosion features;
- Growth of deep rooted vegetation or invasive species that would adversely affect evapotranspiration and/or erosion armoring; and
- Debris or blockage of drainage structures.

Any damages or changes noted will be repaired to comply with the final design specifications for the cover.

Site inspections were conducted on 17 July 2012 for landfill M13, M11 and L3. This report includes copies of the inspection checklist, photographs, recommendations, and conclusions. The Post-Closure Inspection Checklists are found in Attachment A, and Inspection Photographs are found in Attachment B.

2.0 Landfill Descriptions

2.1 Landfill L3

Landfill L3 is located on the western edge of the Site L3 GMZ on the east bank of Prairie Creek. The GMZ comprises approximately 50 acres used as a demolition area directly southwest of Site L2, of which the landfill occupies only 3.32 acres. The area of Landfill L3 was originally contaminated through import of contaminated fill. However, other waste and contaminated soil have been moved to the site as a part of the L3 RA in order to consolidate residual contamination into a smaller footprint. The remedy selected for the consolidated area along Prairie Creek was capping to form Landfill L3. Implementation of the remedy began in 2007 and was completed in 2008.

Landfill L3 is believed to contain metals and explosive residues that could continue to contaminate the underlying groundwater and migrate to Prairie Creek. Because the landfill is bordered by Prairie Creek, any contamination that infiltrates from the filled area would be expected to migrate to Prairie Creek and quickly be discharged as the groundwater flows upward into the surface water body.

2.1.1 Monitoring Locations

Both groundwater and surface water sample points are monitored at Landfill L3 during spring and fall sampling rounds as follows:

- Upgradient Locations
  - SW004 (Surface location where Prairie Creek first touches the L3 GMZ boundary and upstream of the storm water outfall, spring only).
- Downgradient Locations
  - MW410
  - MW412
  - MW630
  - MW631
  - MW633
  - SW777 (Surface water location in Prairie Creek near the L3 GMZ boundary)
  - SW557 (Surface water location in Prairie Creek just upstream of the landfill drainage swale discharge)
  - SW558 (Surface water location at the constructed drainage swale along the southwest side of the newly constructed landfill)

2.2 Landfill M11

Landfill M11 is located in the southwestern portion of the manufacturing side of JOAAP. The GMZ comprises approximately 133 acres. Site M11 was divided into two sections by School House Road and bordered on the west by West Patrol Road. M11 north encompassed approximately 10.5 acres of former gravel pits that were mined and filled with waste. M11 south, a former gravel pit, encompassed approximately 5.6 acres that was also mined and filled with waste. The remedy chosen for Landfill M11 was waste consolidation and capping. Implementation of the remedy began in 2006 and was completed in 2008.

The current conceptual site model is that Landfill M11 is believed to contain manganese and sulfate containing waste that could potentially contaminate underlying groundwater and migrate beyond the GMZ.

With the implementation of the RA at Site M11, it is anticipated that the landfill cap will prevent percolation of precipitation through waste consolidated in the landfill thus, preventing groundwater contamination.

2.2.1 Monitoring Locations

Groundwater sample points are monitored at Landfill M11 in fall as follows:

- Upgradient Locations
  - MW802
  - MW803
- Downgradient Locations

- MW333
- MW334
- MW335
- MW336
- MW804
- MW805

2.3 Landfill M13

Landfill M13 comprises approximately 106 acres of the central portion of the MFG Area known as the gravel pits. It lies north of the Tetryl Production Area, east of the TNT Ditch Complex, and west of the Acid Area. Disposal activities were confined to four discrete areas on the site, none of which extended beyond 12 acres in size. Historical records indicate landfill disposal took place in the Northern Gravel Pit during the period 1966 to 1984 and involved scrap metals, creosote-treated railroad ties, telephone poles, and construction/demolition debris. The three other pits received waste materials that do not appear to pose a threat to human health and the environment.

Soil in the vicinity of the Northern Gravel Pit had been found to contain beryllium, lead, and benzo(a)pyrene as COCs. Explosive compounds that have been observed in groundwater at Site M13 include: TNT, TNB, 2,4-DNT, and 2,6-DNT. On a single occasion in 1991, antimony and cadmium were reported to be present at concentrations in excess of their respective RGs, but they have not exceeded the RGs since then. It is difficult to determine if the original findings could have resulted from turbid samples since low flow sampling and micro purging techniques are now employed to obtain more representative samples.

The current conceptual site model is that metal and benzo(a)pyrene in groundwater may be present as a result of leaching of waste materials in the Northern Gravel Pit. The explosives present in groundwater are far more likely to be present due to infiltration of wastewater in the TNT Ditch. There is no evidence to suggest explosive compounds were ever present in waste materials put into the pit.

With the implementation of the RA on the TNT Ditch and the capping of the Northern Gravel Pit, it is anticipated that contaminants in site groundwater will detach from the source areas and migrate as legacy plumes to the west. As such, concentrations are expected to decline with time.

2.3.1 Monitoring Locations

Groundwater is monitored quarterly through sample collection and analysis at six monitoring wells:

- Upgradient or background wells
  - MW806
  - MW807
- Downgradient or source control wells
  - MW126R
  - MW362
  - MW808
  - MW809

3.0 Inspection Results

The following are the observations from the landfill inspections conducted at L3, M11, and M13 on 17 July 2012.

3.1 Landfill L3

The perimeter fence and site postings were in good condition. The vegetative cover while stressed due to drought was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. Woody growth is present in the rip rap. No subsidence was observed nor was there any evidence of damage due to burrowing animals.

The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable.

3.2 Landfill M11

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion was observed. Growth of the cover appears dormant due to lack of rain. All woody plants observed on the landfill cap during the inspection were cut and removed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. There is woody growth in the rip rap. There was no evidence of damage due to burrowing animals. The vents were undamaged and appeared to be in working order.

3.3 Landfill M13

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. The vents were undamaged and appeared to be in working order. The drainage ditch on the south side of the landfill has significant vegetative growth.

4.0 Conclusions and Recommendations

The deficiencies noted within this report which need to be addressed include the following:

Landfill L3:

- Repair rip rap along Prairie creek. The Army is currently preparing the contract documentation necessary for implementation of the repairs.
- Some woody plants were observed on the landfill cap during the inspection and were cut and removed. Woody growth in the rip rap requires removal.

Landfill M11:

- Some woody plants were observed on the landfill cap during the inspection and were cut and removed. The woody growth in the rip rap needs to be removed.

Landfill M13:

- Some woody plants were observed on the landfill cap during the inspection and were cut and removed.

Attachment A
Post-Closure Inspection Checklists

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: M11		Date of Inspection: July 17, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection:			
Checklist	Yes	No	Explanation
Site Security			
a) Was fencing, gates and signs in good condition?	√		
b) Were gates locked?		√	Chained shut with no lock
c) Evidence of trespassing		√	
Landfill Cover			
d) Evidence of Settling and/or Ponding?		√	
e) Any desiccation or cracking detected?		√	
f) Erosion around cap?		√	
g) Animal burrowing detected?		√	
Vegetation Condition			
h) Is vegetation well established?	√		
i) Evidence of vegetation detrimental to cap?	√		All woody plants observed on the landfill cap during the inspection were cut and removed.
Landfill structures			
j) Evidence of damage to monitoring wells?		√	
k) Evidence of damage to gas vents?		√	
Field Conclusions			
l) Is there an imminent hazard to the integrity of the unit?		√	
m) Are repairs necessary?		√	
Certification			
Inspector Signature: Gary Reside		Printed Name: Gary Reside	
Title: Environmental Manager		Date: July 17, 2012	

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: L3		Date of Inspection: July 17, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection:			
Checklist	Yes	No	Explanation
Site Security			
a) Was fencing, gates and signs in good condition?	√		
b) Were gates locked?	√		
c) Evidence of trespassing		√	
Landfill Cover			
d) Evidence of Settling and/or Ponding?		√	
e) Any desiccation or cracking detected?		√	
f) Erosion around cap?		√	
g) Animal Burrowing detected?		√	
Vegetation Condition			
h) Is vegetation well established?	√		
i) Evidence of vegetation detrimental to cap?	√		All woody plants observed on the landfill cap during the inspection were cut and removed.
Landfill structures			
j) Evidence of damage to monitoring wells?		√	
k) Evidence of damage to gas vents?		√	
Field Conclusions			
l) Is there an imminent hazard to the integrity of the unit?		√	
m) Are repairs necessary?	√		Rip Rap on West side needs repairs
Certification			
Inspector Signature: Gary Reside		Printed Name: Gary Reside	
Title: Environmental Manager		Date: July 17, 2012	

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: M13		Date of Inspection: July 17, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection:			
Checklist	Yes	No	Explanation
Site Security			
a. Was fencing, gates and signs in good condition?	√		
b. Were gates locked?	√		New lock placed on gate.
c. Evidence of trespassing		√	
Landfill Cover			
d. Evidence of Settling and/or Ponding?		√	
e. Any desiccation or cracking detected?		√	
f. Erosion around cap?		√	
g. Animal burrowing detected?		√	
Vegetation Condition			
h. Is vegetation well established?	√		
i. Evidence of vegetation detrimental to cap?	√		All woody plants observed on the landfill cap during the inspection were cut and removed.
Landfill structures			
j. Evidence of damage to monitoring wells?		√	
k. Evidence of damage to gas vents?		√	
Field Conclusions			
l. Is there an imminent hazard to the integrity of the unit?		√	
m. Are repairs necessary?		√	
Certification			
Inspector Signature:		Printed Name: Gary Reside	
Title: Environmental Manager		Date: July 17, 2012	

Attachment B
Inspection Photographs

M13 top of cap. South end looking North.

M13 top of cap, looking East.

M13 top of cap, looking South.

M13 landfill west side looking South.

M13 Southwest corner looking West.

M13 Southwest corner.

L3 West side looking South along Prairie Creek.

L3 Northwest corner looking Southeast.

L3 North side looking east.

L3 East side Looking South.

L3 Southeast corner looking South

L3 South West corner looking North.

L3 South side looking East.

M11 West side looking North.

M11 riprap along West side.

M11 rip rap along East side.

M11 top of cap looking North.

M11 East side looking North.

M11 East side looking Northeast.

M11 North side looking West.

M11 top of cap looking West.

A2 – Landfill Inspection Report – October 2012

POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of
Environmental Remediation Services at
Joliet Army Ammunition Plant
Joliet, Illinois

October 2012

Submitted to:

US Army Contracting Agency
APG Directorate of Contracting - AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:

1480 Ford Street
Maumee, OH 43537
(419) 794-3500

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PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) TolTest, Inc. 1480 Ford Street Maumee, OH 44087	**8. PERFORMING ORGANIZATION REPORT NUMBER**
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None.

14. ABSTRACT
This Post-Closure Inspection report presents TolTest's findings for the conditions at landfills L3, M11 and M13 pursuant to the requirements of the Performance-Based Contract for Environmental Remediation at the Joliet Army Ammunition Plant.

15. SUBJECT TERMS
Landfill, Inspection Report, L3, M11, M13

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18 NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (*Include area code)*

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POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of
Environmental Remediation Services at
Joliet Army Ammunition Plant
Joliet, Illinois

Submitted to:

US Army Contracting Agency
APG Directorate of Contracting - AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:

1480 Ford Street
Maumee, OH 43537
(419) 794-3500

October 2012

DOCUMENT DISTRIBUTION
for the
Post-Closure Inspection Report for Landfills
L3, M11, and M13
for the Performance-Based Acquisition of
Environmental Remediation
Joliet Army Ammunition Plant
Joliet, Illinois

Organization	Distribution	
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Joliet Environmental Information Management System	0	1
United States Army Environmental Command	1	2
United States Army Corps of Engineers - Louisville District	0	2

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LIST OF ACRONYMS

GMZ	Ground Water Monitoring Zone
IAC	Illinois Administrative Code
JOAAP	Joliet Army Ammunition Plant
L3	JOAAP Landfill L3
M11	JOAAP Landfill M11
M13	JOAAP Landfill M13
RA	Remedial Action
RG	Remedial Goal
USAEC	United States Army Environmental Command

POST-CLOSURE INSPECTION REPORT

1.0 Introduction

This document has been prepared for the United States Army Environmental Command to provide documentation of the conditions of three landfills (L3, M11, and M13) located at the former Joliet Army Ammunition Plant (JOAAP).

Post-closure monitoring requirements for Landfills L3, M11 and M13 are mandated by Illinois Administrative Code (IAC) Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed; and
- Keep survey points protected and visible to facilitate identification in the future.

1.1 Landfill Cover Maintenance

According to IAC, the Landfills L3, M11 and M13 covers will be inspected on a quarterly basis for:

- Depressions indicating subsidence or other deformations that could breach the cover;
- Erosion features;
- Growth of deep rooted vegetation or invasive species that would adversely affect evapotranspiration and/or erosion armoring; and
- Debris or blockage of drainage structures.

Any damages or changes noted will be repaired to comply with the final design specifications for the cover.

Site inspections were conducted on 30 October 2012 for landfill M13, M11 and L3. This report includes copies of the inspection checklist, photographs, recommendations, and conclusions. The Post-Closure Inspection Checklists are found in Attachment A, and Inspection Photographs are found in Attachment B.

2.0 Landfill Descriptions

2.1 Landfill L3

Landfill L3 is located on the western edge of the Site L3 GMZ on the east bank of Prairie Creek. The GMZ comprises approximately 50 acres used as a demolition area directly southwest of Site L2, of which the landfill occupies only 3.32 acres. The area of Landfill L3 was originally contaminated through import of contaminated fill. However, other waste and contaminated soil have been moved to the site as a part of the L3 RA in order to consolidate residual contamination into a smaller footprint. The remedy selected for the consolidated area along Prairie Creek was capping to form Landfill L3. Implementation of the remedy began in 2007 and was completed in 2008.

Landfill L3 is believed to contain metals and explosive residues that could continue to contaminate the underlying groundwater and migrate to Prairie Creek. Because the landfill is bordered by Prairie Creek, any contamination that infiltrates from the filled area would be expected to migrate to Prairie Creek and quickly be discharged as the groundwater flows upward into the surface water body.

2.1.1 Monitoring Locations

Both groundwater and surface water sample points are monitored at Landfill L3 during spring and fall sampling rounds as follows:

- Upgradient Locations
  - SW004 (Surface location where Prairie Creek first touches the L3 GMZ boundary and upstream of the storm water outfall, spring only).
- Downgradient Locations
  - MW410
  - MW412
  - MW630
  - MW631
  - MW633
  - SW777 (Surface water location in Prairie Creek near the L3 GMZ boundary)
  - SW557 (Surface water location in Prairie Creek just upstream of the landfill drainage swale discharge)
  - SW558 (Surface water location at the constructed drainage swale along the southwest side of the newly constructed landfill)

2.2 Landfill M11

Landfill M11 is located in the southwestern portion of the manufacturing side of JOAAP. The GMZ comprises approximately 133 acres. Site M11 was divided into two sections by School House Road and bordered on the west by West Patrol Road. M11 north encompassed approximately 10.5 acres of former gravel pits that were mined and filled with waste. M11 south, a former gravel pit, encompassed approximately 5.6 acres that was also mined and filled with waste. The remedy chosen for Landfill M11 was waste consolidation and capping. Implementation of the remedy began in 2006 and was completed in 2008.

The current conceptual site model is that Landfill M11 is believed to contain manganese and sulfate containing waste that could potentially contaminate underlying groundwater and migrate beyond the GMZ.

With the implementation of the RA at Site M11, it is anticipated that the landfill cap will prevent percolation of precipitation through waste consolidated in the landfill thus, preventing groundwater contamination.

2.2.1 Monitoring Locations

Groundwater sample points are monitored at Landfill M11 in fall as follows:

- Upgradient Locations
  - MW802
  - MW803
- Downgradient Locations

- MW333
- MW334
- MW335
- MW336
- MW804
- MW805

2.3 Landfill M13

Landfill M13 comprises approximately 106 acres of the central portion of the MFG Area known as the gravel pits. It lies north of the Tetryl Production Area, east of the TNT Ditch Complex, and west of the Acid Area. Disposal activities were confined to four discrete areas on the site, none of which extended beyond 12 acres in size. Historical records indicate landfill disposal took place in the Northern Gravel Pit during the period 1966 to 1984 and involved scrap metals, creosote-treated railroad ties, telephone poles, and construction/demolition debris. The three other pits received waste materials that do not appear to pose a threat to human health and the environment.

Soil in the vicinity of the Northern Gravel Pit had been found to contain beryllium, lead, and benzo(a)pyrene as COCs. Explosive compounds that have been observed in groundwater at Site M13 include: TNT, TNB, 2,4-DNT, and 2,6-DNT. On a single occasion in 1991, antimony and cadmium were reported to be present at concentrations in excess of their respective RGs, but they have not exceeded the RGs since then. It is difficult to determine if the original findings could have resulted from turbid samples since low flow sampling and micro purging techniques are now employed to obtain more representative samples.

The current conceptual site model is that metal and benzo(a)pyrene in groundwater may be present as a result of leaching of waste materials in the Northern Gravel Pit. The explosives present in groundwater are far more likely to be present due to infiltration of wastewater in the TNT Ditch. There is no evidence to suggest explosive compounds were ever present in waste materials put into the pit.

With the implementation of the RA on the TNT Ditch and the capping of the Northern Gravel Pit, it is anticipated that contaminants in site groundwater will detach from the source areas and migrate as legacy plumes to the west. As such, concentrations are expected to decline with time.

2.3.1 Monitoring Locations

Groundwater is monitored quarterly through sample collection and analysis at six monitoring wells:

- Upgradient or background wells
  - MW806
  - MW807
- Downgradient or source control wells
  - MW126R
  - MW362
  - MW808
  - MW809

3.0 Inspection Results

The following are the observations from the landfill inspections conducted at L3, M11, and M13 on 30 October 2012.

3.1 Landfill L3

The perimeter fence and site postings were in good condition. The vegetative cover was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. However, woody growth is present in the rip rap along the boundary of the landfill. This needs to be removed. No subsidence was observed nor was there any evidence of damage due to burrowing animals.

The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable.

3.2 Landfill M11

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. There was no evidence of damage due to burrowing animals. The vents were undamaged with some loose bolts which required tightening. The vents are in working order.

3.3 Landfill M13

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. The vents were undamaged and appeared to be in working order. The vents were checked to ensure that the fastening bolts were secure. The drainage ditch located on the south side of the landfill is filled with water due to an ineffective design. This ponding has resulted in silting and vegetative growth within the ditch.

4.0 Conclusions and Recommendations

The deficiencies noted within this report which need to be addressed include the following:

Landfill L3:

- Repair rip rap along Prairie creek. The Army is currently preparing the contract documentation necessary for implementation of the repairs.
- Some woody plants were observed on the landfill cap during the inspection and were cut and removed. However, woody growth is present in the rip rap area and needs to be cleared.

Landfill M11:

- Some woody plants were observed on the landfill cap during the inspection and were cut and removed. Woody growth in the rip rap needs to be addressed.

Landfill M13:

- Some woody plants were observed on the landfill cap during the inspection and were cut and removed. The rip rap contains woody growth which needs monitoring.
- The drainage ditch south of the landfill is becoming filled in with vegetation and silt.

Attachment A
Post-Closure Inspection Checklists

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: M11		Date of Inspection: October 30, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection: Ken Corkell, IEPA			
Checklist	Yes	No	Explanation
Site Security			
a) Was fencing, gates and signs in good condition?	√		
b) Were gates locked?		√	Chained shut with no lock
c) Evidence of trespassing		√	
Landfill Cover			
d) Evidence of Settling and/or Ponding?		√	
e) Any desiccation or cracking detected?		√	
f) Erosion around cap?		√	
g) Animal burrowing detected?		√	
Vegetation Condition			
h) Is vegetation well established?	√		
i) Evidence of vegetation detrimental to cap?	√		All woody plants observed on the landfill cap during the inspection were cut and removed.
Landfill structures			
j) Evidence of damage to monitoring wells?		√	
k) Evidence of damage to gas vents?		√	
Field Conclusions			
l) Is there an imminent hazard to the integrity of the unit?		√	
m) Are repairs necessary?		√	
Certification			
Inspector Signature: Gary Reside		Printed Name: Gary Reside	
Title: Environmental Manager		Date: October 30, 2012	

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: L3		Date of Inspection: October 30, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection: Ken Corkell, IEPA			
Checklist	Yes	No	Explanation
Site Security			
a) Was fencing, gates and signs in good condition?	√		
b) Were gates locked?	√		
c) Evidence of trespassing		√	
Landfill Cover			
d) Evidence of Settling and/or Ponding?		√	
e) Any desiccation or cracking detected?		√	
f) Erosion around cap?		√	
g) Animal Burrowing detected?		√	
Vegetation Condition			
h) Is vegetation well established?	√		
i) Evidence of vegetation detrimental to cap?	√		All woody plants observed on the landfill cap during the inspection were cut and removed.
Landfill structures			
j) Evidence of damage to monitoring wells?		√	
k) Evidence of damage to gas vents?		√	
Field Conclusions			
l) Is there an imminent hazard to the integrity of the unit?		√	
m) Are repairs necessary?	√		Rip Rap on West side needs repairs
Certification			
Inspector Signature: Gary Reside		Printed Name: Gary Reside	
Title: Environmental Manager		Date: October 30, 2012	

JOAAP LANDFILL INSPECTION CHECKLIST			
Landfill Designation: M13		Date of Inspection: October 30, 2012	
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky	
Names of those present at inspection: Ken Corkell, IEPA			
Checklist	Yes	No	Explanation
Site Security			
a. Was fencing, gates and signs in good condition?	√		
b. Were gates locked?	√		New lock placed on gate.
c. Evidence of trespassing		√	
Landfill Cover			
d. Evidence of Settling and/or Ponding?		√	
e. Any desiccation or cracking detected?		√	
f. Erosion around cap?		√	
g. Animal burrowing detected?		√	
Vegetation Condition			
h. Is vegetation well established?	√		
i. Evidence of vegetation detrimental to cap?	√		All woody plants observed on the landfill cap during the inspection were cut and removed.
Landfill structures			
j. Evidence of damage to monitoring wells?		√	
k. Evidence of damage to gas vents?		√	
Field Conclusions			
l. Is there an imminent hazard to the integrity of the unit?		√	
m. Are repairs necessary?		√	
Certification			
Inspector Signature:		Printed Name: Gary Reside	
Title: Environmental Manager		Date: October 30, 2012	

Attachment B
Inspection Photographs

M13 Southwest corner looking East.

M13 West side looking North.

M13 Southwest corner looking Northeast

M13 top of cap, West side looking North.

M13 top of cap, North side looking East.

M13 top of cap, East side looking South.

M13 top of cap Southeast corner looking South.

M13 top of cap Southeast corner looking Southwest.

M13 Southwest corner, top of cap looking Southeast.

M11 top of cap, looking North.

M11 middle of cap, looking North.

M11 top of cap looking North.

M11 top of cap looking to Northeast corner.

M11 East side looking Northeast.

M11 West side looking South.

L3 West side looking South along Prairie Creek.

L3 North side of Landfill.

L3 Northeast corner looking West.

L3 East side looking South.

APPENDIX B

HISTORIC DATA TABLES

B1 - Summary of Historical Groundwater Results – Explosives
B2 - Summary of Historical Groundwater Results – Metals
B3 - Summary of Historical Groundwater Results – Indicator Parameters
B4 - Summary of Historical Groundwater Results – Volatile Organic Compounds
B5 - Summary of Historical Analytical Results – Semi-Volatile Organic Compounds

B1 - Summary of Historical Groundwater Results – Explosives

TABLE B1

Summary of Analytical Results - Explosives
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L1	***In-Plume***																													
	MW131	5/10/2002	<20		<20		<39		100		110		<20		<20		<39		<39		<39		<20		<39		**3800**		**4100**	
	MW131(DUP)	5/10/2002	<20		<20		<39		79		77		<20		<20		<39		<39		<39		<20		<39		**3100**		**2700**	
	MW131	10/28/2002	<7.6		<7.6 (0.82)		<15 (4)		42		30		<15		<7.6		<15		<15		<15		<7.6		<15		<7.6		**1200**	
	MW131	5/20/2003	<39		<39 (4.2)		<78 (21)		<78		<78		<78		<39		<78		<78		<78		<39		<78		<39		**1400**	
	MW131	10/23/2003	<4.2		<4.2 (0.46)		<8.5 (2.2)		29		27		<8.5		<4.2		<8.5		<8.5		<8.5		<4.2		<8.5		**1100**		**840**	
	MW131	5/26/2004	<6.4		<6.4 (0.69)		<13 (3.4)		130		87		<13		<6.4		<13		<13		<13		<6.4		<13		**4400**		**8300**	
	MW131	10/26/2004	<39		<39 (12)		<78 (14)		<78		<78		<78		<39		<78		<78		<78		<39		<78		**2000**		**980**	
	MW131	7/27/2005	<3.9		<3.9		<7.8		36		26		<7.8		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		**1600**		**890**	
	MW131	10/25/2005	<3.9		<3.9		**9.6**		48		33		<7.8		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		**1800**		**1300**	
	MW131	5/5/2006	<3.9		<3.9		<7.8		75		62		<7.8		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		**3200**		**4400**	
	MW131	10/19/2006	<3.9		<3.9		<7.8		29		26		<7.8		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		**180**		**150**	
	MW131	5/1/2007	<44		<44		<88		<88		<88		<88		<44		<88		<88		<88		<44		<88		**4200**		**9900**	
	MW131(DUP)	5/1/2007	<50		<50		<100		<100		<100		<100		<50		<100		<100		<100		<50		<100		**4500**		**10000**	
	MW131	10/16/2007	<39		<39		<78		<78		<78		<78		<39		<78		<78		<78		<39		<78		**1700**		**1100**	
	MW131	5/14/2008	<4.5		<4.5		<9		100		63		<9		<4.5		<9		<9		<9		<4.5		<9		**3100**		**4900**	
	MW131	10/28/2008	<3.9		<3.9		<7.8		27		30		<7.8		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		**1100**		**870**	
	MW131	5/1/2009	<1.6		<3.1		<3.1		21		36		<3.1		<1.6		<3.1		<3.1		<3.1		<1.6		<3.9		**460**		**1400**	
	MW131	10/27/2009	<4.1		<7.9		<7.9		89		110		<7.9		17		<7.9		<7.9		<7.9		<4.1		<9.9		**4000**		**11000**	
	MW131	4/12/2010	<4.0		<7.8		<7.8		55		66		<7.8		<4.0		<7.8		<7.8		<7.8		<4.0		<9.8		**3200**		**4100**	
	MW131	10/27/2010	0.49	/ J	<0.54		**6.8**	/ J	40		37		<0.54		<0.28		1.3	/ J	<0.54		<0.54		<0.28		<0.68		**1700**		**1000**	
	MW131	4/15/2011	<30		<57		<57		54	F /	91		<57		<30		<57		<57		<57		<30		<72		**3400**		**5800**	
	MW131	10/11/2011	<1.9		<1.9		<1.9		40		57	/ J	6		<1.9		<3.7		<3.7		<3.7		1.3	F /	<4.6		<1.9		**1100**	
	MW131	4/12/2012	5.4	/ J	<3.1		<3.1		65		70		<3.1		<1.6		<3.1		<3.1		<3.1		<1.6		<3.9		<1.6		**2200**	
	MW131	10/29/2012	<16		<31		<31		<31		35		<31		<16		<31		<31		<31		<16		<39		<16		**1000**	
	MW173	5/10/2002	<0.39		<0.39		<0.78		5.7		5.8		2		<0.39		<0.78		<0.78		<0.78		**14**	/ J	<0.78		4.2		**23**	/ J
	MW173	10/28/2002	<0.53		<0.53 (0.057)		<1.1 (0.28)		7.1		7.9		2.1		<0.53		<1.1		<1.1		<1.1		**15**		<1.1		<0.53		**24**	
	MW173(DUP)	10/28/2002	<0.46		<0.46 (0.049)		<0.91 (0.24)		7		7.8		2		<0.46		<0.91		<0.91		<0.91		**14**		<0.91		<0.46		**23**	
	MW173	5/20/2003	<0.62		<0.62 (0.067)		<1.2 (0.33)		5.2		5.4		1.6		<0.62		<1.2		<1.2		<1.2		**13**		<1.2		<0.62		**16**	
	MW173(DUP)	5/20/2003	<0.67		<0.67 (0.072)		<1.3 (0.36)		5.1		5.3		1.5		<0.67		<1.3		<1.3		<1.3		**13**		<1.3		<0.67		**16**	
	MW173	10/23/2003	<0.49		<0.49 (0.052)		<0.98 (0.26)		6.3		6.7		1.9		<0.49		<0.98		<0.98		<0.98		**17**		<0.98		3.2		**23**	
	MW173(DUP)	10/23/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		6.1		6.5		1.8		<0.39		<0.78		<0.78		<0.78		**15**		<0.78		3		**21**	
	MW173	5/26/2004	<0.42		<0.42 (0.046)		<0.85 (0.22)		5.4		5.7		1.8		<0.42		<0.85		<0.85		<0.85		**14**		<0.85		3.7		**28**	
	MW173	10/26/2004	<0.7		<0.7 (0.22)		<1.4 (0.26)		6.1		6.5		1.9		<0.7		<1.4		<1.4		<1.4		**17**		<1.4		3.6		**26**	
	MW173(DUP)	10/26/2004	<0.42		<0.42 (0.13)		<0.83 (0.15)		6.3		6.6		2		<0.42		<0.83		<0.83		<0.83		**16**		<0.83		3.7		**24**	
	MW173	7/26/2005	<0.39		<0.39		<0.78		4.9		5.6		1.4		<0.39		<0.78		<0.78		<0.78		**13**		<0.78		2.3		**21**	
	MW173	10/25/2005	<0.4		**0.43**		<0.79		6.4		6.9		1.8		<0.4		<0.79		<0.79		<0.79		**13**		<0.79		2.2		**18**	
	MW173	5/5/2006	<0.46		<0.46		<0.91		4.6		5		1.4		<0.46		<0.91		2.8		<0.91		**11**		<0.91		2.5		**15**	
	MW173	10/19/2006	<0.57		<0.57		<1.1		5.5		6.4		<1.1		<0.57		<1.1		<1.1		<1.1		**11**		<1.1		<0.57		**9.6**	
	MW173	5/1/2007	<0.39		<0.39		<0.78		5.6		5.9		2.3		<0.39		<0.78		<0.78		<0.78		**15**		<0.78		3		**33**	
	MW173	10/16/2007	<0.39		<0.39		<0.78		5		7.2		1.6		<0.39		<0.78		<0.78		<0.78		**11**		<0.78		<0.39		7.2	
	MW173	5/14/2008	<0.39		<0.39		<0.78		4.3		4.7		1.1		<0.39		<0.78		<0.78		<0.78		**9.3**		<0.78		1.4		**14**	
	MW173	10/27/2008	<0.39		<0.39		<0.78		5		5.5		1.1		<0.39		<0.78		<0.78		<0.78		**9.5**		<0.78		1.5		**15**	
	MW173	5/1/2009	<0.17		<0.32		<0.32		4.4		5.1		1.3		<0.17		<0.32		<0.32		<0.32		**12**		<0.4		2.6		**20**	
	MW173	10/27/2009	<0.22		<0.43		<0.43		1.8		3.7		1.6	/ J	<0.22		<0.43		<0.43		0.19	F /	**9.6**		<0.54		<0.22		1.7	
	MW173	4/13/2010	<0.17		<0.32		<0.32		4.1		4.8		1.2		<0.17		<0.32		<0.32		<0.32		**8.6**		<0.40		0.94		**10**	
	MW173	10/27/2010	<0.20		<0.38		<0.38		0.84		1		<0.38		<0.20		<0.38		<0.38		<0.38		**3.4**		<0.48		<0.20		0.95	
	MW173	4/14/2011	<0.31		<0.6		<0.6		4.7		5.9		1.3		<0.31		<0.6		<0.6		<0.6		**9.6**		<0.76		0.63		**10**	
	MW173	10/11/2011	<0.33		<0.33		<0.33		3.4	/ J	2.2	/ J	1.4		<0.33		<0.65		<0.65		<0.65		**10**		<0.81		<0.33		8.2	/ J
	MW173	4/11/2012	<0.16		<0.31		<0.31		4.8		5.4		1.4	/ J	<0.16		<0.31		<0.31		<0.31		**10**		<0.39		<0.16		**12**	
	MW173	10/29/2012	<0.8		<1.6		<1.6		<1.6	U / J	<1.6	U / J	<1.6		<0.8	U / J	<1.6		<1.6	U / J	<1.6	U / J	<0.8	U / J	<2	U / J	<0.8		<0.8	U / J
	MW173(DUP)	10/29/2012	<0.8		<1.6		<1.6		4.3		4.3		<1.6		<0.8		<1.6		<1.6		<1.6		**6.2**	/ J	<2		<0.8		2.8	
	WES1	5/10/2002	<0.39		<0.39		<0.78		17		19		<0.39		<0.39		<0.78		<0.78		<0.78		1.3		<0.78		**62**		**51**	
	WES1	10/28/2002	<0.49		<0.49 (0.052)		<0.98 (0.26)		12	J /	12	J /	<0.98		<0.49		<0.98		<0.98		<0.98		<0.49		<0.98		<0.49		**11**	/ J
	WES1	5/20/2003	<0.43		<0.43 (0.046)		<0.86 (0.23)		3.3		3.2		<0.86		<0.43		<0.86		<0.86		<0.86		<0.43		<0.86		<0.43		2.9	
	WES1	10/23/2003	<3.9		<3.9 (0.42)		<7.8 (2.1)		18		17		<7.8		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		**12**		**27**	
	WES1	5/26/2004	<0.75		<0.75 (0.081)		<1.5 (0.4)		12		13		<1.5		<0.75		<1.5		<1.5		<1.5		<0.75		<1.5		**27**		**39**	
	WES1	10/26/2004	<3.9		<3.9 (1.2)		<7.8 (1.4)		13		15		<7.8		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		**34**		**33**	
	WES1	7/27/2005	<0.44		**2.9**		<0.87		15		16		<0.87		<0.44		<0.87		<0.87		<0.87		<0.44		<0.87		**41**		**50**	
	WES1	10/25/2005	<0.39		<0.39		<0.78		2.7		2.9		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		2		2.6	
	WES1	5/5/2006	<0.39		<0.39		<0.78		8		8.3		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		**14**		**14**	
	WES1	10/19/2006	<0.39		<0.39		<0.78		4		4.8		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		4.5		3.7	
	WES1	5/1/2007	<3.9		<3.9		<7.8		16		22		<7.8		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		**71**		**67**	
	WES1	10/16/2007	<5.9		<5.9		<12		16		20		<12		<5.9		<12		<12		<12		<5.9		<12		**20**		**35**	
	WES1	5/14/2008	<3.9		<3.9		<7.8		12		17		<7.8		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		**34**		**40**	
	WES1	10/28/2008	<0.39		<0.39		<0.78		11		15		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		**8.2**		**17**	
	WES1(DUP)	10/28/2008	<0.53		<0.53		<1.1		11		15		<1.1		<0.53		<1.1		<1.1		<1.1		<0.53		<1.1		**8.5**		**19**	
	WES1	10/27/2009	<0.22		<0.43		<0.43		2.1		3.4		<0.43		<0.22		<0.43		<0.43		<0.43		0.36		<0.54		0.78		1.7	
	WES1	4/12/2010	<0.17		<0.32		<0.32		4.2		6.4		<0.32		<0.17		<0.32		<0.32		<0.32		<0.17		<0.40		3.7		7.4	
	WES1	10/27/2010	0.096	F /	**1.6**		<0.31		15		18		<0.31		<0.16		<0.31		<0.31		<0.31		0.73		<0.39		**21**		**34**	
	WES1(DUP)	10/27/2010	<0.21		**1.8**		<0.41		17		20		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.51		**23**		**38**	
	WES1	4/15/2011	<0.29		<0.56		<0.56		14		26		<0.56		<0.29		<0.56		<0.56		<0.56		<0.29		<0.71		**39**		**48**	
	WES1	10/11/2011	<0.25		<0.25		<0.25		11		15		<0.49		<0.25		<0.49		<0.49		<0.49		0.26		<0.61		<0.25		**31**	/ J
	WES1	4/12/2012	<1.6		<3.1		<3.1		13		21	/ J	<3.1		3.9		<3.1		<3.1		<3.1		<1.6		<3.9		**40**	/ J	**38**	
	WES1	10/29/2012	<0.8		<1.6		<1.6		8.1	/ J	9.1		<1.6		<0.8		<1.6		<1.6		<1.6		<0.8		<2		<0.8		6.4	

TABLE B1

Summary of Analytical Results - Explosives
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Joliet Army Ammunition Plant
Will County, Illinois

		Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L1	***Early Warning***																													
	MW174	10/28/2002	<0.69		<0.69 (0.074)		<1.4 (0.37)		<1.4		<1.4		<1.4		<0.69		<1.4		<1.4		<1.4		<0.69		<1.4		<0.69		<0.69	
	MW174	10/23/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW174	10/26/2004	<0.66		<0.66 (0.21)		<1.3 (0.24)		<1.3		<1.3		<1.3		<0.66		<1.3		<1.3		<1.3		<0.66		<1.3		<0.66		<0.66	
	MW174	10/25/2005	<0.77		<0.77		<1.5		<1.5		<1.5		<1.5		<0.77		<1.5		<1.5		<1.5		<0.77		<1.5		<0.77		<0.77	
	MW174	10/19/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW174	10/16/2007	<0.43		<0.43		<0.86		<0.86		<0.86		<0.86		<0.43		<0.86		<0.86		<0.86		<0.43		<0.86		<0.43		<0.43	
	MW174	10/27/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW174	5/4/2009	<0.17		<0.34		<0.34		<0.34		<0.34		<0.34		<0.17		<0.34		<0.34		<0.34		<0.17		<0.42		<0.17		<0.17	
	MW174	10/27/2009	<0.17		<0.33		<0.33		<0.33		<0.33		<0.33		<0.17		<0.33		<0.33		<0.33		<0.17		<0.42		<0.17		<0.17	
	MW174	4/12/2010	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW174	10/27/2010	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW174	4/15/2011	<0.33		<0.63		<0.63		<0.63		<0.63		<0.63		<0.33		<0.63		<0.63		<0.63		<0.33		<0.79		<0.33		0.62	
	MW174	10/11/2011	<0.21		<0.21		<0.21		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.52		<0.21		<0.21	
	MW174	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW174	10/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	WES3	5/10/2002	<0.39		<0.39		<0.78		1.1		1.5		<0.39		<0.39		<0.78		<0.78		<0.78		1.9		<0.78		1.6		3.3	
	WES3	10/28/2002	<0.42		<0.42 (0.045)		<0.83 (0.22)		1.5		2.1		<0.83		<0.42		<0.83		<0.83		<0.83		1.7		<0.83		<0.42		3.4	
	WES3	5/20/2003	<0.68		<0.68 (0.074)		<1.4 (0.36)		<1.4		<1.4		<1.4		<0.68		<1.4		<1.4		<1.4		<0.68		<1.4		<0.68		1.1	
	WES3	10/23/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		1.4		1.8		<0.78		<0.39		<0.78		<0.78		<0.78		1.3		<0.78		1		2.6	
	WES3	5/26/2004	<0.68		<0.68 (0.073)		<1.4 (0.36)		<1.4		<1.4		<1.4		<0.68		<1.4		<1.4		<1.4		1.1		<1.4		1.2		3.1	
	WES3	10/26/2004	<0.39		<0.39 (0.12)		<0.78 (0.14)		1.4		1.8		<0.78		<0.39		<0.78		<0.78		<0.78		1.6		<0.78		1.5		3.5	
	WES3	7/26/2005	<0.39		<0.39		<0.78		<0.78		1		<0.78		<0.39		<0.78		<0.78		<0.78		0.75		<0.78		0.69		1.7	
	WES3	10/25/2005	<0.62		<0.62		<1.2		<1.2		1.4		<1.2		<0.62		<1.2		<1.2		<1.2		0.76		<1.2		0.86		2	
	WES3	5/5/2006	<0.39		<0.39		<0.78		<0.78		0.8		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		0.47		0.9	
	WES3	10/19/2006	<0.41		<0.41		<0.82		1.2		1.6		<0.82		<0.41		<0.82		<0.82		<0.82		1.9		<0.82		0.43		2.6	
	WES3	5/1/2007	<0.39		<0.39		<0.78		<0.78		1		<0.78		<0.39		<0.78		<0.78		<0.78		0.93		<0.78		1		3.2	
	WES3	10/16/2007	<0.39		<0.39		<0.78		0.91		1.4		<0.78		<0.39		<0.78		<0.78		<0.78		1		<0.78		<0.39		1.6	
	WES3	5/14/2008	<0.39		<0.39		<0.78		<0.78		0.82		<0.78		<0.39		<0.78		<0.78		<0.78		0.61		<0.78		<0.39		1.3	
	WES3	10/27/2008	<0.39		<0.39		<0.78		<0.78		0.81		<0.78		<0.39		<0.78		<0.78		<0.78		0.72		<0.78		<0.39		0.44	
	WES3	5/4/2009	<0.17		<0.32		<0.32		<0.32		0.89		<0.32		<0.17		<0.32		<0.32		<0.32		0.69		<0.4		<0.17		1.3	
	WES3(DUP)	5/4/2009	<0.18		<0.35		<0.35		<0.35		0.9		<0.35		<0.18		<0.35		<0.35		<0.35		0.7		<0.44		<0.18		1.3	
	WES3	10/27/2009	<0.19		<0.37		<0.37		0.59		0.85		0.21	F / J	<0.19		<0.37		<0.37		<0.37		0.34		<0.47		<0.19		0.65	
	WES3	4/13/2010	<0.20		<0.39		<0.39		<0.39		<0.39		<0.39		<0.20		<0.39		<0.39		<0.39		0.58		<0.49		<0.20		1.2	
	WES3	10/27/2010	<0.19		<0.38		<0.38		0.8		1.1		<0.38		<0.19		<0.38		<0.38		<0.38		0.53		<0.47		0.23		0.99	
	WES3	4/15/2011	<0.41		<0.79		<0.79		0.69	F /	1.2		<0.79		<0.41		<0.79		<0.79		<0.79		0.57		<0.99		0.38	F /	2.3	
	WES3	10/11/2011	<0.20		<0.20		<0.20		<0.39		<0.39		0.12	F /	<0.20		<0.39		<0.39		<0.39		0.41		<0.49		<0.20		0.9	
	WES3	4/11/2012	<0.16		<0.31		<0.31		0.67		1		<0.31		<0.16		<0.31		<0.31		<0.31		0.74		<0.39		0.2		1.2	
	WES3	10/29/2012	<0.16		<0.31		<0.31		0.82		0.95		<0.31		<0.16		<0.31		<0.31		<0.31		0.43		<0.39		<0.16		0.76	
	Compliance																													
	SW550	5/10/2002	<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW550	10/28/2002	<0.47		<0.47 (0.05)		<0.94 (0.25)		<0.94		<0.94		<0.94		<0.47		<0.94		<0.94		<0.94		<0.47		<0.94		<0.47		<0.47	
	SW550	5/8/2003	<0.55		<0.55 (0.060)		<1.1 (0.29)		<1.1		<1.1		<1.1		<0.55		<1.1		<1.1		<1.1		<0.55		<1.1		<0.55		<0.55	
	SW550	10/9/2003	<0.46		<0.46 (0.049)		<0.91 (0.24)		<0.91		<0.91		<0.91		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	SW550	5/11/2004	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW550	10/14/2004	<0.58		<0.58 (0.18)		<1.2 (0.21)		<1.2		<1.2		<1.2		<0.58		<1.2		<1.2		<1.2		<0.58		<1.2		<0.58		<0.58	
	SW550	7/27/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW550	10/24/2005	<0.48		<0.48		<0.96		<0.96		<0.96		<0.96		<0.48		<0.96		<0.96		<0.96		<0.48		<0.96		<0.48		<0.48	
	SW550	5/5/2006	<0.42		<0.42		<0.83		<0.83		<0.83		<0.83		<0.42		<0.83		<0.83		<0.83		<0.42		<0.83		<0.42		<0.42	
	SW550	10/17/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW550	4/27/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW550(DUP)	4/27/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW550	10/17/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW550	5/19/2008	<0.45		<0.45		<0.9		<0.9		<0.9		<0.9		<0.45		<0.9		<0.9		<0.9		<0.45		<0.9		<0.45		<0.45	
	SW550	10/23/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW550	5/1/2009	<0.16		<0.32		<0.32		<0.32		<0.32		<0.32		<0.16		<0.32		<0.32		<0.32		<0.16		<0.4		<0.16		<0.16	
	SW550	10/27/2009	<0.16		<0.32		<0.32		<0.32		<0.32		<0.32		<0.16		<0.32		<0.32		<0.32		<0.16		<0.4		<0.16		<0.16	
	SW550	4/14/2010	<0.20		<0.38		<0.38		<0.38		<0.38		<0.38		<0.20		<0.38		<0.38		<0.38		<0.20		<0.48		<0.20		<0.20	
	SW550	10/27/2010	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	SW550	4/14/2011	<0.26		<0.5		<0.5		<0.5		<0.5		<0.5		<0.26		<0.5		<0.5		<0.5		<0.26		<0.62		<0.26		<0.26	
	SW550	10/11/2011	<0.36		<0.36		<0.36		<0.69		<0.69		<0.69		<0.36		<0.69		<0.69		<0.69		<0.36		<0.87		<0.36		<0.36	
	SW550	4/12/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	SW550	10/30/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

TABLE B1

Summary of Analytical Results - Explosives
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Will County, Illinois

		Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L2	***Ù-Pluòne***																													
	MW404	5/14/2002	<0.39		<0.39		<0.78		<0.78		<0.78		13		<0.39		<0.78		<0.78		<0.78		**35**		<0.78		<0.39		<0.39	
	MW404(DUP)	5/14/2002	<0.43		<0.43		<0.86		<0.86		<0.86		11		<0.43		<0.86		<0.86		<0.86		**29**		<0.86		<0.43		<0.43	
	MW404	10/29/2002	<0.44		<0.44 (0.047)		<0.87 (0.23)		<0.87		<0.87		59		<0.44		<0.87		<0.87		<0.87		**260**		<0.87		<0.44		<0.44	
	MW404(DUP)	10/29/2002	<0.46		<0.46 (0.049)		<0.91 (0.24)		<0.91		<0.91		59		<0.46		<0.91		<0.91		<0.91		**260**		<0.91		<0.46		<0.46	
	MW404	5/21/2003	<0.56		<0.56 (0.060)		<1.1 (0.3)		<1.1		<1.1		25		<0.56		<1.1		<1.1		<1.1		**120**		<1.1		<0.56		<0.56	
	MW404	10/24/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		79		<0.39		<0.78		<0.78		<0.78		**320**		<0.78		<0.39		<0.39	
	MW404	5/25/2004	<0.6		<0.6 (0.064)		<1.2 (0.32)		<1.2		<1.2		7.4		<0.6		<1.2		<1.2		<1.2		**15**		<1.2		<0.6		<0.6	
	MW404	10/26/2004	<0.51		<0.51 (0.16)		<1 (0.19)		<1		<1		100		<0.51		<1		<1		<1		**350**		<1		<0.51		<0.51	
	MW404	7/26/2005	<0.4		<0.4		<0.79		<0.79		<0.79		99		<0.4		<0.79		<0.79		<0.79		**330**		<0.79		<0.4		<0.4	
	MW404	10/25/2005	<0.6		<0.6		<1.2		<1.2		<1.2		57		<0.6		<1.2		<1.2		<1.2		**270**		<1.2		<0.6		<0.6	
	MW404	5/9/2006	<0.44		<0.44		<0.88		<0.88		<0.88		33		<0.44		<0.88		<0.88		<0.88		**100**		<0.88		<0.44		<0.44	
	MW404	10/13/2006	<0.64		<0.64		<1.3		<1.3		<1.3		78		<0.64		<1.3		<1.3		<1.3		**270**		<1.3		<0.64		<0.64	
	MW404	4/27/2007	<0.39		<0.39		<0.78		<0.78		<0.78		21		<0.39		<0.78		<0.78		<0.78		**45**		<0.78		<0.39		<0.39	
	MW404	10/17/2007	<0.39		<0.39		<0.78		<0.78		<0.78		52		<0.39		<0.78		<0.78		<0.78		**250**		<0.78		<0.39		<0.39	
	MW404	5/19/2008	<0.39		<0.39		<0.78		<0.78		<0.78		32		<0.39		<0.78		<0.78		<0.78		**110**		<0.78		<0.39		<0.39	
	MW404	10/23/2008	<0.49		<0.49		<0.99		<0.99		<0.99		32		<0.49		<0.99		<0.99		<0.99		**120**		<0.99		<0.49		<0.49	
	MW404	5/1/2009	<0.21		<0.41		<0.41		<0.41		<0.41		11		<0.21		<0.41		<0.41		<0.41		**16**		<0.51		<0.21		<0.21	
	MW404	10/26/2009	<0.3		<0.58		<0.58		<0.58		<0.58		15		<0.3		<0.58		<0.58		<0.58		**27**		<0.73		<0.3		<0.3	
	MW404	4/12/2010	<0.16		<0.31		<0.31		<0.31		<0.31		15		<0.16		<0.31		0.086	F /	<0.31		**27**		<0.39		<0.16		<0.16	
	MW404	10/27/2010	<0.18		<0.35		<0.35		<0.35		<0.35		28		<0.18		<0.35		<0.35		<0.35		**46**		<0.44		<0.18		<0.18	
	MW404	4/14/2011	<0.21		<0.4		<0.4		<0.4		<0.4		24		<0.21		<0.4		<0.4		<0.4		**74**		<0.5		<0.21		<0.21	
	MW404	10/11/2011	<0.22		<0.22		<0.22		<0.42		<0.42		30		<0.22		<0.42		<0.42		<0.42		**94**		<0.53	U / UJ	<0.22	U / UJ	<0.22	U / UJ
	MW404	10/26/2012	<0.16		0.21	F /	<0.31		<0.31		<0.31		33		<0.16		0.54	/ J	<0.31		0.65	/ J	**130**		<0.39		<0.16		<0.16	
	MW620	5/14/2002	<0.39		<0.39		<0.78		<0.78		<0.78		1.4		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW620	10/29/2002	<0.43		<0.43 (0.046)		<0.86 (0.23)		<0.86		<0.86		<0.86		<0.43		<0.86		<0.86		<0.86		<0.43		<0.86		<0.43		<0.43	
	MW620	5/20/2003	<0.56		<0.56 (0.060)		<1.1 (0.3)		<1.1		<1.1		<1.1		<0.56		<1.1		<1.1		<1.1		<0.56		<1.1		<0.56		<0.56	
	MW620	10/27/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW620(DUP)	10/27/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW620	5/26/2004	<0.57		<0.57 (0.062)		<1.1 (0.3)		<1.1		<1.1		1.7		<0.57		1.5		<1.1		<1.1		<0.57		<1.1		<0.57		<0.57	
	MW620(DUP)	5/26/2004	<0.81		<0.81 (0.087)		<1.6 (0.43)		<1.6		<1.6		1.8		<0.81		<1.6		<1.6		<1.6		<0.81		<1.6		<0.81		<0.81	
	MW620	10/26/2004	<0.39		<0.39 (0.12)		<0.78 (0.14)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW620(DUP)	10/26/2004	<0.39		<0.39 (0.12)		<0.78 (0.14)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW620	7/26/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW620	10/25/2005	<0.8		<0.8		<1.6		<1.6		<1.6		<1.6		<0.8		<1.6		<1.6		<1.6		<0.8		<1.6		<0.8		<0.8	
	MW620	5/9/2006	<0.5		<0.5		<1		<1		<1		<1		<0.5		<1		<1		<1		<0.5		<1		<0.5		<0.5	
	MW620	10/13/2006	<0.48		<0.48		<0.96		<0.96		<0.96		<0.96		<0.48		<0.96		<0.96		<0.96		<0.48		<0.96		<0.48		<0.48	
	MW620	4/27/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW620	10/17/2007	<0.55		<0.55		<1.1		<1.1		<1.1		<1.1		<0.55		<1.1		<1.1		<1.1		<0.55		<1.1		<0.55		<0.55	
	MW620	5/19/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW620	10/23/2008	<0.45		<0.45		<0.9		<0.9		<0.9		<0.9		<0.45		<0.9		<0.9		<0.9		<0.45		<0.9		<0.45		<0.45	
	MW620	5/1/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW620	10/26/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW620	4/8/2010	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW620	10/27/2010	<0.22		<0.43		<0.43		<0.43		<0.43		<0.43		<0.22		<0.43		<0.43		<0.43		<0.22		<0.55		<0.22		<0.22	
	MW620	4/14/2011	<0.43		<0.84		<0.84		<0.84		<0.84		<0.84		<0.43		<0.84		<0.84		<0.84		<0.43		<1.1		<0.43		<0.43	
	MW620	10/11/2011	<0.32		<0.32		<0.32		<0.61		<0.61		<0.61		<0.32		<0.61		<0.61		<0.61		<0.32		<0.77		<0.32		<0.32	U / UJ
	MW620	10/26/2012	<0.16		0.29	F /	0.13	F /	<0.31		<0.31		<0.31		<0.16		0.28	F /	<0.31		1.5	/ J	<0.16		<0.39		<0.16		<0.16	
	Compliance																													
	MW621	5/14/2002	<0.46		<0.46		<0.91		<0.91		<0.91		<0.46		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	MW621	10/29/2002	<0.51		<0.51 (0.055)		<1 (0.27)		<1		<1		<1		<0.51		<1		<1		<1		<0.51		<1		<0.51		<0.51	
	MW621	5/20/2003	<0.42		<0.42 (0.045)		<0.83 (0.22)		<0.83		<0.83		<0.83		<0.42		<0.83		<0.83		<0.83		<0.42		<0.83		<0.42		<0.42	
	MW621	10/24/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW621	5/26/2004	<0.46		<0.46 (0.049)		<0.91 (0.24)		<0.91		<0.91		<0.91		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	MW621	10/26/2004	<0.39		<0.39 (0.12)		<0.78 (0.14)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW621	7/26/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW621(DUP)	7/26/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW621	10/25/2005	<0.44		<0.44		<0.88		<0.88		<0.88		<0.88		<0.44		<0.88		<0.88		<0.88		<0.44		<0.88		<0.44		<0.44	
	MW621(DUP)	10/25/2005	<0.46		<0.46		<0.92		<0.92		<0.92		<0.92		<0.46		<0.92		<0.92		<0.92		<0.46		<0.92		<0.46		<0.46	
	MW621	5/9/2006	<0.4		<0.4		<0.81		<0.81		<0.81		<0.81		<0.4		<0.81		<0.81		<0.81		<0.4		<0.81		<0.4		<0.4	
	MW621(DUP)	5/9/2006	<0.56		<0.56		<1.1		<1.1		<1.1		<1.1		<0.56		<1.1		<1.1		<1.1		<0.56		<1.1		<0.56		<0.56	
	MW621	10/13/2006	<0.57		<0.57		<1.1		<1.1		<1.1		<1.1		<0.57		<1.1		<1.1		<1.1		<0.57		<1.1		<0.57		<0.57	
	MW621(DUP)	10/13/2006	<0.46		<0.46		<0.91		<0.91		<0.91		<0.91		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	MW621	4/27/2007	<0.48		<0.48		<0.96		<0.96		<0.96		<0.96		<0.48		<0.96		<0.96		<0.96		<0.48		<0.96		<0.48		<0.48	
	MW621	10/17/2007	<0.74		<0.74		<1.5		<1.5		<1.5		<1.5		<0.74		<1.5		<1.5		<1.5		<0.74		<1.5		<0.74		<0.74	
	MW621(DUP)	10/17/2007	<0.69		<0.69		<1.4		<1.4		<1.4		<1.4		<0.69		<1.4		<1.4		<1.4		<0.69		<1.4		<0.69		<0.69	
	MW621	5/19/2008	<0.59		<0.59		<1.2		<1.2		<1.2		<1.2		<0.59		<1.2		<1.2		<1.2		<0.59		<1.2		<0.59		<0.59	
	MW621	10/23/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW621	5/1/2009	<0.16		<0.31		<0.31		<0.31		<0.31		2.5		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW621	10/26/2009	<0.2		<0.38		<0.38		<0.38		<0.38		<0.38		<0.2		<0.38		<0.38		<0.38		<0.2		<0.48		<0.2		<0.2	

TABLE B1

Summary of Analytical Results - Explosives
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Will County, Illinois

		Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L2	***Compliance***																													
	MW621	4/8/2010	<0.21		<0.40		<0.40		<0.40		<0.40		<0.40		<0.21		<0.40		<0.40		<0.40		<0.21		<0.51		<0.21		<0.21	
	MW621	10/27/2010	<0.19		<0.37		<0.37		<0.37		<0.37		<0.37		<0.19		<0.37		<0.37		<0.37		<0.19		<0.46		<0.19		<0.19	
	MW621	4/14/2011	<0.32		<0.61		<0.61		<0.61		<0.61		0.58	F /	<0.32		<0.61		<0.61		<0.61		0.18	F /	<0.77		<0.32		<0.32	
	MW621	10/11/2011	<0.27		<0.27		<0.27		<0.52		<0.52		<0.52		<0.27		<0.52		<0.52		<0.52		<0.27		<0.65		<0.27		<0.27	U / UJ
	MW621	10/26/2012	<0.16		0.42		<0.31		<0.31		<0.31		<0.31		<0.16		0.24	F /	<0.31		0.4		<0.16		<0.39		<0.16		<0.16	
	SW555	5/10/2002	<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		1.3		1.4	
	SW555	10/29/2002	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW555	5/9/2003	<0.53		<0.53 (0.057)		<1.1 (0.28)		<1.1		<1.1		<1.1		<0.53		<1.1		<1.1		<1.1		<0.53		<1.1		<0.53		<0.53	
	SW555(DUP)	5/9/2003	<0.53		<0.53 (0.057)		<1.1 (0.28)		<1.1		<1.1		<1.1		<0.53		<1.1		<1.1		<1.1		<0.53		<1.1		<0.53		<0.53	
	SW555	10/10/2003	<0.46		<0.46 (0.049)		<0.91 (0.24)		<0.91		<0.91		<0.91		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	SW555	5/11/2004	<0.45		<0.45 (0.048)		<0.9 (0.24)		<0.9		<0.9		<0.9		<0.45		<0.9		<0.9		<0.9		<0.45		<0.9		<0.45		<0.45	
	SW555	10/14/2004	<0.73		<0.73 (0.23)		<1.5 (0.27)		<1.5		<1.5		<1.5		<0.73		<1.5		<1.5		<1.5		<0.73		<1.5		<0.73		<0.73	
	SW555	7/26/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW555	10/26/2005	<0.51		<0.51		<1		<1		<1		<1		<0.51		<1		<1		<1		<0.51		<1		<0.51		<0.51	
	SW555	5/9/2006	<0.55		<0.55		<1.1		<1.1		<1.1		<1.1		<0.55		<1.1		<1.1		<1.1		<0.55		<1.1		<0.55		<0.55	
	SW555	10/13/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW555	4/27/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW555	10/17/2007	<0.49		<0.49		<0.98		<0.98		<0.98		<0.98		<0.49		<0.98		<0.98		<0.98		<0.49		<0.98		<0.49		<0.49	
	SW555(DUP)	10/17/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW555	5/19/2008	<0.71		<0.71		<1.4		<1.4		<1.4		<1.4		<0.71		<1.4		<1.4		<1.4		<0.71		<1.4		<0.71		<0.71	
	SW555	10/23/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW555(DUP)	10/23/2008	<0.4		<0.4		<0.79		<0.79		<0.79		<0.79		<0.4		<0.79		<0.79		<0.79		<0.4		<0.79		<0.4		<0.4	
	SW555	5/1/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	SW555	10/26/2009	<0.2		<0.38		<0.38		<0.38		<0.38		<0.38		<0.2		0.3	F /	<0.38		<0.38		<0.2		<0.48		<0.2		<0.2	
	SW555	4/8/2010	<0.21		<0.40		<0.40		<0.40		<0.40		<0.40		<0.21		<0.40		<0.40		<0.40		<0.21		<0.50		<0.21		<0.21	
	SW555	10/27/2010	<0.19		<0.36		<0.36		<0.36		<0.36		<0.36		<0.19		<0.36		<0.36		<0.36		<0.19		<0.46		<0.19		<0.19	
	SW555	4/14/2011	<0.17		<0.32		<0.32		<0.32		<0.32		<0.32		<0.17		<0.32		<0.32		<0.32		<0.17		<0.4		<0.17		<0.17	
	SW555	10/11/2011	<0.25		<0.25		<0.25		<0.49		<0.49		<0.49		<0.25		<0.49		<0.49		<0.49		<0.25		<0.62		<0.25		<0.25	U / UJ
	SW555	10/26/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
L3	***Upgradient***																													
	SW004	5/6/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	SW004	10/23/2009	<0.43		<0.84		<0.84		<0.84		<0.84		<0.84		<0.43		<0.84		<0.84		<0.84		<0.43		<1.1		<0.43		<0.43	
	SW004	4/8/2010	<0.34		<0.65		<0.65		<0.65		<0.65		<0.65		<0.34		<0.65		<0.65		<0.65		<0.34		<0.82		<0.34		<0.34	
	SW004	10/26/2010	<0.49		<0.96		<0.96		<0.96		<0.96		<0.96		<0.49		<0.96		<0.96		<0.96		<0.49		<1.2		<0.49		<0.49	
	SW004(DUP)	10/26/2010	<0.48		<0.93		<0.93		<0.93		<0.93		<0.93		<0.48		<0.93		<0.93		<0.93		<0.48		<1.2		<0.48		<0.48	
	SW004	4/14/2011	<0.22		<0.43		<0.43		<0.43		<0.43		<0.43		<0.22		<0.43		<0.43		<0.43		<0.22		<0.54		<0.22		<0.22	
	SW004(DUP)	4/14/2011	<0.17		<0.33		<0.33		<0.33		<0.33		<0.33		<0.17		<0.33		<0.33		<0.33		<0.17		<0.42		<0.17		<0.17	
	SW004	10/14/2011	<0.41		<0.41		<0.41		<0.79		<0.79		<0.79		<0.41		<0.79		<0.79		<0.79		<0.41		<0.99		<0.41		<0.41	
	SW004	4/12/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	In-Plume/Downgradient																													
	MW410	5/13/2002	<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW410	10/29/2002	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW410	5/21/2003	<0.47		<0.47 (0.050)		<0.94 (0.25)		<0.94		<0.94		<0.94		<0.47		<0.94		<0.94		<0.94		<0.47		<0.94		<0.47		<0.47	
	MW410	10/27/2003	<0.4		<0.4 (0.043)		<0.81 (0.21)		<0.81		<0.81		<0.81		<0.4		<0.81		<0.81		<0.81		0.57		<0.81		<0.4		<0.4	
	MW410(DUP)	10/27/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		0.63		<0.78		<0.39		<0.39	
	MW410	5/26/2004	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW410(DUP)	5/26/2004	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW410	10/26/2004	<0.41		<0.41 (0.13)		<0.82 (0.15)		<0.82		<0.82		<0.82		<0.41		<0.82		<0.82		<0.82		<0.41		<0.82		<0.41		<0.41	
	MW410	7/27/2005	<0.39		<0.39		<0.78		<0.78		<0.78		2		<0.39		<0.78		<0.78		<0.78		**4.7**		<0.78		<0.39		<0.39	
	MW410	10/21/2005	<1.5		<1.5		<2.9		<2.9		<2.9		<2.9		<1.5		<2.9		<2.9		<2.9		<1.5		<2.9		<1.5		<1.5	
	MW410	5/5/2006	<0.68		<0.68		<1.4		<1.4		<1.4		<1.4		<0.68		<1.4		<1.4		<1.4		<0.68		<1.4		<0.68		<0.68	
	MW410	10/18/2006	<0.39		<0.39		<0.78		<0.78		<0.78		0.93		<0.39		<0.78		<0.78		<0.78		2.3		<0.78		<0.39		0.47	
	MW410	4/27/2007	<0.39		<0.39		<0.78		<0.78		<0.78		1.7		<0.39		<0.78		<0.78		<0.78		**5**		<0.78		<0.39		<0.39	
	MW410	5/21/2008	<0.41		<0.41		<0.82		<0.82		<0.82		<0.82		<0.41		<0.82		<0.82		<0.82		**3.3**		<0.82		<0.41		<0.41	
	MW410	10/29/2008	<0.47		<0.47		<0.95		<0.95		<0.95		<0.95		<0.47		<0.95		<0.95		<0.95		<0.47		<0.95		<0.47		<0.47	
	MW410	5/7/2009	<0.24		<0.47		<0.47		<0.47		<0.47		<0.47		<0.24		<0.47		<0.47		<0.47		<0.24		<0.59		<0.24		<0.24	
	MW410	4/8/2010	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW410	10/26/2010	<0.23		<0.44		<0.44		<0.44		<0.44		<0.44		<0.23		<0.44		<0.44		<0.44		<0.23		<0.55		<0.23		<0.23	
	MW410	4/14/2011	<0.31		<0.61		<0.61		<0.61		<0.61		<0.61		<0.31		<0.61		<0.61		<0.61		<0.31		<0.77		<0.31		<0.31	
	MW410	10/14/2011	<0.19		<0.19		<0.19		<0.38		<0.38		<0.38		<0.19		<0.38		<0.38		<0.38		<0.19		<0.47		<0.19		<0.19	
	MW410	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW410	10/30/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

TABLE B1

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		Compound	**1,3-DNB**		**2,4-DNT**		**2,6-DNT**		**2-A-4,6-DNT**		**4-A-2,6-DNT**		**HMX**		**NB**		**2-NT**		**3-NT**		**4-NT**		**RDX**		**Tetryl**		**1,3,5-TNB**		**2,4,6-TNT**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[(1)]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L3	***In-Plume/Downgradient***																													
	MW412	5/13/2002	<0.58		<0.58		<1.2		<1.2		<1.2		19		<0.58		<1.2		<1.2		<1.2		**130**		<1.2		<0.58		<0.58	
	MW412	10/29/2002	<0.52		<0.52 (0.056)		<1 (0.28)		1.4		1.9		24		<0.52		<1		<1		<1		**180**		<1		<0.52		<0.52	
	MW412(DUP)	10/29/2002	<0.39		<0.39 (0.042)		<0.78 (0.21)		1.2		1.7		22		<0.39		<0.78		<0.78		<0.78		**160**		<0.78		<0.39		<0.39	
	MW412	5/21/2003	<0.64		<0.64 (0.069)		<1.3 (0.34)		<1.3		<1.3		15		<0.64		<1.3		<1.3		<1.3		**98**		<1.3		<0.64		<0.64	
	MW412	10/28/2003	<0.42		<0.42 (0.046)		<0.85 (0.22)		<0.85		<0.85		11		<0.42		<0.85		<0.85		<0.85		**58**		<0.85		<0.42		<0.42	
	MW412	5/26/2004	<0.61		<0.61 (0.066)		<1.2 (0.32)		<1.2		1.8		40		<0.61		<1.2		<1.2		<1.2		**390**		<1.2		<0.61		<0.61	
	MW412	10/27/2004	<0.66		<0.66 (0.21)		<1.3 (0.24)		<1.3		<1.3		11		<0.66		<1.3		<1.3		<1.3		**68**		<1.3		<0.66		<0.66	
	MW412(DUP)	10/27/2004	<0.55		<0.55 (0.17)		<1.1 (0.2)		<1.1		<1.1		11		<0.55		<1.1		<1.1		<1.1		**63**		<1.1		<0.55		<0.55	
	MW412	7/27/2005	<0.39		<0.39		<0.78		<0.78		1.1		25		<0.39		<0.78		<0.78		<0.78		**230**		<0.78		<0.39		<0.39	
	MW412	10/21/2005	<1.4		<1.4		<2.8		<2.8		<2.8		28		<1.4		<2.8		<2.8		<2.8		**200**		<2.8		<1.4		<1.4	
	MW412	5/5/2006	<0.39		<0.39		<0.78		<0.78		<0.78		17		<0.39		<0.78		<0.78		<0.78		**100**		<0.78		<0.39		<0.39	
	MW412	10/18/2006	<0.39		<0.39		<0.78		<0.78		0.82		14		<0.39		<0.78		<0.78		<0.78		**71**		<0.78		<0.39		<0.39	
	MW412	4/27/2007	<0.39		<0.39		<0.78		<0.78		<0.78		1.8		<0.39		<0.78		<0.78		<0.78		**5.7**		<0.78		<0.39		<0.39	
	MW412	10/17/2007	<0.39		<0.39		<0.78		1		1.8		39		<0.39		<0.78		<0.78		<0.78		**300**		<0.78		<0.39		<0.39	
	MW412	5/21/2008	<0.39		<0.39		<0.78		1.2		1.8		51		<0.39		<0.78		<0.78		<0.78		**440**		<0.78		<0.39		<0.39	
	MW412	10/29/2008	<0.44		<0.44		<0.88		0.98		1.7		34		<0.44		<0.88		<0.88		<0.88		**170**		<0.88		<0.44		<0.44	
	MW412(DUP)	10/29/2008	<0.4		<0.4		<0.79		1.1		1.8		42		<0.4		<0.79		<0.79		<0.79		**250**		<0.79		<0.4		<0.4	
	MW412	5/6/2009	<0.16		<0.31		<0.31		0.93		1.4		35		<0.16		<0.31		<0.31		<0.31		**210**		<0.39		<0.16		<0.16	
	MW412	10/27/2009	<0.17		<0.33		<0.33		0.96		1.6		30	/ J	<0.17		<0.33		<0.33		<0.33		**130**		<0.42		<0.17		<0.17	
	MW412	4/12/2010	<0.18		<0.35		<0.35		1		1.6		38		<0.18		<0.35		<0.35		<0.35		**220**		<0.44		<0.18		<0.18	
	MW412	10/26/2010	<0.23		<0.45		<0.45		1.3		1.8		29		<0.23		<0.45		<0.45		<0.45		**200**		<0.57		<0.23		<0.23	
	MW412	4/14/2011	<0.28		<0.54		<0.54		0.94		<0.54		26		<0.28		<0.54		<0.54		<0.54		**110**		<0.68		<0.28		<0.28	
	MW412	10/17/2011	<0.22		<0.22		<0.22		<0.42		<0.42		19		<0.22		<0.42		<0.42		<0.42		**67**		<0.53		<0.22		<0.22	U / UJ
	MW412	4/11/2012	<0.16		<0.31		<0.31		0.89		1.7		28	/ J	0.24		<0.31		<0.31		<0.31		**120**		<0.39		0.11	F / J	<0.16	
	MW412	10/30/2012	<0.16		<0.31		<0.31		<0.31		1.9		26		<0.16		<0.31		<0.31		<0.31		**120**		<0.39		<0.16		<0.16	
	Early Warning/Downgradient																													
	MW630	5/13/2002	<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW630	10/29/2002	<0.49		<0.49 (0.053)		<0.99 (0.26)		<0.99		<0.99		<0.99		<0.49		<0.99		<0.99		<0.99		<0.49		<0.99		<0.49		<0.49	
	MW631(DUP)	10/30/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

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		Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L3	***Early Warning/Downgradient***																													
	MW633	5/13/2002	<0.55		<0.55		<1.1		<1.1		<1.1		2.4		<0.55		<1.1		<1.1		<1.1		**17**		<1.1		<0.55		<0.55	
	MW633	10/29/2002	<0.6		<0.6 (0.064)		<1.2 (0.32)		<1.2		<1.2		0.84	J /	<0.6		<1.2		<1.2		<1.2		2.1		<1.2		<0.6		<0.6	
	MW633	5/21/2003	<0.39		<0.39 (0.042		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		2.1		<0.78		<0.39		<0.39	
	MW633	10/27/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		3.3		<0.39		<0.78		<0.78		<0.78		**9.8**		<0.78		<0.39		<0.39	
	MW633	5/25/2004	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		2.1		<0.78		<0.39		<0.39	
	MW633	10/26/2004	<0.46		<0.46 (0.14)		<0.92 (0.17)		<0.92		<0.92		1.2		<0.46		<0.92		<0.92		<0.92		**3.8**		<0.92		<0.46		<0.46	
	MW633	7/27/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		1.4		<0.78		<0.39		<0.39	
	MW633	10/21/2005	<1.3		<1.3		<2.5		<2.5		<2.5		4		<1.3		<2.5		<2.5		<2.5		**11**		<2.5		<1.3		<1.3	
	MW633	5/10/2006	<0.44		<0.44		<0.88		<0.88		<0.88		<0.88		<0.44		<0.88		<0.88		<0.88		<0.44		<0.88		<0.44		<0.44	
	MW633	10/18/2006	<0.45		<0.45		<0.9		<0.9		<0.9		<0.9		<0.45		<0.9		<0.9		<0.9		<0.45		<0.9		<0.45		<0.45	
	MW633	4/27/2007	<0.39		<0.39		<0.78		<0.78		<0.78		1.7		<0.39		<0.78		<0.78		<0.78		**5.1**		<0.78		<0.39		<0.39	
	MW633	10/17/2007	<0.4		<0.4		<0.81		1.1		1.8		35		<0.4		<0.81		<0.81		<0.81		**300**		<0.81		<0.4		<0.4	
	MW633	5/21/2008	<0.39		<0.39		<0.78		1		1.7		47		<0.39		<0.78		<0.78		<0.78		**390**		<0.78		<0.39		<0.39	
	MW633(DUP)	5/21/2008	<0.39		<0.39		<0.78		0.88		1.4		43		<0.39		<0.78		<0.78		<0.78		**280**		<0.78		<0.39		<0.39	
	MW633	10/29/2008	<0.4		<0.4		<0.81		<0.81		<0.81		1.1		<0.4		<0.81		<0.81		<0.81		**4.5**		<0.81		<0.4		<0.4	
	MW633	5/6/2009	<0.17		<0.33		<0.33		<0.33		<0.33		5.7		<0.17		<0.33		<0.33		<0.33		**33**		<0.41		<0.17		<0.17	
	MW633	10/27/2009	<0.16		<0.31		<0.31		<0.31		<0.31		2	/ J	<0.16		<0.31		<0.31		<0.31		**7.7**		<0.39		<0.16		<0.16	
	MW633	4/12/2010	<0.18		<0.34		<0.34		<0.34		<0.34		8.4		<0.18		<0.34		<0.34		<0.34		**56**		<0.43		<0.18		<0.18	
	MW633	10/26/2010	<0.32		<0.61		<0.61		<0.61		<0.61		3.9		<0.32		<0.61		<0.61		<0.61		**16**		<0.77		<0.32		<0.32	
	MW633	4/14/2011	<0.39		<0.76		<0.76		<0.76		<0.76		1.2		<0.39		<0.76		<0.76		<0.76		**4.2**		<0.96		<0.39		<0.39	
	MW633	10/17/2011	<0.39		<0.39		<0.39		<0.76	U / UJ	<0.76		3.1		<0.39		<0.76		<0.76		<0.76		**7.9**		<0.96		<0.39		<0.39	
	MW633	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		2	/ J	<0.16		<0.31		<0.31		<0.31		**6.7**		<0.39		<0.16		<0.16	
	MW633	10/30/2012	<0.16		<0.31		0.13	F / J	<0.31		<0.31		2.7		<0.16		<0.31		<0.31		<0.31		**10**		<0.39		<0.16		<0.16	
	Compliance/Downgradient																													
	SW777	5/10/2002	<0.62		<0.62		<1.2		<1.2		<1.2		1.3		<0.62		<1.2		<1.2		<1.2		4.2		<1.2		<0.62		<0.62	
	SW777	10/29/2002	<0.62		<0.62 (0.067)		<1.2 (0.33)		<1.2		<1.2		<1.2		<0.62		<1.2		<1.2		<1.2		<0.62		<1.2		<0.62		<0.62	
	SW777	5/9/2003	<0.43		<0.43 (0.046)		<0.86 (0.23)		<0.86		<0.86		<0.86		<0.43		<0.86		<0.86		<0.86		0.73		<0.86		<0.43		<0.43	
	SW777	10/10/2003	<0.42		<0.42 (0.045)		<0.83 (0.22)		<0.83		<0.83		<0.83		<0.42		<0.83		<0.83		<0.83		<0.42		<0.83		<0.42		<0.42	
	SW777	5/11/2004	<0.53		<0.53 (0.057)		<1.1 (0.28)		<1.1		<1.1		<1.1		<0.53		<1.1		<1.1		<1.1		1.1	/ J	<1.1		<0.53		<0.53	
	SW777	10/14/2004	<0.73		<0.73 (0.23)		<1.5 (0.27)		<1.5		<1.5		<1.5		<0.73		<1.5		<1.5		<1.5		<0.73		<1.5		<0.73		<0.73	
	SW777	7/27/2005	<0.46		<0.46		<0.91		<0.91		<0.91		<0.91		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	SW777	10/26/2005	<0.72		<0.72		<1.4		<1.4		<1.4		<1.4		<0.72		<1.4		<1.4		<1.4		<0.72		<1.4		<0.72		<0.72	
	SW777	5/5/2006	<0.55		<0.55		<1.1		<1.1		<1.1		<1.1		<0.55		<1.1		<1.1		<1.1		<0.55		<1.1		<0.55		<0.55	
	SW777	10/17/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW777	4/27/2007	<0.41		<0.41		<0.82		<0.82		<0.82		<0.82		<0.41		<0.82		<0.82		<0.82		<0.41		<0.82		<0.41		<0.41	
	SW777	10/17/2007	<0.52		<0.52		<1		<1		<1		<1		<0.52		<1		<1		<1		<0.52		<1		<0.52		<0.52	
	SW777	5/20/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW777	10/23/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW777	5/7/2009	<0.19		<0.38		<0.38		<0.38		<0.38		<0.38		<0.19		<0.38		<0.38		<0.38		<0.19		<0.47		<0.19		<0.19	
	SW777	10/23/2009	<0.4		<0.78		<0.78		<0.78		<0.78		<0.78		<0.4		<0.78		<0.78		<0.78		<0.4		<0.98		<0.4		<0.4	
	SW777	4/9/2010	<0.19		<0.37		<0.37		<0.37		<0.37		<0.37		<0.19		<0.37		<0.37		<0.37		<0.19		<0.46		<0.19		<0.19	
	SW777	10/26/2010	<0.55		<1.1		<1.1		<1.1		<1.1		<1.1		<0.55		<1.1		<1.1		<1.1		<0.55		<1.3		<0.55		<0.55	
	SW777	4/14/2011	<0.34		<0.66		<0.66		<0.66		<0.66		<0.66		<0.34		<0.66		<0.66		<0.66		<0.34		<0.83		<0.34		<0.34	
	SW777	10/14/2011	<0.34		<0.34		<0.34		<0.65		<0.65		<0.65		<0.34		<0.65		<0.65		<0.65		<0.34		<0.82		<0.34		<0.34	
	SW777	4/11/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		0.25		<0.39		<0.16		<0.16	
	SW777	10/30/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	Downgradient																													
	SW557	5/10/2002	<0.46		<0.46		<0.91		<0.91		<0.91		<0.46		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	SW557	10/29/2002	<0.44		<0.44 (0.047)		<0.87 (0.23)		<0.87		<0.87		0.92		<0.44		<0.87		<0.87		<0.87		2.3		<0.87		<0.44		<0.44	
	SW557	5/9/2003	<0.47		<0.47 (0.050)		<0.94 (0.25)		<0.94		<0.94		<0.94		<0.47		<0.94		<0.94		<0.94		<0.47		<0.94		<0.47		<0.47	
	SW557	10/10/2003	<0.44		<0.44 (0.047)		<0.87 (0.23)		<0.87		<0.87		<0.87		<0.44		<0.87		<0.87		<0.87		1.4		<0.87		<0.44		<0.44	
	SW557	5/11/2004	<0.62		<0.62 (0.067)		<1.2 (0.33)		<1.2		<1.2		<1.2		<0.62		<1.2		<1.2		<1.2		<0.62		<1.2		<0.62		<0.62	
	SW557	10/14/2004	<0.46		<0.46 (0.14)		<0.92 (0.17)		<0.92		<0.92		<0.92		<0.46		<0.92		<0.92		<0.92		<0.46		<0.92		<0.46		<0.46	
	SW557	7/27/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW557	10/26/2005	<0.46		<0.46		<0.91		<0.91		<0.91		<0.91		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	SW557	5/5/2006	<0.62		<0.62		<1.2		<1.2		<1.2		<1.2		<0.62		<1.2		<1.2		<1.2		<0.62		<1.2		<0.62		<0.62	
	SW557	10/17/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW557	4/27/2007	<0.4		<0.4		<0.81		<0.81		<0.81		<0.81		<0.4		<0.81		<0.81		<0.81		<0.4		<0.81		<0.4		<0.4	
	SW557	10/17/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW557	5/20/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW557	10/23/2008	<0.47		<0.47		<0.95		<0.95		<0.95		<0.95		<0.47		<0.95		<0.95		<0.95		<0.47		<0.95		<0.47		<0.47	
	SW557	5/7/2009	<0.22		<0.42		<0.42		<0.42		<0.42		<0.42		<0.22		<0.42		<0.42		<0.42		<0.22		<0.53		<0.22		<0.22	
	SW557(DUP)	5/7/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31	U / UJ	<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	SW557	10/23/2009	<0.43		<0.83		<0.83		<0.83		<0.83		<0.83		<0.43		<0.83		<0.83		<0.83		<0.43		<1		<0.43		<0.43	
	SW557(DUP)	10/23/2009	<0.43		<0.83		<0.83		<0.83		<0.83		<0.83		<0.43		<0.83		<0.83		<0.83		<0.43		<1		<0.43		<0.43	
	SW557	4/9/2010	<0.26		<0.51		<0.51		<0.51		<0.51		<0.51		<0.26		<0.51		<0.51		<0.51		<0.26		<0.64		<0.26		<0.26	
	SW557(DUP)	4/9/2010	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	SW557	10/26/2010	<0.37		<0.71		<0.71		<0.71		<0.71		<0.71		<0.37		<0.71		<0.71		<0.71		<0.37		<0.89		<0.37		<0.37	
	SW557	4/14/2011	<0.41		<0.79		<0.79		<0.79		<0.79		<0.79		<0.41		<0.79		<0.79		<0.79		<0.41		<0.99		<0.41		<0.41	
	SW557	10/14/2011	<0.47		<0.47		<0.47		<0.91		<0.91		<0.91		<0.47		<0.91		<0.91		<0.91		<0.47		<1.2		<0.47		<0.47	
	SW557	4/10/2012	<0.16		<0.31		<0.31		<0.31		<0.31		1.1	/ J	<0.16		<0.31		<0.31		<0.31		3.2		<0.39		<0.16		<0.16	
	SW557	10/30/2012	<0.16		<0.31		0.44	/ J	<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

TABLE B1

Summary of Analytical Results - Explosives
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Will County, Illinois

		Compound	**1,3-DNB**		**2,4-DNT**		**2,6-DNT**		**2-A-4,6-DNT**		**4-A-2,6-DNT**		**HMX**		**NB**		**2-NT**		**3-NT**		**4-NT**		**RDX**		**Tetryl**		**1,3,5-TNB**		**2,4,6-TNT**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L3	***Downgradient***																													
	SW558	5/10/2002	<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.39		<0.78		<0.78		<0.78		0.42		<0.78		<0.39		<0.39	
	SW558	5/9/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW558	5/11/2004	<0.68		<0.68 (0.074)		<1.4 (0.36)		<1.4		<1.4		<1.4		<0.68		<1.4		<1.4		<1.4		<0.68		<1.4		<0.68		<0.68	
	SW558	5/5/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW558	4/27/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW558	10/17/2007	<0.49		<0.49		<0.99		<0.99		<0.99		<0.99		<0.49		<0.99		<0.99		<0.99		<0.49		<0.99		<0.49		<0.49	
	SW558	5/20/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW558	10/23/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	SW558	4/14/2011	<0.17		<0.34		<0.34		<0.34		<0.34		<0.34		<0.17		<0.34		<0.34		<0.34		<0.17		<0.42		<0.17		<0.17	
	SW558	4/10/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
L14	***In Plume***																													
	MW511	5/6/2002	<0.57		<0.57		<1.1		<1.1		<1.1		<0.57		<0.57		<1.1		<1.1		<1.1		<0.57		<1.1		<0.57		<0.57	
	MW511	10/30/2002	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		1.6		<0.39		<0.78		<0.78		<0.78		**9.8**		<0.78		<0.39		<0.39	
	MW511	5/21/2003	<0.6		<0.6 (0.065)		<1.2 (0.32)		<1.2		<1.2		6		<0.6		<1.2		<1.2		<1.2		**55**		<1.2		<0.6		<0.6	
	MW511	10/22/2003	<0.49		<0.49 (0.052)		<0.98 (0.26)		<0.98		<0.98		17		<0.49		<0.98		<0.98		<0.98		**160**		<0.98		<0.49		<0.49	
	MW511	5/27/2004	<0.44		<0.44 (0.048)		<0.88 (0.23)		<0.88		<0.88		<0.88		<0.44		<0.88		<0.88		<0.88		<0.44		<0.88		<0.44		<0.44	
	MW511(DUP)	5/27/2004	<0.48		<0.48 (0.052)		<0.96 (0.26)		<0.96		<0.96		<0.96		<0.48		<0.96		<0.96		<0.96		<0.48		<0.96		<0.48		<0.48	
	MW511	10/25/2004	<0.39		<0.39 (0.12)		<0.78 (0.14)		<0.78		<0.78		13		<0.39		<0.78		<0.78		<0.78		**120**		<0.78		<0.39		<0.39	
	MW511	7/27/2005	<0.4		<0.4		<0.81		<0.81		<0.81		12		<0.4		<0.81		<0.81		<0.81		**130**		<0.81		<0.4		<0.4	
	MW511	10/24/2005	<0.6		<0.6		<1.2		<1.2		<1.2		9.8		<0.6		<1.2		<1.2		<1.2		**80**		<1.2		<0.6		<0.6	
	MW511	5/8/2006	<0.42		<0.42		<0.83		<0.83		<0.83		1.6		<0.42		<0.83		<0.83		<0.83		**5.5**		<0.83		<0.42		<0.42	
	MW511	10/16/2006	<0.6		<0.6		<1.2		<1.2		<1.2		14		<0.6		<1.2		<1.2		<1.2		**110**		<1.2		<0.6		<0.6	
	MW511	5/2/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW511	10/15/2007	<0.4		<0.4		<0.79		<0.79		<0.79		19		<0.4		<0.79		<0.79		<0.79		**170**		<0.79		<0.4		<0.4	
	MW511	5/20/2008	<0.4		<0.4		<0.81		<0.81		<0.81		<0.81		<0.4		<0.81		<0.81		<0.81		0.46		<0.81		<0.4		<0.4	
	MW511	10/28/2008	<0.39		<0.39		<0.78		<0.78		<0.78		7.3		<0.39		<0.78		<0.78		<0.78		**58**		<0.78		<0.39		<0.39	
	MW511	4/30/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW511	10/26/2009	<0.18		<0.36		<0.36		<0.36		<0.36		6.4		<0.18		0.29	F /	<0.36		<0.36		**31**		<0.45		<0.18		<0.18	
	MW511	4/7/2010	<0.38		<0.73		<0.73		<0.73		<0.73		<0.73		<0.38		<0.73		<0.73		<0.73		<0.38		<0.92		<0.38		<0.38	
	MW511	10/26/2010	<0.24		<0.47		<0.47		<0.47		<0.47		13		<0.24		<0.47		<0.47		<0.47		**110**		<0.59		<0.24		<0.24	
	MW511	4/18/2011	<0.18		<0.36		<0.36		<0.36		<0.36		0.14	F / J	<0.18		<0.36		<0.36		<0.36		0.94		<0.45		<0.18		<0.18	
	MW511	10/14/2011	<0.33		<0.33		<0.33		<0.65		<0.65		10		<0.33		<0.65		<0.65		<0.65		**84**		<0.81		<0.33		<0.33	
	MW511	10/26/2012	<0.16		0.41		0.17	F / J	<0.31		<0.31		11		<0.16		0.32		<0.31		0.5		**76**		<0.39		<0.16		<0.16	
	MW512	5/6/2002	<0.52		<0.52		<1		<1		<1		21		<0.52		<1		<1		<1		**37**		<1		<0.52		<0.52	
	MW512	10/30/2002	<0.39		<0.39 (0.042)		<0.78 (0.21)		2.3		3.2		94		<0.39		<0.78		<0.78		<0.78		**190**		<0.78		<0.39		<0.39	
	MW512	5/21/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		1.4		2.1		61		<0.39		<0.78		<0.78		<0.78		**190**		<0.78		<0.39		<0.39	
	MW512	10/22/2003	<0.52		<0.52 (0.056)		<1 (0.28)		2.1		3.1		86		<0.52		<1		<1		<1		**210**		<1		<0.52		<0.52	
	MW512	5/27/2004	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		8.9		<0.39		<0.78		<0.78		<0.78		**21**		<0.78		<0.39		<0.39	
	MW512	10/26/2004	<0.51		<0.51 (0.16)		<1 (0.19)		2.1		3.1		85		<0.51		<1		<1		<1		**230**		<1		<0.51		<0.51	
	MW512	7/27/2005	<0.47		<0.47		<0.95		2.3		3.4		90		<0.47		<0.95		<0.95		<0.95		**300**		<0.95		<0.47		<0.47	
	MW512	10/24/2005	<0.39		<0.39		<0.78		2		2.9		90		<0.39		<0.78		<0.78		<0.78		**190**		<0.78		<0.39		<0.39	
	MW512	5/8/2006	<0.75		<0.75		<1.5		<1.5		2.3		76		<0.75		<1.5		<1.5		<1.5		**290**		<1.5		<0.75		<0.75	
	MW512	10/16/2006	<0.55		<0.55		<1.1		2.7		3.8		91		<0.55		<1.1		<1.1		<1.1		**290**		<1.1		<0.55		<0.55	
	MW512	5/1/2007	<0.39		<0.39		<0.78		<0.78		<0.78		7.8		<0.39		<0.78		<0.78		<0.78		**11**		<0.78		<0.39		<0.39	
	MW512	10/15/2007	<0.51		<0.51		<1		1.8		2.6		84		<0.51		<1		<1		<1		**200**		<1		<0.51		<0.51	
	MW512	5/21/2008	<0.39		<0.39		<0.78		<0.78		<0.78		4.6		<0.39		<0.78		<0.78		<0.78		**10**		<0.78		<0.39		<0.39	
	MW512(DUP)	5/21/2008	<0.39		<0.39		<0.78		<0.78		<0.78		4.5		<0.39		<0.78		<0.78		<0.78		11		<0.78		<0.39		<0.39	
	MW512	10/27/2008	<0.39		<0.39		<0.78		2		2.8		68		<0.39		<0.78		<0.78		<0.78		**190**		<0.78		<0.39		<0.39	
	MW512(DUP)	10/27/2008	<0.42		<0.42		<0.83		2.1		3		70		<0.42		<0.83		<0.83		<0.83		**210**		<0.83		<0.42		<0.42	
	MW512	4/30/2009	<0.17		<0.33		<0.33		<0.33		<0.33		1.3		<0.17		<0.33		<0.33		<0.33		0.62		<0.42		<0.17		<0.17	
	MW512	10/23/2009	<0.28		<0.55		<0.55		0.6		0.83		20		<0.28		<0.55		<0.55		<0.55		**42**		<0.69		<0.28		<0.28	
	MW512	4/6/2010	<0.40		<0.78		<0.78		<0.78		<0.78		7.3		<0.40		<0.78		<0.78		<0.78		**11**		<0.98		<0.40		<0.40	
	MW512	10/26/2010	<0.31		<0.59		<0.59		1.7		2.4		61		<0.31		<0.59		<0.59		<0.59		**240**		<0.75		<0.31		<0.31	
	MW512	4/18/2011	<0.36		<0.70		<0.70		0.76		1.2		42	/ J	<0.36		<0.70		<0.70		<0.70		**150**		<0.88		<0.36		<0.36	
	MW512	10/14/2011	<0.28		<0.28		<0.28		0.82		<0.54		74		<0.28		<0.54		<0.54		<0.54		**400**		<0.68		<0.28		<0.28	
	MW512	10/26/2012	<0.16		0.39		0.18	F / J	1.5		2.1		58		<0.16		0.33		<0.31		0.5		**220**		<0.39		<0.16		<0.16	

TABLE B1

Summary of Analytical Results - Explosives
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**1,3-DNB**		**2,4-DNT**		**2,6-DNT**		**2-A-4,6-DNT**		**4-A-2,6-DNT**		**HMX**		**NB**		**2-NT**		**3-NT**		**4-NT**		**RDX**		**Tetryl**		**1,3,5-TNB**		**2,4,6-TNT**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
L14	***Early Warning***																													
	H7	5/6/2002	<0.51		<0.51		<1		<1		<1		<0.51		<0.51		<1		<1		<1		<0.51		<1		<0.51		<0.51	
	H7	10/30/2002	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		1.3		<0.78		<0.39		<0.39	
	H7	5/21/2003	<0.6		<0.6 (0.065)		<1.2 (0.32)		<1.2		<1.2		<1.2		<0.6		<1.2		<1.2		<1.2		<0.6		<1.2		<0.6		<0.6	
	H7	10/22/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		0.63		<0.78		<0.39		<0.39	
	H7	5/27/2004	<0.5		<0.5 (0.054)		<1 (0.27)		<1		<1		<1		<0.5		<1		<1		<1		<0.5		<1		<0.5		<0.5	
	H7	10/25/2004	<0.39		<0.39 (0.12)		<0.78 (0.14)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	H7	7/27/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	H7	10/24/2005	<0.62		<0.62		<1.2		<1.2		<1.2		<1.2		<0.62		<1.2		<1.2		<1.2		1.3		<1.2		<0.62		<0.62	
	H7	5/8/2006	<0.49		<0.49		<0.98		<0.98		<0.98		<0.98		<0.49		<0.98		<0.98		<0.98		<0.49		<0.98		<0.49		<0.49	
	H7	10/16/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	H7	5/2/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	H7	10/15/2007	<0.63		<0.63		<1.3		<1.3		<1.3		<1.3		<0.63		<1.3		<1.3		<1.3		<0.63		<1.3		<0.63		<0.63	
	H7	5/21/2008	<0.47		<0.47		<0.94		<0.94		<0.94		<0.94		<0.47		<0.94		<0.94		<0.94		<0.47		<0.94		<0.47		<0.47	
	H7	10/27/2008	<0.44		<0.44		<0.87		<0.87		<0.87		<0.87		<0.44		<0.87		<0.87		<0.87		<0.44		<0.87		<0.44		<0.44	
	H7	4/30/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	H7	10/23/2009	<0.33		<0.64		<0.64		<0.64		<0.64		<0.64		<0.33		<0.64		<0.64		<0.64		0.4		<0.8		<0.33		<0.33	
	H7	4/6/2010	<0.30		<0.59		<0.59		<0.59		<0.59		<0.59		<0.30		<0.59		<0.59		<0.59		<0.30		<0.74		<0.30		<0.30	
	H7	10/26/2010	<0.17		<0.34		<0.34		<0.34		<0.34		<0.34		<0.17		<0.34		<0.34		<0.34		<0.17		<0.42		<0.17		<0.17	
	H7	4/18/2011	<0.25		<0.48		<0.48		<0.48		<0.48		<0.48	U / UJ	<0.25		<0.48		<0.48		<0.48		<0.25		<0.60		<0.25		<0.25	
	H7	10/14/2011	<0.29		<0.29		<0.29		<0.56		<0.56		<0.56		<0.29		<0.56		<0.56		<0.56		0.24	F /	<0.70		<0.29		<0.29	
	H7	10/26/2012	<0.16		**1.5**		**0.58**		<0.31		<0.31		<0.31		<0.16		1.4		<0.31		1.5		0.97		<0.39		<0.16		<0.16	
MFG	***In-Plume***																													
(M6)	MW212R	5/3/2002	0.62		**480**		**230**		15		16		<0.39		<0.39		1600		180		1000		<0.39		<0.78		2.2		**76**	
	MW212R	10/25/2002	<6.6		**1500**		**570**		45		64		<13		<6.6		**6800**		610		4000		<6.6		<13		**82**		**84**	
	MW212R	5/15/2003	<58		**6400**		**2200**		130		160		<120		<58		**18000**		1600		10000		<58		<120		<58		**710**	
	MW212R	10/17/2003	<3.9		**4400**		**1500**		100		98		<7.8		12		**14000**		1200		8400		<3.9		<7.8		<3.9		**400**	
	MW212R	5/24/2004	<5.5		**64**		**95**		14		11		<11		<5.5		<11		<11		<11		<5.5		<11		<5.5		**9.6**	
	MW212R	10/21/2004	<3.9		**2800**		**860**		66	/ J	67		<7.8		14	/ J	**12000**		970		6500		<3.9		<7.8		<3.9		**210**	
	MW212R	7/13/2005	<3.9		**490**		**200**		32		23		<7.8		<3.9		3500		290		1900		<3.9		<7.8		<3.9		**26**	B /
	MW212R	10/18/2005	<39		**17000**		**3500**		340		320		<78		<39		**81000**		4000		47000		<39		<78		<39		**1000**	
	MW212R	5/1/2006	<4.1		**2800**		**630**		34		28		<8.2		<4.1		**7500**		590		5800		<4.1		<8.2		<4.1		**260**	
	MW212R	10/6/2006	<40		**6300**		**1800**		190		140		<81		<40		**31000**		2600		19000		<40		<81		<40		**880**	
	MW212R	4/24/2007	<3.9		**650**		**250**		45		37		<7.8		<3.9		3300		370		2300		<3.9		<7.8		<3.9		**25**	
	MW212R	10/10/2007	<39		**3800**		**1300**		190		200		<78		<39		**19000**		1700		12000		<39		<78		<39		**440**	
	MW212R	5/9/2008	<4.8		**5700**		**1000**		70		72		<9.6		<4.8		**21000**		1300		15000		<4.8		<9.6		<4.8		**460**	
	MW212R(DUP)	5/9/2008	<3.9		4400		970		68		70		<7.8		4.3		17000		1200		12000		<3.9		<7.8		<3.9		450	
	MW212R	10/16/2008	<0.42		<0.42		<0.83		<0.83		<0.83		<0.83		<0.42		<0.83		<0.83		<0.83		<0.42		<0.83		<0.42		<0.42	
	MW212R	5/7/2009	<16		**1000**		**340**		<31		<31		<31	U / UJ	<16		1800		370		1300		<16		<39		<16		**150**	
	MW212R	10/26/2009	<22		**4500**		**1200**		<43		<43		<43		<22		**20000**		1600		11000		<22		<55		<22		**870**	
	MW212R	4/9/2010	<0.24		**95**		**84**		15		13		<0.46		<0.24		4.8		39		<0.46		<0.24		<0.58		<0.24		8.2	
	MW212R	11/2/2010	<2.0		**140**		**280**		19		14		<3.8		<2.0		2900		260		1700		<2.0		<4.8	U / UJ	<2.0		**67**	
	MW212R	4/21/2011	<28		**2400**		**730**		70		73		<54		<28		4800	/ J	710	/ J	2100	/ J	<28		<68		<28		**230**	/ J
	MW212R(DUP)	4/21/2011	<25		**2900**		**870**		64		74		<49		<25		**8100**	/ J	920	/ J	4200	/ J	<25		<61		<25		**350**	/ J
	MW212R	10/19/2011	<35		**2700**		**1100**		100		57	F / NJ	<68		<35		**12000**		<68		7500		<35		<86		<35		**230**	
	MW212R(DUP)	10/19/2011	<30		**2700**		**1000**		120		54	F / J	<59		<30		**12000**		<59		7700		<30		<74		<30		**210**	
	MW212R	4/15/2012	1.1	F /	**620**		**260**		64	/ J	51	/ J	<3.1		1.9		4100		<3.1		2100		<1.6		<3.9		<1.6		**39**	
	MW212R	10/23/2012	<16		**2500**		**640**		270	/ J	160	/ J	<31		<16		**12000**		<31		6700		<16		<39		<16		**200**	
	MW212R(DUP)	10/23/2012	<16		**3200**		**920**		290	/ J	170	/ J	<31		<16		**15000**		<31		7900		<16		<39		<16		**340**	
	MW652	5/8/2002	7.9		**5700**		**2100**		150		120		<3.9		19		**26000**		2200		17000		<3.9		<7.8		<3.9		**1300**	
	MW652	10/22/2002	10		**7900**		**2600**		180		150		<7.8		24		**36000**		3000		23000		<3.9		<7.8		**36**		**2000**	
	MW652	5/15/2003	9.7		**6200**		**2200**		150		86		<7.9		20		**27000**		2300		17000		<4		<7.9		<4		**1400**	
	MW652(DUP)	5/15/2003	**11**		**7500**		**2700**		180		110		<8.7		24		**34000**		2700		21000		<4.4		<8.7		<4.4		**1700**	
	MW652	10/17/2003	7.1		**4900**		**2000**		130		72		<7.9		19		**19000**		1600		13000		<4		<7.9		<4		**1300**	
	MW652(DUP)	10/17/2003	8.3		**5600**		**2300**		150		86		<9.1		22		**23000**		1800		14000		<4.6		<9.1		<4.6		**1500**	
	MW652	5/24/2004	10		**7100**		**2700**		220		130		<9.1		30		**35000**		2700		23000		<4.6		<9.1		<4.6		**2100**	
	MW652(DUP)	5/24/2004	9.4		**6800**		**2500**		200		120		<7.8		27		**34000**		3000		23000		<3.9		<7.8		<3.9		**2100**	
	MW652	10/21/2004	**13**		**10000**		**4900**		300	/ J	190		<7.8		39		**47000**		3700		31000		<3.9		<7.8		<3.9		**2300**	
	MW652(DUP)	10/21/2004	**13**		**14000**		**4900**	/ J	290	/ J	180		<10		38		**66000**		3800		43000		<5.1		<10		<5.1		**2400**	
	MW652	7/13/2005	<58		**10000**		**3500**		280		<120		<120		<58		**56000**		3900		37000		<58		<120		<58		**2200**	B /
	MW652	10/18/2005	9.3		**21000**		**5400**		270		130		<7.8		25		**98000**		5700		65000		<3.9		<7.8		<3.9		**3400**	
	MW652	5/1/2006	<39		**2900**		**970**		<78		<78		<78		<39		**11000**		1000		8100		<39		<78		<39		**560**	

TABLE B1

Summary of Analytical Results - Explosives
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
MFG	***Tu-Pluume***																													
(M6)	MW652	10/6/2006	<42		**5100**		**1800**		140		91		<85		<42		**23000**		1900		15000		<42		<85		<42		**1300**	
	MW652	4/24/2007	<3.9		**2200**		**670**		60		35		<7.8		<3.9		**9000**		820		6700		<3.9		<7.8		<3.9		**450**	
	MW652	10/10/2007	<39		**4600**		**1700**		160		120		<78		<39		**20000**		1700		13000		<39		<78		<39		**1100**	
	MW652	5/7/2008	4.8		**3800**		**1300**		80		90		<7.8		9.7		**17000**		1400		12000		<3.9		<7.8		<3.9		**710**	
	MW652(DUP)	5/7/2008	5.1		4100		1300		85		96		<7.8		10		18000		1600		13000		<3.9		<7.8		<3.9		710	
	MW652	10/16/2008	<3.9		**4200**		**2700**		120		99		<7.8		<3.9		**17000**		1500		12000		<3.9		<7.8		<3.9		**910**	
	MW652(DUP)	10/16/2008	<3.9		**4400**		**2100**		130		100		<7.8		<3.9		**18000**		1500		12000		<3.9		<7.8		<3.9		**850**	
	MW652	5/7/2009	<16		**2000**		**630**		<31		<31		<31	U / UJ	<16		**5300**		680		5500		<16		<39		<16		**340**	
	MW652	10/26/2009	<21		**4900**		**1500**		120		120		<41		<21		**23000**		1700		14000		<21		<51		<21		**810**	
	MW652	4/9/2010	<29		**8000**		**2800**		<57		<57		<57		<29		**36000**		2800		25000		<29		<72		<29		**1400**	
	MW652	11/2/2010	<2.1		**5800**		**2800**		180		120		<4.1		<2.1		**28000**		2000		18000		<2.1		<5.2	U / UJ	<2.1		**1200**	
	MW652	4/21/2011	<23		**5400**		**1400**		75		73		<44		<23		**24000**		1700	/ J	17000		<23		<56		<23		**770**	
	MW652(DUP)	4/21/2011	<18		**5900**		**1500**		79		79		<36		<18		**27000**		2300	/ J	20000		<18		<45		<18		**870**	
	MW652	10/19/2011	<20		**2800**		**1500**		86		60	/ J	<39		<20		**13000**		<39		8100		<20		<49		<20		**520**	
	MW652(DUP)	10/19/2011	<32		**3000**		**1700**		96		69	/ J	<63		<32		**14000**		<63		9000		<32		<79		<32		**590**	
	MW652	4/14/2012	9.5	F /	**8400**		**3300**		360		380	/ J	<31		<16		**44000**		<31		28000		<16		<39		<16		**1600**	
	MW652(DUP)	4/14/2012	7.9	F /	**6800**		**2700**		320		320	/ J	<31		<16		**35000**		<31		22000	/ J	<16		<39		<16		**1300**	
	MW652	10/23/2012	<16		**5100**		**2000**		280	/ J	230	/ J	<31		<16		**23000**		<31		14000		<16		<39		<16		**950**	
	Early Warning																													
	MW123R	5/8/2002	<0.46		<0.46		<0.91		<0.91		<0.91		<0.46		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	MW123R	10/22/2002	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW123R	10/14/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW123R	5/19/2004	<0.57		<0.57 (0.061)		<1.1 (0.3)		<1.1		<1.1		<1.1		<0.57		<1.1		<1.1		<1.1		<0.57		<1.1		<0.57		<0.57	
	MW123R	10/20/2004	<0.65		<0.65 (0.2)		<1.3 (0.24)		<1.3		<1.3		<1.3		<0.65		<1.3		<1.3		<1.3		<0.65		<1.3		<0.65		<0.65	
	MW123R	7/18/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW123R	10/17/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW123R	5/1/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW123R	10/10/2006	<0.57		<0.57		<1.1		<1.1		<1.1		<1.1		<0.57		<1.1		<1.1		<1.1		<0.57		<1.1		<0.57		<0.57	
	MW123R	4/25/2007	<0.54		<0.54		<1.1		<1.1		<1.1		<1.1		<0.54		<1.1		<1.1		<1.1		<0.54		<1.1		<0.54		<0.54	
	MW123R	10/11/2007	<0.46		<0.46		<0.91		<0.91		<0.91		<0.91		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	MW123R	5/8/2008	<0.53		<0.53		<1.1		<1.1		<1.1		<1.1		<0.53		<1.1		<1.1		<1.1		<0.53		<1.1		<0.53		<0.53	
	MW123R	10/20/2008	<0.45		<0.45		<0.9		<0.9		<0.9		<0.9		<0.45		<0.9		<0.9		<0.9		<0.45		<0.9		<0.45		<0.45	
	MW123R(DUP)	10/20/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW123R	5/6/2009	<0.2		<0.39		<0.39		<0.39		<0.39		<0.39		<0.2		<0.39		<0.39		<0.39		<0.2		<0.49		<0.2		<0.2	
	MW123R	10/26/2009	<0.2		<0.39		<0.39		<0.39		<0.39		<0.39		<0.2		<0.39		<0.39		<0.39		<0.2		<0.49		<0.2		<0.2	
	MW123R	4/8/2010	<0.24		<0.47		<0.47		<0.47		<0.47		<0.47		<0.24		<0.47		<0.47		<0.47		<0.24		<0.59		<0.24		<0.24	
	MW123R	11/1/2010	<0.19		<0.37		<0.37		<0.37		<0.37		<0.37		<0.19		1		<0.37		0.46		<0.19		<0.46		<0.19		<0.19	
	MW123R	4/20/2011	<0.26		<0.51		<0.51		<0.51		<0.51		<0.51		<0.26		<0.51		<0.51		<0.51		<0.26		<0.64		<0.26		<0.26	
	MW123R	10/18/2011	<0.34		<0.34		<0.34		<0.65		<0.65		<0.65		<0.34		<0.65		<0.65		<0.65		<0.34		<0.82		<0.34		<0.34	
	MW123R	4/14/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW123R(DUP)	4/14/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW123R	10/23/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
MFG	***Early Warning***																													
(M7)	MW124R	5/9/2002	<0.39		**1.1**		<0.78		15		22		1.2		<0.39		2.1		<0.78		1.7		**3.5**		<0.78		<0.39		**69**	
	MW124R	10/17/2002	0.58		**4.2**		**1.4**		41		49		3.6		<0.44		<0.88	U / UJ	<0.88	U / UJ	<0.88	U / UJ	**10**		<0.88		<0.44		**46**	
	MW124R	5/13/2003	<2.3		<2.3 (2.5)		<4.6 (1.2)		19		28		<4.6		<2.3		<4.6		<4.6		<4.6		<2.3		<4.6		<2.3		**10**	
	MW124R(DUP)	5/13/2003	<2		<2 (0.21)		<3.9 (1)		18		27		<3.9		<2		<3.9		<3.9		<3.9		<2		<3.9		<2		**12**	
	MW124R	10/15/2003	<0.39		**2.9**		<0.78 (0.21)		55		66		1.3		<0.39		<0.78		<0.78		<7.8		**6.5**		<0.78		**6.3**		**120**	
	MW124R(DUP)	10/15/2003	<0.55		**3.3**		**1.7**		56		66		<11		<0.55		<1.1		<1.1		<11		**6.4**		<1.1		**6.8**		**160**	
	MW124R	5/18/2004	<5.1		<5.1 (0.55)		<10 (2.7)		28		32		<10		<5.1		<10		<10		<10		<5.1		<10		**7.7**		**140**	
	MW124R(DUP)	5/18/2004	<5.2		<5.2 (0.56)		<10 (2.8)		24		28		<10		<5.2		<10		<10		<10		<5.2		<10		**5.7**		**110**	
	MW124R	10/20/2004	<4.8		<4.8 (1.5)		<9.6 (1.8)		35		37		<9.6		<4.8		<9.6		<9.6		<9.6		<4.8		<9.6		<4.8		**74**	
	MW124R(DUP)	10/20/2004	<6.4		<6.4 (2)		<13 (2.3)		45		47		<13		<6.4		<13		<13		<13		**8**		<13		<6.4		**99**	
	MW124R	7/18/2005	<6.9		<6.9		<14		43		46		<14		<6.9		<14		<14		<14		<6.9		<14		<6.9		**86**	
	MW124R(DUP)	7/18/2005	<5.8		<5.8		<12		43		45		<12		<5.8		<12		<12		<12		<5.8		<12		<5.8		**84**	
	MW124R	10/21/2005	<2.1		**6.3**		<4.2		48		48		<4.2		<2.1		<4.2		<4.2		<4.2		**4.1**		<4.2		<2.1		**41**	
	MW124R(DUP)	10/21/2005	<1.9		**6.9**		<3.8		52		52		<3.8		<1.9		<3.8		<3.8		<3.8		**4.2**		<3.8		<1.9		**42**	
	MW124R	5/4/2006	<3.9		<3.9		<7.8		13		16		<7.8		<3.9		<7.8		<7.8		<7.8		**4.6**		<7.8		<3.9		**32**	
	MW124R(DUP)	5/4/2006	<3.9		<3.9		<7.8		13		16		<7.8		<3.9		<7.8		<7.8		<7.8		**4.7**		<7.8		<3.9		**32**	
	MW124R	10/11/2006	<7.3		<7.3		<15		42		39		<15		<7.3		<15		<15		<15		<7.3		<15		<7.3		**69**	
	MW124R(DUP)	10/11/2006	<7		<7		<14		41		41		<14		<7		<14		<14		<14		**7.5**		<14		<7		**79**	
	MW124R	4/30/2007	<0.53		**1.8**		**1.6**		17		17		<1.1		<0.53		<1.1		<1.1		7.9		**5.2**		<1.1		1.6		**58**	
	MW124R	10/11/2007	<0.51		**1.4**		<1		22		20		<1		<0.51		<1		<1		<1		2.5		<1		<0.51		5.5	
	MW124R(DUP)	10/11/2007	<0.43		1.7		<0.86		23		18		0.99		<0.43		<0.86		<0.86		<0.86		2.3		<0.86		<0.43		7.1	
	MW124R	5/8/2008	<0.49		**1**		<0.99		13		13		<0.99		<0.49		<0.99		<0.99		<0.99		1.7		<0.99		<0.49		**13**	
	MW124R(DUP)	5/8/2008	<0.49		1.1		<0.99		14		13		<0.99		<0.49		<0.99		<0.99		<0.99		1.7		<0.99		<0.49		13	
	MW124R	10/16/2008	<0.39		**0.84**		<0.78		15		13		<0.78		<0.39		<0.78		<0.78		<0.78		2.1		<0.78		<0.39		2.6	
	MW124R(DUP)	10/16/2008	<0.39		**0.8**		<0.78		13		12		<0.78		<0.39		<0.78		<0.78		<0.78		1.9		<0.78		<0.39		2.5	
	MW124R	5/6/2009	<0.23		**1.1**		<0.44		17		14		<0.44		<0.23		<0.44		<0.44		<0.44		2.2		<0.55		<0.23		**21**	
	MW124R	10/26/2009	<0.24		**0.65**		<0.46		13		10		<0.46		<0.24		0.27	F /	<0.46		0.35	F /	1		<0.58		<0.24		2.3	
	MW124R	4/8/2010	<0.25		<0.49		<0.49		10		8.8		<0.49		<0.25		<0.49		<0.49		<0.49		1.1		<0.61		<0.25		1.6	
	MW124R(DUP)	4/8/2010	<0.21		**0.68**		<0.41		9.8		8.5		<0.41		<0.21		<0.41		<0.41		<0.41		1.1		<0.52		<0.21		1.6	
	MW124R	11/3/2010	<0.29		<0.56		<0.56		0.87		0.7		<0.56		<0.29		<0.56		<0.56		<0.56		0.36		<0.71		<0.29		<0.29	
	MW124R	4/20/2011	<0.20		0.11	F /	<0.38		3.2		3.1		<0.38		<0.20		<0.38		<0.38		<0.38		<0.20		<0.48		<0.20		<0.20	
	MW124R	10/18/2011	<0.22		<0.22		<0.22		<0.42		<0.42		6	/ J	<0.22		<0.42		<0.42		<0.42		0.66	/ J	<0.53		<0.22		<0.22	
	MW124R(DUP)	10/18/2011	<0.25		<0.25		<0.25		<0.49		<0.49		6.9	/ J	<0.25		<0.49		<0.49		<0.49		0.65	/ J	<0.61		<0.25		<0.25	
	MW124R	4/14/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW124R	10/23/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

TABLE B1

Summary of Analytical Results - Explosives
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Joliet Army Ammunition Plant
Will County, Illinois

		Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
MFG	***Early Warning***																													
(M6)	MW162R	5/8/2002	<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW162R	10/22/2002	<0.42		<0.42 (0.046)		<0.85 (0.22)		<0.85		<0.85		<0.85		<0.42		<0.85		<0.85		<0.85		<0.42		<0.85		<0.42		<0.42	
	MW162R	5/13/2003	<0.58		<0.58 (0.062)		<1.2 (0.31)		<1.2		<1.2		<1.2		<0.58		<1.2		<1.2		<1.2		<0.58		<1.2		<0.58		<0.58	
	MW162R	10/15/2003	<0.54		<0.54 (0.058)		<1.1 (0.29)		<1.1		<1.1		<1.1		<0.54		<1.1		<1.1		<1.1		<0.54		<1.1		<0.54		<0.54	
	MW162R	5/19/2004	<0.54		<0.54 (0.058)		<1.1 (0.29)		<1.1		<1.1		<1.1		<0.54		<1.1		<1.1		<1.1		<0.54		<1.1		<0.54		<0.54	
	MW162R	10/20/2004	<0.39		<0.39 (0.12)		<0.78 (0.14)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW162R	7/13/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW162R	10/20/2005	<0.63		<0.63		<1.3		<1.3		<1.3		<1.3		<0.63		<1.3		<1.3		<1.3		<0.63		<1.3		<0.63		<0.63	
	MW162R	5/3/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW162R	10/11/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW162R	4/25/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW162R	10/9/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW162R	5/1/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW162R	10/20/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW162R	5/6/2009	<0.22		<0.42		<0.42		<0.42		<0.42		<0.42		<0.22		<0.42		<0.42		<0.42		<0.22		<0.53		<0.22		<0.22	
	MW162R	10/26/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW162R	4/8/2010	<0.29		<0.57		<0.57		<0.57		<0.57		<0.57		<0.29		<0.57		<0.57		<0.57		<0.29		<0.72		<0.29		<0.29	
	MW162R	11/1/2010	<0.27		<0.52		<0.52		<0.52		<0.52		<0.52		<0.27		<0.52		<0.52		<0.52		<0.27		<0.65		<0.27		<0.27	
	MW162R	4/20/2011	<0.21		<0.41		<0.41		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.51		<0.21		<0.21	
	MW162R	10/18/2011	<0.41		<0.41		<0.41		<0.79		<0.79		<0.79		<0.41		<0.79		<0.79		<0.79		<0.41		<0.99		<0.41		<0.41	
	MW162R(DUP)	10/18/2011	<0.33		<0.33		<0.33		<0.64		<0.64		<0.64		<0.33		<0.64		<0.64		<0.64		<0.33		<0.81		<0.33		<0.33	
	MW162R	4/14/2012	<0.16		0.27	F / J	0.14	F /	<0.31		<0.31		<0.31		<0.16		0.7		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW162R	10/23/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW313	5/8/2002	<0.47		<0.47		<0.94		<0.94		<0.94		<0.47		<0.47		<0.94		<0.94		<0.94		<0.47		<0.94		<0.47		<0.47	
	MW313	10/22/2002	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW313	5/16/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW313	10/17/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW313	5/24/2004	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		1.8		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW313	10/22/2004	<0.39		<0.39 (0.12)		<0.78 (0.14)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW313	7/19/2005	<0.63		<0.63		<1.3		<1.3		<1.3		<1.3		<0.63		<1.3		<1.3		<1.3		<0.63		<1.3		<0.63		<0.63	
	MW313	10/19/2005	<0.45		<0.45		<0.9		<0.9		<0.9		<0.9		<0.45		<0.9		<0.9		<0.9		<0.45		<0.9		<0.45		<0.45	
	MW313	5/2/2006	<0.58		<0.58		<1.2		<1.2		<1.2		<1.2		<0.58		<1.2		<1.2		<1.2		<0.58		<1.2		<0.58		<0.58	
	MW313	10/11/2006	<0.6		<0.6		<1.2		<1.2		<1.2		<1.2		<0.6		<1.2		<1.2		<1.2		<0.6		<1.2		<0.6		<0.6	
	MW313	4/30/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW313	10/10/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW313	5/7/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW313	10/16/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW313	5/7/2009	<0.19		<0.37		<0.37		<0.37		<0.37		<0.37	U / UJ	<0.19		<0.37		<0.37		<0.37		<0.19		<0.46		<0.19		<0.19	
	MW313(DUP)	5/7/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31	U / UJ	<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW313	10/26/2009	<0.2		<0.39		<0.39		<0.39		<0.39		<0.39		<0.2		0.63		<0.39		0.27	F /	<0.2		<0.49		<0.2		<0.2	
	MW313(DUP)	10/26/2009	<0.19		<0.36		<0.36		<0.36		<0.36		<0.36		<0.19		<0.36		<0.36		<0.36		<0.19		<0.46		<0.19		<0.19	
	MW313	4/9/2010	<0.29		<0.56		<0.56		<0.56		<0.56		<0.56		<0.29		<0.56		<0.56		<0.56		<0.29		<0.71		<0.29		<0.29	
	MW313	11/2/2010	<0.20		<0.38		<0.38		<0.38		<0.38		<0.38		<0.20		<0.38		<0.38		<0.38		<0.20		<0.48		<0.20		<0.20	
	MW313(DUP)	11/2/2010	<0.38		<0.73		<0.73		<0.73		<0.73		<0.73		<0.38		<0.73		<0.73		<0.73		<0.38		<0.92		<0.38		<0.38	
	MW313	4/21/2011	<0.20		<0.38		<0.38		<0.38		<0.38		<0.38		<0.20		<0.38		<0.38		<0.38		<0.20		<0.48	U / UJ	<0.20		<0.20	
	MW313	10/19/2011	<0.36		<0.36		<0.36		<0.70		<0.70		<0.70		<0.36		<0.70		<0.70		<0.70		<0.36		<0.88		<0.36		<0.36	
	MW313	4/15/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW313	10/23/2012	<1.6		**5**		**3.3**	/ J	<3.1		<3.1		<3.1		<1.6		44		<3.1		28		<1.6		<3.9		<1.6		<1.6	
	MW318	5/8/2002	<4.4		<4.4		<8.7		<8.7		<8.7		<4.4		<4.4		<8.7		<8.7		<8.7		<4.4		<8.7		<4.4		<4.4	
	MW318	10/21/2002	<2	U / UJ	<2 (0.21)	U / UJ	<3.9 (1)	U / UJ	<3.9	U / UJ	<3.9	U / UJ	<3.9	U / UJ	<2	U / UJ	<3.9	U / UJ	<3.9	U / UJ	<3.9	U / UJ	<2	U / UJ	<3.9	U / UJ	<2	U / UJ	<2	U / UJ
	MW318	5/14/2003	<0.66		<0.66 (0.071)		<1.3 (0.35)		<1.3		<1.3		<1.3		<0.66		<1.3		<1.3		<1.3		<0.66		<1.3		<0.66		<0.66	
	MW318	10/14/2003	<0.46		<0.46 (0.049)		<0.91 (0.24)		<0.91		<0.91		6.1		<0.46		<0.91		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	MW318	5/19/2004	<0.65		<0.65 (0.07)		<1.3 (0.35)		<1.3		<1.3		<1.3		<0.65		<1.3		<1.3		<1.3		<0.65		<1.3	U / J	<0.65		<0.65	
	MW318	10/21/2004	<2		<2 (0.61)		**6.7**	/ J	<3.9		<3.9		<3.9		<2		<3.9		<3.9		<3.9		<2		<3.9		<2		<2	
	MW318	7/13/2005	<0.55		<0.55		<1.1		<1.1		<1.1		<1.1		<0.55		<1.1		<1.1		<1.1		<0.55		<1.1		<0.55		<0.55	
	MW318(DUP)	7/13/2005	<0.55		<0.55		<1.1		<1.1		<1.1		<1.1		<0.55		<1.1		<1.1		<1.1		<0.55		<1.1		<0.55		<0.55	
	MW318	10/18/2005	<0.44		<0.44		<0.88		<0.88		<0.88		<0.88		<0.44		<0.88		<0.88		<0.88		<0.44		<0.88		<0.44		<0.44	
	MW318(DUP)	10/18/2005	<0.44		<0.44		<0.87		<0.87		<0.87		<0.87		<0.44		<0.87		<0.87		<0.87		<0.44		<0.87		<0.44		<0.44	
	MW318	5/2/2006	<0.78		<0.78		<1.6		<1.6		<1.6		3.4		<0.78		<1.6		<1.6		<1.6		<0.78		<1.6		<0.78		<0.78	
	MW318(DUP)	5/2/2006	<0.78		<0.78		<1.6		<1.6		<1.6		4.1		<0.78		<1.6		<1.6		<1.6		<0.78		<1.6		<0.78		<0.78	
	MW318	10/10/2006	<0.47		<0.47		<0.95		<0.95		<0.95		<0.95		<0.47		<0.95		4.4		<0.95		<0.47		<0.95		<0.47		<0.47	
	MW318(DUP)	10/10/2006	<0.4		<0.4		<0.79		<0.79		<0.79		<0.79		<0.4		<0.79		2.8		<0.79		<0.4		<0.79		<0.4		<0.4	
	MW318	4/23/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW318	10/9/2007	<0.51		<0.51		<1		<1		<1		<1		<0.51		<1		<1		<1		<0.51		<1		<0.51		<0.51	
	MW318	5/7/2008	<0.94		<0.94		<1.9		<1.9		<1.9		<1.9		<0.94		<1.9		<1.9		<1.9		<0.94		<1.9		<0.94		<0.94	
	MW318	10/14/2008	<0.78		<0.78		<1.6		<1.6		<1.6		<1.6		<0.78		<1.6		<1.6		<1.6		**4.4**		<1.6		<0.78		<0.78	
	MW318	5/6/2009	<0.16	U / UJ	<0.31	U / UJ	<0.31	U / UJ	<0.31	U / UJ	<0.31	U / UJ	<0.31	U / UJ	<0.16	U / UJ	<0.31	U / UJ	<0.31	U / UJ	<0.31	U / UJ	<0.16	U / UJ	<0.39	U / UJ	<0.16	U / UJ	<0.16	U / UJ
	MW318	10/26/2009	<0.83		<1.6		<1.6		<1.6		<1.6		<1.6		<0.83		<1.6		<1.6		<1.6		<0.83		<2		<0.83		<0.83	
	MW318	4/8/2010	<0.21		<0.41		<0.41		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.52		<0.21		<0.21	
	MW318	11/2/2010	<0.36		<0.70		<0.70		<0.70		<0.70		<0.70		<0.36		<0.70		<0.70		<0.70		<0.36		<0.88		<0.36		<0.36	
	MW318	4/21/2011	<0.29		<0.56		<0.56		<0.56		<0.56		<0.56		<0.29		0.85		<0.56		<0.56		<0.29		<0.71		<0.29		<0.29	

TABLE B1

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		Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
MFG	***Early Warning***																													
(M6)	MW318	10/19/2011	<0.95		<0.95		**2.8**	/ NJ	<1.8		<1.8		<1.8		<0.95		<1.8		<1.8		<1.8		<0.95		<2.3		<0.95		2.9	/ J
	MW318	4/14/2012	<0.32		0.21	F / J	**0.45**	F / J	<0.62		<0.62		<0.62		<0.32		<0.62		<0.62		<0.62		<0.32		<0.78		<0.32		<0.32	
	MW318	10/23/2012	<0.8		<1.6		<1.6		<1.6		<1.6		<1.6		<0.8		<1.6		<1.6		<1.6		<0.8		<2		<0.8		<0.8	
	MW319	5/8/2002	<3.9		<3.9		<7.8		<7.8		<7.8		<3.9		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		<3.9		<3.9	
	MW319(DUP)	5/8/2002	<3.9		<3.9		<7.8		<7.8		<7.8		<3.9		<3.9		<7.8		<7.8		<7.8		<3.9		<7.8		<3.9		<3.9	
	MW319	10/21/2002	<2	U / UJ	<2 (0.21)	U / UJ	<3.9 (1)	U / UJ	<3.9	U / UJ	<3.9	U / UJ	<3.9	U / UJ	<2	U / UJ	<3.9	U / UJ	<3.9	U / UJ	<3.9	U / UJ	<2	U / UJ	<3.9	U / UJ	<2	U / UJ	<2	U / UJ
	MW319	5/14/2003	<2		<2 (0.21)		<3.9 (1)		<3.9		<3.9		<3.9		<2		<3.9		<3.9		<3.9		<2		<3.9		<2		<2	
	MW319	10/14/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW319	5/19/2004	<0.42		<0.42 (0.046)		<0.85 (0.22)		<0.85		<0.85		<0.85		<0.42		<0.85		<0.85		<0.85		<0.42		<0.85	U / J	<0.42		<0.42	
	MW319	10/21/2004	<2.7		<2.7 (0.83)		<5.3 (0.98)		<5.3		<5.3		<5.3		<2.7		<5.3		<5.3		<5.3		<2.7		<5.3		<2.7		<2.7	
	MW319	7/13/2005	<0.49		<0.49		<0.99		<0.99		<0.99		<0.99		<0.49		<0.99		<0.99		<0.99		<0.49		<0.99		<0.49		<0.49	
	MW319	10/18/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW319	5/2/2006	<0.78		<0.78		<1.6		<1.6		<1.6		8.9		<0.78		<1.6		<1.6		<1.6		<0.78		<1.6		<0.78		<0.78	
	MW319	10/10/2006	<0.43		<0.43		**11**		<0.86		<0.86		<0.86		<0.43		<0.86		6.7		<0.86		<0.43		<0.86		<0.43		<0.43	
	MW319	4/23/2007	<0.41		<0.41		**2**		<0.82		<0.82		<0.82		<0.41		<0.82		<0.82		<0.82		<0.41		<0.82		<0.41		<0.41	
	MW319	10/9/2007	<0.67		<0.67		<1.3		<1.3		<1.3		<1.3		<0.67		<1.3		<1.3		<1.3		<0.67		<1.3		<0.67		<0.67	
	MW319	5/7/2008	<2		<2		<4		<4		<4		<4		<2		<4		<4		<4		<2		<4		<2		<2	
	MW319	10/14/2008	<0.83		<0.83		<1.7		<1.7		<1.7		<1.7		<0.83		<1.7		<1.7		<1.7		**12**		<1.7		<0.83		<0.83	
	MW319	5/6/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW319	10/26/2009	<0.8		<1.6		<1.6		<1.6		<1.6		<1.6		<0.8		<1.6		<1.6		<1.6		<0.8		<2		<0.8		<0.8	
	MW319	4/8/2010	<0.25		<0.49		**3**		<0.49		<0.49		<0.49		<0.25		<0.49		<0.49		<0.49		<0.25		<0.62		<0.25		<0.25	
	MW319	11/2/2010	<0.19		**6.2**	/ J	<0.36		<0.36		<0.36		<0.36		<0.19		0.85	/ J	<0.36		<0.36		<0.19		<0.46		<0.19		<0.19	
	MW319	4/21/2011	<0.18		**0.74**		<0.35		<0.35		<0.35		<0.35		<0.18		<0.35		<0.35		<0.35		<0.18		<0.44		<0.18		<0.18	
	MW319	10/19/2011	<0.87		<0.87		<0.87		<1.7		<1.7		<1.7		<0.87		<1.7		<1.7		<1.7		<0.87		<2.1		<0.87		5.8	/ J
	MW319	4/14/2012	<0.32		<0.62		<0.62		<0.62		<0.62		<0.62		<0.32		<0.62		<0.62		<0.62		<0.32		<0.78		<0.32		0.29	F / J
	MW319	10/23/2012	<0.8		<1.6		<1.6		<1.6		<1.6		<1.6		<0.8		<1.6		<1.6		<1.6		<0.8		<2		<0.8		<0.8	
	MW654	5/8/2002	<0.73		<0.73		<1.5		<1.5		<1.5		<0.73		<0.73		<1.5		<1.5		<1.5		<0.73		<1.5		<0.73		<0.73	
	MW654(DUP)	5/8/2002	<0.39		<0.39		<0.78		<0.78		1.1		<0.39		<0.39		1		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW654	10/22/2002	<0.39		**1.2**		**1.1**		0.91		1.1		<0.78		<0.39		<0.78		<0.78		<0.78		0.91		<0.78		<0.39		<0.39	
	MW654	5/15/2003	<0.48		<0.48 (0.052)		<0.96 (0.26)		<0.96		1.1		<0.96		<0.48		<0.96		<0.96		<0.96		<0.48		<0.96		<0.48		<0.48	
	MW654	10/20/2003	<0.39		**1.7**	/ J	**1.1**		1.7		2.1		<0.78		<0.39		2		<0.78		2.2		0.55		<0.78		<0.39		<0.39	
	MW654	5/21/2004	<0.39		**0.79**		**1.1**		1.7		2.2		<0.78		<0.39		1.8		<0.78		2		<0.39		<0.78		<0.39		<0.39	
	MW654	10/22/2004	<0.4		**3**		**1.9**		1.6		2		<0.81		<0.4		3.3		<0.81		1.8		<0.4		<0.81		<0.4		<0.4	
	MW654	7/13/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW654	10/18/2005	<0.39		**0.55**		<0.78		<0.78		0.85		<0.78		<0.39		1.1		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW654	5/2/2006	<0.39		<0.39		<0.78		<0.78		0.88		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW654	10/6/2006	<0.46		**1.2**		<0.91		<0.91		1.2		<0.91		<0.46		1.3		<0.91		<0.91		<0.46		<0.91		<0.46		<0.46	
	MW654	4/24/2007	<0.39		**0.95**		<0.78		1.7		3.2		<0.78		<0.39		1.2		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW654	10/10/2007	<0.44		<0.44		<0.87		1.6		3		<0.87		<0.44		<0.87		<0.87		<0.87		**3.4**		<0.87		<0.44		<0.44	
	MW654	5/6/2008	<0.47		<0.47		<0.94		1.4		2.6		<0.94		<0.47		<0.94		<0.94		<0.94		0.55		<0.94		<0.47		<0.47	
	MW654	10/16/2008	<0.66		<0.66		<1.3		<1.3		<1.3		<1.3		<0.66		<1.3		<1.3		<1.3		<0.66		<1.3		<0.66		<0.66	
	MW654(DUP)	10/16/2008	<0.39		<0.39		<0.78		<0.78		1.7		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW654	5/7/2009	<0.16		<0.31		<0.31		2.2		5.8		<0.31	U / UJ	<0.16		<0.31		<0.31		<0.31		0.7		<0.39		<0.16		<0.16	
	MW654	10/26/2009	<0.21		**0.63**		0.25	F /	0.36	F /	0.69		<0.41		<0.21		1.6		<0.41		0.58		<0.21		<0.52		<0.21		<0.21	
	MW654	4/9/2010	<0.26		<0.51		<0.51		1.3		4.4		<0.51		<0.26		<0.51		<0.51		<0.51		0.7		<0.64		<0.26		<0.26	
	MW654	11/2/2010	<0.16		0.084	F /	0.1	F /	0.19	F /	1		<0.31		<0.16		0.7		<0.31		0.25	F /	<0.16		<0.39	U / UJ	<0.16		<0.16	
	MW654	4/21/2011	<0.20		<0.38		<0.38		0.81		3		<0.38		<0.20		0.35	F /	<0.38		<0.38		<0.20		<0.48	U / UJ	<0.20		<0.20	
	MW654	10/19/2011	<0.20		<0.20		<0.20		<0.38		<0.38		<0.38		<0.20		<0.38		<0.38		<0.38		<0.20		<0.48		<0.20		<0.20	
	MW654	4/15/2012	<0.16		**1.7**		**0.97**		0.7		2.2		<0.31		<0.16		18		0.23	F / J	11		0.31	/ J	<0.39		<0.16		0.18	/ J
	MW654	10/23/2012	<1.6		**8.9**		**4.8**		<3.1		<3.1		<3.1		<1.6		86		<3.1		52		<1.6		<3.9		<1.6		<1.6	
	Compliance																													
	MW117	5/3/2002	<0.4		<0.4		<0.81		<0.81		<0.81		<0.4		<0.4		<0.81		<0.81		<0.81		<0.4		<0.81		<0.4		<0.4	
	MW117	10/17/2002	<0.55		<0.55 (0.059)		<1.1 (0.29)		<1.1		<1.1		<1.1		<0.55		<1.1		<1.1		<1.1		<0.55		<1.1		<0.55		<0.55	
	MW117	5/13/2003	<0.65		<0.65 (0.070)		<1.3 (0.35)		<1.3		<1.3		<1.3		<0.65		<1.3		<1.3		<1.3		<0.65		<1.3		<0.65		<0.65	
	MW117	10/15/2003	<0.53		<0.53 (0.057)		<1.1 (0.28)		<1.1		<1.1		<1.1		<0.53		<1.1		<1.1		<1.1		<0.53		<1.1		<0.53		<0.53	
	MW117	5/19/2004	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW117	10/19/2004	<0.64		<0.64 (0.2)		<1.3 (0.23)		<1.3		<1.3		<1.3		<0.64		<1.3		<1.3		<1.3		<0.64		<1.3		<0.64		<0.64	
	MW117	7/14/2005	<0.44		<0.44		<0.87		<0.87		<0.87		<0.87		<0.44		<0.87		<0.87		<0.87		<0.44		<0.87		<0.44		<0.44	
	MW117	10/20/2005	<0.58		<0.58		<1.2		<1.2		<1.2		<1.2		<0.58		<1.2		<1.2		<1.2		<0.58		<1.2		<0.58		<0.58	
	MW117	5/3/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW117	10/11/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW117	4/30/2007	<0.43		<0.43		<0.86		<0.86		<0.86		<0.86		<0.43		<0.86		<0.86		<0.86		<0.43		<0.86		<0.43		<0.43	
	MW117	10/11/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW117	5/9/2008	<0.44		<0.44		<0.87		<0.87		<0.87		<0.87		<0.44		1.4		<0.87		<0.87		<0.44		<0.87		<0.44		<0.44	
	MW117	5/8/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW117(DUP)	5/8/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW117	10/22/2009	<0.18		<0.35		<0.35		<0.35		<0.35		<0.35		<0.18		<0.35		<0.35		<0.35		<0.18		<0.44		<0.18		<0.18	
	MW117	4/8/2010	<0.22		<0.43		<0.43		<0.43		<0.43		<0.43		<0.22		<0.43		<0.43		<0.43		<0.22		<0.54		<0.22		<0.22	
	MW117	11/1/2010	<0.21		<0.41		<0.41		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.51		<0.21		<0.21	
	MW117(DUP)	11/1/2010	<0.21		<0.41		<0.41		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.52		<0.21		<0.21	
	MW117	4/20/2011	<0.20		<0.39		<0.39		<0.39		<0.39		<0.39		<0.20		<0.39		<0.39		<0.39		<0.20		<0.49		<0.20		<0.20	
	MW117(DUP)	4/20/2011	<0.17		<0.33		<0.33		<0.33		<0.33		<0.33		<0.17		<0.33		<0.33		<0.33		<0.17		<0.42		<0.17		<0.17	
	MW117	10/17/2011	<0.40		<0.40		<0.40		<0.77		<0.77		<0.77		<0.40		<0.77		<0.77		<0.77		<0.40		<0.97		<0.40		<0.40	U / UJ
	MW117	4/13/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / UJ	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW117	10/23/2012	<1.6	U / UJ	**2.6**	F / J	<3.1	U / UJ	<3.1	U / UJ	<3.1	U / UJ	<3.1	U / UJ	<1.6	U / UJ	24	/ J	<3.1	U / UJ	16	/ J	<1.6	U / UJ	<3.9	U / UJ	<1.6	U / UJ	<1.6	U / UJ

TABLE B1

Summary of Analytical Results - Explosives
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**1,3-DNB**		**2,4-DNT**		**2,6-DNT**		**2-A-4,6-DNT**		**4-A-2,6-DNT**		**HMX**		**NB**		**2-NT**		**3-NT**		**4-NT**		**RDX**		**Tetryl**		**1,3,5-TNB**		**2,4,6-TNT**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[(1)]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
MFG	***Compliance***																													
(Other Areas)	MW118	5/3/2002	<0.45		<0.45		<0.9		<0.9		<0.9		<0.45		<0.45		<0.9		<0.9		<0.9		<0.45		<0.9		<0.45		<0.45	
	MW118	10/17/2002	<0.63		<0.63 (0.068)		<1.3 (0.33)		<1.3		<1.3		<1.3		<0.63		<1.3		<1.3		<1.3		<0.63		<1.3		<0.63		<0.63	
	MW118	5/13/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW118	10/16/2003	<0.51		<0.51 (0.055)		<1 (0.27)		<1		<1		<1		<0.51		<1		<1		<1		<0.51		<1		<0.51		<0.51	
	MW118	5/19/2004	<0.55		<0.55 (0.059)		<1.1 (0.29)		<1.1		<1.1		<1.1		<0.55		<1.1		<1.1		<1.1		<0.55		<1.1		<0.55		<0.55	
	MW118	10/22/2004	<0.48		<0.48 (0.15)		<0.96 (0.18)		<0.96		<0.96		<0.96		<0.48		<0.96		<0.96		<0.96		<0.48		<0.96		<0.48		<0.48	
	MW118	7/13/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		0.77	U /
	MW118	10/19/2005	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW118	5/3/2006	<0.52		<0.52		<1		<1		<1		<1		<0.52		<1		<1		<1		<0.52		<1		<0.52		<0.52	
	MW118	10/11/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW118	4/30/2007	<0.4		<0.4		<0.81		<0.81		<0.81		<0.81		<0.4		<0.81		<0.81		<0.81		<0.4		<0.81		<0.4		<0.4	
	MW118	10/12/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW118	5/6/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW118	10/20/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW118	5/8/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW118	10/22/2009	<0.18		<0.34		<0.34		<0.34		<0.34		<0.34		<0.18		<0.34		<0.34		<0.34		<0.18		<0.43		<0.18		<0.18	
	MW118	4/8/2010	<0.23		<0.44		<0.44		<0.44		<0.44		<0.44		<0.23		<0.44		<0.44		<0.44		<0.23		<0.56		<0.23		<0.23	
	MW118	11/2/2010	<0.22		<0.43		<0.43		<0.43		<0.43		<0.43		<0.22		<0.43		<0.43		<0.43		<0.22		<0.55		<0.22		<0.22	
	MW118	4/20/2011	<0.18		<0.35		<0.35		<0.35		<0.35		<0.35		<0.18		<0.35		<0.35		<0.35		<0.18		<0.44		<0.18		<0.18	
	MW118	10/17/2011	<0.33		<0.33		<0.33		<0.65		<0.65		<0.65		<0.33		<0.65		<0.65		<0.65		<0.33		<0.81		<0.33		<0.33	U / UJ
	MW118	4/13/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / UJ	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW118	10/23/2012	<1.6	U / UJ	**2.3**	F / J	<3.1	U / UJ	<3.1	U / UJ	<3.1	U / UJ	<3.1	U / UJ	<1.6	U / UJ	20	/ J	<3.1	U / UJ	15	/ J	<1.6	U / UJ	<3.9	U / UJ	<1.6	U / UJ	<1.6	U / UJ
	MW119	5/3/2002	<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW119	10/17/2002	<0.59		<0.59 (0.064)		<1.2 (0.31)		<1.2		<1.2		<1.2		<0.59		<1.2		<1.2		<1.2		<0.59		<1.2		<0.59		<0.59	
	MW119(DUP)	10/17/2002	<0.47		<0.47 (0.050)		<0.94 (0.25)		<0.94		<0.94		<0.94		<0.47		<0.94		<0.94		<0.94		<0.47		<0.94		<0.47		<0.47	
	MW119	5/13/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW119	10/16/2003	<0.39		<0.39 (0.042)		<0.78 (0.21)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW119	5/19/2004	<0.68		<0.68 (0.073)		<1.4 (0.36)		<1.4		<1.4		<1.4		<0.68		<1.4		<1.4		<1.4		<0.68		<1.4		<0.68		<0.68	
	MW119	10/22/2004	<0.39		<0.39 (0.12)		<0.78 (0.14)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW119	7/18/2005	<0.57		<0.57		<1.1		<1.1		<1.1		<1.1		<0.57		<1.1		<1.1		<1.1		<0.57		<1.1		<0.57		<0.57	
	MW119	10/21/2005	<0.52		<0.52		<1		<1		<1		<1		<0.52		<1		<1		<1		<0.52		<1		<0.52		<0.52	
	MW119	5/3/2006	<0.44		<0.44		<0.87		<0.87		<0.87		<0.87		<0.44		<0.87		<0.87		<0.87		<0.44		<0.87		<0.44		<0.44	
	MW119	10/9/2006	<0.49		<0.49		<0.99		<0.99		<0.99		<0.99		<0.49		<0.99		<0.99		<0.99		<0.49		<0.99		<0.49		<0.49	
	MW119	4/30/2007	<0.6		<0.6		<1.2		<1.2		<1.2		<1.2		<0.6		<1.2		<1.2		<1.2		<0.6		<1.2		<0.6		<0.6	
	MW119	10/10/2007	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW119(DUP)	10/10/2007	<0.4		<0.4		<0.81		<0.81		<0.81		<0.81		<0.4		<0.81		<0.81		<0.81		<0.4		<0.81		<0.4		<0.4	
	MW119	5/6/2008	<0.72		<0.72		<1.4		<1.4		<1.4		<1.4		<0.72		<1.4		<1.4		<1.4		<0.72		<1.4		<0.72		<0.72	
	MW119	10/15/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW119	5/7/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31	U / UJ	<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW119	10/22/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW119	4/8/2010	<0.17		<0.33		<0.33		<0.33		<0.33		<0.33		<0.17		<0.33		<0.33		<0.33		<0.17		<0.42		<0.17		<0.17	
	MW119	11/2/2010	<0.22		<0.43		<0.43		<0.43		<0.43		<0.43		<0.22		<0.43		<0.43		<0.43		<0.22		<0.55		<0.22		<0.22	
	MW119	4/20/2011	<0.20		<0.39		<0.39		<0.39		<0.39		<0.39		<0.20		<0.39		<0.39		<0.39		<0.20		<0.49		<0.20		<0.20	
	MW119	10/17/2011	<0.41		<0.41		<0.41		<0.80		<0.80		<0.80		<0.41		<0.80		<0.80		<0.80		<0.41		<1.0		<0.41		<0.41	U / UJ
	MW119	4/13/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / UJ	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW119	10/23/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
M11	***Upgradient***																													
	MW802	5/15/2008	<0.7		<0.7		<1.4		<1.4		3		<1.4		<0.7		<1.4		<1.4		<1.4		<0.7		<1.4		<0.7		<0.7	
	MW802	10/7/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW802(DUP)	10/7/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW802	5/4/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW802	10/27/2009	<0.24		<0.47		<0.47		<0.47		<0.47		<0.47		<0.24		<0.47		<0.47		<0.47		<0.24		<0.59		<0.24		<0.24	
	MW802	4/13/2010	<0.17		<0.33		<0.33		<0.33		<0.33		<0.33		<0.17		<0.33		<0.33		<0.33		<0.17		<0.42		<0.17		<0.17	
	MW802	10/28/2010	<0.34		<0.65		<0.65		<0.65		<0.65		<0.65		<0.34		<0.65		<0.65		<0.65		<0.34		<0.82		<0.34		<0.34	
	MW802	4/15/2011	<0.37		<0.72		<0.72		<0.72		<0.72		<0.72		<0.37		<0.72		<0.72		<0.72		<0.37		<0.91		<0.37		<0.37	
	MW802	10/11/2011	<0.17		<0.17		<0.17		<0.34		<0.34		<0.34		<0.17		<0.34		<0.34		<0.34		<0.17		<0.42		<0.17		<0.17	
	MW802	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW802	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW803	10/7/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW803	5/4/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW803	10/27/2009	<0.20		<0.39		<0.39		<0.39		<0.39		<0.39		<0.20		<0.39		<0.39		<0.39		<0.20		<0.49		<0.20		<0.20	
	MW803	4/13/2010	<0.17		<0.32		<0.32		<0.32		<0.32		<0.32		<0.17		<0.32		<0.32		<0.32		<0.17		<0.40		<0.17		<0.17	
	MW803	10/28/2010	<0.33		<0.63		<0.63		<0.63		<0.63		<0.63		<0.33		<0.63		<0.63		<0.63		<0.33		<0.79		<0.33		<0.33	
	MW803	4/15/2011	<0.31		<0.59		<0.59		<0.59		<0.59		<0.59		<0.31		<0.59		<0.59		<0.59		<0.31		<0.75		<0.31		<0.31	
	MW803	10/11/2011	<0.18		<0.18		<0.18		<0.35		<0.35		<0.35		<0.18		<0.35		<0.35		<0.35		<0.18		<0.44		<0.18		<0.18	
	MW803	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

TABLE B1

Summary of Analytical Results - Explosives
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M11	***Downgradient***																													
	MW333	5/12/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW333	10/6/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW333	5/5/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW333	10/28/2009	<0.21		<0.41		<0.41		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.52		<0.21		<0.21	
	MW333	4/13/2010	<0.17		<0.34		<0.34		<0.34		<0.34		<0.34		<0.17		<0.34		<0.34		<0.34		<0.17		<0.42		<0.17		<0.17	
	MW333	10/28/2010	<0.30		<0.58		<0.58		<0.58		<0.58		<0.58		<0.30		<0.58		<0.58		<0.58		<0.30		<0.73		<0.30		<0.30	
	MW333	4/18/2011	<0.18		<0.36		<0.36		<0.36		<0.36		<0.36	U / UJ	<0.18		<0.36		<0.36		<0.36		<0.18		<0.45		<0.18		<0.18	
	MW333	10/11/2011	<0.17		<0.17		<0.17		<0.34		<0.34		<0.34		<0.17		<0.34		<0.34		<0.34		<0.17		<0.42		<0.17		<0.17	
	MW333	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW334	5/12/2008	<0.46		<0.46		<0.92		<0.92		<0.92		<0.92		<0.46		<0.92		<0.92		<0.92		<0.46		<0.92		<0.46		<0.46	
	MW334	10/6/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW334	5/5/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW334	10/28/2009	<0.20		<0.39		<0.39		<0.39		<0.39		<0.39		<0.20		<0.39		<0.39		<0.39		<0.20		<0.49		<0.20		<0.20	
	MW334	4/13/2010	<0.18		<0.34		<0.34		<0.34		<0.34		<0.34		<0.18		<0.34		<0.34		<0.34		<0.18		<0.43		<0.18		<0.18	
	MW334	10/28/2010	<0.32		<0.63		<0.63		<0.63		<0.63		<0.63		<0.32		<0.63		<0.63		<0.63		<0.32		<0.79		<0.32		<0.32	
	MW334	4/18/2011	<0.19		<0.37		<0.37		<0.37		<0.37		<0.37	U / UJ	<0.19		<0.37		<0.37		<0.37		<0.19		<0.47		<0.19		<0.19	
	MW334	10/11/2011	<0.18		<0.18		<0.18		<0.36		<0.36		<0.36		<0.18		<0.36		<0.36		<0.36		0.15	F / NJ	<0.45		<0.18		<0.18	
	MW334(DUP)	10/11/2011	<0.26		<0.26		<0.26		<0.51		<0.51		<0.51		<0.26		<0.51		<0.51		<0.51		0.21	F / NJ	<0.64		<0.26		<0.26	
	MW334	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW335	5/13/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW335	10/7/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW335(DUP)	10/7/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW335	5/4/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW335	10/28/2009	<0.29		<0.56		<0.56		<0.56		<0.56		<0.56		<0.29		<0.56		<0.56		<0.56		<0.29		<0.71		<0.29		<0.29	
	MW335	4/13/2010	<0.25		<0.49		<0.49		<0.49		<0.49		<0.49		<0.25		<0.49		<0.49		<0.49		<0.25		<0.62		<0.25		<0.25	
	MW335(DUP)	4/13/2010	<0.18		<0.36		<0.36		<0.36		<0.36		<0.36		<0.18		<0.36		<0.36		<0.36		<0.18		<0.45		<0.18		<0.18	
	MW335	10/28/2010	<0.24		<0.46		<0.46		<0.46		<0.46		<0.46		<0.24		<0.46		<0.46		<0.46		<0.24		<0.58		<0.24		<0.24	
	MW335	4/15/2011	<0.19		<0.38		<0.38		<0.38		<0.38		<0.38		<0.19		<0.38		<0.38		<0.38		<0.19		<0.47		<0.19		<0.19	
	MW335	10/12/2011	<0.24		<0.24		<0.24		<0.47		<0.47		<0.47		<0.24		<0.47		<0.47		<0.47		<0.24		<0.59		<0.24		<0.24	U / UJ
	MW335	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW335	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	Upgradient																													
	MW336	5/13/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW336	10/7/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW336	5/5/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW336(DUP)	5/5/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW336	10/27/2009	<0.21		<0.40		<0.40		<0.40		<0.40		<0.40		<0.21		<0.40		<0.40		<0.40		<0.21		<0.51		<0.21		<0.21	
	MW336(DUP)	10/27/2009	<0.21		<0.41		<0.41		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.51		<0.21		<0.21	
	MW336	4/13/2010	<0.24		<0.46		<0.46		<0.46		<0.46		<0.46		<0.24		<0.46		<0.46		<0.46		<0.24		<0.58		<0.24		<0.24	
	MW336	10/28/2010	<0.30		<0.59		<0.59		<0.59		<0.59		<0.59		<0.30		<0.59		<0.59		<0.59		<0.30		<0.74		<0.30		<0.30	
	MW336	4/18/2011	<0.19		<0.37		<0.37		<0.37		<0.37		<0.37	U / UJ	<0.19		<0.37		<0.37		<0.37		<0.19		<0.47		<0.19		<0.19	
	MW336	10/12/2011	<0.18		<0.18		<0.18		<0.36		<0.36		<0.36		<0.18		<0.36		<0.36		<0.36		<0.18		<0.45		<0.18		<0.18	U / UJ
	MW336	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW336	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31	U / J	<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW336(DUP)	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW804	5/15/2008	<0.42		<0.42		<0.83		<0.83		<0.83		<0.83		<0.42		<0.83		<0.83		<0.83		<0.42		<0.83		<0.42		<0.42	
	MW804	10/6/2008	<0.46		<0.46		<0.92		1.6		4.7		<0.92		<0.46		<0.92		<0.92		<0.92		<0.46		<0.92		<0.46		0.52	
	MW804	5/5/2009	<0.16		<0.31		<0.31		0.81		2.6		0.8		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		0.57	
	MW804	10/27/2009	<0.24		<0.47		<0.47		0.73		2.3		0.79		<0.24		<0.47		<0.47		<0.47		0.22	F /	<0.59		<0.24		1.4	
	MW804	4/13/2010	<0.17		<0.33		<0.33		<0.33		0.88		<0.33		<0.17		<0.33		<0.33		<0.33		<0.17		<0.41		<0.17		<0.17	
	MW804	10/28/2010	<0.38		<0.74		<0.74		<0.74		<0.74		<0.74		<0.38		<0.74		<0.74		<0.74		<0.38		<0.93		<0.38		<0.38	
	MW804	4/15/2011	<0.45		<0.88		<0.88		0.52	F /	1.4		0.37	F /	<0.45		<0.88		<0.88		<0.88		0.26	F /	<1.1		<0.45		<0.45	
	MW804(DUP)	4/15/2011	<0.32		<0.61		<0.61		0.51	F /	1.4		0.39	F /	<0.32		<0.61		<0.61		<0.61		<0.32		<0.77		<0.32		<0.32	
	MW804	10/11/2011	<0.16		<0.16		<0.16		0.37		1	/ J	0.68		<0.16		<0.31		<0.31		<0.31		0.22		<0.39		<0.16		<0.16	
	MW804	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	Downgradient																													
	MW805	10/6/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW805	5/5/2009	<0.17		<0.32		<0.32		<0.32		<0.32		<0.32		<0.17		<0.32		<0.32		<0.32		<0.17		<0.40		<0.17		<0.17	
	MW805	10/27/2009	<0.16		<0.32		<0.32		<0.32		0.26	F /	<0.32		<0.16		<0.32		<0.32		<0.32		<0.16		<0.40		<0.16		<0.16	
	MW805	4/13/2010	<0.41		<0.79		<0.79		<0.79		<0.79		<0.79		<0.41		<0.79		<0.79		<0.79		<0.41		<0.99		<0.41		<0.41	
	MW805	11/2/2010	<0.27		<0.52		<0.52		<0.52		<0.52		<0.52		<0.27		<0.52		<0.52		<0.52		<0.27		<0.66		<0.27		<0.27	
	MW805	4/15/2011	<0.31		<0.59		<0.59		<0.59		<0.59		<0.59		<0.31		<0.59		<0.59		<0.59		<0.31		<0.75		<0.31		<0.31	
	MW805	10/11/2011	<0.16		<0.16		<0.16		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW805	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW805	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
M13	***Upgradient***																													
	MW806	5/15/2008	<0.56		<0.56		<1.1		<1.1		<1.1		<1.1		<0.56		<1.1		<1.1		<1.1		<0.56		<1.1		<0.56		<0.56	
	MW806	8/19/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW806	10/21/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW806	2/4/2009	<0.20		<0.38		<0.38		<0.38		<0.38		<0.38		<0.20		<0.38		<0.38		<0.38		<0.20		<0.48		<0.20		<0.20	
	MW806	5/5/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW806	7/29/2009	<0.2		<0.38		<0.38		<0.38		<0.38		<0.38		<0.2		<0.38		<0.38		<0.38		<0.2		<0.48		<0.2		<0.2	
	MW806	10/28/2009	<0.19		<0.37		<0.37		<0.37		<0.37		<0.37		<0.19		<0.37		<0.37		<0.37		<0.19		<0.46		<0.19		<0.19	
	MW806	1/15/2010	<0.19		<0.36		<0.36		<0.36		<0.36		<0.36		<0.19		<0.36		<0.36		<0.36		<0.19		<0.46		<0.19		<0.19	

TABLE B1

Summary of Analytical Results - Explosives
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	1,3-DNB		2,4-DNT		2,6-DNT		2-A-4,6-DNT		4-A-2,6-DNT		HMX		NB		2-NT		3-NT		4-NT		RDX		Tetryl		1,3,5-TNB		2,4,6-TNT	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Upgradient***																													
	MW806	4/14/2010	<0.20		<0.38		<0.38		<0.38		<0.38		<0.38		<0.20		<0.38		<0.38		<0.38		<0.20		<0.48		<0.20		<0.20	
	MW806	7/21/2010	<0.27		<0.52		<0.52		<0.52		<0.52		<0.52		<0.27		<0.52		<0.52		<0.52		<0.27		<0.65		<0.27		<0.27	
	MW806	10/28/2010	<0.25		<0.49		<0.49		<0.49		<0.49		<0.49		<0.25		<0.49		<0.49		<0.49		<0.25		<0.62		<0.25		<0.25	
	MW806	1/27/2011	<0.25		<0.49		<0.49		<0.49		<0.49		<0.49		<0.25		<0.49		<0.49		<0.49		<0.25		<0.62		<0.25		<0.25	
	MW806	4/19/2011	<0.24		<0.47		<0.47		<0.47		<0.47		<0.47		<0.24		<0.47		<0.47		<0.47		<0.24		<0.59		<0.24		<0.24	
	MW806	7/28/2011	<0.22		<0.22		<0.22		<0.42		<0.42		<0.42		<0.22		<0.42		<0.42		<0.42		<0.22		<0.53		<0.22		<0.22	
	MW806	10/12/2011	<0.31		<0.31		<0.31		<0.61		<0.61		<0.61		<0.31		<0.61		<0.61		<0.61		<0.31		<0.77		<0.31		<0.31	U / UJ
	MW806	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW806	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW806	7/17/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW806	10/24/2012	<0.16		**1.4**		**0.96**		<0.31		<0.31		<0.31		<0.16		5.5		<0.31		5		<0.16		<0.39		<0.16		<0.16	
	MW807	5/15/2008	<0.41		<0.41		<0.82		<0.82		<0.82		<0.82		<0.41		<0.82		<0.82		<0.82		<0.41		<0.82		<0.41		<0.41	
	MW807(DUP)	5/15/2008	<0.83		<0.83		<1.7		<1.7		<1.7		<1.7		<0.83		<1.7		<1.7		<1.7		<0.83		<1.7		<0.83		<0.83	
	MW807	8/19/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW807(DUP)	8/19/2008	<0.41		<0.41		<0.82		<0.82		<0.82		<0.82		<0.41		<0.82		<0.82		<0.82		<0.41		<0.82		<0.41		<0.41	
	MW807	10/21/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW807	2/4/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW807	5/5/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW807	7/29/2009	<0.21		<0.41		<0.41		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.51		<0.21		<0.21	
	MW807	10/28/2009	<0.22		<0.42		<0.42		<0.42		<0.42		<0.42		<0.22		<0.42		<0.42		<0.42		<0.22		<0.53		<0.22		<0.22	
	MW807	1/15/2010	<0.32		<0.61		<0.61		<0.61		<0.61		<0.61		<0.32		<0.61		<0.61		<0.61		<0.32		<0.77		<0.32		<0.32	
	MW807	4/14/2010	<0.17		<0.34		<0.34		<0.34		<0.34		<0.34		<0.17		<0.34		<0.34		<0.34		<0.17		<0.42		<0.17		<0.17	
	MW807	7/21/2010	<0.20		<0.39		<0.39		<0.39		<0.39		<0.39		<0.20		<0.39		<0.39		<0.39		<0.20		<0.49		<0.20		<0.20	
	MW807	10/28/2010	<0.21		<0.40		<0.40		<0.40		<0.40		<0.40		<0.21		<0.40		<0.40		<0.40		<0.21		<0.50		<0.21		<0.21	
	MW807	1/27/2011	<0.25		<0.48		<0.48		<0.48		<0.48		<0.48		<0.25		<0.48		<0.48		<0.48		<0.25		<0.60		<0.25		<0.25	
	MW807	4/19/2011	<0.22		<0.42		<0.42		<0.42		<0.42		<0.42		<0.22		<0.42		<0.42		<0.42		<0.22		<0.53		<0.22		<0.22	
	MW807	7/28/2011	<0.22		<0.22		<0.22		<0.42		<0.42		<0.42		<0.22		<0.42		<0.42		<0.42		<0.22		<0.53	U / UJ	<0.22		<0.22	
	MW807	10/12/2011	<0.23		<0.23		<0.23		<0.44		<0.44		<0.44		<0.23		<0.44		<0.44		<0.44		<0.23		<0.55		<0.23		<0.23	
	MW807	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW807	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	U / UJ
	MW807	7/17/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW807	10/24/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	Downgradient																													
	MW126	5/9/2002	<0.78		**5**		<1.6		1.9		1.6		<0.78		<0.78		<1.6		<1.6		<1.6		<0.78		<1.6		<0.78		<0.78	
	MW126	10/21/2004	<0.39		<0.39 (0.12)		<0.78 (0.14)		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW126R	2/4/2004	<0.42		<0.42 (0.046)		<0.85 (0.22)		<0.85		<0.85		<0.85		<0.42		<0.85		<0.85		<0.85		<0.42		<0.85		<0.42		<0.42	
	MW126R	5/25/2004	<0.58		<0.58 (0.063)		<1.2 (0.31)		<1.2		<1.2		<1.2		<0.58		<1.2		<1.2		<1.2		<0.58		<1.2		<0.58		<0.58	
	MW126R(DUP)	5/25/2004	<0.85		<0.85 (0.091)		<1.7 (0.45)		<1.7		<1.7		<1.7		<0.85		<1.7		<1.7		<1.7		<0.85		<1.7		<0.85		<0.85	
	MW126R	7/22/2005	<0.48		<0.48		<0.96		<0.96		<0.96		<0.96		<0.48		<0.96		<0.96		<0.96		<0.48		<0.96		<0.48		<0.48	
	MW126R	10/20/2005	<0.7		<0.7		<1.4		<1.4		<1.4		<1.4		<0.7		<1.4		<1.4		<1.4		<0.7		<1.4		<0.7		<0.7	
	MW126R	5/4/2006	<0.64		<0.64		<1.3		<1.3		<1.3		<1.3		<0.64		<1.3		<1.3		<1.3		<0.64		<1.3		<0.64		<0.64	
	MW126R	10/17/2006	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW126R	4/26/2007	<0.56		<0.56		<1.1		<1.1		<1.1		<1.1		<0.56		<1.1		<1.1		<1.1		<0.56		<1.1		<0.56		<0.56	
	MW126R	10/12/2007	<0.45		<0.45		<0.9		<0.9		<0.9		<0.9		<0.45		<0.9		<0.9		<0.9		<0.45		<0.9		<0.45		<0.45	
	MW126R	5/20/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW126R	8/20/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW126R	10/22/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW126R	2/5/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW126R	5/5/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW126R	7/28/2009	<0.26		<0.51		<0.51		<0.51		<0.51		<0.51		<0.26		<0.51		<0.51		<0.51		<0.26		<0.64		<0.26		<0.26	
	MW126R	10/29/2009	<0.23		<0.45		<0.45		<0.45		<0.45		<0.45		<0.23		<0.45		<0.45		<0.45		<0.23		<0.57		<0.23		<0.23	
	MW126R	1/14/2010	<0.29		<0.55		<0.55		<0.55		<0.55		<0.55		<0.29		<0.55		<0.55		<0.55		<0.29		<0.70		<0.29		<0.29	
	MW126R	4/14/2010	<0.20		<0.39		<0.39		<0.39		<0.39		<0.39		<0.20		<0.39		<0.39		<0.39		<0.20		<0.49		<0.20		<0.20	
	MW126R(DUP)	4/14/2010	<0.51		<0.98		<0.98		<0.98		<0.98		<0.98		<0.51		<0.98		<0.98		<0.98		<0.51		<1.2		<0.51		<0.51	
	MW126R	7/20/2010	<0.21		<0.41		<0.41		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.51		<0.21		<0.21	
	MW126R	10/28/2010	<0.22		<0.43		<0.43		<0.43		<0.43		<0.43		<0.22		<0.43		<0.43		<0.43		<0.22		<0.54		<0.22		<0.22	
	MW126R	1/28/2011	<0.27		<0.52		<0.52		<0.52		<0.52		<0.52		<0.27		<0.52		<0.52		<0.52		<0.27		<0.65		<0.27		<0.27	
	MW126R	4/19/2011	<0.46		<0.90		<0.90		<0.90		<0.90		<0.90		<0.46		<0.90		<0.90		<0.90		<0.46		<1.1		<0.46		<0.46	
	MW126R	7/28/2011	<0.28		<0.28		<0.28		<0.54		<0.54		<0.54		<0.28		<0.54		<0.54		<0.54		<0.28		<0.68	U / UJ	<0.28		<0.28	
	MW126R	10/13/2011	<0.31		<0.31		<0.31		<0.61		<0.61		<0.61		<0.31		<0.61		<0.61		<0.61		<0.31		<0.77		<0.31		<0.31	
	MW126R	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW126R	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		0.35		<0.31		0.3	F /	<0.16		<0.39		<0.16		<0.16	
	MW126R	7/17/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW126R	10/25/2012	<0.16		**1.1**		**0.62**		<0.31		<0.31		<0.31		<0.16		2.1		0.17	F / J	2.4		<0.16		<0.39		0.22		<0.16	
	MW362	2/3/2004	<0.39		**5.7**		<0.78 (0.21)		1.6		1.3		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW362	5/25/2004	<0.71		**1.9**		<1.4 (0.38)		2.1		1.7		<1.4		<0.71		<1.4		<1.4		<1.4		<0.71		<1.4		<0.71		<0.71	
	MW362	10/21/2004	<0.39		**8.1**		**0.88**		2.1		1.7		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW362	7/21/2005	<0.54		**6.9**		<1.1		1.9		1.5		<1.1		<0.54		<1.1		<1.1		<1.1		<0.54		<1.1		<0.54		<0.54	
	MW362	10/24/2005	<0.6		<0.6		<1.2		<1.2		<1.2		<1.2		<0.6		<1.2		<1.2		<1.2		<0.6		<1.2		<0.6		<0.6	
	MW362	5/4/2006	<0.39		<0.39		**0.8**		2		1.7		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW362	10/18/2006	<0.53		<0.53		<1.1		<1.1		<1.1		<1.1		<0.53		<1.1		<1.1		<1.1		<0.53		<1.1		<0.53		<0.53	
	MW362	4/26/2007	<0.42		<0.42		<0.85		1.8		1.6		<0.85		<0.42		<0.85		<0.85		<0.85		<0.42		<0.85		<0.42		<0.42	

TABLE B1

Summary of Analytical Results - Explosives
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		Compound	**1,3-DNB**		**2,4-DNT**		**2,6-DNT**		**2-A-4,6-DNT**		**4-A-2,6-DNT**		**HMX**		**NB**		**2-NT**		**3-NT**		**4-NT**		**RDX**		**Tetryl**		**1,3,5-TNB**		**2,4,6-TNT**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Downgradient***																													
	MW362(DUP)	4/26/2007	<0.49		<0.49		<0.99		1.9		1.6		<0.99		<0.49		<0.99		<0.99		<0.99		<0.49		<0.99		<0.49		<0.49	
	MW362	10/12/2007	<0.39		**6.7**		<0.78		1.8		1.5		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW362	5/13/2008	<0.45		<0.45		<0.9		1.3		1.1		<0.9		<0.45		<0.9		<0.9		<0.9		<0.45		<0.9		<0.45		<0.45	
	MW362	8/20/2008	<0.44		<0.44		<0.88		<0.88		<0.88		<0.88		<0.44		<0.88		<0.88		<0.88		<0.44		<0.88		<0.44		<0.44	
	MW362	10/22/2008	<0.39		**0.55**		<0.78		1.1		0.91		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW362	2/5/2009	<0.16		**7.1**		<0.31		1.5		1.2		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW362	5/5/2009	<0.16		<0.31		<0.31		0.94		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW362	7/28/2009	<0.17		<0.33		<0.33		<0.33		<0.33		<0.33		<0.17		<0.33		<0.33		<0.33		<0.17		<0.42		<0.17		<0.17	
	MW362	10/29/2009	<0.17		**4.3**		0.42		0.96		0.75		<0.34		<0.17		<0.34		<0.34		<0.34		<0.17		<0.42		<0.17		<0.17	
	MW362	1/14/2010	<0.30		**6.5**		<0.58		1.4		1.1		<0.58		<0.30		<0.58		<0.58		<0.58		<0.30		<0.73		<0.30		<0.30	
	MW362(DUP)	1/14/2010	<0.19		**6.4**		<0.37		1.3		1.1		<0.37		<0.19		<0.37		<0.37		<0.37		<0.19		<0.47		<0.19		<0.19	
	MW362	4/14/2010	<0.24		**5**		<0.47		1.6		1.3		<0.47		<0.24		<0.47		<0.47		<0.47		<0.24		<0.59		<0.24		<0.24	
	MW362	7/20/2010	<0.22		**3.3**		<0.42		1.6		1.3		<0.42		<0.22		<0.42		<0.42		<0.42		<0.22		<0.53		<0.22		<0.22	
	MW362	10/28/2010	<0.25		**7.2**		<0.48		1.7		1.3		<0.48		<0.25		<0.48		<0.48		<0.48		<0.25		<0.60		<0.25		<0.25	
	MW362	1/28/2011	<0.23		**7.5**		**0.78**		1.9		1.7		<0.44		<0.23		<0.44		<0.44		<0.44		<0.23		<0.56		<0.23		<0.23	
	MW362	4/19/2011	<0.18		**3.2**		**1.2**		1.7		1.4		<0.34		<0.18		<0.34		<0.34		<0.34		<0.18		<0.43		<0.18		<0.18	
	MW362	7/28/2011	<0.44		**3.3**		**0.65**		1.4		1.2		<0.85		<0.44		<0.85		<0.85		<0.85		**4.8**		<1.1	U / UJ	<0.44		<0.44	
	MW362	10/13/2011	<0.26		**2.9**		0.36		<0.51		<0.51		<0.51		<0.26		<0.51		<0.51		<0.51		<0.26		<0.64		<0.26		<0.26	
	MW362	2/29/2012	<0.16		**1.5**		<0.31		0.83		0.78		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW362	4/16/2012	<0.16		**4.9**		<0.31		1.2		1.1		<0.31		<0.16		0.24	F / J	<0.31		<0.31	U / UJ	<0.16		<0.39		<0.16		0.073	F /
	MW362(DUP)	4/16/2012	<0.16		**5.4**		<0.31		1.2		1		<0.31		<0.16		2	/ J	0.19	F /	1.9	/ J	<0.16		<0.39		<0.16		0.097	F /
	MW362	7/17/2012	<0.16		**3.6**		**0.68**		1.6		1.3		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW362	10/25/2012	<0.16		**6.7**		**1**		1.4		0.97		<0.31		<0.16		1.6		0.16	F /	1.9		**13**		<0.39		<0.16		0.08	F /
	MW808	5/15/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW808	8/19/2008	<0.44		<0.44		<0.87		<0.87		<0.87		<0.87		<0.44		<0.87		<0.87		<0.87		<0.44		<0.87		<0.44		<0.44	
	MW808	10/21/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW808(DUP)	10/21/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW808	2/4/2009	<0.21		<0.40		<0.40		<0.40		<0.40		<0.40		<0.21		<0.40		<0.40		<0.40		<0.21		<0.51		<0.21		<0.21	
	MW808(DUP)	2/4/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	5/4/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808(DUP)	5/4/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	7/29/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	10/29/2009	<0.18		<0.35		<0.35		<0.35		<0.35		<0.35		<0.18		<0.35		<0.35		<0.35		<0.18		<0.44		<0.18		<0.18	
	MW808	1/15/2010	<0.20		<0.39		<0.39		<0.39		<0.39		<0.39		<0.20		<0.39		<0.39		<0.39		<0.20		<0.49		<0.20		<0.20	
	MW808	4/13/2010	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	7/20/2010	<0.28		<0.54		<0.54		<0.54		<0.54		<0.54		<0.28		<0.54		<0.54		<0.54		<0.28		<0.68		<0.28		<0.28	
	MW808(DUP)	7/20/2010	<0.19		<0.38		<0.38		<0.38		<0.38		<0.38		<0.19		<0.38		<0.38		<0.38		<0.19		<0.47		<0.19		<0.19	
	MW808	10/29/2010	<0.40		<0.78		<0.78		<0.78		<0.78		<0.78		<0.40		<0.78		<0.78		<0.78		<0.40		<0.98		<0.40		<0.40	
	MW808	1/27/2011	<0.24		<0.46		<0.46		<0.46		<0.46		<0.46		<0.24		<0.46		<0.46		<0.46		<0.24		<0.58		<0.24		<0.24	
	MW808(DUP)	1/27/2011	<0.30		<0.58		<0.58		<0.58		<0.58		<0.58		<0.30		<0.58		<0.58		<0.58		<0.30		<0.73		<0.30		<0.30	
	MW808	4/18/2011	<0.20		<0.38		<0.38		<0.38		<0.38		<0.38		<0.20		<0.38		<0.38		<0.38		<0.20		<0.48		<0.20		<0.20	
	MW808(DUP)	4/18/2011	<0.22		<0.43		<0.43		<0.43		<0.43		<0.43		<0.22		<0.43		<0.43		<0.43		<0.22		<0.54		<0.22		<0.22	
	MW808	7/28/2011	<0.25		<0.25		<0.25		<0.48		<0.48		<0.48		<0.25		<0.48		<0.48		<0.48		<0.25		<0.60		<0.25		<0.25	
	MW808(DUP)	7/28/2011	<0.24		<0.24		<0.24		<0.46		<0.46		<0.46		<0.24		<0.46		<0.46		<0.46		<0.24		<0.58		<0.24		<0.24	
	MW808	10/12/2011	<0.19		<0.19		<0.19		<0.38		<0.38		<0.38		<0.19		<0.38		<0.38		<0.38		<0.19		<0.47		<0.19		<0.19	
	MW808	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	7/18/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808(DUP)	7/18/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW808	10/25/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	5/15/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW809	8/19/2008	<0.4		<0.4		<0.81		<0.81		<0.81		<0.81		<0.4		<0.81		<0.81		<0.81		<0.4		<0.81		<0.4		<0.4	
	MW809	10/21/2008	<0.39		<0.39		<0.78		<0.78		<0.78		<0.78		<0.39		<0.78		<0.78		<0.78		<0.39		<0.78		<0.39		<0.39	
	MW809	2/5/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	5/5/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

TABLE B1

Summary of Analytical Results - Explosives
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		Compound	**1,3-DNB**		**2,4-DNT**		**2,6-DNT**		**2-A-4,6-DNT**		**4-A-2,6-DNT**		**HMX**		**NB**		**2-NT**		**3-NT**		**4-NT**		**RDX**		**Tetryl**		**1,3,5-TNB**		**2,4,6-TNT**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[(1)]	10		0.42		0.42		NS		NS		5100		51		5100		NS		NS		2.6		200		5.1		9.5	
		Surface Water RG	4		330		150		NS		NS		260		8000		62		NS		NS		500		700		15		75	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Downgradient***																													
	MW809	7/29/2009	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	10/29/2009	<0.25		<0.49		<0.49		<0.49		<0.49		<0.49		<0.25		<0.49		<0.49		<0.49		<0.25		<0.62		<0.25		<0.25	
	MW809(DUP)	10/29/2009	<0.22		<0.42		<0.42		<0.42		<0.42		<0.42		<0.22		<0.42		<0.42		<0.42		<0.22		<0.53		<0.22		<0.22	
	MW809	1/15/2010	<0.22		<0.43		<0.43		<0.43		<0.43		<0.43		<0.22		<0.43		<0.43		<0.43		<0.22		<0.54		<0.22		<0.22	
	MW809	4/13/2010	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	7/20/2010	<0.21		<0.41		<0.41		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.51		<0.21		<0.21	
	MW809	10/29/2010	<0.24		<0.46		<0.46		<0.46		<0.46		<0.46		<0.24		<0.46		<0.46		<0.46		<0.24		<0.58		<0.24		<0.24	
	MW809(DUP)	10/29/2010	<0.24		<0.47		<0.47		<0.47		<0.47		<0.47		<0.24		<0.47		<0.47		<0.47		<0.24		<0.59		<0.24		<0.24	
	MW809	1/27/2011	<0.21		<0.41		<0.41		<0.41		<0.41		<0.41		<0.21		<0.41		<0.41		<0.41		<0.21		<0.52		<0.21		<0.21	
	MW809	4/19/2011	<0.24		<0.47		<0.47		<0.47		<0.47		<0.47		<0.24		<0.47		<0.47		<0.47		<0.24		<0.59		<0.24		<0.24	
	MW809	7/28/2011	<0.23		<0.23		<0.23		<0.44		<0.44		<0.44		<0.23		<0.44		<0.44		<0.44		<0.23		<0.55		<0.23		<0.23	
	MW809	10/12/2011	<0.26		<0.26		<0.26		<0.51		<0.51		<0.51		<0.26		<0.51		<0.51		<0.51		<0.26		<0.64		<0.26		<0.26	
	MW809(DUP)	10/12/2011	<0.24		<0.24		<0.24		<0.46		<0.46		<0.46		<0.24		<0.46		<0.46		<0.46		<0.24		<0.58		<0.24		<0.24	
	MW809	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809(DUP)	2/29/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	4/16/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	7/18/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809	10/25/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	
	MW809(DUP)	10/25/2012	<0.16		<0.31		<0.31		<0.31		<0.31		<0.31		<0.16		<0.31		<0.31		<0.31		<0.16		<0.39		<0.16		<0.16	

Footnotes:
(1) Project Action Limits (Remedial Goal, {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the *Long Term Monitoring Plan* (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:
Only data collected since 2001 are shown.
µg/L = microgram per liter
NS = No standard
LF/VF = Lab Flag/Validation Flag
Bolded result indicates Preventive Action Limit (Remedial Goal {RG}) exceedance
< = Result shows laboratory Method Reporting Limit for non-detected results
B = Blank contamination
F = Concentration below the reported detection limit
J = Estimated concentration
U = Not detected
UJ = Estimated detection limit
DUP = duplicate

1,3-DNB = 1,3-Dinitrobenzene
2,4-DNT = 2,4-Dinitrotoluene
2,6-DNT = 2,6-Dinitrotoluene
2-A-4,6-DNT = 2-amino-4,6-Dinitrotoluene
4-A-2,6-DNT = 4-amino-2,6-Dinitrotoluene
HMX = high melting explosive
NB = Nitrobenzene
2-NT = 2-Nitrotoluene
3-NT = 3 Nitrotoluene
4-NT = 4-Nitrotoluene
RDX = Royal demolition explosive
1,3,5-TNB = 1,3,5-Trinitrobenzene
2,4,6-TNT = 2,4,6-Trinitrotoluene

B2 - Summary of Historical Groundwater Results – Metals

TABLE B2

Summary of Analytical Results - Metals
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			Analyte	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Iron (Dissolved)	Lead	Magnesium	Manganese	Manganese (Dissolved)	Mercury	Nickel	Potassium	Silver	Sodium	Vanadium	Zinc
			Project Action Limit[1]	mg/L	100	0.024	0.2	NS	0.05	NS	1.0	NS	NS	5.0	5.0	0.1	NS	10	10	NS	NS	NS	0.511	NS	NS	10
			Surface Water RG	mg/L	NS	0.61	0.16	5	0.0023	NS	0.44	NS	0.026	1.0	1.0	0.064	NS	1.0	1.0	0.103	1.0	NS	0.005	NS	NS	1.0
Site	**Well**	**Date**	**Units**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**
L3	***Upgradient***																								
	SW004	5/6/2009	mg/L	<0.20	<0.020	<0.010	0.037	<0.0020	68	<0.010	0.004 F /	<0.010	<0.10	NA	<0.0050	28	0.036	NA	<0.0002	<0.010	1.5	<0.0050	11	<0.0050	<0.020
	SW004	10/23/2009	mg/L	2.7	<0.02	<0.01	0.047	<0.002	34	0.0041 F /	0.0019 F /	0.0079 F /	3.9	NA	0.0058	15	0.15	NA	<0.0002	0.007 F /	5.8	<0.005	5.6	0.0079	0.019 F / U
	SW004	4/8/2010	mg/L	0.08 F / U	<0.020	<0.010	0.029	<0.0020	47	<0.010	0.0053	0.0019 F /	0.09 F / U	NA	<0.0050	20	0.023	NA	<0.0002	0.002 F /	2.7	<0.0050	12	0.0021 F /	0.005 F /
	SW004	10/26/2010	mg/L	<0.20	<0.020	<0.010	0.042	0.0006 F / U	75	<0.010	<0.0050	0.0018 F /	0.045 F /	NA	<0.0050	38	0.023	NA	<0.0002	<0.010	2.7	<0.0050	14	<0.0050	<0.020
	SW004(DUP)	10/26/2010	mg/L	<0.20	<0.020	<0.010	0.042	0.00076 F / U	75	<0.010	<0.0050	0.002 F /	0.055 F /	NA	<0.0050	38	0.023	NA	0.000066 F / J	<0.010	2.7	<0.0050	14	<0.0050	<0.020
	SW004	4/14/2011	mg/L	0.052 F /	<0.02	<0.01	0.04	<0.002	77	<0.01	<0.005	<0.01	<0.2	NA	<0.005	35	0.056	NA	<0.0002	<0.01	1.5	<0.005	16	0.0024 F /	<0.02
	SW004(DUP)	4/14/2011	mg/L	<0.2	<0.02	<0.01	0.04	<0.002	77	<0.01	<0.005	<0.01	<0.2	NA	0.0021 F /	35	0.055	NA	<0.0002	<0.01	1.5	<0.005	16	0.0029 F /	<0.02
	SW004	10/14/2011	mg/L	<0.20	<0.020	<0.010	0.026	0.00072 F /	63	<0.010	<0.0050	0.0014 F /	<0.20	NA	<0.0050	35	0.018	NA	<0.0002 U / UJ	<0.010	1.8	<0.0050	20	<0.0050	<0.020
	SW004	4/10/2012	mg/L	<0.20	<0.020	<0.010	0.039	0.0009 F /	73	<0.010	<0.0050	0.018 / U	<0.20	NA	<0.0050	38	0.09	NA	<0.20	<0.010	1.4	<0.0050	15	<0.0050	<0.020
	In-Plume/Downgradient																								
	MW412	10/28/2003	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	<50	NA	NA	NA	1 J /	NA	NA	NA	NA	NA	NA	NA
	MW412	5/21/2008	mg/L	<0.2	<0.02	<0.01	0.043	<0.002	94	<0.01	<0.005	0.0027 F /	<0.15	NA	0.0029 F /	49	<0.01	NA	<0.0002	<0.01	0.95	<0.005	11	<0.005	0.0069 F /
	MW412	10/29/2008	mg/L	0.016 F /	<0.02	<0.01	0.05	<0.002	95	<0.01	<0.005	<0.01	<0.15	NA	<0.005	49	0.036	NA	<0.0002	<0.01	1.3	<0.005	10	0.0037 F /	0.02 F /
	MW412(DUP)	10/29/2008	mg/L	0.032 F /	<0.02	<0.01	0.052	<0.002	99	<0.01	<0.005	0.001 F /	<0.15	NA	<0.005	51	0.051	NA	<0.0002	<0.01	1.4	<0.005	11	0.0044 F /	0.018 F /
	MW412	5/6/2009	mg/L	<0.2 U / UJ	<0.02 U / UJ	<0.01 U / UJ	0.042 / J	<0.002 U / UJ	87 / J	<0.01 U / UJ	0.0018 F / J	<0.01 U / UJ	<0.1 U / UJ	NA	<0.005 U / UJ	47 / J	0.0025 F / J	NA	<0.0002	<0.01 U / UJ	1.2 / J	<0.005 U / UJ	9.9 / J	<0.005 U / UJ	<0.02 U / UJ
	MW412	10/27/2009	mg/L	<0.2	<0.02	<0.01	0.049	<0.002	92	<0.01	0.0018 F /	<0.01	<0.1	NA	<0.005	49	0.003 F /	NA	<0.0002	<0.01	1.2	<0.005	8.1	0.0031 F /	<0.02
	MW412	4/12/2010	mg/L	<0.20	<0.020	<0.010	0.043	<0.0020	96	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	52	<0.010	NA	<0.0002	<0.010	0.95	<0.0050	8.7	0.0026 F /	<0.020
	MW412	10/26/2010	mg/L	<0.20	<0.020	<0.010	0.07	0.00079 F / U	100	<0.010	<0.0050	0.002 F /	<0.20	NA	0.0023 F /	52	0.0033 F /	NA	<0.0002	<0.010	1.6	<0.0050	10	<0.0050	0.0053 F /
	MW412	4/14/2011	mg/L	<0.2	<0.02	<0.01	0.04	<0.002	91	<0.01	<0.005	<0.01	<0.2	NA	<0.005	48	<0.01	NA	<0.0002	<0.01	1	<0.005	8.1	0.0025 F /	0.0044 F /
	MW412	10/17/2011	mg/L	<0.20	<0.020	<0.010	0.048	0.00086 F / U	92	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	45	<0.010	NA	<0.0002	<0.010	1.3	<0.0050	6.9	<0.0050	<0.020
	MW412	4/11/2012	mg/L	<0.20	<0.020	<0.010	0.042	0.0011 F /	96	<0.010	<0.0050	0.026 / U	<0.20	NA	<0.0050	51	<0.010	NA	<0.20	<0.010	1	<0.0050	7.7	<0.0050	<0.020
	MW412	10/30/2012	mg/L	<0.2	<0.02	<0.01	0.053	0.00093 F /	100	<0.01	<0.005	0.0018 F /	<0.2	NA	0.0017 F /	52	<0.01	NA	<0.2	<0.01	1.4	<0.005	11	<0.005	<0.02
	Early Warning/Downgradient																								
	MW630	10/28/2003	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	<50	NA	NA	NA	24	NA	NA	NA	NA	NA	NA	NA
	MW630	5/20/2008	mg/L	<0.2	<0.02	<0.01	0.011	<0.002	72	<0.01	<0.005	0.0019 F /	<0.15	NA	0.0021 F /	38	0.023	NA	<0.0002	0.0066 F /	5.5	<0.005	25	<0.005	0.023
	MW630	10/28/2008	mg/L	0.026 F /	<0.02	<0.01	0.012	<0.002	75	<0.01	<0.005	<0.01	0.047 F /	NA	0.0026 F /	40	0.018	NA	<0.0002	<0.01	5.1	<0.005	26	0.0036 F /	0.021
	MW630	10/26/2009	mg/L	<0.2	<0.02	<0.01	0.013	<0.002	90	<0.01	0.00094 F /	<0.01	0.36	NA	<0.005	48	0.015	NA	<0.0002	<0.01	5.7	<0.005	25	0.0038 F /	<0.02
	MW630	4/9/2010	mg/L	0.021 F / U	<0.020	<0.010	0.011	<0.0020	81	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	43	0.021	NA	<0.0002	<0.010	4.3	<0.0050	22	0.0024 F /	<0.020
	MW630(DUP)	4/9/2010	mg/L	<0.20	<0.020	<0.010	0.011	<0.0020	81	<0.010	<0.0050	0.0028 F /	<0.20	NA	<0.0050	43	0.021	NA	<0.0002	<0.010	4.3	<0.0050	22	0.0026 F /	0.0036 F /
	MW630	10/26/2010	mg/L	<0.20	<0.020	<0.010	0.012 / U	0.00076 F / U	78	<0.010	<0.0050	<0.010	0.067 F /	NA	<0.0050	40	0.015	NA	0.000077 F / J	<0.010	5.6	<0.0050	28	<0.0050	<0.020
	MW630	4/14/2011	mg/L	<0.2	0.0036 F /	<0.01	0.011	<0.002	82	<0.01	<0.005	<0.01	<0.2	NA	<0.005	42	0.016	NA	<0.0002	<0.01	4.7	<0.005	21	0.003 F /	<0.02
	MW630	10/14/2011	mg/L	<0.20	<0.020	<0.010	0.012	0.00091 F /	84	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	43	0.026	NA	<0.0002 U / UJ	<0.010	5	<0.0050	24	<0.0050	<0.020
	MW630(DUP)	10/14/2011	mg/L	<0.20	<0.020	<0.010	0.012	0.00092 F /	82	<0.010	<0.0050	<0.010	0.07 F /	NA	<0.0050	42	0.025	NA	<0.0002 U / UJ	<0.010	4.9	<0.0050	23	<0.0050	<0.020
	MW630	4/11/2012	mg/L	<0.20	<0.020	<0.010	0.011	0.00078 F /	83	<0.010	<0.0050	0.027 / U	<0.20	NA	<0.0050	43	0.033	NA	<0.20	<0.010	4.4	<0.0050	22	<0.0050	0.0087 F /
	MW630(DUP)	4/11/2012	mg/L	<0.20	<0.020	<0.010	0.011	0.00087 F /	84	<0.010	<0.0050	0.02 / U	<0.20	NA	<0.0050	44	0.032	NA	<0.20	<0.010	4.4	<0.0050	22	<0.0050	<0.020
	MW630	10/30/2012	mg/L	<0.2	0.0026 F /	<0.01	0.012 / F	0.00081 F /	78	<0.01	<0.005	0.0019 F /	<0.2	NA	<0.005	40	0.019	NA	<0.2	<0.01	5.5	<0.005	27	<0.005	<0.02
	MW631	10/28/2003	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	100	<50	NA	NA	NA	11	NA	NA	NA	NA	NA	NA	NA
	MW631	5/20/2008	mg/L	<0.2	0.0067 F /	<0.01	0.011	<0.002	67	<0.01	<0.005	0.0022 F /	0.06 F /	NA	<0.005	36	0.014	NA	<0.0002	<0.01	5.5	<0.005	26	<0.005	0.025
	MW631	10/28/2008	mg/L	0.018 F /	<0.02	<0.01	0.011	<0.002	71	<0.01	<0.005	<0.01	0.093 F /	NA	<0.005	38	0.0089 F /	NA	<0.0002	<0.01	5	<0.005	26	0.0037 F /	0.0099 F /
	MW631	10/26/2009	mg/L	<0.2	<0.02	<0.01	0.01	<0.002	70	<0.01	0.0032 F /	<0.01	0.049 F / U	NA	<0.005	38	0.013	NA	<0.0002	<0.01	5.1	<0.005	25	0.003 F /	<0.02
	MW631	4/9/2010	mg/L	0.037 F / U	<0.020	<0.010	0.011	<0.0020	64	0.0019 F /	<0.0050	<0.010	0.33 / U	NA	0.0019 F / U	34	0.025	NA	<0.0002	<0.010	4.7	0.00088 F /	25	0.0025 F /	0.095
	MW631	10/26/2010	mg/L	<0.20	0.0035 F /	<0.010	0.01 / U	0.0006 F / U	66	<0.010	<0.0050	<0.010	0.1 F /	NA	<0.0050	34	0.0086 F /	NA	0.000062 F / J	<0.010	5.1	<0.0050	28	<0.0050	<0.020
	MW631	4/14/2011	mg/L	<0.2	<0.02	<0.01	0.014	<0.002	68	<0.01	<0.005	<0.01	<0.2	NA	0.0024 F /	36	0.014	NA	<0.0002	<0.01	5.6	<0.005	26	0.002 F /	0.0088 F /
	MW631	10/14/2011	mg/L	<0.20	<0.020	<0.010	0.018	0.00081 F /	67	<0.010	<0.0050	<0.010	0.1 F /	NA	<0.0050	35	0.029	NA	<0.0002 U / UJ	<0.010	5.1	<0.0050	28	<0.0050	<0.020
	MW631	4/11/2012	mg/L	<0.20	<0.020	<0.010	0.017	0.00082 F /	67	<0.010	<0.0050	0.015 / U	<0.20	NA	<0.0050	36	0.022	NA	<0.20	<0.010	4.9	<0.0050	28	<0.0050	<0.020
	MW631	10/30/2012	mg/L	<0.2	<0.02	<0.01	0.017	0.0007 F /	67	<0.01	<0.005	0.0011 F /	0.17 F /	NA	<0.005	35	0.029	NA	<0.2	<0.01	5.3	<0.005	29	<0.005	<0.02
	MW631(DUP)	10/30/2012	mg/L	<0.2	<0.02	<0.01	0.017	0.00071 F /	67	<0.01	<0.005	0.0012 F /	0.14 F /	NA	0.0017 F /	34	0.029	NA	<0.2	<0.01	5.2	<0.005	29	<0.005	<0.02
	MW633	10/27/2003	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	<50	NA	NA	NA	28	NA	NA	NA	NA	NA	NA	NA
	MW633	5/21/2008	mg/L	<0.2	<0.02	<0.01	0.039	<0.002	85	<0.01	<0.005	0.0034 F /	<0.15	NA	0.0033 F /	44	<0.01	NA	<0.0002	<0.01	0.89	<0.005	11	<0.005	0.021
	MW633(DUP)	5/21/2008	mg/L	<0.2	<0.02	<0.01	0.043	<0.002	93	<0.01	<0.005	0.0029 F /	<0.15	NA	0.0022 F /	49	<0.01	NA	<0.0002	<0.01	0.95	<0.005	11	<0.005	0.0067 F /
	MW633	10/29/2008	mg/L	0.026 F /	<0.02	<0.01	0.066	<0.002	80	<0.01	<0.005	0.0012 F /	<0.15	NA	<0.005	35	<0.01	NA	<0.0002	<0.01	1.4	<0.005	23	0.0035 F /	0.025
	MW633	5/6/2009	mg/L	<0.2 U / UJ	<0.02 U / UJ	<0.01 U / UJ	0.045 / J	<0.002 U / UJ	72 / J	<0.01 U / UJ	0.0027 F / J	<0.01 U / UJ	<0.1 U / UJ	NA	<0.005 U / UJ	32 / J	0.0047 F / J	NA	<0.0002	<0.01 U / UJ	1.3 / J	<0.005 U / UJ	6 / J	<0.005 U / UJ	<0.02 U / UJ
	MW633	10/27/2009	mg/L	<0.2	<0.02	<0.01	0.066	<0.002	100	<0.01	0.0032 F /	<0.01	<0.1	NA	<0.005	45	0.0048 F /	NA	<0.0002	0.0013 F /	1.4	<0.005	6.4	0.0033 F /	<0.02
	MW633	4/12/2010	mg/L	<0.20	<0.020	<0.010	0.045	<0.0020	80	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	38	<0.010	NA	<0.0002	<0.010	0.93	<0.0050	5.6	0.0017 F /	<0.020
	MW633	10/26/2010	mg/L	0.038 F /	<0.020	<0.010	0.066	0.00052 F / U	93	<0.010	<0.0050	<0.010	0.089 F /	NA	<0.0050	41	0.0062 F /	NA	<0.0002	<0.010	1.5	<0.0050	6.3	<0.0050	<0.020
	MW633	4/14/2011	mg/L	<0.2	<0.02	<0.01	0.04	<0.002	76	<0.01	<0.005	<0.01	<0.2	NA	0.0018 F /	34	<0.01	NA	<0.0002	<0.01	0.93	<0.005	5.2	0.0025 F /	<0.02
	MW633	10/17/2011	mg/L	0.16 F /	0.0029 F /	<0.010	0.065	0.00086 F / U	98	<0.010	<0.0050	0.0014 F /	0.25	NA	<0.0050	42	0.0048 F /	NA	<0.0002	<0.010	1.1	<0.0050	10	<0.0050	<0.020
	MW633	4/11/2012	mg/L	<0.20	<0.020	<0.010	0.047	0.00079 F /	83	<0.010	<0.0050	0.023 / U	<0.20	NA	<0.0050	37	<0.010	NA	<0.20	<0.010	1	<0.0050	5.7	<0.0050	<0.020
	MW633	10/30/2012	mg/L	0.069 F /	<0.02	<0.01	0.062	0.0007 F /	93	0.0012 F /	<0.005	0.0027 F /	0.16 F /	NA	<0.005	41	0.0016 F /	NA	<0.2	<0.01	1.4	<0.005	7.9	0.00087 F /	<0.02
	Compliance/Downgradient																								
	SW777	5/20/2008	mg/L	<0.2	0.0059 F /	<0.01	0.04	<0.002	74	<0.01	<0.005	0.0031 F /	<0.15	NA	0.0019 F /	34	0.023	NA	<0.0002	<0.01	1	<0.005	5.8	<0.005	0.0072 F /
	SW777	10/23/2008	mg/L	0.024 F /	<0.02	<0.01	0.046	<0.002	85	<0.01	<0.005	0.0011 F /	0.021 F /	NA	<0.005	38	0.024	NA	<0.0002	<0.01	2.2	<0.005	14	0.004 F /	0.0042 F /
	SW777	5/7/2009	mg/L	<0.2 U / UJ	<0.02 U / UJ	<0.01 U / UJ	0.036 / J	<0.002 U / UJ	64 / J	<0.01 U / UJ	0.0049 F / J	<0.01 U / UJ	<0.1 U / UJ	NA	<0.005 U / UJ	27 / J	0.033 / J	NA	<0.0002	<0.01 U / UJ	1.5 / J	<0.005 U / UJ	11 / J	<0.005 U / UJ	<0.02 U / UJ
	SW777	10/23/2009	mg/L	0.53	<0.02	<0.01	0.033	<0.002	33	<0.01	0.0022 F /	0.004 F /	0.77	NA	<0.005	14	0.089	NA	<0.0002	0.0029 F /	5.4	<0.005	5.6	0.0036 F /	<0.02
	SW777	4/9/2010	mg/L	0.13 F / U	<0.020	<0.010	0.033	<0.0020	60	<0.010	0.0012 F /	0.0017 F /	0.13 F / U	NA	0.0021 F / U	26	0.028	NA	<0.0002	<0.010	1.9	<0.0050	11	0.0021 F /	0.0037 F /
	SW777	10/26/2010	mg/L	<0.20	<0.020	<0.010	0.044	0.00058 F / U	72	<0.010	<0.0050	0.0015 F /	0.11 F /	NA	<0.0050	38	0.092	NA	0.00013 F / J	<0.010	3.9	<0.0050	14	<0.0050	<0.020
	SW777	4/14/2011	mg/L	<0.2	<0.02	<0.01	0.04	<0.002	75	<0.01	<0.005	<0.01	<0.2	NA	0.0017 F /	34	0.039	NA	<0.0002	<0.01	1.3	<0.005	14	0.003 F /	<0.02
	SW777	10/14/2011	mg/L	<0.20	<0.020	<0.010	0.031	0.00078 F /	61	<0.010	<0.0050	0.0018 F /	<0.20	NA	<0.0050	34	0.071	NA	<0.0002 U / UJ	0.00081 F /	2.7	<0.0050	19	<0.0050	<0.020
	SW777	4/11/2012	mg/L	<0.20	<0.020	<0.010	0.039	0.00087 F /	73	<0.010	<0.0050	0.0041 F / U	<0.20	NA	<0.0050	39	0.06	NA	<0.20	<0.010	1.4	<0.0050	14	<0.0050	0.0087 F /
	SW777	10/30/2012	mg/L	<0.2	<0.02	<0.01	0.026	0.00076 F /	42	<0.01	<0.005	0.0029 F /	<0.2	NA	0.0019 F /	35	0.0046 F /	NA	<0.2	<0.01	3	<0.005	8.6	<0.005	0.0053 F /

TABLE B2

Summary of Analytical Results - Metals
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

			Analyte	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Iron (Dissolved)	Lead	Magnesium	Manganese	Manganese (Dissolved)	Mercury	Nickel	Potassium	Silver	Sodium	Vanadium	Zinc
	Project Action Limit[1]		mg/L	100	0.024	0.2	NS	0.05	NS	1.0	NS	NS	5.0	5.0	0.1	NS	10	10	NS	NS	NS	0.511	NS	NS	10
	Surface Water RG		mg/L	NS	0.61	0.16	5	0.0023	NS	0.44	NS	0.026	1.0	1.0	0.064	NS	1.0	1.0	0.103	1.0	NS	0.005	NS	NS	1.0
Site	**Well**	**Date**	**Units**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**
L3	***Downgradient***																								
	SW557	5/20/2008	mg/L	<0.2	0.005 F /	<0.01	0.039	<0.002	74	<0.01	<0.005	0.0029 F /	<0.15	NA	<0.005	34	0.039	NA	<0.0002	<0.01	1.3	<0.005	13	<0.005	0.0048 F /
	SW557	10/23/2008	mg/L	0.023 F /	<0.02	<0.01	0.046	<0.002	84	<0.01	<0.005	0.0013 F /	0.042 F /	NA	<0.005	37	0.023	NA	<0.0002	0.018	2.1	<0.005	13	0.0035 F /	0.0063 F /
	SW557	5/7/2009	mg/L	0.031 F / J	<0.02 U / UJ	<0.01 U / UJ	0.045 / J	<0.002 U / UJ	65 / J	<0.01 U / UJ	0.0022 F / J	<0.01 U / UJ	<0.1 U / UJ	NA	<0.005 U / UJ	27 / J	0.028 / J	NA	<0.0002	0.0016 F / J	1.5 / J	<0.005 U / UJ	11 / J	0.0021 F / J	<0.02 U / UJ
	SW557(DUP)	5/7/2009	mg/L	<0.2 U / UJ	<0.02 U / UJ	<0.01 U / UJ	0.038 / J	<0.002 U / UJ	67 / J	<0.01 U / UJ	<0.005 U / UJ	<0.01 U / UJ	<0.1 U / UJ	NA	<0.005 U / UJ	28 / J	0.026 / J	NA	<0.0002	<0.01 U / UJ	1.6 / J	<0.005 U / UJ	11 / J	<0.005 U / UJ	<0.02 U / UJ
	SW557	10/23/2009	mg/L	2 / J	0.0036 F /	<0.01	0.043	<0.002	35	0.0031 F /	0.0015 F /	0.007 F /	2.8 / J	NA	0.0043 F /	15	0.13	NA	<0.0002	0.0051 F /	5.8	<0.005	5.7	0.0066	0.012 F / U
	SW557(DUP)	10/23/2009	mg/L	3 / J	<0.02	<0.01	0.046	<0.002	33	0.0045 F /	0.002 F /	0.0081 F /	4.1 / J	NA	0.0058	15	0.15	NA	<0.0002	0.0067 F /	5.7	<0.005	5.3	0.0089	0.019 F / U
	SW557	4/9/2010	mg/L	0.059 F / U	<0.020	<0.010	0.025	<0.0020	46	<0.010	<0.0050	<0.010	0.057 F / U	NA	<0.0050	20 / J	0.016	NA	<0.0002	<0.010	1.4	<0.0050	8.9	0.0012 F /	<0.020
	SW557(DUP)	4/9/2010	mg/L	0.077 F / U	<0.020	<0.010	0.032	<0.0020	59	<0.010	<0.0050	0.00094 F /	0.07 F / U	NA	<0.0050	26 / J	0.022	NA	<0.0002	<0.010	1.8	<0.0050	11	0.0018 F /	<0.020
	SW557	10/26/2010	mg/L	<0.20	<0.020	<0.010	0.043	0.0007 F / U	78	<0.010	0.0015 F /	<0.010	0.051 F /	NA	<0.0050	40	0.02	NA	<0.0002	<0.010	2.8	<0.0050	15	<0.0050	0.0044 F /
	SW557	4/14/2011	mg/L	<0.2	<0.02	<0.01	0.04	<0.002	75	0.0014 F /	<0.005	<0.01	<0.2	NA	0.0024 F /	35	0.048	NA	<0.0002	<0.01	1.4	<0.005	16	0.0028 F /	<0.02
	SW557	10/14/2011	mg/L	<0.20	<0.020	0.0046 F /	0.025	0.00062 F /	59	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	35	0.0025 F /	NA	<0.0002 U / UJ	<0.010	1.8	<0.0050	20	<0.0050	<0.020
	SW557	4/10/2012	mg/L	<0.20	<0.020	<0.010	0.039	0.00085 F /	75	<0.010	<0.0050	0.023 / U	<0.20	NA	<0.0050	39	0.072	NA	<0.20	<0.010	1.4	<0.0050	15	<0.0050	<0.020
	SW557	10/30/2012	mg/L	<0.2	<0.02	<0.01	0.027	0.0008 F /	43	<0.01	<0.005	0.0025 F /	<0.2	NA	<0.005	35	0.0013 F /	NA	<0.2	<0.01	2.7	<0.005	8.7	<0.005	<0.02
	SW558	5/20/2008	mg/L	<0.2	0.006 F /	<0.01	0.038	<0.002	72	<0.01	<0.005	0.0024 F /	<0.15	NA	0.0018 F /	33	0.0093 F /	NA	<0.0002	<0.01	0.98	<0.005	5.8	<0.005	0.0053 F /
	SW558	10/23/2008	mg/L	0.049 F /	<0.02	<0.01	0.046	<0.002	87	<0.01	<0.005	0.0012 F /	0.022 F /	NA	<0.005	39	0.024	NA	<0.0002	<0.01	2.2	<0.005	14	0.0037 F /	0.0076 F /
	SW558	4/14/2011	mg/L	<0.2	<0.02	<0.01	0.043	<0.002	74	<0.01	<0.005	<0.01	<0.2	NA	0.0018 F /	33	0.0056 F /	NA	<0.0002	<0.01	0.98	<0.005	5.4	0.0024 F /	<0.02
	SW558	4/10/2012	mg/L	<0.20	<0.020	<0.010	0.042	0.00079 F /	80	<0.010	<0.0050	0.0066 F / U	<0.20	NA	<0.0050	43	0.0027 F /	NA	<0.20	<0.010	1	<0.0050	6.2	<0.0050	<0.020
M11	***Upgradient***																								
	MW802	5/15/2008	mg/L	<0.2	<0.02	<0.01	0.018	<0.002	120	<0.01	<0.005	0.0011 F /	<0.15	NA	<0.005	76	0.039	NA	<0.0002	<0.01	0.6	<0.005	15	0.0015 F /	0.0041 F /
	MW802(DUP)	10/7/2008	mg/L	<0.2	<0.02	<0.01	0.025	<0.002	71	<0.01	<0.005	0.001 F /	0.026 F /	NA	<0.005	31	0.12	NA	<0.0002	<0.01	0.86	<0.005	29	0.0025 F /	0.041
	MW802	10/7/2008	mg/L	0.038 F /	<0.02	<0.01	0.027	<0.002	77	<0.01	<0.005	<0.01	0.033 F /	NA	<0.005	33	0.13	NA	<0.0002	<0.01	0.97	<0.005	32	0.0029 F /	0.044
	MW802	5/4/2009	mg/L	<0.20	<0.020	<0.010	0.024	<0.0020	74	<0.010	0.0029 F /	0.0028 F /	0.14	NA	<0.0050	32	0.23	NA	<0.0002	<0.010	0.86	<0.0050	36	<0.0050	<0.020
	MW802	10/27/2009	mg/L	<0.20	<0.020	<0.010	0.037	<0.0020	94	<0.010	0.0024 F /	<0.010	0.69	NA	<0.0050	44	0.8	NA	<0.0002	0.0022 F /	1	<0.0050	34	0.0029 F /	<0.020
	MW802	4/13/2010	mg/L	<0.20	<0.020	<0.010	0.022	<0.0020	73	<0.010	<0.0050	<0.010	0.076 F /	NA	<0.0050	34	0.4	NA	<0.0002	<0.010	1.1	<0.0050	30	0.0018 F /	0.0047 F /
	MW802	10/28/2010	mg/L	<0.20	<0.020	0.0027 F /	0.04	0.00042 F / U	93	<0.010	<0.0050	<0.010	3.6	NA	<0.0050	40	0.63	NA	<0.0002	<0.010	1.4	<0.0050	32	<0.0050	0.0039 F /
	MW802	4/15/2011	mg/L	<0.2	<0.02	<0.01	0.033	<0.002	86	<0.01	<0.005	<0.01	0.14 F / U	NA	<0.005	39	0.01	NA	<0.0002	0.00081 F /	1.2 / J	<0.005	25	0.0024 F /	<0.02
	MW802	10/11/2011	mg/L	<0.20	<0.020	<0.010	0.043	0.001 F / U	100	<0.010	<0.0050	0.0019 F /	1.4	NA	<0.0050	46	0.64	NA	0.000087 F / J	<0.010	2	<0.0050	27	<0.0050	<0.020
	MW802	4/16/2012	mg/L	<0.20	<0.020	<0.010	0.026	<0.0020	75	<0.010	<0.0050	0.0012 F /	<0.20	NA	<0.0050	34	0.75	NA	<0.20	0.0023 F /	2	<0.0050	19	0.0025 F /	0.0078 F /
	MW802	10/24/2012	mg/L	<0.2	<0.02	<0.01	0.099	0.00098 F /	120	<0.01	<0.005	0.0018 F /	<0.2	NA	<0.005	55	0.58	NA	<0.2	<0.01	3.2	<0.005	33	0.00067 F /	<0.02
	MW803	10/7/2008	mg/L	<0.2	<0.02	<0.01	0.028	<0.002	42	<0.01	<0.005	0.00093 F /	<0.15	NA	<0.005	23	<0.01	NA	<0.0002	<0.01	7.4	<0.005	97	0.0019 F /	0.018 F /
	MW803	5/4/2009	mg/L	<0.20	<0.020	<0.010	0.028	<0.0020	43	<0.010	0.001 F /	<0.010	<0.10	NA	<0.0050	23	<0.010	NA	<0.0002	<0.010	6.7	<0.0050	100	<0.0050	<0.020
	MW803	10/27/2009	mg/L	<0.20	<0.020	<0.010	0.027	<0.0020	43	<0.010	<0.0050	<0.010	<0.10	NA	<0.0050	25	<0.010	NA	<0.0002	0.0018 F /	7.5	<0.0050	93	0.0022 F /	<0.020
	MW803	4/13/2010	mg/L	<0.20	<0.020	<0.010	0.027	<0.0020	44	<0.010	<0.0050	0.0012 F /	<0.20	NA	<0.0050	26	<0.010	NA	<0.0002	<0.010	7.6	<0.0050	90	0.0021 F /	0.0046 F /
	MW803	10/28/2010	mg/L	<0.20	<0.020	<0.010	0.027	0.00039 F / U	45	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	26	<0.010	NA	<0.0002	<0.010	7	<0.0050	92	<0.0050	<0.020
	MW803	4/15/2011	mg/L	<0.2	<0.02	<0.01	0.027	<0.002	43	<0.01	<0.005	<0.01	<0.2	NA	<0.005	26	<0.01	NA	<0.0002	0.0015 F /	8.8 / J	<0.005	83	0.0019 F /	<0.02
	MW803	10/11/2011	mg/L	<0.20	<0.020	<0.010	0.026	0.0008 F / U	43	<0.010	<0.0050	0.0019 F /	<0.20	NA	<0.0050	25	<0.010	NA	0.000093 F / J	<0.010	6.9	<0.0050	85	<0.0050	<0.020
	MW803	10/24/2012	mg/L	<0.2	<0.02	<0.01	0.028	0.0012 F /	47	<0.01	<0.005	<0.01	<0.2	NA	<0.005	28	<0.01	NA	<0.2	<0.01	7.3	<0.005	84	<0.005	<0.02
	Downgradient																								
	MW333	5/12/2008	mg/L	<0.2	<0.02	<0.01	0.19	<0.002	49	<0.01	<0.005	<0.01	<0.15	NA	<0.005	33	<0.01	NA	<0.0002	<0.01	6.3	<0.005	34	<0.005	0.026
	MW333	10/6/2008	mg/L	<0.2	<0.02	<0.01	0.22	<0.002	52	<0.01	0.0014 F /	<0.01	0.72	NA	<0.005	35	1	NA	<0.0002	<0.01	6.6	<0.005	37	0.0029 F /	0.0065 F /
	MW333	5/5/2009	mg/L	<0.20	<0.020	<0.010	0.17	<0.0020	50	<0.010	0.00072 F /	<0.010	0.074 F /	NA	<0.0050	32	0.042	NA	<0.0002	<0.010	6.6	<0.0050	44	<0.0050	<0.020
	MW333	10/28/2009	mg/L	<0.20	<0.020	<0.010	0.18	<0.0020	47	<0.010	0.00061 F /	<0.010	0.28	NA	<0.0050	33	1.2	NA	<0.0002	<0.010	6.4	<0.0050	38	0.0023 F /	<0.020
	MW333	4/13/2010	mg/L	<0.20	<0.020	<0.010	0.14	<0.0020	50	<0.010	<0.0050	0.0018 F /	<0.20	NA	<0.0050	34	<0.010	NA	<0.0002	<0.010	6.4	<0.0050	39	0.0021 F /	0.0038 F /
	MW333	10/28/2010	mg/L	<0.20	<0.020	<0.010	0.16	0.00064 F / U	51	<0.010	0.0015 F /	<0.010	0.4	NA	<0.0050	34	1	NA	<0.0002	<0.010	6.6	<0.0050	45	<0.0050	0.006 F /
	MW333	4/18/2011	mg/L	<0.20	0.0034 F /	<0.010	0.14	0.001 F / U	47	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	33	<0.010	NA	<0.0002	<0.010	6.7	<0.0050	45	<0.0050	<0.020
	MW333	10/11/2011	mg/L	<0.20	<0.020	<0.010	0.12	0.00083 F / U	49	<0.010	<0.0050	0.0016 F /	<0.20	NA	<0.0050	33	0.099	NA	<0.0002	<0.010	6.3	<0.0050	42	<0.0050	<0.020
	MW333	10/24/2012	mg/L	<0.2	<0.02	<0.01	0.1	0.00073 F /	51	<0.01	<0.005	<0.01	<0.2	NA	<0.005	34	0.011	NA	<0.2	<0.01	6.4	<0.005	43	<0.005	<0.02
	MW334	5/12/2008	mg/L	<0.2	<0.02	<0.01	0.023	<0.002	160	<0.01	<0.005	<0.01	<0.15	NA	<0.005	110	0.024	NA	<0.0002	<0.01	5.7	<0.005	28	<0.005	0.074
	MW334	10/6/2008	mg/L	<0.2	<0.02	<0.01	0.034	<0.002	180	<0.01	0.0036 F /	<0.01	3.4	NA	<0.005	120	1.1	NA	<0.0002	<0.01	6.5	<0.005	35	0.0053	0.01 F /
	MW334	5/5/2009	mg/L	<0.20	<0.020	<0.010	0.025	<0.0020	150	<0.010	0.0016 F /	<0.010	0.049 F /	NA	<0.0050	99	0.027	NA	<0.0002	<0.010	5.6	<0.0050	40	<0.0050	<0.020 F / U
	MW334	10/28/2009	mg/L	<0.20	<0.020	0.0037 F /	0.039	<0.0020	150	<0.010	0.0047 F /	<0.010	**5.2**	NA	<0.0050	100	0.83	NA	<0.0002	<0.010	6.3	<0.0050	42	0.0041 F /	<0.020
	MW334	4/13/2010	mg/L	<0.20	<0.020	<0.010	0.027	<0.0020	150	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	100	0.056	NA	<0.0002	<0.010	6.3	<0.0050	44	0.005	<0.020
	MW334	10/28/2010	mg/L	<0.20	0.0043 F /	0.002 F /	0.034	0.00084 F / U	130	<0.010	0.003 F /	<0.010	3.4	NA	<0.0050	90	0.57	NA	<0.0002	<0.010	5.7	0.00091 F / U	43	<0.0050	<0.020
	MW334	4/18/2011	mg/L	<0.20	0.0034 F /	<0.010	0.027	0.0013 F / U	120	<0.010	<0.0050	<0.010	0.056 F /	NA	<0.0050	82	0.044	NA	<0.0002	<0.010	5.4	<0.0050	49	<0.0050	<0.020
	MW334	10/11/2011	mg/L	<0.20	0.0037 F /	<0.010	0.037	0.00099 F / U	110	<0.010	<0.0050	0.0017 F /	0.92	NA	<0.0050	77	0.76	NA	0.00016 F / J	<0.010	5.3	<0.0050	46	<0.0050	<0.020
	MW334(DUP)	10/11/2011	mg/L	<0.20	0.0039 F /	<0.010	0.037	0.0011 F / U	110	<0.010	<0.0050	0.0018 F /	0.71	NA	<0.0050	79	0.75	NA	0.00016 F / J	<0.010	5.4	<0.0050	47	<0.0050	<0.020
	MW334	10/24/2012	mg/L	<0.2	<0.02	<0.01	0.038	0.0011 F /	110	<0.01	0.0012 F /	<0.01	2	NA	<0.005	71	0.52	NA	<0.2	<0.01	5.2	<0.005	46	0.00073 F /	<0.02
	MW335	5/13/2008	mg/L	0.024 F /	<0.02	<0.01	0.016	<0.002	260	<0.01	0.0011 F /	0.0028 F /	<0.15	NA	<0.005	220	0.083	NA	<0.0002	0.0031 F /	5.3	<0.005	47	<0.005	0.06
	MW335	10/7/2008	mg/L	<0.2	<0.02	<0.01	0.021	<0.002	310	<0.01	<0.005	0.0053 F /	<0.15	NA	<0.005	220	0.1	NA	<0.0002	0.0045 F /	6.1	<0.005	49	0.0071	0.032
	MW335(DUP)	10/7/2008	mg/L	0.028 F /	<0.02	<0.01	0.02	<0.002	140	<0.01	0.0012 F /	<0.01	0.79	NA	<0.005	95	0.13	NA	<0.0002	0.0042 F /	5	<0.005	58	0.0054	0.0026 F /
	MW335	5/4/2009	mg/L	<0.20	<0.020	<0.010	0.018	<0.0020	290	<0.010	0.001 F /	0.007 F /	<0.10	NA	<0.0050	230	<0.010	NA	<0.0002	<0.010	4.6	<0.0050	60	<0.0050	<0.020
	MW335	10/28/2009	mg/L	<0.20	<0.020	<0.010	0.025	<0.0020	290	<0.010	0.0073	<0.010	0.051 F /	NA	<0.0050	200	1.4	NA	<0.0002	0.011	5.2	<0.0050	48	0.0052	<0.020
	MW335	4/13/2010	mg/L	<0.20	<0.020	<0.010	0.017	<0.0020	260	<0.010	<0.0050	0.005 F /	<0.20	NA	<0.0050	200	0.0088 F /	NA	<0.0002	0.002 F /	4.9	<0.0050	50	0.0049 F /	<0.020
	MW335(DUP)	4/13/2010	mg/L	<0.20	<0.020	<0.010	0.018	<0.0020	270	<0.010	<0.0050	0.005 F /	<0.20	NA	<0.0050	200	0.0086 F /	NA	<0.0002	0.0024 F /	5.1	<0.0050	51	0.0061	<0.020
	MW335	10/28/2010	mg/L	<0.20	0.0037 F /	<0.010	0.024	0.001 F / U	240	<0.010	<0.0050	0.0071 F /	<0.20	NA	<0.0050	170	0.29	NA	<0.0002	0.0041 F /	4.7	<0.0050	53	<0.0050	0.0047 F /
	MW335	4/15/2011	mg/L	<0.2	<0.02	<0.01	0.018	<0.002	200	<0.01	<0.005	0.004 F /	<0.2	NA	<0.005	140	<0.01	NA	<0.0002	0.0018 F /	5.9 / J	<0.005	42	0.0032 F /	0.0079 F /
	MW335	10/12/2011	mg/L	<0.20	<0.020	<0.010	0.022	0.001 F /	210	<0.010	<0.0050	0.0066 F /	0.042 F /	NA	<0.0050	140	0.057	NA	<0.0002	0.0011 F /	5.1	<0.0050	49	<0.0050	<0.020
	MW335	4/16/2012	mg/L	<0.20	<0.020	<0.010	0.021	<0.0020	210	<0.010	<0.0050	0.0051 F /	<0.20	NA	<0.0050	140	<0.010	NA	<0.20	0.0024 F /	6.4	<0.0050	48	0.0047 F /	0.0047 F /
	MW335	10/24/2012	mg/L	<0.2	<0.02	<0.01	0.027	0.0012 F /	200	<0.01	<0.005	0.0081 F /	<0.2	NA	<0.005	120	0.076	NA	<0.2	0.0037 F /	6.6	<0.005	51	<0.005	0.0051 F /

TABLE B2

Summary of Analytical Results - Metals
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

			Analyte	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Iron (Dissolved)	Lead	Magnesium	Manganese	Manganese (Dissolved)	Mercury	Nickel	Potassium	Silver	Sodium	Vanadium	Zinc
	Project Action Limit[1]		mg/L	100	0.024	0.2	NS	0.05	NS	1.0	NS	NS	5.0	5.0	0.1	NS	10	10	NS	NS	NS	0.511	NS	NS	10
	Surface Water RG		mg/L	NS	0.61	0.16	5	0.0023	NS	0.44	NS	0.026	1.0	1.0	0.064	NS	1.0	1.0	0.103	1.0	NS	0.005	NS	NS	1.0
Site	**Well**	**Date**	**Units**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**
M11	***Downgradient***																								
	MW336	5/13/2008	mg/L	0.018 F /	<0.02	<0.01	0.019	<0.002	110	<0.01	<0.005	<0.01	0.11 F /	NA	<0.005	78	0.042	NA	<0.0002	<0.01	4.2	<0.005	51	0.0013 F /	0.034
	MW336	10/7/2008	mg/L	0.022 F /	<0.02	<0.01	0.02	<0.002	140	<0.01	0.0017 F /	<0.01	0.77	NA	<0.005	93	0.13	NA	<0.0002	0.0042 F /	4.9	<0.005	57	0.0058	0.004 F /
	MW336	5/5/2009	mg/L	<0.20	<0.020	<0.010	0.019	<0.0020	140	<0.010	<0.0050	<0.010	<0.10	NA	<0.0050	96	0.0077 F /	NA	<0.0002	<0.010	4.2	<0.0050	73	<0.0050	<0.020
	MW336(DUP)	5/5/2009	mg/L	<0.20	<0.020	<0.010	0.019	<0.0020	140	<0.010	0.00047 F /	<0.010	<0.10	NA	<0.0050	97	0.0051 F /	NA	<0.0002	<0.010	4.1	<0.0050	71	<0.0050	<0.020
	MW336	10/27/2009	mg/L	<0.20	<0.020	<0.010	0.021	<0.0020	140	<0.010	0.0004 F /	<0.010	0.54	NA	<0.0050	91	0.14	NA	<0.0002	<0.010	4.2	<0.0050	60	0.0044 F /	<0.020
	MW336(DUP)	10/27/2009	mg/L	<0.20	<0.020	<0.010	0.021	<0.0020	140	<0.010	<0.0050	<0.010	0.54	NA	<0.0050	91	0.14	NA	<0.0002	0.0016 F /	4.3	<0.0050	61	0.0042 F /	<0.020
	MW336	4/13/2010	mg/L	<0.20	<0.020	<0.010	0.019	<0.0020	140	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	95	0.007 F /	NA	<0.0002	0.002 F /	4.4	<0.0050	63	0.0038 F /	<0.020
	MW336	10/28/2010	mg/L	<0.20	0.0051 F /	<0.010	0.028	0.00084 F / U	140	<0.010	0.0014 F /	<0.010	1.2	NA	<0.0050	94	0.36	NA	<0.0002	<0.010	4.6	<0.0050	69	<0.0050	<0.020
	MW336	4/18/2011	mg/L	<0.20	0.0038 F /	<0.010	0.023	0.0013 F / U	130	<0.010	<0.0050	<0.010	0.096 F /	NA	<0.0050	85	0.019	NA	<0.0002	<0.010	4.1	<0.0050	67	<0.0050	<0.020
	MW336	10/12/2011	mg/L	<0.20	<0.020	<0.010	0.029	0.0011 F /	130	<0.010	0.0046 F /	0.0018 F /	1.7	NA	<0.0050	87	0.42	NA	<0.0002	0.0029 F /	4.1	<0.0050	63	<0.0050	<0.020
	MW336	4/16/2012	mg/L	<0.20	<0.020	<0.010	0.02	<0.0020	120	<0.010	<0.0050	0.0011 F /	0.15 F /	NA	<0.0050	80	0.033	NA	<0.20	<0.010	4.1	<0.0050	56	0.004 F /	0.0069 F /
	MW336	10/24/2012	mg/L	<0.2	<0.02	<0.01	0.024	0.001 F /	150	<0.01	0.0015 F /	0.0016 F /	0.24	NA	<0.005	110	0.15	NA	<0.2	0.0036 F /	4.6	<0.005	77	<0.005	<0.02
	MW336(DUP)	10/24/2012	mg/L	<0.2	0.0046 F /	<0.01	0.025	0.001 F /	160	<0.01	0.0018 F /	0.0014 F /	0.29	NA	<0.005	110	0.16	NA	<0.2	0.0047 F /	4.8	<0.005	79	<0.005	0.0056 F /
	MW804	5/15/2008	mg/L	0.017 F /	<0.02	<0.01	0.025	<0.002	75	<0.01	<0.005	0.00086 F /	<0.15	NA	<0.005	35	0.31	NA	<0.0002	<0.01	0.62	<0.005	26	0.0014 F /	0.0031 F /
	MW804	10/6/2008	mg/L	0.019 F /	<0.02	<0.01	0.031	<0.002	160	<0.01	<0.005	0.0034 F /	<0.15	NA	<0.005	100	0.036	NA	<0.0002	0.0038 F /	2.4	<0.005	32	0.0059	0.059
	MW804	5/7/2009	mg/L	<0.2 U / UJ	<0.02 U / UJ	<0.01 U / UJ	0.019 / J	<0.002 U / UJ	120 / J	<0.01 U / UJ	0.0031 F / J	<0.01 U / UJ	<0.1 U / UJ	NA	<0.005 U / UJ	72 / J	0.038 / J	NA	<0.0002	<0.01 U / UJ	0.67 / J	<0.005 U / UJ	17 / J	<0.005 U / UJ	<0.02 U / UJ
	MW804	10/27/2009	mg/L	<0.20	<0.020	<0.010	0.028	<0.0020	130	<0.010	<0.0050	<0.010	<0.10	NA	<0.0050	82	0.039	NA	<0.0002	0.0019 F /	1.8	<0.0050	27	0.0038 F /	<0.020
	MW804	4/13/2010	mg/L	<0.20	<0.020	<0.010	0.023	<0.0020	120	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	77	0.12	NA	<0.0002	<0.010	0.54 / J	<0.0050	14	0.0042 F /	0.0043 F /
	MW804	10/28/2010	mg/L	<0.20	<0.020	<0.010	0.066	0.00086 F / U	140	<0.010	0.0023 F /	<0.010	2	NA	<0.0050	110	0.58	NA	<0.0002	0.0024 F /	4.2	<0.0050	49	<0.0050	<0.020
	MW804	4/15/2011	mg/L	<0.2	<0.02	<0.01	0.024	<0.002	100	<0.01	<0.005	0.0019 F /	<0.2	NA	<0.005	64	<0.01	NA	<0.0002	0.0015 F /	0.82 / J	<0.005	15	0.0032 F /	<0.02
	MW804(DUP)	4/15/2011	mg/L	<0.2	<0.02	<0.01	0.024	<0.002	100	<0.01	<0.005	0.0017 F /	<0.2	NA	<0.005	62	<0.01	NA	<0.0002	0.0012 F /	0.78 / J	<0.005	15	0.0036 F /	<0.02
	MW804	10/11/2011	mg/L	<0.20	0.0028 F /	<0.010	0.042	0.0011 F / U	140	<0.010	<0.0050	0.0018 F /	0.44	NA	<0.0050	90	0.088	NA	0.00011 F / J	0.0027 F /	2.3	<0.0050	29	<0.0050	<0.020
	MW804	10/24/2012	mg/L	<0.2	0.0056 F /	<0.01	0.076	0.00074 F /	150	<0.01	0.0028 F /	0.0016 F /	1.7	NA	<0.005	110	0.53	NA	<0.2	<0.01	5.3	0.0073	64	0.0063	<0.02
	MW805	10/6/2008	mg/L	<0.2	<0.02	<0.01	0.029	<0.002	120	<0.01	<0.005	0.0011 F /	0.035 F /	NA	<0.005	73	0.0092 F /	NA	<0.0002	0.0076 F /	13	<0.005	100	0.005 F /	0.085
	MW805	5/7/2009	mg/L	<0.2 U / UJ	<0.02 U / UJ	<0.01 U / UJ	0.029 / J	<0.002 U / UJ	120 / J	<0.01 U / UJ	<0.005 U / UJ	<0.01 U / UJ	<0.1 U / UJ	NA	<0.005 U / UJ	77 / J	<0.01 U / UJ	NA	<0.0002	0.0042 F / J	11 / J	<0.005 U / UJ	130 / J	<0.005 U / UJ	<0.02 U / UJ
	MW805	10/27/2009	mg/L	<0.20	<0.020	<0.010	0.027	<0.0020	120	<0.010	<0.0050	<0.010	<0.10	NA	<0.0050	78	<0.010	NA	<0.0002	0.0048 F /	12	<0.0050	110	0.0042 F /	<0.020
	MW805	4/13/2010	mg/L	<0.20	<0.020	<0.010	0.031	<0.0020	130	<0.010	<0.0050	0.0012 F /	<0.20	NA	<0.0050	84	<0.010	NA	<0.0002	0.005 F /	11 / J	<0.0050	120	0.0042 F /	0.0044 F /
	MW805	11/2/2010	mg/L	<0.20	<0.020	<0.010	0.036	0.00092 F / U	130	<0.010	0.0016 F /	<0.010	1.2	NA	<0.0050	83	0.026	NA	<0.0002	0.0034 F /	9.9	<0.0050	120	<0.0050	<0.020
	MW805	4/15/2011	mg/L	<0.2	<0.02	<0.01	0.033	<0.002	120	<0.01	<0.005	0.0014 F /	<0.2	NA	<0.005	82	<0.01	NA	<0.0002	0.0055 F /	13 / J	<0.005	120	0.0036 F /	<0.02
	MW805	10/11/2011	mg/L	<0.20	0.0029 F /	<0.010	0.03	0.001 F / U	120	<0.010	<0.0050	0.0023 F /	<0.20	NA	<0.0050	79	0.004 F /	NA	<0.0002	0.0029 F /	8.5	<0.0050	110	<0.0050	<0.020
	MW805	4/16/2012	mg/L	<0.20	<0.020	<0.010	0.028	<0.0020	110	<0.010	<0.0050	0.0016 F /	<0.20	NA	<0.0050	75	<0.010	NA	<0.20	0.0059 F /	9.5	<0.0050	97	0.0037 F /	0.0078 F /
	MW805	10/24/2012	mg/L	<0.2	<0.02	<0.01	0.029	0.00098 F /	110	<0.01	<0.005	0.0018 F /	0.099 F /	NA	<0.005	79	0.0094 F /	NA	<0.2	0.004 F /	8.1	<0.005	100	<0.005	<0.02
M13	***Upgradient***																								
	MW806	5/15/2008	mg/L	<0.2	<0.02	<0.01	0.095	<0.002	80	<0.01	<0.005	<0.01	<0.15	NA	<0.005	46	0.053	NA	<0.0002	<0.01	2.8	<0.005	24	<0.005	0.013 F /
	MW806	8/19/2008	mg/L	<0.2	<0.02	<0.01	0.093	<0.002	78	<0.01	<0.005	0.0012 F /	0.058 F /	NA	<0.005	46	0.051	NA	<0.0002	<0.01	2.3	<0.005	25	0.002 F /	0.0047 F /
	MW806	10/21/2008	mg/L	0.016 F /	<0.02	<0.01	0.1	<0.002	77	<0.01	<0.005	<0.01	0.61	NA	0.0032 F /	46	0.038	NA	<0.0002	<0.01	2	<0.005	24	0.0043 F /	0.024
	MW806	2/4/2009	mg/L	<0.20	<0.020	<0.010	0.094	<0.0020	77	<0.010	<0.0050	<0.010	<0.10	NA	<0.0050	46	0.013	NA	<0.0002	<0.010	1.9 / J	<0.0050	24	0.0041 F /	<0.020 F / U
	MW806	5/5/2009	mg/L	<0.20	<0.020	<0.010	0.099	<0.0020	77	<0.010	<0.0050	<0.010	<0.10	NA	<0.0050	44	<0.010	NA	<0.0002	<0.010	2.1	<0.0050	28	<0.0050	<0.020
	MW806	7/29/2009	mg/L	<0.2	0.0027 F /	<0.01	0.091	<0.002	78	<0.01	0.0018 F /	<0.01	0.12	NA	0.0058 / U	46	0.077	NA	<0.0002	<0.01	1.9 / J	<0.005	24	0.0032 F /	<0.02
	MW806	10/28/2009	mg/L	<0.20	<0.020	<0.010	0.093	<0.0020	75	<0.010	<0.0050	<0.010	0.26	NA	<0.0050	44	0.03	NA	<0.0002	<0.010	1.9 / J	<0.0050	23	0.0024 F /	<0.020
	MW806	1/15/2010	mg/L	<0.20	<0.020	<0.010	0.093	<0.0020	73	<0.010	0.0043 F /	<0.010	<0.10	NA	<0.0050	45	0.0061 F /	NA	<0.0002	0.0014 F /	1.9 / J	<0.0050	24	0.0035 F /	<0.020
	MW806	4/14/2010	mg/L	<0.20	<0.020	<0.010	0.098	<0.0020	82	<0.010	<0.0050	0.001 F /	<0.20	NA	<0.0050	49	0.00057 F /	NA	<0.0002	<0.010	2 / J	<0.0050	25	0.0036 F /	<0.020
	MW806	7/21/2010	mg/L	<0.20	<0.020	<0.010	0.092	<0.0020	83	<0.010	<0.0050	<0.010	0.11 F / U	NA	<0.0050	48	0.06	NA	<0.0002	<0.010	1.8	<0.0050	25	0.003 F /	0.005 F / U
	MW806	10/28/2010	mg/L	<0.20	<0.020	<0.010	0.099	0.00045 F / U	77	<0.010	<0.0050	<0.010	0.79	NA	<0.0050	44	0.021	NA	<0.0002	<0.010	1.9	<0.0050	25	<0.0050	0.0035 F /
	MW806	1/27/2011	mg/L	0.083 F /	<0.020	<0.010	0.085	<0.0020	72	<0.010	<0.0050	0.0015 F /	<0.20	NA	<0.0050	43 / J	0.0073 F /	NA	<0.0002	<0.010	2.3	<0.0050	27 / J	0.0019 F /	0.036
	MW806	4/19/2011	mg/L	<0.20	0.0029 F /	<0.010	0.095	0.001 F / U	80	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	45	0.001 F /	NA	<0.0002	<0.010	2	<0.0050	26	<0.0050	0.011 F /
	MW806	7/28/2011	mg/L	<0.20	<0.020	<0.010	0.096	0.00069 F / U	77	<0.010	<0.0050	<0.010	0.27	NA	<0.0050	44	0.063	NA	<0.0002	<0.010	1.8	<0.0050	25	<0.0050	<0.020
	MW806	10/12/2011	mg/L	<0.20	<0.020	<0.010	0.091	0.00098 F /	75	<0.010	<0.0050	<0.010	0.68	NA	<0.0050	43	0.032	NA	<0.0002	<0.010	1.8	<0.0050	24	<0.0050	<0.020
	MW806	2/29/2012	mg/L	<0.20	<0.020	<0.010	0.096	<0.0020	76	0.001 F /	<0.0050	<0.010	<0.20	NA	<0.0050	46	0.0017 F /	NA	<0.20	<0.010	2.1 / J	<0.0050	24	0.0031 F /	<0.020
	MW806	4/16/2012	mg/L	<0.20	<0.020	<0.010	0.082	0.00068 F /	68	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	40 / J	0.0024 F /	NA	<0.20 U / UJ	<0.010	1.6	<0.0050	22 / J	<0.0050	0.013 F /
	MW806	7/17/2012	mg/L	<0.2	<0.02	<0.01	0.1	0.00078 F /	81	<0.01	<0.005	0.0014 F /	0.65	NA	<0.005	46	0.025	NA	U / R	<0.01	1.9	<0.005	24	<0.005	<0.02
	MW806	10/24/2012	mg/L	<0.2	<0.02	<0.01	0.097	0.00097 F /	79	<0.01	<0.005	0.0013 F /	0.089 F /	NA	<0.005	45	0.021	NA	<0.2	<0.01	1.9	<0.005	26	<0.005	<0.02
	MW807	5/15/2008	mg/L	0.02 F /	<0.02	<0.01	0.094	<0.002	180	<0.01	0.0024 F /	<0.01	0.69	NA	<0.005	86	0.14	NA	<0.0002	0.0056 F /	15	<0.005	310	0.0017 F /	0.11
	MW807(DUP)	5/15/2008	mg/L	0.018 F /	<0.02	<0.01	0.089	<0.002	170	<0.01	0.0017 F /	<0.01	0.55	NA	<0.005	81	0.13	NA	<0.0002	0.0045 F /	13	<0.005	300	0.0019 F /	0.1
	MW807	8/19/2008	mg/L	<0.2	<0.02	<0.01	0.023	<0.002	43	<0.01	<0.005	0.0036 F /	<0.15	NA	<0.005	21	<0.01	NA	<0.0002	0.0051 F /	13	<0.005	66	0.0017 F /	0.013 F /
	MW807(DUP)	8/19/2008	mg/L	<0.2	<0.02	<0.01	0.021	<0.002	40	<0.01	<0.005	0.0024 F /	<0.15	NA	<0.005	19	0.0029 F /	NA	<0.0002	0.0038 F /	12	<0.005	65	<0.005	0.011 F /
	MW807	10/21/2008	mg/L	<0.2	<0.02	<0.01	0.1	<0.002	190	<0.01	0.0014 F /	<0.01	0.77	NA	<0.005	91	0.11	NA	<0.0002	0.0031 F /	11	<0.005	350	0.0062	0.019 F /
	MW807	2/4/2009	mg/L	0.018 F /	<0.020	<0.010	0.096	<0.0020	180	<0.010	0.0013 F /	<0.010	1.3	NA	<0.0050	91	0.079	NA	<0.0002	<0.010	14 / J	<0.0050	330	0.0049 F /	<0.020
	MW807	5/5/2009	mg/L	<0.20	<0.020	<0.010	0.095	<0.0020	180	<0.010	0.00053 F /	<0.010	1.1	NA	<0.0050	87	0.083	NA	<0.0002	<0.010	9.1	<0.0050	350	<0.0050	<0.020
	MW807	7/29/2009	mg/L	<0.2	0.0028 F /	<0.01	0.097	<0.002	190	<0.01	0.0012 F /	<0.01	1.1	NA	<0.005	97	0.096	NA	<0.0002	0.0021 F /	14 / J	<0.005	400	0.0041 F /	<0.02
	MW807	10/28/2009	mg/L	<0.20	<0.020	<0.010	0.11	<0.0020	190	<0.010	0.00044 F /	<0.010	1	NA	<0.0050	97	0.097	NA	<0.0002	0.002 F /	13 / J	<0.0050	390	0.004 F /	0.018 F / U
	MW807	1/15/2010	mg/L	<0.20	<0.020	<0.010	0.095	<0.0020	180	<0.010	0.0034 F /	<0.010	1.3	NA	<0.0050	91	0.079	NA	<0.0002	0.0021 F /	15 / J	<0.0050	410	0.0046 F /	<0.020
	MW807	4/14/2010	mg/L	<0.20	<0.020	<0.010	0.1	<0.0020	200	<0.010	<0.0050	<0.010	1.3	NA	<0.0050	100	0.08	NA	<0.0002	<0.010	15 / J	<0.0050	410	0.004 F /	<0.020
	MW807	7/21/2010	mg/L	<0.20	<0.020	<0.010	0.094	<0.0020	190	<0.010	<0.0050	<0.010	0.98	NA	<0.0050	96	0.096	NA	<0.0002	0.0021 F /	14	<0.0050	380	0.0034 F /	0.0036 F / U
	MW807	10/28/2010	mg/L	<0.20	0.0039 F /	<0.010	0.087	0.00084 F / U	170	<0.010	<0.0050	0.0016 F /	1.1	NA	<0.0050	86	0.069	NA	<0.0002	<0.010	9.9	<0.0050	370	<0.0050	<0.020
	MW807	1/27/2011	mg/L	<0.20	<0.020	<0.010	0.085	<0.0020	170	<0.010	<0.0050	<0.010	1.1	NA	<0.0050	82 / J	0.068	NA	<0.0002	<0.010	15	<0.0050	360 / J	0.0033 F /	<0.020
	MW807	4/19/2011	mg/L	<0.20	0.0097 F /	<0.010	0.09	0.0011 F / U	180	0.0022 F /	<0.0050	0.0032 F /	0.91	NA	0.0037 F /	84	0.1	NA	<0.0002	<0.010	8.3	<0.0050	380	0.0022 F /	0.017 F /
	MW807	7/28/2011	mg/L	<0.20	<0.020	<0.010	0.093	0.001 F / U	180	<0.010	<0.0050	<0.010	1	NA	<0.0050	90	0.086	NA	<0.0002	0.0016 F /	9.5	<0.0050	400	<0.0050	<0.020
	MW807	10/12/2011	mg/L	<0.20	0.0032 F /	<0.010	0.089	0.00099 F /	180	<0.010	<0.0050	0.0029 F /	0.81	NA	<0.0050	88	0.097	NA	<0.0002	<0.010	8.6	<0.0050	410	<0.0050	<0.020
	MW807	2/29/2012	mg/L	0.026 F /	0.003 F / U	<0.010	0.097	<0.0020	180	<0.010	<0.0050	<0.010	0.82	NA	0.0017 F / U	89	0.092	NA	<0.20	0.0021 F /	14 / J	<0.0050	400	0.004 F /	<0.020
	MW807	4/16/2012	mg/L	<0.20	<0.020	<0.010	0.088	0.00098 F /	160	<0.010	<0.0050	<0.010	0.59	NA	<0.0050	79 / J	0.11	NA	<0.20 U / UJ	0.0025 F /	7.2	<0.0050	380 / J	<0.0050	0.0095 F /
	MW807	7/17/2012	mg/L	<0.2	0.0031 F /	<0.01	0.095	0.0012 F /	180	<0.01	<0.005	0.0022 F /	0.2	NA	<0.005	89	0.15	NA	U / R	0.0025 F /	7.6	<0.005	390	<0.005	<0.02
	MW807	10/24/2012	mg/L	<0.2	0.0033 F /	<0.01	0.094	0.0009 F /	180	<0.01	<0.005	0.0014 F /	0.5	NA	<0.005	90	0.12	NA	<0.2	0.0021 F /	7.6	<0.005	390	<0.005	<0.02

TABLE B2

Summary of Analytical Results - Metals
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

			Analyte	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Iron (Dissolved)	Lead	Magnesium	Manganese	Manganese (Dissolved)	Mercury	Nickel	Potassium	Silver	Sodium	Vanadium	Zinc
			Project Action Limit[1]	mg/L	100	0.024	0.2	NS	0.05	NS	1.0	NS	NS	5.0	5.0	0.1	NS	10	10	NS	NS	NS	0.511	NS	NS	10
			Surface Water RG	mg/L	NS	0.61	0.16	5	0.0023	NS	0.44	NS	0.026	1.0	1.0	0.064	NS	1.0	1.0	0.103	1.0	NS	0.005	NS	NS	1.0
Site	**Well**	**Date**	**Units**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**
M13	***Downgradient***																								
	MW126R	2/4/2004	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	90	71	NA	NA	NA	250	NA	NA	NA	NA	NA	NA	NA
	MW126R	5/20/2008	mg/L	<0.2	0.0052 F /	<0.01	0.058	<0.002	71	<0.01	<0.005	0.0024 F /	<0.15	NA	0.0018 F /	46	0.0041 F /	NA	<0.0002	<0.01	2.6	<0.005	25	<0.005	0.011 F /
	MW126R	8/20/2008	mg/L	<0.2	<0.02	<0.01	<0.01	<0.002	3.4	<0.01	<0.005	0.0012 F /	<0.15	NA	<0.005	0.91	<0.01	NA	<0.0002	<0.01	0.082 F /	<0.005	2	<0.005	0.0042 F /
	MW126R	10/22/2008	mg/L	0.02 F /	<0.02	<0.01	0.00087 F /	<0.002	0.08 F /	<0.01	<0.005	0.0049 F /	0.039 F /	NA	0.0028 F /	<0.1	<0.01	NA	<0.0002	<0.01	<0.5	<0.005	<1	<0.005	0.0058 F /
	MW126R	2/5/2009	mg/L	<0.20	<0.020	<0.010	0.055	<0.0020	68	<0.010	<0.0050	<0.010	<0.10 F / U	NA	<0.0050	43	0.0089 F /	NA	<0.0002	<0.010	2.2 / J	<0.0050	24	0.0033 F /	<0.020 F / U
	MW126R	5/5/2009	mg/L	<0.20	<0.020	<0.010	0.056	<0.0020	73	<0.010	<0.0050	<0.010	<0.10	NA	<0.0050	43	0.0069 F /	NA	<0.0002	<0.010	2	<0.0050	27	<0.0050	<0.020
	MW126R	7/28/2009	mg/L	<0.20	<0.020	<0.010	0.058	<0.0020	72	<0.010	<0.0050	<0.010	0.18	NA	<0.0050	45	0.022	NA	<0.0002	<0.010	2.2	<0.0050	27 / J	0.0024 F /	<0.020
	MW126R	10/29/2009	mg/L	<0.20	<0.020	<0.010	0.066	<0.0020	79	<0.010	<0.0050	<0.010	0.052 F /	NA	<0.0050	46	0.03	NA	<0.0002	<0.010	2.6 / J	<0.0050	30	0.003 F /	<0.020
	MW126R	1/14/2010	mg/L	<0.20	0.0039 F / U	<0.010	0.13	<0.0020	120	<0.010	0.0026 F / U	<0.010	<0.10	NA	<0.0050	64	0.022	NA	<0.0002	0.0022 F /	4.5 / J	<0.0050	140	0.0041 F /	<0.020
	MW126R	4/14/2010	mg/L	<0.20	<0.020	<0.010	0.099	<0.0020	97	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	49	0.00056 F /	NA	<0.0002	<0.010	4.1 / J	<0.0050	200	0.0032 F /	<0.020
	MW126R(DUP)	4/14/2010	mg/L	<0.20	<0.020	<0.010	0.098	<0.0020	97	<0.010	<0.0050	0.0013 F /	<0.20	NA	<0.0050	50	<0.010	NA	<0.0002	<0.010	3.9 / J	<0.0050	200	0.0025 F /	<0.020
	MW126R	7/20/2010	mg/L	<0.20	<0.020	<0.010	0.064	<0.0020	77	0.0015 F /	<0.0050	<0.010	0.091 F / U	NA	<0.0050	45	0.03	NA	<0.0002	0.0018 F /	2.3	0.0009 F /	47	0.0027 F /	0.0068 F / U
	MW126R	10/28/2010	mg/L	<0.20	<0.020	<0.010	0.086	0.00066 F / U	92	<0.010	<0.0050	0.0032 F /	<0.20	NA	<0.0050	45	0.015	NA	<0.0002	<0.010	3.3	<0.0050	46	<0.0050	0.0051 F /
	MW126R	1/28/2011	mg/L	<0.20	<0.020	<0.010	0.069	<0.0020	78	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	44	0.0058 F /	NA	<0.0002	<0.010	3 / J	<0.0050	38	0.0021 F /	<0.020
	MW126R	4/19/2011	mg/L	<0.20	<0.020	<0.010	0.062	0.00099 F / U	75	<0.010	<0.0050	0.0014 F /	<0.20	NA	<0.0050	44	0.0027 F /	NA	<0.0002	<0.010	2.5	<0.0050	42	<0.0050	0.021
	MW126R	7/28/2011	mg/L	<0.20	0.0034 F /	<0.010	0.058	0.00089 F / U	72	<0.010	<0.0050	<0.010	0.14 F /	NA	<0.0050	43	0.025	NA	<0.0002	<0.010	2	<0.0050	32	<0.0050	<0.020
	MW126R	10/13/2011	mg/L	<0.20	<0.020	<0.010	0.057	0.00091 F /	68	<0.010	<0.0050	0.064	0.19 F /	NA	<0.0050	43	0.027	NA	<0.0002	<0.010	2.3	<0.0050	28	<0.0050	0.04
	MW126R	2/29/2012	mg/L	<0.20	<0.020	<0.010	0.055	<0.0020	67	<0.010	<0.0050	<0.010	<0.20	NA	0.0016 F / U	43	0.0088 F /	NA	<0.20	<0.010	2.4 / J	<0.0050	26	0.0029 F /	<0.020
	MW126R	4/16/2012	mg/L	<0.20	<0.020	<0.010	0.048	0.00078 F /	61	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	39 / J	0.0032 F /	NA	<0.20 U / UJ	0.0022 F /	2	<0.0050	25 / J	<0.0050	0.009 F /
	MW126R	7/17/2012	mg/L	<0.2	<0.02	<0.01	0.054	0.00079 F /	69	<0.01	<0.005	0.0014 F /	0.12 F /	NA	<0.005	43	0.019	NA	U / R	<0.01	2.2	<0.005	24	<0.005	<0.02
	MW126R	10/25/2012	mg/L	<0.2	0.0036 F / U	<0.01	0.058	<0.002	70	0.0011 F / U	<0.005	<0.01	0.88	NA	<0.005	44	0.023	NA	<0.2	<0.01	2.4	<0.005	24	0.004 F /	<0.02
	MW362	2/3/2004	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50	<250	NA	NA	NA	82	NA	NA	NA	NA	NA	NA	NA
	MW362	5/13/2008	mg/L	0.032 F /	<0.02	<0.01	0.045	<0.002	140	<0.01	<0.005	<0.01	<0.15	NA	<0.005	91	0.041	NA	<0.0002	<0.01	7.9	<0.005	160	0.0012 F /	0.046
	MW362	8/20/2008	mg/L	<0.2	<0.02	<0.01	<0.01	<0.002	3.4	<0.01	<0.005	<0.01	<0.15	NA	<0.005	0.92	<0.01	NA	<0.0002	<0.01	0.087 F /	<0.005	2	<0.005	0.0049 F /
	MW362	10/22/2008	mg/L	<0.2	<0.02	<0.01	0.046	<0.002	170	<0.01	0.0013 F /	<0.01	<0.15	NA	<0.005	99	0.11	NA	<0.0002	0.0049 F /	7.5	<0.005	150	0.0056	0.016 F /
	MW362	2/5/2009	mg/L	0.017 F /	<0.020	<0.010	0.048	<0.0020	170	<0.010	0.0014 F /	<0.010	<0.10 F / U	NA	<0.0050	97	0.17	NA	<0.0002	0.0037 F /	7.7 / J	<0.0050	190	0.0056	<0.020 F / U
	MW362	5/5/2009	mg/L	<0.20	<0.020	<0.010	0.041	<0.0020	150	<0.010	<0.0050	<0.010	<0.10	NA	<0.0050	89	0.016	NA	<0.0002	<0.010	5.8	<0.0050	150	<0.0050	<0.020
	MW362	7/28/2009	mg/L	<0.20	<0.020	<0.010	0.043	<0.0020	160	<0.010	0.0025 F /	<0.010	<0.10	NA	<0.0050	97	0.059	NA	<0.0002	0.0033 F /	7.7	<0.0050	160 / J	0.0045 F /	<0.020
	MW362	10/29/2009	mg/L	<0.20	<0.020	<0.010	0.048	<0.0020	170	<0.010	0.0008 F /	<0.010	<0.10	NA	<0.0050	100	0.17	NA	<0.0002	0.0042 F /	7.9 / J	<0.0050	180	0.0037 F /	<0.020
	MW362	1/14/2010	mg/L	<0.20	<0.020	<0.010	0.048	<0.0020	160	<0.010	0.00098 F / U	<0.010	<0.10	NA	<0.0050	97	0.18	NA	<0.0002	0.0046 F /	8.2 / J	<0.0050	220	0.004 F /	<0.020
	MW362(DUP)	1/14/2010	mg/L	<0.20	<0.020	<0.010	0.048	<0.0020	160	<0.010	0.004 F /	<0.010	<0.10	NA	<0.0050	99	0.18	NA	<0.0002	0.005 F /	8.3 / J	<0.0050	220	0.0044 F /	<0.020
	MW362	4/14/2010	mg/L	<0.20	<0.020	<0.010	0.051	<0.0020	180	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	110	0.088	NA	<0.0002	0.0036 F /	8.9 / J	<0.0050	250	0.0045 F /	<0.020
	MW362	7/20/2010	mg/L	<0.20	<0.020	<0.010	0.049	<0.0020	180	<0.010	<0.0050	<0.010	0.17 F / U	NA	<0.0050	110	0.072	NA	<0.0002	0.0029 F /	6.5	0.00094 F /	280	0.0032 F /	0.0075 F / U
	MW362	10/28/2010	mg/L	<0.20	<0.020	<0.010	0.053	0.00059 F / U	180	<0.010	<0.0050	0.002 F /	0.088 F /	NA	<0.0050	100	0.18	NA	<0.0002	0.0031 F /	7	<0.0050	300	<0.0050	<0.020
	MW362	1/28/2011	mg/L	<0.20	<0.020	<0.010	0.054	<0.0020	180	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	100	0.23	NA	<0.0002	0.004 F /	11 / J	<0.0050	340	0.0034 F /	<0.020
	MW362	4/19/2011	mg/L	<0.20	0.0032 F /	<0.010	0.05	0.0014 F / U	180	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	100	0.077	NA	<0.0002	0.001 F /	6.8	<0.0050	290	<0.0050	0.013 F /
	MW362	7/28/2011	mg/L	<0.20	0.0034 F /	<0.010	0.047	0.001 F / U	180	<0.010	<0.0050	0.0016 F /	<0.20	NA	<0.0050	100	0.083	NA	<0.0002	0.0029 F /	6.7	<0.0050	260	<0.0050	<0.020
	MW362	10/13/2011	mg/L	<0.20	<0.020	<0.010	0.043	0.0012 F /	160	<0.010	0.00058 F /	<0.010	<0.20	NA	<0.0050	99	0.083	NA	<0.0002	0.0029 F /	6.2	<0.0050	220	<0.0050	<0.020
	MW362	2/29/2012	mg/L	<0.20	0.0035 F / U	<0.010	0.044	<0.0020	160	0.001 F /	0.0011 F /	<0.010	<0.20	NA	0.0016 F / U	100	0.043	NA	<0.20	0.0044 F /	8.5 / J	<0.0050	180	0.0047 F /	<0.020
	MW362	4/16/2012	mg/L	0.034 F /	<0.020	<0.010	0.041	0.00098 F /	150	<0.010	<0.0050	<0.010	0.14 F /	NA	<0.0050	89 / J	0.078	NA	<0.20 U / UJ	0.0042 F /	5.8	<0.0050	200 / J	<0.0050	<0.020
	MW362(DUP)	4/16/2012	mg/L	<0.20	<0.020	<0.010	0.042	0.001 F /	150	<0.010	<0.0050	<0.010	0.38	NA	<0.0050	93 / J	0.078	NA	<0.20 U / UJ	0.0063 F /	6	<0.0050	210 / J	<0.0050	0.011 F /
	MW362	7/17/2012	mg/L	<0.2	0.0032 F /	<0.01	0.048	0.0011 F /	180	<0.01	<0.005	0.0022 F /	<0.2	NA	<0.005	100	0.096	NA	U / R	0.0035 F /	7	<0.005	270	<0.005	<0.02
	MW362	10/25/2012	mg/L	<0.2	<0.02	<0.01	0.05	<0.002	180	<0.01	0.0011 F /	<0.01	<0.2	NA	<0.005	110	0.18	NA	<0.2	0.0051 F /	7.1	<0.005	300	0.0046 F /	<0.02
	MW808	5/15/2008	mg/L	0.018 F /	<0.02	<0.01	0.18	<0.002	180	<0.01	0.0073	0.0014 F /	0.042 F /	NA	<0.005	78	0.9	NA	<0.0002	0.019	3.6	<0.005	130	<0.005	0.057
	MW808	8/19/2008	mg/L	<0.2	<0.02	<0.01	0.19	<0.002	190	<0.01	0.0062	0.00084 F /	<0.15	NA	<0.005	84	1.1	NA	<0.0002	0.021	4.3	<0.005	140	0.0021 F /	0.0058 F /
	MW808	10/21/2008	mg/L	<0.2	<0.02	<0.01	0.17	<0.002	150	<0.01	0.013	<0.01	0.96	NA	<0.005	65	1.2	NA	<0.0002	0.021	2.6	<0.005	57	0.005	0.044
	MW808(DUP)	10/21/2008	mg/L	0.021 F /	<0.02	<0.01	0.17	<0.002	150	<0.01	0.014	<0.01	0.95	NA	0.0019 F /	65	1.2	NA	0.0001 F /	0.021	2.6	<0.005	56	0.0056	0.052
	MW808	2/4/2009	mg/L	0.02 F /	<0.020	<0.010	0.27	<0.0020	190	<0.010	0.03	<0.010	2.8	NA	<0.0050	89	2.4	NA	<0.0002	0.054	2.9 / J	<0.0050	120	0.005	<0.020 F / U
	MW808(DUP)	2/4/2009	mg/L	0.018 F /	<0.020	<0.010	0.25	<0.0020	180	<0.010	0.029	<0.010	2.7	NA	<0.0050	85	2.3	NA	<0.0002	0.052	2.7 / J	<0.0050	120	0.0049 F /	<0.020 F / U
	MW808	5/4/2009	mg/L	<0.20	<0.020	<0.010	0.24	<0.0020	200	<0.010	0.0093	<0.010	0.1	NA	<0.0050	85	1.5	NA	<0.0002	0.014	5.8	<0.0050	200	<0.0050	<0.020
	MW808(DUP)	5/4/2009	mg/L	<0.20	<0.020	<0.010	0.25	<0.0020	210	<0.010	0.01	<0.010	0.087 F /	NA	<0.0050	89	1.6	NA	<0.0002	0.015	6.3	<0.0050	220	<0.0050	<0.020
	MW808	7/29/2009	mg/L	<0.2	<0.02	<0.01	0.19	<0.002	180	<0.01	0.018	<0.01	1.8	NA	0.0036 F / U	77	1.6	NA	<0.0002	0.019	4.5 / J	<0.005	98	0.0038 F /	<0.02
	MW808	10/29/2009	mg/L	<0.20	<0.020	<0.010	0.2	<0.0020	150	<0.010	0.015	<0.010	4.3	NA	<0.0050	72	1.5	NA	<0.0002	0.025	5.2 / J	<0.0050	84	0.0035 F /	<0.020
	MW808	1/15/2010	mg/L	<0.20	0.0024 F / U	<0.010	0.18	<0.0020	130	<0.010	0.019	<0.010	2.2	NA	<0.0050	65	1.4	NA	<0.0002	0.026	5.4 / J	<0.0050	96	0.0031 F /	<0.020
	MW808	4/13/2010	mg/L	<0.20	<0.020	0.002 F /	0.19	<0.0020	140	<0.010	0.019	<0.010	**7.9**	NA	<0.0050	72	1.3	NA	<0.0002	0.03	5.4	<0.0050	53	0.0031 F /	<0.020
	MW808	7/20/2010	mg/L	<0.20	<0.020	0.0042 F /	0.19	<0.0020	130	<0.010	0.018	<0.010	**7.8**	NA	0.0017 F /	74	1.1	NA	<0.0002	0.031	5.8	0.0013 F /	96	0.0032 F /	0.015 F / U
	MW808(DUP)	7/20/2010	mg/L	<0.20	<0.020	0.0038 F /	0.19	<0.0020	130	<0.010	0.018	<0.010	**7.9**	NA	0.0018 F /	74	1.1	NA	<0.0002	0.03	5.8	<0.0050	97	0.0035 F /	0.012 F / U
	MW808	10/29/2010	mg/L	0.029 F /	0.0035 F /	<0.010	0.16	0.00081 F / U	120	<0.010	0.0082	<0.010	1.1	NA	<0.0050	60	1.3	NA	<0.0002	0.018	5.2	<0.0050	85	<0.0050	<0.020
	MW808	1/27/2011	mg/L	<0.20	<0.020	<0.010	0.17	<0.0020	130	<0.010	0.0058	<0.010	0.31	NA	<0.0050	68 / J	2	NA	<0.0002	0.023	6.2	<0.0050	75 / J	0.002 F /	<0.020
	MW808(DUP)	1/27/2011	mg/L	<0.20	<0.020	<0.010	0.17	<0.0020	130	<0.010	0.0061	<0.010	0.4	NA	<0.0050	68 / J	2	NA	<0.0002	0.023	6.3	<0.0050	75 / J	0.0025 F /	<0.020
	MW808	4/18/2011	mg/L	<0.20	0.0041 F /	<0.010	0.2	0.0012 F / U	180	<0.010	0.037	<0.010	4.5	NA	<0.0050	100	1.9	NA	<0.0002	0.036	6.2	<0.0050	74	<0.0050	0.015 F /
	MW808(DUP)	4/18/2011	mg/L	<0.20	0.0038 F /	<0.010	0.2	0.0012 F / U	180	<0.010	0.038	<0.010	4.7	NA	<0.0050	100	1.9	NA	<0.0002	0.036	6.2	<0.0050	77	<0.0050	0.015 F /
	MW808	7/28/2011	mg/L	<0.20	<0.020	<0.010	0.17	0.001 F / U	150	<0.010	0.0067	<0.010	0.23	NA	<0.0050	61	1.2	NA	<0.0002	0.013	5.2	<0.0050	120	<0.0050	<0.020
	MW808(DUP)	7/28/2011	mg/L	<0.20	<0.020	<0.010	0.18	0.0011 F / U	160	<0.010	0.0072	0.0019 F /	0.23	NA	<0.0050	66	1.3	NA	<0.0002	0.013	5.6	0.00099 F /	120	<0.0050	<0.020
	MW808	10/12/2011	mg/L	<0.20	<0.020	<0.010	0.17	0.00094 F /	140	<0.010	0.015	0.0018 F /	5	NA	<0.0050	67	1.2	NA	<0.0002	0.021	6.4	<0.0050	88	<0.0050	<0.020
	MW808	2/29/2012	mg/L	<0.20	0.0033 F / U	<0.010	0.16	<0.0020	120	<0.010	0.0082	<0.010	1.7	NA	<0.0050	67	0.55	NA	<0.20	0.022	11 / J	<0.0050	61	0.004 F /	0.0066 F /
	MW808	4/16/2012	mg/L	<0.20	<0.020	<0.010	0.14	0.00081 F /	100	<0.010	0.016	0.0011 F /	2.6	NA	<0.0050	59 / J	0.89	NA	<0.20 U / UJ	0.026	8.3	<0.0050	56 / J	<0.0050	0.0069 F /
	MW808	7/18/2012	mg/L	<0.2	<0.02	<0.01	0.23	0.00099 F /	140	<0.01	0.022	0.0019 F /	4.2	NA	<0.005	77	1.1	NA	U / R	0.028	15	<0.005	85	<0.005	<0.02
	MW808(DUP)	7/18/2012	mg/L	<0.2	<0.02	<0.01	0.23	0.0011 F /	140	<0.01	0.021	0.0017 F /	3.9	NA	<0.005	77	1.1	NA	U / R	0.028	16	<0.005	85	<0.005	<0.02
	MW808	10/25/2012	mg/L	<0.2	0.0034 F / U	<0.01	0.22	<0.002	150	0.0010 F / U	0.021	<0.01	3	NA	<0.005	86	1.4	NA	<0.2	0.029	12	<0.005	80	0.0052	<0.02

TABLE B2

Summary of Analytical Results - Metals
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

			Analyte	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Iron (Dissolved)	Lead	Magnesium	Manganese	Manganese (Dissolved)	Mercury	Nickel	Potassium	Silver	Sodium	Vanadium	Zinc
	Project Action Limit[1]		mg/L	100	0.024	0.2	NS	0.05	NS	1.0	NS	NS	5.0	5.0	0.1	NS	10	10	NS	NS	NS	0.511	NS	NS	10
	Surface Water RG		mg/L	NS	0.61	0.16	5	0.0023	NS	0.44	NS	0.026	1.0	1.0	0.064	NS	1.0	1.0	0.103	1.0	NS	0.005	NS	NS	1.0
Site	**Well**	**Date**	**Units**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**	**Result LF/VF**
M13	***Downgradient***																								
	MW809	5/15/2008	mg/L	<0.2	<0.02	<0.01	0.029	<0.002	39	<0.01	<0.005	<0.01	<0.15	NA	<0.005	31	0.0056 F /	NA	<0.0002	0.0027 F /	3.7	<0.005	18	<0.005	0.041
	MW809	8/19/2008	mg/L	<0.2	<0.02	<0.01	0.028	<0.002	41	<0.01	<0.005	0.0015 F /	<0.15	NA	<0.005	33	0.003 F /	NA	<0.0002	<0.01	4.2	<0.005	20	0.0013 F /	0.0074 F /
	MW809	10/21/2008	mg/L	0.019 F /	<0.02	<0.01	0.032	<0.002	40	<0.01	<0.005	<0.01	<0.15	NA	0.0022 F /	32	0.027	NA	<0.002	<0.01	3.6	<0.005	20	0.0035 F /	0.024
	MW809	2/5/2009	mg/L	<0.20	<0.020	<0.010	0.028	<0.0020	41	<0.010	0.0014 F /	<0.010	0.24	NA	<0.0050	32	0.025	NA	<0.0002	<0.010	3.7 / J	<0.0050	20	0.0024 F /	<0.020 F / U
	MW809	5/5/2009	mg/L	<0.20	<0.020	<0.010	0.037	<0.0020	44	<0.010	<0.0050	<0.010	<0.10	NA	<0.0050	34	0.0022 F /	NA	<0.0002	<0.010	3.9	<0.0050	25	<0.0050	<0.020
	MW809	7/29/2009	mg/L	<0.2	<0.02	<0.01	0.032	<0.002	45	<0.01	0.00082 F /	<0.01	<0.1	NA	<0.005	35	0.0023 F /	NA	<0.0002	<0.01	3.5 / J	<0.005	21	0.0028 F /	<0.02
	MW809	10/29/2009	mg/L	<0.20	<0.020	<0.010	0.032	<0.0020	43	<0.010	0.0022 F /	<0.010	<0.10	NA	<0.0050	34	0.023	NA	<0.0002	<0.010	3.2 / J	<0.0050	21	0.0021 F /	<0.020
	MW809(DUP)	10/29/2009	mg/L	<0.20	<0.020	<0.010	0.031	<0.0020	42	<0.010	<0.0050	<0.010	<0.10	NA	<0.0050	33	0.019	NA	<0.0002	<0.010	3.1 / J	<0.0050	20	0.0019 F /	<0.020
	MW809	1/15/2010	mg/L	<0.20	0.0026 F / U	<0.010	0.029	<0.0020	44	<0.010	0.0044 F /	<0.010	0.097 F /	NA	<0.0050	33	0.041	NA	<0.0002	0.0024 F /	3.5 / J	0.0014 F /	20	0.0031 F /	<0.020
	MW809	4/13/2010	mg/L	<0.20	<0.020	<0.010	0.033	<0.0020	43	<0.010	<0.0050	<0.010	0.067 F /	NA	<0.0050	34	0.0091 F /	NA	<0.0002	<0.010	3.1	<0.0050	20	0.002 F /	<0.020
	MW809	7/20/2010	mg/L	<0.20	<0.020	<0.010	0.033	<0.0020	45	<0.010	<0.0050	0.0017 F /	0.2 / U	NA	<0.0050	34	0.034	NA	<0.0002	0.002 F /	2.8	0.0011 F /	21	0.0023 F /	0.013 F / U
	MW809	10/29/2010	mg/L	<0.20	<0.020	<0.010	0.029	0.00069 F / U	42	<0.010	<0.0050	<0.010	<0.20	NA	0.002 F /	31	0.0086 F /	NA	<0.0002	<0.010	3.1	<0.0050	21	<0.0050	<0.020
	MW809(DUP)	10/29/2010	mg/L	<0.20	<0.020	<0.010	0.028	0.00052 F / U	41	<0.010	<0.0050	<0.010	0.047 F /	NA	0.002 F /	30	0.0085 F /	NA	<0.0002	<0.010	3	<0.0050	21	<0.0050	0.0045 F /
	MW809	1/27/2011	mg/L	<0.20	<0.020	<0.010	0.026	<0.0020	41	<0.010	<0.0050	<0.010	0.15 F /	NA	<0.0050	31 / J	0.02	NA	<0.0002	<0.010	3.4	<0.0050	19 / J	0.0017 F /	<0.020
	MW809	4/19/2011	mg/L	<0.20	<0.020	<0.010	0.026	0.00091 F / U	45	<0.010	<0.0050	<0.010	0.66	NA	<0.0050	32	0.019	NA	<0.0002	<0.010	3.6	<0.0050	21	<0.0050	0.016 F /
	MW809	7/28/2011	mg/L	<0.20	<0.020	<0.010	0.029	0.00062 F / U	42	<0.010	<0.0050	<0.010	0.045 F /	NA	<0.0050	31	0.0016 F /	NA	<0.0002	<0.010	2.9	<0.0050	21	<0.0050	<0.020
	MW809	10/12/2011	mg/L	<0.20	0.0033 F /	<0.010	0.029	0.00076 F /	41	<0.010	<0.0050	<0.010	0.08 F /	NA	<0.0050	30	0.0024 F /	NA	<0.0002	<0.010	2.6	<0.0050	20	<0.0050	<0.020
	MW809(DUP)	10/12/2011	mg/L	<0.20	<0.020	<0.010	0.028	0.00081 F /	40	<0.010	<0.0050	0.0015 F /	<0.20	NA	<0.0050	30	0.0023 F /	NA	<0.0002	<0.010	2.5	<0.0050	20	<0.0050	<0.020
	MW809	2/29/2012	mg/L	<0.20	0.0028 F / U	<0.010	0.031	<0.0020	41	<0.010	<0.0050	<0.010	<0.20	NA	<0.0050	31	0.0055 F /	NA	<0.20	<0.010	2.6 / J	<0.0050	19	0.0022 F /	<0.020
	MW809(DUP)	2/29/2012	mg/L	<0.20	0.0031 F / U	<0.010	0.031	<0.0020	40	<0.010	<0.0050	<0.010	<0.20	NA	0.0016 F / U	31	0.0059 F /	NA	<0.20	<0.010	2.6 / J	<0.0050	19	0.0024 F /	<0.020
	MW809	4/16/2012	mg/L	0.028 F /	<0.020	<0.010	0.028	0.00065 F /	38	<0.010	<0.0050	<0.010	0.094 F /	NA	<0.0050	29 / J	0.0024 F /	NA	<0.20 U / UJ	0.0044 F /	2.4	<0.0050	19 / J	<0.0050	0.0073 F /
	MW809	7/18/2012	mg/L	<0.2	<0.02	<0.01	0.029	0.00075 F /	43	<0.01	<0.005	0.0014 F /	<0.2	NA	<0.005	32	0.0018 F /	NA	U / R	<0.01	2.6	<0.005	20	<0.005	<0.02
	MW809	10/25/2012	mg/L	<0.2	<0.02	<0.01	0.029	<0.002	43	<0.01	<0.005	<0.01	<0.2	NA	<0.005	33	0.0038 F /	NA	<0.2	<0.01	2.8	<0.005	19	0.0029 F /	<0.02
	MW809(DUP)	10/25/2012	mg/L	<0.2	0.0027 F / U	<0.01	0.029	<0.002	43	0.0019 F / U	<0.005	<0.01	<0.2	NA	<0.005	33	0.0038 F /	NA	<0.2	<0.01	2.8	<0.005	19	0.0029 F /	<0.02

Footnotes:
(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of th*Long Term Monitoring Plan* (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both availabl

General Notes:
An abbreviated list of analytes is used for reporting based on historically detected and reported compound
Only data collected since 2001 are shown
µg/L = microgram per liter
NS = No standard
NA = not analyzed
LF/VF = Lab Flag/Validation Flag
Bolded result indicates Project Action Limit (RG) exceedanc

< = Result shows laboratory Method Reporting Limit for non-detected result
F = Concentration below the reported detection lim
J = Estimated concentratior
U = Not detected
UJ = Estimated detection limi
DUP = duplicate

B3 - Summary of Historical Groundwater Results – Indicator Parameters

TABLE B3

Summary of Analytical Results - Indicator Parameters
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Will County, Illinois

		Compound	**Nitrate**		**Sulfate (SO_4)**	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M1	***In-Plume***					
	MW107	5/2/2002	NA		**35,000**	
	MW107	10/25/2002	NA		**35,000**	
	MW107(DUP)	10/25/2002	NA		230	
	MW107	5/19/2003	NA		**35,000**	/ J
	MW107(DUP)	5/19/2003	NA		**57,000**	/ J
	MW107	10/21/2003		/ R	**38,000**	/ J
	MW107(DUP)	10/21/2003		/ R	**35,000**	/ J
	MW107	5/17/2004	NA		**45,000**	
	MW107(DUP)	5/17/2004	NA		**31,000**	
	MW107	10/18/2004	NA		**34,000**	
	MW107(DUP)	10/18/2004	NA		**31,000**	
	MW107	7/12/2005	NA		**36,000**	
	MW107	10/13/2005	NA		**35,000**	
	MW107	4/28/2006	NA		**24,000**	
	MW107	10/16/2006	NA		**53,000**	
	MW107	4/18/2007	NA		**26,000**	
	MW107	10/4/2007	NA		**38,000**	
	MW107	4/30/2008	NA		**21,000**	
	MW107	10/8/2008	NA		**12,000**	
	MW107	5/2/2009	NA		**49,000**	
	MW107	10/29/2009	NA		**34,000**	
	MW107	4/12/2010	NA		**30,000**	
	MW107	10/31/2010	NA		**26,000**	
	MW107	4/20/2011	NA		**26,000**	
	MW107	10/15/2011	NA		**23,000**	
	MW107	4/12/2012	NA		**26,000**	
	MW107	10/25/2012	NA		**22,000**	
	MW231	5/2/2002	NA		**38,000**	
	MW231	10/24/2002	NA		180	
	MW231	5/19/2003	NA		**27,000**	/ J
	MW231	10/22/2003		/ R	**30,000**	/ J
	MW231	5/18/2004	NA		**32,000**	
	MW231	10/18/2004	NA		**31,000**	
	MW231	7/12/2005	NA		**36,000**	
	MW231	10/14/2005	NA		**31,000**	
	MW231	4/28/2006	NA		**34,000**	
	MW231	10/16/2006	NA		**41,000**	
	MW231	4/18/2007	NA		**33,000**	
	MW231(DUP)	4/18/2007	NA		**32,000**	
	MW231	10/4/2007	NA		**38,000**	
	MW231	4/30/2008	NA		**32,000**	
	MW231	10/8/2008	8.1		**35,000**	
	MW231	5/2/2009	NA		**41,000**	
	MW231	10/29/2009	NA		**38,000**	
	MW231	4/9/2010	NA		**41,000**	
	MW231	10/31/2010	NA		**32,000**	
	MW231	4/20/2011	NA		**34,000**	
	MW231	10/15/2011	NA		**32,000**	
	MW231(DUP)	10/15/2011	NA		**33,000**	
	MW231	4/12/2012	NA		**35,000**	
	MW231	10/25/2012	NA		**36,000**	

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		Compound	**Nitrate**		**Sulfate (SO_4)**	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M1	***In-Plume***					
	MW640	5/2/2002	NA		**3,000**	
	MW640	10/24/2002	NA		**2,700**	
	MW640	5/20/2003	NA		**3,100**	/ J
	MW640	10/22/2003		J / R	**2,100**	/ J
	MW640	5/17/2004	NA		**2,200**	
	MW640	10/19/2004	NA		**3,000**	
	MW640	7/12/2005	NA		<5	
	MW640	10/12/2005	NA		**3,100**	
	MW640	4/28/2006	NA		**4,400**	
	MW640	10/12/2006	NA		**6,100**	
	MW640	4/23/2007	NA		**2,900**	
	MW640	10/2/2007	NA		**1,500**	
	MW640	4/30/2008	NA		**4,100**	
	MW640	10/8/2008	NA		**2,400**	
	MW640(DUP)	10/8/2008	NA		**2,700**	
	MW640	5/2/2009	NA		**5,000**	
	MW640	10/29/2009	NA		**5,000**	
	MW640	4/12/2010	NA		**5,200**	
	MW640	10/31/2010	NA		**5,000**	
	MW640	4/19/2011	NA		**5,400**	
	MW640	10/15/2011	NA		**5,100**	
	MW640	4/12/2012	NA		**5,200**	
	MW640	10/25/2012	NA		**4,300**	
	MW641	5/2/2002	NA		**960**	
	MW641	10/24/2002	NA		**1,800**	
	MW641	5/16/2003	NA		**1,500**	
	MW641	10/22/2003		J / R	**1,100**	/ J
	MW641	5/18/2004	NA		**760**	
	MW641	10/19/2004	NA		**880**	
	MW641	7/12/2005	NA		**560**	
	MW641(DUP)	7/12/2005	NA		**590**	
	MW641	10/12/2005	NA		**1,300**	
	MW641	4/28/2006	NA		**670**	
	MW641(DUP)	4/28/2006	NA		**680**	
	MW641	10/12/2006	NA		**880**	
	MW641(DUP)	10/12/2006	NA		**870**	
	MW641	4/20/2007	NA		**900**	
	MW641	10/2/2007	NA		**990**	
	MW641	4/30/2008	NA		**940**	
	MW641(DUP)	4/30/2008	NA		**930**	
	MW641	10/8/2008	NA		**1,000**	
	MW641	5/2/2009	NA		**820**	
	MW641	10/29/2009	NA		**910**	
	MW641	4/12/2010	NA		**920**	
	MW641	10/31/2010	NA		**1,300**	
	MW641	4/20/2011	NA		**670**	
	MW641	10/17/2011	NA		**1,100**	
	MW641	4/12/2012	NA		**640**	
	MW641	4/12/2012	NA		**640**	
	MW641	10/25/2012	NA		**1,100**	

TABLE B3

Summary of Analytical Results - Indicator Parameters
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		Compound	**Nitrate**		**Sulfate (SO_4)**	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M1	***In-Plume***					
	MW642	5/2/2002	NA		**930**	
	MW642	10/24/2002	NA		**720**	
	MW642	5/19/2003	NA		**660**	/ J
	MW642	10/22/2003		U / R	**640**	/ J
	MW642	5/18/2004	NA		**600**	
	MW642	10/19/2004	NA		**470**	
	MW642	7/11/2005	NA		390	
	MW642	10/12/2005	NA		**410**	
	MW642	4/28/2006	NA		400	
	MW642	10/16/2006	NA		**440**	
	MW642	4/19/2007	NA		**450**	
	MW642	10/8/2007	NA		**450**	
	MW642	5/7/2008	NA		380	
	MW642	10/9/2008	NA		**430**	
	MW642	5/2/2009	NA		**440**	
	MW642	10/29/2009	NA		**430**	
	MW642	4/12/2010	NA		**430**	
	MW642(DUP)	4/12/2010	NA		**450**	
	MW642	10/31/2010	NA		**460**	
	MW642	4/20/2011	NA		**430**	
	MW642(DUP)	4/20/2011	NA		**500**	
	MW642	10/17/2011	NA		**410**	
	MW642	4/12/2012	NA		**420**	
	MW642(DUP)	4/12/2012	NA		**420**	
	MW642	10/25/2012	NA		390	
	MW642(DUP)	10/25/2012	NA		400	
	Early Warning					
	MW643	5/2/2002	NA		270	
	MW643	10/25/2002	NA		18	
	MW643	5/15/2003	NA		270	
	MW643	10/20/2003	<0.1		180	
	MW643	5/18/2004	NA		140	
	MW643	10/19/2004	NA		120	
	MW643	7/11/2005	NA		150	
	MW643	10/12/2005	NA		210	
	MW643	4/27/2006	NA		340	
	MW643	10/16/2006	NA		270	
	MW643	4/18/2007	NA		270	
	MW643	10/3/2007	NA		150	
	MW643	4/29/2008	NA		130	
	MW643	10/8/2008	NA		93	
	MW643	5/2/2009	NA		110	
	MW643	10/28/2009	NA		53	
	MW643(DUP)	10/28/2009	NA		52	
	MW643	4/12/2010	NA		59	
	MW643	11/1/2010	NA		25	
	MW643	4/18/2011	NA		54	
	MW643	10/15/2011	NA		38	
	MW643	4/13/2012	NA		58	
	MW643	10/26/2012	NA		160	

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		Compound	Nitrate		Sulfate (SO_4)	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M1	*Early Warning*					
	MW644	5/2/2002	NA		370	
	MW644(DUP)	5/2/2002	NA		370	
	MW644	10/25/2002	NA		320	
	MW644	5/16/2003	NA		310	
	MW644(DUP)	5/16/2003	NA		**560**	
	MW644	10/20/2003	0.2		330	
	MW644	5/18/2004	NA		340	
	MW644	10/19/2004	NA		340	
	MW644	7/11/2005	NA		210	
	MW644	10/12/2005	NA		200	
	MW644	4/27/2006	NA		320	
	MW644	10/16/2006	NA		290	
	MW644	4/18/2007	NA		300	
	MW644	10/3/2007	NA		310	
	MW644	4/29/2008	NA		240	
	MW644(DUP)	4/29/2008	NA		240	
	MW644	10/8/2008	NA		95	
	MW644	5/2/2009	NA		240	
	MW644	10/28/2009	NA		120	/ U
	MW644	4/12/2010	NA		140	
	MW644	11/1/2010	NA		170	
	MW644	4/18/2011	NA		170	
	MW644	10/15/2011	NA		180	
	MW644	4/13/2012	NA		160	
	MW644	10/26/2012	NA		86	
	Compliance					
	MW645	5/2/2002	NA		400	
	MW645(DUP)	5/2/2002	NA		180	
	MW645	5/15/2003	NA		190	
	MW645	10/20/2003	0.15		240	
	MW645	5/18/2004	NA		210	
	MW645	10/19/2004	NA		190	
	MW645	7/11/2005	NA		140	
	MW645	10/12/2005	NA		150	
	MW645	4/27/2006	NA		210	
	MW645	10/16/2006	NA		170	
	MW645	4/18/2007	NA		150	
	MW645	10/3/2007	NA		150	
	MW645	4/29/2008	NA		94	
	MW645	10/8/2008	NA		100	
	MW645	5/2/2009	NA		65	
	MW645	10/28/2009	NA		65	
	MW645	4/12/2010	NA		57	
	MW645	11/1/2010	NA		70	
	MW645	4/18/2011	NA		90	
	MW645	10/15/2011	NA		88	
	MW645	4/13/2012	NA		67	
	MW645	10/25/2012	NA		90	

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		Compound	Nitrate		Sulfate (SO_4)	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M1	*Compliance*					
	MW646	5/2/2002	NA		250	
	MW646	10/25/2002	NA		180	
	MW646	5/15/2003	NA		80	
	MW646	10/20/2003	0.18		240	
	MW646	5/18/2004	NA		180	
	MW646	10/19/2004	NA		190	
	MW646	7/11/2005	NA		150	
	MW646	10/12/2005	NA		150	
	MW646	4/27/2006	NA		200	
	MW646	10/16/2006	NA		180	
	MW646	4/18/2007	NA		170	
	MW646	10/3/2007	NA		150	
	MW646	4/29/2008	NA		140	
	MW646	10/8/2008	NA		100	
	MW646	5/2/2009	NA		130	
	MW646	10/28/2009	NA		100	/ J
	MW646	4/12/2010	NA		190	
	MW646	11/1/2010	NA		150	
	MW646	4/19/2011	NA		120	
	MW646	10/15/2011	NA		120	
	MW646	4/13/2012	NA		110	
	MW646	10/25/2012	NA		110	
	MW648	5/2/2002	NA		29	
	MW648	10/25/2002	NA		28	
	MW648	5/19/2003	NA		50	/ J
	MW648	10/20/2003	0.072	J /	34	
	MW648	5/17/2004	NA		47	
	MW648	10/18/2004	NA		25	
	MW648	7/12/2005	NA		<5	
	MW648	10/12/2005	NA		33	
	MW648	4/28/2006	NA		28	
	MW648	10/12/2006	NA		34	
	MW648	4/23/2007	NA		24	
	MW648	10/3/2007	NA		30	
	MW648	4/30/2008	NA		120	
	MW648	10/8/2008	NA		28	
	MW648	10/28/2009	NA		10	
	MW648	4/12/2010	NA		10	
	MW648	11/1/2010	NA		10	
	MW648	4/18/2011	NA		37	
	MW648	10/15/2011	NA		7.5	
	MW648	4/12/2012	NA		34	
	MW648	10/25/2012	NA		14	

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		Compound	**Nitrate**		**Sulfate (SO_4)**	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M1	***Compliance***					
	MW649	5/2/2002	NA		100	
	MW649	10/24/2002	NA		**810**	
	MW649	5/20/2003	NA		210	/ J
	MW649	10/22/2003		/ R	**510**	/ J
	MW649(DUP)	10/22/2003		/ R	**500**	/ J
	MW649	5/18/2004	NA		160	
	MW649(DUP)	5/18/2004	NA		160	
	MW649	10/18/2004	NA		300	
	MW649(DUP)	10/18/2004	NA		300	
	MW649	7/11/2005	NA		230	
	MW649	10/13/2005	NA		320	
	MW649	4/27/2006	NA		180	
	MW649	10/17/2006	NA		250	
	MW649	4/18/2007	NA		110	
	MW649	10/8/2007	NA		220	
	MW649	4/29/2008	NA		100	
	MW649	10/8/2008	NA		120	
	MW649(DUP)	10/8/2008	NA		120	
	MW649	10/29/2009	NA		100	
	MW649	4/12/2010	NA		57	
	MW649	11/1/2010	NA		240	
	MW649	4/20/2011	NA		86	
	MW649	10/17/2011	NA		68	
	MW649	4/13/2012	NA		64	
	MW649	10/25/2012	NA		120	
	SW709	5/2/2009	NA		33	
	SW709	10/26/2009	NA		39	
	SW709	4/12/2010	NA		43	
	SW709	11/1/2010	NA		86	
	SW709	4/18/2011	NA		54	
	SW709	10/15/2011	NA		47	
	SW709	4/13/2012	NA		60	
	SW709	10/26/2012	NA		180	
MFG (M8)	***In-Plume***					
	MW330	5/7/2002	NA		370	
	MW330	10/21/2003		J / R	**500**	/ J
	MW330	5/21/2004	NA		**570**	
	MW330	10/21/2004	NA		**440**	
	MW330	10/19/2005	NA		340	
	MW330	5/4/2006	NA		**510**	
	MW330	10/12/2006	NA		**560**	
	MW330	4/30/2007	NA		**570**	
	MW330(DUP)	4/30/2007	NA		370	
	MW330	10/16/2007	NA		**540**	
	MW330	5/19/2008	NA		**570**	
	MW330	5/6/2009	NA		**530**	/ J
	MW330	10/23/2009	NA		**410**	/ J
	MW330	4/9/2010	NA		**410**	
	MW330	11/3/2010	NA		**460**	
	MW330	4/20/2011	NA		**420**	
	MW330	10/18/2011	NA		**440**	
	MW330	4/17/2012	NA		**430**	
	MW330	10/23/2012	NA		**440**	

TABLE B3

Summary of Analytical Results - Indicator Parameters
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		Compound	**Nitrate**		**Sulfate (SO_4)**	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M11	***Upgradient***					
	MW802	5/15/2008	<0.1		320	
	MW802	10/7/2008	0.034	F /	91	
	MW802(DUP)	10/7/2008	0.055	F /	93	
	MW802	5/4/2009	<0.10	U / UJ	45	/ J
	MW802	10/27/2009	0.13		82	
	MW802	4/13/2010	<0.10		51	
	MW802	10/28/2010	0.063	F / J	79	
	MW802	4/15/2011	0.42		130	
	MW802	10/11/2011	0.18	/ UJ	140	
	MW802	4/16/2012	0.11		85	
	MW802	10/24/2012	0.13	F /	260	
	MW803	10/7/2008	0.77		110	
	MW803	5/4/2009	0.82	/ J	91	/ J
	MW803	10/27/2009	0.28		87	
	MW803	4/13/2010	0.82		91	
	MW803	10/28/2010	0.95	/ J	91	
	MW803	4/15/2011	1.2		89	
	MW803	10/11/2011	1.1	/ J	92	
	MW803	10/24/2012	0.99		98	
	Downgradient					
	MW333	5/12/2008	0.19		66	
	MW333	10/6/2008	0.042	F /	68	
	MW333	5/5/2009	NA		58	/ J
	MW333	10/28/2009	<0.10		46	
	MW333	4/13/2010	0.22		59	
	MW333	10/28/2010	<0.10		56	
	MW333	4/18/2011	0.22		60	
	MW333	10/11/2011	0.19	/ UJ	59	
	MW333	10/24/2012	0.14	F /	59	
	MW334	5/12/2008	0.09	F /	**530**	
	MW334	10/6/2008	0.036	F /	**520**	
	MW334	5/5/2009	0.2	/ J	**420**	
	MW334	10/28/2009	<0.10		330	/ J
	MW334	4/13/2010	<0.10		340	
	MW334	10/28/2010	0.066	F / J	340	
	MW334	4/18/2011	0.094	F /	300	
	MW334	10/11/2011	0.23	/ UJ	250	
	MW334(DUP)	10/11/2011	0.25	/ UJ	260	
	MW334	10/24/2012	<0.2		240	
	MW335	5/13/2008	0.11		**1,300**	
	MW335	10/7/2008	0.12		**1,300**	
	MW335(DUP)	10/7/2008	<0.1		**460**	
	MW335	5/4/2009	0.21	/ J	**1,100**	
	MW335	10/28/2009	<0.10		190	/ J
	MW335	4/13/2010	0.36		**890**	
	MW335(DUP)	4/13/2010	0.34		**910**	
	MW335	10/28/2010	0.079	F / J	**780**	
	MW335	4/15/2011	0.47		**710**	
	MW335	10/12/2011	0.28	/ UJ	**750**	
	MW335	4/16/2012	0.31		**660**	
	MW335	10/24/2012	<0.2		**580**	

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		Compound	**Nitrate**		**Sulfate (SO_4)**	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M11	***Downgradient***					
	MW336	5/13/2008	0.026	F /	400	
	MW336	10/7/2008	0.031	F /	**510**	
	MW336	5/5/2009	<0.10		**490**	
	MW336(DUP)	5/5/2009	<0.10	/ U	**500**	
	MW336	10/27/2009	<0.10		**450**	/ J
	MW336(DUP)	10/27/2009	0.1		**2,100**	/ J
	MW336	4/13/2010	0.089	F /	**430**	
	MW336	10/28/2010	0.088	F / J	**480**	
	MW336	4/18/2011	0.14		400	
	MW336	10/12/2011	0.14	/ UJ	**410**	
	MW336	4/16/2012	0.12		**410**	
	MW336	10/24/2012	0.37		**510**	
	MW336(DUP)	10/24/2012	0.37		**530**	
	MW804	5/15/2008	<0.1		78	
	MW804	10/6/2008	0.088	F /	**520**	
	MW804	5/5/2009	<0.10	U / UJ	190	
	MW804	10/27/2009	0.11		210	
	MW804	4/13/2010	<0.10		140	
	MW804	10/28/2010	0.068	F / J	**470**	
	MW804	4/15/2011	0.087	F /	190	
	MW804(DUP)	4/15/2011	0.091	F /	190	
	MW804	10/11/2011	0.21	/ UJ	320	
	MW804	10/24/2012	0.17	F /	**490**	
	MW805	10/6/2008	1.5		**590**	
	MW805	5/5/2009	1.1	/ J	**490**	
	MW805	10/27/2009	1.4		**510**	/ J
	MW805	4/13/2010	0.29		**490**	
	MW805	11/2/2010	<0.10		**540**	
	MW805	4/15/2011	0.18		**500**	
	MW805	10/11/2011	0.21	/ UJ	**470**	
	MW805	4/16/2012	0.22		**470**	
	MW805	10/24/2012	0.21		**450**	
M13	***Upgradient***					
	MW806	5/15/2008	0.18		86	
	MW806	8/19/2008	<0.1		59	
	MW806	10/21/2008	0.093	F /	85	
	MW806	2/4/2009	0.49	/ J	75	
	MW806	5/5/2009	<0.10	/ U	70	
	MW806	7/29/2009	0.18		74	
	MW806	10/28/2009	0.12	/ J	63	/ J
	MW806	1/15/2010	0.34		69	
	MW806	4/14/2010	0.57		77	
	MW806	7/21/2010	0.092	F /	69	
	MW806	10/28/2010	0.055	F / J	80	
	MW806	1/27/2011	0.37		70	/ J
	MW806	4/19/2011	0.34		76	
	MW806	7/28/2011	0.16	/ J	79	
	MW806	10/12/2011	<0.10	U / UJ	66	
	MW806	2/29/2012	0.39		79	
	MW806	4/16/2012	0.39	/ J	80	
	MW806	7/17/2012	0,19	/ J	76	
	MW806	10/24/2012	0.13	F /	71	

TABLE B3

Summary of Analytical Results - Indicator Parameters
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		Compound	**Nitrate**		**Sulfate (SO_4)**	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Upgradient***					
	MW807	5/15/2008	<0.1		190	
	MW807(DUP)	5/15/2008	0.029	F /	190	
	MW807	8/19/2008	1.1		54	
	MW807(DUP)	8/19/2008	<0.1		55	
	MW807	10/21/2008	0.17		240	
	MW807	2/4/2009	<0.10	U / UJ	210	
	MW807	5/5/2009	<1.0	U / UJ	200	
	MW807	7/29/2009	<0.1		220	
	MW807	10/28/2009	<2.0		190	/ J
	MW807	1/15/2010	<2.0		210	
	MW807	4/14/2010	<2.0		200	
	MW807	7/21/2010	<2.0		220	
	MW807	10/28/2010	0.22	/ J	230	
	MW807	1/27/2011	<1.0		220	/ J
	MW807	4/19/2011	<1.0		230	
	MW807	7/28/2011	<1.0	/ J	230	
	MW807	10/12/2011	<1.0	U / UJ	230	
	MW807	2/29/2012	<1.0		230	
	MW807	4/16/2012	<1.0	U / UJ	230	
	MW807	7/17/2012		U / R	230	
	MW807	10/24/2012	<2		230	
	Downgradient					
	MW126R	2/4/2004	NA		84	
	MW126R	5/20/2008	0.047	F /	63	
	MW126R	8/20/2008	<0.1		<5	
	MW126R	10/22/2008	0.064	F /	62	
	MW126R	2/5/2009	<0.10	/ UJ	53	
	MW126R	5/5/2009	0.15	/ J	53	/ J
	MW126R	7/28/2009	0.12		53	
	MW126R	10/29/2009	0.95	/ J	79	/ J
	MW126R	1/14/2010	<2.0		57	
	MW126R	4/14/2010	0.83		83	
	MW126R(DUP)	4/14/2010	0.87		84	
	MW126R	7/20/2010	0.39		51	
	MW126R	10/28/2010	0.98	/ J	60	
	MW126R	1/28/2011	0.18		61	
	MW126R	4/19/2011	0.19		57	
	MW126R	7/28/2011	0.13	/ J	53	
	MW126R	10/13/2011	0.57		49	
	MW126R	2/29/2012	0.12		53	
	MW126R	4/16/2012	0.13		52	
	MW126R	7/17/2012	0.11	/ J	53	
	MW126R	10/25/2012	0.16	F /	55	

TABLE B3

Summary of Analytical Results - Indicator Parameters
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		Compound	Nitrate		Sulfate (SO_4)	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	*Downgradient*					
	MW362	2/3/2004	0.11		230	
	MW362	5/13/2008	0.079	F /	260	
	MW362	8/20/2008	<0.1		<5	
	MW362	10/22/2008	0.032	F /	310	
	MW362	2/5/2009	<0.10		240	
	MW362	5/5/2009	<1.0	U / UJ	240	
	MW362	7/28/2009	<0.10		260	
	MW362	10/29/2009	<2.0		360	
	MW362	1/14/2010	<2.0		230	
	MW362(DUP)	1/14/2010	<2.0		220	
	MW362	4/14/2010	<2.0		210	
	MW362	7/20/2010	<2.0		220	/ J
	MW362	10/28/2010	0.21	/ J	250	
	MW362	1/28/2011	<2.0		240	
	MW362	4/19/2011	<1.0		250	
	MW362	7/28/2011		U / R	260	
	MW362	10/13/2011	<1.0		260	
	MW362	2/29/2012	<1.0		280	
	MW362	4/16/2012	<1.0		270	
	MW362	4/16/2012	<1.0	U / UJ	270	
	MW362	7/17/2012	<1.0	/ J	270	
	MW362	10/25/2012	<2		250	
	MW808	5/15/2008	0.4		140	
	MW808	8/19/2008	<0.1		130	
	MW808	10/21/2008	0.14		100	
	MW808(DUP)	10/21/2008	0.18		99	
	MW808	2/4/2009	<0.10	U / UJ	150	
	MW808(DUP)	2/4/2009	<0.10		150	
	MW808	5/4/2009	0.33	/ J	190	
	MW808(DUP)	5/4/2009	2	/ J	180	
	MW808	7/29/2009	<0.1		380	
	MW808	10/29/2009	<0.10		140	/ J
	MW808	1/15/2010	<0.10		94	
	MW808	4/13/2010	<0.10		64	
	MW808	7/20/2010	<0.10		63	
	MW808(DUP)	7/20/2010	<0.10		65	
	MW808	10/29/2010	0.15		92	
	MW808	1/27/2011	<0.10		81	/ J
	MW808(DUP)	1/27/2011	0.58	F / U	87	/ J
	MW808	4/18/2011	<0.10		230	
	MW808(DUP)	4/18/2011	<0.10		220	
	MW808	7/28/2011	0.98		120	
	MW808(DUP)	7/28/2011	0.84	/ J	120	
	MW808	10/12/2011	<1.0	U / UJ	160	
	MW808	2/29/2012	<0.10		99	
	MW808	4/16/2012	<0.10		88	
	MW808	7/18/2012	<0.1		160	
	MW808	7/18/2012	<0.1		160	
	MW808	10/25/2012	<2		140	

TABLE B3

Summary of Analytical Results - Indicator Parameters
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		Compound	**Nitrate**		**Sulfate (SO_4)**	
		Units	mg/L		mg/L	
		Project Action Limit[1]	10		400	
		Surface Water RG	NS		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Downgradient***					
	MW809	5/15/2008	<0.1		6.1	
	MW809	8/19/2008	0.21		9.5	
	MW809	10/21/2008	0.16		12	
	MW809	2/5/2009	<0.10	U / UJ	9.9	
	MW809	5/5/2009	0.27	/ J	9.2	/ J
	MW809	7/29/2009	0.23		11	
	MW809	10/29/2009	0.09	F / J	8.9	/ J
	MW809(DUP)	10/29/2009	0.13	/ J	8.9	/ J
	MW809	1/15/2010	<0.10		9.5	
	MW809	4/13/2010	0.12		8	
	MW809	7/20/2010	0.11		9.9	
	MW809	10/29/2010	0.053	F /	10	
	MW809(DUP)	10/29/2010	0.053	F /	12	/ U
	MW809	1/27/2011	<0.10		9.4	/ J
	MW809	4/19/2011	0.067	F /	7.3	
	MW809	7/28/2011	0.14	/ U	7.7	
	MW809	10/12/2011	0.13	/ J	6.3	
	MW809(DUP)	10/12/2011	0.12	/ J	6.5	
	MW809	2/29/2012	<0.10		5.9	
	MW809	2/29/2012	<0.10		5.9	
	MW809	4/16/2012	0.13	/ J	5.4	
	MW809	7/18/2012	0.15		7.5	
	MW809	10/25/2012	0.14	F /	8.3	
	MW809	10/25/2012	0.11	F /	8.1	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG})obtained from Worksheet #15 of Appendix B (QAPP) of the *Long Term Monitoring Plan* (Toltest 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

Only data collected since 2001 are shown.
mg/L = milligrams per liter
NS = No standard
NA = not analyzed
LF/VF = Lab Flag/Validation Flag
Bolded result indicates Project Action Limit (RG) exceedance
< = Result shows laboratory Method Reporting Limit for non-detected results
R = Rejected data, unusable
F = Concentration below the reported detection limit
J = Estimated concentration
U = Not detected
UJ = Estimated detection limit
DUP = duplicate

B4 - Summary of Historical Groundwater Results – Volatile Organic Compounds

TABLE B4

Summary of Analytical Results - Volatile Organic Compounds
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		Compound	Acetone		Benzene		Carbon disulfide		Chlorobenzene		Chloromethane		1,1-DCA		1,2-DCA		cis-1,2-DCE		1,2-DCE(tot)		Ethyl Benzene		MethCl		MEK		Naphthalene		PCE		Toluene		1,1,1-TCA		TCE		VC		Xylenes (total)	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	NS		25		NS		500		NS		3500		25		200		25		1,000		NS		NS		NS		25		2,500		1,000		25		25		10,000	
		Surface Water RG	120,000		420		NS		79		NS		2,000		4,500		NS		1,100		17		NS		NS		NS		150		650		390		NS		NS		110	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M11	***Upgradient***																																							
	MW802	5/15/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW802	10/7/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW802(DUP)	10/7/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW802	5/4/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW802	10/28/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW802	4/13/2010	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW802	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW802	4/15/2011	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW802	10/11/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW802	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW802	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW803	10/7/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW803	5/4/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW803	10/27/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW803	4/13/2010	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW803	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW803	4/15/2011	<5	U / UJ	<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW803	10/11/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW803	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	Downgradient																																							
	MW333	5/12/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW333	10/6/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW333	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW333	10/28/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW333	4/13/2010	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW333	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW333	4/18/2011	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW333	10/11/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW333	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW334	5/12/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW334	10/6/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW334	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW334	10/28/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW334	4/13/2010	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW334	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW334	4/18/2011	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW334	10/11/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW334(DUP)	10/11/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW334	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW335	5/13/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW335	10/7/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW335(DUP)	10/7/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW335	5/4/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW335	10/28/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	

TABLE B4

Summary of Analytical Results - Volatile Organic Compounds
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	Acetone		Benzene		Carbon disulfide		Chlorobenzene		Chloromethane		1,1-DCA		1,2-DCA		cis-1,2-DCE		1,2-DCE(tot)		Ethyl Benzene		MethCl		MEK		Naphthalene		PCE		Toluene		1,1,1-TCA		TCE		VC		Xylenes (total)	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	NS		25		NS		500		NS		3500		25		200		25		1,000		NS		NS		NS		25		2,500		1,000		25		25		10,000	
		Surface Water RG	120,000		420		NS		79		NS		2,000		4,500		NS		1,100		17		NS		NS		NS		150		650		390		NS		NS		110	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M11	***Downgradient***																																							
	MW335	4/13/2010	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW335(DUP)	4/13/2010	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW335	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW335	4/15/2011	<5	U / UJ	<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW335	10/12/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW335	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW335	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW336	5/13/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW336	10/7/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW336	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW336(DUP)	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW336	10/27/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW336(DUP)	10/27/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW336	4/13/2010	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW336	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW336	4/18/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		0.94	F /	<1.0		<1.0		<1.0		<1.0		<1.0	
	MW336	10/12/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW336	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW336	10/24/2012	5.1		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW336(DUP)	10/24/2012	5.4		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW804	5/15/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW804	10/6/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW804	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW804	10/27/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW804	4/13/2010	<5.0	U / UJ	<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW804	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW804	4/15/2011	<5	U / UJ	<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW804(DUP)	4/15/2011	<5	U / UJ	<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW804	10/11/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW804	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW805	10/6/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW805	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW805	10/27/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW805	4/13/2010	<5.0	U / UJ	<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW805	11/2/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW805	4/15/2011	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW805	10/11/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW805	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW805	10/24/2012	5.5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	

TABLE B4

Summary of Analytical Results - Volatile Organic Compounds
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	Acetone		Benzene		Carbon disulfide		Chlorobenzene		Chloromethane		1,1-DCA		1,2-DCA		cis-1,2-DCE		1,2-DCE(tot)		Ethyl Benzene		MethCl		MEK		Naphthalene		PCE		Toluene		1,1,1-TCA		TCE		VC		Xylenes (total)	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	NS		25		NS		500		NS		3500		25		200		25		1,000		NS		NS		NS		25		2,500		1,000		25		25		10,000	
		Surface Water RG	120,000		420		NS		79		NS		2,000		4,500		NS		1,100		17		NS		NS		NS		150		650		390		NS		NS		110	
Site	Well	Date	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF	Result	LF/VF
M13	*Upgradient*																																							
	MW806	5/15/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW806	8/19/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW806	10/21/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW806	2/4/2009	<5.0	U / UJ	<1.0	U / UJ	<5.0	U / UJ	<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<2.0	
	MW806	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW806	7/29/2009	<5		<1		<5	U / UJ	<1		<1		<1		<1		<1		NA		<1		<3		<5	U / UJ	<1		<1		<1		<1		<1		<1		<2	
	MW806	10/28/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW806	1/15/2010	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW806	4/14/2010	<5.0	U / UJ	<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW806	7/21/2010	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW806	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW806	1/27/2011	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<2.0	
	MW806	4/19/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		2.6	F / U	<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW806	7/28/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW806	10/12/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW806	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW806	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW806	7/17/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW806	10/24/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW807	5/15/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW807(DUP)	5/15/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW807	8/19/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW807(DUP)	8/19/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW807	10/21/2008	<10		<1		<5		<1		<1		1.3		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW807	2/4/2009	<5.0	U / UJ	<1.0	U / UJ	<5.0	U / UJ	<1.0	U / UJ	<1.0		1.2		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<2.0	
	MW807	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	1.5		<1.0		0.79	F /	NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW807	7/29/2009	<5		<1		<5	U / UJ	<1		<1		1.5		<1		<1		NA		<1		<3		<5	U / UJ	<1		<1		<1		<1		<1		<1		<2	
	MW807	10/28/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	1.5		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW807	1/15/2010	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		1.5		<1.0		0.76	F /	NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW807	4/14/2010	<5.0	U / UJ	<1.0		<5.0	U / UJ	<1.0		<1.0		1.6		<1.0		0.66	F /	NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW807	7/21/2010	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	1.6		<1.0		0.85	F /	NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW807	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		1.7		<1.0		0.81	F /	NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW807	1/27/2011	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<2.0	
	MW807	4/19/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	1.6		<1.0		0.94	F /	NA		<1.0		2.6	F / U	<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW807	7/28/2011	<5.0		<1.0		<5.0		<1.0		<1.0		1.6		<1.0		0.76	F /	NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW807	10/12/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	1.7		<1.0		0.95	F /	NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW807	2/29/2012	<5.0		<1.0		2.4	F /	<1.0		<1.0	U / UJ	1.4		<1.0		0.79	F /	NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW807	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW807	7/17/2012		U / R	<1		<5		<1			U / R	1.5		<1		1.1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW807	10/24/2012	<5		<1		<5		<1		<1		1.5		<1		1		NA		<1		<3		<5		<1		<1		<1		<1		0.23	F /	<1		<1	
	Downgradient																																							
	MW126R	5/20/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW126R	8/20/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW126R	10/22/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW126R	2/5/2009	<5.0	U / UJ	<1.0	U / UJ	<5.0	U / UJ	<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<2.0	
	MW126R	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		1.2	/ J	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW126R	7/28/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW126R	10/29/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW126R	1/14/2010	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW126R	4/14/2010	<5.0	U / UJ	<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW126R(DUP)	4/14/2010	<5.0	U / UJ	<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW126R	7/20/2010	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW126R	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW126R	1/28/2011	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<2.0	
	MW126R	4/19/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		2.5	F / U	<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	

TABLE B4

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Joliet Army Ammunition Plant
Will County, Illinois

		Compound	Acetone		Benzene		Carbon disulfide		Chlorobenzene		Chloromethane		1,1-DCA		1,2-DCA		cis-1,2-DCE		1,2-DCE(tot)		Ethyl Benzene		MethCl		MEK		Naphthalene		PCE		Toluene		1,1,1-TCA		TCE		VC		Xylenes (total)	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	NS		25		NS		500		NS		3500		25		200		25		1,000		NS		NS		NS		25		2,500		1,000		25		25		10,000	
		Surface Water RG	120,000		420		NS		79		NS		2,000		4,500		NS		1,100		17		NS		NS		NS		150		650		390		NS		NS		110	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Downgradient***																																							
	MW126R	7/28/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW126R	10/13/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW126R	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW126R	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		0.23	F /	<1.0		<1.0	
	MW126R	7/17/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW126R	10/25/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW362	5/13/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW362	8/20/2008	5.8	F /	<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW362	10/22/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW362	2/5/2009	<5.0	U / UJ	<1.0	U / UJ	<5.0	U / UJ	<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<2.0	
	MW362	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		1.7	/ J	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW362	7/28/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW362	10/29/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW362	1/14/2010	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW362(DUP)	1/14/2010	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW362	4/14/2010	<5.0	U / UJ	<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW362	7/20/2010	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW362	10/28/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		0.43	F /	<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW362	1/28/2011	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<2.0	
	MW362	4/19/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		2.5	F / U	<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362	7/28/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362	10/13/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362(DUP)	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW362	7/17/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW362	10/25/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW808	5/15/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW808	8/19/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW808	10/21/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW808(DUP)	10/21/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW808	2/4/2009	<5.0	U / UJ	<1.0	U / UJ	<5.0	U / UJ	<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<2.0	
	MW808(DUP)	2/4/2009	<5.0	U / UJ	<1.0	U / UJ	<5.0	U / UJ	<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<2.0	
	MW808	5/4/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW808(DUP)	5/4/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW808	7/29/2009	<5		<1		<5	U / UJ	<1		<1		<1		<1		<1		NA		<1		<3		<5	U / UJ	<1		<1		<1		<1		<1		<1		<2	
	MW808	10/29/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW808	1/15/2010	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW808	4/13/2010	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW808	7/20/2010	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW808(DUP)	7/20/2010	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW808	10/29/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW808	1/27/2011	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<2.0	
	MW808(DUP)	1/27/2011	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		2.8	F /	<5.0		<1.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<2.0	
	MW808	4/18/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		2.5	F / U	<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW808(DUP)	4/18/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		2.7	F / U	<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW808	7/28/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW808(DUP)	7/28/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW808	10/12/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW808	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW808	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW808	7/18/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW808(DUP)	7/18/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW808	10/25/2012	22		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	

TABLE B4

Summary of Analytical Results - Volatile Organic Compounds
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**Acetone**		**Benzene**		**Carbon disulfide**		**Chlorobenzene**		**Chloromethane**		**1,1-DCA**		**1,2-DCA**		**cis-1,2-DCE**		**1,2-DCE(tot)**		**Ethyl Benzene**		**MethCl**		**MEK**		**Naphthalene**		**PCE**		**Toluene**		**1,1,1-TCA**		**TCE**		**VC**		**Xylenes (total)**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	NS		25		NS		500		NS		3500		25		200		25		1,000		NS		NS		NS		25		2,500		1,000		25		25		10,000	
		Surface Water RG	120,000		420		NS		79		NS		2,000		4,500		NS		1,100		17		NS		NS		NS		150		650		390		NS		NS		110	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Downgradient***																																							
	MW809	5/15/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW809	8/19/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW809	10/21/2008	<10		<1		<5		<1		<1		<1		<1		NA		<2		<1		<1		<10		NA		<1		<1		<1		<1		<1		<2	
	MW809	2/5/2009	<5.0	U / UJ	<1.0	U / UJ	<5.0	U / UJ	<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<2.0	
	MW809	5/5/2009	<5.0		<1.0		<5.0	U / UJ	<1.0		1.1	/ J	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW809	7/29/2009	<5		<1		<5	U / UJ	<1		<1		<1		<1		<1		NA		<1		<3		<5	U / UJ	<1		<1		<1		<1		<1		<1		<2	
	MW809	10/29/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW809(DUP)	10/29/2009	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW809	1/15/2010	<5.0	U / UJ	<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW809	4/13/2010	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW809	7/20/2010	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW809	10/29/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW809(DUP)	10/29/2010	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<2.0	
	MW809	1/27/2011	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		2.4	F /	<5.0		<1.0		<1.0		<1.0		<1.0		<1.0	U / UJ	<2.0	
	MW809	4/19/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		2.6	F / U	<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		
M13	***Downgradient***																																							
	MW809	7/28/2011	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809	10/12/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809(DUP)	10/12/2011	<5.0		<1.0		<5.0	U / UJ	<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809(DUP)	2/29/2012	<5.0		<1.0		<5.0		<1.0		<1.0	U / UJ	<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0	U / UJ	<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809	4/16/2012	<5.0		<1.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		NA		<1.0		<3.0		<5.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0		<1.0	
	MW809	7/18/2012		U / R	<1		<5		<1			U / R	<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW809	10/25/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	
	MW809(DUP)	10/25/2012	<5		<1		<5		<1		<1		<1		<1		<1		NA		<1		<3		<5		<1		<1		<1		<1		<1		<1		<1	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the *Long Term Monitoring Plan* (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of compounds is used for reporting based on historically detected and reported compounds.
Only data collected since 2001 are shown.
µg/L = micrograms per liter
NS = No standard
NA = not analyzed
LF/VF = Lab Flag/Validation Flag
Bolded result indicates Project Action Limit (RG) exceedance
< = Result shows laboratory Method Reporting Limit for non-detected results
F = Concentration below the reported detection limit
J = Estimated concentration
U = Not detected
UJ = Estimated detection limit
DUP = duplicate
1,1-DCA = 1,1-Dichloroethane
1,2-DCA = 1,2-Dichloroethane
cis-1,2-DCE = cis-1,2-Dichloroethene
MethCl = Methylene Chloride
MEK = Methyl Ethyl Ketone (2-butanone)
PCE = Tetrachloroethene
1,1,1-TCA = 1,1,1-Trichloroethane
TCE = Trichloroethene
VC = Vinyl chloride

B5 - Summary of Historical Analytical Results – Semi-Volatile Organic Compounds

TABLE B5

Summary of Analytical Results - Semivolatile Organic Compounds
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**2,4-DNT**		**2,6-DNT**		**Naphthalene**		**NB**		**2-Methylnaphthalene**		**Phenol**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	0.42		0.42		NS		51		NS		NS	
		Surface Water RG	330		150		68		8000		12		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M11	***Upgrdient***													
	MW802	5/15/2008	<0.95		<0.48		<0.95		<1.4		<0.48		<4.8	
	MW802	10/7/2008	<0.95		<0.48		<0.95		<1.4		<0.48		<4.8	
	MW802(DUP)	10/7/2008	<0.96		<0.48		<0.96		<1.4		<0.48		<4.8	
	MW802	5/4/2009	<1.3		<0.48		<0.95		<0.95		<0.48		<4.8	
	MW802	10/27/2009	<1.3		<0.47		<0.93		<0.93	U / UJ	<0.47		<4.7	U / UJ
	MW802	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW802	10/28/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW802	4/15/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW802	10/11/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW802	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW802	10/24/2012	<1.4		<0.51		<1		<1		<0.51		<5.1	
	MW803	10/7/2008	<0.93		<0.47		<0.93		<1.4		<0.47		<4.7	
	MW803	5/4/2009	<1.3		<0.47		<0.94		<0.94		<0.47		<4.7	
	MW803	10/27/2009	<1.3		<0.47		<0.94		<0.94	U / UJ	<0.47		<4.7	U / UJ
	MW803	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW803	10/28/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW803	4/15/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW803	10/11/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW803	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	Downgradient													
	MW333	5/12/2008	<0.98		<0.49		<0.98		<1.5		<0.49		<4.9	
	MW333	10/6/2008	<0.98		<0.49		<0.98		<1.4		<0.47		<4.7	
	MW333	5/5/2009	<1.3		<0.47		<0.94		<0.94		<0.47		<4.7	
	MW333	10/28/2009	<1.3		<0.47		<0.93		<0.93	U / UJ	<0.47		<4.7	U / UJ
	MW333	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW333	10/28/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW333	4/18/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW333	10/11/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW333	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW334	5/12/2008	<0.98		<0.49		<0.98		<1.5		<0.49		<4.9	
	MW334	10/6/2008	<0.97		<0.49		<0.97		<1.5		<0.49		<4.9	
	MW334	5/5/2009	<1.3		<0.48		<0.95		<0.95		<0.48		<4.8	
	MW334	10/28/2009	<1.3		<0.47		<0.93		<0.93	U / UJ	<0.47		<4.7	U / UJ
	MW334	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW334	10/28/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW334	4/18/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW334	10/11/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW334(DUP)	10/11/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW334	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	

TABLE B5

Summary of Analytical Results - Semivolatile Organic Compounds
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Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**2,4-DNT**		**2,6-DNT**		**Naphthalene**		**NB**		**2-Methylnaphthalene**		**Phenol**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	0.42		0.42		NS		51		NS		NS	
		Surface Water RG	330		150		68		8000		12		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M11	***Downgradient***													
	MW335	5/13/2008	<0.96		<0.48		<0.96		<1.4		<0.48		<4.8	
	MW335	10/7/2008	<0.99		<0.5		<0.99		<1.5		<0.5		<5	
	MW335(DUP)	10/7/2008	<0.94		<0.47		<0.94		<1.4		<0.47		<4.7	
	MW335	5/4/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW335	10/28/2009	<1.3		<0.47		<0.94		<0.94	U / UJ	<0.47		<4.7	U / UJ
	MW335	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW335(DUP)	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW335	10/28/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW335	4/15/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW335	10/12/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW335	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW335	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW336	5/13/2008	<0.96		<0.48		<0.96		<1.4		<0.48		<4.8	
	MW336	10/7/2008	<0.93		<0.47		<0.93		<1.4		<0.47		<4.7	
	MW336	5/5/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW336(DUP)	5/5/2009	<1.3		<0.47		<0.94		<0.94		<0.47		<4.7	
	MW336	10/27/2009	<1.3		<0.47		<0.93		<0.93	U / UJ	<0.47		<4.7	U / UJ
	MW336(DUP)	10/27/2009	<1.3		<0.47		<0.93		<0.93	U / UJ	<0.47		<4.7	U / UJ
	MW336	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW336	10/28/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW336	4/18/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW336	10/12/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW336	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW336	10/24/2012	<1.3	U / J	<0.47	U / J	<0.93	U / J	<0.93	U / J	<0.47	U / J	<4.7	U / J
	MW336	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW804	5/15/2008	<0.96		<0.48		<0.96		<1.4		<0.48		<4.8	
	MW804	10/6/2008	<0.94		<0.47		<0.94		<1.4		<0.47		<4.7	
	MW804	5/5/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW804	10/27/2009	<1.3		<0.48		<0.95		<0.95	U / UJ	<0.48		<4.8	U / UJ
	MW804	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW804	10/28/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW804	4/15/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW804(DUP)	4/15/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW804	10/11/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW804	10/24/2012	<4		<1.4		<2.9		<2.9		<1.4		<14	
	MW805	10/6/2008	<1		<0.51		<1		<1.5		<0.51		<5.1	
	MW805	5/5/2009	<1.3		<0.47		<0.94		<0.94		<0.47		<4.7	
	MW805	10/27/2009	<1.3		<0.47		<0.93		<0.93	U / UJ	<0.47		<4.7	U / UJ
	MW805	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW805	11/2/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW805	4/15/2011	<1.3		<0.47		<0.93		<0.93	U / UJ	<0.47		<4.7	
	MW805	10/11/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW805	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW805	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	

TABLE B5

Summary of Analytical Results - Semivolatile Organic Compounds
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Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**2,4-DNT**		**2,6-DNT**		**Naphthalene**		**NB**		**2-Methylnaphthalene**		**Phenol**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	0.42		0.42		NS		51		NS		NS	
		Surface Water RG	330		150		68		8000		12		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Upgradient***													
	MW806	5/15/2008	<0.95		<0.48		<0.95		<1.4		<0.48		<4.8	
	MW806	8/19/2008	<0.94		<0.47		<0.94		<1.4		<0.47		<4.7	
	MW806	10/21/2008	<1		<0.5		<1		<1.5		<0.5		<5	
	MW806	2/4/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW806	5/5/2009	<1.3		<0.47		<0.93		<0.93		<0.47		8.2	
	MW806	7/29/2009	<1.3	U / UJ	<0.47		<0.93		<0.93		<0.47		<4.7	
	MW806	10/28/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW806	1/15/2010	<1.3		0.23	F /	<0.94		<0.94		<0.47		<4.7	
	MW806	4/14/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW806	7/21/2010	<1.3		<0.47		0.64	F /	<0.93		<0.47		<4.7	
	MW806	10/28/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW806	1/27/2011	<1.4		<0.50		<1.0		<1.0		<0.50	U / UJ	<5.0	
	MW806	4/19/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW806	7/28/2011	<1.4		<0.51		<1.0		<1.0		<0.51		<5.1	
	MW806	10/12/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW806	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW806	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW806	7/17/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW806	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	5/15/2008	<0.99		<0.5		<0.99		<1.5		<0.5		<5	
	MW807(DUP)	5/15/2008	<0.95		<0.48		<0.95		<1.4		<0.48		<4.8	
	MW807	8/19/2008	<0.94		<0.47		<0.94		<1.4		<0.47		<4.7	
	MW807(DUP)	8/19/2008	<0.94		<0.47		<0.94		<1.4		<0.47		<4.7	
	MW807	10/21/2008	<0.93		<0.47		<0.93		<1.4		<0.47		<4.7	
	MW807	2/4/2009	<1.3		<0.47		0.49	F /	<0.93		1.4		<4.7	
	MW807	5/5/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	7/29/2009	<1.3	U / UJ	<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	10/28/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	1/15/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	4/14/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW807	7/21/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	10/28/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	1/27/2011	<1.4		<0.50		<1.0		<1.0		<0.50	U / UJ	<5.0	
	MW807	4/19/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	7/28/2011	<1.4	U / UJ	<0.49	U / UJ	<0.98	U / UJ	<0.98	U / UJ	<0.49	U / UJ	<4.9	
	MW807	10/12/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW807	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW807	7/17/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW807	10/24/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	

TABLE B5

Summary of Analytical Results - Semivolatile Organic Compounds
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**2,4-DNT**		**2,6-DNT**		**Naphthalene**		**NB**		**2-Methylnaphthalene**		**Phenol**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	0.42		0.42		NS		51		NS		NS	
		Surface Water RG	330		150		68		8000		12		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Downgradient***													
	MW126R	5/20/2008	<0.93		<0.47		<0.93		<1.4		<0.47		<4.7	
	MW126R	8/20/2008	<0.94		<0.47		<0.94		<1.4		<0.47		<4.7	
	MW126R	10/22/2008	<0.99		<0.5		<0.99		<1.5		<0.5		<5	
	MW126R	2/5/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW126R	5/5/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW126R	7/28/2009	<1.3	U / UJ	<0.47		<0.93		<0.93		<0.47		<4.7	
	MW126R	10/29/2009	<1.3		<0.47		<0.94		<0.94		<0.47		<4.7	
	MW126R	1/14/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW126R	4/14/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW126R(DUP)	4/14/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW126R	7/20/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW126R	10/28/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW126R	1/28/2011	<1.4		<0.52		<1.0		<1.0		<0.52		<5.2	
	MW126R	4/19/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW126R	7/28/2011	<1.4		<0.50		<0.99		<0.99		<0.50		<5.0	
	MW126R	10/13/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW126R	2/29/2012	<1.3		<0.48		<0.95		<0.95		<0.48	U / UJ	<4.8	
	MW126R	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW126R	7/17/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW126R	10/25/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW362	5/13/2008	<0.98		<0.49		<0.98		<1.5		<0.49		<4.9	
	MW362	8/20/2008	<0.95		<0.48		<0.95		<1.4		<0.48		<4.8	
	MW362	10/22/2008	<0.97		<0.49		<0.97		<1.5		<0.49		<4.9	
	MW362	2/5/2009	**2.2**		0.2	F /	<0.93		<0.93		<0.47		<4.7	
	MW362	5/5/2009	<1.3		0.19	F /	<0.93		<0.93		<0.47		<4.7	
	MW362	7/28/2009	**1.3**	F / J	<0.47		<0.93		<0.93		<0.47		<4.7	
	MW362	10/29/2009	**2.3**		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW362	1/14/2010	**3.8**		0.32	F /	<0.93		<0.93		<0.47		<4.7	
	MW362(DUP)	1/14/2010	**3.6**		0.35	F /	<0.93		<0.93		<0.47		<4.7	
	MW362	4/14/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW362	7/20/2010	**2.2**		**0.55**		<0.93		<0.93		<0.47		<4.7	
	MW362	10/28/2010	**5.7**		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW362	1/28/2011	**7.1**		<0.52		0.17	F /	<1.0		<0.52		<5.2	
	MW362	4/19/2011	**1.7**		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW362	7/28/2011	**0.95**	F /	0.2	F /	<1.1		<1.1		<0.54		<5.4	
	MW362	10/13/2011	**1.9**		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW362	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW362	4/16/2012	**3.3**		0.25	F /	<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW362	4/16/2012	**2.6**		0.29	F /	<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW362	7/17/2012	**2.8**		0.29	F /	<0.93		<0.93		<0.47		<4.7	
	MW362	10/25/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	

TABLE B5

Summary of Analytical Results - Semivolatile Organic Compounds
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	**2,4-DNT**		**2,6-DNT**		**Naphthalene**		**NB**		**2-Methylnaphthalene**		**Phenol**	
		Units	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
		Project Action Limit[1]	0.42		0.42		NS		51		NS		NS	
		Surface Water RG	330		150		68		8000		12		NS	
Site	**Well**	**Date**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**	**Result**	**LF/VF**
M13	***Downgradient***													
	MW808	5/15/2008	<0.95		<0.48		<0.95		<1.4		<0.48		<4.8	
	MW808	8/19/2008	<0.98		<0.49		<0.98		<1.5		<0.49		<4.9	
	MW808	10/21/2008	<0.98		<0.49		<0.98		<1.5		<0.49		<4.9	
	MW808(DUP)	10/21/2008	<0.99		<0.5		<0.99		<1.5		<0.5		<5	
	MW808	2/4/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808(DUP)	2/4/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	5/4/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808(DUP)	5/4/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	7/29/2009	<1.3	U / UJ	<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	10/29/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	1/15/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW808	7/20/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808(DUP)	7/20/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	10/29/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	1/27/2011	<1.5		<0.54		<1.1		<1.1		<0.54	U / UJ	<5.4	
	MW808(DUP)	1/27/2011	<1.4		<0.51		<1.0		<1.0		<0.51	U / UJ	<5.1	
	MW808	4/18/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808(DUP)	4/18/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	7/28/2011		U / R		U / R		U / R		U / R		U / R		U / R
	MW808(DUP)	7/28/2011		U / R		U / R		U / R		U / R		U / R		U / R
	MW808	10/12/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW808	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW808	7/18/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	7/18/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW808	10/25/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
M13	***Downgradient***													
	MW809	5/15/2008	<0.95		<0.48		<0.95		<1.4		<0.48		<4.8	
	MW809	8/19/2008	<0.94		<0.47		<0.94		<1.4		<0.47		<4.7	
	MW809	10/21/2008	<0.98		<0.49		<0.98		<1.5		<0.49		<4.9	
	MW809	2/5/2009	<1.3		<0.47		<0.93		<0.93		0.16	F /	<4.7	
	MW809	5/5/2009	<1.3		<0.47		<0.93		<0.93	U / UJ	<0.47		<4.7	
	MW809	7/29/2009	<1.3	U / UJ	<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809	10/29/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809(DUP)	10/29/2009	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809	1/15/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809	4/13/2010	<1.3	U / UJ	<0.47	U / UJ	<0.93		<0.93		<0.47		<4.7	
	MW809	7/20/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809	10/29/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809(DUP)	10/29/2010	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809	1/27/2011	<1.4		<0.51		<1.0		<1.0		<0.51	U / UJ	<5.1	
	MW809	4/19/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809	7/28/2011	<1.3	U / UJ	<0.47	U / UJ	<0.93	U / UJ	<0.93	U / UJ	<0.47	U / UJ	<4.7	
	MW809	10/12/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809(DUP)	10/12/2011	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW809(DUP)	2/29/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW809	4/16/2012	<1.3		<0.47		<0.93		<0.93		<0.47	U / UJ	<4.7	
	MW809	7/18/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809	10/25/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	
	MW809(DUP)	10/25/2012	<1.3		<0.47		<0.93		<0.93		<0.47		<4.7	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the *Long Term Monitoring Plan* (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of compounds analyzed is used for reporting based on historically detected and reported compounds.
Only data collected since 2001 are shown.

µg/L = microgram per liter
NS = No standard
LF/VF = Lab Flag/Validation Flag
Bolded result indicates Project Action Limit (RG) exceedance
< = Result shows laboratory Method Reporting Limit for non-detected results
R = Rejected data, unusable
F = Concentration below the reported detection limit
J = Estimated concentration
U = Not detected
UJ = Estimated detection limit
DUP = duplicate

2,4-DNT = 2,4-Dinitrotoluene
2,6-DNT = 2,6-Dinitrotoluene
NB = Nitrobenzene

APPENDIX C

DATA REPORTS

C1 - DATA EVALUATION REPORTS
C2 - DATA USABILITY REPORT

C1 - DATA EVALUATION REPORTS

JOAAP Data Evaluation Report - July 2012 Report 1

for

TestAmerica Laboratory SDG 500-48319-1

(July 2012 Samples)

Solutions for Your Site Development, Construction, and Environmental Projects.

January 4, 2013 Project No. 22271

Revised Data Quality Evaluation of Analytical Data for Environmental Remediation Services

Contract No. W91ZLK-05-D-0012
Site-Wide Long Term Groundwater Monitoring at Joilet Army Ammunition Plant, Wilmington, Illinois

INTRODUCTION:
TolTest has developed this draft Data Quality Evaluation (DQE) Report for the groundwater sampling conducted for site-wide long-term monitoring at the Joliet Army Ammunition Plant (JOAAP), in Wilmington, Illinois. The data evaluation was completed on the groundwater analytical data generated from groundwater monitoring samples collected in July 2012. Groundwater samples were analyzed for volatile organic compounds (VOCs) using *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW 846) Method 8260B, metals using SW846 6010B, mercury using SW846 7470A, semi-volatile organic compounds (SVOC) using SW846 8270C, explosives using SW846 8330, and anions (nitrate as N, and sulfate) using MCAWW 300.0 by Test America, Inc. **Table 1** shows a cross reference of the sample information to the laboratory analytical data package 500-48319-1.

Table 1, Groundwater Samples

Date(s) Sampled:	July 17, 2012	July 17, 2012	July 17, 2012	July 17, 2012	July 18, 2012	July 18, 2012	July 18, 2012	July 18, 2012
Report Date:	August 9, 2012	August 9, 2012	August 9, 2012	August 9, 2012	August 9, 2012	August 9, 2012	August 9, 2012	August 9, 2012
Lab No.:	500-48319-1	500-48319-2	500-48319-3	500-48319-4	500-48319-5	500-48319-6	500-48319-7	500-48319-8TB
Sample ID:	JP-M13-GWMW 806	JP-M13-GWMW 807	JP-M13-GWMW 362	JP-M13-GWMW 126R	JP-M13-GWMW 808	JP-M13-GWMW 809	JP-M13-GWMW 999	Trip Blank
Matrix:	water	water	water	water	water	water	water	water
Time Sampled	10:10	11:20	12:40	13:25	14:10	13:15	12:00	

OVERVIEW:
The samples were assessed based on the criteria specified in the *Final Quality Assurance Project Plan Environmental Remediation Services at Joliet Army Ammunition Plant, Will County, Illinois* (TolTest, Inc. March 2010) (QAPP), the *Louisville DOD Quality Systems Manual Supplement, version 1* (USACE Louisville District, March 2007), DoD Quality Systems Manual Version 4 Draft, (January 2009), *Louisville Chemistry Guideline*, (LCG) (June 2002), and U.S. EPA Contract Laboratory Program National Functional Guidelines in conjunction with the internal laboratory quality control (QC) criteria. Quality checks evaluated included holding times, sample preservation, cooler temperatures, daily tune requirements, internal standards, surrogates, laboratory control samples (LCS), method blanks, trip blank, matrix spike and duplicate (MS/MSD) analysis, initial and continuing calibration verifications and blanks (ICV, CCV, CCB), and QC Method Reporting Limit (QC/MRL) recovery. Level III data review was completed in accordance with the QAPP, therefore raw data was not evaluated.

SUMMARY

This section summarizes the findings from the data evaluation of the laboratory analytical data packages. The tables below present the quality control check requirements, the analytes that failed the criteria, analysis flags, and the data to which the flags are applied. Each of the quality checks reviewed in the laboratory analytical data package are summarize under each method subheading.

EPA SW846 Method 8260

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Tuning Requirements

- Instrument tuning requirements were met and within quality control requirements.

Initial Calibration

- Initial calibration requirements were met. The percent relative standard deviations (%RSD) were less than or equal to 15% for each individual compound and less than or equal to 30% for calibration check compounds (CCC).

- In cases where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990 which meets quality control requirements.

- The average response factors (RRF) for all compounds in system performance check compounds (SPCC) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent differences (%D) were within quality control requirements of less than or equal to 25% for each individual compound with the following exceptions. The ICV %D exceeded the quality control limits for dichlorodifluoromethane, chloromethane, acetone, iodomethane, and methyl acetate. Dichlorodifluormethane, chloromethane, and acetate are target compounds. Initial calibration was not re-run. Consistent with the QAPP Worksheet #28 and referenced laboratory SOP Table B-3 the data should be qualified as follows:

Date	Compound	%D	Associated Samples	Flag
7/24/12	Dichlorodifluoromethane Chloromethane Acetone	52.2% 37.3% 37.8%	JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13-GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	R

Continuing Calibration

- The continuing calibration verification samples (CCV) were run every twelve hours consistent with the method, DoD QSM, and U.S. EPA National Functional Guidelines. The project QAPP requires the CCV to be run every ten samples.
- The %D for cyclohexanone in the CCV exceeded the requirement of <30% but was not a target analyte.

- The %D for all compounds were within the quality control requirements of less than or equal to 20%. The %D for the CCC and the continuing calibration response factors for SPCC were with quality control limits.

Blanks

- The method blanks met quality control requirements. The trip blank met quality control requirements.

Surrogate Spikes

- Surrogate percent recoveries (%R) were within quality control requirements.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

Laboratory Control Samples

- The %R for the laboratory control samples (LCS) were within quality control limits.

Internal Standards

- The internal standard areas and retention times were within quality control limits.

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

EPA SW846 Method 8270

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Tuning Requirements

- Instrument tuning requirements were met and within quality control requirements.

Initial Calibration

- Initial calibration requirements were met. The percent relative standard deviations (%RSD) were less than or equal to 15% for each individual compound and less than or equal to 30% for calibration check compounds (CCC) with the following exceptions.

- The %RSD for isodrin in the initial calibration curve analyzed on instrument CMS11 exceeded the QC limit. Associated samples included the quality control samples MB, LCS/LCSD associated with project samples JP-M13-GWMW808, JP-M13-GWMW809, and JP-M13-GWMW999. Isodrin is not a target analyte, therefore data are not affected.

- The %RSD for chrysene in the initial calibration curve analyzed on instrument CMS12 exceeded the QC limit. The associated samples included JP-M13-GWMW806, JP-M13-GWMW807, JP-M13-GWMW362, JP-M13-GWMW126R, JP-M13-GWMW808, JP-M13-GWMW809, and JP-M13-GWMW999. Chrysene is a target analyte and sample results for this analyte in the associated samples were non-detect. Historical data

indicate that chrysene has not been detected in the samples over time and therefore would not be expected to be detected in the sample results then the data may be qualified with a "J" flag.

Date	Compound	%RSD	Associated Samples	Flag
8/7/12 instrument CMS12	chrysene	20.0%	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13-GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	J

- In cases where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r2) were greater than or equal to 0.990.

- The average response factors (RRF) for all compounds in system performance check compounds (SPCC) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent differences (%D) were within quality control requirements of less than or equal to 25% for each individual compound.

Continuing Calibration

- The continuing calibration verification samples (CCV) were run every twelve hours consistent with the method, DoD QSM, and U.S. EPA National Functional Guidelines. The project QAPP requires the CCV to be run every ten samples.
- The %D for all compounds were within the quality control requirements of less than or equal to 20% with the following exceptions. The %D for pyridine in CCV 500-157408/6 analyzed on instrument CMS11 exceeded the QC limit. Pyridine is not a target analyte.

- The %D for n-nitrosodimethylamine, n-nitrosodi-n-propylamine, n-nitrosopyrrolidine, 2-nitrophenol, n-nitrosodi-n-butylamine, 2-nitroaniline, 5-nitro-o-toluidine, 4-nitroaniline, phenacetin, pentachloronitrobenzene, pronaminde, benzidine, di-n-octylphthalate exceeded the QC limit of 20% in the CCV 500-158843/2 analyzed on instrument CMS12. N-nitrosodimethylamine, n-nitrosodi-n-propylamine, 2-nitrophenol, 2-nitroaniline, 4-nitroaniline, benzidine, and di-n-octylphthalate are target analytes. The %D for these analytes is less than the 25% QC limit permitted by the QAPP with the exception of n-nitrosodi-n-propylamine, n-nitrosopyrrolidine, di-n-octylphthalate, and pronimide. All of the project samples were analyzed on instrument CMS12. N-nitrosopyrrolidine, n-nitrosodi-n-butylamine, 5-nitro-o-toluidine, phenacetin, pentachloronitrobenzene, and pronimide are not target analytes therefore the samples are not affected for these analytes. Consistent with the QAPP Worksheet #28 and referenced laboratory SOP Table B-3 the data should be qualified as follows:

Date	Compound	%D	Associated Samples	Flag
8/7/12 instrument CMS12	n-nitrosodi-n-propylamine N-nitrosodimethylamine 2-nitrophenol 2-nitroaniline 4-nitroaniline Benzidine di-n-octylphthalate	35.5% 22.9% 22.0% 22.0% 24.0% 21.5% 26.4%	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13-GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	J (all detects) UJ (all non-detects)

- The continuing calibration response factors for SPCC were within quality control limits.

- The %D for the CCC met the quality control requirements with the following exception. The CCC di-n-octylphthalate %D (26.4%) in the CCV 500-158843/2 analyzed on instrument CMS12 exceeded the QC limit of <20%. In addition the CCC 2-nitrophenol %D (22%) exceeded the QC limit of 20%. These have been qualified in the above table.

Blanks

- The method blanks met quality control requirements.

Surrogate Spikes

- Surrogate percent recoveries (%R) were within quality control requirements.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

Laboratory Control Samples

- The %R for the laboratory control samples (LCS) were within quality control limits.

- The LCS/LCSD %RPD exceeded the QC limit for pyrene,and benzidine associated with samples JP-M13-GWMW806, JP-M13-GWMW807, JP-M13-GWMW362, JP-M13-GWMW126R. The individual %R were within the QC limits for these analytes, therefore the samples will not be qualified. The LCS/LCSD %RPD exceeded the QC limit for benzidine associated with samples JP-M13-GWMW808, JP-M13-GWMW809, and JP-M13-GWMW999. The individual %R were within the QC limits for this analyte; the samples will not be qualified.

Internal Standards

- The internal standard areas and retention times were within quality control limits for the method blank, LCS/LCSD, CCV, and project samples.

- The EICP internal standard area response in the ICV 500-158707/13 analyzed on instrument CMS12 were outside the QC limits for all of the internal standards. The ICV contained a partial list of analytes which most of them were target analytes. The case narrative stated the ICV was not reanalyzed because the %D for these analytes was within the QC limits, however per the DoD QSM any sample associated with out of control results for the internal standard must be reanalyzed. In addition, per the method QC if the EICP area for any of the internal standards in the calibration verification standard changes from that in the mid-point standard level of the initial calibration, the mass spectrometer must be inspected and corrections made. Reanalysis of samples analyzed while the system is malfunctioning is required. The subsequent ICV containing the remaining target analytes was within the QC limits. The MB, LCS/LCSD, CCV, and project samples internal standard area responses were within QC limits. Two samples, JP-M13-GWMW806, and JP-M13-GWMW807 were analyzed immediately following the ICV analysis with the failed internal standard area responses, then the CCV was analyzed prior to the remaining project samples. Flagging criteria are not appropriate for standards therefore the ICV should be rejected and the sample results for the following should be qualified with a "Q" flag consistent with the QAPP Worksheet #28 and referenced SOP Table B-3: n-nitrosodimethylamine, n-nitrosodi-n-propylamine, 4-chloroaniline, 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, benzidine, and 3,3'-dichlorobenzidine.

Date	Compound	QC Sample	Associated Samples	Flag
8/7/12 instrument CMS12	n-nitrosodimethylamine n-nitrosodi-n-propylamine 4-chloroaniline 2-nitroaniline 3-nitroaniline 4-nitroaniline Benzidine 3,3'-dichlorobenzidine.	ICV internal standard	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	Q

- The EICP internal standard area in the ICV 500-157014/14 analyzed on CMS11 was outside the QC limit for the internal standard perylene-d12. The samples were not analyzed on this instrument.

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

EPA SW846 Method 6010B

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent recoveries (%R) were within quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements.

Blanks

- Potassium was detected in the method blank at concentrations between the MDL and RL. Sample results that were detected positive for these analytes were qualified by the laboratory with a "B". The sample results were greater than 5 times the method blank results, therefore the sample results were not qualified and the "B" qualifier added by the laboratory should be removed.

Compound	QC Sample	Concentration	Associated Samples	Concentration	Flag to be removed
potassium	Method blank	0.082 mg/L	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	1.9 mg/L 7.6 mg/L 7.0 mg/L 2.2 mg/L 15 mg/L 2.6 mg/L 16 mg/L	B

- The initial and continuing calibration blanks met method quality control requirements.

Quality Control/Method Reporting Limit Check

- The MRL check exceeded the upper QC limit for arsenic, beryllium, cadmium, cobalt, lead, manganese, potassium, selenium, and vanadium. A CRI and detection limit check standard were performed and were within the laboratory control limits. The detection limit check standard is less than the MRL. The DoD QSM requires that a low-level calibration check standard be less than or equal to the reporting limit. The detection limit check standard limits were less than the reporting limits and MRL check standard. The sample results are not affected.

- The linear range check standard exceeded the upper QC limit for arsenic, selenium, and zinc. The laboratory flagged the samples for these analytes. The sample results were non-detect for these analytes and no dilutions were necessary. The samples that were flagged with "^" by the laboratory included JP-M13-GWMW806, JP-M13-GWMW807, JP-M13-GWMW362, JP-M13-GWMW126R, JP-M13-GWMW808, JP-M13-GWMW809, and JP-M13-GWMW999.

Interelement Check Standard

- The interference check standard (ICS-A and ICS-AB) met quality control requirements.

Matrix Spike/Matrix Spike Duplicate Analysis

- The matrix spike and matrix spike duplicate (MS/MSD) sample percent recoveries (%R) were within quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

EPA SW846 Method 7470A

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent recoveries (%R) were within quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements. The CCV 500-15775/19 was below the QAPP lower quality control limit of 90%, however was within the DoD QSM quality control limits of 80-120%. The data were not flagged for the CCV not meeting quality control criteria because the ICV did not meet the quality requirements and will be flagged for the ICV failing.

Second Source Calibration Verification (Initial Calibration Verification)

- The ICV %R exceeded the DoD QSM and QAPP upper quality control limit of 110% and 105% respectively, however was within the LCG quality control limits of 80-120%. The laboratory case narrative noted this

variance, however did not perform a reanalysis of the ICV. The sample results for mercury should be qualified with "R."

Date	Compound	%R	Associated Samples	Flag
7/27/12	mercury	115%	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	R

Blanks

- The initial, method, and continuing calibration blanks met method quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

EPA SW846 Method 8330

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent relative standard deviation (%RSD) was within quality control requirements.

Continuing Calibration

- Continuing calibration %D was within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The ICV %D was within quality control requirements.

Blanks

- Method blank analysis met quality control requirements.

Surrogate Spikes

- Surrogate percent recoveries (%R) were within quality control requirements.
- The case narrative noted a slight retention time shift on both columns as indicated by the retention time of the surrogates in the samples. The retention times of the reported positively detected analytes in sample JP-M13-GWMW362 were within the retention time window of the initial calibration and continuing calibration, therefore have not been qualified.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

Laboratory Control Samples

- The %R for the LCS were within quality control limits.

General Chemistry

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration met quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements with the following exception.

- The %R for nitrate was below the lower QC limit (90%-110%) in the ICV 500-156765/1 analyzed on 7/18/12. The ICV was not reanalyzed. The %R in the subsequent CCV following the analysis of ten samples was within the control limits. The samples affected include JP-13-GWMW806, JP-13-GWMW807, JP-13-GWMW362, and JP-13-GWMW126R. The sample results for nitrate should be qualified with "J."

Date	Compound	%R	Associated Samples	Flag
7/18/12	nitrate	86%	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13GWMW126R	J

Blanks

- Method blank analysis met quality control requirements.

Matrix Spike/Matrix Spike Duplicate Analysis

- The MS/MSD sample %R was within quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

- All other acceptance criteria were met for the general chemistry data as reported.

Summary

The QC requirements met the acceptance criteria for each method as specified in the project QAPP and guidance documents listed with the exceptions note above.

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-48319-1
Client Matrix: Water

Date Sampled: 07/17/2012 1010
Date Received: 07/18/2012 0950

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-157246	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	48319-01.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	07/24/2012 1525			Final Weight/Volume:	5 mL
Prep Date:	07/24/2012 1525				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0	R	1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4		0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0	R	0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0	R	0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-48319-2
Client Matrix: Water

Date Sampled: 07/17/2012 1120
Date Received: 07/18/2012 0950

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-157246	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	48319-02.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	07/24/2012 1549			Final Weight/Volume:	5 mL
Prep Date:	07/24/2012 1549				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4		0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	1.5		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	1.1		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-48319-3
Client Matrix: Water

Date Sampled: 07/17/2012 1240
Date Received: 07/18/2012 0950

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-157246	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	48319-03.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	07/24/2012 1613			Final Weight/Volume:	5 mL
Prep Date:	07/24/2012 1613				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0	R	1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4		0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0	R	0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0	R	0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-48319-4
Client Matrix: Water

Date Sampled: 07/17/2012 1325
Date Received: 07/18/2012 0950

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-157246	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	48319-04.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	07/24/2012 1637			Final Weight/Volume:	5 mL
Prep Date:	07/24/2012 1637				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0	R	1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4		0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0	R	0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0	R	0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-48319-5
Client Matrix: Water

Date Sampled: 07/18/2012 1410
Date Received: 07/19/2012 0700

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-157246	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	48319-05.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	07/24/2012 1701			Final Weight/Volume:	5 mL
Prep Date:	07/24/2012 1701				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0	R	1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4		0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0	R	0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0	R	0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-48319-6
Client Matrix: Water

Date Sampled: 07/18/2012 1315
Date Received: 07/19/2012 0700

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-157246	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	48319-06.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	07/24/2012 1725			Final Weight/Volume:	5 mL
Prep Date:	07/24/2012 1725				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0	R	1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4		0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0	R	0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0	R	0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-48319-7
Client Matrix: Water

Date Sampled: 07/18/2012 1200
Date Received: 07/19/2012 0700

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-157246	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	48319-07.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	07/24/2012 1749			Final Weight/Volume:	5 mL
Prep Date:	07/24/2012 1749				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0	R	1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4		0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0	R	0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0	R	0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-48319-1
Client Matrix: Water

Date Sampled: 07/17/2012 1010
Date Received: 07/18/2012 0950

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158707	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156717	Lab File ID:	48319-1.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/07/2012 2116			Final Weight/Volume:	1.0 mL
Prep Date:	07/18/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3	UJ, Q	1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	* UJ, Q	19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47	J	0.13	0.47
Dibenz(a,h)anthracene	<0.28	CCB	0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7	10/18/13	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3	UJ	2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-48319-1
Client Matrix: Water

Date Sampled: 07/17/2012 1010
Date Received: 07/18/2012 0950

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158707	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156717	Lab File ID:	48319-1.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/07/2012 2116			Final Weight/Volume:	1.0 mL
Prep Date:	07/18/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	UJ,Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	UJ,Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3	UJ	2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	UJ,Q	0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93	*	0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	28		20 - 110
Phenol-d5	19		10 - 115
Nitrobenzene-d5	54		40 - 110
2-Fluorobiphenyl	59		50 - 110
2,4,6-Tribromophenol	65		40 - 125
Terphenyl-d14	87		50 - 135

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-48319-2
Client Matrix: Water

Date Sampled: 07/17/2012 1120
Date Received: 07/18/2012 0950

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158707	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156717	Lab File ID:	48319-2.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/07/2012 2140			Final Weight/Volume:	1.0 mL
Prep Date:	07/18/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3	UJ, Q	1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	* UJ, Q	19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47	* J	0.13	0.47
Dibenz(a,h)anthracene	<0.28	RSB	0.060	0.28
Dibenzofuran	<1.9	10/31/13	0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3	UJ	2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-48319-2

Client Matrix: Water

Date Sampled: 07/17/2012 1120

Date Received: 07/18/2012 0950

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158707	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156717	Lab File ID:	48319-2.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/07/2012 2140			Final Weight/Volume:	1.0 mL
Prep Date:	07/18/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	UJ, Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	UJ, Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3	UJ	2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	UJ, Q	0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93	*	0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	43		20 - 110
Phenol-d5	28		10 - 115
Nitrobenzene-d5	79		40 - 110
2-Fluorobiphenyl	85		50 - 110
2,4,6-Tribromophenol	81		40 - 125
Terphenyl-d14	91		50 - 135

JR 1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-48319-3

Client Matrix: Water

Date Sampled: 07/17/2012 1240

Date Received: 07/18/2012 0950

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158843	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156717	Lab File ID:	48319-3.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/09/2012 0103			Final Weight/Volume:	1.0 mL
Prep Date:	07/18/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3	UJ,Q	1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	* UJ,Q	19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47	R J	0.13	0.47
Dibenz(a,h)anthracene	<0.28	10/31/13	0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	2.8		0.28	1.3
2,6-Dinitrotoluene	0.29	J	0.11	0.47
Di-n-octyl phthalate	<9.3	UJ	2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

JR 11/1/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-48319-3
Client Matrix: Water

Date Sampled: 07/17/2012 1240
Date Received: 07/18/2012 0950

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158843	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156717	Lab File ID:	48319-3.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/09/2012 0103			Final Weight/Volume:	1.0 mL
Prep Date:	07/18/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	UJ, Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	UJ, Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3	UJ	2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	UJ, Q	0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93	*	0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	30		20 - 110
Phenol-d5	19		10 - 115
Nitrobenzene-d5	60		40 - 110
2-Fluorobiphenyl	61		50 - 110
2,4,6-Tribromophenol	76		40 - 125
Terphenyl-d14	100		50 - 135

JP 1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-48319-4
Client Matrix: Water

Date Sampled: 07/17/2012 1325
Date Received: 07/18/2012 0950

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158843	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156717	Lab File ID:	48319-4.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/09/2012 0127			Final Weight/Volume:	1.0 mL
Prep Date:	07/18/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3	UJ, Q	1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	* UJ, Q	19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47	R J	0.13	0.47
Dibenz(a,h)anthracene	<0.28	10/31/13	0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3	UJ	2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

JR 11/7/13

Analytical Data

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-48319-4
Client Matrix: Water

Date Sampled: 07/17/2012 1325
Date Received: 07/18/2012 0950

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158843	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156717	Lab File ID:	48319-4.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/09/2012 0127			Final Weight/Volume:	1.0 mL
Prep Date:	07/18/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	UJ, Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	UJ, Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3	UJ	2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	UJ, Q	0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	43		20 - 110
Phenol-d5	27		10 - 115
Nitrobenzene-d5	86		40 - 110
2-Fluorobiphenyl	88		50 - 110
2,4,6-Tribromophenol	78		40 - 125
Terphenyl-d14	109		50 - 135

JR 1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-48319-5
Client Matrix: Water

Date Sampled: 07/18/2012 1410
Date Received: 07/19/2012 0700

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158843	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156872	Lab File ID:	48319-5.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/09/2012 0150			Final Weight/Volume:	1.0 mL
Prep Date:	07/19/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3	UJ,Q	1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	* UJ,Q	19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47	R J	0.13	0.47
Dibenz(a,h)anthracene	<0.28	CRB	0.060	0.28
Dibenzofuran	<1.9	10/31/13	0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3	UJ	2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

JR 11/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-48319-5

Client Matrix: Water

Date Sampled: 07/18/2012 1410

Date Received: 07/19/2012 0700

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158843	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156872	Lab File ID:	48319-5.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/09/2012 0150			Final Weight/Volume:	1.0 mL
Prep Date:	07/19/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	UJ, Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	UJ, Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3	UJ	2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	UJ, Q	0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	36		20 - 110
Phenol-d5	24		10 - 115
Nitrobenzene-d5	69		40 - 110
2-Fluorobiphenyl	73		50 - 110
2,4,6-Tribromophenol	94		40 - 125
Terphenyl-d14	112		50 - 135

JR 1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-48319-6
Client Matrix: Water

Date Sampled: 07/18/2012 1315
Date Received: 07/19/2012 0700

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158843	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156872	Lab File ID:	48319-6.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/09/2012 0214			Final Weight/Volume:	1.0 mL
Prep Date:	07/19/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3	UJ, Q	1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	* UJ, Q	19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47	& J	0.13	0.47
Dibenz(a,h)anthracene	<0.28	RRB	0.060	0.28
Dibenzofuran	<1.9	8/21/13	0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3	UJ	2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7	JR 1/7/13	1.0	4.7

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-48319-6

Client Matrix: Water

Date Sampled: 07/18/2012 1315

Date Received: 07/19/2012 0700

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158843	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156872	Lab File ID:	48319-6.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/09/2012 0214			Final Weight/Volume:	1.0 mL
Prep Date:	07/19/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	UJ, Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	UJ, Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3	UJ	2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	UJ, Q	0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	27		20 - 110
Phenol-d5	18		10 - 115
Nitrobenzene-d5	51		40 - 110
2-Fluorobiphenyl	54		50 - 110
2,4,6-Tribromophenol	67		40 - 125
Terphenyl-d14	101		50 - 135

JR
1/7/13

Client: Toltest Inc. Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-48319-7 Date Sampled: 07/18/2012 1200
Client Matrix: Water Date Received: 07/19/2012 0700

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158843	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156872	Lab File ID:	48319-7.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/09/2012 0238			Final Weight/Volume:	1.0 mL
Prep Date:	07/19/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3	UJ,Q	1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	UJ,Q	19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47	& J	0.13	0.47
Dibenz(a,h)anthracene	<0.28	RB 11/13/13	0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3	UJ	2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7	JR 11/7/13	1.0	4.7

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-48319-7
Client Matrix: Water

Date Sampled: 07/18/2012 1200
Date Received: 07/19/2012 0700

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-158843	Instrument ID:	CMS12
Prep Method:	3510C	Prep Batch:	500-156872	Lab File ID:	48319-7.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	08/09/2012 0238			Final Weight/Volume:	1.0 mL
Prep Date:	07/19/2012 1918			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	UJ, Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	UJ, Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3	UJ	2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	UJ, Q	0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	35		20 - 110
Phenol-d5	23		10 - 115
Nitrobenzene-d5	65		40 - 110
2-Fluorobiphenyl	69		50 - 110
2,4,6-Tribromophenol	93		40 - 125
Terphenyl-d14	116		50 - 135

JR
1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

General Chemistry

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-48319-1

Client Matrix: Water

Date Sampled: 07/17/2012 1010

Date Received: 07/18/2012 0950

CDB 10/30/13

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.19	J	mg/L	0.028	0.10	1.0	300.0
Analysis Batch: 500-156765	Analysis Date: 07/18/2012 1235						
Sulfate-Dissolved	76		mg/L	0.78	2.0	10	300.0
Analysis Batch: 500-156765	Analysis Date: 07/18/2012 1250						

JR 1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

General Chemistry

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-48319-2

Client Matrix: Water

Date Sampled: 07/17/2012 1120

Date Received: 07/18/2012 0950

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<1.0	J	mg/L	0.28	1.0	10	300.0
Analysis Batch: 500-156765	Analysis Date: 07/18/2012 1321						
Sulfate-Dissolved	230		mg/L	3.9	10	50	300.0
Analysis Batch: 500-156967	Analysis Date: 07/19/2012 1618						

General Chemistry

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-48319-3 Date Sampled: 07/17/2012 1240

Client Matrix: Water Date Received: 07/18/2012 0950

RCB 1/21/13

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<1.0	J ^ R	mg/L	0.28	1.0	10	300.0
Analysis Batch: 500-156765	Analysis Date: 07/18/2012 1352						
Sulfate-Dissolved	270		mg/L	3.9	10	50	300.0
Analysis Batch: 500-156967	Analysis Date: 07/19/2012 1633						

JR 1/7/13

General Chemistry

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-48319-4 Date Sampled: 07/17/2012 1325

Client Matrix: Water Date Received: 07/18/2012 0950

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.11	J	mg/L	0.028	0.10	1.0	300.0
Analysis Batch: 500-156765	Analysis Date: 07/18/2012 1407						
Sulfate-Dissolved	53		mg/L	0.78	2.0	10	300.0
Analysis Batch: 500-156765	Analysis Date: 07/18/2012 1422						

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW999**

Lab Sample ID: 500-48319-7

Client Matrix: Water

Date Sampled: 07/18/2012 1200

Date Received: 07/19/2012 0700

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-157846	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-157489	Lab File ID:	P6072712C.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2012 2257			Final Weight/Volume:	50 mL
Prep Date:	07/25/2012 1630				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.23		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.0011	J	0.00054	0.0020
Calcium	140		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.021		0.0010	0.0050
Copper	0.0017	J	0.0011	0.010
Iron	3.9		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	77		0.024	0.10
Manganese	1.1		0.0011	0.010
Nickel	0.028		0.0019	0.010
Potassium	16	B	0.070	0.50
Selenium	<0.010	^	0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	85		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020	^	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-157775	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-157618	Lab File ID:	072712RG.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	07/27/2012 1346			Final Weight/Volume:	25 mL
Prep Date:	07/26/2012 1645				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20	^ R	0.070	0.20

JL
1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-48319-6
Client Matrix: Water

Date Sampled: 07/18/2012 1315
Date Received: 07/19/2012 0700

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-157846	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-157489	Lab File ID:	P6072712C.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2012 2253			Final Weight/Volume:	50 mL
Prep Date:	07/25/2012 1630				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.029		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00075	J	0.00054	0.0020
Calcium	43		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0014	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	32		0.024	0.10
Manganese	0.0018	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	2.6	~~B~~	0.070	0.50
Selenium	<0.010	^	0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	20		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020	^	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-157775	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-157618	Lab File ID:	072712RG.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	07/27/2012 1344			Final Weight/Volume:	25 mL
Prep Date:	07/26/2012 1645				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20	^ R	0.070	0.20

JR
1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-48319-5
Client Matrix: Water

Date Sampled: 07/18/2012 1410
Date Received: 07/19/2012 0700

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-157846	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-157489	Lab File ID:	P6072712C.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2012 2249			Final Weight/Volume:	50 mL
Prep Date:	07/25/2012 1630				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.23		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00099	J	0.00054	0.0020
Calcium	140		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.022		0.0010	0.0050
Copper	0.0019	J	0.0011	0.010
Iron	4.2		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	77		0.024	0.10
Manganese	1.1		0.0011	0.010
Nickel	0.028		0.0019	0.010
Potassium	15	~~B~~	0.070	0.50
Selenium	<0.010	^	0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	85		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020	^	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-157775	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-157618	Lab File ID:	072712RG.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	07/27/2012 1342			Final Weight/Volume:	25 mL
Prep Date:	07/26/2012 1645				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20	^ R	0.070	0.20

JR 1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-48319-2
Client Matrix: Water

Date Sampled: 07/17/2012 1120
Date Received: 07/18/2012 0950

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-157846	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-157489	Lab File ID:	P6072712C.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2012 2225			Final Weight/Volume:	50 mL
Prep Date:	07/25/2012 1630				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0031	J	0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.095		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.0012	J	0.00054	0.0020
Calcium	180		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0022	J	0.0011	0.010
Iron	0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	89		0.024	0.10
Manganese	0.15		0.0011	0.010
Nickel	0.0025	J	0.0019	0.010
Potassium	7.6	~~B~~	0.070	0.50
Selenium	<0.010	^	0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	390		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020	^	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-157775	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-157618	Lab File ID:	072712RG.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	07/27/2012 1337			Final Weight/Volume:	25 mL
Prep Date:	07/26/2012 1645				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20	^ f	0.070	0.20

JR 1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-48319-1

Client Matrix: Water

Date Sampled: 07/17/2012 1010

Date Received: 07/18/2012 0950

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-157846	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-157489	Lab File ID:	P6072712C.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2012 2201			Final Weight/Volume:	50 mL
Prep Date:	07/25/2012 1630				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.10		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00078	J	0.00054	0.0020
Calcium	81		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0014	J	0.0011	0.010
Iron	0.65		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	46		0.024	0.10
Manganese	0.025		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	1.9	~~B~~	0.070	0.50
Selenium	<0.010	^	0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	24		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020	^	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-157775	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-157618	Lab File ID:	072712RG.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	07/27/2012 1335			Final Weight/Volume:	25 mL
Prep Date:	07/26/2012 1645				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20	^ R	0.070	0.20

JR 1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-48319-3

Client Matrix: Water

Date Sampled: 07/17/2012 1240

Date Received: 07/18/2012 0950

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-157846	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-157489	Lab File ID:	P6072712C.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2012 2231			Final Weight/Volume:	50 mL
Prep Date:	07/25/2012 1630				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0032	J	0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.048		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.0011	J	0.00054	0.0020
Calcium	180		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0022	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	100		0.024	0.10
Manganese	0.096		0.0011	0.010
Nickel	0.0035	J	0.0019	0.010
Potassium	7.0	~~B~~	0.070	0.50
Selenium	<0.010	^	0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	270		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020	^	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-157775	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-157618	Lab File ID:	072712RG.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	07/27/2012 1339			Final Weight/Volume:	25 mL
Prep Date:	07/26/2012 1645				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20	^ R	0.070	0.20

JR
1/7/13

Client: Toltest Inc.

Job Number: 500-48319-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-48319-4

Client Matrix: Water

Date Sampled: 07/17/2012 1325

Date Received: 07/18/2012 0950

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-157846	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-157489	Lab File ID:	P6072712C.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	07/27/2012 2245			Final Weight/Volume:	50 mL
Prep Date:	07/25/2012 1630				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.054		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00079	J	0.00054	0.0020
Calcium	69		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0014	J	0.0011	0.010
Iron	0.12	J	0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	43		0.024	0.10
Manganese	0.019		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	2.2	~~B~~	0.070	0.50
Selenium	<0.010	^	0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	24		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020	^	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-157775	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-157618	Lab File ID:	072712RG.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	07/27/2012 1341			Final Weight/Volume:	25 mL
Prep Date:	07/26/2012 1645				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20	^ R	0.070	0.20

JR 1/7/13

JOAAP Data Evaluation Report - October 2012 Report 1

for

TestAmerica Laboratory SDG 500-51660

(October 2012 Samples)

Solutions for Your Site Development, Construction, and Environmental Projects.

January 7, 2013 Project No. 20392

Revised Data Quality Evaluation of Analytical Data for Environmental Remediation Services

Contract No. W91ZLK-05-D-0012
Site-Wide Long Term Groundwater Monitoring at Joilet Army Ammunition Plant, Wilmington, Illinois

INTRODUCTION:
TolTest has developed this draft Data Quality Evaluation (DQE) Report for the groundwater sampling conducted for site-wide long-term monitoring at the Joliet Army Ammunition Plant (JOAAP), in Wilmington, Illinois. The data evaluation was completed on the groundwater analytical data generated from groundwater monitoring samples collected on October 23, 2012 and received by the laboratory on October 24, 2012. The samples were analyzed by Test America Laboratories, Inc., laboratory report number 500-51660.

Groundwater samples were analyzed for explosives using *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW 846) Method 8330, and sulfate using MCAWW 300. **Table 1** shows a cross reference of the sample information to the laboratory analytical data package.

Table 1, Groundwater Samples

Sample ID:	Date(s) Sampled:	Time Sampled:	Lab Sample No.:	Analysis:	Matrix:	Report Date:
JP-M6-GWMW318	Oct. 23, 2012	10:25	500-51660-1	1	water	Nov. 15, 2012
JP-M6-GWMW319	Oct. 23, 2012	11:00	500-51660-2	1	water	Nov. 15, 2012
JP-M6-GWMW123R	Oct. 23, 2012	09:40	500-51660-3	1	water	Nov. 15, 2012
JP-M6-GWMW162R	Oct. 23, 2012	10:23	500-51660-4	1	water	Nov. 15, 2012
JP-M6-GWMW999	Oct. 23, 2012	12:00	500-51660-5	1	water	Nov. 15, 2012
JP-M6-GWMW212R	Oct. 23, 2012	12:30	500-51660-6	1	water	Nov. 15, 2012
JP-M6-GWMW652	Oct. 23, 2012	11:22	500-51660-7	1	water	Nov. 15, 2012
JP-M6-GWMW654	Oct. 23, 2012	12:38	500-51660-8	1	water	Nov. 15, 2012
JP-M9-GWMW330	Oct. 23, 2012	14:35	500-51660-9	2	water	Nov. 15, 2012
JP-M7-GWMW124R	Oct. 23, 2012	15:22	500-51660-10	1	water	Nov. 15, 2012
JP-M6-GWMW313	Oct. 23, 2012	13:25	500-51660-11	1	water	Nov. 15, 2012

Table 1, Groundwater Samples Continued

Sample ID:	Date(s) Sampled:	Time Sampled:	Lab Sample No.:	Analysis:	Matrix:	Report Date:
JP-OA-GWMW117	Oct. 23, 2012	14:45	500-51660-12	1	water	Nov. 15, 2012
JP-OA-GWMW118	Oct. 23, 2012	15:19	500-51660-13	1	water	Nov. 15, 2012
JP-OA-GWMW119	Oct. 23, 2012	16:07	500-51660-14	1	water	Nov. 15, 2012

Sample Analysis
1. explosives
2. sulfate
3. explosives, sulfate

OVERVIEW:
The samples were assessed based on the criteria specified in the *Final Quality Assurance Project Plan Environmental Remediation Services at Joliet Army Ammunition Plant, Will County, Illinois (TolTest, Inc. March 2010)* (QAPP), the *Louisville DOD Quality Systems Manual Supplement, version 1 (USACE Louisville District, March 2007),* DoD Quality Systems Manual Version 4 Draft, (January 2009), *Louisville Chemistry Guideline,* (LCG) (June 2002), and U.S. EPA Contract Laboratory Program National Functional Guidelines in conjunction with the internal laboratory quality control (QC) criteria. Quality checks evaluated included holding times, sample preservation, cooler temperatures, surrogates, laboratory control samples (LCS), method blanks, matrix spike and duplicate (MS/MSD) analysis, initial and continuing calibration verifications, (ICV, CCV), and QC Method Reporting Limit (QC/MRL) recovery.

SUMMARY
This section summarizes the findings from the data evaluation of the laboratory analytical data packages. The tables below present the quality control check requirements, the analytes that failed the criteria, analysis flags, and the data to which the flags are applied. Each of the quality checks reviewed in the laboratory analytical data package are summarized under each method subheading.

EPA SW846 Method 8330

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent relative standard deviation (%RSD) was within quality control requirements.

Continuing Calibration

- Continuing calibration %D was within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The ICV %D was within quality control requirements.

Blanks

- Method blank analysis met quality control requirements.

Surrogate Spikes

- Surrogate percent recoveries (%R) were within quality control requirements with the following exception.

- Samples JP-M6-GWMW999, JP-M6-GWMW212R, and JP-M6-GWMW652 required dilution. As a result the surrogates were diluted out and the surrogate recoveries were below the lower quality control limit.

- The surrogate percent recoveries in samples JP-OA-GWMW117, JP-OA-GWMW118 were below the lower quality control limit on the primary column. The surrogate recovery was within the quality control limits on the secondary confirmation column. The positive results should be flagged with a "J" and the non-detect results flagged with a "UJ".

Date	Compound	%R	Associated Samples	Flag
11/04/12	Surrogate 1,2-Dinitrobenzene	22%	JP-OA-GWMW117 JP-OA-GWMW118	J for detects and UJ for non-detects

- The surrogate retention time shifted in the samples from the surrogate relative retention time on the primary column for most of the samples. In addition, there was a retention time shift for the method blank, LCS, LCSD and end of run CCV on the secondary column. The case narrative discussed the retention time shift and noted the samples were evaluated based on the shift. The retention times for the detected analytes were within the relative retention time windows of the respective analytes of the continuing calibration standard on each column, and therefore have not been qualified.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

Laboratory Control Samples

- The %R for the LCS was within quality control limits with the following exception.

- The percent recovery (%R) for RDX in the LCS on the secondary column exceeded the upper quality control limit. The %R for RDX in the LCSD was within quality control limits. The %R for 4-amino-2,6-dinitrotoluene exceeded the upper quality control limit in the LCSD on the secondary column; the %R in the LCS was within the control limits. The %R for these compounds was within the quality control limits on the primary column, therefore the samples were not flagged.

- The relative percent difference (RPD) between the LCS/LCSD on the secondary column for 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene exceeded the quality control limit. The samples were not flagged since this was the confirmation column and the RPD was within the control limits on the primary reporting column.

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

Sample Analysis

- Sample analysis met method requirements for retention times, secondary column confirmation, dilutions, and RPD between the primary and secondary columns with the following exception.

- The RPD between the primary and secondary columns exceeded the quality control limit of less than or equal to 40% for 4-aminio-2,6-DNT, and 2-amino-4,6-DNT, in samples JP-M6-GWMW999, JP-M6-GWMW212R, JP-M6-GWMW652; 2,6-DNT in sample JP-M6-GWMW313; and 2,4-DNT in samples JP-OA-GWMW117 and JP-OA-GWMW118. These analytes should be qualified with a "J" in these samples.

Date	Compound	%RPD	Associated Samples	Flag
11/03/12	4-aminio-2,6-dinitrotoluene 2-amino-4,6-dinitrotoluene	70.4% 58.4%	JP-M6-GWMW999	J
	4-aminio-2,6-dinitrotoluene 2-amino-4,6-dinitrotoluene	77.6% 55.5%	JP-M6-GWMW212R	J
	4-aminio-2,6-dinitrotoluene 2-amino-4,6-dinitrotoluene	54.1% 39.9%	JP-M6-GWMW652	J
11/04/12	2,6-dinitrotoluene	55.1%	JP-M6-GWMW313	J
11/04/12	2,4-dinitrotoluene	61.4% 66.9%	JP-OA-GWMW117 JP-OA-GWMW118	J

EPA MCAWW 300.0 General Chemistry

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration met quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements.

Blanks

- Method and calibration blank analysis met quality control requirements.

Matrix Spike/Matrix Spike Duplicate Analysis

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

Summary

The QC requirements met the acceptance criteria for each method as specified in the project QAPP and guidance documents listed with the exceptions note above.

Client: Toltest Inc.

Job Number: 500-51660-1

Client Sample ID: **JP-OA-GWMW117**

Lab Sample ID: 500-51660-12

Client Matrix: Water

Date Sampled: 10/23/2012 1445

Date Received: 10/24/2012 1150

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167357	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	11/04/2012 1255			Injection Volume:	100 uL
Prep Date:	10/25/2012 1956			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<3.1	UJ	0.88	3.1
RDX	<1.6	UJ	0.83	1.6
1,3,5-Trinitrobenzene	<1.6	UJ	0.47	1.6
1,3-Dinitrobenzene	<1.6	UJ	0.30	1.6
Nitrobenzene	<1.6	UJ	0.41	1.6
2,4,6-Trinitrotoluene	<1.6	UJ	0.65	1.6
Tetryl	<3.9	UJ	0.97	3.9
2,4-Dinitrotoluene	2.6	J	0.60	3.1
2,6-Dinitrotoluene	<3.1	UJ	0.97	3.1
2-Amino-4,6-dinitrotoluene	<3.1	UJ	1.5	3.1
4-Amino-2,6-dinitrotoluene	<3.1	UJ	1.4	3.1
2-Nitrotoluene	24	J	1.2	3.1
4-Nitrotoluene	16	J	1.1	3.1
3-Nitrotoluene	<3.1	UJ	0.69	3.1

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	22	X	70 - 130

JR 1/8/13

Client: Toltest Inc.

Job Number: 500-51660-1

Client Sample ID: **JP-OA-GWMW118**

Lab Sample ID: 500-51660-13

Client Matrix: Water

Date Sampled: 10/23/2012 1519

Date Received: 10/24/2012 1150

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167357	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	11/04/2012 1347			Injection Volume:	100 uL
Prep Date:	10/25/2012 1956			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<3.1	UJ	0.88	3.1
RDX	<1.6	UJ	0.83	1.6
1,3,5-Trinitrobenzene	<1.6	UJ	0.47	1.6
1,3-Dinitrobenzene	<1.6	UJ	0.30	1.6
Nitrobenzene	<1.6	UJ	0.41	1.6
2,4,6-Trinitrotoluene	<1.6	UJ	0.65	1.6
Tetryl	<3.9	UJ	0.97	3.9
2,4-Dinitrotoluene	2.3	J	0.60	3.1
2,6-Dinitrotoluene	<3.1	UJ	0.97	3.1
2-Amino-4,6-dinitrotoluene	<3.1	UJ	1.5	3.1
4-Amino-2,6-dinitrotoluene	<3.1	UJ	1.4	3.1
2-Nitrotoluene	20	J	1.2	3.1
4-Nitrotoluene	15	J	1.1	3.1
3-Nitrotoluene	<3.1	UJ	0.69	3.1

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	33	X	70 - 130

Client: Toltest Inc.

Job Number: 500-51660-1

Client Sample ID: **JP-M6-GWMW999**

Lab Sample ID: 500-51660-5

Client Matrix: Water

Date Sampled: 10/23/2012 1200

Date Received: 10/24/2012 1150

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167357	Initial Weight/Volume:	770 mL
Dilution:	100			Final Weight/Volume:	6.0 mL
Analysis Date:	11/03/2012 0714			Injection Volume:	100 uL
Prep Date:	10/25/2012 1956			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<31		8.8	31
RDX	<16		8.3	16
1,3,5-Trinitrobenzene	<16		4.7	16
1,3-Dinitrobenzene	<16		3.0	16
Nitrobenzene	<16		4.1	16
2,4,6-Trinitrotoluene	340		6.5	16
Tetryl	<39		9.7	39
2,6-Dinitrotoluene	920		9.7	31
2-Amino-4,6-dinitrotoluene	290	J	15	31
4-Amino-2,6-dinitrotoluene	170	J	14	31
3-Nitrotoluene	<31		6.9	31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	0	D	70 - 130

JR 1/9/13

Client: Toltest Inc.

Job Number: 500-51660-1

Client Sample ID: **JP-M6-GWMW212R**

Lab Sample ID: 500-51660-6
Client Matrix: Water

Date Sampled: 10/23/2012 1230
Date Received: 10/24/2012 1150

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167357	Initial Weight/Volume:	770 mL
Dilution:	100			Final Weight/Volume:	6.0 mL
Analysis Date:	11/03/2012 0949			Injection Volume:	100 uL
Prep Date:	10/25/2012 1956			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<31		8.8	31
RDX	<16		8.3	16
1,3,5-Trinitrobenzene	<16		4.7	16
1,3-Dinitrobenzene	<16		3.0	16
Nitrobenzene	<16		4.1	16
2,4,6-Trinitrotoluene	200		6.5	16
Tetryl	<39		9.7	39
2,6-Dinitrotoluene	640		9.7	31
2-Amino-4,6-dinitrotoluene	270	J	15	31
4-Amino-2,6-dinitrotoluene	160	J	14	31
3-Nitrotoluene	<31		6.9	31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	0	D	70 - 130

JP 11/9/13

Client: Toltest Inc.

Job Number: 500-51660-1

Client Sample ID: **JP-M6-GWMW652**

Lab Sample ID: 500-51660-7

Client Matrix: Water

Date Sampled: 10/23/2012 1122

Date Received: 10/24/2012 1150

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167357	Initial Weight/Volume:	770 mL
Dilution:	100			Final Weight/Volume:	6.0 mL
Analysis Date:	11/03/2012 1315			Injection Volume:	100 uL
Prep Date:	10/25/2012 1956			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<31		8.8	31
RDX	<16		8.3	16
1,3,5-Trinitrobenzene	<16		4.7	16
1,3-Dinitrobenzene	<16		3.0	16
Nitrobenzene	<16		4.1	16
Tetryl	<39		9.7	39
2-Amino-4,6-dinitrotoluene	280		15	31
4-Amino-2,6-dinitrotoluene	230		14	31
3-Nitrotoluene	<31		6.9	31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	0	D	70 - 130

Client: Toltest Inc.

Job Number: 500-51660-1

Client Sample ID: **JP-M6-GWMW313**

Lab Sample ID: 500-51660-11

Client Matrix: Water

Date Sampled: 10/23/2012 1325

Date Received: 10/24/2012 1150

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167357	Initial Weight/Volume:	770 mL
Dilution:	10			Final Weight/Volume:	6.0 mL
Analysis Date:	11/04/2012 1204			Injection Volume:	100 uL
Prep Date:	10/25/2012 1956			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<3.1		0.88	3.1
RDX	<1.6		0.83	1.6
1,3,5-Trinitrobenzene	<1.6		0.47	1.6
1,3-Dinitrobenzene	<1.6		0.30	1.6
Nitrobenzene	<1.6		0.41	1.6
2,4,6-Trinitrotoluene	<1.6		0.65	1.6
Tetryl	<3.9		0.97	3.9
2,4-Dinitrotoluene	5.0		0.60	3.1
2,6-Dinitrotoluene	3.3	J	0.97	3.1
2-Amino-4,6-dinitrotoluene	<3.1		1.5	3.1
4-Amino-2,6-dinitrotoluene	<3.1		1.4	3.1
2-Nitrotoluene	44		1.2	3.1
4-Nitrotoluene	28		1.1	3.1
3-Nitrotoluene	<3.1		0.69	3.1

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	104		70 - 130

JR 11/6/12

JOAAP Data Evaluation Report - October 2012 Report 2

for

TestAmerica Laboratory SDG 500-51693

(October 2012 Samples)

Solutions for Your Site Development, Construction, and Environmental Projects.

January 11, 2013 Project No. 22271

Revised Data Quality Evaluation of Analytical Data for Environmental Remediation Services

Contract No. W91ZLK-05-D-0012
Site-Wide Long Term Groundwater Monitoring at Joilet Army Ammunition Plant, Wilmington, Illinois

INTRODUCTION:
TolTest has developed this draft Data Quality Evaluation (DQE) Report for the groundwater sampling conducted for site-wide long-term monitoring at the Joliet Army Ammunition Plant (JOAAP), in Wilmington, Illinois. The data evaluation was completed on the groundwater analytical data generated from groundwater monitoring samples collected on October 24, 2012 and received by the laboratory on October 25, 2012. The samples were analyzed by Test America Laboratories, Inc., laboratory report number 500-51693.

Groundwater samples were analyzed for explosives using *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW846) Method 8330, volatile organic compounds (VOC) using SW846 Method 8260B, semi-volatile organic compounds (SVOC) using SW846 8270C, metals using SW846 Method 6010B, mercury using SW846 Method 7470A, and sulfate using MCAWW 300. **Table 1** shows a cross reference of the sample information to the laboratory analytical data package.

Table 1, Groundwater Samples

Sample ID:	Date(s) Sampled:	Time Sampled:	Lab Sample No.:	Analysis:	Matrix:	Report Date:
JP-M11-GWMW998	Oct. 24, 2012	0800	500-51693-1	1	water	Nov. 20, 2012
JP-M11-GWMW336	Oct. 24, 2012	0932	500-51693-2	1	water	Nov. 20, 2012
JP-M11-GWMW336	Oct. 24, 2012	0932	500-51693-2MS	1	water	Nov. 20, 2012
JP-M11-GWMW336	Oct. 24, 2012	0932	500-51693-2MSD	1	water	Nov. 20, 2012
JP-M11-GWMW804	Oct. 24, 2012	1130	500-51693-3	1	water	Nov. 20, 2012
JP-M11-GWMW805	Oct. 24, 2012	1214	500-51693-4	1	water	Nov. 20, 2012
JP-M11-GWMW335	Oct. 24, 2012	1417	500-51693-5	1	water	Nov. 20, 2012
JP-M11-GWMW334	Oct. 24, 2012	1502	500-51693-6	1	water	Nov. 20, 2012
JP-M11-GWMW803	Oct. 24, 2012	1547	500-51693-7	1	water	Nov. 20, 2012
JP-M11-GWMW802	Oct. 24, 2012	1035	500-51693-8	1	water	Nov. 20, 2012
JP-M11-GWMW333	Oct. 24, 2012	1722	500-51693-9	1	water	Nov. 20, 2012
JP-M13-GWMW806	Oct. 24, 2012	1550	500-51693-10	1	water	Nov. 20, 2012

Sample ID:	Date(s) Sampled:	Time Sampled:	Lab Sample No.:	Analysis:	Matrix:	Report Date:
JP-M13-GWMW807	Oct. 24, 2012	1128	500-51693-11	1	water	Nov. 20, 2012
Trip Blank	Oct. 24, 2012		500-51693-12	3	water	Nov. 20, 2012

Sample Analysis
1. explosives, VOC, SVOC, metals, sulfate/nitrate
2. sulfate
3. VOC

OVERVIEW:
The samples were assessed based on the criteria specified in the *Final Quality Assurance Project Plan Environmental Remediation Services at Joliet Army Ammunition Plant, Will County, Illinois (TolTest, Inc. March 2010)* (QAPP), the *Louisville DOD Quality Systems Manual Supplement, version 1 (USACE Louisville District, March 2007),* DoD Quality Systems Manual Version 4 Draft, (January 2009), *Louisville Chemistry Guideline,* (LCG) (June 2002), and U.S. EPA Contract Laboratory Program National Functional Guidelines in conjunction with the internal laboratory quality control (QC) criteria. Quality checks evaluated included holding times, sample preservation, cooler temperatures, daily tune requirements, internal standards, surrogates, laboratory control samples (LCS), method blanks, matrix spike and duplicate (MS/MSD) analysis, initial and continuing calibration verifications, (ICV, CCV), calibration blanks, and QC Method Reporting Limit (QC/MRL) recovery. Level III data review was completed in accordance with the QAPP, therefore raw data was not evaluated.

SUMMARY
This section summarizes the findings from the data evaluation of the laboratory analytical data packages. The tables below present the quality control check requirements, the analytes that failed the criteria, analysis flags, and the data to which the flags are applied. Each of the quality checks reviewed in the laboratory analytical data package are summarized under each method subheading.

EPA SW846 Method 8260B

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Tuning Requirements

- Instrument tuning requirements were met and within quality control requirements.

Initial Calibration

- Initial calibration requirements were met. The percent relative standard deviations (%RSD) were less than or equal to 15% for each individual compound and less than or equal to 30% for calibration check compounds (CCC).

- In cases where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r2) were greater than or equal to 0.990 which meets quality control requirements.

- The average response factors (RRF) for all compounds in system performance check compounds (SPCC) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent differences (%D) were within quality control requirements of less than or equal to 25% for each individual compound with the following exceptions.

- The %D for bromomethane and vinyl acetate in the ICV 500-165139/11 exceeded the quality control limit. These compounds were not detected in the samples. Consistent with the QAPP Worksheet #28 and referenced laboratory SOP Table B-3 the data should be qualified as follows:

Date	Compound	%D	Associated Samples	Flag
10/9/12	Bromomethane Vinyl acetate	29.0% 73.2%	JP-M11-GWMW998 JP-M11-GWMW336 JP-M11-GWMW804 JP-M11-GWMW805 JP-M11-GWMW335 JP-M11-GWMW334 JP-M11-GWMW803 JP-M11-GWMW802 JP-M11-GWMW333 JP-M13-GWMW806 JP-M13-GWMW807	R

Continuing Calibration

- The continuing calibration verification samples (CCV) were run every twelve hours consistent with the method, DoD QSM, and U.S. EPA National Functional Guidelines. The project QAPP requires the CCV to be run every ten samples.

- The %D for all compounds were within the quality control requirements of less than or equal to 20%. The %D for the CCC and the continuing calibration response factors for SPCC were with quality control limits with the following exception.

- The %D for vinyl acetate in the CCV 500-168521/2 analyzed on 11/5/12 at 19:54 exceeded the quality control limit. The %D in the CCV 500-168521/3 analyzed on 11/5/12 at 20:18 exceeded the quality control limit for butadiene and iodomethane; these compounds were not target analytes. Vinyl acetate was not detected in the samples. The %D in the CCV 500-168614/3 analyzed on 11/6/12 at 08:37 exceeded the quality control limit for cyclohexanone; this is not a target analyte. Since the ICV failed for vinyl acetate the samples will be qualified based on the failed ICV.

Date	Compound	%D	Associated Samples	Flag
11/5/12 instrument CMS25	Vinyl acetate	35.9%	JP-M13-GWMW806 JP-M13-GWMW807	R

Blanks

- The method blanks met quality control requirements. The trip blank met quality control requirements.

Surrogate Spikes

- Surrogate percent recoveries (%R) were within quality control requirements.

Matrix Spikes/Matrix Spike Duplicates

- The percent recoveries (%R) were within quality control limits for the MS and MSD samples with the following exception. The %R for vinyl acetate in the MS and MSD samples exceeded the upper quality control limit. This compound was not detected in the parent sample. The parent sample, JP-M1-GWMW336 should be flagged "J" for vinyl acetate. Since the ICV failed for vinyl acetate the samples will be qualified based on the failed ICV.

Laboratory Control Samples

- The %R for the laboratory control samples (LCS) were within quality control limits with the following exception. The %R for vinyl acetate in the LCS samples in both batch 168614 and 168521 exceeded the upper quality control limit. This compound was not detected in the samples. Since the ICV failed for vinyl acetate the samples will be qualified based on the failed ICV.

Internal Standards

- The internal standard areas and retention times were within quality control limits.

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

EPA SW846 Method 8270C

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Tuning Requirements

- Instrument tuning requirements were met and within quality control requirements.

Initial Calibration

- Initial calibration requirements were met. The percent relative standard deviations (%RSD) were less than or equal to 15% for each individual compound and less than or equal to 30% for calibration check compounds (CCC) with the following exceptions.

- The %RSD exceeded the quality control limit for n-nitrosodi-n-propylamine, n-nitrosopyrrolidine, 4-nitroaniline in the initial calibration run on 11/13/12 at 15:40 on instrument CMS24. The method blank and LCS samples were analyzed with this curve. The samples were analyzed on a different instrument and are not affected. The LCS %Rs were within quality control limits for these analytes.

- In cases where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r2) were greater than or equal to 0.990.

- The average response factors (RRF) for all compounds in system performance check compounds (SPCC) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent differences (%D) were within quality control requirements of less than or equal to 25% for each individual compound with the following exception.

- The %D for 4-nitroaniline in the ICV 500-169545/13 exceeded the quality control limit. In addition, the %D for phenol, 2-methylphenol exceeded the quality control limit. Associated samples included the method blank and the LCS. The samples were analyzed on a different instrument and are not affected. The LCS %Rs were within quality control limits for these analytes.

Continuing Calibration

- The continuing calibration verification samples (CCV) were run every twelve hours consistent with the method, DoD QSM, and U.S. EPA National Functional Guidelines. The project QAPP requires the CCV to be run every ten samples.

- The %D for all compounds were within the quality control requirements of less than or equal to 20% with the following exceptions.

- The %D in the CCV sample 500-170095/2 exceeded the quality control limit for diethyl phthalate, di-n-butyl phthalate, butyl benzyl phthalate, bis (2-ethylhexyl) phthalate, di-n-octyl phthalate. Associated samples included the method blank and LCS. The samples should be qualified Q for diethyl phthalate, di-n-butyl phthalate, butyl benzyl phthalate since the %R in the LCS was also outside quality control limits. The %R for bis (2-ethylhexyl) phthalate, di-n-octyl phthalate were within quality control limits therefore the samples were not qualified for these analytes.

- The continuing calibration response factors for SPCC were within quality control limits, and the %D for the CCC met the quality control requirements.

Blanks

- The method blanks met quality control requirements.

Surrogate Spikes

- The sample surrogate percent recoveries (%R) were within quality control requirements.

Matrix Spikes/Matrix Spike Duplicates

- The percent recoveries (%R) were within quality control limits for the MS and MSD samples with the following exception.

- The %RPD for the MS/MSD samples exceeded the quality control limit for all of the analytes. The case narrative explained that the RPD exceedances were due to the difference in volumes that were extracted. The individual recoveries for each analyte were within the quality control limits. The parent sample should be qualified with J for all analytes.

Date	Compound	%RPD	Associated Samples	Flag
11/17/12	All compounds		JP-M11-GWMW336	J

Laboratory Control Samples

- The %R for the laboratory control samples (LCS) were within quality control limits with the following exception.

- The LCS %R for butyl benzyl phthalate, di-n-butyl phthalate, diethyl phthalate exceeded the upper quality control limit. These compounds were not detected in the samples. The laboratory flagged these analytes in the sample results. The samples should be qualified with a "Q" flag for these compounds.

Date	Compound	%R	Associated Samples	Flag
11/17/12	butyl benzyl phthalate di-n-butyl phthalate diethyl phthalate	122% 122% 136%	JP-M11-GWMW998 JP-M11-GWMW336 JP-M11-GWMW804 JP-M11-GWMW805 JP-M11-GWMW335 JP-M11-GWMW334 JP-M11-GWMW803 JP-M11-GWMW802 JP-M11-GWMW333 JP-M13-GWMW806 JP-M13-GWMW807	Q

Internal Standards

- The internal standard areas and retention times were within quality control limits with the following exception.

- The retention times of the internal standards in the method blank and LCS samples were outside the quality control limit. The case narrative explained the samples were not reanalyzed since there were no analytes detected in the method blank and the surrogate recoveries were within quality limits. The data were not qualified since the internal standards and surrogates are sample specific.

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

EPA SW846 Method 6010B

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent recoveries (%R) were within quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements.

Blanks

- The initial and continuing calibration blanks met method quality control requirements.

- Sodium was detected in the method blank at a concentration between the method detection limit and reporting limit and less than one half the reporting limit. The laboratory qualified the sample results with a "B" flag for this analyte when detected in the samples. The sample results were greater than five times the method blank results for sodium, therefore the sample results were not qualified for this analyte and the laboratory qualifier should be removed.

Compound	**QC Sample**	**Method Blank Concentration**	**Associated Samples**	**Sample Concentration**	**Flag to be removed**
sodium	Method blank	0.133 mg/L	JP-M11-GWMW998 Sodium	79 mg/L	B
			JP-M11-GWMW336 Sodium	77 mg/L	
			JP-M11-GWMW804 sodium	64 mg/L	
			JP-M11-GWMW805 sodium	100 mg/L	
			JP-M11-GWMW335 Sodium	51 mg/L	
			JP-M11-GWMW334 Sodium	46 mg/L	
			JP-M11-GWMW803 Sodium	84 mg/L	
			JP-M11-GWMW802 Sodium	33 mg/L	
			JP-M11-GWMW333 Sodium	43 mg/L	
			JP-M13-GWMW806 Sodium	26 mg/L	
			JP-M13-GWMW807 sodium	390 mg/L	

Interelement Check Standard

- The interference check standard (ICS-A and ICS-AB) met quality control requirements.

Matrix Spike/Matrix Spike Duplicate Analysis

- The matrix spike and matrix spike duplicate (MS/MSD) sample percent recoveries (%R) were within quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

Quality Control/Method Reporting Limit Check

- The QC/MRL met quality control requirements with the following exception. The MRL %R for selenium in batch 169318 exceeded the quality control limit. Associated sample included JP-M11-GWMW804 diluted analysis. The CRI and detection limit check standard were within QC limits therefore the sample was not qualified.

- The linear range check standard exceeded the quality control limit for arsenic. The case narrative stated the S1 results for arsenic were within quality control limits and sample results were below the S1 value, therefore no further action was performed. The S1 results met the method criteria for correlation coefficient and y-intercept.

EPA SW846 Method 7470A

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent recoveries (%R) were within quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements.

Blanks

- The initial, method, and continuing calibration blanks met method quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes met method quality control requirements.

EPA SW846 Method 8330

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent relative standard deviation (%RSD) was within quality control requirements.

Continuing Calibration

- Continuing calibration %D was within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The ICV %D was within quality control requirements.

Blanks

- Method blank analysis met quality control requirements.

Surrogate Spikes

- Surrogate percent recoveries (%R) were within quality control requirements.

- The surrogate retention time shifted in the samples from the surrogate relative retention time on the primary column for most of the samples. In addition, there was a retention time shift for the method blank, LCS, and one sample on the secondary column. The case narrative discussed the retention time shift and noted the samples were evaluated based on the shift. The retention times for the detected analytes were within the relative retention times of the respective analytes in the continuing calibration verification sample on each column.

Matrix Spikes/Matrix Spike Duplicates

- The matrix spike and matrix spike duplicate (MS/MSD) sample percent recoveries (%R) were within quality control requirements. The %RPD between the MS/MSD samples exceeded the quality control limit for 2-nitrotoluene. The individual recoveries were within the quality control limits. The parent sample should be qualified "J" for 2-nitrotoluene.

Date	Compound	%RPD	Associated Samples	Flag
10/31/12	2-nitrotoluene	27	JP-M11-GWMW336	J

Laboratory Control Samples

- The %R for the LCS were within quality control limits.

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

Sample Analysis

- Sample analysis met method requirements for retention times, secondary column confirmation, dilutions, and RPD between the primary and secondary columns.

EPA MCAWW 300

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration met quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements.

Blanks

- Method blank analysis met quality control requirements.

Matrix Spike/Matrix Spike Duplicate Analysis

- The MS/MSD sample %R was within quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

All other acceptance criteria were met for the general chemistry data as reported.

Summary

The QC requirements met the acceptance criteria for each method as specified in the project QAPP and guidance documents listed with the exceptions note above.

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW998**

Lab Sample ID: 500-51693-1
Client Matrix: Water

Date Sampled: 10/24/2012 0800
Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168614	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-01.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 1037			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 1037				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	5.4		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

SL 1/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-51693-2
Client Matrix: Water

Date Sampled: 10/24/2012 0932
Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168614	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-02.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 1101			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 1101				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	5.1		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW804**

Lab Sample ID: 500-51693-3

Client Matrix: Water

Date Sampled: 10/24/2012 1130

Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168614	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-03.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 1126			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 1126				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

JR 11/14/12

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW805**

Lab Sample ID: 500-51693-4

Client Matrix: Water

Date Sampled: 10/24/2012 1214

Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168614	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-04.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 1150			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 1150				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	5.5		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

JR 1/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW335**

Lab Sample ID: 500-51693-5
Client Matrix: Water

Date Sampled: 10/24/2012 1417
Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168614	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-05.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 1214			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 1214				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

JR 11/14/12

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW334**

Lab Sample ID: 500-51693-6

Client Matrix: Water

Date Sampled: 10/24/2012 1502

Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168614	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-06.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 1238			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 1238				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW803**

Lab Sample ID: 500-51693-7 Date Sampled: 10/24/2012 1547
Client Matrix: Water Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168614	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-07.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 1302			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 1302				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW802**

Lab Sample ID: 500-51693-8 Date Sampled: 10/24/2012 1635
Client Matrix: Water Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168614	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-08.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 1327			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 1327				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW333**

Lab Sample ID: 500-51693-9

Client Matrix: Water

Date Sampled: 10/24/2012 1722

Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168614	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-09.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 1351			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 1351				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-51693-10

Client Matrix: Water

Date Sampled: 10/24/2012 1550

Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168521	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-10.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/05/2012 2155			Final Weight/Volume:	5 mL
Prep Date:	11/05/2012 2155				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

JR 1/14/13

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-51693-11 Date Sampled: 10/24/2012 1128
Client Matrix: Water Date Received: 10/25/2012 1120

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168521	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51693-11.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/05/2012 2219			Final Weight/Volume:	5 mL
Prep Date:	11/05/2012 2219				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	1.5		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW998**

Lab Sample ID: 500-51693-1
Client Matrix: Water

Date Sampled: 10/24/2012 0800
Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-1.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1423			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9	* Q	0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7	* Q	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9	* Q	0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

SR 1/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-51693-2
Client Matrix: Water

Date Sampled: 10/24/2012 0932
Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-2.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1448			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93	J	0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3	J	2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9	* Q J	0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9	J	0.33	1.9
Di-n-butyl phthalate	<4.7	* Q J	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3	J	2.1	9.3
Diethyl phthalate	<1.9	* Q J	0.41	1.9
2,4-Dimethylphenol	<9.3	J	3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7	J	1.0	4.7

JR 1/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-51693-2

Client Matrix: Water

Date Sampled: 10/24/2012 0932

Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-2.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1448			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7	J	0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7	J	1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	38		20 - 110
Phenol-d5	25		10 - 115
Nitrobenzene-d5	68	JE 1/14/13	40 - 110
2-Fluorobiphenyl	66		50 - 110
2,4,6-Tribromophenol	65		40 - 125
Terphenyl-d14	76		50 - 135

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW804**

Lab Sample ID: 500-51693-3 Date Sampled: 10/24/2012 1130
Client Matrix: Water Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-3.D
Dilution:	1.0			Initial Weight/Volume:	350 mL
Analysis Date:	11/17/2012 1512			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<2.9		1.0	2.9
N-Nitrosodimethylamine	<29		3.9	29
Acenaphthylene	<2.9		0.91	2.9
Anthracene	<2.9		0.91	2.9
Benzidine	<110		57	110
Benzoic acid	<57		13	57
Benzo[a]anthracene	<0.57		0.13	0.57
Benzo[b]fluoranthene	<0.57		0.17	0.57
Benzo[k]fluoranthene	<0.71		0.21	0.71
Benzo[g,h,i]perylene	<2.9		1.2	2.9
Benzo[a]pyrene	<0.57		0.16	0.57
Benzyl alcohol	<57		8.7	57
Bis(2-chloroethoxy)methane	<5.7		0.86	5.7
Bis(2-chloroethyl)ether	<5.7		1.0	5.7
2,2'-oxybis[1-chloropropane]	<5.7		0.86	5.7
Bis(2-ethylhexyl) phthalate	<29		6.9	29
4-Bromophenyl phenyl ether	<14		2.6	14
Butyl benzyl phthalate	<5.7	* Q	0.77	5.7
Carbazole	<14		2.8	14
4-Chloroaniline	<29		6.0	29
4-Chloro-3-methylphenol	<29		6.3	29
2-Chloronaphthalene	<5.7		0.97	5.7
2-Chlorophenol	<14		2.3	14
4-Chlorophenyl phenyl ether	<14		2.3	14
Chrysene	<1.4		0.40	1.4
Dibenz(a,h)anthracene	<0.86		0.18	0.86
Dibenzofuran	<5.7		1.0	5.7
Di-n-butyl phthalate	<14	* Q	2.3	14
1,2-Dichlorobenzene	<5.7		0.83	5.7
1,3-Dichlorobenzene	<5.7		0.71	5.7
1,4-Dichlorobenzene	<5.7		0.77	5.7
3,3'-Dichlorobenzidine	<14		2.7	14
2,4-Dichlorophenol	<29		6.5	29
Diethyl phthalate	<5.7	* Q	1.3	5.7
2,4-Dimethylphenol	<29		9.5	29
Dimethyl phthalate	<5.7		1.1	5.7
4,6-Dinitro-2-methylphenol	<57		14	57
2,4-Dinitrophenol	<57		21	57
2,4-Dinitrotoluene	<4.0		0.86	4.0
2,6-Dinitrotoluene	<1.4		0.34	1.4
Di-n-octyl phthalate	<29		7.1	29
Fluoranthene	<2.9		0.91	2.9
Fluorene	<2.9		1.1	2.9
1,2-Diphenylhydrazine	<14		2.0	14
Hexachlorobenzene	<1.4		0.40	1.4
Hexachlorobutadiene	<14		3.2	14

JL 1/14/13

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW805**

Lab Sample ID: 500-51693-4 Date Sampled: 10/24/2012 1214
Client Matrix: Water Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-4.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1536			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9	* Q	0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7	* Q	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9	* Q	0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW335**

Lab Sample ID: 500-51693-5

Client Matrix: Water

Date Sampled: 10/24/2012 1417

Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-5.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1601			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9	* Q	0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7	* Q	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9	* Q	0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

JR 1/14/13

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW334**

Lab Sample ID: 500-51693-6 Date Sampled: 10/24/2012 1502
Client Matrix: Water Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-6.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1625			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9	* Q	0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7	* Q	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9	* Q	0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

JP 1/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW803**

Lab Sample ID: 500-51693-7

Client Matrix: Water

Date Sampled: 10/24/2012 1547

Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-7.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1650			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9	* Q	0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7	* Q	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9	* Q	0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

JR 1/14/13

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW802**

Lab Sample ID: 500-51693-8 Date Sampled: 10/24/2012 1635
Client Matrix: Water Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-8.D
Dilution:	1.0			Initial Weight/Volume:	980 mL
Analysis Date:	11/17/2012 1714			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<1.0		0.37	1.0
N-Nitrosodimethylamine	<10		1.4	10
Acenaphthylene	<1.0		0.33	1.0
Anthracene	<1.0		0.33	1.0
Benzidine	<41		20	41
Benzoic acid	<20		4.7	20
Benzo[a]anthracene	<0.20		0.045	0.20
Benzo[b]fluoranthene	<0.20		0.059	0.20
Benzo[k]fluoranthene	<0.26		0.076	0.26
Benzo[g,h,i]perylene	<1.0		0.43	1.0
Benzo[a]pyrene	<0.20		0.057	0.20
Benzyl alcohol	<20		3.1	20
Bis(2-chloroethoxy)methane	<2.0		0.31	2.0
Bis(2-chloroethyl)ether	<2.0		0.36	2.0
2,2'-oxybis[1-chloropropane]	<2.0		0.31	2.0
Bis(2-ethylhexyl) phthalate	<10		2.5	10
4-Bromophenyl phenyl ether	<5.1		0.93	5.1
Butyl benzyl phthalate	<2.0	* Q	0.28	2.0
Carbazole	<5.1		1.0	5.1
4-Chloroaniline	<10		2.1	10
4-Chloro-3-methylphenol	<10		2.2	10
2-Chloronaphthalene	<2.0		0.35	2.0
2-Chlorophenol	<5.1		0.82	5.1
4-Chlorophenyl phenyl ether	<5.1		0.83	5.1
Chrysene	<0.51		0.14	0.51
Dibenz(a,h)anthracene	<0.31		0.065	0.31
Dibenzofuran	<2.0		0.36	2.0
Di-n-butyl phthalate	<5.1	* Q	0.82	5.1
1,2-Dichlorobenzene	<2.0		0.30	2.0
1,3-Dichlorobenzene	<2.0		0.26	2.0
1,4-Dichlorobenzene	<2.0		0.28	2.0
3,3'-Dichlorobenzidine	<5.1		0.96	5.1
2,4-Dichlorophenol	<10		2.3	10
Diethyl phthalate	<2.0	* Q	0.45	2.0
2,4-Dimethylphenol	<10		3.4	10
Dimethyl phthalate	<2.0		0.39	2.0
4,6-Dinitro-2-methylphenol	<20		5.0	20
2,4-Dinitrophenol	<20		7.6	20
2,4-Dinitrotoluene	<1.4		0.31	1.4
2,6-Dinitrotoluene	<0.51		0.12	0.51
Di-n-octyl phthalate	<10		2.5	10
Fluoranthene	<1.0		0.33	1.0
Fluorene	<1.0		0.39	1.0
1,2-Diphenylhydrazine	<5.1		0.71	5.1
Hexachlorobenzene	<0.51		0.14	0.51
Hexachlorobutadiene	<5.1		1.1	5.1

JR 1/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW333**

Lab Sample ID: 500-51693-9
Client Matrix: Water

Date Sampled: 10/24/2012 1722
Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-9.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1738			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9	* Q	0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7	* Q	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9	* Q	0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

JR 1/14/13

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-51693-10 Date Sampled: 10/24/2012 1550
Client Matrix: Water Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-10.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1803			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9	* Q	0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7	* Q	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9	* Q	0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

JR 11/14/12

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-51693-11
Client Matrix: Water

Date Sampled: 10/24/2012 1128
Date Received: 10/25/2012 1120

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170091	Instrument ID:	CMS20
Prep Method:	3510C	Prep Batch:	500-167825	Lab File ID:	51693-11.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1827			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1055			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9	* Q	0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7	* Q	0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9	* Q	0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-51693-2
Client Matrix: Water

Date Sampled: 10/24/2012 0932
Date Received: 10/25/2012 1120

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167762	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	10/31/2012 1805			Injection Volume:	100 uL
Prep Date:	10/30/2012 0121			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.088	0.31
RDX	<0.16		0.083	0.16
1,3,5-Trinitrobenzene	<0.16		0.047	0.16
1,3-Dinitrobenzene	<0.16		0.030	0.16
Nitrobenzene	<0.16		0.041	0.16
2,4,6-Trinitrotoluene	<0.16		0.065	0.16
Tetryl	<0.39		0.097	0.39
2,4-Dinitrotoluene	<0.31		0.060	0.31
2,6-Dinitrotoluene	<0.31		0.097	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.15	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.14	0.31
2-Nitrotoluene	<0.31	J	0.12	0.31
4-Nitrotoluene	<0.31		0.11	0.31
3-Nitrotoluene	<0.31		0.069	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	129		70 - 130

SL 11/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW998**

Lab Sample ID: 500-51693-1
Client Matrix: Water

Date Sampled: 10/24/2012 0800
Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0051			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0046	J	0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.025		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.0010	J	0.00054	0.0020
Calcium	160		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.0018	J	0.0010	0.0050
Copper	0.0014	J	0.0011	0.010
Iron	0.29		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	110		0.024	0.10
Manganese	0.16		0.0011	0.010
Nickel	0.0047	J	0.0019	0.010
Potassium	4.8		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	79	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.0056	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1217			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JR 1/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW336**

Lab Sample ID: 500-51693-2
Client Matrix: Water

Date Sampled: 10/24/2012 0932
Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0055			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.024		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.0010	J	0.00054	0.0020
Calcium	150		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.0015	J	0.0010	0.0050
Copper	0.0016	J	0.0011	0.010
Iron	0.24		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	110		0.024	0.10
Manganese	0.15		0.0011	0.010
Nickel	0.0036	J	0.0019	0.010
Potassium	4.6		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	77	B	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1219			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JR 1/14/13

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW804**

Lab Sample ID: 500-51693-3 Date Sampled: 10/24/2012 1130
Client Matrix: Water Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0119			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0056	J	0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.076		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00074	J	0.00054	0.0020
Calcium	150		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.0028	J	0.0010	0.0050
Copper	0.0016	J	0.0011	0.010
Iron	1.7		0.070	0.20
Magnesium	110		0.024	0.10
Manganese	0.53		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	5.3		0.070	0.50
Silver	0.0073		0.0011	0.0050
Sodium	64	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0063		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

Analysis Method:	6010B	Analysis Batch:	500-169318	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6111012A.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/10/2012 1231			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Lead	<0.0050		0.0016	0.0050
Selenium	<0.010		0.0027	0.010

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1230			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JR 11/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW805**

Lab Sample ID: 500-51693-4
Client Matrix: Water

Date Sampled: 10/24/2012 1214
Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0123			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.029		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00098	J	0.00054	0.0020
Calcium	110		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0018	J	0.0011	0.010
Iron	0.099	J	0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	79		0.024	0.10
Manganese	0.0094	J	0.0011	0.010
Nickel	0.0040	J	0.0019	0.010
Potassium	8.1		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	100	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1232			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JR 1/14/13

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW335**

Lab Sample ID: 500-51693-5 Date Sampled: 10/24/2012 1417
Client Matrix: Water Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0134			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.027		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.0012	J	0.00054	0.0020
Calcium	200		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0081	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	120		0.024	0.10
Manganese	0.076		0.0011	0.010
Nickel	0.0037	J	0.0019	0.010
Potassium	6.6		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	51	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.0051	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1234			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JP 11/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW334**

Lab Sample ID: 500-51693-6

Client Matrix: Water

Date Sampled: 10/24/2012 1502

Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0138			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.038		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.0011	J	0.00054	0.0020
Calcium	110		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.0012	J	0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	2.0		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	71		0.024	0.10
Manganese	0.52		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	5.2		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	46	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.00073	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1235			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JR 1/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW803**

Lab Sample ID: 500-51693-7
Client Matrix: Water

Date Sampled: 10/24/2012 1547
Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0142			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.028		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.0012	J	0.00054	0.0020
Calcium	47		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	28		0.024	0.10
Manganese	<0.010		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	7.3		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	84	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1237			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JR 1/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW802**

Lab Sample ID: 500-51693-8
Client Matrix: Water

Date Sampled: 10/24/2012 1635
Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0147			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.099		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00098	J	0.00054	0.0020
Calcium	120		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0018	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	55		0.024	0.10
Manganese	0.58		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	3.2		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	33	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.00067	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1239			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JL 1/14/13

Client: Toltest Inc.

Job Number: 500-51693-1

Client Sample ID: **JP-M11-GWMW333**

Lab Sample ID: 500-51693-9

Client Matrix: Water

Date Sampled: 10/24/2012 1722

Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0151			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.10		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00073	J	0.00054	0.0020
Calcium	51		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	34		0.024	0.10
Manganese	0.011		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	6.4		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	43	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1240			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JE 11/14/13

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M13-GWMW806**

Lab Sample ID: 500-51693-10 Date Sampled: 10/24/2012 1550
Client Matrix: Water Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0155			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.097		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00097	J	0.00054	0.0020
Calcium	79		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0013	J	0.0011	0.010
Iron	0.089	J	0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	45		0.024	0.10
Manganese	0.021		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	1.9		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	26	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1242			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JK 1/14/13

Client: Toltest Inc. Job Number: 500-51693-1

Client Sample ID: **JP-M13-GWMW807**

Lab Sample ID: 500-51693-11 Date Sampled: 10/24/2012 1128
Client Matrix: Water Date Received: 10/25/2012 1120

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169086	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168588	Lab File ID:	P6110812D.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/09/2012 0159			Final Weight/Volume:	50 mL
Prep Date:	11/05/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0033	J	0.0026	0.020
Arsenic	<0.010	^	0.0024	0.010
Barium	0.094		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00090	J	0.00054	0.0020
Calcium	180		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0014	J	0.0011	0.010
Iron	0.50		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	90		0.024	0.10
Manganese	0.12		0.0011	0.010
Nickel	0.0021	J	0.0019	0.010
Potassium	7.6		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	390	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169186	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1247			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JR 1/24/13

JOAAP Data Evaluation Report - October 2012 Report 3

for

TestAmerica Laboratory SDG 500-51766

(October 2012 Samples)

Solutions for Your Site Development, Construction, and Environmental Projects.

January 11, 2013 Project No. 22271

Revised Data Quality Evaluation of Analytical Data for Environmental Remediation Services

Contract No. W91ZLK-05-D-0012
Site-Wide Long Term Groundwater Monitoring at Joilet Army Ammunition Plant, Wilmington, Illinois

INTRODUCTION:
TolTest has developed this draft Data Quality Evaluation (DQE) Report for the groundwater sampling conducted for site-wide long-term monitoring at the Joliet Army Ammunition Plant (JOAAP), in Wilmington, Illinois. The data evaluation was completed on the groundwater analytical data generated from groundwater monitoring samples collected on October 25, 2012 and received by the laboratory on October 26, 2012. The samples were analyzed by Test America Laboratories, Inc., laboratory report number 500-51766.

Groundwater samples were analyzed for explosives using *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW846) Method 8330, volatile organic compounds (VOC) using SW846 Method 8260B, semi-volatile organic compounds (SVOC) using SW846 8270C, metals using SW846 Method 6010B, mercury using SW846 Method 7470A, and sulfate using MCAWW 300. **Table 1** shows a cross reference of the sample information to the laboratory analytical data package.

Table 1, Groundwater Samples

Sample ID:	Date(s) Sampled:	Time Sampled:	Lab Sample No.:	Analysis:	Matrix:	Report Date:
JP-M13-GWMW808	Oct. 25, 2012	1050	500-51766-1	1	water	Nov. 20, 2012
JP-M13-GWMW809	Oct. 25, 2012	1134	500-51766-2	1	water	Nov. 20, 2012
JP-M13-GWMW997	Oct. 25, 2012	1200	500-51766-3	1	water	Nov. 20, 2012
JP-M13-GWMW126R	Oct. 25, 2012		500-51766-4	1	water	Nov. 20, 2012
JP-M13-GWMW362	Oct. 25, 2012	1200	500-51766-5	1	water	Nov. 20, 2012
JP-M1-GWMW648	Oct. 25, 2012	1416	500-51766-6	2	water	Nov. 20, 2012
JP-M1-GWMW642	Oct. 25, 2012	1500	500-51766-7	2	water	Nov. 20, 2012
JP-M1-GWMW642	Oct. 25, 2012	1500	500-51766-7MS	2	water	Nov. 20, 2012
JP-M1-GWMW642	Oct. 25, 2012	1500	500-51766-7MSD	2	water	Nov. 20, 2012
JP-M1-GWMW996	Oct. 25, 2012	1515	500-51766-8	2	water	Nov. 20, 2012
JP-M1-GWMW641	Oct. 25, 2012	1544	500-51766-9	2	water	Nov. 20, 2012
JP-M1-GWMW649	Oct. 25, 2012	1634	500-51766-10	2	water	Nov. 20, 2012

Sample ID:	Date(s) Sampled:	Time Sampled:	Lab Sample No.:	Analysis:	Matrix:	Report Date:
JP-M1-GWMW231	Oct. 25, 2012	1425	500-51766-11	2	water	Nov. 20, 2012
JP-M1-GWMW107	Oct. 25, 2012	1514	500-51766-12	2	water	Nov. 20, 2012
JP-M1-GWMW640	Oct. 25, 2012	1620	500-51766-13	2	water	Nov. 20, 2012
JP-M1-GWMW646	Oct. 25, 2012	1720	500-51766-14	2	water	Nov. 20, 2012
JP-M1-GWMW645	Oct. 25, 2012	1720	500-51766-15	2	water	Nov. 20, 2012
Trip Blank	Oct. 25, 2012	0800	500-51766-16TB	3	water	Nov. 20, 2012

Sample Analysis
1. explosives, VOC, SVOC, metals, sulfate/nitrate
2. sulfate
3. VOC

OVERVIEW:
The samples were assessed based on the criteria specified in the *Final Quality Assurance Project Plan Environmental Remediation Services at Joliet Army Ammunition Plant, Will County, Illinois (TolTest, Inc. March 2010)* (QAPP), the *Louisville DOD Quality Systems Manual Supplement, version 1 (USACE Louisville District, March 2007),* DoD Quality Systems Manual Version 4 Draft, (January 2009), *Louisville Chemistry Guideline,* (LCG) (June 2002), and U.S. EPA Contract Laboratory Program National Functional Guidelines in conjunction with the internal laboratory quality control (QC) criteria. Quality checks evaluated included holding times, sample preservation, cooler temperatures, daily tune requirements, internal standards, surrogates, laboratory control samples (LCS), method blanks, trip blanks, matrix spike and duplicate (MS/MSD) analysis, initial and continuing calibration verifications, (ICV, CCV), calibration blanks, and QC Method Reporting Limit (QC/MRL) recovery. Level III data review was completed in accordance with the QAPP, therefore raw data was not evaluated.

SUMMARY
This section summarizes the findings from the data evaluation of the laboratory analytical data packages. The tables below present the quality control check requirements, the analytes that failed the criteria, analysis flags, and the data to which the flags are applied. Each of the quality checks reviewed in the laboratory analytical data package are summarize under each method subheading.

EPA SW846 Method 8260B

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Tuning Requirements

- Instrument tuning requirements were met and within quality control requirements.

Initial Calibration

- Initial calibration requirements were met. The percent relative standard deviations (%RSD) were less than or equal to 15% for each individual compound and less than or equal to 30% for calibration check compounds (CCC).
- In cases where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r2) were greater than or equal to 0.990 which meets quality control requirements.

- The average response factors (RRF) for all compounds in system performance check compounds (SPCC) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent differences (%D) were within quality control requirements of less than or equal to 25% for each individual compound with the following exceptions.

- The %D for bromomethane and vinyl acetate in the ICV 500-165139/11 exceeded the quality control limit. These compounds were not detected in the samples. Consistent with the QAPP Worksheet #28 and referenced laboratory SOP Table B-3 the data should be qualified as follows:

Date	Compound	%D	Associated Samples	Flag
10/9/12	Bromomethane Vinyl acetate	29.0% 73.2%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	R

Continuing Calibration

- The continuing calibration verification samples (CCV) were run every twelve hours consistent with the method, DoD QSM, and U.S. EPA National Functional Guidelines. The project QAPP requires the CCV to be run every ten samples.

- The %D for all compounds were within the quality control requirements of less than or equal to 20%. The %D for the CCC and the continuing calibration response factors for SPCC were with quality control limits with the following exception.

- The %D for vinyl acetate in the CCV 500-168521/2 analyzed on 11/5/12 at 19:54 exceeded the quality control limit. The %D in the CCV 500-168521/3 analyzed on 11/5/12 at 20:18 exceeded the quality control limit for butadiene and iodomethane; these compounds were not target analytes. Vinyl acetate was not detected in the samples. The %D in the CCV 500-168614/3 analyzed on 11/6/12 at 08:37 exceeded the quality control limit for cyclohexanone; this is not a target analyte. Since the ICV failed for vinyl acetate the samples will be qualified based on the failed ICV.

Date	Compound	%D	Associated Samples	Flag
11/5/12 instrument CMS25	Vinyl acetate	35.9%	JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	R

Blanks

- The method blanks met quality control requirements. The trip blank met quality control requirements.

Surrogate Spikes

- Surrogate percent recoveries (%R) were within quality control requirements.

Matrix Spikes/Matrix Spike Duplicates

- The percent recoveries (%R) were within quality control limits for the MS and MSD samples with the following exception. The %R for vinyl acetate in the MS and MSD samples exceeded the upper quality control limit. This compound was not detected in the parent sample. The parent sample, JPM13-GWMW809 should be flagged "J" for vinyl acetate. Since the ICV failed for vinyl acetate the samples will be qualified based on the failed ICV.

Laboratory Control Samples

- The %R for the laboratory control samples (LCS) were within quality control limits with the following exception. The %R for vinyl acetate in the LCS samples in both batch 168614 and 168521 exceeded the upper quality control limit. This compound was not detected in the samples. Since the ICV failed for vinyl acetate the samples will be qualified based on the failed ICV.

Internal Standards

- The internal standard areas and retention times were within quality control limits.

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

EPA SW846 Method 8270C

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Tuning Requirements

- Instrument tuning requirements were met and within quality control requirements.

Initial Calibration

- Initial calibration requirements were met. The percent relative standard deviations (%RSD) were less than or equal to 15% for each individual compound and less than or equal to 30% for calibration check compounds (CCC) with the following exceptions.

- The %RSD exceeded the quality control limit for pyridine, n-nitrosodiethylamine, 2,4-dinitrophenol, benzoic acid, kepone in the initial calibration run on 10/19/12. The method blank and LCS samples were analyzed with this curve. Pyridine, n-nitrosodiethylamine and kepone were not target analytes. The compounds 2,4-dinitrophenol and benzoic acid should be qualified with "R".

- The %RSD exceeded the quality control limit for n-nitrosodi-n-propylamine, 3&4 methylphenol, 2,4-dinitrophenol, kepone in the initial calibration run on 11/12/12. Kepone was not a target analyte. The associated samples included JP-M13-GWMW808, JP-M13-GWM809, JP-M13-GWMW997, JP-M13-GWMW126R, JP-M13-GWMW362. The compounds n-nitrosodi-n-propylamine, 3&4 methylphenol, 2,4-dinitrophenol should be qualified "R" in the samples.

Date	Compound	%RSD	Associated Samples	Flag
11/12/12	n-nitrosodi-n-propylamine	27.0%	JP-M13-GWMW808	R

	3&4 methylphenol 2,4-dinitrophenol	22.0% 29.0%	JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	

- In cases where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r2) were greater than or equal to 0.990.

- The average response factors (RRF) for all compounds in system performance check compounds (SPCC) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent differences (%D) were within quality control requirements of less than or equal to 25% for each individual compound with the following exception.

- The %D for benzoic acid in the ICV sample 500-166608/14 exceeded the quality control limit. The associated samples included the method blank and LCS. The %D for benzoic acid in the ICV sample 500-169392/14 exceeded the quality control limit. The associated samples included JP-M13-GWMW808, JP-M13-GWM809, JP-M13-GWMW997, JP-M13-GWMW126R, JP-M13-GWMW362. The samples should be qualified "R" for benzoic acid.

Date	Compound	%D	Associated Samples	Flag
11/12/12	Benzoic acid	64.8%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	R

Continuing Calibration

- The continuing calibration verification samples (CCV) were run every twelve hours consistent with the method, DoD QSM, and U.S. EPA National Functional Guidelines. The project QAPP requires the CCV to be run every ten samples.

- The %D for all compounds were within the quality control requirements of less than or equal to 20% with the following exceptions.

- The %D in the CCV sample 500-169270/2 for n-nitrosodimethylamine, bis(2-chloroethyl) ether, 2-methylphenol, naphthalene, 2-chloronaphthalene, 2,4-dinitrophenol, pentachlorophenol, 2,4,6-tribromophenol exceeded the quality control limit. Associated samples included the method blank and the LCS. These compounds were not detected in the method blank and the LCS %R was within the control limits for these compounds, therefore the data are not affected.

- The %D in the CCV sample 500-170093/2 exceeded the quality control limit for 2,2'-oxybis(1-chloropropane), benzoic acid, acenaphthene, 2,4-dinitrophenol, dibenzofuran, fluorene, 1,2-diphenylhydrazine. Associated samples included JP-M13-GWMW808, JP-M13-GWM809, JP-M13-GWMW997, JP-M13-GWMW126R, JP-M13-GWMW362. The samples should be qualified "J" for these analytes for positive results.

Date	Compound	%D	Associated Samples	Flag
11/17/12	2,2'-oxybis(1-chloropropane)	27.3%	JP-M13-GWMW808	J (all detects)

	benzoic acid Acenaphthene 2,4-dinitrophenol dibenzofuran Fluorene 1,2-diphenylhydrazine	36.7% 22.0% 50.1% 29.2% 23.4% 25.3%	JP-M13-GWMW809 JP-M13-GWMW997 JP-M13 GWMW126R JP-M13-GWMW362	UJ (all non-detects) except for benzoic acid and 2,4dinitrophenol which should be"R"

- The continuing calibration response factors for SPCC were within quality control limits, and the %D for the CCC met the quality control requirements.

Blanks

- The method blanks met quality control requirements.

Surrogate Spikes

- The sample surrogate percent recoveries (%R) were within quality control requirements with one exception. The surrogate 2,4,6-tribromophenol %R exceeded the upper quality control limit in the LCS. This surrogate was one of six surrogates. The sample results are not affected since surrogates are specific to the individual samples.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

Laboratory Control Samples

- The %R for the laboratory control samples (LCS) were within quality control limits with the following exception. The LCS %R for 2,4-dinitrophenol and pentachlorophenol exceeded the upper quality control limit. These compounds were not detected in the samples. The samples should be qualified with a "Q" flag for pentachlorophenol. The samples were qualified with an "R" for 2,4-dinitrophenol for failed initial calibration and ICV.

Date	Compound	%R	Associated Samples	Flag
11/12/12	pentachlorophenol	130%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M1GWMW126R JP-M13-GWMW362	Q

Internal Standards

- The internal standard areas and retention times were within quality control limits with the following exception.

- The retention times of the internal standards in the method blank and LCS samples were outside the quality control limit. The case narrative explained the system retention times were updated for proper analyte identification. In addition, the internal standard areas were outside the quality control limits for three of the internal standards in the ICV sample 500-166608/13. This ICV contained only a partial list of the compounds. In addition, the EICP internal standard area was outside the quality control limit for one of the internal standards in the ICV sample 500-169392/14. The case narrative stated no further action was required, however per the LCG and DoD QSM states any sample associated with out of control results for the internal standard must be reanalyzed. In addition, per the method QC if the EICP area for any of the internal standards in the calibration verification standard changes from that in the mid-point standard level of the initial calibration, the mass

spectrometer must be inspected and corrections made. Reanalysis of samples analyzed while the system is malfunctioning is required. The sample results for the following should be qualified with a "Q" flag: n-nitrosodi-n-propylamine, 4-chloroaniline, 2-nitroaniline, 3-nitroaniline, 4-nitroaniline, benzidine, 3,3'-dichlorobenzidine since the method blank and LCS are QC samples and the precision and bias of those sample results are questionable.

Date	Compound	QC Sample	Associated Samples	Flag
8/7/12 instrument CMS20	n-nitrosodi-n-propylamine 4-chloroaniline 2-nitroaniline 3-nitroaniline 4-nitroaniline Benzidine 3,3'-dichlorobenzidine.	ICV internal standard	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M1GWMW126R JP-M13-GWMW362	Q

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

EPA SW846 Method 6010B

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent recoveries (%R) were within quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements. The %R for zinc in the CCV sample 500-168695/71 slightly exceeded the upper quality control limit. The samples were analyzed for potassium and sodium in this curve therefore the sample results are not affected.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements.

Blanks

- Antimony, barium, and chromium were detected in the method blank at a concentration between the method detection limit and reporting limit and less than one half the reporting limit. The laboratory qualified the sample results with a "B" flag for these analytes when detected in the samples. The sample results were greater than five times the method blank results for barium, therefore the sample results were not qualified for this analyte and the laboratory qualifier should be removed. The sample results for antimony and chromium were above the reporting limit but less than five times the method blank concentration in samples JP-M13-GWMW808, JP-

M13-GWMW997, and JP-M13-GW126R and should be qualified with a "B". Samples JP-M13-GWMW809 and JP-M13-GWMW362 were non-detect for antimony and chromium and were not qualified.

Compound	QC Sample	Method Blank Concentration	Associated Samples	Sample Concentration	Flag to be removed
Antimony	Method blank	0.00330 mg/L	JP-M13-GWMW808		B
Barium		0.000480 mg/L	Antimony	0.0034 mg/L	Qualify B
chromium		0.00103 mg/L	Barium	0.22 mg/L	remove
			chromium	0.0010 mg/L	Qualify B
			JP-M13-GWMW809		
			Antimony	<0.020 mg/L	
			Barium	0.029 mg/L	remove
			chromium	<0.010 mg/L	
			JP-M13-GWMW997		
			Antimony	0.0027 mg/L	Qualify B
			Barium	0.029 mg/L	remove
			chromium	0.0019 mg/L	Qualify B
			JP-M13-GW126R		
			Antimony	0.0036 mg/L	Qualify B
			Barium	0.058 mg/L	remove
			chromium	0.0011 mg/L	Qualify B
			JP-M13-GWMW362		
			Antimony	<0.020 mg/L	
			Barium	0.050 mg/L	remove
			chromium	<0.010 mg/L	

-The initial and continuing calibration blanks met method quality control requirements.

Interelement Check Standard

- The interference check standard (ICS-A and ICS-AB) met quality control requirements.

Matrix Spike/Matrix Spike Duplicate Analysis

- The matrix spike and matrix spike duplicate (MS/MSD) sample percent recoveries (%R) were within quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

Quality Control/Method Reporting Limit Check

- The QC/MRL met quality control requirements.

EPA SW846 Method 7470A

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent recoveries (%R) were within quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements.

Blanks

- The initial, method, and continuing calibration blanks met method quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

EPA SW846 Method 8330

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent relative standard deviation (%RSD) was within quality control requirements.

Continuing Calibration

- Continuing calibration %D was within quality control requirements with the following exception. The %D for RDX in the CCV sample 500-169119/27 on the secondary column exceeded the quality control limit. The CCV was the end run for sample analysis. The associated sample was JP-M13-GWMW362 dilution. The CCV analyzed prior to the sample was within quality control limits. The sample results were quantified on the primary column, therefore the sample results for the JP-M13-GWMW362DL were not qualified.

Second Source Calibration Verification (Initial Calibration Verification)

- The ICV %D was within quality control requirements.

Blanks

- Method blank analysis met quality control requirements.

Surrogate Spikes

- Surrogate percent recoveries (%R) were within quality control requirements.

- The surrogate retention time shifted in the samples from the surrogate relative retention time on the primary column for most of the samples. In addition, there was a retention time shift for the method blank, LCS, LCSD, one sample and the end run CCV on the secondary column. The case narrative discussed the retention time shift and noted the samples were evaluated based on the shift. The retention times for the detected analytes were within the relative retention times of the respective analytes in the continuing calibration verification sample on each column except for RDX in samples JP-M13-GWMW362 and JP-M13-GWMW362DL, which the retention time on both columns for this analyte was above the upper limit. The shift does not affect the data in regards to false positives since the analyte was detected on both columns.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

Laboratory Control Samples

- The %R for the LCS were within quality control limits with the following exception.
- The LSCD %R for 2-amino-4,6-DNT and 4-amino-2,6-DNT exceeded the upper quality control limit on the secondary column analysis. In addition, the RPD also exceeded the quality control limit for these same analytes. The LCS %R was within the quality control limit and the LSC/LSCD %R was within the quality control limits on the primary column for these analytes, therefore the results for these analytes were not qualified.

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

Sample Analysis

- Sample analysis met method requirements for retention times, secondary column confirmation, dilutions, and RPD between the primary and secondary columns with the following exception.
- The RPD between the primary and secondary columns exceeded the quality control limit for 3-NT in sample JP-M13-GWMW126R, for 4-amino-2,6-DNT and 2-amino-4,6-DNT in the LCSD sample. These analytes should be qualified with a "J" in these samples. The laboratory flagged the samples for these analytes.

Date	Compound	%RPD	Associated Samples	Flag
11/9/12	3-nitrotoluene	50.9%	JP-M13-GWMW126R	J

EPA MCAWW 300

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration met quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements.

Blanks

- Method blank analysis met quality control requirements.

Matrix Spike/Matrix Spike Duplicate Analysis

- The MS/MSD sample %R was within quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

All other acceptance criteria were met for the general chemistry data as reported.

Summary

The QC requirements met the acceptance criteria for each method as specified in the project QAPP and guidance documents listed with the exceptions note above.

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-51766-1
Client Matrix: Water

Date Sampled: 10/25/2012 1050
Date Received: 10/26/2012 1335

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168614	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51766-01.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 1013			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 1013				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	22		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-51766-2

Client Matrix: Water

Date Sampled: 10/25/2012 1134

Date Received: 10/26/2012 1335

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168521	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51766-2.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/05/2012 2356			Final Weight/Volume:	5 mL
Prep Date:	11/05/2012 2356				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW997**

Lab Sample ID: 500-51766-3

Client Matrix: Water

Date Sampled: 10/25/2012 1200

Date Received: 10/26/2012 1335

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168521	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51766-3.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 0021			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 0021				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-51766-4
Client Matrix: Water

Date Sampled: 10/25/2012 0000
Date Received: 10/26/2012 1335

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168521	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51766-4.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 0045			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 0045				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-51766-5
Client Matrix: Water

Date Sampled: 10/25/2012 1200
Date Received: 10/26/2012 1335

8260B VOC

Analysis Method:	8260B	Analysis Batch:	500-168521	Instrument ID:	CMS25
Prep Method:	5030B	Prep Batch:	N/A	Lab File ID:	51766-5.D
Dilution:	1.0			Initial Weight/Volume:	5 mL
Analysis Date:	11/06/2012 0109			Final Weight/Volume:	5 mL
Prep Date:	11/06/2012 0109				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.3	5.0
Benzene	<1.0		0.074	1.0
Bromobenzene	<1.0		0.25	1.0
Bromochloromethane	<1.0		0.40	1.0
Bromodichloromethane	<1.0		0.17	1.0
Bromoform	<1.0		0.28	1.0
Bromomethane	<1.4	R	0.31	1.4
2-Butanone (MEK)	<5.0		1.5	5.0
n-Butylbenzene	<1.0		0.13	1.0
sec-Butylbenzene	<1.0		0.15	1.0
tert-Butylbenzene	<1.0		0.14	1.0
Carbon disulfide	<5.0		0.43	5.0
Carbon tetrachloride	<1.0		0.26	1.0
Chlorobenzene	<1.0		0.14	1.0
Dibromochloromethane	<1.0		0.32	1.0
Chloroethane	<1.4		0.34	1.4
Chloroform	<1.0		0.20	1.0
Chloromethane	<1.0		0.18	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0	* R	0.33	2.0
4-Chlorotoluene	<1.0		0.20	1.0
1,2-Dibromo-3-Chloropropane	<2.6		0.87	2.6
1,2-Dibromoethane	<1.0		0.36	1.0
Dibromomethane	<1.0		0.33	1.0
1,2-Dichlorobenzene	<1.0		0.27	1.0
1,3-Dichlorobenzene	<1.0		0.15	1.0
1,4-Dichlorobenzene	<1.0		0.15	1.0
Dichlorodifluoromethane	<1.0		0.20	1.0
1,1-Dichloroethane	<1.0		0.19	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.31	1.0
cis-1,2-Dichloroethene	<1.0		0.12	1.0
trans-1,2-Dichloroethene	<1.0		0.25	1.0
1,2-Dichloropropane	<1.0		0.20	1.0
1,3-Dichloropropane	<1.0		0.13	1.0
2,2-Dichloropropane	<1.0		0.32	1.0
1,1-Dichloropropene	<1.0		0.34	1.0
cis-1,3-Dichloropropene	<1.0		0.18	1.0
trans-1,3-Dichloropropene	<1.0		0.21	1.0
Ethylbenzene	<1.0		0.13	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.26	1.0
Isopropylbenzene	<1.0		0.14	1.0
p-Isopropyltoluene	<1.0		0.17	1.0
Methylene Chloride	<3.0		0.68	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.33	5.0

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-51766-1
Client Matrix: Water

Date Sampled: 10/25/2012 1050
Date Received: 10/26/2012 1335

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170093	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-167900	Lab File ID:	51766-1.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1134			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1719			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93	UJ	0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	Q	19	37
Benzoic acid	<19	^ R	4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9	UJ	0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9	UJ	0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19	* R	6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93	UJ	0.36	0.93
1,2-Diphenylhydrazine	<4.7	UJ	0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-51766-1
Client Matrix: Water

Date Sampled: 10/25/2012 1050
Date Received: 10/26/2012 1335

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170093	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-167900	Lab File ID:	51766-1.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1134			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1719			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9	R	0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	R	0.13	0.47
Pentachlorophenol	<9.3	* Q	5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	31		20 - 110
Phenol-d5	22		10 - 115
Nitrobenzene-d5	72		40 - 110
2-Fluorobiphenyl	65		50 - 110
2,4,6-Tribromophenol	92		40 - 125
Terphenyl-d14	61		50 - 135

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-51766-2
Client Matrix: Water

Date Sampled: 10/25/2012 1134
Date Received: 10/26/2012 1335

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170093	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-167900	Lab File ID:	51766-2.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1155			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1719			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93	UJ	0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	Q	19	37
Benzoic acid	<19	^ R	4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9	UJ	0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9	UJ	0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19	* R	6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93	UJ	0.36	0.93
1,2-Diphenylhydrazine	<4.7	UJ	0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-51766-2
Client Matrix: Water

Date Sampled: 10/25/2012 1134
Date Received: 10/26/2012 1335

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170093	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-167900	Lab File ID:	51766-2.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1155			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1719			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9	R	0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	R	0.13	0.47
Pentachlorophenol	<9.3	* Q	5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	29		20 - 110
Phenol-d5	21		10 - 115
Nitrobenzene-d5	71		40 - 110
2-Fluorobiphenyl	61		50 - 110
2,4,6-Tribromophenol	79		40 - 125
Terphenyl-d14	68		50 - 135

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW997**

Lab Sample ID: 500-51766-3
Client Matrix: Water

Date Sampled: 10/25/2012 1200
Date Received: 10/26/2012 1335

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170093	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-167900	Lab File ID:	51766-3.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1216			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1719			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93	UJ	0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	Q	19	37
Benzoic acid	<19	^ R	4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9	UJ	0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9	UJ	0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19	* R	6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93	UJ	0.36	0.93
1,2-Diphenylhydrazine	<4.7	UJ	0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW997**

Lab Sample ID: 500-51766-3
Client Matrix: Water

Date Sampled: 10/25/2012 1200
Date Received: 10/26/2012 1335

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170093	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-167900	Lab File ID:	51766-3.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1216			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1719			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9	R	0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	R	0.13	0.47
Pentachlorophenol	<9.3	* Q	5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	29		20 - 110
Phenol-d5	20		10 - 115
Nitrobenzene-d5	65		40 - 110
2-Fluorobiphenyl	58		50 - 110
2,4,6-Tribromophenol	66		40 - 125
Terphenyl-d14	74		50 - 135

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-51766-4
Client Matrix: Water

Date Sampled: 10/25/2012 0000
Date Received: 10/26/2012 1335

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170093	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-167900	Lab File ID:	51766-4.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1237			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1719			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93	UJ	0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	Q	19	37
Benzoic acid	<19	^ R	4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9	UJ	0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9	UJ	0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19	* R	6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93	UJ	0.36	0.93
1,2-Diphenylhydrazine	<4.7	UJ	0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-51766-4
Client Matrix: Water

Date Sampled: 10/25/2012 0000
Date Received: 10/26/2012 1335

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170093	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-167900	Lab File ID:	51766-4.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1237			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1719			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9	R	0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	R	0.13	0.47
Pentachlorophenol	<9.3	* Q	5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	27		20 - 110
Phenol-d5	19		10 - 115
Nitrobenzene-d5	62		40 - 110
2-Fluorobiphenyl	56		50 - 110
2,4,6-Tribromophenol	76		40 - 125
Terphenyl-d14	63		50 - 135

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-51766-5
Client Matrix: Water

Date Sampled: 10/25/2012 1200
Date Received: 10/26/2012 1335

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170093	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-167900	Lab File ID:	51766-5.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1259			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1719			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93	UJ	0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37	Q	19	37
Benzoic acid	<19	^ R	4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9	UJ	0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3	Q	2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9	UJ	0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7	Q	0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19	* R	6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93	UJ	0.36	0.93
1,2-Diphenylhydrazine	<4.7	UJ	0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-51766-5
Client Matrix: Water

Date Sampled: 10/25/2012 1200
Date Received: 10/26/2012 1335

8270C SVOC

Analysis Method:	8270C	Analysis Batch:	500-170093	Instrument ID:	CMS21
Prep Method:	3510C	Prep Batch:	500-167900	Lab File ID:	51766-5.D
Dilution:	1.0			Initial Weight/Volume:	1070 mL
Analysis Date:	11/17/2012 1259			Final Weight/Volume:	1.0 mL
Prep Date:	10/30/2012 1719			Injection Volume:	1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9	R	0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7	Q	1.0	4.7
3-Nitroaniline	<9.3	Q	2.1	9.3
4-Nitroaniline	<9.3	Q	3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47	R	0.13	0.47
Pentachlorophenol	<9.3	* Q	5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	28		20 - 110
Phenol-d5	21		10 - 115
Nitrobenzene-d5	67		40 - 110
2-Fluorobiphenyl	58		50 - 110
2,4,6-Tribromophenol	81		40 - 125
Terphenyl-d14	64		50 - 135

Client: Toltest Inc. Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW808**

Lab Sample ID: 500-51766-1 Date Sampled: 10/25/2012 1050
Client Matrix: Water Date Received: 10/26/2012 1335

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-168655	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-167822	Lab File ID:	P51105C
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/06/2012 0305			Final Weight/Volume:	50 mL
Prep Date:	10/30/2012 0830				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0034	J B	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.22	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	150		0.087	0.20
Chromium	0.0010	J B	0.00096	0.010
Cobalt	0.021		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	3.0		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	86		0.024	0.10
Manganese	1.4		0.0011	0.010
Nickel	0.029		0.0019	0.010
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0052		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

Analysis Method:	6010B	Analysis Batch:	500-168695	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-167822	Lab File ID:	P6110612A.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/06/2012 1240			Final Weight/Volume:	50 mL
Prep Date:	10/30/2012 0830				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Potassium	12		0.070	0.50
Sodium	80		0.12	1.0

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-168699	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-168583	Lab File ID:	110612R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/06/2012 1320			Final Weight/Volume:	25 mL
Prep Date:	11/05/2012 1900				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW809**

Lab Sample ID: 500-51766-2
Client Matrix: Water

Date Sampled: 10/25/2012 1134
Date Received: 10/26/2012 1335

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-168655	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-167822	Lab File ID:	P51105C
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/06/2012 0311			Final Weight/Volume:	50 mL
Prep Date:	10/30/2012 0830				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.029	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	43		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	33		0.024	0.10
Manganese	0.0038	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	19		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0029	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

Analysis Method:	6010B	Analysis Batch:	500-168695	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-167822	Lab File ID:	P6110612A.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/06/2012 1244			Final Weight/Volume:	50 mL
Prep Date:	10/30/2012 0830				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Potassium	2.8		0.070	0.50

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-168699	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-168583	Lab File ID:	110612R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/06/2012 1322			Final Weight/Volume:	25 mL
Prep Date:	11/05/2012 1900				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW997**

Lab Sample ID: 500-51766-3
Client Matrix: Water

Date Sampled: 10/25/2012 1200
Date Received: 10/26/2012 1335

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-168655	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-167822	Lab File ID:	P51105C
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/06/2012 0317			Final Weight/Volume:	50 mL
Prep Date:	10/30/2012 0830				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0027	J B	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.029	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	43		0.087	0.20
Chromium	0.0019	J B	0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	33		0.024	0.10
Manganese	0.0038	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	19		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0029	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

Analysis Method:	6010B	Analysis Batch:	500-168695	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-167822	Lab File ID:	P6110612A.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/06/2012 1248			Final Weight/Volume:	50 mL
Prep Date:	10/30/2012 0830				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Potassium	2.8		0.070	0.50

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-168699	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-168583	Lab File ID:	110612R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/06/2012 1324			Final Weight/Volume:	25 mL
Prep Date:	11/05/2012 1900				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-51766-4
Client Matrix: Water

Date Sampled: 10/25/2012 0000
Date Received: 10/26/2012 1335

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-168655	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-167822	Lab File ID:	P51105C
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/06/2012 0323			Final Weight/Volume:	50 mL
Prep Date:	10/30/2012 0830				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0036	J B	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.058	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	70		0.087	0.20
Chromium	0.0011	J B	0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	0.88		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	44		0.024	0.10
Manganese	0.023		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	24		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0040	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

Analysis Method:	6010B	Analysis Batch:	500-168695	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-167822	Lab File ID:	P6110612A.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/06/2012 1252			Final Weight/Volume:	50 mL
Prep Date:	10/30/2012 0830				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Potassium	2.4		0.070	0.50

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-168699	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-168583	Lab File ID:	110612R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/06/2012 1325			Final Weight/Volume:	25 mL
Prep Date:	11/05/2012 1900				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

Client: Toltest Inc. Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW362**

Lab Sample ID: 500-51766-5 Date Sampled: 10/25/2012 1200
Client Matrix: Water Date Received: 10/26/2012 1335

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-168655	Instrument ID:	ICP5
Prep Method:	3010A	Prep Batch:	500-167822	Lab File ID:	P51105C
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/06/2012 0329			Final Weight/Volume:	50 mL
Prep Date:	10/30/2012 0830				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.050	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	180		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.0011	J	0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	110		0.024	0.10
Manganese	0.18		0.0011	0.010
Nickel	0.0051	J	0.0019	0.010
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0046	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

Analysis Method:	6010B	Analysis Batch:	500-168695	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-167822	Lab File ID:	P6110612A.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/06/2012 1256			Final Weight/Volume:	50 mL
Prep Date:	10/30/2012 0830				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Potassium	7.1		0.070	0.50
Sodium	300		0.12	1.0

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-168699	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-168582	Lab File ID:	110612R.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/06/2012 1222			Final Weight/Volume:	25 mL
Prep Date:	11/05/2012 1900				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

Client: Toltest Inc.

Job Number: 500-51766-1

Client Sample ID: **JP-M13-GWMW126R**

Lab Sample ID: 500-51766-4

Client Matrix: Water

Date Sampled: 10/25/2012 0000

Date Received: 10/26/2012 1335

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-169121	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167913	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	11/09/2012 2249			Injection Volume:	100 uL
Prep Date:	10/30/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.088	0.31
RDX	<0.16		0.083	0.16
1,3,5-Trinitrobenzene	0.22		0.047	0.16
1,3-Dinitrobenzene	<0.16		0.030	0.16
Nitrobenzene	<0.16		0.041	0.16
2,4,6-Trinitrotoluene	<0.16		0.065	0.16
Tetryl	<0.39		0.097	0.39
2,4-Dinitrotoluene	1.1		0.060	0.31
2,6-Dinitrotoluene	0.62		0.097	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.15	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.14	0.31
2-Nitrotoluene	2.1		0.12	0.31
4-Nitrotoluene	2.4		0.11	0.31
3-Nitrotoluene	0.17	J	0.069	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	103		70 - 130

JOAAP Data Evaluation Report - October 2012 Report 4

for

TestAmerica Laboratory SDG 500-51811

(October 2012 Samples)

Solutions for Your Site Development, Construction, and Environmental Projects.

January 8, 2013 Project No. 22271

Revised Data Quality Evaluation for of Analytical Data for Environmental Remediation Services

Contract No. W91ZLK-05-D-0012
Site-Wide Long Term Groundwater Monitoring at Joilet Army Ammunition Plant, Wilmington, Illinois

INTRODUCTION:
TolTest has developed this draft Data Quality Evaluation (DQE) Report for the groundwater sampling conducted for site-wide long-term monitoring at the Joliet Army Ammunition Plant (JOAAP), in Wilmington, Illinois. The data evaluation was completed on the groundwater analytical data generated from groundwater monitoring samples collected on October 26, 2012 and received by the laboratory on October 29, 2012. The samples were analyzed by Test America Laboratories, Inc., laboratory report number 500-51811.

Groundwater samples were analyzed for explosives using *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW846) Method 8330, and sulfate using MCAWW 300. **Table 1** shows a cross reference of the sample information to the laboratory analytical data package.

Table 1, Groundwater Samples

Sample ID:	Date(s) Sampled:	Time Sampled:	Lab Sample No.:	Analysis:	Matrix:	Report Date:
JP-M1-GWMW643	Oct. 26, 2012	1008	500-51811-1	2	water	Nov. 19, 2012
JP-M1-GWMW644	Oct. 26, 2012	1032	500-51811-2	2	water	Nov. 19, 2012
JP-M1-SW709	Oct. 26, 2012	1045	500-51811-3	2	water	Nov. 19, 2012
JP-L02-GWMW404	Oct. 26, 2012	1429	500-51811-4	1	water	Nov. 19, 2012
JP-L02-GWMW621	Oct. 26, 2012	1344	500-51811-5	1	water	Nov. 19, 2012
JP-L02-GWMW620	Oct. 26, 2012	1306	500-51811-6	1	water	Nov. 19, 2012
JP-L14-GWMWH7	Oct. 26, 2012	1000	500-51811-7	1	water	Nov. 19, 2012
JP-L14-GWMW511	Oct. 26, 2012	1100	500-51811-8	1	water	Nov. 19, 2012
JP-L14-GWMW512	Oct. 26, 2012	1146	500-51811-9	1	water	Nov. 19, 2012
JP-L02-SW555	Oct. 26, 2012	1310	500-51811-10	1	water	Nov. 19, 2012

Sample Analysis
1. explosives
2. sulfate
3. explosives, sulfate

OVERVIEW:
The samples were assessed based on the criteria specified in the *Final Quality Assurance Project Plan Environmental Remediation Services at Joliet Army Ammunition Plant, Will County, Illinois (TolTest, Inc. March 2010)* (QAPP), the *Louisville DOD Quality Systems Manual Supplement, version 1 (USACE Louisville District, March 2007),* DoD

Quality Systems Manual Version 4 Draft, (January 2009), *Louisville Chemistry Guideline*, (LCG) (June 2002), and U.S. EPA Contract Laboratory Program National Functional Guidelines in conjunction with the internal laboratory quality control (QC) criteria. Quality checks evaluated included holding times, sample preservation, cooler temperatures, surrogates, laboratory control samples (LCS), method blanks, matrix spike and duplicate (MS/MSD) analysis, initial and continuing calibration verifications, (ICV, CCV), and QC Method Reporting Limit (QC/MRL) recovery.

SUMMARY

This section summarizes the findings from the data evaluation of the laboratory analytical data packages. The tables below present the quality control check requirements, the analytes that failed the criteria, analysis flags, and the data to which the flags are applied. Each of the quality checks reviewed in the laboratory analytical data package are summarized under each method subheading.

EPA SW846 Method 8330

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent relative standard deviation (%RSD) was within quality control requirements.

Continuing Calibration

- Continuing calibration %D was within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The ICV %D was within quality control requirements.

Blanks

- Method blank analysis met quality control requirements.

Surrogate Spikes

- Surrogate percent recoveries (%R) were within quality control requirements with the following exception.
- Sample JP-L02-GWMW404 and JP-L14-GWMW512 required dilution. As a result the surrogate was diluted out during the re-analysis of the diluted sample and the surrogate recovery was below the lower quality control limit.

- The surrogate retention time shifted in the samples from the surrogate relative retention time on the primary column for most of the samples. In addition, there was a retention time shift for the method blank, LCS and LCSD on the secondary column. The case narrative discussed the retention time shift and noted the samples were evaluated based on the shift. The retention times for the detected analytes were within the relative retention times of the respective analytes in the continuing calibration verification sample on each column except for RDX in samples JP-L02-GWMW9404, JP-L14-GWMW512 and HMX in sample JP-L14-GWMW511, which the retention time was above the upper limit on the secondary column for these analytes in the three samples. The shift does not affect the data in regards to false positives since the analytes were detected on both columns and the results were quantified from the primary column.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

Laboratory Control Samples

- The %R for the LCS was within quality control limits with the following exception.
- The LSCD %R for 2-amino-4,6-DNT and 4-amino-2,6-DNT exceeded the upper quality control limit on the secondary column analysis. In addition, the RPD also exceeded the quality control limit for these same analytes. The LCS %R was within the quality control limit and the LSC/LSCD %R was within the quality control limits on the primary column for these analytes, therefore the data have not been qualified.

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

Sample Analysis

- Sample analysis met method requirements for retention times, secondary column confirmation, dilutions, and RPD between the primary and secondary columns with the following exception.

- The RPD between the primary and secondary columns exceeded the quality control limit for 2,4-DNT, 2-NT, and 4-NT in sample JP-L02-GWMW404; for 2,6-DNT and 4-NT in sample JP-L02-GWMW620; for 2,6-DNT in samples JP-L14-GWMW511 and JP-L14-GWMW512. These analytes should be qualified with a "J" in these samples. In addition, the RPD exceeded the quality control limit for 2-amino-4,6-DNT and 4-amino-2,6-DNT in the LCSD. The laboratory flagged the samples for these analytes.

Date	Compound	%RPD	Associated Samples	Flag
11/10/12	2,4-dinitrotoluene 2-nitrotoluene 4-nitrotoluene	46.4% 119.8% 83.4%	JP-L02-GWMW404	J
11/10/12	2,6-dinitrotoluene 4-nitrotoluene	51.7% 134.4%	JP-L02-GWMW620	J
11/10/12 11/10/12	2,6-dinitrotoluene	65.5% 80.8%	JP-L14-GWMW511 JP-L14-GWMW512	J J

EPA MCAWW 300 General Chemistry

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration met quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements.

Blanks

- Method and calibration blank analysis met quality control requirements.

Matrix Spike/Matrix Spike Duplicate Analysis

- Sample matrix spikes were not analyzed with this sample group. The data are not affected.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

Summary

The QC requirements met the acceptance criteria for each method as specified in the project QAPP and guidance documents listed with the exceptions note above.

Client: Toltest Inc.

Job Number: 500-51811-1

Client Sample ID: **JP-L02-GWMW404**

Lab Sample ID: 500-51811-4

Client Matrix: Water

Date Sampled: 10/26/2012 1429

Date Received: 10/29/2012 1023

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-169121	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167913	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	11/10/2012 0045			Injection Volume:	100 uL
Prep Date:	10/30/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,3,5-Trinitrobenzene	<0.16		0.047	0.16
1,3-Dinitrobenzene	<0.16		0.030	0.16
Nitrobenzene	<0.16		0.041	0.16
2,4,6-Trinitrotoluene	<0.16		0.065	0.16
Tetryl	<0.39		0.097	0.39
2,4-Dinitrotoluene	0.21	J	0.060	0.31
2,6-Dinitrotoluene	<0.31		0.097	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.15	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.14	0.31
2-Nitrotoluene	0.54	J	0.12	0.31
4-Nitrotoluene	0.65	J	0.11	0.31
3-Nitrotoluene	<0.31		0.069	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	106		70 - 130

JE 1/9/13

Client: Toltest Inc.

Job Number: 500-51811-1

Client Sample ID: **JP-L02-GWMW620**

Lab Sample ID: 500-51811-6

Client Matrix: Water

Date Sampled: 10/26/2012 1306

Date Received: 10/29/2012 1023

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-169121	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167913	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	11/10/2012 0320			Injection Volume:	100 uL
Prep Date:	10/30/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.088	0.31
RDX	<0.16		0.083	0.16
1,3,5-Trinitrobenzene	<0.16		0.047	0.16
1,3-Dinitrobenzene	<0.16		0.030	0.16
Nitrobenzene	<0.16		0.041	0.16
2,4,6-Trinitrotoluene	<0.16		0.065	0.16
Tetryl	<0.39		0.097	0.39
2,4-Dinitrotoluene	0.29	J	0.060	0.31
2,6-Dinitrotoluene	0.13	J	0.097	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.15	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.14	0.31
2-Nitrotoluene	0.28	J	0.12	0.31
4-Nitrotoluene	1.5	J	0.11	0.31
3-Nitrotoluene	<0.31		0.069	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	104		70 - 130

JR 1/9/13

Client: Toltest Inc.

Job Number: 500-51811-1

Client Sample ID: **JP-L14-GWMW511**

Lab Sample ID: 500-51811-8

Client Matrix: Water

Date Sampled: 10/26/2012 1100

Date Received: 10/29/2012 1023

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-169121	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167913	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	11/10/2012 0503			Injection Volume:	100 uL
Prep Date:	10/30/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,3,5-Trinitrobenzene	<0.16		0.047	0.16
1,3-Dinitrobenzene	<0.16		0.030	0.16
Nitrobenzene	<0.16		0.041	0.16
2,4,6-Trinitrotoluene	<0.16		0.065	0.16
Tetryl	<0.39		0.097	0.39
2,4-Dinitrotoluene	0.41		0.060	0.31
2,6-Dinitrotoluene	0.17	J	0.097	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.15	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.14	0.31
2-Nitrotoluene	0.32		0.12	0.31
4-Nitrotoluene	0.50		0.11	0.31
3-Nitrotoluene	<0.31		0.069	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	102		70 - 130

Client: Toltest Inc.

Job Number: 500-51811-1

Client Sample ID: **JP-L14-GWMW512**

Lab Sample ID: 500-51811-9
Client Matrix: Water

Date Sampled: 10/26/2012 1146
Date Received: 10/29/2012 1023

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-169121	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-167913	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	11/10/2012 0554			Injection Volume:	100 uL
Prep Date:	10/30/2012 2030			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,3,5-Trinitrobenzene	<0.16		0.047	0.16
1,3-Dinitrobenzene	<0.16		0.030	0.16
Nitrobenzene	<0.16		0.041	0.16
2,4,6-Trinitrotoluene	<0.16		0.065	0.16
Tetryl	<0.39		0.097	0.39
2,4-Dinitrotoluene	0.39		0.060	0.31
2,6-Dinitrotoluene	0.18	J	0.097	0.31
2-Amino-4,6-dinitrotoluene	1.5		0.15	0.31
4-Amino-2,6-dinitrotoluene	2.1		0.14	0.31
2-Nitrotoluene	0.33		0.12	0.31
4-Nitrotoluene	0.50		0.11	0.31
3-Nitrotoluene	<0.31		0.069	0.31

JOAAP Data Evaluation Report - October 2012 Report 5

for

TestAmerica Laboratory SDG 500-51872

(October 2012 Samples)

Solutions for Your Site Development, Construction, and Environmental Projects.

January 8, 2013 Project No. 22271

Revised Data Quality Evaluation for of Analytical Data for Environmental Remediation Services

Contract No. W91ZLK-05-D-0012
Site-Wide Long Term Groundwater Monitoring at Joilet Army Ammunition Plant, Wilmington, Illinois

INTRODUCTION:
TolTest has developed this draft Data Quality Evaluation (DQE) Report for the groundwater sampling conducted for site-wide long-term monitoring at the Joliet Army Ammunition Plant (JOAAP), in Wilmington, Illinois. The data evaluation was completed on the groundwater analytical data generated from groundwater monitoring samples collected on October 29-30, 2012 and received by the laboratory on October 31, 2012. The samples were analyzed by Test America Laboratories, Inc., laboratory report number 500-51872.

Groundwater samples were analyzed for explosives using *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW846) Method 8330, SW846 6010B, and SW846 7470A. **Table 1** shows a cross reference of the sample information to the laboratory analytical data package.

Table 1, Groundwater Samples

Sample ID:	Date(s) Sampled:	Time Sampled:	Lab Sample No.:	Analysis:	Matrix:	Report Date:
JP-L1-GWMW173	Oct. 29, 2012	1130	500-51872-1	1	water	Nov. 15, 2012
JP-L1-GWMW173	Oct. 29, 2012	1130	500-51872-1MS	1	water	Nov. 15, 2012
JP-L1-GWMW173	Oct. 29, 2012	1130	500-51872-1MSD	1	water	Nov. 15, 2012
JP-L1-GWMW995	Oct. 29, 2012	1200	500-51872-2	1	water	Nov. 15, 2012
JP-L1-GWWES3	Oct. 29, 2012	1223	500-51872-3	1	water	Nov. 15, 2012
JP-L1-GWMW174	Oct. 29, 2012	1248	500-51872-4	1	water	Nov. 15, 2012
JP-L1-GWWES1	Oct. 29, 2012	1315	500-51872-5	1	water	Nov. 15, 2012
JP-L1-GWMW131	Oct. 29, 2012	1501	500-51872-6	1	water	Nov. 15, 2012
JP-L1-SW550	Oct. 30, 2012	0930	500-51872-7	1	water	Nov. 15, 2012
JP-L3-GWMW631	Oct. 30, 2012	1044	500-51872-8	3	water	Nov. 15, 2012
JP-L3-GWMW631	Oct. 30, 2012	1044	500-51872-8MS	3	water	Nov. 15, 2012
JP-L3-GWMW631	Oct. 30, 2012	1044	500-51872-8MSD	3	water	Nov. 15, 2012
JP-L3-GWMW630	Oct. 30, 2012	1142	500-51872-9	3	water	Nov. 15, 2012

Table 1, Groundwater Samples Continued

Sample ID:	Date(s) Sampled:	Time Sampled:	Lab Sample No.:	Analysis:	Matrix:	Report Date:
JP-L3-GWMW994	Oct. 30, 2012	1200	500-51872-10	3	water	Nov. 15, 2012
JP-L3-SW557	Oct. 30, 2012	1200	500-51872-11	3	water	Nov. 15, 2012
JP-L3-SW777	Oct. 30, 2012	1220	500-51872-12	3	water	Nov. 15, 2012
JP-L3-GWMW633	Oct. 30, 2012	1024	500-51872-13	3	water	Nov. 15, 2012
JP-L3-GWMW410	Oct. 30, 2012	1226	500-51872-14	1	water	Nov. 15, 2012
JP-L3-GWMW412	Oct. 30, 2012	1135	500-51872-15	3	water	Nov. 15, 2012

Sample Analysis
1. explosives
2. metals
3. explosives, metals

OVERVIEW:
The samples were assessed based on the criteria specified in the *Final Quality Assurance Project Plan Environmental Remediation Services at Joliet Army Ammunition Plant, Will County, Illinois (TolTest, Inc. March 2010)* (QAPP), the *Louisville DOD Quality Systems Manual Supplement, version 1 (USACE Louisville District, March 2007),* DoD Quality Systems Manual Version 4 Draft, (January 2009), *Louisville Chemistry Guideline,* (LCG) (June 2002), and U.S. EPA Contract Laboratory Program National Functional Guidelines in conjunction with the internal laboratory quality control (QC) criteria. Quality checks evaluated included holding times, sample preservation, cooler temperatures, surrogates, laboratory control samples (LCS), method blanks, matrix spike and duplicate (MS/MSD) analysis, initial and continuing calibration verifications, (ICV, CCV), and QC Method Reporting Limit (QC/MRL) recovery.

SUMMARY
This section summarizes the findings from the data evaluation of the laboratory analytical data packages. The tables below present the quality control check requirements, the analytes that failed the criteria, analysis flags, and the data to which the flags are applied. Each of the quality checks reviewed in the laboratory analytical data package are summarized under each method subheading.

EPA SW846 Method 8330

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration percent relative standard deviation (%RSD) was within quality control requirements.

Continuing Calibration

- Continuing calibration %D was within quality control requirements.

- The %D for 2,4,6-TNT in the CCV analyzed on 11/2/2012 at 16:32 on the secondary column exceeded the quality control limit. The %D for HMX, MNX, and RDX in the CCV analyzed on 11/13/12 at 13:32 exceeded the quality control limit on the secondary column. These were within the quality control limits on the primary column and samples were quantified from the primary column therefore the samples were not qualified.

Second Source Calibration Verification (Initial Calibration Verification)

- The ICV %D was within quality control requirements.

Blanks

- Method blank analysis met quality control requirements.

Surrogate Spikes

- Surrogate percent recoveries (%R) were within quality control requirements with the following exception.

- Sample JP-L1-GWMW131 required dilution. As a result the surrogate was diluted out and the surrogate recovery was below the lower quality control limit. Sample JP-L3-GWMW412 required dilution for RDX and as a result the surrogate recovery for the diluted re-analysis was diluted out and the recovery was below the lower quality control limit.

- The surrogate retention time shifted in the samples from the surrogate relative retention time on the primary column for most of the samples. In addition, there was a retention time shift for the CCV on the secondary column. The case narrative discussed the retention time shift and noted the samples were evaluated based on the shift. The retention times for the detected analytes were within the relative retention times of the respective analytes in the continuing calibration verification sample on each column except for RDX in samples JP-L1-GWMW995, JP-L3-GWMW412 and HMX in samples JP-L3-GWMW630, JP-L3-GWMW633, JP-L3-GWMW412 on the secondary column, which the retention time was above the upper limit for these analytes in the five samples. The shift does not affect the data in regards to false positives since the analytes were detected on both columns.

Matrix Spikes/Matrix Spike Duplicates

- The %R was within the quality control limits for the MS and MSD samples with the following exception.

- The samples JP-L1- GWMW173 MS/MSD percent recoveries (%R) exceeded the upper quality control limit for RDX, nitrobenzene, 2,4,6-TNT, 2-amino-4,6-DNT, 4-amino-2,6-DNT, 4-NT, and 3-NT. In addition, the %R for tetryl was below the lower quality control limit in the MSD sample. The parent sample required dilution due to the abundance of non-target analytes, and the case narrative noted matrix interferences were present. The parent sample should be qualified with a "J" flag for these analytes.

QC Sample	Compound	%R	Associated Samples	Flag
MS	RDX	535%	JP-L1-GWMW173	J
	Nitrobenzene	167%		
	2,4,6-trinitrotoluene	345%		
	2-amino-4,6-dinitrotoluene	374%		
	4-amino-2,6-dinitrotoluene	252%		
	4-nitrotoluene	161%		
	3-nitrotoluene	238%		
MSD	RDX	514%	JP-L1-GWMW173	J
	Nitrobenzene	155%		
	2,4,6-trinitrotoluene	306%		
	2-amino-4,6-dinitrotoluene	366%		
	4-amino-2,6-dinitrotoluene	244%		
	4-nitrotoluene	162%		
	3-nitrotoluene	240%		
	Tetryl	69%		

Laboratory Control Samples

- The %R for the LCS was within quality control limits.

Quality Control/Method Reporting Limit Check

- The quality control/method reporting limit check (QC/MRL) is required to be performed quarterly at a minimum in accordance with the DoD QSM. The QC/MRL was not reported for this method, however the quarterly check may not be required at this time. The data are not affected.

Sample Analysis

- Sample analysis met method requirements for retention times, secondary column confirmation, dilutions, and RPD between the primary and secondary columns with the following exception.

- The RPD between the primary and secondary columns exceeded the quality control limit for RDX in sample JP-L1-GWMW995; for 2-amino-4,6-DNT in sample JP-L1-GWWES1; for 2,6-DNT in samples JP-L3-SW557, JP-L3-GWMW633. These analytes should be qualified with a "J" in these samples.

Date	Compound	%RPD	Associated Samples	Flag
11/3/12	RDX	113.2%	JP-L1-GWMW995	J
11/2/12	2-amino-4,6-dinitrotoluene	93.0%	JP-L1-GWWES1	J
11/2/12	2,6-dinitrotoluene	60.2% 104.2%	JP-L3-SW557 JP-L3-GWMW633	J

EPA SW846 Method 6010B

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration met quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The initial calibration verification (ICV) percent recoveries (%R) were within quality control requirements.

Blanks

- Barium, selenium, sodium were detected in the method blank at concentrations between the method detection limit and reporting limit and less than one half the reporting limit. The sample results were qualified by the laboratory with "B" flags for these analytes. Selenium was not detected in the samples and therefore not qualified by the laboratory or during validation. The sample results were greater than five times the method blank results for sodium and barium, therefore the sample results were not qualified for this analyte. One

exception the sample results for barium in sample JP-L3-GWMW630 was above the reporting limit but less than five times the method blank concentration and should be qualified with a "B". The laboratory qualifier should be removed for the remaining samples for barium and sodium.

QC Sample	Compound	Method Blank Concentration	Associated Samples	Sample Concentration	Flag to be removed
Method blank	Barium	0.00348 mg/L	JP-L3-GWMW631	0.017 mg/L	B
	Selenium	0.00308 mg/L		Not detected	
	Sodium	0.120 mg/L		29 mg/L	B
	Barium		JP-L3-GWMW994	0.017 mg/L	B
	Selenium			Not detected	
	Sodium			29 mg/L	B
	Barium		JP-L3-SW557	0.027 mg/L	B
	Selenium			Not detected	
	Sodium			8.7 mg/L	B
	Barium		JP-L3-SW777	0.026 mg/L	B
	Selenium			Not detected	
	Sodium			8.6 mg/L	B
	Barium		JP-L3-GWMW633	0.062 mg/L	B
	Selenium			Not detected	
	Sodium			7.9 mg/L	B
	Barium		JP-L3-GWMW412	0.053 mg/L	B
	Selenium			Not detected	
	Sodium			11 mg/L	B
	Barium		JP-L3-GWMW630	0.012 mg/L	Qualify 'B'
	Selenium			Not detected	
	sodium			27 mg/L	B

- The initial and continuing calibration blanks met method quality control requirements.

Quality Control/Method Reporting Limit Check

- The method reporting limit check met method quality control requirements.

Interelement Check Standard

- The interference check standard (ICS-A and ICS-AB) met quality control requirements.

Matrix Spike/Matrix Spike Duplicate Analysis

- The matrix spike and matrix spike duplicate (MS/MSD) sample percent recoveries (%R) were within quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

EPA SW846 Method 7470A

Holding Time/Sample Preservation

- Holding time requirements were met and cooler temperatures were within quality control requirements.

Initial Calibration

- Initial calibration met quality control requirements.

Continuing Calibration

- Continuing calibration percent recoveries (%R) were within quality control requirements.

Second Source Calibration Verification (Initial Calibration Verification)

- The ICV %R was within quality control requirements.

Blanks

- The initial, method, and continuing calibration blanks met method quality control requirements.

Laboratory Control Sample

- The LCS percent recoveries (%R) were within quality control requirements.

Matrix Spikes/Matrix Spike Duplicates

- Sample matrix spikes %R were within quality control requirements.

Summary

The QC requirements met the acceptance criteria for each method as specified in the project QAPP and guidance documents listed with the exceptions note above.

Client: Toltest Inc. Job Number: 500-51872-1

Client Sample ID: **JP-L1-GWMW173**

Lab Sample ID: 500-51872-1 Date Sampled: 10/29/2012 1130
Client Matrix: Water Date Received: 10/31/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-168237	Initial Weight/Volume:	770 mL
Dilution:	5.0			Final Weight/Volume:	6.0 mL
Analysis Date:	11/03/2012 0113			Injection Volume:	100 uL
Prep Date:	11/01/2012 2341			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<1.6		0.44	1.6
RDX	<0.80	J	0.41	0.80
1,3,5-Trinitrobenzene	<0.80		0.23	0.80
1,3-Dinitrobenzene	<0.80		0.15	0.80
Nitrobenzene	<0.80	J	0.20	0.80
2,4,6-Trinitrotoluene	<0.80	J	0.33	0.80
Tetryl	<2.0	J	0.48	2.0
2,4-Dinitrotoluene	<1.6		0.30	1.6
2,6-Dinitrotoluene	<1.6		0.49	1.6
2-Amino-4,6-dinitrotoluene	<1.6	J	0.75	1.6
4-Amino-2,6-dinitrotoluene	<1.6	J	0.68	1.6
2-Nitrotoluene	<1.6		0.59	1.6
4-Nitrotoluene	<1.6	J	0.54	1.6
3-Nitrotoluene	<1.6	J	0.34	1.6

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	117		70 - 130

JM 1/11/13

Client: Toltest Inc.

Job Number: 500-51872-1

Client Sample ID: **JP-L1-GWMW995**

Lab Sample ID: 500-51872-2

Client Matrix: Water

Date Sampled: 10/29/2012 1200

Date Received: 10/31/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-168237	Initial Weight/Volume:	770 mL
Dilution:	5.0			Final Weight/Volume:	6.0 mL
Analysis Date:	11/03/2012 0348			Injection Volume:	100 uL
Prep Date:	11/01/2012 2341			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<1.6		0.44	1.6
RDX	6.2	J	0.41	0.80
1,3,5-Trinitrobenzene	<0.80		0.23	0.80
1,3-Dinitrobenzene	<0.80		0.15	0.80
Nitrobenzene	<0.80		0.20	0.80
2,4,6-Trinitrotoluene	2.8		0.33	0.80
Tetryl	<2.0		0.48	2.0
2,4-Dinitrotoluene	<1.6		0.30	1.6
2,6-Dinitrotoluene	<1.6		0.49	1.6
2-Amino-4,6-dinitrotoluene	4.3		0.75	1.6
4-Amino-2,6-dinitrotoluene	4.3		0.68	1.6
2-Nitrotoluene	<1.6		0.59	1.6
4-Nitrotoluene	<1.6		0.54	1.6
3-Nitrotoluene	<1.6		0.34	1.6

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	103		70 - 130

JK 1/11/13

Client: Toltest Inc.

Job Number: 500-51872-1

Client Sample ID: **JP-L1-GWWES1**

Lab Sample ID: 500-51872-5
Client Matrix: Water

Date Sampled: 10/29/2012 1315
Date Received: 10/31/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-168237	Initial Weight/Volume:	770 mL
Dilution:	5.0			Final Weight/Volume:	6.0 mL
Analysis Date:	11/02/2012 1122			Injection Volume:	100 uL
Prep Date:	11/01/2012 2341			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<1.6		0.44	1.6
RDX	<0.80		0.41	0.80
1,3,5-Trinitrobenzene	<0.80		0.23	0.80
1,3-Dinitrobenzene	<0.80		0.15	0.80
Nitrobenzene	<0.80		0.20	0.80
2,4,6-Trinitrotoluene	6.4		0.33	0.80
Tetryl	<2.0		0.48	2.0
2,4-Dinitrotoluene	<1.6		0.30	1.6
2,6-Dinitrotoluene	<1.6		0.49	1.6
2-Amino-4,6-dinitrotoluene	8.1	J	0.75	1.6
4-Amino-2,6-dinitrotoluene	9.1		0.68	1.6
2-Nitrotoluene	<1.6		0.59	1.6
4-Nitrotoluene	<1.6		0.54	1.6
3-Nitrotoluene	<1.6		0.34	1.6

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	83		70 - 130

JL 11/11/13

Client: Toltest Inc.

Job Number: 500-51872-1

Client Sample ID: **JP-L3-SW557**

Lab Sample ID: 500-51872-11
Client Matrix: Water

Date Sampled: 10/30/2012 1200
Date Received: 10/31/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-168237	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	11/02/2012 2004			Injection Volume:	100 uL
Prep Date:	11/01/2012 2341			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.088	0.31
RDX	<0.16		0.083	0.16
1,3,5-Trinitrobenzene	<0.16		0.047	0.16
1,3-Dinitrobenzene	<0.16		0.030	0.16
Nitrobenzene	<0.16		0.041	0.16
2,4,6-Trinitrotoluene	<0.16		0.065	0.16
Tetryl	<0.39		0.097	0.39
2,4-Dinitrotoluene	<0.31		0.060	0.31
2,6-Dinitrotoluene	0.44	J	0.097	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.15	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.14	0.31
2-Nitrotoluene	<0.31		0.12	0.31
4-Nitrotoluene	<0.31		0.11	0.31
3-Nitrotoluene	<0.31		0.069	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	99		70 - 130

JK 11/13

Client: Toltest Inc.

Job Number: 500-51872-1

Client Sample ID: **JP-L3-GWMW633**

Lab Sample ID: 500-51872-13

Client Matrix: Water

Date Sampled: 10/30/2012 1024

Date Received: 10/31/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:	8330	Analysis Batch:	500-167856	Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-168237	Initial Weight/Volume:	770 mL
Dilution:	1.0			Final Weight/Volume:	6.0 mL
Analysis Date:	11/02/2012 2147			Injection Volume:	100 uL
Prep Date:	11/01/2012 2341			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	2.7		0.088	0.31
1,3,5-Trinitrobenzene	<0.16		0.047	0.16
1,3-Dinitrobenzene	<0.16		0.030	0.16
Nitrobenzene	<0.16		0.041	0.16
2,4,6-Trinitrotoluene	<0.16		0.065	0.16
Tetryl	<0.39		0.097	0.39
2,4-Dinitrotoluene	<0.31		0.060	0.31
2,6-Dinitrotoluene	0.13	J	0.097	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.15	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.14	0.31
2-Nitrotoluene	<0.31		0.12	0.31
4-Nitrotoluene	<0.31		0.11	0.31
3-Nitrotoluene	<0.31		0.069	0.31

Surrogate	%Rec	Qualifier	Acceptance Limits
1,2-Dinitrobenzene	99		70 - 130

Client: Toltest Inc.

Job Number: 500-51872-1

Client Sample ID: **JP-L3-GWMW631**

Lab Sample ID: 500-51872-8

Client Matrix: Water

Date Sampled: 10/30/2012 1044

Date Received: 10/31/2012 0700

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169319	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168742	Lab File ID:	P6111012B.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/10/2012 1607			Final Weight/Volume:	50 mL
Prep Date:	11/06/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.017	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00070	J	0.00054	0.0020
Calcium	67		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0011	J	0.0011	0.010
Iron	0.17	J	0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	35		0.024	0.10
Manganese	0.029		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	5.3		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	29	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169185	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1146			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JL 11/11/13

Client: Toltest Inc.

Job Number: 500-51872-1

Client Sample ID: **JP-L3-GWMW994**

Lab Sample ID: 500-51872-10
Client Matrix: Water

Date Sampled: 10/30/2012 1200
Date Received: 10/31/2012 0700

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169319	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168742	Lab File ID:	P6111012B.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/10/2012 1631			Final Weight/Volume:	50 mL
Prep Date:	11/06/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.017	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00071	J	0.00054	0.0020
Calcium	67		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0012	J	0.0011	0.010
Iron	0.14	J	0.070	0.20
Lead	0.0017	J	0.0016	0.0050
Magnesium	34		0.024	0.10
Manganese	0.029		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	5.2		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	29	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169185	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1155			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JL 11/13

Client: Toltest Inc.

Job Number: 500-51872-1

Client Sample ID: **JP-L3-SW557**

Lab Sample ID: 500-51872-11
Client Matrix: Water

Date Sampled: 10/30/2012 1200
Date Received: 10/31/2012 0700

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169319	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168742	Lab File ID:	P6111012B.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/10/2012 1635			Final Weight/Volume:	50 mL
Prep Date:	11/06/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.027	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00080	J	0.00054	0.0020
Calcium	43		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0025	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	35		0.024	0.10
Manganese	0.0013	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	2.7		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	8.7	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169185	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1156			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JL 11/11/13

Client: Toltest Inc.

Job Number: 500-51872-1

Client Sample ID: **JP-L3-SW777**

Lab Sample ID: 500-51872-12

Client Matrix: Water

Date Sampled: 10/30/2012 1220

Date Received: 10/31/2012 0700

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169319	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168742	Lab File ID:	P6111012B.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/10/2012 1639			Final Weight/Volume:	50 mL
Prep Date:	11/06/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.026	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00076	J	0.00054	0.0020
Calcium	42		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0029	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	0.0019	J	0.0016	0.0050
Magnesium	35		0.024	0.10
Manganese	0.0046	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	3.0		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	8.6	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.0053	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169185	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1158			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JK 11/14/13

Client: Toltest Inc. Job Number: 500-51872-1

Client Sample ID: **JP-L3-GWMW633**

Lab Sample ID: 500-51872-13 Date Sampled: 10/30/2012 1024
Client Matrix: Water Date Received: 10/31/2012 0700

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169319	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168742	Lab File ID:	P6111012B.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/10/2012 1643			Final Weight/Volume:	50 mL
Prep Date:	11/06/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	0.069	J	0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.062	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00070	J	0.00054	0.0020
Calcium	93		0.087	0.20
Chromium	0.0012	J	0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0027	J	0.0011	0.010
Iron	0.16	J	0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	41		0.024	0.10
Manganese	0.0016	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	1.4		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	7.9	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.00087	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169185	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1200			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JR 11/11/13

Client: Toltest Inc.

Job Number: 500-51872-1

Client Sample ID: **JP-L3-GWMW412**

Lab Sample ID: 500-51872-15

Client Matrix: Water

Date Sampled: 10/30/2012 1135

Date Received: 10/31/2012 0700

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169319	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168742	Lab File ID:	P6111012B.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/10/2012 1654			Final Weight/Volume:	50 mL
Prep Date:	11/06/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.053	~~B~~	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00093	J	0.00054	0.0020
Calcium	100		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0018	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	0.0017	J	0.0016	0.0050
Magnesium	52		0.024	0.10
Manganese	<0.010		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	1.4		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	11	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169185	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1205			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JK 11/11/13

Client: Toltest Inc.

Job Number: 500-51872-1

Client Sample ID: **JP-L3-GWMW630**

Lab Sample ID: 500-51872-9
Client Matrix: Water

Date Sampled: 10/30/2012 1142
Date Received: 10/31/2012 0700

6010B Metals (ICP)-Dissolved

Analysis Method:	6010B	Analysis Batch:	500-169319	Instrument ID:	ICP6
Prep Method:	3010A	Prep Batch:	500-168742	Lab File ID:	P6111012B.asc
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	11/10/2012 1627			Final Weight/Volume:	50 mL
Prep Date:	11/06/2012 1600				

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0026	J	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.012	B JK	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00081	J	0.00054	0.0020
Calcium	78		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0019	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	40		0.024	0.10
Manganese	0.019		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	5.5		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	27	~~B~~	0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method:	7470A	Analysis Batch:	500-169391	Instrument ID:	HG6
Prep Method:	7470A	Prep Batch:	500-169185	Lab File ID:	111212RA.CSV
Dilution:	1.0			Initial Weight/Volume:	25 mL
Analysis Date:	11/12/2012 1153			Final Weight/Volume:	25 mL
Prep Date:	11/09/2012 1700				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Mercury	<0.20		0.071	0.20

JK 1/11/13

C2 - DATA USABILITY REPORT

APPENDIX C2

DATA USABILITY REPORT
GROUNDWATER AND SURFACE WATER SAMPLING
JULY AND OCTOBER 2012

JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

Submitted to:

US Army Contracting Agency
APG Directorate of Contracting – AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012

TolTest Project Number: 22271

Submitted by:

1480 Ford Street
Maumee, OH 43537
(419) 794-3500

DATA USABILITY REPORT

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1 Summary of "R" Qualified Results

ACRONYMS AND ABBREVIATIONS

%D	percent difference
%R	percent recovery
CCB	continuing calibration blank
CCV	continuing calibration verification
GC/MS	gas chromatography/mass spectroscopy
ICAL	initial calibration
ICB	initial calibration blank
ICS	interference check sample
ICV	initial calibration verification
J	estimated value
JOAAP	Joliet Army Ammunition Plant
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LDC	Laboratory Data Consultants
MD	matrix duplicate (metals)
mg/L	milligrams per liter
MRL	method reporting limit
MS/MSD	matrix spike/matrix spike duplicate
MWH	MWH Americas, Inc.
ORP	oxidation/reduction potential
QA	quality assurance
QC	quality control
R	analytical result is unusable
RPD	relative percent difference
SDG	sample delivery group
SVOCs	semivolatile organic compounds
TAL	target analyte list
Test America	Test America Laboratories, Inc.
ug/L	micrograms per liter
U	analyte analyzed for but not detected
UJ	analyte is not detected estimated quantitation limit
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds

APPENDIX C2

DATA USABILITY SUMMARY

1.0 INTRODUCTION

The following data usability summary discusses quality assurance/quality control (QA/QC) outliers for each analyte group per sampling round. Data qualifiers were added to results and imported into the Joliet Army Ammunition Plant (JOAAP) database. Data qualifiers used in the validation process may include the following:

- U – Not detected. This validation qualifier was added if there was blank contamination and the sample concentration was less than five times the blank concentration (ten times for common organic contaminants methylene chloride, acetone, and phthalates)
- J – Estimated value. This validation qualifier was added if the reported concentration is estimated.
- UJ – Not detected, estimated quantitation limit. This validation qualifier was added if the analyte was not detected but QA/QC parameters were not met.
- R – Unusable data. This validation qualifier was added if the QA/QC parameters were not met and were extremely low (i.e. less than 10% recovery for laboratory control samples (LCS) or surrogate recoveries)

Test America Laboratories, Inc. (Test America) located at 2417 Bond Street, University Park, Illinois performed the analyses of groundwater and surface water samples collected in July and October 2012 at the JOAAP located in Wilmington, Illinois. Groundwater was collected from site M13 Landfill and analyzed for the following parameters in July 2012:

- Volatile organic compounds (VOCs) were analyzed by SW846 Method 8260B.
- Semivolatile organic compounds (SVOCs) were analyzed by SW846 Method 8270C.
- Explosives were analyzed by SW846 Method 8330.
- Target analyte list (TAL) metals were analyzed by SW846 Methods 6010B and 7470A (mercury).
- Sulfate was analyzed by United States Environmental Protection Agency (USEPA) Method 300.0.
- Nitrate was analyzed by USEPA Method 300.0.

Groundwater was collected from nine sites (L1, L2, L3, L14, M6, M7, M9, M11, M13, and MFG Area) and analyzed for the following parameters in October 2012:

- VOCs were analyzed by SW846 Method 8260B at Sites M3, M11 Landfill and M13 Landfill.
- SVOCs were analyzed by SW846 Method 8270C at Sites M11 Landfill and M13

Landfill.

- Explosives were analyzed by SW846 Method 8330 at Sites M5, M6, M7, L1, L2, L3, L14, OA, L3 Landfill, M11 Landfill, and M13 Landfill.
- TAL metals were analyzed by SW846 Methods 6010B and 7470A at Sites L2, L3, L3 Landfill, M11 Landfill, and M13 Landfill.
- Sulfate was analyzed by USEPA Method 300.0 at Sites M1, M8, M9, M11 Landfill and M13 Landfill.
- Nitrate was analyzed by USEPA Method 300.0 at Sites M11 Landfill and M13 Landfill.

Surface water was collected from four sites at JOAAP and analyzed for the following parameters:

- Explosives were analyzed by SW846 Method 8330 at Sites L1, L2, L3, and L3 Landfill.
- TAL metals were analyzed by SW846 Methods 6010B and 7470A at Sites L1 and L3 Landfill.
- Sulfate was analyzed by USEPA Method 300.0 at Site M1.

Field parameters are not discussed in this data usability report, but were recorded by field personnel with a water quality meter at the time of sample collection and included:

- pH, temperature, specific conductivity, dissolved oxygen, turbidity, and oxidation/reduction potential (ORP)

The following summarizes the sample delivery group (SDG) and corresponding data validation report:

Sample Delivery Group	Data Validation Report	Associated Samples
500-48319-1	JOAAP Data Evaluation Report - July 2012 Report 1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999
500-51660-1	JOAAP Data Evaluation Report - October 2012 Report 1	JP-M6-GWMW123R JP-M6-GWMW162R JP-M6-GWMW212R JP-M6-GWMW313 JP-M6-GWMW318 JP-M6-GWMW319 JP-M6-GWMW652 JP-M6-GWMW654

Sample Delivery Group	Data Validation Report	Associated Samples
		JP-M6-GWMW999 JP-M7-GWMW124R JP-M9-GWMW330 JP-OA-GWMW118 JP-OA-GWMW119 JP-OA-GWMW117
500-51693-1	JOAAP Data Evaluation Report - October 2012 Report 2	JP-M11-GWMW998 JP-M11-GWMW335 JP-M11-GWMW334 JP-M11-GWMW803 JP-M11-GWMW802 JP-M11-GWMW333 JP-M13-GWMW806 JP-M13-GWMW807 JP-M11-GWMW336 (MS/MSD) JP-M11-GWMW805 JP-M11-GWMW804 Trip Blank
500-51766-1	JOAAP Data Evaluation Report - October 2012 Report 3	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M1-GWMW648 JP-M1-GWMW642 (MS/MSD) JP-M1-GWMW996 JP-M1-GWMW641 JP-M1-GWMW649 JP-M1-GWMW231 JP-M1-GWMW107 JP-M1-GWMW640 JP-M1-GWMW646 JP-M1-GWMW645 Trip Blank
500-51811-1	JOAAP Data Evaluation Report - October 2012 Report 4	JP-M1-GWMW643 JP-M1-GWMW644 JP-M1-SW709 JP-L02-GWMW404 JP-L02-GWMW621 JP-L02-GWMW620 JP-L14-GWMWH7 JP-L14-GWMW511 JP-L14-GWMW512 JP-L02-SW555

Sample Delivery Group	Data Validation Report	Associated Samples
500-51872-1	JOAAP Data Evaluation Report - October 2012 Report 5	JP-L1-GWMW173 (MS/MSD) JP-L1-GWMW995 JP-L1-GWWES3 JP-L1-GWMW174 JP-L1-GWWES1 JP-L1-GWMW131 JP-L1-SW550 JP-L3-GWMW631 (MS/MSD) JP-L3-GWMW630 JP-L3-GWMW994 JP-L3-SW557 JP-L3-SW777 JP-L3-GWMW633 JP-L3-GWMW410 JP-L3-GWMW412

2.0 LABORATORY QA/QC ELEMENTS

Toltest, Inc. (Toltest) performed the equivalent of USEPA Level III validation on 100% of the data using the JOAAP Quality Assurance Project Plan (QAPP) for Long Term Monitoring, a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, and the Department of Defense Quality Systems Manual for Environmental Laboratories validation guidelines, as appropriate. QAPP Worksheets # 34, #35, and #36 describe the verification process and QAPP Worksheet #37 describes the data usability assessment.

Data were evaluated for precision, accuracy, representativeness, comparability, and completeness based on results of the following QA/QC samples and parameters, where applicable:

- Sample preservation
- Sample holding times
- Surrogate spikes (organics)
- Laboratory control sample (LCS/LCSD)
- Matrix spike/matrix spike duplicate (MS/MSD)
- Matrix duplicate (MD) for metals
- Laboratory duplicate samples
- Gas chromatography/mass spectroscopy (GC/MS) tunes (organics)
- Internal standards (organics)
- Initial calibration (ICAL) standards
- Initial calibration verification (ICV) standards
- Continuing calibration verification (CCV) standards
- Interference check samples (ICSs) (metals)
- Trip blanks (VOCs)
- Serial dilution (metals)
- Method blanks
- Initial calibration blanks (ICBs)
- Continuing calibration blanks (CCBs)

The following field QA/QC samples were collected and analyzed:

- One field duplicate per 10 field samples collected
- One MS/MSD (extra sample volume) per 20 field samples collected
- Trip blanks included with each cooler containing VOC samples.

Samples were stored in coolers on wet ice, transported, and hand delivered to the analytical laboratory under chain-of-custody documentation.

3.0 EVALUATION OF MEASUREMENT QUALITY OBJECTIVES

For each analytical method, laboratory QA/QC results were compared to the established acceptance limits. Refer to the associated Data Evaluation Reports presented in Appendix C1 for analysis of the below criteria for each individual SDG and associated samples. The parameters reviewed by method within each Data Evaluation Report for each SDG each are outlined as follows.

Precision was quantitatively evaluated by reviewing the relative percent differences (RPDs) for the following QA/QC samples:

- MS/MSDs
- Matrix duplicate (metals)
- LCS/LCSDs
- Laboratory duplicate samples
- Serial dilution (metals)
- Field duplicate samples

Accuracy was quantitatively evaluated by comparing the percent recovery (%R) or percent difference (%D) for the following QA/QC samples or parameters:

- Surrogate spikes (VOCs and SVOCs)
- Internal standards (VOCs and SVOCs)
- ICVs
- CCVs
- MS/MSDs
- LCSs
- ICSs (metals)

Refer to Worksheet #12 (Method Performance Criteria Table) and Worksheet #28 (QC Samples Table) for QC samples analyzed and criteria limits.

Representativeness was evaluated through a review of the following QA/QC elements:

- Sample preservation
- Sample holding times
- Compliance with sample collection, handling, and analysis methods specified in the Work Plan

Refer to QAPP Worksheets # 21 through # 27 for evaluation criteria related to representativeness.

Comparability was qualitatively evaluated through a review of the following QA/QC elements:

- Sample collection and handling procedures

- Sample preparation, analysis, and quantitation procedures
- Units of measure

Refer to QAPP Worksheets # 21 through # 27 for evaluation criteria related to comparability. Comparability was acceptable for the July and October 2012 sampling events.

The following samples, presented in Table 1, were rejected as a result of not meeting one or more of the above criteria as presented in the Data Evaluation Reports in Appendix C1.

3.1 COMPLETENESS

Completeness was calculated by dividing the number of acceptable sample results by the total number of scheduled sample results. The completeness goal for holding times was 100%. Completeness goals for holding times were met for all analytes in the July and October 2012 sampling rounds.

The laboratory completeness goal for the number of acceptable sample results compared to the total sample results is 100%. Only results qualified "R" as unusable were considered unacceptable sample results for calculating laboratory completeness. Sample results qualified "J" as estimated, "U" as not detected, or "UJ" as not detected estimated quantitation limit were considered quantitative and acceptable.

No analytes were qualified "R" as unusable for the July and October 2012 sampling rounds with the exception of those listed in Table 1 of this Appendix. Completeness and usability was 99.0% and 99.3% for July and October 2012, respectively.

Refer to QAPP Worksheet #37 for the data usability criteria.

3.2 SENSITIVITY

Sensitivity was evaluated by comparing method reporting limits (MRLs) with appropriate criteria. In samples not requiring dilutions, adequate sensitivity was demonstrated with MRLs equal to or less than the associated criteria.

Refer to QAPP Worksheet #15 the Reference Limits and Evaluation Table for compound specific MRLs, method detection limits, and project action limits.

3.3 TRACEABILITY

Traceability was evaluated by reviewing field documentation, chain-of-custody documentation, and analytical reports. Each sample was found to be traceable from collection through analysis.

3.4 DATA QUALIFIERS

Refer to Tables 3.1 through 3.5 for summaries of groundwater and surface water data. Refer to Appendix C1 for data evaluation reports associated with each SDG.

3.5 CONCLUSIONS

As discussed in Section 3.1, completeness goals were met for the July and October 2012 analytical data. The data complies with contract requirements. Sample results determined to be rejected as unusable were not a contaminants of concern in groundwater. A summary of rejected results is presented in Table 1. A summary of all qualified data is presented in Table 2. The estimated data qualified “J” or “UJ” and blank qualified data qualified “U” which does not meet QA criteria are considered usable and do not negatively impact the project objectives. There were no biases or trends observed in this dataset.

4.0 REFERENCES

DoD, 2006. *Quality Systems Manual for Environmental Laboratories, Final Version 3*, DoD Environmental Data Quality Workgroup. January 2006.

MWH, 2011. *Final Quality Assurance Project Plan (QAPP) JOAAP Environmental Remediation,* MWH America's Inc. (MWH), March 2011.

USEPA, 1986. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods Third Edition*. November 1986.

USEPA, 2008. *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*. June 2008.

USEPA, 2010. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*. January 2010.

APPENDIX C2
TABLE 1

Summary of "R" Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

July 2012 Samples

Analysis	Failed Criteria	Date	Compound	%D or %R	Associated Samples	SDG
VOCs	ICV	7/24/2012	dichlorodifluoromethane	52.20%	JP-M13-GWMW806	500-48319-1
			chloromethane	37.30%	JP-M13-GWMW807	
			acetone	37.80%	JP-M13-GWMW362	
					JP-M13-GWMW126R	
					JP-M13-GWMW808	
					JP-M13-GWMW809	
					JP-M13-GWMW999	
Metals	ICV	7/27/2012	mercury	115%	JP-M13 GWMW806	500-48319-1
					JP-M13-GWMW807	
					JP-M13-GWMW362	
					JP-M13GWMW126R	
					JP-M13-GWMW808	
					JP-M13-GWMW809	
					JP-M13-GWMW999	

APPENDIX C2
TABLE 1

Summary of "R" Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

October 2012 Samples

Analysis	Failed Criteria	Date	Compound	%D or %R	Associated Samples	SDG
VOCs	ICV	10/9/2012	bromomethane vinyl acetate	29.00% 73.20%	JP-M11-GWMW998 JP-M11-GWMW336 JP-M11-GWMW804 JP-M11-GWMW805 JP-M11-GWMW335 JP-M11-GWMW334 JP-M11-GWMW803 JP-M11-GWMW802 JP-M11-GWMW333 JP-M13-GWMW806 JP-M13-GWMW807	500-51693-1
VOCs	CCV	11/5/2012	vinyl acetate	35.9	JP-M13-GWMW806 JP-M13-GWMW807	500-51693-1
VOCs	ICV	10/9/2012	bromomethane vinyl acetate	29.00% 73.20%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	500-51766-1
VOCs	CCV	11/5/2012	vinyl acetate	35.9	JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	500-51766-1
SVOCs	ICAL	11/12/2012	n-nitrosodi-n-propylamine 3&4 methylphenol 2,4-dinitrophenol	27.00% 22.00% 29.00%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	500-51766-1
SVOCs	ICV	11/12/2012	benzoic acid	64.80%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	500-51766-1

APPENDIX C2
TABLE 2

Summary of Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

Lab Report	Criteria	Date	Compound	%D	Associated Samples	Flag
500-48319-1	ICV	7/24/2012	Dichlorodifluoromethane Chloromethane Acetone	52.20% 37.30% 37.80%	JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13-GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	R
		Date	**Compound**	**%RSD**	**Associated Samples**	**Flag**
500-48319-1	Initial Calibration	8/7/12 instrument CMS12	chrysene	20.00%	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13-GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	J
		Date	**Compound**	**%D**	**Associated Samples**	**Flag**
500-48319-1	CCV	8/7/12 instrument CMS12	n-nitrosodi-n-propylamine N-nitrosodimethylamine 2-nitrophenol 2-nitroaniline 4-nitroaniline Benzidine di-n-octylphthalate	35.50% 22.90% 22.00% 22.00% 24.00% 21.50% 26.40%	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13-GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	J (all detects) UJ (all non-detects)
		Date	**Compound**	**QC Sample**	**Associated Samples**	**Flag**
500-48319-1	Internal Standards	8/7/12 instrument CMS12	n-nitrosodimethylamine n-nitrosodi-n-propylamine 4-chloroaniline 2-nitroaniline 3-nitroaniline 4-nitroaniline Benzidine 3,3'-dichlorobenzidine.	ICV internal standard	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	Q

APPENDIX C2
TABLE 2

Summary of Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Date	Compound	%R	Associated Samples	Flag
500-48319-1	ICV	7/27/2012	mercury	115%	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13GWMW126R JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW999	R
		Date	**Compound**	**%R**	**Associated Samples**	**Flag**
500-48319-1	ICV	7/18/2012	nitrate	86%	JP-M13 GWMW806 JP-M13-GWMW807 JP-M13-GWMW362 JP-M13GWMW126R	J
		Date	**Compound**	**%R**	**Associated Samples**	**Flag**
500-61660-1	Surrogate Spike Recovery	11/4/2012	Surrogate 1,2-Dinitrobenzene	22%	JP-OA-GWMW117 JP-OA-GWMW118	J for detects and UJ for non-detects
		Date	**Compound**	**%RPD**	**Associated Samples**	**Flag**
500-61660-1	Primary and Secondary column columns	11/3/2012	4-aminio-2,6-dinitrotoluene	70.40%	JP-M6-GWMW999	J
			2-amino-4,6-dinitrotoluene	58.40%		
			4-aminio-2,6-dinitrotoluene	77.60%	JP-M6-GWMW212R	J
			2-amino-4,6-dinitrotoluene	55.50%		
			4-aminio-2,6-dinitrotoluene	54.10%	JP-M6-GWMW652	J
			2-amino-4,6-dinitrotoluene	39.90%		
		11/4/2012	2,6-dinitrotoluene	55.10%	JP-M6-GWMW313	J
		11/4/2012	2,4-dinitrotoluene	61.40% 66.90%	JP-OA-GWMW117 JP-OA-GWMW118	J

APPENDIX C2
TABLE 2

Summary of Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Date	Compound	%D	Associated Samples	Flag
500-51693-1	ICV	10/9/2012	Bromomethane	29.00%	JP-M11-GWMW998 JP-M11-GWMW336 JP-M11-GWMW804 JP-M11-GWMW805 JP-M11-GWMW335 JP-M11-GWMW334 JP-M11-GWMW803 JP-M11-GWMW802 JP-M11-GWMW333 JP-M13-GWMW806 JP-M13-GWMW807	R
			Vinyl acetate	73.20%		
		Date	**Compound**	**%D**	**Associated Samples**	**Flag**
500-51693-1	CCV	11/5/2012 instrument CMS25	Vinyl acetate	35.90%	JP-M13-GWMW806 JP-M13-GWMW807	R
		Date	**Compound**	**%RPD**	**Associated Samples**	**Flag**
500-51693-1	MS/MSD	11/17/2012	All compounds		JP-M11-GWMW336	J
		Date	**Compound**	**%R**	**Associated Samples**	**Flag**
500-51693-1	LCS	11/17/2012	butyl benzyl phthalate	122%	JP-M11-GWMW998	Q
			di-n-butyl phthalate	122%	JP-M11-GWMW336	
					JP-M11-GWMW804	
					JP-M11-GWMW805	
					JP-M11-GWMW335	
					JP-M11-GWMW334	
			diethyl phthalate	136%	JP-M11-GWMW803	
					JP-M11-GWMW802	
					JP-M11-GWMW333	
					JP-M13-GWMW806	
					JP-M13-GWMW807	

APPENDIX C2
TABLE 2

Summary of Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	QC Sample	Method Blank Concentration	Associated Samples	Sample Concentration	Flag to be removed
500-51693-1	Method Blank	sodium	Method blank	0.133 mg/L	JP-M11-GWMW998 Sodium	79 mg/L	B
					JP-M11-GWMW336 Sodium	77 mg/L	
					JP-M11-GWMW804 sodium	64 mg/L	
					JP-M11-GWMW805 sodium	100 mg/L	
					JP-M11-GWMW335 Sodium	51 mg/L	
					JP-M11-GWMW334 Sodium	46 mg/L	
					JP-M11-GWMW803 Sodium	84 mg/L	
					JP-M11-GWMW802 Sodium	33 mg/L	
					JP-M11-GWMW333 Sodium	43 mg/L	
					JP-M13-GWMW806 Sodium	26 mg/L	
					JP-M13-GWMW807 sodium	390 mg/L	

APPENDIX C2
TABLE 2

Summary of Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Date	Compound	%RPD	Associated Samples	Flag
500-51693-1	MS/MSD	10/31/2012	2-nitrotoluene	27	JP-M11-GWMW336	J

		Date	Compound	%D	Associated Samples	Flag
500-51766	ICV	10/9/2012	Bromomethane Vinyl acetate	29% 73%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	R

		Date	Compound	%D	Associated Samples	Flag
500-51766	CCV	11/5/2012	Vinyl acetate	35.9%	JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	R

		Date	Compound	%RSD	Associated Samples	Flag
500-51766	ICV	11/12/2012	n-nitrosodi-n-propylamine 3&4 methylphenol 2,4-dinitrophenol	27% 22% 29%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	R

		Date	Compound	%D	Associated Samples	Flag
500-51766	ICV	11/12/2012	Benzoic acid	64.80%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M13-GWMW126R JP-M13-GWMW362	R

APPENDIX C2
TABLE 2

Summary of Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Date	Compound	%D	Associated Samples	Flag
500-51766	CCV	11/17/2012	2,2'-oxybis(1-chloropropane) benzoic acid Acenaphthene 2,4-dinitrophenol dibenzofuran Fluorene 1,2-diphenylhydrazine	27.30% 36.70% 22.00% 50.10% 29.20% 23.40% 25.30%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M13 GWMW126R JP-M13-GWMW362	J (all detects) UJ (all non-detects) except for benzoic acid and 2,4dinitrophenol which should be"R"
		Date	**Compound**	**%R**	**Associated Samples**	**Flag**
500-51766	LCS	11/12/2012	pentachlorophenol	130%	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M1GWMW126R JP-M13-GWMW362	Q
		Date	**Compound**	**QC Sample**	**Associated Samples**	**Flag**
500-51766	ICV	8/7/12 instrument CMS20	n-nitrosodi-n-propylamine 4-chloroaniline 2-nitroaniline 3-nitroaniline 4-nitroaniline Benzidine 3,3'-dichlorobenzidine.	ICV internal standard	JP-M13-GWMW808 JP-M13-GWMW809 JP-M13-GWMW997 JP-M1GWMW126R JP-M13-GWMW362	Q

APPENDIX C2
TABLE 2

Summary of Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Compound	QC Sample	Method Blank Concentration	Associated Samples	Sample Concentration	Flag to be removed
500-51766	Blank	Antimony	Method blank	0.00330 mg/L	JP-M13-GWMW808		B
		Barium		0.000480 mg/L	Antimony	0.0034 mg/L	Qualify B
					Barium	0.22 mg/L	remove
					chromium	0.0010 mg/L	Qualify B
					JP-M13-GWMW809		
					Antimony	<0.020 mg/L	
					Barium	0.029 mg/L	remove
					chromium	<0.010 mg/L	
					JP-M13-GWMW997		
					Antimony	0.0027 mg/L	Qualify B
					Barium	0.029 mg/L	remove
		chromium		0.00103 mg/L	chromium	0.0019 mg/L	Qualify B
					JP-M13-GW126R		
					Antimony	0.0036 mg/L	Qualify B
					Barium	0.058 mg/L	remove
					chromium	0.0011 mg/L	Qualify B
					JP-M13-GWMW362		
					Antimony	<0.020 mg/L	
					Barium	0.050 mg/L	
					chromium	<0.010 mg/L	remove

		Date	Compound	%RPD	Associated Samples	Flag
500-51766	Primary and Secondary columns	11/9/2012	3-nitrotoluene	50.90%	JP-M13-GWMW126R	J

		Date	Compound	%RPD	Associated Samples	Flag
500-51811	LCS	11/10/2012	2,4-dinitrotoluene 2-nitrotoluene 4-nitrotoluene	46.40% 119.80% 83.40%	JP-L02-GWMW404	J
		11/10/2012	2,6-dinitrotoluene 4-nitrotoluene	51.70% 134.40%	JP-L02-GWMW620	J
		11/10/2012 11/10/2012	2,6-dinitrotoluene	65.50% 80.80%	JP-L14-GWMW511 JP-L14-GWMW512	J J

APPENDIX C2
TABLE 2

Summary of Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		QC Sample	Compound	%R	Associated Samples	Flag
500-51872	MS/MSD	MS	RDX	535%	JP-L1-GWMW173	J
			Nitrobenzene	167%		
			2,4,6-trinitrotoluene	345%		
			2-amino-4,6-dinitrotoluene			
			4-amino-2,6-dinitrotoluene	374%		
			4-nitrotoluene			
			3-nitrotoluene	252%		
				161%		
				238%		
		MSD	RDX	514%	JP-L1-GWMW173	J
			Nitrobenzene	155%		
			2,4,6-trinitrotoluene	306%		
			2-amino-4,6-dinitrotoluene			
			4-amino-2,6-dinitrotoluene	366%		
			4-nitrotoluene			
			3-nitrotoluene Tetryl	244%		
				162%		
				240%		
				69%		

APPENDIX C2
TABLE 2

Summary of Qualified Results
2012 Annual Groundwater Monitoring Report
Joliet Army Ammunition Plant
Will County, Illinois

		Date	Compound	%RPD	Associated Samples	Flag
500-51872	Primary and Secondary columns	11/3/2012	RDX	113.20%	JP-L1-GWMW995	J
		11/2/2012	2-amino-4,6-dinitrotoluene	93.00%	JP-L1-GWWES1	J
		11/2/2012	2,6-dinitrotoluene	60.20%	JP-L3-SW557	J
				104.20%	JP-L3-GWMW633	

		QC Sample	Compound	Method Blank Concentration	Associated Samples	Sample Concentration	Flag to be removed
500-51872	Blank	Method blank	Barium	0.00348 mg/L	JP-L3-GWMW631	0.017 mg/L	B
			Selenium	0.00308 mg/L		Not detected	
			Sodium			29 mg/L	B
			Barium		JP-L3-GWMW994	0.017 mg/L	B
			Selenium			Not detected	
			Sodium			29 mg/L	B
			Barium		JP-L3-SW557	0.027 mg/L	B
			Selenium			Not detected	
			Sodium			8.7 mg/L	B
			Barium	0.120 mg/L	JP-L3-SW777	0.026 mg/L	B
			Selenium			Not detected	
			Sodium			8.6 mg/L	B
			Barium		JP-L3-GWMW633	0.062 mg/L	B
			Selenium			Not detected	
			Sodium			7.9 mg/L	B
			Barium			0.053 mg/L	B
			Selenium		JP-L3-GWMW412	Not detected	
			Sodium			11 mg/L	B
			Barium Selenium sodium		JP-L3-GWMW630	0.012 mg/L Not detected 27 mg/L	Qualify 'B' B

APPENDIX D

FIRST ORDER RATE DECAY TREND ANALYSIS

D1 – Trend Graphs
D2 – Estimated Clean-up Time: Example Calculation

D1 – Trend Graphs

Figure D1-1

Site L1 - MW131
Trend in Groundwater - 2,4,6-TNT
Joliet Army Ammunition Plant

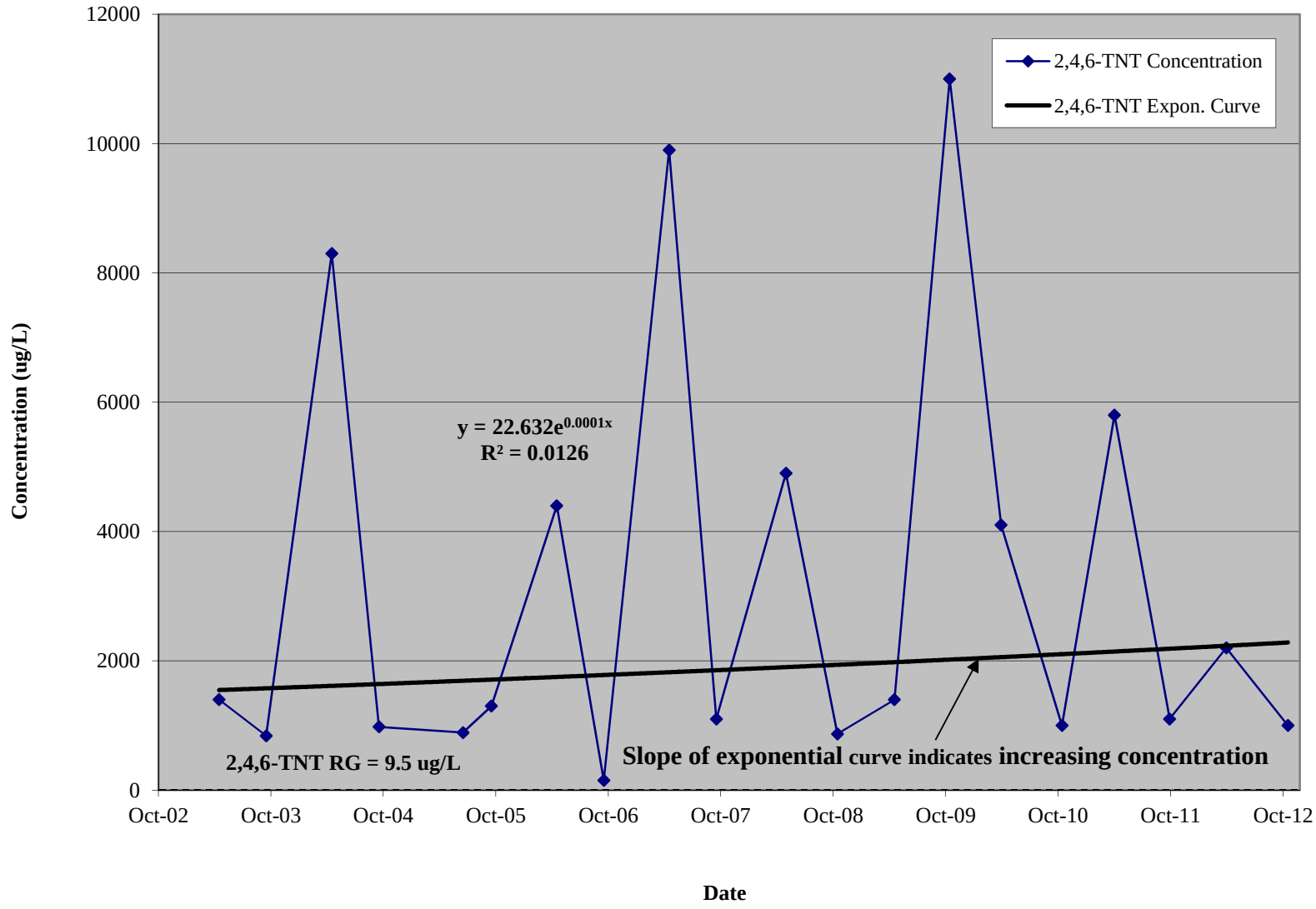

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Figure D1-2

Site L1 - MW131
Trend in Groundwater - 1,3,5-TNB
Joliet Army Ammunition Plant

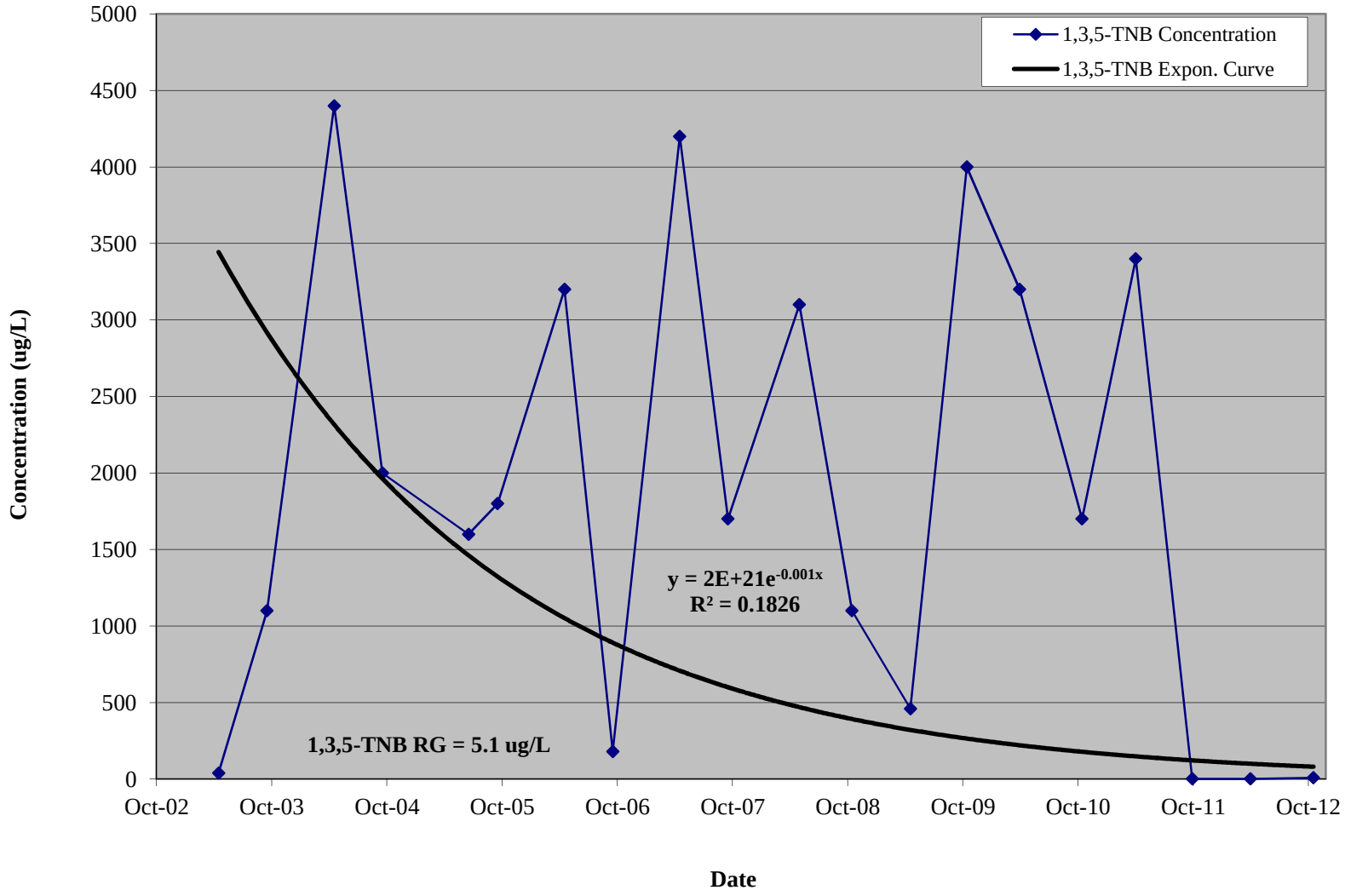

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Figure D1-3

Site L1 - MW173
Trend in Groundwater - RDX
Joliet Army Ammunition Plant

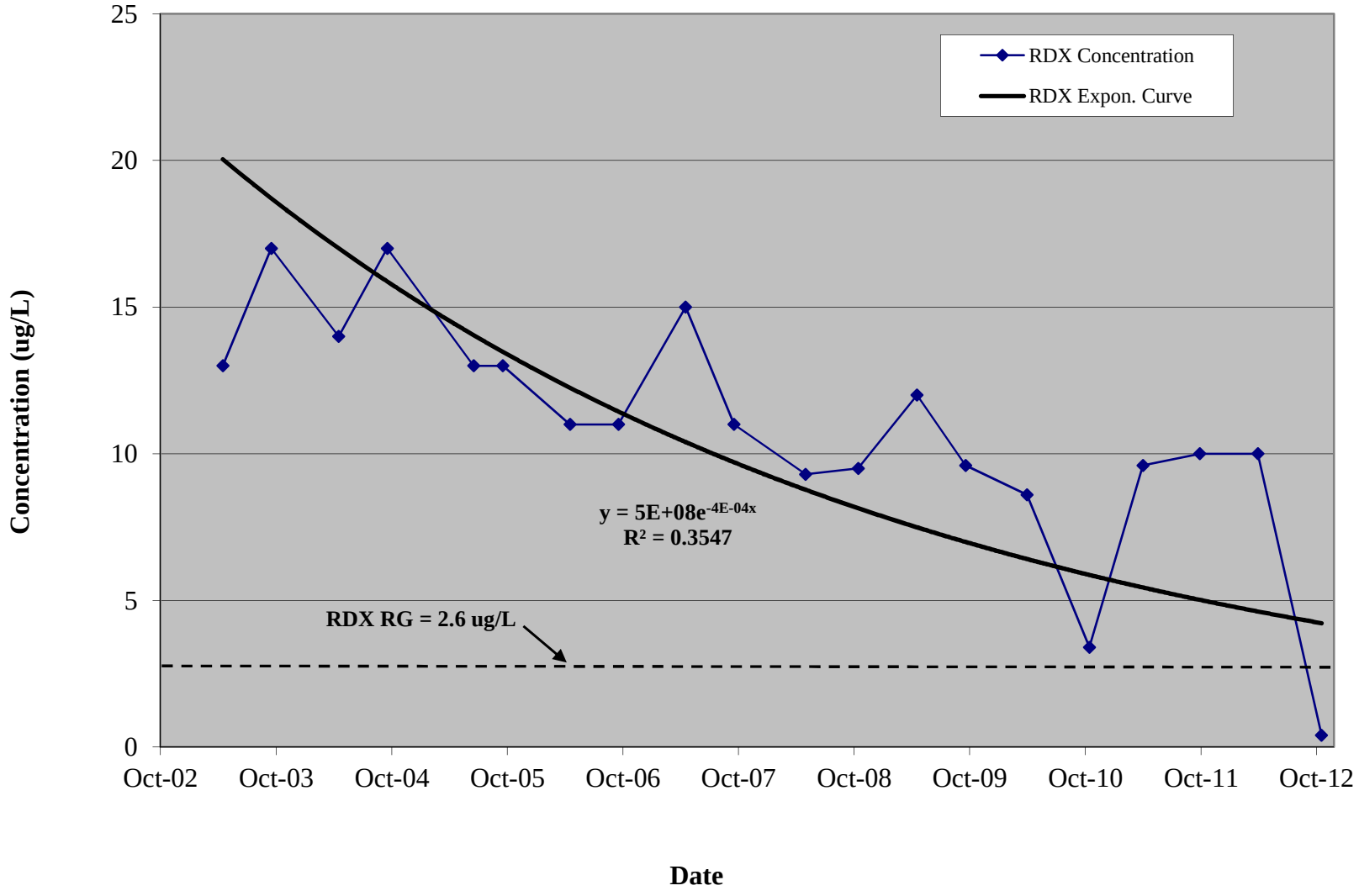

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Figure D1-4

Site L1 - MW173
Trend in Groundwater - 2,4,6-TNT
Joliet Army Ammunition Plant

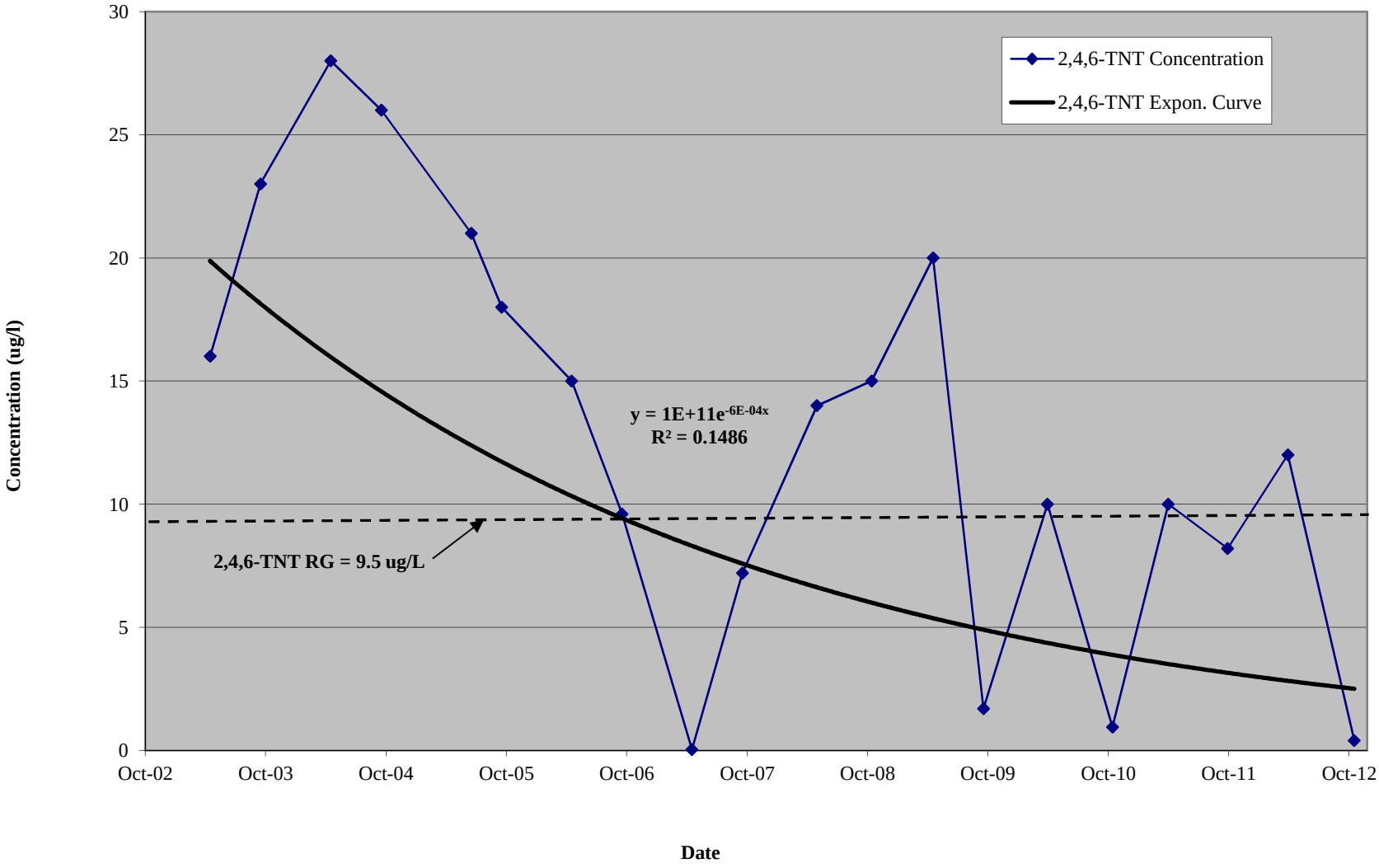

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Figure D1-5

Site L2 - MW404
Trend in Groundwater - RDX
Joliet Army Ammunition Plant

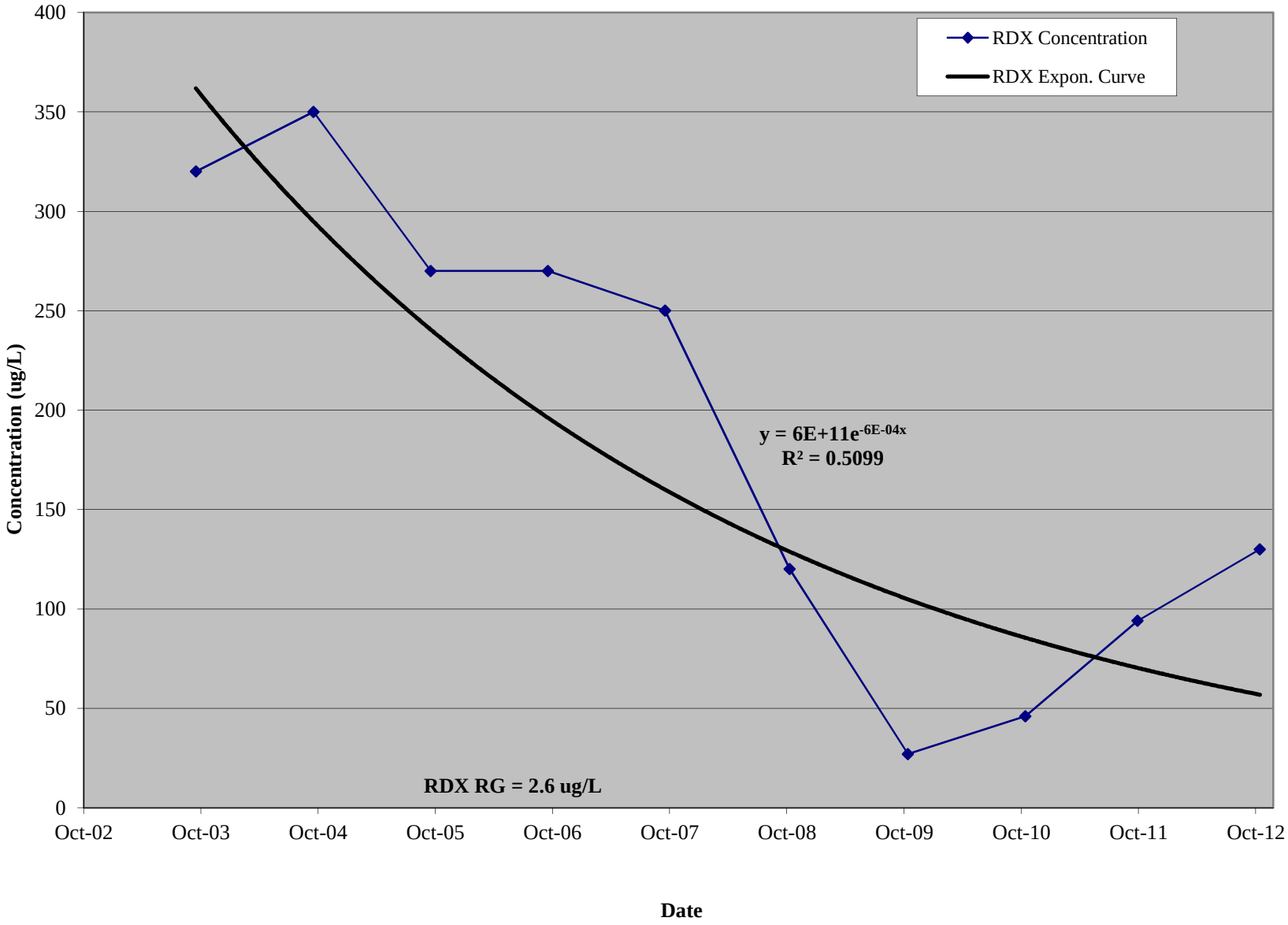

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Figure D1-6

Site L3 - MW412
Trend in Groundwater - RDX
Joliet Army Ammunition Plant

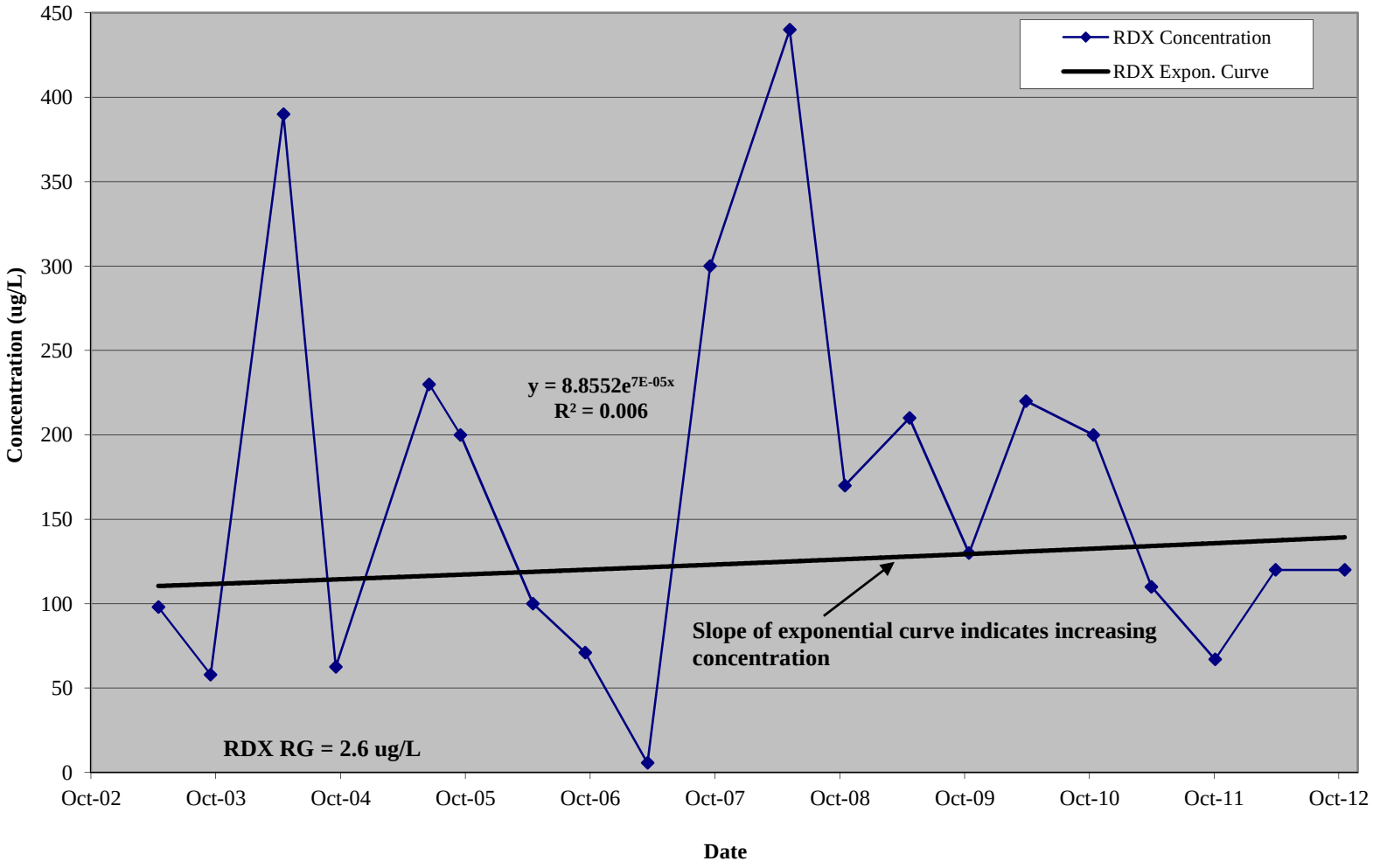

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Figure D1-7

Site L3 - MW630
Trend in Groundwater - RDX
Joliet Army Ammunition Plant

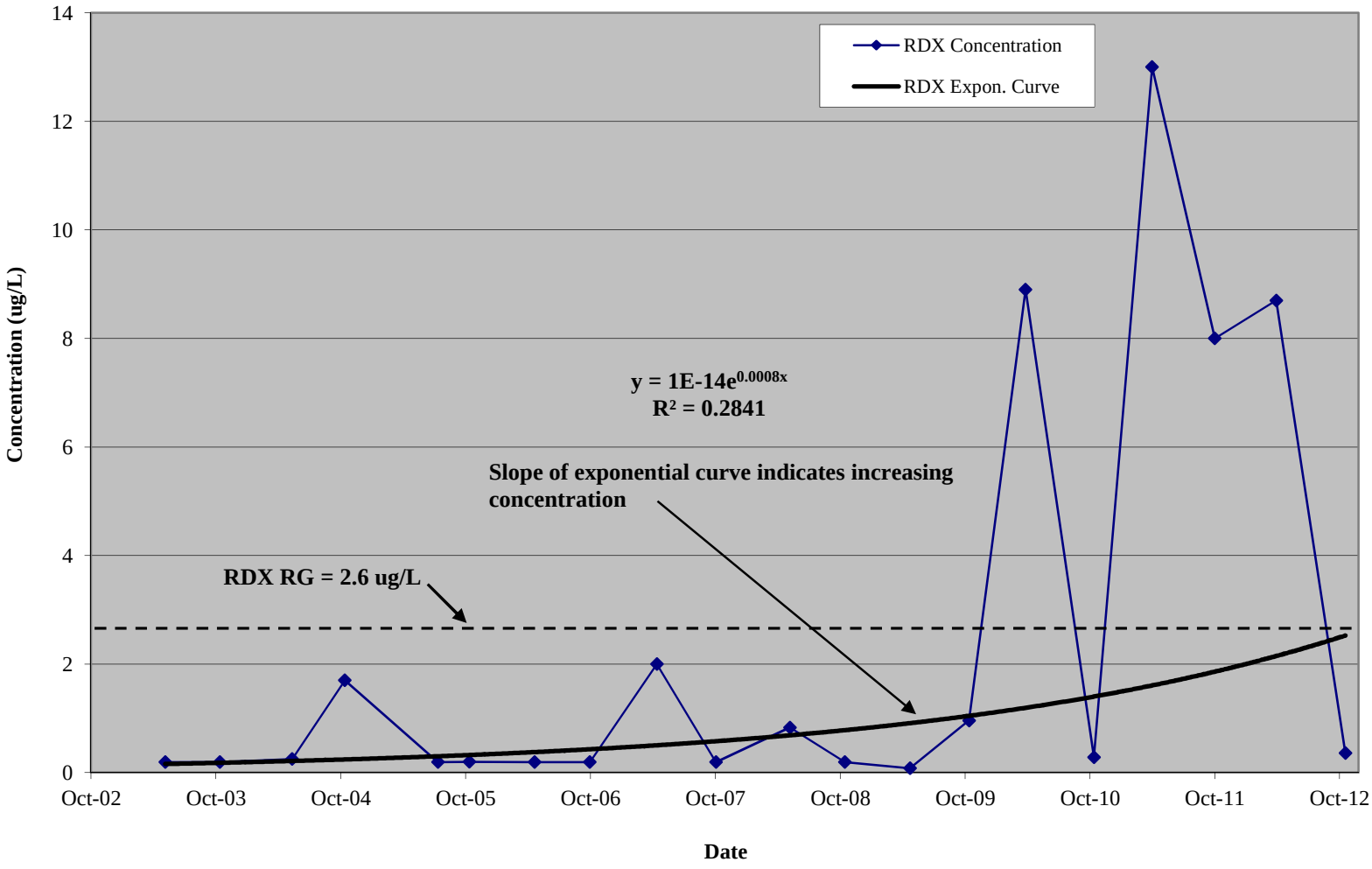

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Figure D1-8

Site L3 - MW633
Trend in Groundwater - RDX
Joliet Army Ammunition Plant

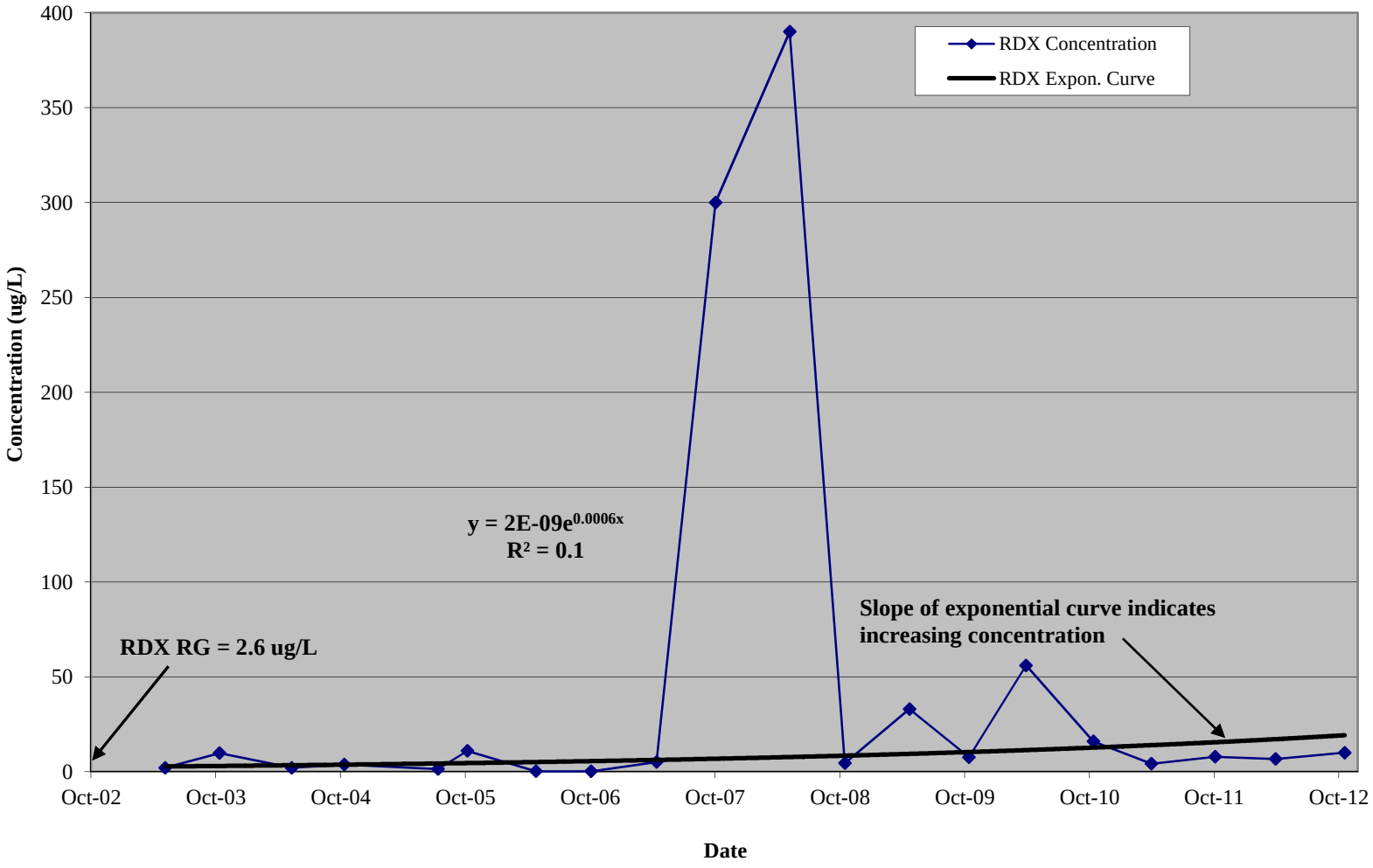

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Figure D1-9

Site L14 - MW511
Trend in Groundwater - RDX
Joliet Army Ammunition Plant

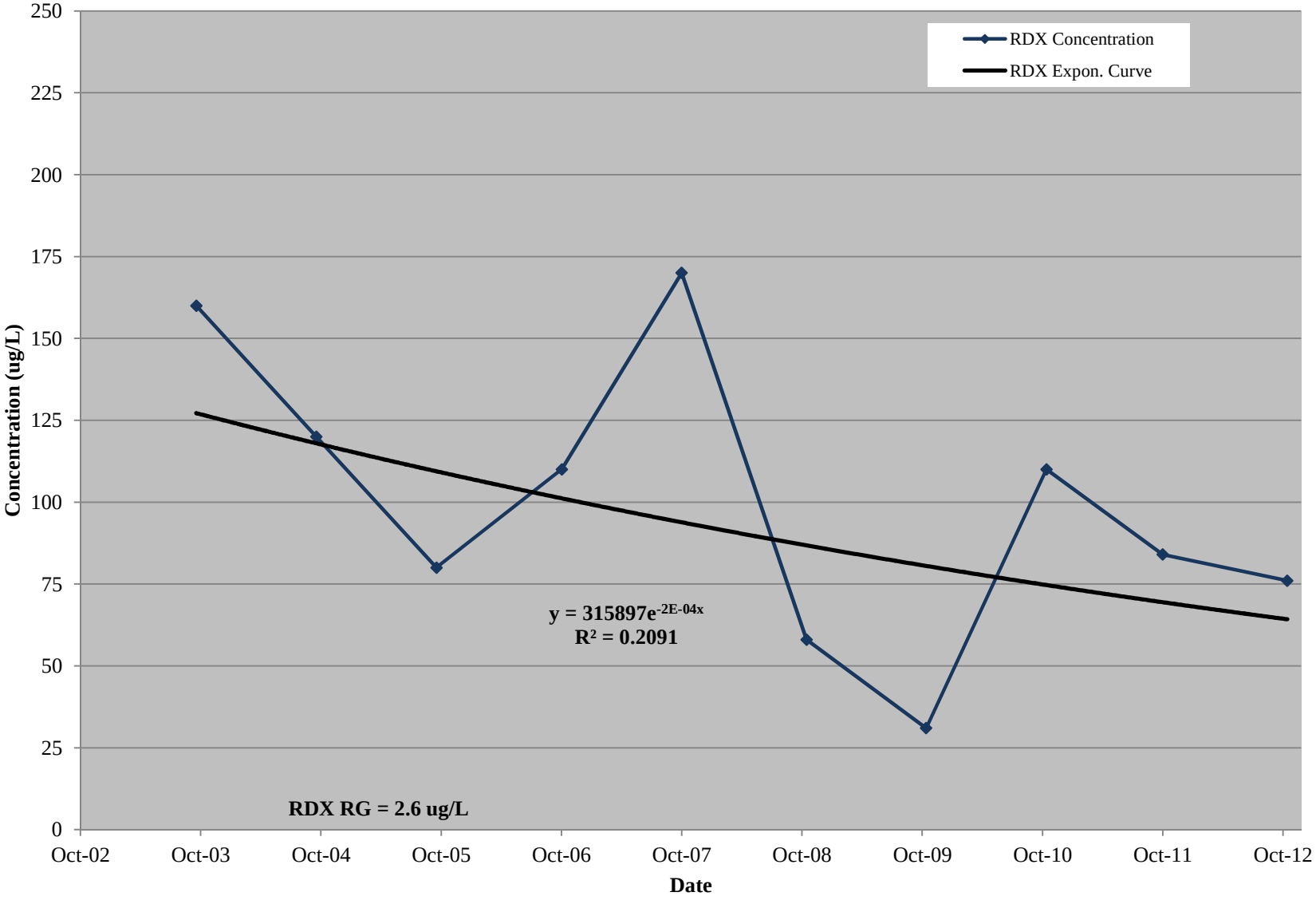

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Figure D1-10

Site L14 - MW512
Trend in Groundwater - RDX
Joliet Army Ammunition Plant

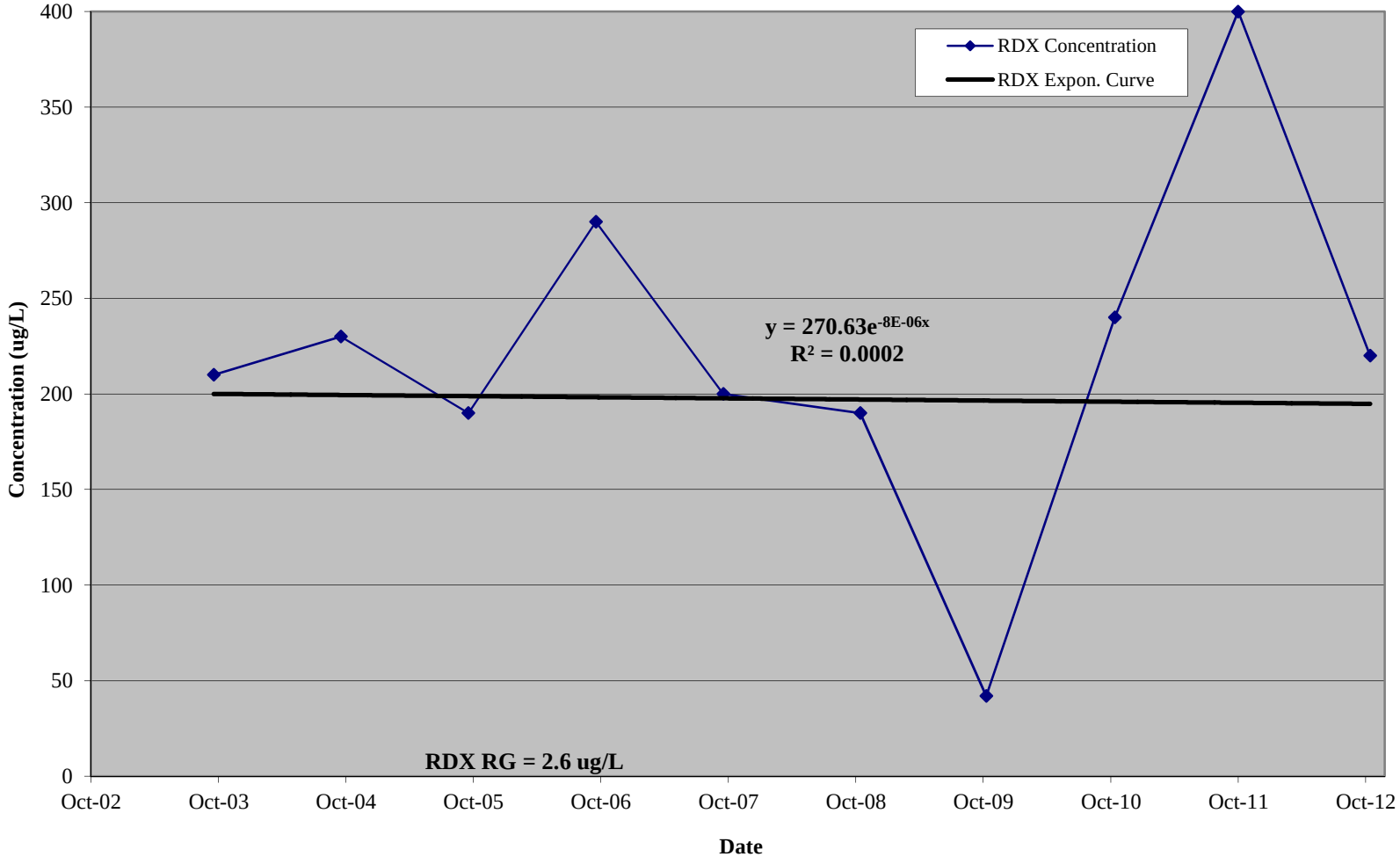

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Figure D1-11

Site M1 - MW107
Trend in Groundwater - Sulfate
Joliet Army Ammunition Plant

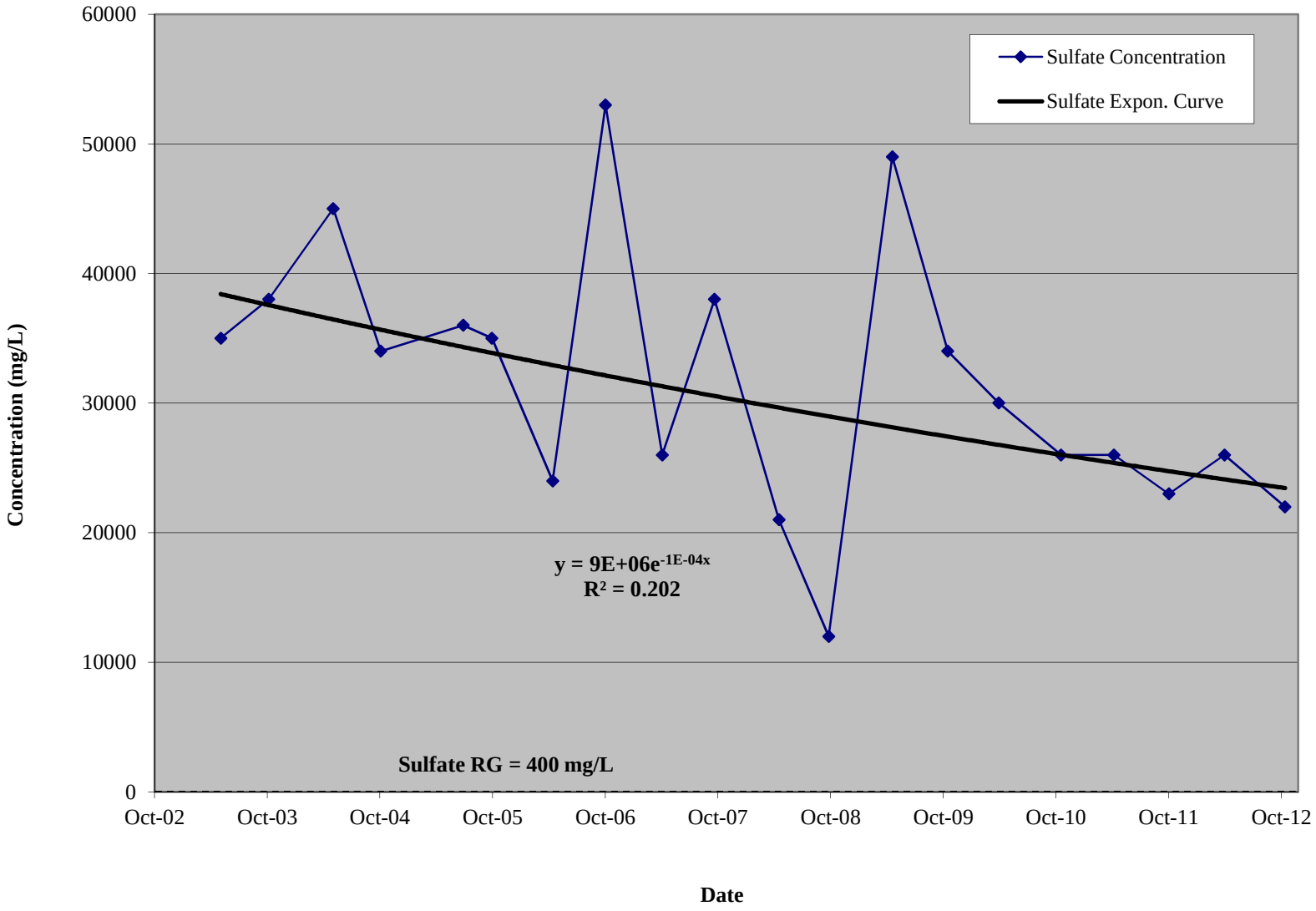

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Figure D1-12

Site M1 - MW231
Trend in Groundwater - Sulfate
Joliet Army Ammunition Plant

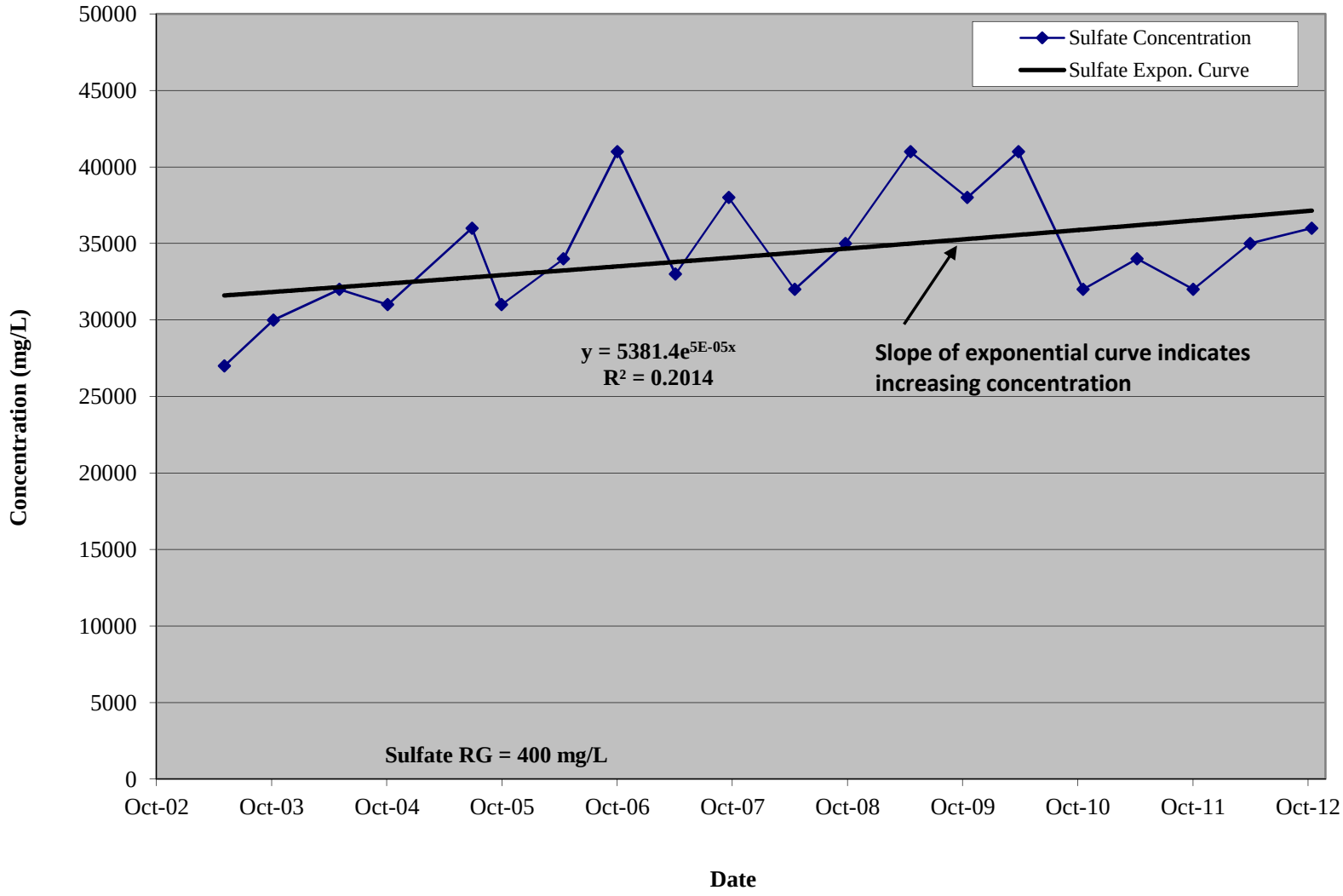

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Figure D1-13

Site M1 - MW640
Trend in Groundwater - Sulfate
Joliet Army Ammunition Plant

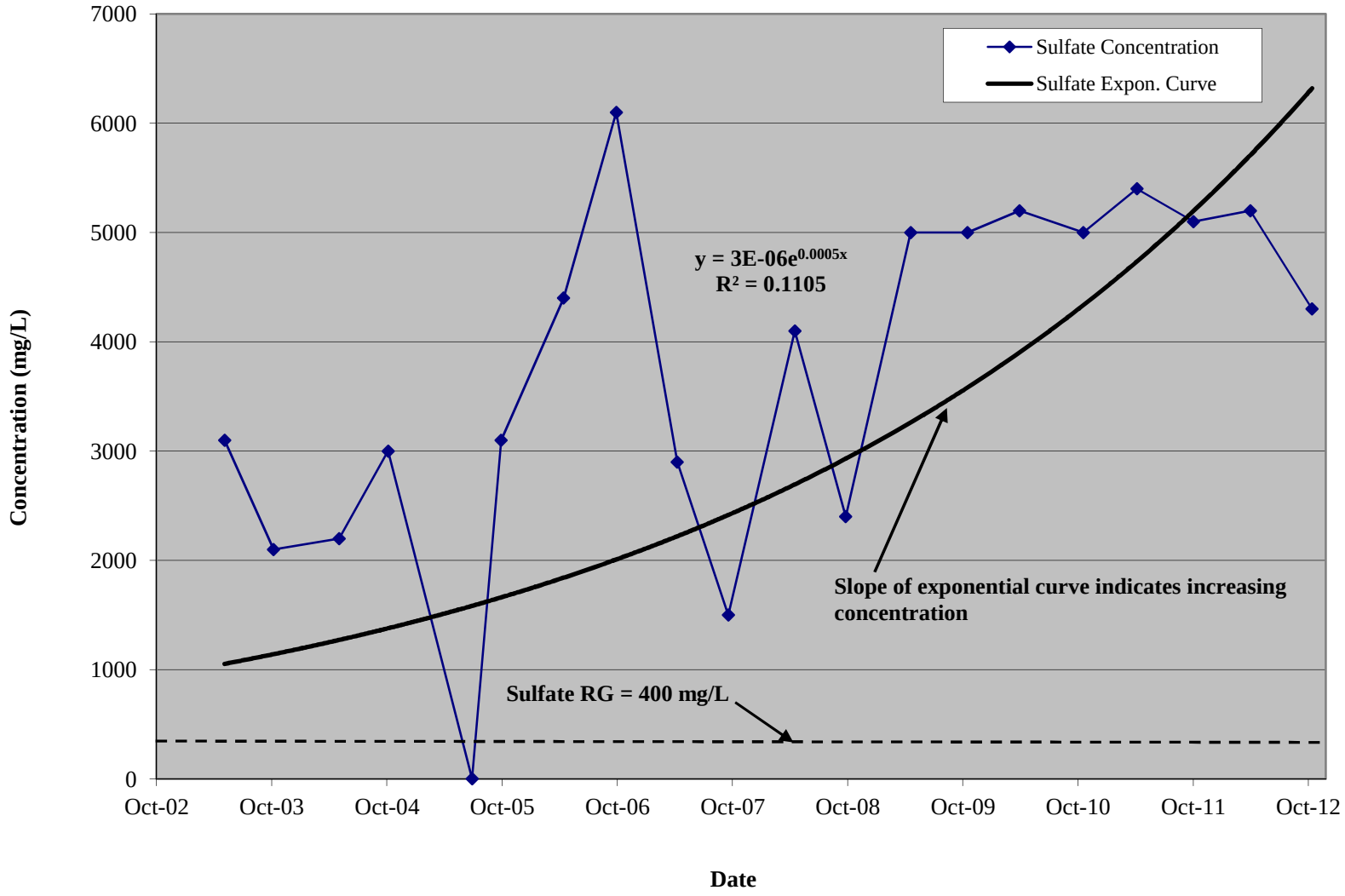

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Figure D1-14

Site M1 - MW641
Trend in Groundwater - Sulfate
Joliet Army Ammunition Plant

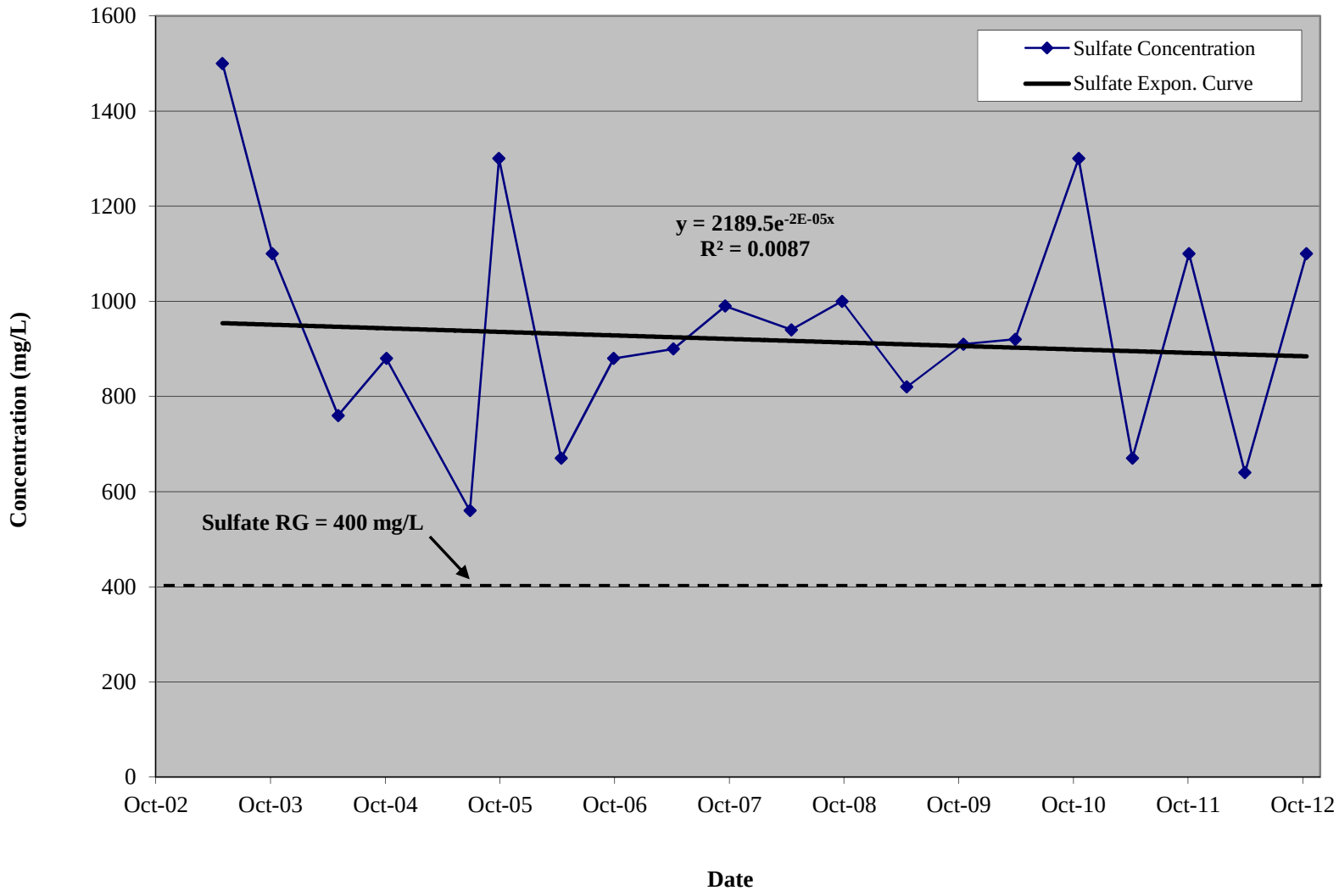

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Figure D1-15

Site M1 - MW642
Trend in Groundwater - Sulfate
Joliet Army Ammunition Plant

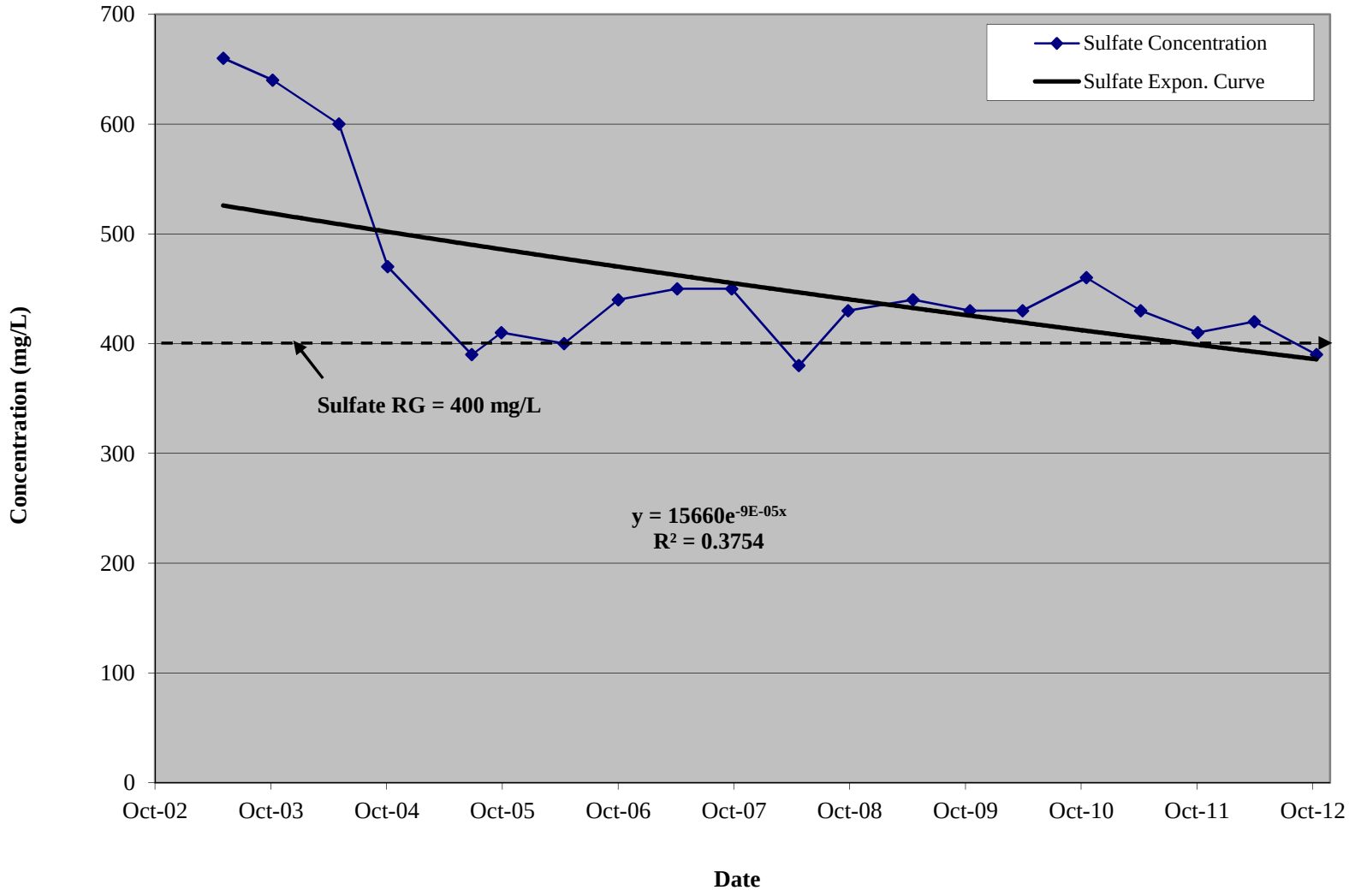

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Figure D1-16

Site M6 - MW212R
Trend in Groundwater - 2,4,6-Trinitrotoluene
Joliet Army Ammunition Plant

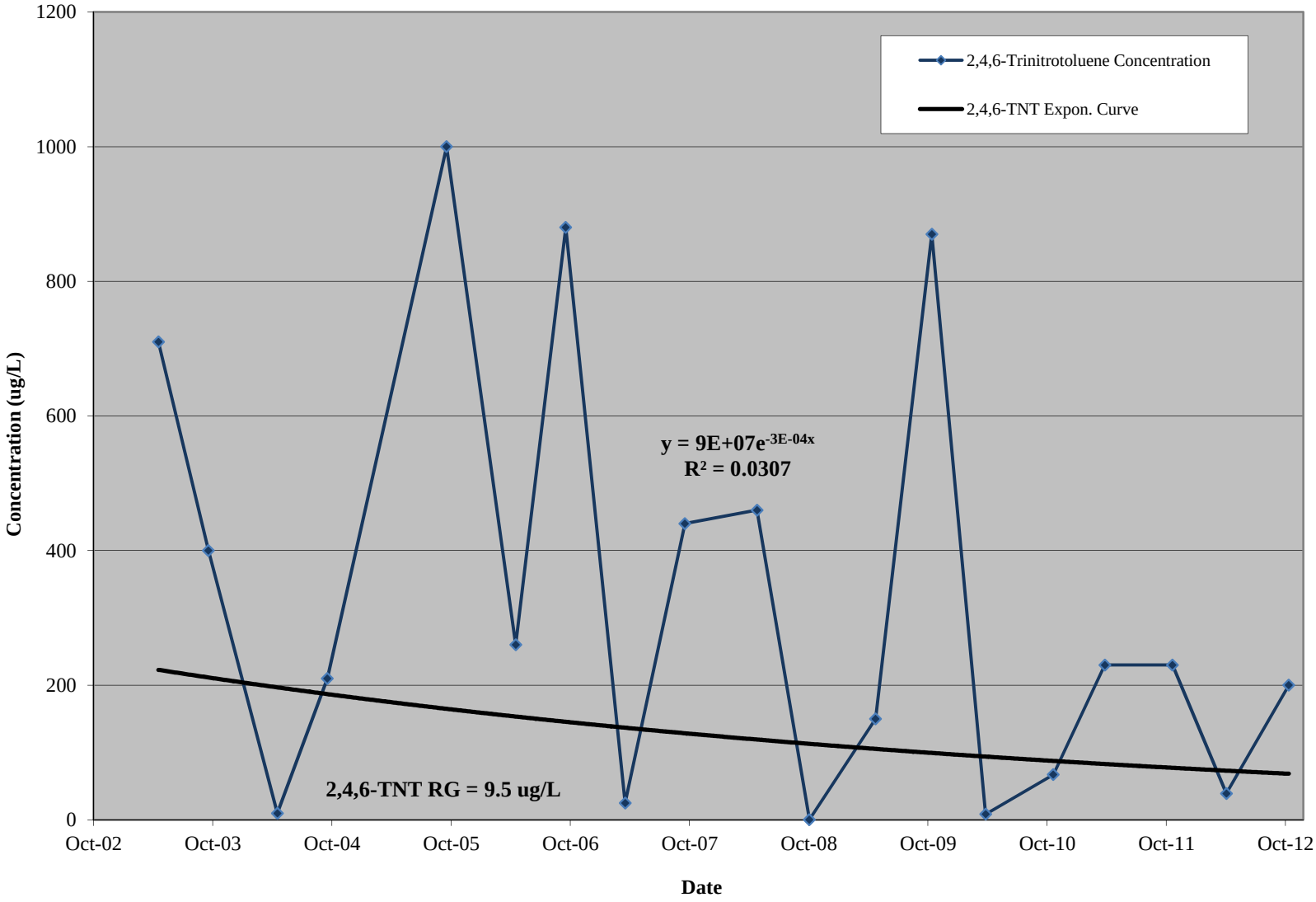

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Figure D1-17

Site M6 - MW652
Trend in Groundwater - 2,4,6-Trinitrotoluene
Joliet Army Ammunition Plant

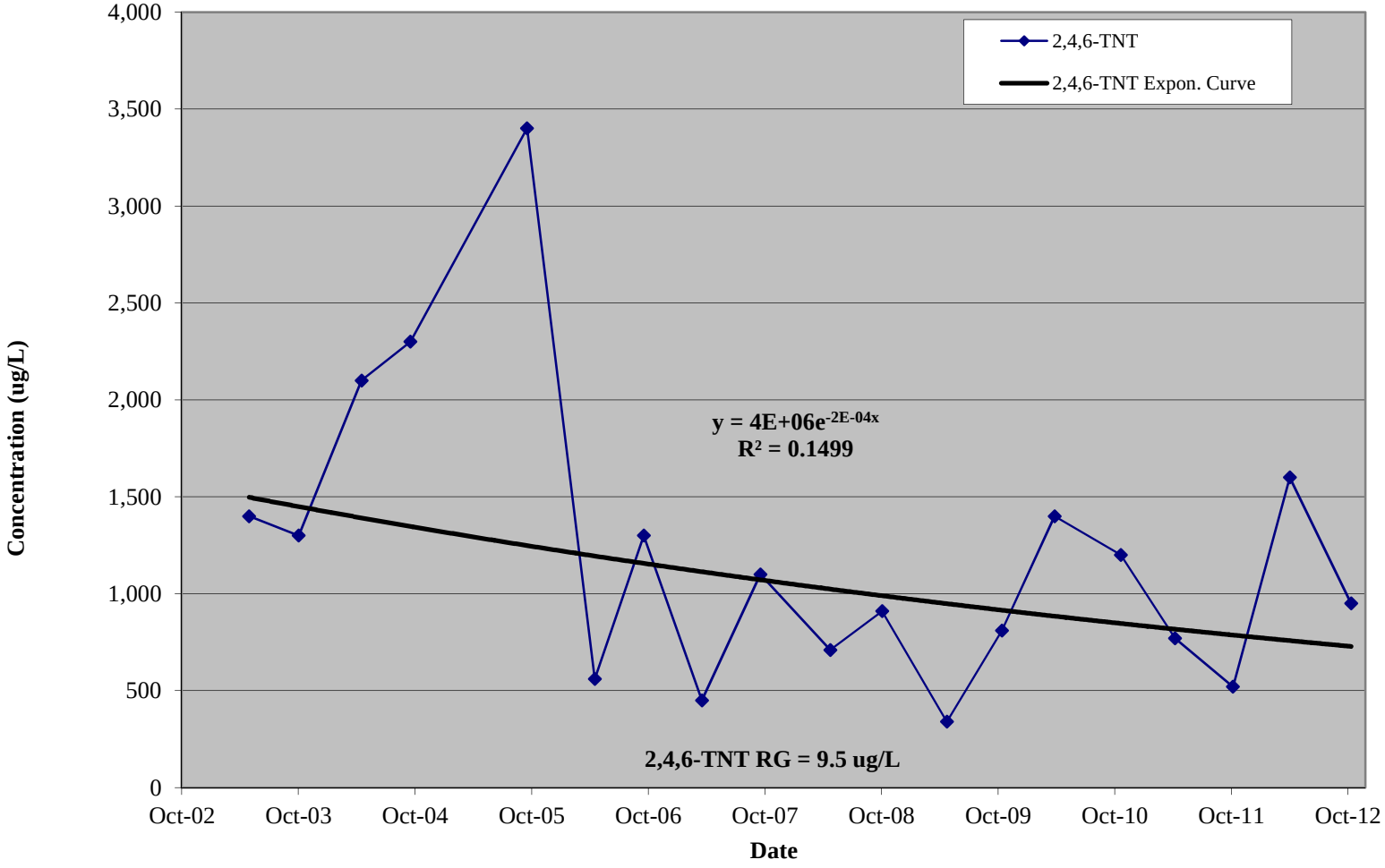

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Figure D1-18

Site M6 - MW652
Trend in Groundwater - 2,4-Dinitrotoluene
Joliet Army Ammunition Plant

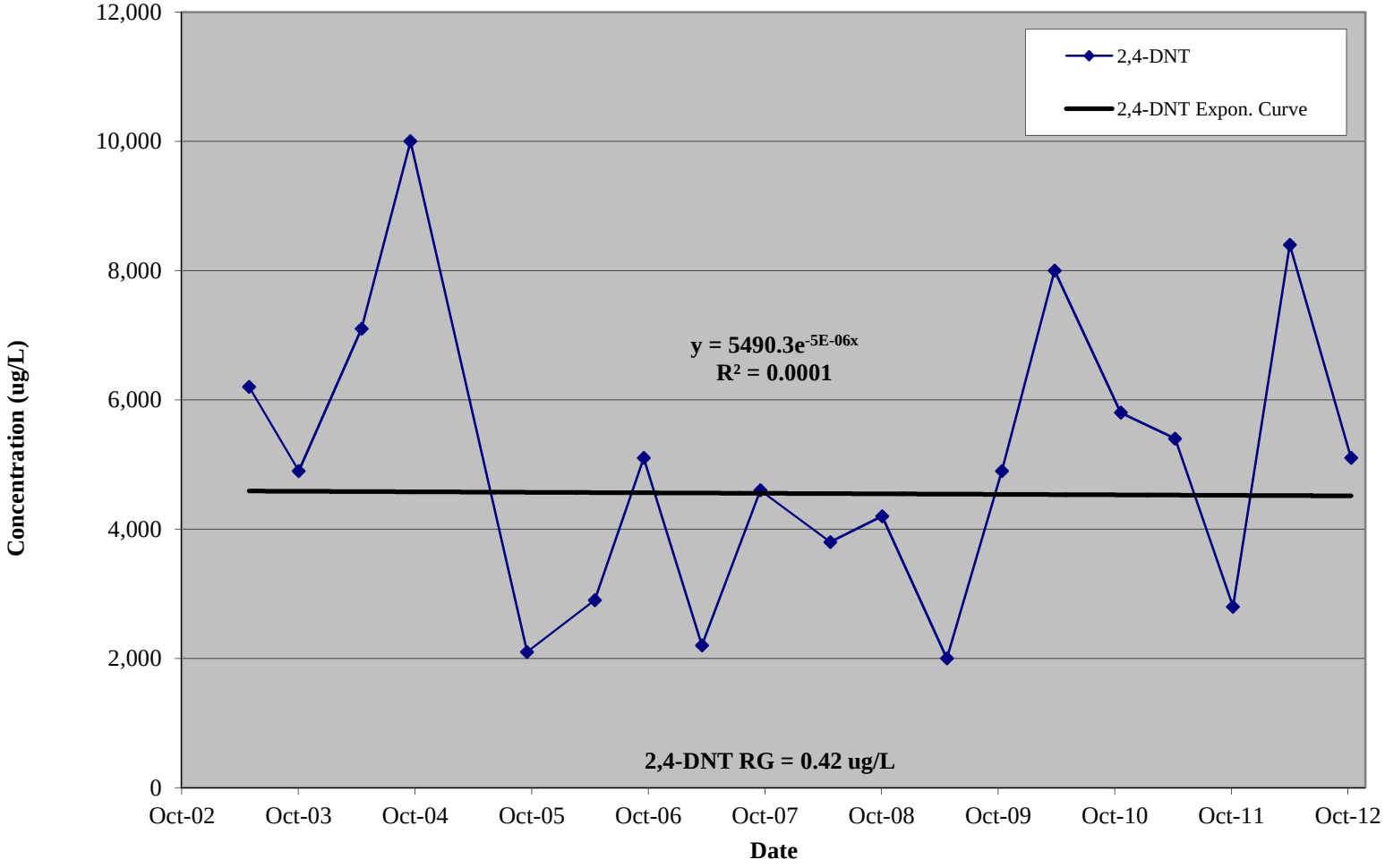

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Figure D1-19

Site M6 - MW652
Trend in Groundwater - 2,6-Dinitrotoluene
Joliet Army Ammunition Plant

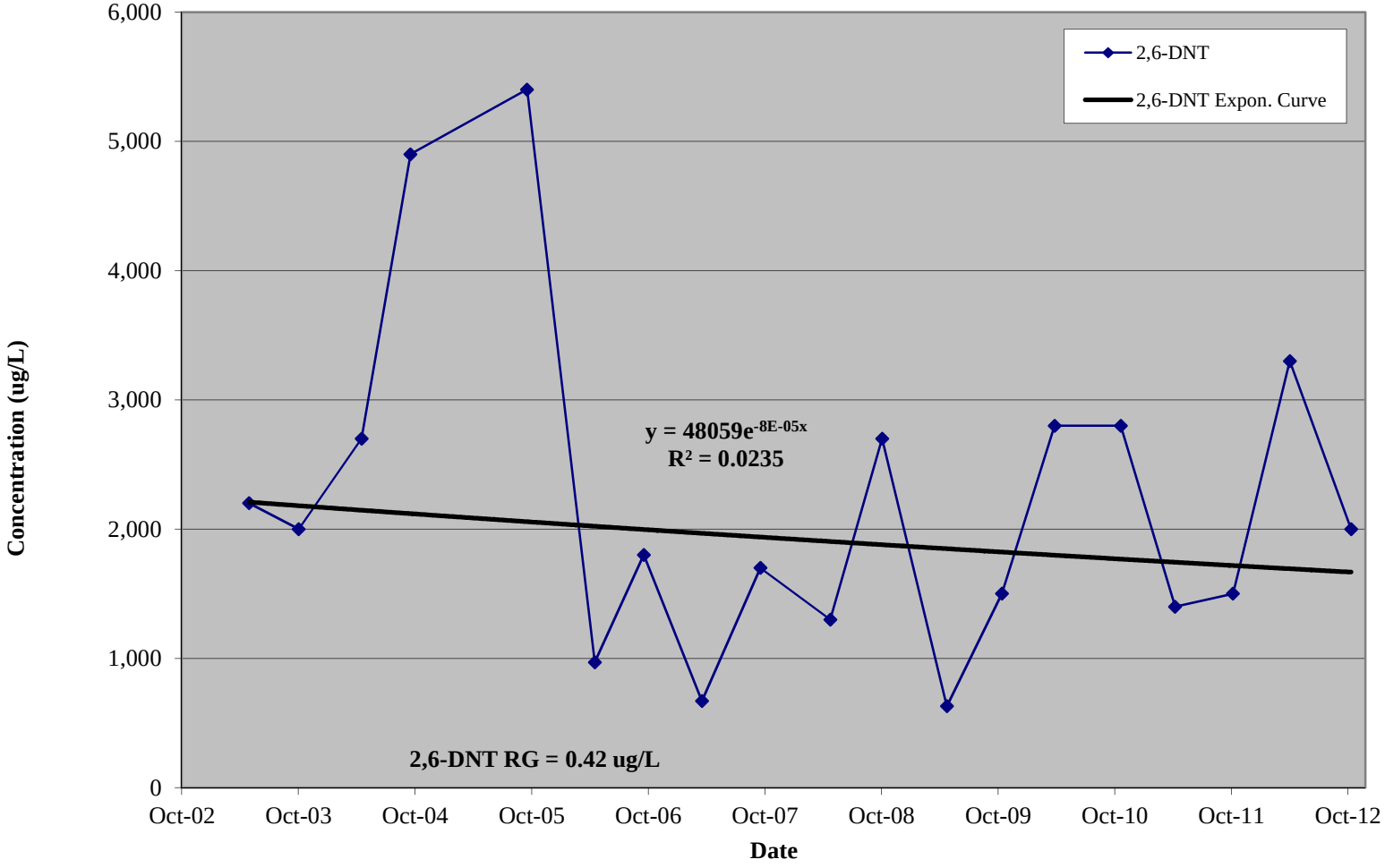

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Figure D1-20

Site M6 - MW652
Trend in Groundwater - 2-Nitrotoluene
Joliet Army Ammunition Plant

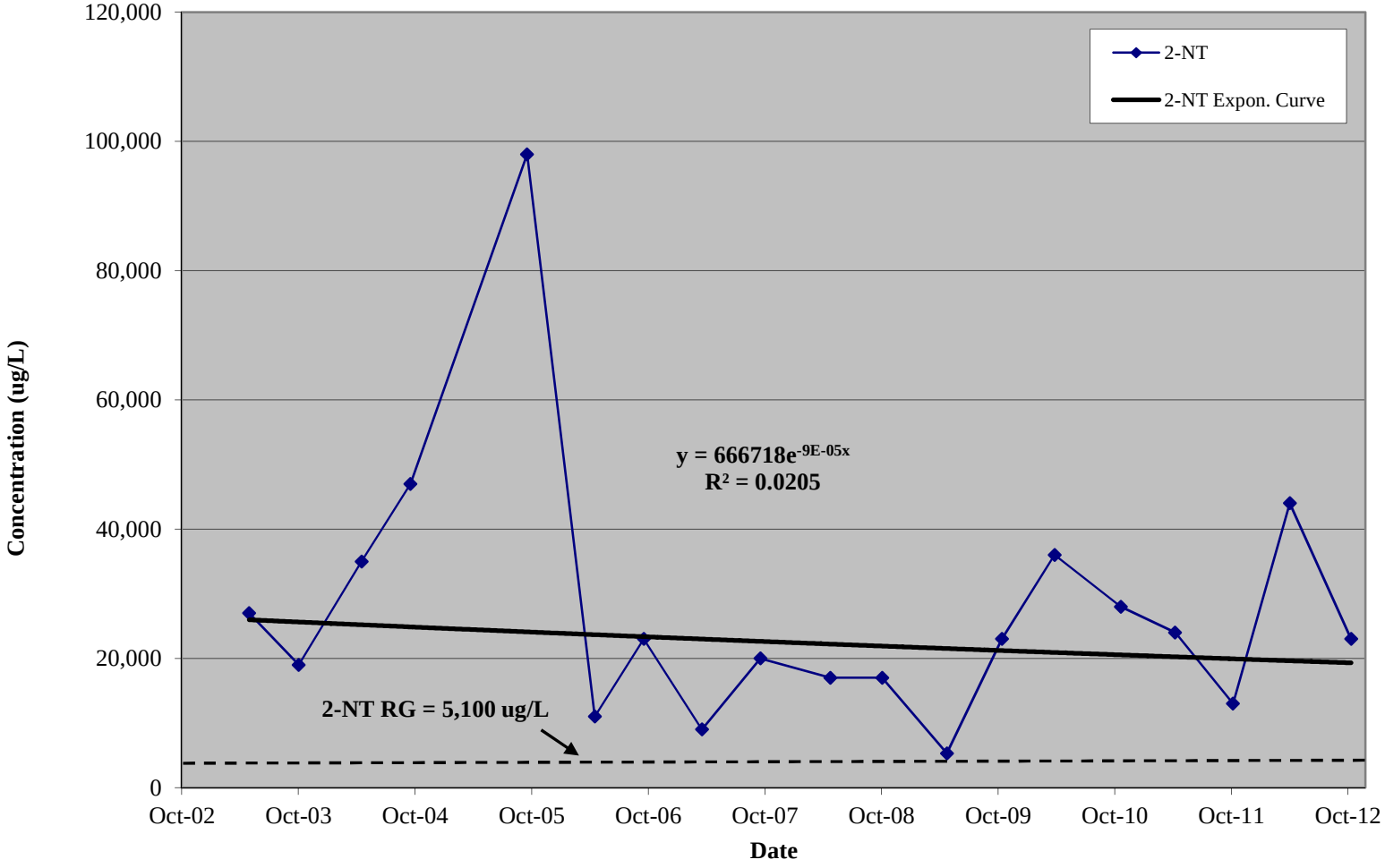

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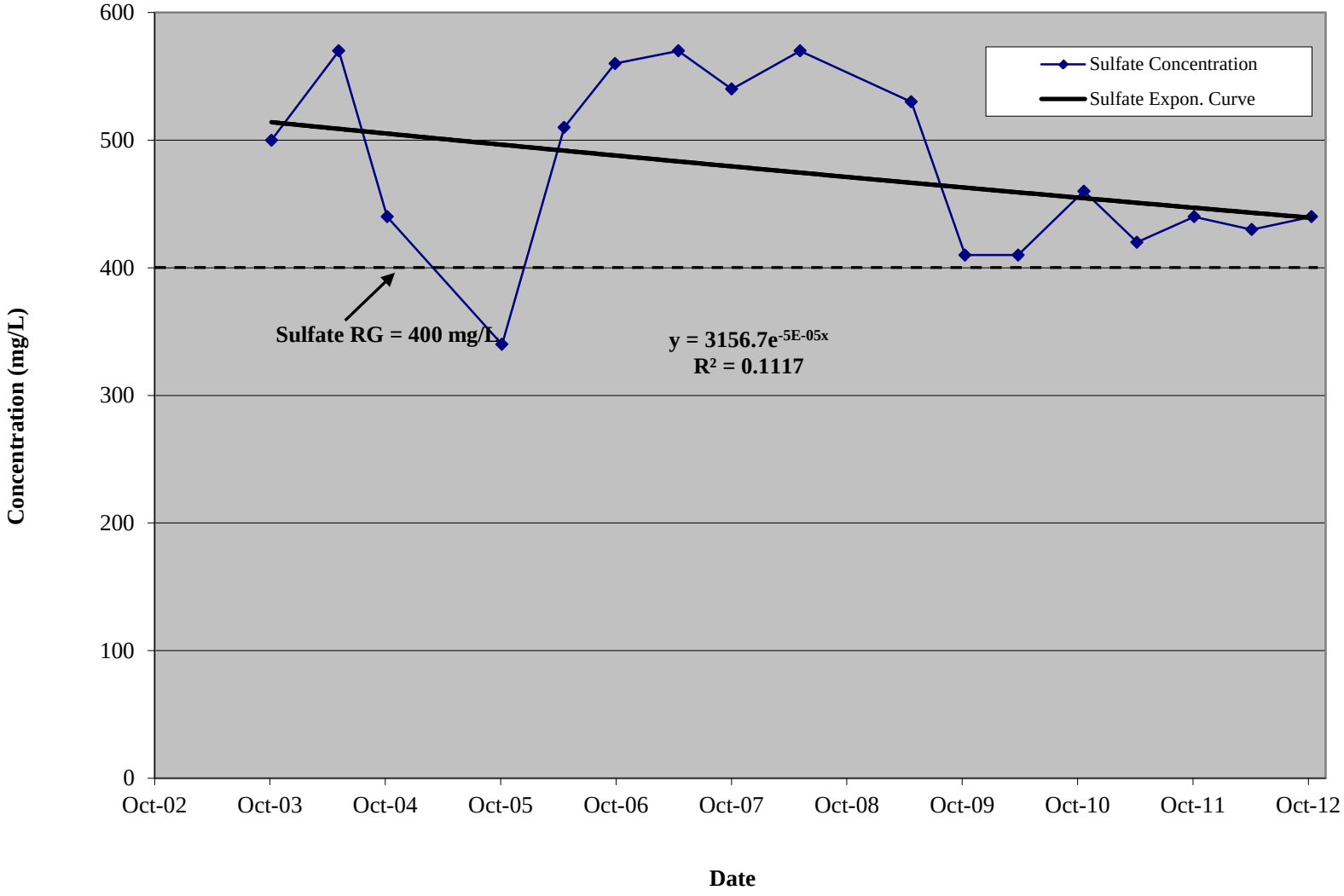
Figure D1-21

Site M8 - MW330
Trend in Groundwater - Sulfate
Joliet Army Ammunition Plant



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J:\Madison Projects\209\1115\2012 Annual GW Report\Final\Appendix D - First Order Rate Decay Trend Analysis\D1 - Trend Graphs\D21_M8 Trend Analysis_2012(MW330 Sulfate)

Figure D1-22

Site M11 - MW335
Trend in Groundwater - Sulfate
Joliet Army Ammunition Plant

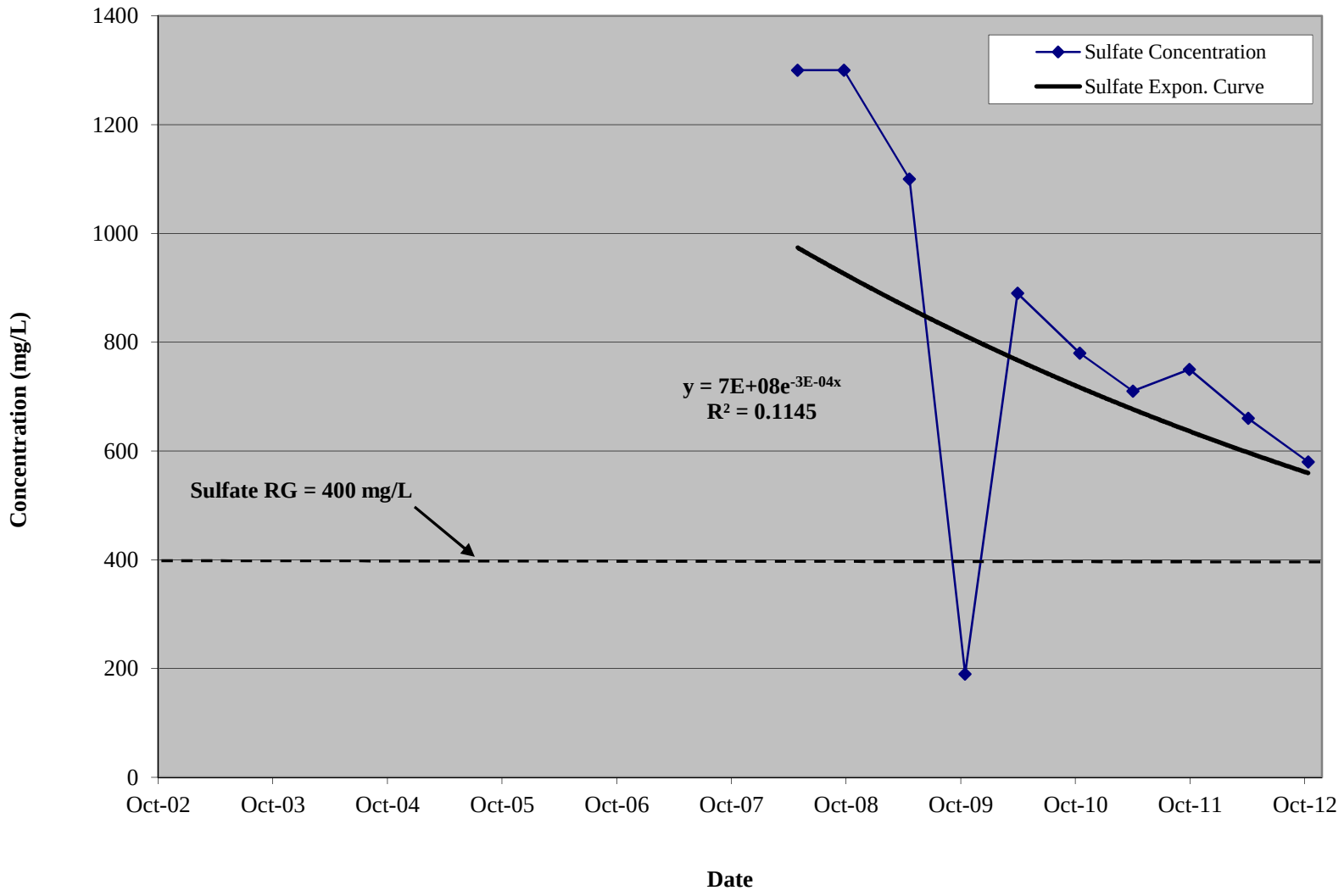

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Figure D1-23

Site M11 - MW336
Trend in Groundwater - Sulfate
Joliet Army Ammunition Plant

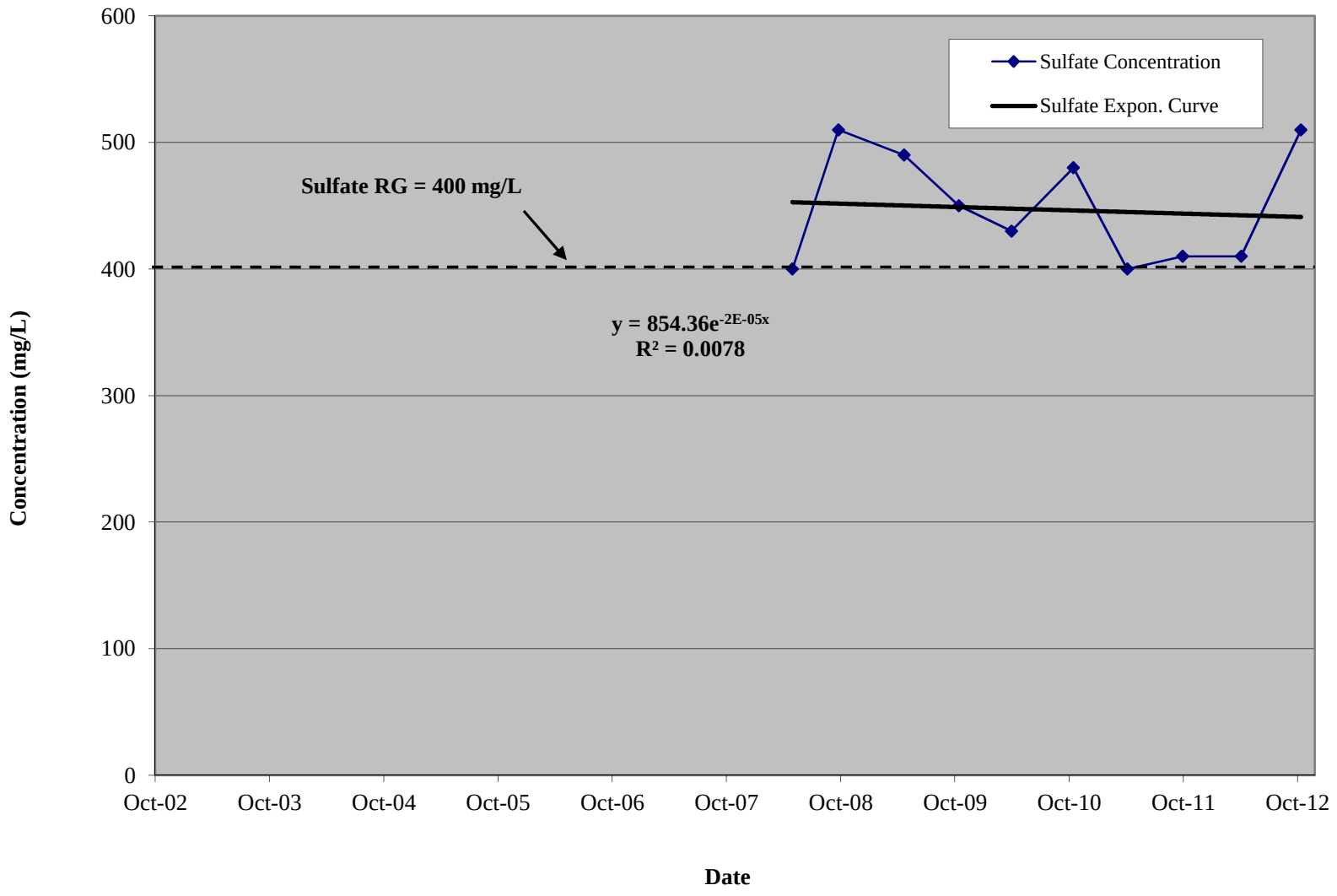

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Figure D1-24

Site M11 - MW805
Trend in Groundwater - Sulfate
Joliet Army Ammunition Plant

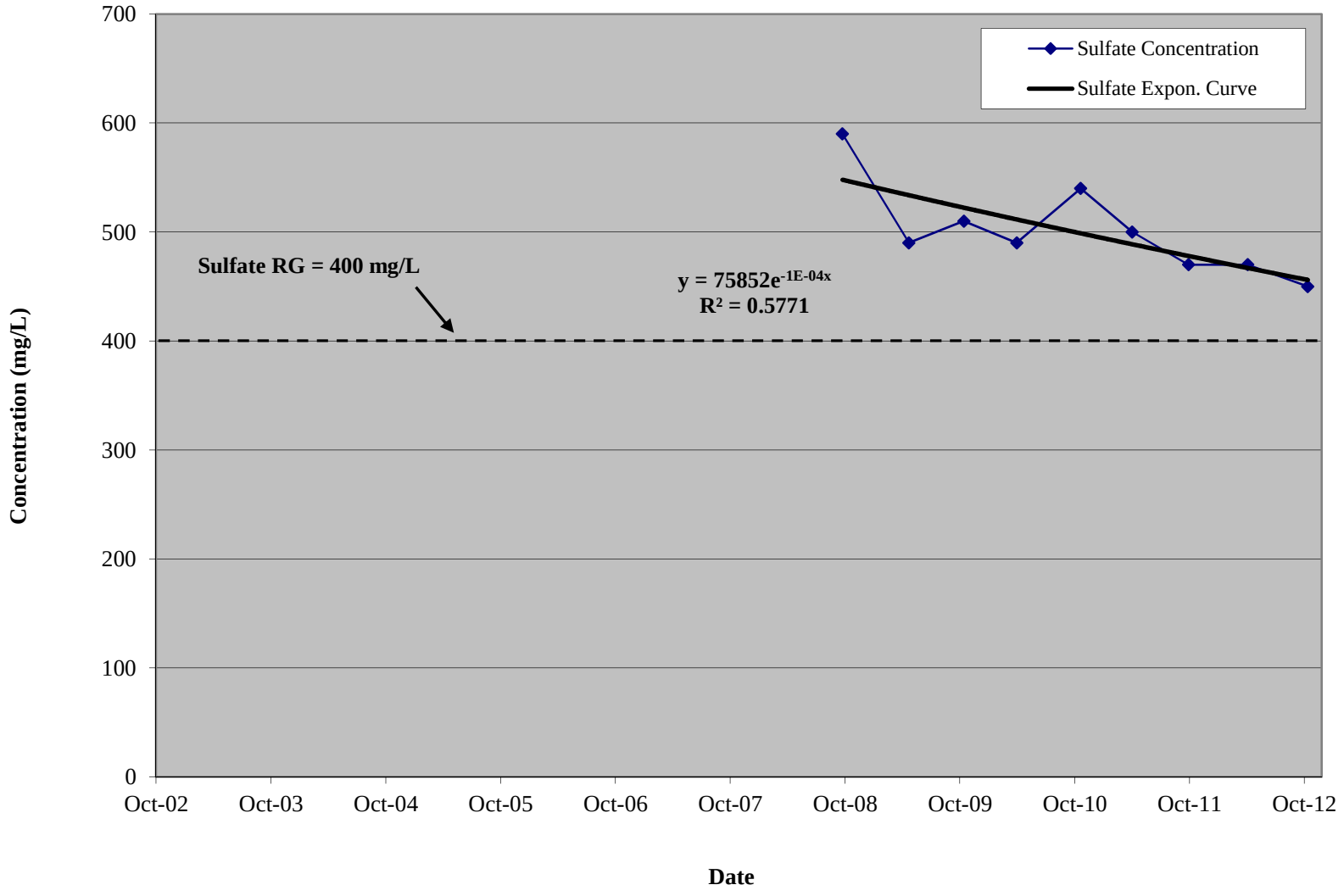

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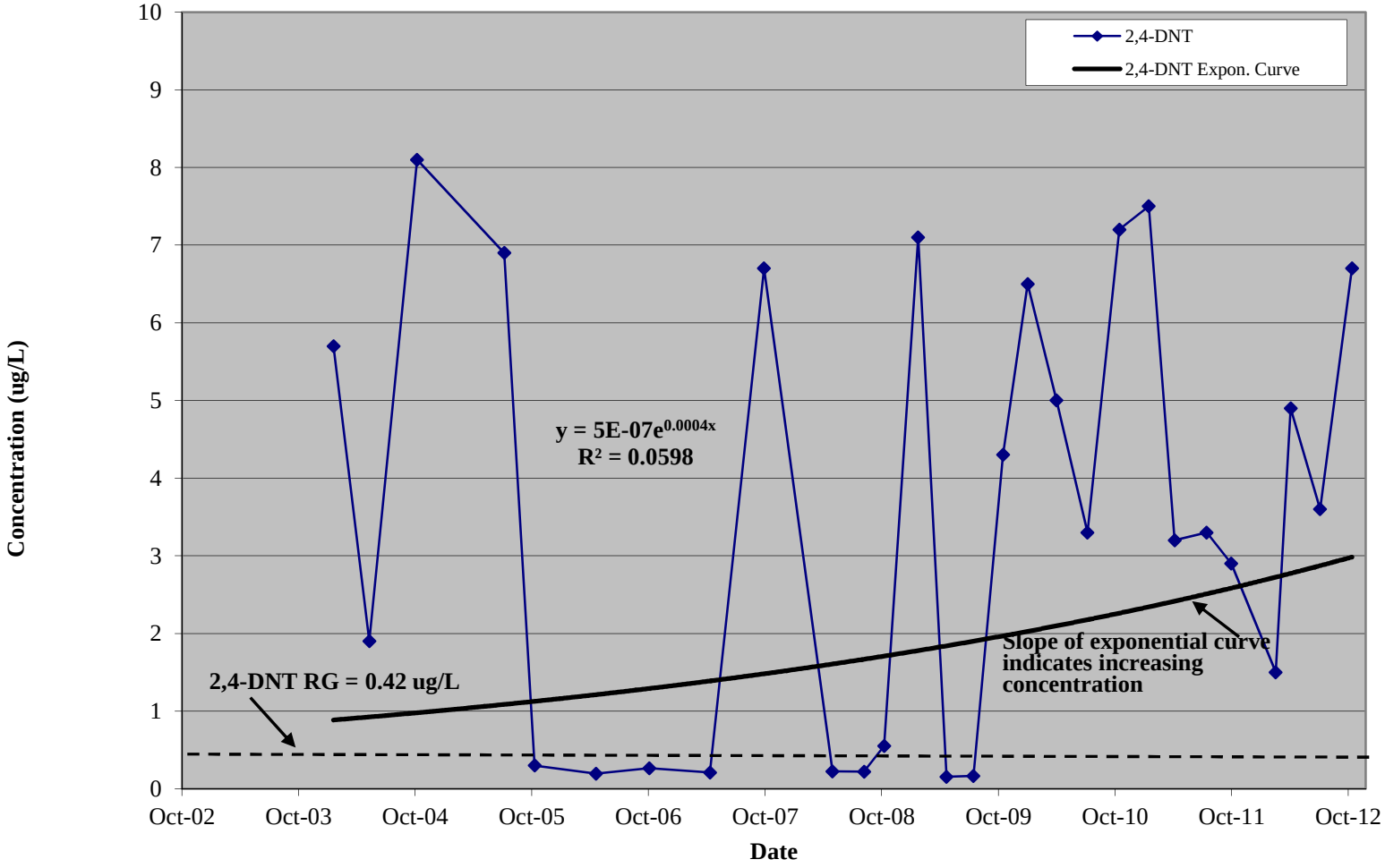
Figure D1-25

Site M13 - MW362
Trend in Groundwater - 2,4-Dinitrotoluene
Joliet Army Ammunition Plant



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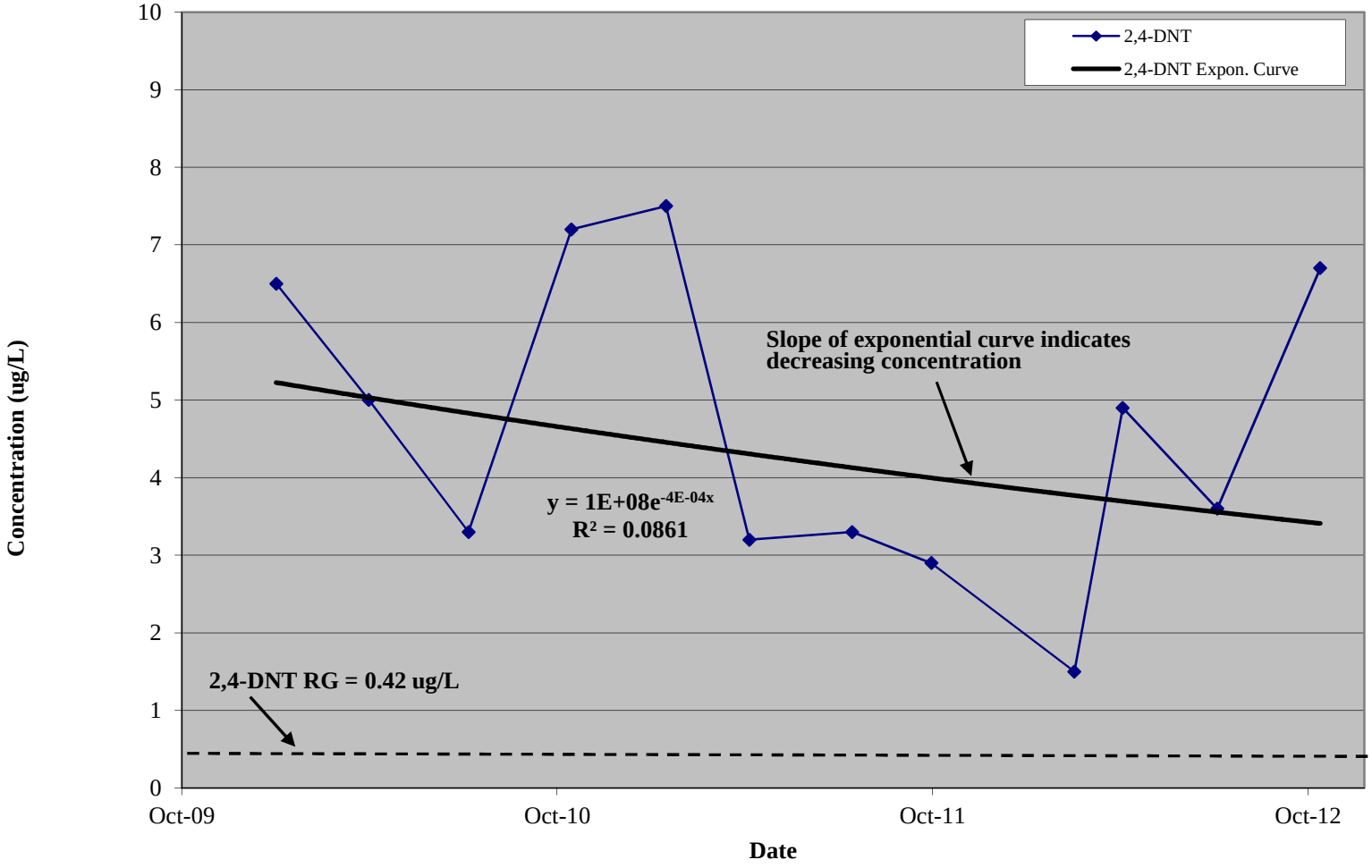
J:\Madison Projects\209\1115\2012 Annual GW Report\Draft Final\Appendix D - First Order Rate Decay Trend Analysis\D1 - Trend Graphs\D25_M13 Trend Analysis_2012(MW362 2,4-DNT)

Figure D1-26

Site M13 - MW362
2010, 2011, and 2012 Trend in Groundwater - 2,4-Dinitrotoluene
Joliet Army Ammunition Plant



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J:\Madison Projects\209\1115\2012 Annual GW Report\Draft Final\Appendix D - First Order Rate Decay Trend Analysis\D1 - Trend Graphs\D26_M13 Trend Analysis_2010-2011-2012(MW362 2,4-DNT)

D2 – Estimated Clean-up Time: Example Calculation

EXPECTED CLEAN-UP TIME: EXAMPLE CALCULATION

The following example calculation illustrates the use of existing groundwater quality data to project future contaminant reduction rates. This analysis calculates the projected time at which the concentration of a selected compound in a selected well is reduced to its RG. However, based on the variability of the data, primarily due to seasonal fluctuations, the calculated cleanup times are only an estimate based on the data available. This particular example pertains to the reduction of RDX in well MW173 at Site L1 (Figure D1-3). The end result of this and other calculations are shown in Table 3-6.

The contaminant reduction equation is based on the first order decay equation that describes biological degradation processes. This general equation is

$$C_t/C_0 = e^{-kt}$$

where

C_t = concentration at time t
C_0 = concentration at time zero
k = decay rate
t = time t

This equation was then fit using a regression analysis to available concentration vs. time data for RDX (see Figure D1-3 for data for well MW173 at Site L1).

Equation 1

Contaminant Reduction Equation: $C = 500000000e^{-4E-04t}$

Where: C = contaminant concentration at time t (µg/L)
t = time after maximum concentration

In this regression analysis, the spreadsheet calculates a correlation coefficient (R^2). The closer R^2 is to 1.0, the greater the field data fit the first order decay equation describing biological decay. An R^2 value equal to 1.0 is an exact fit, and values which approach zero suggest a very poor fit. R^2 values are displayed on the plots used for the expected clean-up time analysis. R^2 values range between approximately 0.1 and 0.5, mainly due to seasonal variations in the data. At MW173 the R value is 0.3547

The goal of this analysis is to determine the time (T) at which the contaminant concentration reaches the site RG. Therefore, the contaminant reduction equation is solved for time (T) and Equation 1 becomes:

Equation 2

$$T = \frac{Ln\left(\frac{C}{500000000}\right)}{-0.0004}$$

In its simplest form, Equation 2 gives the concentration (C) at any time (T). With a few modifications, this relationship will yield the time (from present date) to clean-up. The information required for this calculation is obtained from Figure D1-3.

Explosives Compound:	RDX
Maximum Concentration (C_o):	17 µg/L
Date of Initial Concentration (To):	October 2003
Remediation Goal (C_{RG}):	2.6 µg/L

The following steps are performed to arrive at the time required for reduction of the contaminant to the site RG.

Step 1: Determine the time (T) required for the maximum observed (initial) concentration (C_o) to degrade to the RG (C_{RG}) for that particular compound. This is accomplished by using Equation 2 and calculating the difference in time (T_{total}) between a concentration at a selected point in time (C_{t1} at time t1) and the RG (C_{RG}). This relationship is as follows:

Equation D-3

$$T_{total} = \frac{Ln\left(\frac{C_{RG}}{500000000}\right)}{-0.0004} - \frac{Ln\left(\frac{C_{T1}}{500000000}\right)}{-0.0004}$$

Using C_{t1} = 17 µg/L in 2003, results in:

$$= \frac{Ln\left(\frac{2.6\ ug/L}{500000000}\right)}{-0.0004} - \frac{Ln\left(\frac{17\ ug/L}{500000000}\right)}{-0.0004}$$

$$T_{total} \cong 13 \text{ years after } 2003$$

Note: T_{total} represents the clean-up time in years past the time of C_{t1} (2003).

Step 2: Compute the time from the current reporting date (2012) to the time at which the RG is met. This would be:

Time from 2012 = T_{total} - (2012-2003)

This example calculation would be:

13 yrs – 9 yrs = 4 years from 2012

The end result of this example calculation shows that RDX at well MW173 (Site L1) may degrade to the site RG of 2.6 µg/L in approximately 4 years from the current reporting date, or in the year 2016 (Table 3-6). Based on the variability of the data, primarily due to seasonal fluctuations, the calculated cleanup times are only an estimate based on the data available. It should be noted that this is an approximation only and that there are several other variables not considered in this analysis that may alter the future trend in contaminant reduction.