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ENVIRONMENTAL JOB ORDER CONTRACT
NO. N68950-00-D-0200
DELIVERY ORDER NO. 0027

QUARTERLY MONITORING REPORT
SECOND QUARTER 2004
BIOSPARGE REMEDIATION SYSTEM
BUILDING 1600A
GREAT LAKES, ILLINOIS

PREPARED FOR

DEPARTMENT OF THE NAVY
NAVAL STATION GREAT LAKES
ENVIRONMENTAL DEPARTMENT
BUILDING 1-A, 201 DECATUR AVENUE
GREAT LAKES, ILLINOIS 60088-5600

SUBMITTED
AUGUST 2004

BY

TOLTEST, INC.

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TOLTEST PROJECT NO. 41791.01

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Prepared by:

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1000 Northpoint Boulevard
Waukegan, Illinois 60085

TolTest, Inc. hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under this contract is complete, accurate, and complies with all requirements of the contract.

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EXECUTIVE SUMMARY

TolTest, Inc. completed quarterly sampling and monitoring on the biosparge remediation system at Building 1600A, Naval Station Great Lakes. This report discusses the sampling events performed during July 2004 for the Second Quarter of sampling in 2004. In addition, a summary of all previous sampling events and a summary of the maintenance work performed on the biosparge system during the First Quarter of 2004 are included in this report.

Groundwater samples were collected from each monitoring well (MW-1 through MW-9) and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), methyl-tertiary butyl ether (MTBE) and poly-nuclear aromatic (PNA) compounds. In addition, the monitoring wells closest to the contaminant source (MW-1, MW-2, MW-3, and MW-9) were analyzed for total lead. Due to the moderate turbidity of the sample collected from MW-3, this sample was analyzed for Synthetic Precipitation Leaching Potential (SPLP) lead. Analytical results of groundwater sampling during the Second Quarter of 2004, indicate benzo(a)anthracene and total lead in MW-1; ethylbenze and naphthalene in MW-2; and total lead in MW-3 exceed the Illinois Environmental Protection Agency (IEPA) Groundwater Remediation Objectives (GROs) Class I. The SPLP lead concentration in MW-3 was below the laboratory method detection limit (MDL). Benzo(a)anthracene had not been detected during previous sampling events. It will be monitored as a contaminant of concern (COC). The COCs [benzene, ethylbenzene, naphthalene, benzo(a)anthracene, and total lead] are compounds that currently exceed the GROs or have exceeded the GROs during past sampling events. Benzene, which continues to be listed as a COC, was detected in MW-4 at concentrations below the GRO. Benzene was not detected above laboratory MDLs in samples collected from the remaining monitoring wells.

Despite the detection of COCs which exceed the GROs, the general trend of concentrations of the COCs remains in a downward direction below the GRO. Based on the current analytical data, the contaminant plume boundary for the organic constituents is defined by MW-1 and MW-2. Although elevated total lead levels were detected during this sampling event, this can be attributed to sediment in groundwater samples and seasonal fluctuations in the groundwater table. In the sample collected from MW-3, SPLP was used to evaluate the leaching of lead into groundwater and the results were below the MDL. The SPLP lead results are a more realistic assessment of the lead concentrations in the groundwater because it takes into account the leaching potential due to normal rainfall and weathering. The direction of groundwater flow continues to be towards the southeast. Hydraulic gradient calculations for the second quarter of 2004 are 2.4 feet per 120 feet.

The biosparge system is working as intended as indicated by the decreases in contaminant concentrations and plume size. Maintenance of the biosparge system has occurred on a routine basis. No significant issues have been encountered during maintenance activities. TolTest recommends that quarterly sampling continue for the remainder of 2004 to evaluate the effect of seasonal fluctuations in the groundwater table and in the temperature on the contaminate concentrations.

TABLE OF CONTENTS

Section **Page No.**

Executive Summary **E-1**
List Of Acronyms ..... **ii**
1.0 Introduction **1**
2.0 Monitoring Well Sampling **2**
2.1 Schedule of Sampling 2
2.2 Analytical Results 2
2.3 Discussion of Analytical Results 8
2.3.1 Benzene 8
2.3.2 Ethylbenzene 8
2.3.3 Toluene 8
2.3.4 Naphthalene 8
2.3.5 MTBE 9
2.3.6 Benzo(a)anthracene 9
2.3.7 Total Lead 9
2.4 Groundwater Issues 9
2.4.1 Groundwater Flow 9
2.4.2 Plume Migration 9
3.0 Routine Maintenance and Inspections **12**
4.0 References **15**

TABLES

Table 1 Laboratory Analytical Results 3
Table 2 Groundwater Elevations 7

APPENDICES

Appendix A Figures
Appendix B Analytical Data
Appendix C Graphs
Appendix D Checklists

LIST OF ACRONYMS

BTEX	Benzene, toluene, ethylbenzene, xylenes
CAP	Corrective Action Plan
COC	Contaminant of Concern
DOCR	Delivery Order Completion Report
IEPA	Illinois Environmental Protection Agency
mg/L	Milligrams per liter
MDLs	Method Detection Limits
MTBE	Methyl tertiary butyl ether
MW	Monitoring Well
GRO	Groundwater Remediation Objective
SPLP	Synthetic Precipitation Leaching Procedure
UST	Underground Storage Tank
U.S. EPA	United States Environmental Protection Agency

1.0 INTRODUCTION

This Quarterly Monitoring Report documents the operation of the biosparge remediation system at Building 1600A, Naval Station Great Lakes, Great Lakes, Illinois. This work was performed pursuant to the *Corrective Action Plan* (CAP) [TolTest, 2000a], *CAP Supplement* [TolTest, 2000b], and the *Work Plan and Site Health & Safety Plan,* [TolTest, 2001a]. This report discusses the following: sampling event on July 2, 2004; summary of previous sampling events; and a summary of the maintenance work performed on the biosparge system. Additional information about the site can be found in the *Delivery Order Completion Report* (DOCR) [TolTest, 2000].

Building 1600A was utilized as a fueling station and motor pool until 1997. The underground storage tanks (USTs) located beneath the site, which contained gasoline and diesel fuel, were removed in 1997. Leakage from these USTs caused contamination of the groundwater and subsurface soils. Heritage Environmental Services (HES) removed a portion of the contaminated soil in 1998, but due to the physical characteristics of the site, not all of the contaminated soil could be excavated. HES also advanced 35 soil borings at the site and determined that the plume of contamination in the soil was larger than the plume of contamination in the groundwater.

TolTest subsequently advanced 11 soil borings and installed 6 monitoring wells in 1999. TolTest installed three additional monitoring wells and a biosparge remediation system in 2001. This system consists of two directionally drilled horizontal wells situated approximately 10 feet below ground surface (approximately five feet below the water table). Optimization of the biosparge system was completed in September 2001. For reporting purposes, the first quarter of operation ended on December 31, 2001. The sampling event of August 2001 essentially provides baseline data prior to operation of the biosparge system.

The biosparge system is designed to remediate soils and groundwater to acceptable cleanup goals by injecting air into the subsurface. Injecting air into the groundwater at low rates can dramatically increase biological activity associated with the natural attenuation of organic compounds. This process, known as biosparging, is more efficient and more economical for treatment of subsurface contamination than soil vapor extraction or conventional air sparging technologies. A more complete description of the project can be found in the CAP, Work Plan, and DOCR. Operation and maintenance of the biosparge system is detailed in the *Operations and Maintenance Plan* [TolTest, 2002].

Figure 1 in **Appendix A** depicts the site with significant features including locations of the monitoring wells, both horizontal biosparge wells, and equipment sheds.

2.0 MONITORING WELL SAMPLING

2.1 Schedule of Sampling

During the Second Quarter of 2004, TolTest collected groundwater samples from the nine groundwater monitoring wells (MW-1 through MW-9) at Building 1600A on July 2, 2004. The groundwater samples were submitted to Severn Trent Laboratories in University Park, Illinois for analyses. The analytical results are provided in **Appendix B**.

Groundwater collected for laboratory analysis from each of the nine monitoring wells was analyzed for the following parameters:

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tertiary-butyl ether (MTBE) by United States Environmental Protection Agency (U.S. EPA) Method 8260B.
- Poly-nuclear aromatic (PNA) compounds by U.S. EPA Method 8270C.

The Illinois Environmental Protection Agency (IEPA) approved a sampling plan that was designed to determine the lead content in the monitoring wells closest to the source of contamination (monitoring wells MW-1, MW-2, MW-3, and MW-9). This analysis includes performing total lead using U.S. EPA Method 6010B on samples collected from MW-1, MW-2, MW-3, and MW-9. Analysis for Synthetic Precipitation Leaching Procedure (SPLP) lead was performed on the sample collected from MW-3 since this was the only sample near the source of contamination where sediment was observed during sample collection.

2.2 Analytical Results

The analytical results were compared to the IEPA Tiered Approach to Corrective Action Objectives Tier I Groundwater Remediation Objectives (GROs), Class I, which is the most stringent. Three PNA compounds [benzo(a)anthracene, benzo(b)fluoranthene, and chrysene], which have not been detected during previous sampling events, were detected in MW-1 during the current sampling event. Benzo(a)anthracene exceeded its GRO. The current analytical results indicate that total lead concentrations exceeded the GRO in samples collected from MW-1 and MW-3. However, the SPLP lead concentration in MW-3 was below the method detection limit (MDL). During the previous sampling event, the total lead concentration in MW-1 exceeded the GRO but was below the laboratory MDL in the sample collected from MW-3. Benzene, ethylbenzene, xylenes, and naphthalene constituents continue to be detected in MW-2 and MW-4, and MTBE continues to be detected in MW-5 and MW-8 at concentrations exceeding the laboratory MDLs. Out of these five constituents, ethylbenzene and naphthalene in MW-2 exceed their respective GROs. **Table 1** on the following pages summarizes the laboratory analytical results from the sampling events.

For visualization of general trends, **Appendix C** contains graphs of benzene, ethylbenzene, and naphthalene in MW-2 and MW-4 compared with their respective GROs (the value of 0.001 was used for non-detect). The analytical data from August 2001 through July 2004 indicates the concentrations of the contaminants of concern (COC) is generally trending in a downward direction. Comparing the current sampling event to the previous sampling event, there was an

increase in the ethylbenzene concentration and a slight increase in the naphthalene concentration in samples collected from MW-2. During the current sampling event, benzo(a)anthracene in MW-1 was not graphed because data from more than one quarter is necessary to establish a trend.

Table 1. Laboratory Analytical Results

Well Number	Date	Benzene	Ethylbenzene	MTBE	Toluene	Xylenes	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Total Lead	SPLP Lead
MW-1	08/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	11/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	02/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0021	NA
	06/02	ND	ND	ND	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	10/02	ND	ND	ND	ND	ND	ND	ND	ND	0.10	ND	ND	ND	ND	ND	ND	ND	ND	0.0149	NA
	01/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	03/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0046	NA
	06/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	09/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	12/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	03/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.082	ND
	07/04	ND	ND	ND	ND	ND	0.00012	ND	ND	ND	ND	ND	ND	0.00014	0.00017	0.00012	ND	ND	0.019	NA
MW-2	08/01	1.41	0.375	ND	2.38	1.7	0.0017	0.024	ND	ND	ND	0.038	ND	ND	ND	ND	ND	ND	NA	NA
	11/01	0.0716	0.691	0.112	0.435	1.2	ND	ND	ND	ND	0.101	ND	ND	ND	ND	ND	ND	ND	ND	NA
	02/02	0.076	0.720	0.110	0.230	1.200	0.020	0.062	ND	0.001	0.098	ND	ND	ND	ND	ND	ND	ND	ND	NA
	06/02	0.048	0.900	ND	0.240	1.600	0.025	ND	0.0002	0.03	0.048	0.0023	ND	ND	ND	ND	ND	ND	0.002	NA
	10/02	0.0227	0.679	ND	0.0728	0.842	ND	ND	ND	ND	0.0721	ND	ND	ND	ND	ND	ND	ND	ND	NA
	01/03	0.0174	0.898	ND	0.109	1.221	ND	ND	ND	ND	0.0926	ND	ND	ND	ND	ND	ND	ND	ND	NA
	03/03	ND	0.33	ND	0.057	0.8	ND	ND	ND	ND	0.065	ND	ND	ND	ND	ND	ND	ND	0.0037	NA
	06/03	0.0065	0.693	ND	0.0106	0.323	ND	ND	ND	ND	0.062	ND	ND	ND	ND	ND	ND	ND	ND	NA
	09/03	0.0033	0.492	ND	ND	0.272	ND	ND	ND	ND	0.0309	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/03	0.00103	0.495	ND	0.00172	0.30654	ND	ND	ND	ND	0.0299	ND	ND	ND	ND	ND	ND	ND	ND	ND
	03/04	ND	0.450	ND	ND	0.530	ND	ND	ND	ND	0.024	ND	ND	ND	ND	ND	ND	ND	0.022	ND
	07/04	ND	0.860	ND	ND	0.660	ND	ND	ND	ND	0.030	ND	ND	ND	ND	ND	ND	ND	ND	NA
MW-3	08/01	0.0016	0.0019	0.0324	0.0067	0.0088	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	11/01	ND	0.00438	0.0906	ND	ND	ND	ND	ND	ND	0.00096	ND	ND	ND	ND	ND	ND	ND	ND	NA
	02/02	ND	0.044	0.045	ND	0.0076	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	06/02	ND	ND	0.004	ND	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.003	NA
	10/02	ND	ND	0.00814	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00727	NA
	01/03	ND	0.00484	0.00743	ND	0.00605	ND	ND	ND	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	NA
	03/03	ND	ND	0.0082	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0032	NA
	06/03	ND	0.0034	0.0011	ND	0.0025 J	ND	ND	ND	ND	0.0005	ND	ND	ND	ND	ND	ND	ND	ND	NA
	09/03	ND	ND	0.00708	ND	ND	ND	ND	ND	ND	0.00024J	ND	ND	ND	ND	ND	ND	ND	0.00947	NA
	12/03	ND	ND	0.00162	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	03/04	ND	ND	0.0017	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.035	ND
	07/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.051	ND

Well Number	Date	Benzene	Ethylbenzene	MTBE	Toluene	Xylenes	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Total Lead	SPLP Lead
MW-4	08/01	0.156	0.648	ND	0.122	1.03	0.00033	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	NA	NA
	11/01	0.123	0.762	ND	0.0939	1.4	ND	ND	ND	ND	0.0235	ND	ND	ND	ND	ND	ND	ND	NA	NA
	02/02	0.082	0.900	0.018	0.067	0.990	ND	0.0085	ND	ND	0.022	ND	ND	ND	ND	ND	ND	ND	NA	NA
	06/02	0.028	0.380	ND	0.036	0.530	ND	0.0032	ND	ND	0.0054	ND	ND	ND	ND	ND	ND	ND	NA	NA
	10/02	0.0296	0.631	ND	0.032	0.4082	ND	ND	ND	ND	0.0137	ND	ND	ND	ND	ND	ND	ND	NA	NA
	01/03	0.0635	0.604	ND	0.0588	0.8639	ND	ND	ND	ND	0.0181	ND	ND	ND	ND	ND	ND	ND	NA	NA
	03/03	0.0073	0.13	ND	0.0085	0.175	ND	ND	ND	ND	0.002	ND	ND	ND	ND	ND	ND	ND	NA	NA
	06/03	0.029	0.403	0.0006 J	0.0203	0.3478	ND	ND	ND	ND	0.0117	ND	ND	ND	ND	ND	ND	ND	NA	NA
	09/03	0.0137	0.410	ND	0.0119	0.3543J	ND	ND	ND	ND	0.00792	ND	ND	ND	ND	ND	ND	ND	0.0035	NA
	12/03	0.00573	0.302	ND	0.00364	0.1708	ND	ND	ND	ND	0.00923	ND	ND	ND	ND	ND	ND	ND	NA	NA
	03/04	0.0025	0.082	ND	0.00048	0.044	ND	ND	ND	ND	0.0011	ND	ND	ND	ND	ND	ND	ND	ND	ND
	07/04	0.0019	0.045	ND	ND	0.024	ND	ND	ND	ND	0.0012	ND	ND	ND	ND	ND	ND	ND	NA	NA
MW-5	08/01	0.0117	0.102	ND	0.036	0.273	0.0002	ND	ND	0.00031	0.00027	0.00013	ND	ND	ND	ND	ND	ND	NA	NA
	11/01	ND	ND	0.0166	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	02/02	ND	0.0035	0.0046	ND	0.0063	ND	ND	ND	ND	0.0012	ND	ND	ND	ND	ND	ND	ND	NA	NA
	06/02	ND	ND	ND	ND	0.001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	10/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	01/03	ND	ND	0.00053	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	03/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	06/03	ND	0.0028	0.0009	ND	0.003	ND	ND	ND	ND	0.0002 J	ND	ND	ND	ND	ND	ND	ND	NA	NA
	09/03	ND	ND	0.000980	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0054	NA
	12/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	03/04	ND	ND	0.00053	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	07/04	ND	ND	0.00053	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
MW-6	08/01	ND	ND	ND	0.0017	ND	ND	ND	ND	ND	0.00036	0.00012	ND	ND	ND	ND	ND	ND	NA	NA
	11/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00036	ND	ND	ND	ND	ND	ND	ND	NA	NA
	02/02	ND	0.0015	ND	ND	0.0028	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	06/02	ND	ND	0.003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	10/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	01/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	03/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	06/03	ND	0.0018	ND	ND	0.0018 J	0.0002 J	ND	ND	ND	0.0003J	ND	ND	ND	ND	ND	ND	ND	NA	NA
	09/03	ND	ND	ND	0.00056J	ND	0.00025J	ND	ND	ND	0.00028J	ND	ND	ND	ND	ND	ND	ND	ND	NA
	12/03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	NS	NS
	03/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	07/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA

Well Number	Date	Benzene	Ethylbenzene	MTBE	Toluene	Xylenes	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Total Lead	SPLP Lead
MW-7	08/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00011	ND	ND	ND	ND	ND	ND	NA	NA
	11/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00054	ND	ND	ND	ND	ND	ND	ND	NA	NA
	02/02	ND	0.0012	ND	ND	0.0022	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	06/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	10/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND						NA	NA
	1/03	ND	0.00164	ND	ND	0.0025	ND	ND	ND	ND	0.00012	ND	ND	ND	ND	ND	ND	ND	NA	NA
	03/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	06/03	ND	0.0009 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	09/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0038 J	NA
	12/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	03/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	07/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
MW-8	08/01	0.109	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	11/01	0.139	0.0035	0.00598	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	02/02	0.0058	0.0014	0.0030	ND	0.0023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	06/02	ND	ND	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	10/02	ND	ND	0.00184	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	01/03	ND	ND	0.00199	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	03/03	ND	ND	0.0013	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	06/03	ND	0.0016	0.0013	ND	0.0012 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	09/03	ND	ND	0.00142	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0037J	NA
	12/03	ND	ND	0.00144	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA
	03/04	ND	ND	0.00075	ND	ND	ND	ND	ND	ND	ND	ND	0.00037	ND	ND	ND	ND	ND	ND	ND
	07/04	ND	ND	0.00096	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA

Well Number	Date	Benzene	Ethylbenzene	MTBE	Toluene	Xylenes	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Total Lead	SPLP Lead
MW-9	08/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.018	0.018
	11/01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	02/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	06/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.001**	NA
	10/02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	01/03	ND	**0.00146**	ND	ND	**0.0002**	ND	ND	ND	ND	ND	**0.00011**	ND	ND	ND	ND	ND	ND	ND	NA
	03/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	06/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
	09/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	03/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	07/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
Remediation Objective		0.005	0.7	0.07	1.0	10	0.42	NR	2.1	0.28	0.025	NR	0.21	0.00013	0.0015	0.00018	0.00017	0.0002	0.0075	0.0075

Notes:
1. Concentrations are reported in milligrams per liter (mg/L)
2. NA – Not Analyzed
3. ND – Not Detected at Reporting Limit
4. NS - Not Sampled
5. NR – No established Remediation Objective
6. Shaded – Exceed Remediation Objective
7. Bold value exceeds MDLs
8. J – as estimated value

2.3 Discussion of Analytical Results

During the past 11 quarterly sampling events, four volatile organic compounds (benzene, ethylbenzene, toluene, and MTBE), one PNA compound (naphthalene), and one inorganic compound (lead) have been detected above GROs. Therefore, these analytes were chosen as the COCs. Because toluene and MTBE have not been detected at concentrations exceeding the GROs during the past several quarters, these constituents are no longer considered COCs. However, they will continue to be monitored. For the first time since quarterly sampling began in the year 2001, three new PNA compounds [benzo(a)anthracene, benzo(b)fluoranthene and chrysene] were detected above their MDLs in MW-1. Benzo(a)anthracene exceeds its GRO and has been included as a COC. The contaminants are discussed individually below.

2.3.1 Benzene

During the current sampling event, benzene was detected in MW-4 at concentrations above the MDL but below the GRO, which is the same as the results from the previous quarter. In addition, benzene was below MDLs in the remaining monitoring wells. To confirm the downward trend below the GRO, the concentration of benzene will remain a contaminant of concern during subsequent sampling events.

2.3.2 Ethylbenzene

Ethylbenzene was detected above the laboratory MDL in the samples collected from MW-2 and MW-4. The concentration of ethylbenzene in the sample collected from MW-2 exceeded the GRO but did not exceed the GRO in the sample collected from MW-4. Until the current sampling event, the ethylbenzene concentrations in MW-2 had been below its MDL for at least the past five sampling events. Ethylbenzene continues to be below the laboratory MDL in the samples collected from the remaining seven wells. Since sampling began, ethylbenzene has only been detected at concentrations above its GRO in MW-2 and MW-4. Ethylbenzene will be monitored as a COC.

2.3.3 Toluene

Toluene has been detected in MW-2 and MW-4 in the previous sampling events, but at concentrations that are well below the GRO. During the current sampling event, toluene was not detected at concentrations exceeding the MDLs in samples collected from any of the monitoring wells. The data indicates that toluene is no longer a contaminant of concern in any of the monitoring wells on site but will continue to be monitored.

2.3.4 Naphthalene

Naphthalene was detected at concentrations exceeding its MDLs in the samples collected from MW-2 and MW-4 but did not exceed laboratory MDLs in samples collected from the remaining samples. During the previous sampling event, the naphthalene concentration in the sample collected from MW-2 did not exceed the GRO for the first time since the previous nine sampling events. However, during the current sampling event, naphthalene exceeded its GRO in MW-2.

Naphthalene remains a constituent of concern in MW-2. The concentration of naphthalene in MW-4 was below its GRO for the tenth consecutive sampling event and no longer appears to be a contaminant of concern in MW-4. Naphthalene will continue to be monitored.

2.3.5 MTBE

As seen in the previous sampling event, MTBE concentrations in MW-5 and MW-8 exceed the laboratory MDL but is below the GRO. The concentrations of MTBE in samples collected from the remaining wells were below detection limits. MTBE is not a contaminant of concern but will continue to be monitored.

2.3.6 Benzo(a)anthracene

Benzo(a)anthracene was detected above its MDL for the first time in the sample collected from MW-1. This concentration of benzo(a)anthracene slightly exceeded its GRO. Benzo(a)anthracene will be monitored as a contaminant of concern .

2.3.7 Total Lead

In MW-1 and MW-3, total lead was detected at concentrations, which exceed its GRO. Total lead was not detected above the laboratory MDLs in MW-2 and MW-9. During the previous sampling event, total lead concentrations which exceed the GROs were detected in MW-1 and MW-3 but SPLP lead samples were not detected at concentrations exceeding the laboratory MDL. The sample collected from MW-3 during the current sampling event was analyzed for SPLP lead; the findings were below the MDL. This suggests that the elevated total lead concentrations are not leaching into the groundwater when exposed to normal rainfall and weathering and is a more realistic characterization of the lead levels in the groundwater. The elevated total lead levels may be an effect of soil and groundwater interactions and seasonal fluctuations in the groundwater table. The lead levels will continue to be monitored.

2.4 Groundwater Issues

2.4.1 Groundwater Flow

As illustrated on the Water Table Contour Map, **Figure 2** in **Appendix A**, the groundwater flow continues to be to the southeast. This southeasterly flow has been observed since the installation of the biosparge system. The hydraulic gradient calculation for this quarter is 2.4 feet per 120 feet. **Table 2** summarizes the groundwater elevations to the National Geodetic Vertical Datum of 1929. A visual representation of the data presented in Table 2 is provided in the Monitoring Well Hydrograph in **Appendix C**.

2.4.2 Plume Migration

Based on the analytical data, the plume is localized in the vicinity of MW-1 and MW-2. The analytical results suggest that remediation of the contaminant plume requires continuation. The slightly elevated benzo(a)anthracene concentration in MW-1 and the elevated ethylbenzene and

naphthalene concentrations in MW-2 all exceed their respective GROs. The elevated total lead concentrations in MW-1 and MW-3 can be attributed to sediment in the groundwater samples and seasonal fluctuations in the groundwater table. As previously stated, the groundwater flow direction continues to be toward the southeast. The groundwater elevation data suggests that there are seasonal fluctuations in the groundwater table, which affect the hydraulic gradient.

TolTest recommends that quarterly sampling continue for the remainder of 2004 to evaluate the affect of seasonal fluctuations in the groundwater table and in the temperature on the contaminate concentrations and plume migration.

Table 2. Groundwater Elevations (National Geodetic Vertical Datum), feet)

Well No.	8/23/01	11/29/01	2/25/02	6/12/02	10/10/02	1/3/03	3/25/03	6/26/03	9/25/03	12/15/03 - 12/17/03	3/10/04 - 3/11/04	7/2/04
MW-1	658.93	658.90	659.30	660.16	659.35	658.42	658.86	659.31	658.10	660.17	660.53	659.6
MW-2	657.58	657.70	657.98	659.24	658.13	656.81	657.28	658.36	656..29	658.49	658.60	658.9
MW-3	657.29	657.05	656.98	658.01	657.10	656.10	657.05	656.92	655.77	657.44	657.08	657.51
MW-4	656.98	655.83	656.27	657.13	656.01	655.30	656.11	658.32	655.16	655.97	656.39	656.03
MW-5	656.62	655.59	656.34	656.54	655.84	652.43	655.12	653.02	654..51	652..92	656.66	655.11
MW-6	656.31	655.88	656.28	656.39	656.03	655.18	655.83	655.9	655..53	NS	655.34	655.87
MW-7	656.95	656.31	656.69	657.39	656.89	655.76	656.49	656.99	655..32	656.10	657.11	655.92
MW-8	657.14	655.21	655.24	655.71	655.12	654.91	655.43	655.33	654.75	655.21	655.45	655.19
MW-9	657.81	657.87	657.94	658.61	658.29	656.88	658.26	658.2	656.33	658.87	656.45	659.12

Note:
1. NS indicates not sampled. Therefore, static groundwater levels were not taken

3.0 ROUTINE MAINTENANCE AND INSPECTIONS

The biosparge system operation instructions and maintenance schedules are detailed in the Operation & Maintenance Plan. Functional Performance Checklists and Weekly Checklists associated with system monitoring are supplied in **Appendix D**. Regular maintenance on the system from July 2003 through June 2004 was completed as follows:

- July 3, 2003
  Performed a systems check on both units.
  South unit shut off due to high temperature.
  Changed oil and grease on both units.
  Restarted South unit.
- July 10, 2003
  Performed a systems check on both units.
  Replaced air filter on South unit.
- July 18, 2003
  Performed a systems check on both units.
  Greased bearings on both units.
  Reset North shed blower and re-started.
- July 25, 2003
  Performed a systems check on both units.
  Reset system on North unit.
  Changed oil and grease on both units.
- August 1,2003
  Performed a systems check on both units.
- August 8,2003
  Performed a systems check on both units.
  Changed oil and grease on both units.
  Re-adjusted flow to a lower temperature inside shed.
- August 14, 2003
  Performed a systems check on both units.
- August 22, 2003
  Performed a systems check on both units.
  Reset temperature alarm on the heat exchange for the south shed.
  Changed oil and grease on both units.
- September 12, 2003
  Performed a systems check on both units.
  Replaced air filters on both units.
  Changed oil and grease on both units.
  Restarted South unit.

- September 19, 2003
  Performed a systems check on both units.
- September 26, 2003
  Performed a systems check on both units.
  Changed oil and grease on both units.
- October 2, 2003
  Performed a systems check on both units.
- October 10, 2003
  Performed a systems check on both units.
  Changed oil and grease on both units
- October 24, 2003
  Performed a systems check on both units.
  Changed oil and grease on both units.
- November 17, 2003
  Performed a systems check on both units.
- December 5, 2003
  Performed a systems check on both units.
  Replaced air filters on both units.
  Changed oil and grease on both units.
- December 18, 2003
  Performed a systems check on both units.
  Replaced air filters on both units.
  Changed oil and grease on both units.
- January 6, 2004
  Performed systems check on both units.
  Heat exchanger high temperature alarm not operating on north unit.
  Reset alarm and started system on north unit.
  Greased blower borings on both units.
- February 2, 2004,
  Performed systems check on both units.
  Replaced air filters on both units.
  Changed oil and grease on both units.
- February 12, 2004
  Performed systems check on both units.
  Replaced air filters on both units.

- February 26, 2004
  Perform systems check on both units.
  Change oil and air filters on both units.
  Grease bearings on both units.
  Restart system.
- March 7, 2004
  Performed a systems check on both units.
  Replaced air filters on both units.
  Changed oil and grease on both units.
- March 10, 2004
  Performed a systems check on both units.
  Replaced air filters on both units.
- March 14, 2004
  Performed a systems check on both units.
- April 22, 2004
  Both north and south shed/blower units were not operating.
  North shed indicated "spare blower TAH".
  South shed indicated "heat exchanger TAH".
  Change oil and grease on both units.
  Restarted both systems.
- April 29, 2004
  Performed a systems check on both units.
  Reset airflow.
- May 13, 2004
  Performed system check on both units.
  Reset north unit system.
  Changed oil on both units.
- June 2, 2004
  Performed system check on both units.
  Replaced air filter on both units.
- June 11, 2004
  Both units are not operating.
  Changed oil, air filters and greased both units.
  Restarted system.
- June 22, 2004
  Performed systems check on both units.
  Replaced air filter on both units.
  Changed oil and lubed both units
  Reset/adjusted air flow on north unit.

4.0 REFERENCES

TolTest 2000a. *Corrective Action Plan*, Building 1600A, Great Lakes, Illinois. February 2000.

TolTest 2000b. *Corrective Action Plan Supplement*, Building 1600A, Great Lakes, Illinois. August 2000.

TolTest 2001a. *Work Plan and Site Health & Safety Plan*, Building 1600A, Great Lakes, Illinois. March 2001.

TolTest 2001b. *Delivery Order Completion Report, System Start-Up Report*, Building 1600A, Great Lakes, Illinois. September 2001.

TolTest 2002. *Operation and Maintenance Plan, Biosparge Remediation System*, Building 1600A, Naval Training Center, Great Lakes, Illinois. December 2002.

APPENDIX A

FIGURES

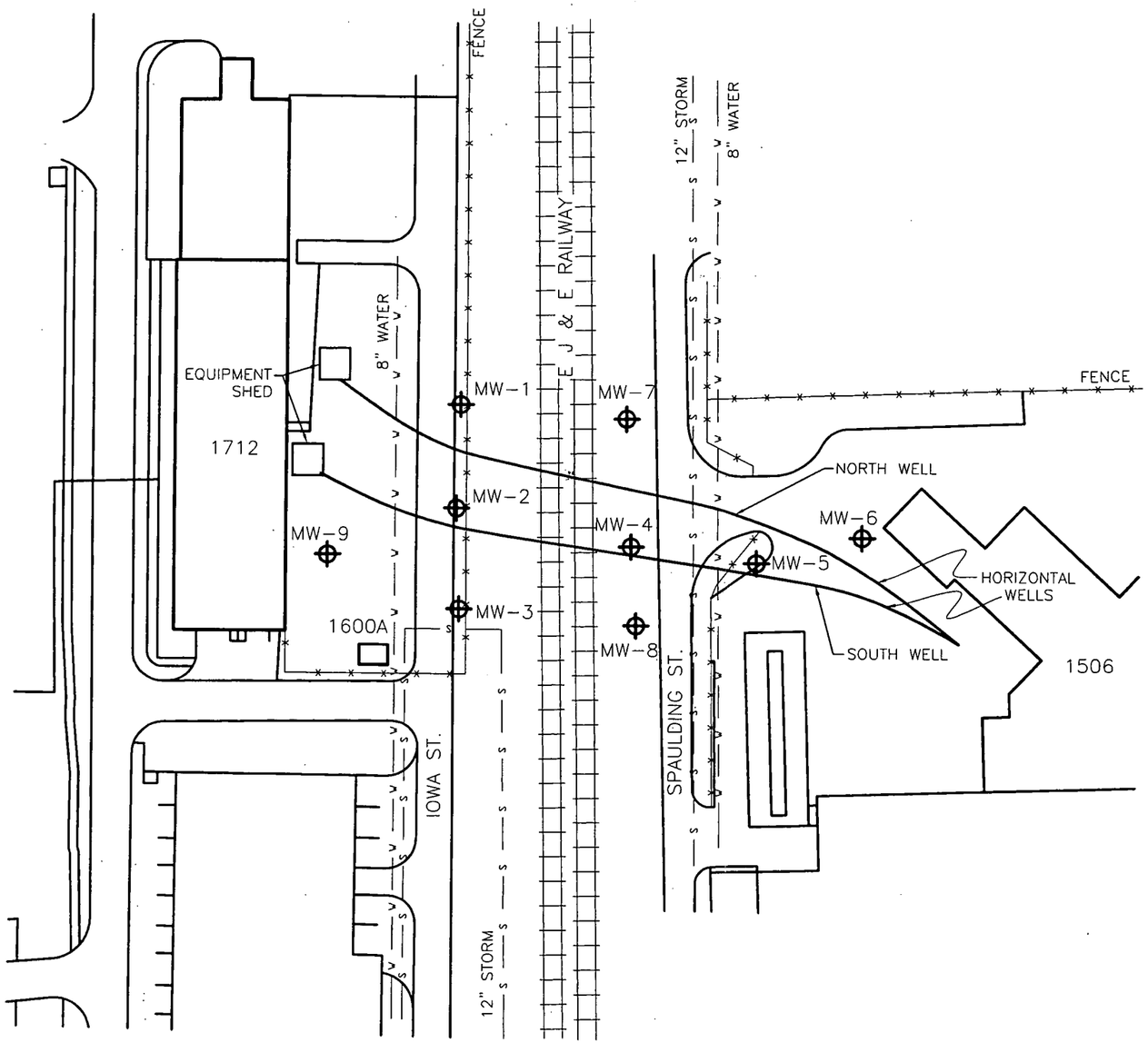
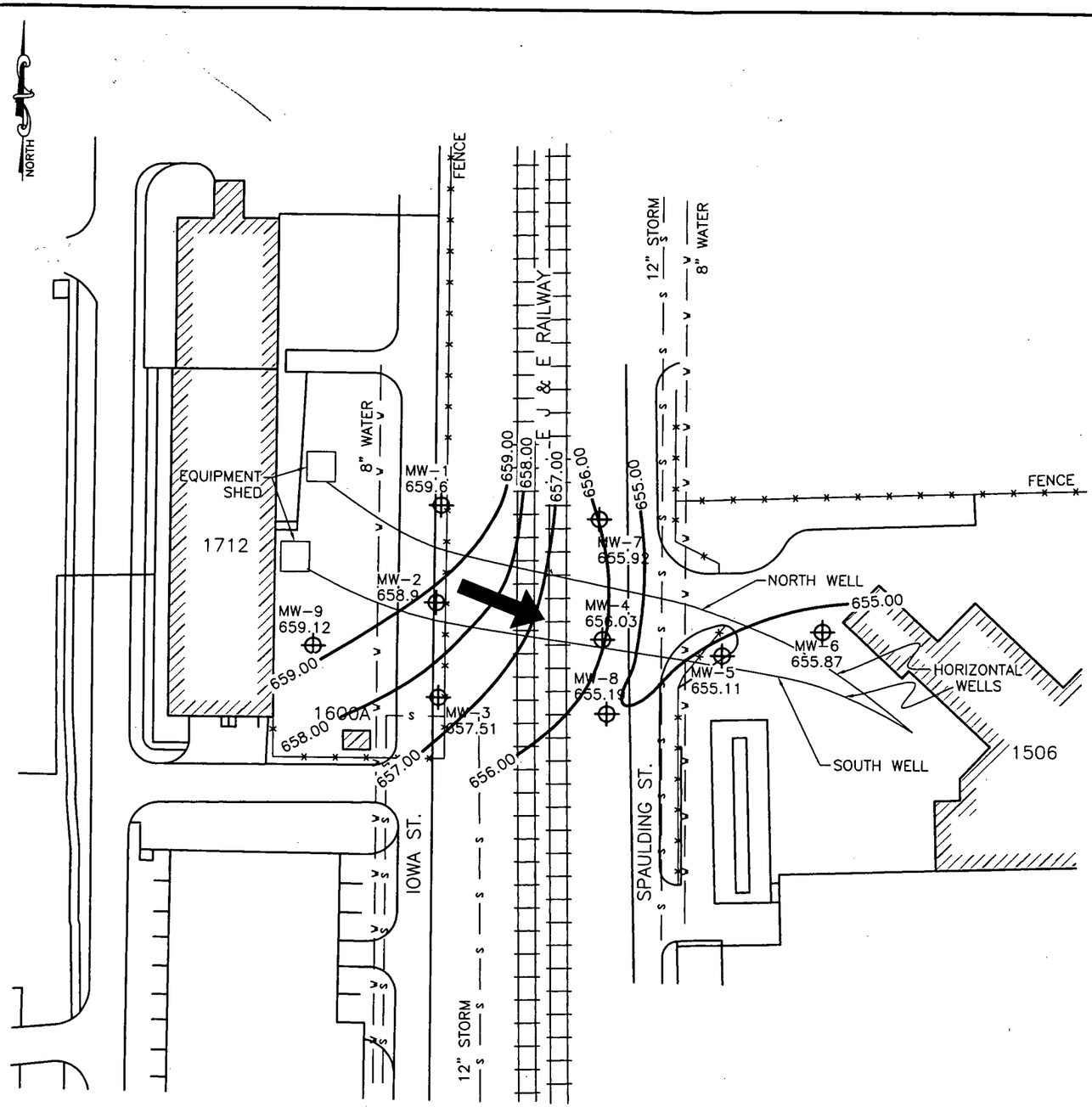


FIGURE 1
SITE MAP
BUILDING 1600A
GREAT LAKES NAVAL TRAINING CENTER, ILLINOIS

PREPARED FOR
UNITED STATES NAVY
GREAT LAKES NAVAL TRAINING CENTER

DRAWN MRC\5-25-00	CHECKED
REVISED	APPROVED
JOB NO.: 41791.01	TOLTEST, INC.
DRAWING NUMBER 377556A	



MW-1 – MONITORING WELL

656.0 – WATER TABLE CONTOUR LINE (DASHED WHERE INFERRED)

– GROUNDWATER FLOW DIRECTION

CONTOUR INTERVAL 0.5 FEET
NATIONAL GEODETIC VERTICAL
DATUM OF 1929

APPROXIMATE SCALE – FEET

0 80 160

FIGURE 2.0
WATER TABLE CONTOUR MAP
JULY 2, 2004
BIOSPARGE REMEDIATION SYSTEM, BUILDING 1600A
2nd QUARTER 2004 QUARTERLY REPORT
NAVAL STATION GREAT LAKES, ILLINOIS

PREPARED FOR
DEPARTMENT OF THE NAVY
NAVAL STATION GREAT LAKES

DRAWN MRC/7-27-04	CHECKED
REVISED	APPROVED
JOB NO.: 41791.01	TOLTEST, INC.
DRAWING NUMBER 4179101-13F	

APPENDIX B

ANALYTICAL DATA

SEVERN TRENT STL

STL Chicago
2417 Bond Street
University Park, IL 60466

Tel: 708 534 5200 Fax: 708 534 5211
www.stl-inc.com

July 28, 2004

Ms. Lynn Smith
TolTest, Inc.
1000 Northpoint Blvd.
Waukegan, IL 60085

RE: Navy Projects
Job# 228229

Dear Ms. Smith:

Enclosed is a revised report for the project and job number listed above. Per your request, samples one and two have been re-run and re-reported. If you have any questions, please contact me at 708-534-5200.

Sincerely,

Severn Trent Laboratories

Nancy S. McDonald

Nancy S. McDonald
Project Manager

pmb

Enclosure

The results presented in this report relate only to the analytical testing and conditions of sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

SEVERN TRENT STL

STL Chicago
2417 Bond Street
University Park, IL 60466

Tel: 708 534 5200 Fax: 708 534 5211
www.stl-inc.com

SEVERN TRENT LABORATORIES ANALYTICAL REPORT

JOB NUMBER: 228229

Prepared For:

TolTest, Inc.
1000 Northpoint Blvd.
Waukegan, IL 60085

Project: Navy Projects

Attention: Lynn Smith

Date: 07/28/2004

Nancy S. McDonald
Signature

7/28/04
Date

Name: Nancy S. McDonald

Title: Project Manager

E-Mail: nmcdonald@stl-inc.com

STL Chicago
2417 Bond Street
University Park, IL 60466

PHONE: (708) 534-5200
FAX..: (708) 534-5211

This Report Contains (36) Pages

Severn Trent Laboratories Chicago
GC/MS Case Narrative

TolTest, Inc.
Navy Projects
Job Number: 228229
VOA DATA:

1. The sample preparation and analyses were performed within the recommended hold times from the date of collection.

2. All Method Blank target compounds were below reporting limits.

3. All of the spike recoveries and RPD values for the controlled compounds were within the in-house generated QC limits in the LCS/LCD samples.

4. Matrix Spike/Matrix Spike Duplicate analyses were not performed on this sample set.

5. All surrogate recoveries were within in-house QC limits.

6. The water samples were prepared using Method 5030 and analyzed following SW846 Method 8260B/8000B. All calibration criteria are met per method or SOP (for minimum R values for certain compounds). The low point in the initial calibration verifies the base reporting limits. The target compounds were quantitated using the initial calibration.

7. All internal standard areas and retention times were within SOP acceptance limits as compared to the corresponding calibration verification standard.

8. The water samples were analyzed using a 25mL purge volume. An initial dilution was required on sample 2 for sample matrix. Secondary dilutions were required on samples 2 and 4 for target compounds. The results and reporting limits were adjusted to account for the dilutions performed.

Jennifer S. O'Gorman
Jennifer S. O'Gorman
GC/MS Dept.

7-19-4
Date

STL Chicago is part of Severn Trent Laboratories, Inc.

SAMPLE INFORMATION
Date: 07/28/2004

Job Number.: 228229
Customer...: TolTest, Inc.
Attn.....: Lynn Smith

Project Number.....: 20001959
Customer Project ID....: BLDG 1600A
Project Description....: Navy Projects

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
228229-1	MW-1	Water	07/02/2004	10:00	07/06/2004	11:00
228229-2	MW-2	Water	07/02/2004	10:45	07/06/2004	11:00
228229-3	MW-3	Water	07/02/2004	11:25	07/06/2004	11:00
228229-4	MW-4	Water	07/02/2004	14:20	07/06/2004	11:00
228229-5	MW-5	Water	07/02/2004	12:50	07/06/2004	11:00
228229-6	MW-6	Water	07/02/2004	12:15	07/06/2004	11:00
228229-7	MW-7	Water	07/02/2004	13:35	07/06/2004	11:00
228229-8	MW-8	Water	07/02/2004	15:05	07/06/2004	11:00
228229-9	MW-9	Water	07/02/2004	09:15	07/06/2004	11:00
228229-10	MW-10	Water	07/02/2004	16:00	07/06/2004	11:00

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 228229

Date:07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Customer Sample ID: MW-1
Date Sampled.....: 07/02/2004
Time Sampled.....: 10:00
Sample Matrix.....: Water

Laboratory Sample ID: 228229-1
Date Received.....: 07/06/2004
Time Received.....: 11:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
6010B	Metals Analysis (ICAP Trace)											
	Lead	0.019			0.0029	0.0050	1	mg/L	122844		07/08/04 1738	lmr
8260B	Volatile Organics											
	Methyl-tert-butyl-ether (MTBE)	ND	U		0.14	1.0	1.00000	ug/L	123276		07/13/04 1210	jso
	Benzene	ND	U		0.090	1.0	1.00000	ug/L	123276		07/13/04 1210	jso
	Toluene	ND	U		0.10	1.0	1.00000	ug/L	123276		07/13/04 1210	jso
	Ethylbenzene	ND	U		0.070	1.0	1.00000	ug/L	123276		07/13/04 1210	jso
	Xylenes (total)	ND	U		0.28	1.0	1.00000	ug/L	123276		07/13/04 1210	jso
8270C	Semivolatile Organics											
	Naphthalene, Low Level Water	ND	U		0.16	0.99	1.00000	ug/L	123423		07/27/04 1804	glr
	Acenaphthylene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/27/04 1804	glr
	Acenaphthene, Low Level Water	0.12	J		0.12	0.99	1.00000	ug/L	123423		07/27/04 1804	glr
	Fluorene, Low Level Water	ND	U		0.13	0.99	1.00000	ug/L	123423		07/27/04 1804	glr
	Phenanthrene, Low Level Water	ND	U		0.14	0.99	1.00000	ug/L	123423		07/27/04 1804	glr
	Anthracene, Low Level Water	ND	U		0.15	0.99	1.00000	ug/L	123423		07/27/04 1804	glr
	Fluoranthene, Low Level Water	ND	U		0.14	0.99	1.00000	ug/L	123423		07/27/04 1804	glr
	Pyrene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/27/04 1804	glr
	Benzo(a)anthracene, Low Level Water	0.14		H	0.049	0.13	1.00000	ug/L	123423		07/27/04 1804	glr
	Chrysene, Low Level Water	0.17	J		0.045	0.50	1.00000	ug/L	123423		07/27/04 1804	glr
	Benzo(b)fluoranthene, Low Level Water	0.12	J	H	0.066	0.18	1.00000	ug/L	123423		07/27/04 1804	glr
	Benzo(k)fluoranthene, Low Level Water	ND	U		0.071	0.17	1.00000	ug/L	123423		07/27/04 1804	glr
	Benzo(a)pyrene, Low Level Water	ND	U		0.083	0.20	1.00000	ug/L	123423		07/27/04 1804	glr
	Indeno(1,2,3-cd)pyrene, Low Level Water	ND	U		0.085	0.20	1.00000	ug/L	123423		07/27/04 1804	glr
	Dibenzo(a,h)anthracene, Low Level Water	ND	U		0.13	0.20	1.00000	ug/L	123423		07/27/04 1804	glr
	Benzo(ghi)perylene, Low Level Water	ND	U		0.19	0.99	1.00000	ug/L	123423		07/27/04 1804	glr

* In Description = Dry Wgt.

STL Chicago is part of Severn Trent Laboratories, Inc.

LABORATORY TEST RESULTS

Job Number: 228229

Date:07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Customer Sample ID: MW-2
Date Sampled.....: 07/02/2004
Time Sampled.....: 10:45
Sample Matrix.....: Water

Laboratory Sample ID: 228229-2
Date Received.....: 07/06/2004
Time Received.....: 11:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
6010B	Metals Analysis (ICAP Trace)											
	Lead	ND	U		0.0029	0.0050	1	mg/L	122844		07/08/04 1745	lmr
8260B	Volatile Organics											
	Methyl-tert-butyl-ether (MTBE)	ND	U		1.4	10	10.0000	ug/L	123606		07/13/04 0258	jso
	Benzene	ND	U		0.90	10	10.0000	ug/L	123606		07/13/04 0258	jso
	Toluene	ND	U		1.0	10	10.0000	ug/L	123606		07/13/04 0258	jso
	Ethylbenzene	860			7.0	100	100.000	ug/L	123606	D1	07/13/04 0323	jso
	Xylenes (total)	660			2.8	10	10.0000	ug/L	123606		07/13/04 0258	jso
8270C	Semivolatile Organics											
	Naphthalene, Low Level Water	30			0.16	1.0	1.00000	ug/L	123423		07/27/04 1831	glr
	Acenaphthylene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/27/04 1831	glr
	Acenaphthene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/27/04 1831	glr
	Fluorene, Low Level Water	ND	U		0.13	1.0	1.00000	ug/L	123423		07/27/04 1831	glr
	Phenanthrene, Low Level Water	ND	U		0.14	1.0	1.00000	ug/L	123423		07/27/04 1831	glr
	Anthracene, Low Level Water	ND	U		0.15	1.0	1.00000	ug/L	123423		07/27/04 1831	glr
	Fluoranthene, Low Level Water	ND	U		0.14	1.0	1.00000	ug/L	123423		07/27/04 1831	glr
	Pyrene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/27/04 1831	glr
	Benzo(a)anthracene, Low Level Water	ND	U		0.049	0.13	1.00000	ug/L	123423		07/27/04 1831	glr
	Chrysene, Low Level Water	ND	U		0.045	0.50	1.00000	ug/L	123423		07/27/04 1831	glr
	Benzo(b)fluoranthene, Low Level Water	ND	U		0.067	0.18	1.00000	ug/L	123423		07/27/04 1831	glr
	Benzo(k)fluoranthene, Low Level Water	ND	U		0.072	0.17	1.00000	ug/L	123423		07/27/04 1831	glr
	Benzo(a)pyrene, Low Level Water	ND	U		0.084	0.20	1.00000	ug/L	123423		07/27/04 1831	glr
	Indeno(1,2,3-cd)pyrene, Low Level Water	ND	U		0.086	0.20	1.00000	ug/L	123423		07/27/04 1831	glr
	Dibenzo(a,h)anthracene, Low Level Water	ND	U		0.13	0.20	1.00000	ug/L	123423		07/27/04 1831	glr
	Benzo(ghi)perylene, Low Level Water	ND	U		0.19	1.0	1.00000	ug/L	123423		07/27/04 1831	glr

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 228229

Date:07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Customer Sample ID: MW-3
Date Sampled.....: 07/02/2004
Time Sampled.....: 11:25
Sample Matrix.....: Water

Laboratory Sample ID: 228229-3
Date Received.....: 07/06/2004
Time Received.....: 11:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
6010B	Metals Analysis (ICAP Trace)											
	Lead	0.051			0.0029	0.0050	1	mg/L	122844		07/08/04 1815	lmr
8260B	Volatile Organics											
	Methyl-tert-butyl-ether (MTBE)	ND	U		0.14	1.0	1.00000	ug/L	123606		07/13/04 0349	jso
	Benzene	ND	U		0.090	1.0	1.00000	ug/L	123606		07/13/04 0349	jso
	Toluene	ND	U		0.10	1.0	1.00000	ug/L	123606		07/13/04 0349	jso
	Ethylbenzene	ND	U		0.070	1.0	1.00000	ug/L	123606		07/13/04 0349	jso
	Xylenes (total)	ND	U		0.28	1.0	1.00000	ug/L	123606		07/13/04 0349	jso
8270C	Semivolatile Organics											
	Naphthalene, Low Level Water	ND	U		0.16	0.99	1.00000	ug/L	123423		07/12/04 1828	glr
	Acenaphthylene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 1828	glr
	Acenaphthene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 1828	glr
	Fluorene, Low Level Water	ND	U		0.13	0.99	1.00000	ug/L	123423		07/12/04 1828	glr
	Phenanthrene, Low Level Water	ND	U		0.14	0.99	1.00000	ug/L	123423		07/12/04 1828	glr
	Anthracene, Low Level Water	ND	U		0.15	0.99	1.00000	ug/L	123423		07/12/04 1828	glr
	Fluoranthene, Low Level Water	ND	U		0.14	0.99	1.00000	ug/L	123423		07/12/04 1828	glr
	Pyrene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 1828	glr
	Benzo(a)anthracene, Low Level Water	ND	U		0.049	0.13	1.00000	ug/L	123423		07/12/04 1828	glr
	Chrysene, Low Level Water	ND	U		0.045	0.50	1.00000	ug/L	123423		07/12/04 1828	glr
	Benzo(b)fluoranthene, Low Level Water	ND	U		0.066	0.18	1.00000	ug/L	123423		07/12/04 1828	glr
	Benzo(k)fluoranthene, Low Level Water	ND	U		0.071	0.17	1.00000	ug/L	123423		07/12/04 1828	glr
	Benzo(a)pyrene, Low Level Water	ND	U		0.083	0.20	1.00000	ug/L	123423		07/12/04 1828	glr
	Indeno(1,2,3-cd)pyrene, Low Level Water	ND	U		0.085	0.20	1.00000	ug/L	123423		07/12/04 1828	glr
	Dibenzo(a,h)anthracene, Low Level Water	ND	U		0.13	0.20	1.00000	ug/L	123423		07/12/04 1828	glr
	Benzo(ghi)perylene, Low Level Water	ND	U		0.19	0.99	1.00000	ug/L	123423		07/12/04 1828	glr
6010B	Leachable, Metals Analysis (ICAP)											
	Lead, SPLP Leach	ND	U		0.0050	0.0075	1	mg/L	123080		07/12/04 1741	lmr

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 228229

Date:07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Customer Sample ID: MW-4
Date Sampled.....: 07/02/2004
Time Sampled.....: 14:20
Sample Matrix.....: Water

Laboratory Sample ID: 228229-4
Date Received.....: 07/06/2004
Time Received.....: 11:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Methyl-tert-butyl-ether (MTBE)	ND	U		0.14	1.0	1.00000	ug/L	123606		07/13/04 0414	jso
	Benzene	1.9			0.090	1.0	1.00000	ug/L	123606		07/13/04 0414	jso
	Toluene	ND	U		0.10	1.0	1.00000	ug/L	123606		07/13/04 0414	jso
	Ethylbenzene	45			0.70	10	10.0000	ug/L	123606	D1	07/13/04 0440	jso
	Xylenes (total)	24			0.28	1.0	1.00000	ug/L	123606		07/13/04 0414	jso
8270C	Semivolatile Organics											
	Naphthalene, Low Level Water	1.2			0.16	1.0	1.00000	ug/L	123423		07/12/04 1855	glr
	Acenaphthylene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 1855	glr
	Acenaphthene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 1855	glr
	Fluorene, Low Level Water	ND	U		0.13	1.0	1.00000	ug/L	123423		07/12/04 1855	glr
	Phenanthrene, Low Level Water	ND	U		0.14	1.0	1.00000	ug/L	123423		07/12/04 1855	glr
	Anthracene, Low Level Water	ND	U		0.15	1.0	1.00000	ug/L	123423		07/12/04 1855	glr
	Fluoranthene, Low Level Water	ND	U		0.14	1.0	1.00000	ug/L	123423		07/12/04 1855	glr
	Pyrene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 1855	glr
	Benzo(a)anthracene, Low Level Water	ND	U		0.049	0.13	1.00000	ug/L	123423		07/12/04 1855	glr
	Chrysene, Low Level Water	ND	U		0.045	0.50	1.00000	ug/L	123423		07/12/04 1855	glr
	Benzo(b)fluoranthene, Low Level Water	ND	U		0.067	0.18	1.00000	ug/L	123423		07/12/04 1855	glr
	Benzo(k)fluoranthene, Low Level Water	ND	U		0.072	0.17	1.00000	ug/L	123423		07/12/04 1855	glr
	Benzo(a)pyrene, Low Level Water	ND	U		0.084	0.20	1.00000	ug/L	123423		07/12/04 1855	glr
	Indeno(1,2,3-cd)pyrene, Low Level Water	ND	U		0.086	0.20	1.00000	ug/L	123423		07/12/04 1855	glr
	Dibenzo(a,h)anthracene, Low Level Water	ND	U		0.13	0.20	1.00000	ug/L	123423		07/12/04 1855	glr
	Benzo(ghi)perylene, Low Level Water	ND	U		0.19	1.0	1.00000	ug/L	123423		07/12/04 1855	glr

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 228229

Date:07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Customer Sample ID: MW-5
Date Sampled.....: 07/02/2004
Time Sampled.....: 12:50
Sample Matrix.....: Water

Laboratory Sample ID: 228229-5
Date Received.....: 07/06/2004
Time Received.....: 11:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Methyl-tert-butyl-ether (MTBE)	0.53	J		0.14	1.0	1.00000	ug/L	123606		07/13/04 0505	jso
	Benzene	ND	U		0.090	1.0	1.00000	ug/L	123606		07/13/04 0505	jso
	Toluene	ND	U		0.10	1.0	1.00000	ug/L	123606		07/13/04 0505	jso
	Ethylbenzene	ND	U		0.070	1.0	1.00000	ug/L	123606		07/13/04 0505	jso
	Xylenes (total)	ND	U		0.28	1.0	1.00000	ug/L	123606		07/13/04 0505	jso
8270C	Semivolatile Organics											
	Naphthalene, Low Level Water	ND	U		0.16	0.99	1.00000	ug/L	123423		07/12/04 1923	glr
	Acenaphthylene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 1923	glr
	Acenaphthene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 1923	glr
	Fluorene, Low Level Water	ND	U		0.13	0.99	1.00000	ug/L	123423		07/12/04 1923	glr
	Phenanthrene, Low Level Water	ND	U		0.14	0.99	1.00000	ug/L	123423		07/12/04 1923	glr
	Anthracene, Low Level Water	ND	U		0.15	0.99	1.00000	ug/L	123423		07/12/04 1923	glr
	Fluoranthene, Low Level Water	ND	U		0.14	0.99	1.00000	ug/L	123423		07/12/04 1923	glr
	Pyrene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 1923	glr
	Benzo(a)anthracene, Low Level Water	ND	U		0.049	0.13	1.00000	ug/L	123423		07/12/04 1923	glr
	Chrysene, Low Level Water	ND	U		0.045	0.50	1.00000	ug/L	123423		07/12/04 1923	glr
	Benzo(b)fluoranthene, Low Level Water	ND	U		0.066	0.18	1.00000	ug/L	123423		07/12/04 1923	glr
	Benzo(k)fluoranthene, Low Level Water	ND	U		0.071	0.17	1.00000	ug/L	123423		07/12/04 1923	glr
	Benzo(a)pyrene, Low Level Water	ND	U		0.083	0.20	1.00000	ug/L	123423		07/12/04 1923	glr
	Indeno(1,2,3-cd)pyrene, Low Level Water	ND	U		0.085	0.20	1.00000	ug/L	123423		07/12/04 1923	glr
	Dibenzo(a,h)anthracene, Low Level Water	ND	U		0.13	0.20	1.00000	ug/L	123423		07/12/04 1923	glr
	Benzo(ghi)perylene, Low Level Water	ND	U		0.19	0.99	1.00000	ug/L	123423		07/12/04 1923	glr

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 228229

Date:07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Customer Sample ID: MW-6
Date Sampled.....: 07/02/2004
Time Sampled.....: 12:15
Sample Matrix.....: Water

Laboratory Sample ID: 228229-6
Date Received.....: 07/06/2004
Time Received.....: 11:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Methyl-tert-butyl-ether (MTBE)	ND	U		0.14	1.0	1.00000	ug/L	123606		07/13/04 0531	jso
	Benzene	ND	U		0.090	1.0	1.00000	ug/L	123606		07/13/04 0531	jso
	Toluene	ND	U		0.10	1.0	1.00000	ug/L	123606		07/13/04 0531	jso
	Ethylbenzene	ND	U		0.070	1.0	1.00000	ug/L	123606		07/13/04 0531	jso
	Xylenes (total)	ND	U		0.28	1.0	1.00000	ug/L	123606		07/13/04 0531	jso
8270C	Semivolatile Organics											
	Naphthalene, Low Level Water	ND	U		0.16	1.0	1.00000	ug/L	123423		07/12/04 1951	glr
	Acenaphthylene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 1951	glr
	Acenaphthene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 1951	glr
	Fluorene, Low Level Water	ND	U		0.13	1.0	1.00000	ug/L	123423		07/12/04 1951	glr
	Phenanthrene, Low Level Water	ND	U		0.14	1.0	1.00000	ug/L	123423		07/12/04 1951	glr
	Anthracene, Low Level Water	ND	U		0.15	1.0	1.00000	ug/L	123423		07/12/04 1951	glr
	Fluoranthene, Low Level Water	ND	U		0.14	1.0	1.00000	ug/L	123423		07/12/04 1951	glr
	Pyrene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 1951	glr
	Benzo(a)anthracene, Low Level Water	ND	U		0.049	0.13	1.00000	ug/L	123423		07/12/04 1951	glr
	Chrysene, Low Level Water	ND	U		0.045	0.50	1.00000	ug/L	123423		07/12/04 1951	glr
	Benzo(b)fluoranthene, Low Level Water	ND	U		0.067	0.18	1.00000	ug/L	123423		07/12/04 1951	glr
	Benzo(k)fluoranthene, Low Level Water	ND	U		0.072	0.17	1.00000	ug/L	123423		07/12/04 1951	glr
	Benzo(a)pyrene, Low Level Water	ND	U		0.084	0.20	1.00000	ug/L	123423		07/12/04 1951	glr
	Indeno(1,2,3-cd)pyrene, Low Level Water	ND	U		0.086	0.20	1.00000	ug/L	123423		07/12/04 1951	glr
	Dibenzo(a,h)anthracene, Low Level Water	ND	U		0.13	0.20	1.00000	ug/L	123423		07/12/04 1951	glr
	Benzo(ghi)perylene, Low Level Water	ND	U		0.19	1.0	1.00000	ug/L	123423		07/12/04 1951	glr

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 228229

Date:07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Customer Sample ID: MW-7
Date Sampled.....: 07/02/2004
Time Sampled.....: 13:35
Sample Matrix.....: Water

Laboratory Sample ID: 228229-7
Date Received.....: 07/06/2004
Time Received.....: 11:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Methyl-tert-butyl-ether (MTBE)	ND	U		0.14	1.0	1.00000	ug/L	123606		07/13/04 0557	jso
	Benzene	ND	U		0.090	1.0	1.00000	ug/L	123606		07/13/04 0557	jso
	Toluene	ND	U		0.10	1.0	1.00000	ug/L	123606		07/13/04 0557	jso
	Ethylbenzene	ND	U		0.070	1.0	1.00000	ug/L	123606		07/13/04 0557	jso
	Xylenes (total)	ND	U		0.28	1.0	1.00000	ug/L	123606		07/13/04 0557	jso
8270C	Semivolatile Organics											
	Naphthalene, Low Level Water	ND	U		0.16	1.0	1.00000	ug/L	123423		07/12/04 2019	glr
	Acenaphthylene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 2019	glr
	Acenaphthene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 2019	glr
	Fluorene, Low Level Water	ND	U		0.13	1.0	1.00000	ug/L	123423		07/12/04 2019	glr
	Phenanthrene, Low Level Water	ND	U		0.14	1.0	1.00000	ug/L	123423		07/12/04 2019	glr
	Anthracene, Low Level Water	ND	U		0.15	1.0	1.00000	ug/L	123423		07/12/04 2019	glr
	Fluoranthene, Low Level Water	ND	U		0.14	1.0	1.00000	ug/L	123423		07/12/04 2019	glr
	Pyrene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 2019	glr
	Benzo(a)anthracene, Low Level Water	ND	U		0.051	0.13	1.00000	ug/L	123423		07/12/04 2019	glr
	Chrysene, Low Level Water	ND	U		0.046	0.52	1.00000	ug/L	123423		07/12/04 2019	glr
	Benzo(b)fluoranthene, Low Level Water	ND	U		0.069	0.19	1.00000	ug/L	123423		07/12/04 2019	glr
	Benzo(k)fluoranthene, Low Level Water	ND	U		0.074	0.18	1.00000	ug/L	123423		07/12/04 2019	glr
	Benzo(a)pyrene, Low Level Water	ND	U		0.087	0.21	1.00000	ug/L	123423		07/12/04 2019	glr
	Indeno(1,2,3-cd)pyrene, Low Level Water	ND	U		0.089	0.21	1.00000	ug/L	123423		07/12/04 2019	glr
	Dibenzo(a,h)anthracene, Low Level Water	ND	U		0.13	0.21	1.00000	ug/L	123423		07/12/04 2019	glr
	Benzo(ghi)perylene, Low Level Water	ND	U		0.20	1.0	1.00000	ug/L	123423		07/12/04 2019	glr

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 228229

Date:07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Customer Sample ID: MW-8
Date Sampled.....: 07/02/2004
Time Sampled.....: 15:05
Sample Matrix.....: Water

Laboratory Sample ID: 228229-8
Date Received.....: 07/06/2004
Time Received.....: 11:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8260B	Volatile Organics											
	Methyl-tert-butyl-ether (MTBE)	0.96	J		0.14	1.0	1.00000	ug/L	123606		07/13/04 0622	jso
	Benzene	ND	U		0.090	1.0	1.00000	ug/L	123606		07/13/04 0622	jso
	Toluene	ND	U		0.10	1.0	1.00000	ug/L	123606		07/13/04 0622	jso
	Ethylbenzene	ND	U		0.070	1.0	1.00000	ug/L	123606		07/13/04 0622	jso
	Xylenes (total)	ND	U		0.28	1.0	1.00000	ug/L	123606		07/13/04 0622	jso
8270C	Semivolatile Organics											
	Naphthalene, Low Level Water	ND	U		0.16	1.0	1.00000	ug/L	123423		07/12/04 2047	glr
	Acenaphthylene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 2047	glr
	Acenaphthene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 2047	glr
	Fluorene, Low Level Water	ND	U		0.13	1.0	1.00000	ug/L	123423		07/12/04 2047	glr
	Phenanthrene, Low Level Water	ND	U		0.14	1.0	1.00000	ug/L	123423		07/12/04 2047	glr
	Anthracene, Low Level Water	ND	U		0.15	1.0	1.00000	ug/L	123423		07/12/04 2047	glr
	Fluoranthene, Low Level Water	ND	U		0.14	1.0	1.00000	ug/L	123423		07/12/04 2047	glr
	Pyrene, Low Level Water	ND	U		0.12	1.0	1.00000	ug/L	123423		07/12/04 2047	glr
	Benzo(a)anthracene, Low Level Water	ND	U		0.049	0.13	1.00000	ug/L	123423		07/12/04 2047	glr
	Chrysene, Low Level Water	ND	U		0.045	0.51	1.00000	ug/L	123423		07/12/04 2047	glr
	Benzo(b)fluoranthene, Low Level Water	ND	U		0.068	0.18	1.00000	ug/L	123423		07/12/04 2047	glr
	Benzo(k)fluoranthene, Low Level Water	ND	U		0.073	0.17	1.00000	ug/L	123423		07/12/04 2047	glr
	Benzo(a)pyrene, Low Level Water	ND	U		0.085	0.20	1.00000	ug/L	123423		07/12/04 2047	glr
	Indeno(1,2,3-cd)pyrene, Low Level Water	ND	U		0.087	0.20	1.00000	ug/L	123423		07/12/04 2047	glr
	Dibenzo(a,h)anthracene, Low Level Water	ND	U		0.13	0.20	1.00000	ug/L	123423		07/12/04 2047	glr
	Benzo(ghi)perylene, Low Level Water	ND	U		0.19	1.0	1.00000	ug/L	123423		07/12/04 2047	glr

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 228229

Date:07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Customer Sample ID: MW-9
Date Sampled.....: 07/02/2004
Time Sampled.....: 09:15
Sample Matrix.....: Water

Laboratory Sample ID: 228229-9
Date Received.....: 07/06/2004
Time Received.....: 11:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
6010B	Metals Analysis (ICAP Trace)											
	Lead	ND	U		0.0029	0.0050	1	mg/L	122844		07/08/04 1821	lmr
8260B	Volatile Organics											
	Methyl-tert-butyl-ether (MTBE)	ND	U		0.14	1.0	1.00000	ug/L	123606		07/13/04 0648	jso
	Benzene	ND	U		0.090	1.0	1.00000	ug/L	123606		07/13/04 0648	jso
	Toluene	ND	U		0.10	1.0	1.00000	ug/L	123606		07/13/04 0648	jso
	Ethylbenzene	ND	U		0.070	1.0	1.00000	ug/L	123606		07/13/04 0648	jso
	Xylenes (total)	ND	U		0.28	1.0	1.00000	ug/L	123606		07/13/04 0648	jso
8270C	Semivolatile Organics											
	Naphthalene, Low Level Water	ND	U		0.16	0.99	1.00000	ug/L	123423		07/12/04 2114	glr
	Acenaphthylene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 2114	glr
	Acenaphthene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 2114	glr
	Fluorene, Low Level Water	ND	U		0.13	0.99	1.00000	ug/L	123423		07/12/04 2114	glr
	Phenanthrene, Low Level Water	ND	U		0.14	0.99	1.00000	ug/L	123423		07/12/04 2114	glr
	Anthracene, Low Level Water	ND	U		0.15	0.99	1.00000	ug/L	123423		07/12/04 2114	glr
	Fluoranthene, Low Level Water	ND	U		0.14	0.99	1.00000	ug/L	123423		07/12/04 2114	glr
	Pyrene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 2114	glr
	Benzo(a)anthracene, Low Level Water	ND	U		0.049	0.13	1.00000	ug/L	123423		07/12/04 2114	glr
	Chrysene, Low Level Water	ND	U		0.045	0.50	1.00000	ug/L	123423		07/12/04 2114	glr
	Benzo(b)fluoranthene, Low Level Water	ND	U		0.066	0.18	1.00000	ug/L	123423		07/12/04 2114	glr
	Benzo(k)fluoranthene, Low Level Water	ND	U		0.071	0.17	1.00000	ug/L	123423		07/12/04 2114	glr
	Benzo(a)pyrene, Low Level Water	ND	U		0.083	0.20	1.00000	ug/L	123423		07/12/04 2114	glr
	Indeno(1,2,3-cd)pyrene, Low Level Water	ND	U		0.085	0.20	1.00000	ug/L	123423		07/12/04 2114	glr
	Dibenzo(a,h)anthracene, Low Level Water	ND	U		0.13	0.20	1.00000	ug/L	123423		07/12/04 2114	glr
	Benzo(ghi)perylene, Low Level Water	ND	U		0.19	0.99	1.00000	ug/L	123423		07/12/04 2114	glr

* In Description = Dry Wgt.

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LABORATORY TEST RESULTS

Job Number: 228229

Date:07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Customer Sample ID: MW-10
Date Sampled.....: 07/02/2004
Time Sampled.....: 16:00
Sample Matrix.....: Water

Laboratory Sample ID: 228229-10
Date Received.....: 07/06/2004
Time Received.....: 11:00

TEST METHOD	PARAMETER/TEST DESCRIPTION	SAMPLE RESULT	Q	FLAGS	MDL	RL	DILUTION	UNITS	BATCH	DT	DATE/TIME	TECH
8270C	Semivolatile Organics											
	Naphthalene, Low Level Water	1.1			0.16	0.99	1.00000	ug/L	123423		07/12/04 2142	glr
	Acenaphthylene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 2142	glr
	Acenaphthene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 2142	glr
	Fluorene, Low Level Water	ND	U		0.13	0.99	1.00000	ug/L	123423		07/12/04 2142	glr
	Phenanthrene, Low Level Water	ND	U		0.14	0.99	1.00000	ug/L	123423		07/12/04 2142	glr
	Anthracene, Low Level Water	ND	U		0.15	0.99	1.00000	ug/L	123423		07/12/04 2142	glr
	Fluoranthene, Low Level Water	ND	U		0.14	0.99	1.00000	ug/L	123423		07/12/04 2142	glr
	Pyrene, Low Level Water	ND	U		0.12	0.99	1.00000	ug/L	123423		07/12/04 2142	glr
	Benzo(a)anthracene, Low Level Water	ND	U		0.049	0.13	1.00000	ug/L	123423		07/12/04 2142	glr
	Chrysene, Low Level Water	ND	U		0.045	0.50	1.00000	ug/L	123423		07/12/04 2142	glr
	Benzo(b)fluoranthene, Low Level Water	ND	U		0.066	0.18	1.00000	ug/L	123423		07/12/04 2142	glr
	Benzo(k)fluoranthene, Low Level Water	ND	U		0.071	0.17	1.00000	ug/L	123423		07/12/04 2142	glr
	Benzo(a)pyrene, Low Level Water	ND	U		0.083	0.20	1.00000	ug/L	123423		07/12/04 2142	glr
	Indeno(1,2,3-cd)pyrene, Low Level Water	ND	U		0.085	0.20	1.00000	ug/L	123423		07/12/04 2142	glr
	Dibenzo(a,h)anthracene, Low Level Water	ND	U		0.13	0.20	1.00000	ug/L	123423		07/12/04 2142	glr
	Benzo(ghi)perylene, Low Level Water	ND	U		0.19	0.99	1.00000	ug/L	123423		07/12/04 2142	glr

* In Description = Dry Wgt.

Severn Trent Laboratories, Inc.

LABORATORY CHRONICLE

Job Number: 228229 Date: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Lab ID: 228229-1 Client ID: MW-1 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
5030B	5030 25 mL Purge Prep	1	123213		07/13/2004	1210	
5030B	5030 25 mL Purge Prep	2	123089		07/13/2004	0232	
3010A	Acid Digestion (ICAP)	1	122655		07/07/2004	1005	
3520C	Extraction Continuous Liq/Liq (SVOC)	1	122831		07/09/2004	0915	
6010B	Metals Analysis (ICAP Trace)	1	122844	122655	07/08/2004	1738	
8270C	Semivolatile Organics	1	123423	122831	07/27/2004	1804	1.00000
8260B	Volatile Organics	1	123276	123213	07/13/2004	1210	1.00000

Lab ID: 228229-2 Client ID: MW-2 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
5030B	5030 25 mL Purge Prep	1	123089		07/13/2004	0323	
5030B	5030 25 mL Purge Prep	2	123089		07/13/2004	0258	
3010A	Acid Digestion (ICAP)	1	122655		07/07/2004	1005	
3520C	Extraction Continuous Liq/Liq (SVOC)	1	122831		07/09/2004	0915	
6010B	Metals Analysis (ICAP Trace)	1	122844	122655	07/08/2004	1745	
8270C	Semivolatile Organics	1	123423	122831	07/27/2004	1831	1.00000
8260B	Volatile Organics	1	123606	123089	07/13/2004	0258	10.0000
8260B	Volatile Organics	1	123606	123089	07/13/2004	0323	100.000

Lab ID: 228229-3 Client ID: MW-3 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
1312	1312 SPLP	1	122857		07/09/2004	1045	
5030B	5030 25 mL Purge Prep	1	123089		07/13/2004	0349	
3010A	Acid Dig. Leachates (ICAP)	1	122908	122857	07/09/2004	1520	
3010A	Acid Digestion (ICAP)	1	122655		07/07/2004	1005	
3520C	Extraction Continuous Liq/Liq (SVOC)	1	122831		07/09/2004	0915	
6010B	Leachable, Metals Analysis (ICAP)	1	123080	122908-122857	07/12/2004	1741	
6010B	Metals Analysis (ICAP Trace)	1	122844	122655	07/08/2004	1815	
8270C	Semivolatile Organics	1	123423	122831	07/12/2004	1828	1.00000
8260B	Volatile Organics	1	123606	123089	07/13/2004	0349	1.00000

Lab ID: 228229-4 Client ID: MW-4 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
5030B	5030 25 mL Purge Prep	1	123089		07/13/2004	0414	
5030B	5030 25 mL Purge Prep	2	123089		07/13/2004	0440	
3520C	Extraction Continuous Liq/Liq (SVOC)	1	122831		07/09/2004	0915	
8270C	Semivolatile Organics	1	123423	122831	07/12/2004	1855	1.00000
8260B	Volatile Organics	1	123606	123089	07/13/2004	0414	1.00000
8260B	Volatile Organics	1	123606	123089	07/13/2004	0440	10.0000

Lab ID: 228229-5 Client ID: MW-5 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
5030B	5030 25 mL Purge Prep	1	123089		07/13/2004	0505	
3520C	Extraction Continuous Liq/Liq (SVOC)	1	122831		07/09/2004	0915	
8270C	Semivolatile Organics	1	123423	122831	07/12/2004	1923	1.00000
8260B	Volatile Organics	1	123606	123089	07/13/2004	0505	1.00000

Lab ID: 228229-6 Client ID: MW-6 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
5030B	5030 25 mL Purge Prep	1	123089		07/13/2004	0531	
3520C	Extraction Continuous Liq/Liq (SVOC)	1	122831		07/09/2004	0915	
8270C	Semivolatile Organics	1	123423	122831	07/12/2004	1951	1.00000
8260B	Volatile Organics	1	123606	123089	07/13/2004	0531	1.00000

Lab ID: 228229-7 Client ID: MW-7 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
5030B	5030 25 mL Purge Prep	1	123089		07/13/2004	0557	

L A B O R A T O R Y C H R O N I C L E

Job Number: 228229 Date: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Lab ID: 228229-7 Client ID: MW-7 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
3520C	Extraction Continuous Liq/Liq (SVOC)	1	122831		07/09/2004	0915	
8270C	Semivolatile Organics	1	123423	122831	07/12/2004	2019	1.00000
8260B	Volatile Organics	1	123606	123089	07/13/2004	0557	1.00000

Lab ID: 228229-8 Client ID: MW-8 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
5030B	5030 25 mL Purge Prep	1	123089		07/13/2004	0622	
3520C	Extraction Continuous Liq/Liq (SVOC)	1	122831		07/09/2004	0915	
8270C	Semivolatile Organics	1	123423	122831	07/12/2004	2047	1.00000
8260B	Volatile Organics	1	123606	123089	07/13/2004	0622	1.00000

Lab ID: 228229-9 Client ID: MW-9 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
5030B	5030 25 mL Purge Prep	1	123089		07/13/2004	0648	
3010A	Acid Digestion (ICAP)	1	122655		07/07/2004	1005	
3520C	Extraction Continuous Liq/Liq (SVOC)	1	122831		07/09/2004	0915	
6010B	Metals Analysis (ICAP Trace)	1	122844	122655	07/08/2004	1821	
8270C	Semivolatile Organics	1	123423	122831	07/12/2004	2114	1.00000
8260B	Volatile Organics	1	123606	123089	07/13/2004	0648	1.00000

Lab ID: 228229-10 Client ID: MW-10 Date Recvd: 07/06/2004 Sample Date: 07/02/2004

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
3520C	Extraction Continuous Liq/Liq (SVOC)	1	122831		07/09/2004	0915	
8270C	Semivolatile Organics	1	123423	122831	07/12/2004	2142	1.00000

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SURROGATE RECOVERIES REPORT

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Method.....: Volatile Organics
Method Code...: 8260B

Test Matrix...: Water
Batch(s).....: 123606

Prep Batch..: 123089

Lab ID	DT	Sample ID	Date	12DCED	BRFLBE	DBRFLM	TOLD8
LCS			07/13/2004	102	106	100	104
MB			07/13/2004	95	98	98	101
228229- 2		MW-2	07/13/2004	99	104	101	107
228229- 2	D1	MW-2	07/13/2004	97	98	100	104
228229- 3		MW-3	07/13/2004	102	99	102	107
228229- 4		MW-4	07/13/2004	95	97	94	100
228229- 4	D1	MW-4	07/13/2004	102	101	101	106
228229- 5		MW-5	07/13/2004	102	101	100	105
228229- 6		MW-6	07/13/2004	101	100	100	105
228229- 7		MW-7	07/13/2004	100	98	99	102
228229- 8		MW-8	07/13/2004	97	93	94	99
228229- 9		MW-9	07/13/2004	104	101	100	106

Test	Test Description	Limits
12DCED	1,2-Dichloroethane-d4 (surr)	61 - 131
BRFLBE	4-Bromofluorobenzene (surr)	73 - 122
DBRFLM	Dibromofluoromethane (surr)	66 - 132
TOLD8	Toluene-d8 (surr)	78 - 128

Method.....: Volatile Organics
Method Code...: 8260B

Test Matrix...: Water
Batch(s).....: 123276

Prep Batch..: 123213

Lab ID	DT	Sample ID	Date	12DCED	BRFLBE	DBRFLM	TOLD8
LCD			07/13/2004	97	93	96	96
LCS			07/13/2004	94	96	92	96
MB			07/13/2004	89	93	89	95
228229- 1		MW-1	07/13/2004	92	92	90	95

Test	Test Description	Limits
12DCED	1,2-Dichloroethane-d4 (surr)	61 - 131
BRFLBE	4-Bromofluorobenzene (surr)	73 - 122
DBRFLM	Dibromofluoromethane (surr)	66 - 132
TOLD8	Toluene-d8 (surr)	78 - 128

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SURROGATE RECOVERIES REPORT

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

Method.....: Semivolatile Organics
Method Code...: 8270

Test Matrix...: Low Level Water
Batch(s).....: 123423

Prep Batch..: 122831

Lab ID	DT	Sample ID	Date	2FLUBP	NITRD5	TERD14
LCD			07/12/2004	85	79	66
LCS			07/12/2004	85	82	81
MB			07/12/2004	78	78	88
228229- 1		MW-1	07/27/2004	72	61	37
228229- 2		MW-2	07/27/2004	49	56	32
228229- 3		MW-3	07/12/2004	77	79	19
228229- 4		MW-4	07/12/2004	78	86	36
228229- 5		MW-5	07/12/2004	61	63	29
228229- 6		MW-6	07/12/2004	57	59	25
228229- 7		MW-7	07/12/2004	65	67	35
228229- 8		MW-8	07/12/2004	76	82	22
228229- 9		MW-9	07/12/2004	65	66	26
228229- 10		MW-10	07/12/2004	77	75	33

Test	Test Description	Limits
2FLUBP	2-Fluorobiphenyl (surr)	24 - 116
NITRD5	Nitrobenzene-d5 (surr)	20 - 100
TERD14	Terphenyl-d14 (surr)	12 - 137

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time
LCD	Laboratory Control Sample Duplicate	004GWLBLKA	122831-003		07/12/2004	1704

Test Method.....: 8270C
Method Description.: Semivolatile Organics

Equipment Code....: GCL1
Batch.....: 123423

Analyst...: glr

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value		QC Calc.	*	Limits	F
Naphthalene, Low Level Water	ug/L	36.717	38.306	50.000	0.160	U	73 4	% R	32-100 20	
Acenaphthylene, Low Level Water	ug/L	39.338	40.667	50.000	0.120	U	79 3	% R	39-107 20	
Acenaphthene, Low Level Water	ug/L	40.394	42.062	50.000	0.120	U	81 4	% R	37-105 20	
Fluorene, Low Level Water	ug/L	40.314	42.979	50.000	0.130	U	81 6	% R	46-105 20	
Phenanthrene, Low Level Water	ug/L	45.891	47.164	50.000	0.140	U	92 3	% R	46-110 20	
Anthracene, Low Level Water	ug/L	44.833	45.659	50.000	0.150	U	90 2	% R	50-111 20	
Fluoranthene, Low Level Water	ug/L	46.932	46.339	50.000	0.140	U	94 1	% R	50-118 20	
[illegible]ene, Low Level Water	ug/L	41.542	47.521	50.000	0.120	U	83 13	% R	40-115 20	
Benzo(a)anthracene, Low Level Water	ug/L	38.734	41.710	50.000	0.049	U	77 7	% R	42-112 20	
Chrysene, Low Level Water	ug/L	40.614	42.653	50.000	0.045	U	81 5	% R	38-116 20	
Benzo(b)fluoranthene, Low Level Water	ug/L	36.482	36.174	50.000	0.067	U	73 1	% R	33-115 20	
Benzo(k)fluoranthene, Low Level Water	ug/L	39.243	41.708	50.000	0.072	U	78 6	% R	27-135 20	
Benzo(a)pyrene, Low Level Water	ug/L	35.127	36.942	50.000	0.084	U	70 5	% R	27-119 20	
Indeno(1,2,3-cd)pyrene, Low Level Wate	ug/L	46.879	52.260	50.000	0.086	U	94 11	% R	18-133 20	
Dibenzo(a,h)anthracene, Low Level Wate	ug/L	38.891	43.055	50.000	0.130	U	78 10	% R	18-125 20	
Benzo(ghi)perylene, Low Level Water	ug/L	44.223	49.437	50.000	0.190	U	88 11	% R	27-120 20	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 8270C
Method Description.: Semivolatile Organics

Equipment Code....: GCL1
Batch.....: 123423

Analyst...: glr

LCS	Laboratory Control Sample	004GWLBLKA	122831-002		07/12/2004	1637

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value		QC Calc.	*	Limits	F
Naphthalene, Low Level Water	ug/L	38.306		50.000	0.160	U	77	%	32-100	
Acenaphthylene, Low Level Water	ug/L	40.667		50.000	0.120	U	81	%	39-107	
Acenaphthene, Low Level Water	ug/L	42.062		50.000	0.120	U	84	%	37-105	
Fluorene, Low Level Water	ug/L	42.979		50.000	0.130	U	86	%	46-105	
Phenanthrene, Low Level Water	ug/L	47.164		50.000	0.140	U	94	%	46-110	
Anthracene, Low Level Water	ug/L	45.659		50.000	0.150	U	91	%	50-111	
Fluoranthene, Low Level Water	ug/L	46.339		50.000	0.140	U	93	%	50-118	
Pyrene, Low Level Water	ug/L	47.521		50.000	0.120	U	95	%	40-115	
Benzo(a)anthracene, Low Level Water	ug/L	41.710		50.000	0.049	U	83	%	42-112	
Chrysene, Low Level Water	ug/L	42.653		50.000	0.045	U	85	%	38-116	
Benzo(b)fluoranthene, Low Level Water	ug/L	36.174		50.000	0.067	U	72	%	33-115	
Benzo(k)fluoranthene, Low Level Water	ug/L	41.708		50.000	0.072	U	83	%	27-135	
Benzo(a)pyrene, Low Level Water	ug/L	36.942		50.000	0.084	U	74	%	27-119	
Indeno(1,2,3-cd)pyrene, Low Level Wate	ug/L	52.260		50.000	0.086	U	105	%	18-133	
Dibenzo(a,h)anthracene, Low Level Wate	ug/L	43.055		50.000	0.130	U	86	%	18-125	
Benzo(ghi)perylene, Low Level Water	ug/L	49.437		50.000	0.190	U	99	%	27-120	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 8270C
Method Description.: Semivolatile Organics

Equipment Code....: GCL1
Batch.....: 123423

Analyst...: glr

MB	Method Blank		122831-001		07/12/2004	1433

Parameter/Test Description	Units	QC Result		QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Naphthalene, Low Level Water	ug/L	0.160	U							
Acenaphthylene, Low Level Water	ug/L	0.120	U							
Acenaphthene, Low Level Water	ug/L	0.120	U							
Fluorene, Low Level Water	ug/L	0.130	U							
Phenanthrene, Low Level Water	ug/L	0.140	U							
Anthracene, Low Level Water	ug/L	0.150	U							
Fluoranthene, Low Level Water	ug/L	0.140	U							
Pyrene, Low Level Water	ug/L	0.120	U							
Benzo(a)anthracene, Low Level Water	ug/L	0.049	U							
Chrysene, Low Level Water	ug/L	0.045	U							
Benzo(b)fluoranthene, Low Level Water	ug/L	0.067	U							
Benzo(k)fluoranthene, Low Level Water	ug/L	0.072	U							
Benzo(a)pyrene, Low Level Water	ug/L	0.084	U							
Indeno(1,2,3-cd)pyrene, Low Level Wate	ug/L	0.086	U							
Dibenzo(a,h)anthracene, Low Level Wate	ug/L	0.130	U							
Benzo(ghi)perylene, Low Level Water	ug/L	0.190	U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 8260B
Method Description.: Volatile Organics

Equipment Code....: GCL3
Batch.....: 123276

Analyst...: jso

LCD	Laboratory Control Sample Duplicate	V04G13DSA	123213-003		07/13/2004	1906

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value		QC Calc.	*	Limits	F
Methyl-tert-butyl-ether (MTBE)	ug/L	12.284	10.830	10.000	0.140	U	123	%	52-156	
							13	R	20	
Benzene	ug/L	9.782	10.203	10.000	0.090	U	98	%	74-116	
							4	R	20	
Toluene	ug/L	9.974	10.572	10.000	0.100	U	100	%	71-122	
							6	R	20	
Ethylbenzene	ug/L	10.106	10.736	10.000	0.070	U	101	%	74-121	
							6	R	20	
Xylenes (total)	ug/L	31.425	33.794	30.000	0.280	U	105	%	76-138	
							7	R	20	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 8260B
Method Description.: Volatile Organics

Equipment Code....: GCL3
Batch.....: 123276

Analyst...: jso

LCS	Laboratory Control Sample	V04G13DSA	123213-002		07/13/2004	0900

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Methyl-tert-butyl-ether (MTBE)	ug/L	10.830		10.000	0.140 U	108	%	52-156	
Benzene	ug/L	10.203		10.000	0.090 U	102	%	74-116	
Toluene	ug/L	10.572		10.000	0.100 U	106	%	71-122	
Ethylbenzene	ug/L	10.736		10.000	0.070 U	107	%	74-121	
Xylenes (total)	ug/L	33.794		30.000	0.280 U	113	%	76-138	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 8260B
Method Description.: Volatile Organics

Equipment Code....: GCL3
Batch.....: 123276

Analyst...: jso

MB	Method Blank		123213-001		07/13/2004	0935

Parameter/Test Description	Units	QC Result		QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Methyl-tert-butyl-ether (MTBE)	ug/L	0.140	U							
Benzene	ug/L	0.090	U							
Toluene	ug/L	0.100	U							
Ethylbenzene	ug/L	0.070	U							
Xylenes (total)	ug/L	0.280	U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 8260B
Method Description.: Volatile Organics

Equipment Code....: GCL3
Batch.....: 123606

Analyst...: jso

LCS	Laboratory Control Sample	V04G12DSA	123089-002		07/13/2004	0025

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Methyl-tert-butyl-ether (MTBE)	ug/L	10.847		10.000	0.140 U	108	%	52-156	
Benzene	ug/L	10.138		10.000	0.090 U	101	%	74-116	
Toluene	ug/L	10.548		10.000	0.100 U	105	%	71-122	
Ethylbenzene	ug/L	10.712		10.000	0.070 U	107	%	74-121	
Xylenes (total)	ug/L	33.726		30.000	0.280 U	112	%	76-138	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 8260B
Method Description.: Volatile Organics

Equipment Code....: GCL3
Batch.....: 123606

Analyst...: jso

MB	Method Blank		123089-001		07/13/2004	0000

Parameter/Test Description	Units	QC Result		QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Methyl-tert-butyl-ether (MTBE)	ug/L	0.140	U							
Benzene	ug/L	0.090	U							
Toluene	ug/L	0.100	U							
Ethylbenzene	ug/L	0.070	U							
Xylenes (total)	ug/L	0.280	U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B
Method Description.: Metals Analysis (ICAP Trace)
Equipment Code....: ICP3
Batch.....: 122844
Analyst...: lmr

LCS	Laboratory Control Sample	M04FSPK001	122605-002		07/08/2004	1229

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead	mg/L	0.10075		0.10000	0.00290 U	101	%	80-120	

LCS	Laboratory Control Sample	M04FSPK001	122655-002		07/08/2004	1653

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead	mg/L	0.08823		0.10000	0.00290 U	88	%	80-120	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B
Method Description.: Metals Analysis (ICAP Trace)
Equipment Code....: ICP3
Batch.....: 122844
Analyst...: lmr

MB	Method Blank	122605	122605-001		07/08/2004	1222

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead	mg/L	0.00290 U							

MB	Method Blank	122655	122655-001		07/08/2004	1647

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead	mg/L	0.00290 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN: Lynn Smith

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)
Equipment Code....: ICP5
Batch.....: 123080
Analyst...: lmr

EB1	Extraction Blank 1	122906	122906-001		07/12/2004	1600

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead, TCLP Leach	mg/L	0.00500 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)
Equipment Code....: ICP5
Batch.....: 123080
Analyst...: lmr

EB3	DI Blank	122908	122908-001		07/12/2004	1727

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead, SPLP Leach	mg/L	0.00500 U							

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)
Equipment Code....: ICP5
Batch.....: 123080
Analyst...: lmr

LCS	Laboratory Control Sample	M04FSPK001	122906-002		07/12/2004	1607

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead, TCLP Leach	mg/L	0.10273		0.10000	0.00500 U	103	%	80-120	

LCS	Laboratory Control Sample	M04FSPK001	122908-002		07/12/2004	1734

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead, SPLP Leach	mg/L	0.10264		0.10000	0.00500 U	103	%	80-120	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)

Equipment Code....: ICP5
Batch.....: 123080

Analyst...: lmr

MD	Method Duplicate		228229-3		07/12/2004	1754

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead, SPLP Leach	mg/L	0.00500 U			0.00500 U	0.00055	A	0.05000	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)

Equipment Code....: ICP5
Batch.....: 123080

Analyst...: lmr

MS	Matrix Spike	M04DSPK001	228229-3		07/12/2004	1801

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead, SPLP Leach	mg/L	4.41944		5.00000	0.00500 U	88	%	50-150	

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

QUALITY CONTROL RESULTS

Job Number.: 228229

Report Date.: 07/28/2004

CUSTOMER: TolTest, Inc. PROJECT: BLDG 1600A ATTN:

QC Type	Description	Reag. Code	Lab ID	Dilution Factor	Date	Time

Test Method.....: 6010B
Method Description.: Leachable, Metals Analysis (ICAP)

Equipment Code....: ICP5
Batch.....: 123080

Analyst...: lmr

SD	Serial Dilution		228229-3		07/12/2004	1747

Parameter/Test Description	Units	QC Result	QC Result	True Value	Orig. Value	QC Calc.	*	Limits	F
Lead, SPLP Leach	mg/L	0.00500 U			0.00500 U				

* %=% REC, R=RPD, A=ABS Diff., D=% Diff.

REPORT COMMENTS

1) All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.
2) Soil, sediment and sludge sample results are reported on a "dry weight" basis except when analyzed for landfill disposal or incineration parameters. All other solid matrix samples are reported on an "as received" basis unless noted differently.
3) Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.
4) The test results for the noted analytical method(s) meet the requirements of NELAC. Lab Cert. ID# 100201
5) According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH Field) they were not analyzed immediately, but as soon as possible on laboratory receipt.

Glossary of flags, qualifiers and abbreviations (any number of which may appear in the report)

Inorganic Qualifiers (Q-Column)

U Analyte was not detected at or above the stated limit.
< Not detected at or above the reporting limit.
J Result is less than the RL, but greater than or equal to the method detection limit.
B Result is less than the CRDL/RL, but greater than or equal to the IDL/MDL.
S Result was determined by the Method of Standard Additions.
F AFCEE: Result is less than the RL, but greater than or equal to the method detection limit.

Inorganic Flags (Flag Column)

^ ICV,CCV,ICB,CCB,ISA,ISB,CRI,CRA,MRL: Instrument related QC exceed the upper or lower control limits.
* LCS, LCD, MD: Batch QC exceeds the upper or lower control limits.
+ MSA correlation coefficient is less than 0.995.
4 MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
E SD: Serial dilution exceeds the control limits.
H MB, EB1, EB2, EB3: Batch QC is greater than reporting limit or had a negative instrument reading lower than the absolute value of the reporting limit.
N MS, MSD: Spike recovery exceeds the upper or lower control limits.
W AS(GFAA) Post-digestion spike was outside 85-115% control limits.

Organic Qualifiers (Q - Column)

U Analyte was not detected at or above the stated limit.
ND Compound not detected.
J Result is an estimated value below the reporting limit or a tentatively identified compound (TIC).
Q Result was qualitatively confirmed, but not quantified.
C Pesticide identification was confirmed by GC/MS.
Y The chromatographic response resembles a typical fuel pattern.
Z The chromatographic response does not resemble a typical fuel pattern.
E Result exceeded calibration range, secondary dilution required.
F AFCEE:Result is an estimated value below the reporting limit or a tentatively identified compound (TIC)

Organic Flags (Flags Column)

B MB: Batch QC is greater than reporting limit.
* LCS, LCD, ELC, ELD, CV, MS, MSD, Surrogate: Batch QC exceeds the upper or lower control limits.
^ EB1, EB2, EB3, MLE: Batch QC is greater than reporting Limit
A Concentration exceeds the instrument calibration range
a Concentration is below the method Reporting Limit (RL)
B Compound was found in the blank and sample.
D Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution will be flagged with a D.
H Alternate peak selection upon analytical review
I Indicates the presence of an interfence, recovery is not calculated.
M Manually integrated compound.
P The lower of the two values is reported when the % difference between the results of two GC columns is

greater than 25%.

Abbreviations

AS	Post Digestion Spike (GFAA Samples - See Note 1 below)
Batch	Designation given to identify a specific extraction, digestion, preparation set, or analysis set
CAP	Capillary Column CCB Continuing Calibration Blank
CCV	Continuing Calibration Verification
CF	Confirmation analysis of original
C1	Confirmation analysis of A1 or D1
C2	Confirmation analysis of A2 or D2
C3	Confirmation analysis of A3 or D3
CRA	Low Level Standard Check - GFAA; Mercury
CRI	Low Level Standard Check - ICP
CV	Calilbration Verification Standard
Dil Fac	Dilution Factor - Secondary dilution analysis
D1	Dilution 1
D2	Dilution 2
D3	Dilution 3
DLFac	Detection Limit Factor
DSH	Distilled Standard - High Level
DSL	Distilled Standard - Low Level
DSM	Distilled Standard - Medium Level
EB1	Extraction Blank 1
EB2	Extraction Blank 2
EB3	DI Blank
ELC	Method Extracted LCS
ELD	Method Extracted LCD
ICAL	Initial calibration
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
IDL	Instrument Detection Limit
ISA	Interference Check Sample A - ICAP
ISB	Interference Check Sample B - ICAP
Job No.	The first six digits of the sample ID which refers to a specific client, project and sample group
	Lab ID An 8 number unique laboratory identification
LCD	Laboratory Control Standard Duplicate
LCS	Laboratory Control Standard with reagent grade water or a matrix free from the analyte of interest
MB	Method Blank or (PB) Preparation Blank
MD	Method Duplicate
MDL	Method Detection Limit
MLE	Medium Level Extraction Blank
MRL	Method Reporting Limit Standard
MSA	Method of Standard Additions
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ND	Not Detected
PREPF	Preparation factor used by the Laboratory's Information Management System (LIMS)
PDS	Post Digestion Spike (ICAP)
RA	Re-analysis of original
A1	Re-analysis of D1
A2	Re-analysis of D2
A3	Re-analysis of D3
RD	Re-extraction of dilution
RE	Re-extraction of original
RC	Re-extraction Confirmation
RL	Reporting Limit
RPD	Relative Percent Difference of duplicate (unrounded) analyses
RRF	Relative Response Factor
RT	Retention Time

RTW	Retention Time Window Sample ID A 9 digit number unique for each sample, the first six digits are referred as the job number
SCB	Seeded Control Blank
SD	Serial Dilution (Calculated when sample concentration exceeds 50 times the MDL)
UCB	Unseeded Control Blank
SSV	Second Source Verification Standard
SLCS	Solid Laboratory Control Standard(LCS)
PHC	pH Calibration Check LCSP pH Laboratory Control Sample
LCDP	pH Laboratory Control Sample Duplicate
MDPH	pH Sample Duplicate
MDFP	Flashpoint Sample Duplicate
LCFP	Flashpoint LCS
G1	Gelex Check Standard Range 0-1
G2	Gelex Check Standard Range 1-10
G3	Gelex Check Standard Range 10-100
G4	Gelex Check Standard Range 100-1000

Note 1: The Post Spike Designation on Batch QC for GFAA is designated with an "S" added to the current abbreviation used. EX. LCS S=LCS Post Spike (GFAA); MSS=MS Post Spike (GFAA)

Note 2: The MD calculates an absolute difference (A) when the sample concentration is less than 5 times the reporting limit. The control limit is represented as +/- the RL.

4.0 REFERENCES

TolTest 2000a. *Corrective Action Plan*, Building 1600A, Great Lakes, Illinois. February 2000.

TolTest 2000b. *Corrective Action Plan Supplement*, Building 1600A, Great Lakes, Illinois. August 2000.

TolTest 2001a. *Work Plan and Site Health & Safety Plan*, Building 1600A, Great Lakes, Illinois. March 2001.

TolTest 2001b. *Delivery Order Completion Report, System Start-Up Report*, Building 1600A, Great Lakes, Illinois. September 2001.

TolTest 2002. *Operation and Maintenance Plan, Biosparge Remediation System*, Building 1600A, Naval Training Center, Great Lakes, Illinois. December 2002.

SEVERN TRENT **STL**

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Contact:
Company: TolTest
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Toledo, OH 43603
Phone: 419-241-7175
Fax: 419-321-6259
PO#: 3510 Quote:

Shaded Areas For Internal Use Only 1 of 1

Lab Lot# 228229

Package Sealed: Yes (No)	Samples Sealed: Yes (No)
Received on Ice: (Yes) No	Samples Intact: Yes (No)
Temperature °C of Cooler: 4.2 3.8	

Sampler Name: Lynn Smith
Signature: Lynn P. Smith
Project Name: Bldg. 1600A
Project Number: 41791.01
Project Location: Naval Station Great Lakes
Date Required: Hard Copy: 7/16/04 Email Fax: 7/16/04
Lab PM: Nancy McDonald

Bottle # / # / Cont. / Volume / Preserv.

Within Hold Time: (Yes) No	Preserv. Indicated: (Yes) No NA
pH Check OK: (Yes) No NA	Rem Cl2 Check OK: Yes No (NA)
Sample Labels and COC Agree: (Yes) No	COC not present

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	BTEX/MTBE 8260B	PNAs 8270	Total Lead	SPLP Lead	Additional Analyses / Remarks
1		MW-1	7-2-04	1000	W	G	X	X	X		Use MDLs which meet
2		MW-2	7-2-04	1045	W	G	X	X	X		TACO Tier I Class I
3		MW-3	7-2-04	1125	W	G	X	X	X	X	Remediation Objectives.
4		MW-4	7-2-04	1420	W	G	X	X			
5		MW-5	7-2-04	1250	W	G	X	X			
6		MW-6	7-2-04	1215	W	G	X	X			
7		MW-7	7-2-04	1335	W	G	X	X			
8		MW-8	7-2-04	1505	W	G	X	X			
9		MW-9	7-2-04	0915	W	G	X	X	X		
10		MW-10	7-2-04	1600	W	G	X	X			

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
Lynn P. Smith	TolTest	7-2-04	1750	[illegible]	STL	7/6/04	1010
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
				[illegible]	SR	7/6/04	1430

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O = _____

Container Key.
1. Plastic
2. VOA Vial
3. Sterile Plastic
4. Amber Glass
5. Widemouth Glass
6. Other _____

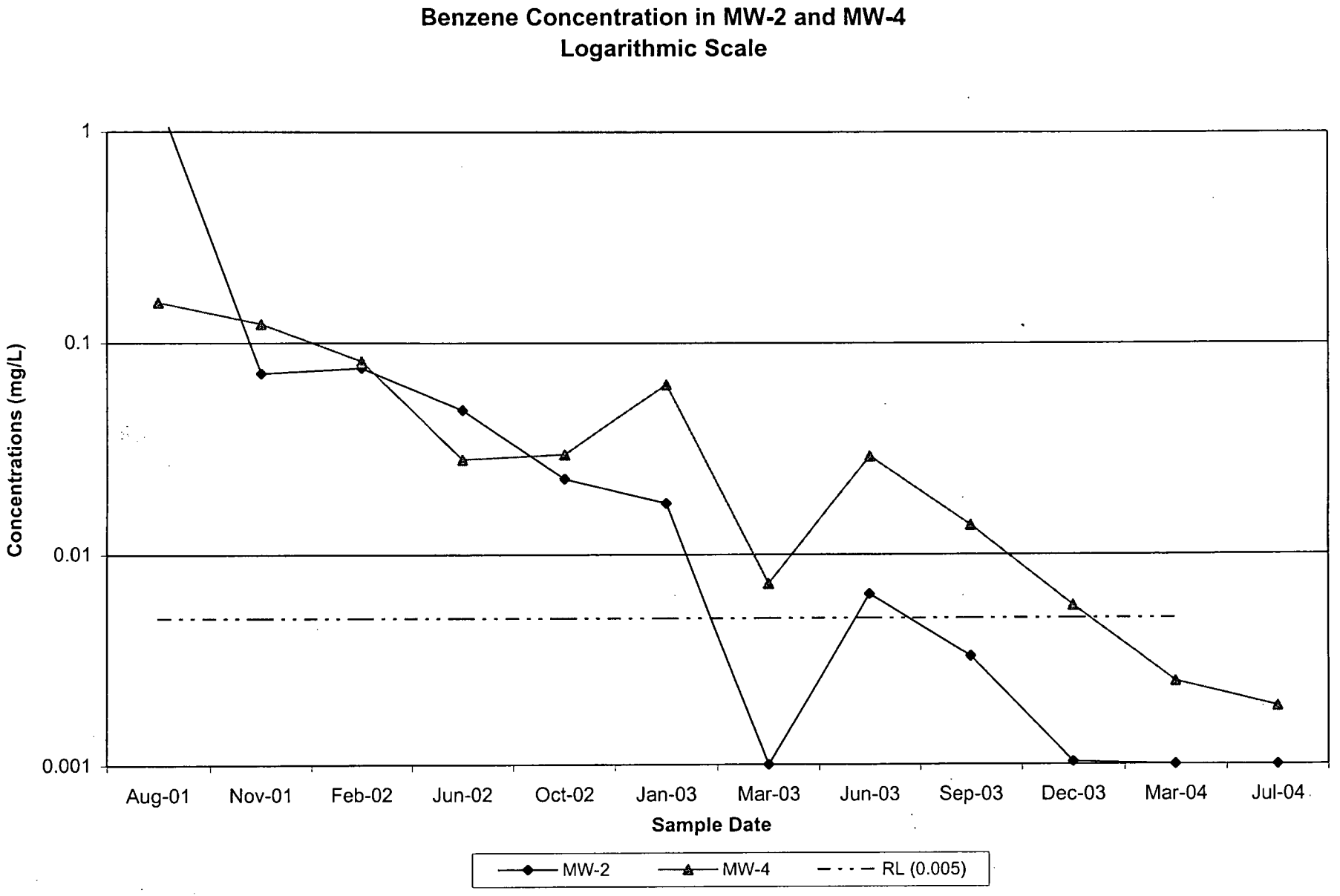
Preservative Key
1. HCl, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. Cool to 4°
7. None

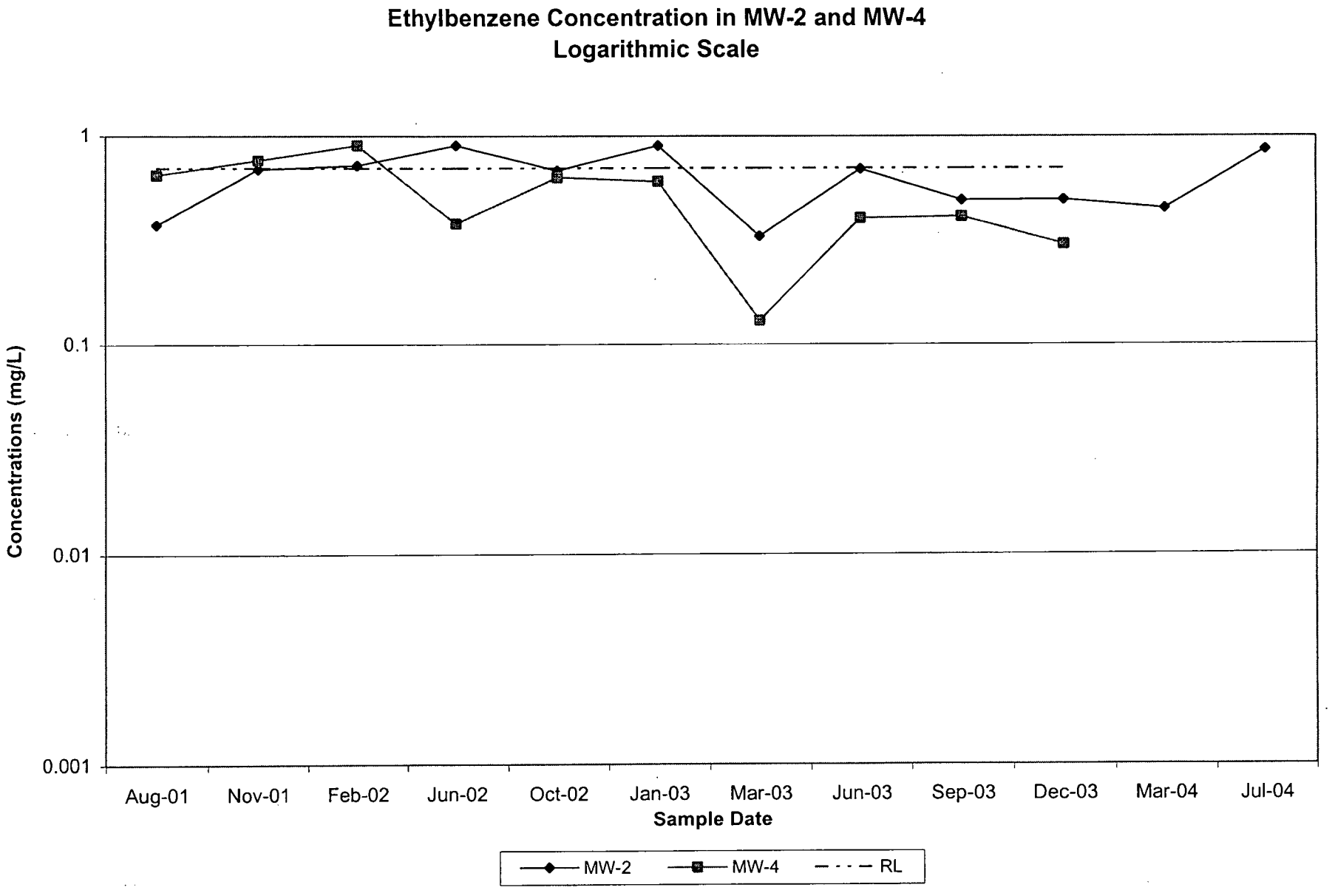
COMMENTS

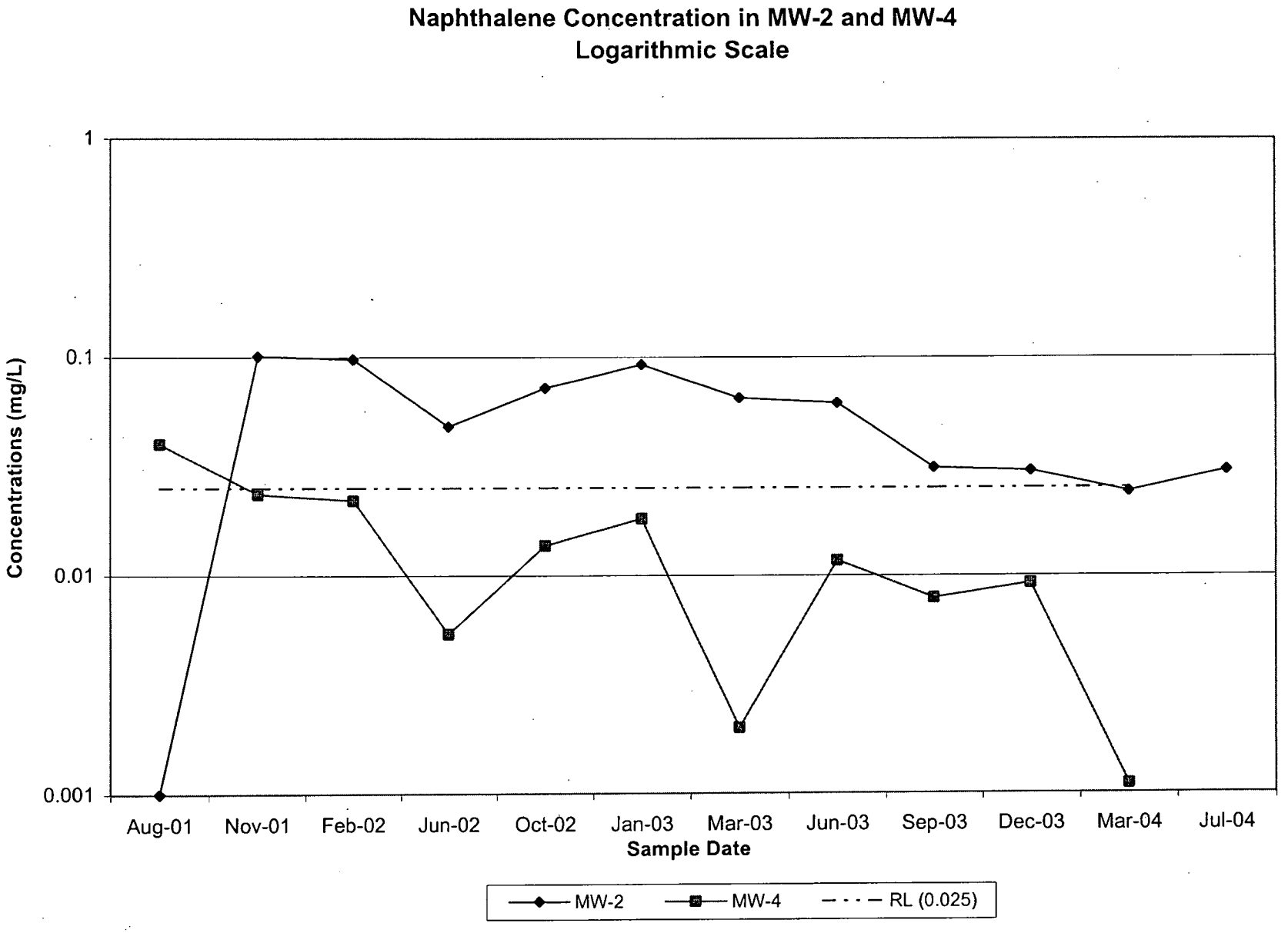
Date Received 7/6/04
Courier: SR
Hand Delivered ☒
Bill of Lading

APPENDIX C

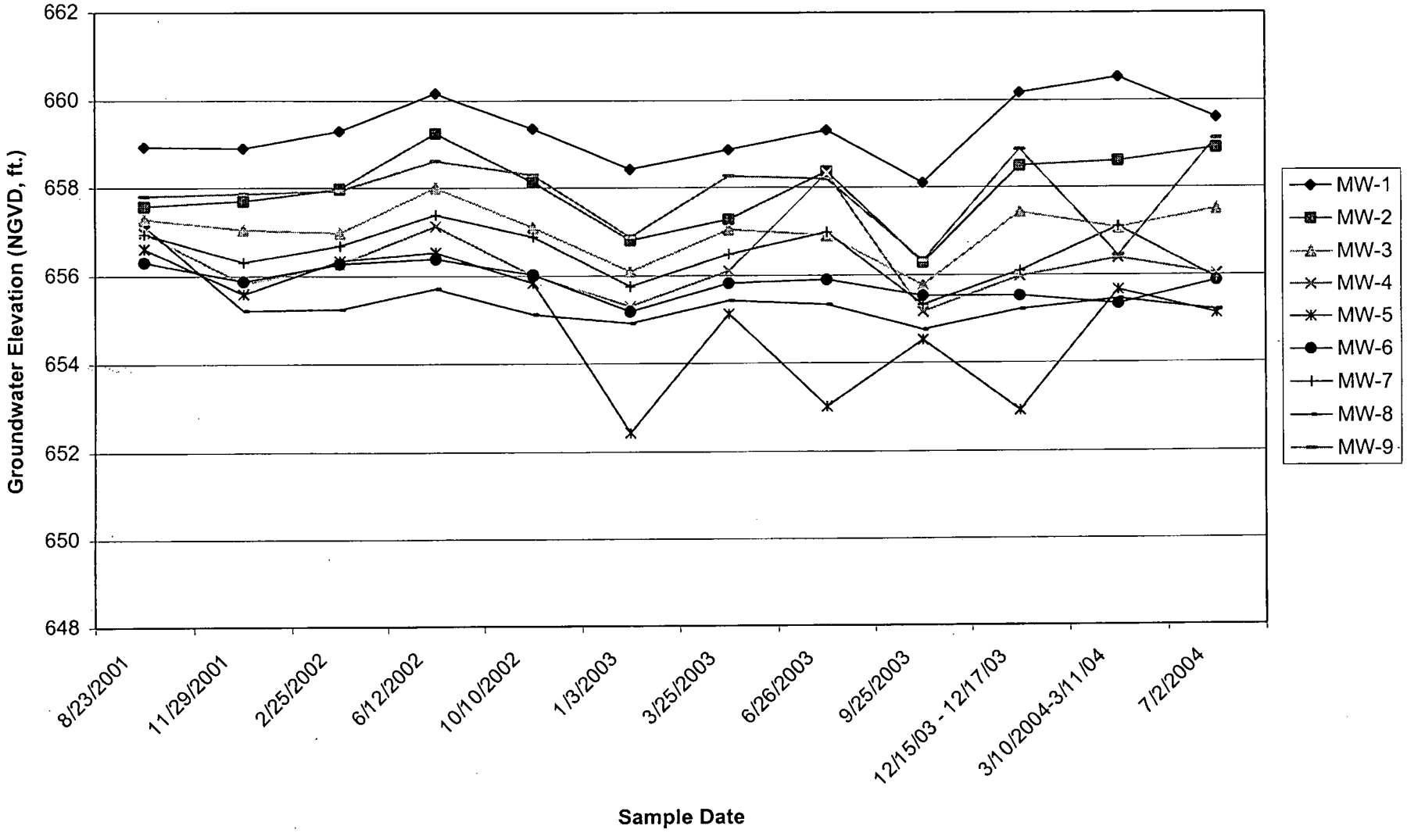
GRAPHS


Benzene Concentration in MW-2 and MW-4
Logarithmic Scale
Concentrations (mg/L)
1
0.1
0.01
0.001
Aug-01
Nov-01
Feb-02
Jun-02
Oct-02
Jan-03
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jul-04
Sample Date
MW-2
MW-4
RL (0.005)


Ethylbenzene Concentration in MW-2 and MW-4
Logarithmic Scale
Concentrations (mg/L)
1
0.1
0.01
0.001
Aug-01
Nov-01
Feb-02
Jun-02
Oct-02
Jan-03
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jul-04
Sample Date
MW-2
MW-4
RL


Naphthalene Concentration in MW-2 and MW-4
Logarithmic Scale
Concentrations (mg/L)
1
0.1
0.01
0.001
Aug-01
Nov-01
Feb-02
Jun-02
Oct-02
Jan-03
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jul-04
Sample Date
MW-2
MW-4
RL (0.025)

Monitoring Well Hydrograph, Building 1600A, Naval Station Great Lakes



APPENDIX D

CHECKLISTS

Weekly Checklist
Biosparge System - Building 1600A

TolTest No. 41791.01

Date: 4/22/04 Time: Inspected By: T. Boos

Biosparge System

Well #	North		Well #	South	
Main Voltage Check	_____	(voltage range)	Main Voltage Check	_____	(voltage range)
TSH-1001 Setpoint	_____	(deg. F.)	TSH-1001 Setpoint	_____	(deg. F.)
TSH-1002 Setpoint	_____	(deg. F.)	TSH-1002 Setpoint	_____	(deg. F.)
K-1001 Dis. Temp. at TI-1001	_____	(deg. F.)	K-1001 Dis. Temp. at TI-1001	_____	(deg. F.)
K-1001 Dis. Press. at PI-1001	_____	(psig)	K-1001 Dis. Press. at PI-1001	_____	(psig)
E-1001 Dis. Temp. at TI-1002	_____	(deg. F.)	E-1001 Dis. Temp. at TI-1002	_____	(deg. F.)
E-1001 Dis. Press. at PI-1002	_____	(psig)	E-1001 Dis. Press. at PI-1002	_____	(psig)
FI-1001 Air flow	_____	(cfm)	FI-1001 Air flow	_____	(cfm)

Comments/Maintenance Performed: Both North and South Shed/Blower units were not operating. North shed indicated "spare blower TAH"; and south shed indicated "Heat Exchanger TAH"

Monitoring Wells

Well #	Pressure (in. of water)	PID (ppm)	SWL (ft.)	Comments
MW-1				
MW-2				
MW-3				
MW-4				
MW-5				
MW-6				
MW-7				
MW-8				
MW-9				

NOTES: Oil changed, units greased and both systems restarted.

Functional Performance Checklist

Checklist Item	Initails	Date
Subsurface		
No piping/well pneumatic leaks		
Water level rise within specification tolerances		
Monitoring point compositions within expected ranges (if measured)		
Monitoring point pressures and temperatures within expected ranges		
Blowers		
Start/stop from all control mechanisms		4/22/04
Operating points match blower curve specification for flow rate vs. pressure through start-up		
Current draw and voltage balance match specifications for all phases		
No excessive vibration/noise/temperature rise		
Systems		
Air treatment system (heat exchangers) performance meets specifications		
Control system operates within set parameters		
Monitoring systems/instruments hold calibration		

Weekly Checklist
Biosparge System - Building 1600A

TolTest No. 41791.01

Date: 4/29/04 Time: Inspected By: T. Boos

Biosparge System

Well #	North		Well #	South	
Main Voltage Check		(voltage range)	Main Voltage Check		(voltage range)
TSH-1001 Setpoint		(deg. F.)	TSH-1001 Setpoint		(deg. F.)
TSH-1002 Setpoint		(deg. F.)	TSH-1002 Setpoint		(deg. F.)
K-1001 Dis. Temp. at TI-1001	170	(deg. F.)	K-1001 Dis. Temp. at TI-1001	200	(deg. F.)
K-1001 Dis. Press. at PI-1001	5	(psig)	K-1001 Dis. Press. at PI-1001	6.5	(psig)
E-1001 Dis. Temp. at TI-1002	102	(deg. F.)	E-1001 Dis. Temp. at TI-1002	108	(deg. F.)
E-1001 Dis. Press. at PI-1002	3	(psig)	E-1001 Dis. Press. at PI-1002	3	(psig)
FI-1001 Air flow	147	(cfm)	FI-1001 Air flow	80	(cfm)

Comments/Maintenance Performed: AF = 9" wc | AF = 10" wc

reset Airflow to 120 cfm | reset air flow to 105 CFM

Monitoring Wells

Well #	Pressure (in. of water)	PID (ppm)	SWL (ft.)	Comments
MW-1				
MW-2				
MW-3				
MW-4				
MW-5				
MW-6				
MW-7				
MW-8				
MW-9				

NOTES:

Functional Performance Checklist

Checklist Item	Initails	Date
Subsurface		
No piping/well pneumatic leaks		
Water level rise within specification tolerances		
Monitoring point compositions within expected ranges (if measured)		
Monitoring point pressures and temperatures within expected ranges		
Blowers		
Start/stop from all control mechanisms	TAB	4/29/04
Operating points match blower curve specification for flow rate vs. pressure through start-up	TAB	4/29/04
Current draw and voltage balance match specifications for all phases	TAB	4/29/04
No excessive vibration/noise/temperature rise	TAB	4/29/04
Systems		
Air treatment system (heat exchangers) performance meets specifications	TAB	4/29/04
Control system operates within set parameters	TAB	4/29/04
Monitoring systems/instruments hold calibration	TAB	4/29/04

Weekly Checklist
Biosparge System - Building 1600A

TolTest No. 41791.01

Date: 5/13/04 Time: 9:30 Inspected By: T. Boos

Biosparge System

Well #	North		Well #	South	
Main Voltage Check		(voltage range)	Main Voltage Check		(voltage range)
TSH-1001 Setpoint		(deg. F.)	TSH-1001 Setpoint		(deg. F.)
TSH-1002 Setpoint		(deg. F.)	TSH-1002 Setpoint		(deg. F.)
K-1001 Dis. Temp. at TI-1001		(deg. F.)	K-1001 Dis. Temp. at TI-1001	160°	(deg. F.)
K-1001 Dis. Press. at PI-1001		(psig)	K-1001 Dis. Press. at PI-1001	4.5	(psig)
E-1001 Dis. Temp. at TI-1002		(deg. F.)	E-1001 Dis. Temp. at TI-1002	92°	(deg. F.)
E-1001 Dis. Press. at PI-1002		(psig)	E-1001 Dis. Press. at PI-1002	3.0	(psig)
FI-1001 Air flow		(cfm)	FI-1001 Air flow	105	(cfm)

Comments/Maintenance Performed:

system fault "sparge blower TAH" reset system. Then changed oil and lube unit.

AF= 14" WC
change oil and lube unit.

Monitoring Wells

Well #	Pressure (in. of water)	PID (ppm)	SWL (ft.)	Comments
MW-1				
MW-2				
MW-3				
MW-4				
MW-5				
MW-6				
MW-7				
MW-8				
MW-9				

NOTES:

Functional Performance Checklist

Checklist Item	Initails	Date
Subsurface		
No piping/well pneumatic leaks		
Water level rise within specification tolerances		
Monitoring point compositions within expected ranges (if measured)		
Monitoring point pressures and temperatures within expected ranges		
Blowers		
Start/stop from all control mechanisms	TKB	5/13
Operating points match blower curve specification for flow rate vs. pressure through start-up	TKB	5/13
Current draw and voltage balance match specifications for all phases	TKB	5/13
No excessive vibration/noise/temperature rise	TKB	5/13
Systems		
Air treatment system (heat exchangers) performance meets specifications	TKB	5/13
Control system operates within set parameters	TKB	5/13
Monitoring systems/instruments hold calibration	TKB	5/13

Contract No. N68950-00-D-0200

Weekly Checklist
Biosparge System - Building 1600A

TolTest No. 41791.01

Date: 6/2/04 Time: Inspected By: T. Boos

Biosparge System

Well #	North		Well #	South	
Main Voltage Check		(voltage range)	Main Voltage Check		(voltage range)
TSH-1001 Setpoint		(deg. F.)	TSH-1001 Setpoint		(deg. F.)
TSH-1002 Setpoint		(deg. F.)	TSH-1002 Setpoint		(deg. F.)
K-1001 Dis. Temp. at TI-1001	208	(deg. F.)	K-1001 Dis. Temp. at TI-1001	168	(deg. F.)
K-1001 Dis. Press. at PI-1001	8	(psig)	K-1001 Dis. Press. at PI-1001	5	(psig)
E-1001 Dis. Temp. at TI-1002	94	(deg. F.)	E-1001 Dis. Temp. at TI-1002	88	(deg. F.)
E-1001 Dis. Press. at PI-1002	3	(psig)	E-1001 Dis. Press. at PI-1002	3.5	(psig)
FI-1001 Air flow	105	(cfm)	FI-1001 Air flow	91	(cfm)

Comments/Maintenance Performed: Air filter = 7" wc | AF = <20" wc

replaced filter (Air)

Monitoring Wells

Well #	Pressure (in. of water)	PID (ppm)	SWL (ft.)	Comments
MW-1				
MW-2				
MW-3				
MW-4				
MW-5				
MW-6				
MW-7				
MW-8				
MW-9				

NOTES:

Functional Performance Checklist

Checklist Item	Initails	Date
Subsurface		
No piping/well pneumatic leaks		
Water level rise within specification tolerances		
Monitoring point compositions within expected ranges (if measured)		
Monitoring point pressures and temperatures within expected ranges		
Blowers		
Start/stop from all control mechanisms	TAB	6/2
Operating points match blower curve specification for flow rate vs. pressure through start-up	TAB	6/2
Current draw and voltage balance match specifications for all phases	TAB	6/2
No excessive vibration/noise/temperature rise	TAB	6/2
Systems		
Air treatment system (heat exchangers) performance meets specifications	TAB	6/2
Control system operates within set parameters	TAB	6/2
Monitoring systems/instruments hold calibration	TAB	6/2

Contract No. N68950-00-D-0200

Weekly Checklist

Biosparge System - Building 1600A

TolTest No. 41791.01

Date: 6/11/04 Time: 8:30A Inspected By: T. Boos

Biosparge System

Well #	North		Well #	South	
Main Voltage Check	_____	(voltage range)	Main Voltage Check	_____	(voltage range)
TSH-1001 Setpoint	_____	(deg. F.)	TSH-1001 Setpoint	_____	(deg. F.)
TSH-1002 Setpoint	_____	(deg. F.)	TSH-1002 Setpoint	_____	(deg. F.)
K-1001 Dis. Temp. at TI-1001	_____	(deg. F.)	K-1001 Dis. Temp. at TI-1001	_____	(deg. F.)
K-1001 Dis. Press. at PI-1001	_____	(psig)	K-1001 Dis. Press. at PI-1001	_____	(psig)
E-1001 Dis. Temp. at TI-1002	_____	(deg. F.)	E-1001 Dis. Temp. at TI-1002	_____	(deg. F.)
E-1001 Dis. Press. at PI-1002	_____	(psig)	E-1001 Dis. Press. at PI-1002	_____	(psig)
FI-1001 Air flow	_____	(cfm)	FI-1001 Air flow	_____	(cfm)

Comments/Maintenance Performed:

Both units Not operating. Changed oil, air filters and greased both North and South units. Restarted system.

Monitoring Wells

Well #	Pressure (in. of water)	PID (ppm)	SWL (ft.)	Comments
MW-1				
MW-2				
MW-3				
MW-4				
MW-5				
MW-6				
MW-7				
MW-8				
MW-9				

NOTES:

Functional Performance Checklist

Checklist Item	Initails	Date
Subsurface		
No piping/well pneumatic leaks		
Water level rise within specification tolerances		
Monitoring point compositions within expected ranges (if measured)		
Monitoring point pressures and temperatures within expected ranges		
Blowers		
Start/stop from all control mechanisms		
Operating points match blower curve specification for flow rate vs. pressure through start-up		
Current draw and voltage balance match specifications for all phases		
No excessive vibration/noise/temperature rise		
Systems		
Air treatment system (heat exchangers) performance meets specifications		
Control system operates within set parameters		
Monitoring systems/instruments hold calibration		

TAB 6/11/04

Weekly Checklist
Biosparge System - Building 1600A

TolTest No. 41791.01

Date: 6/22/04 Time: 8:10 Inspected By: T. Boos

Biosparge System

Well #	North		Well #	South	
Main Voltage Check		(voltage range)	Main Voltage Check		(voltage range)
TSH-1001 Setpoint		(deg. F.)	TSH-1001 Setpoint		(deg. F.)
TSH-1002 Setpoint		(deg. F.)	TSH-1002 Setpoint		(deg. F.)
K-1001 Dis. Temp. at TI-1001	208	(deg. F.)	K-1001 Dis. Temp. at TI-1001	148°	(deg. F.)
K-1001 Dis. Press. at PI-1001	8	(psig)	K-1001 Dis. Press. at PI-1001	2.5	(psig)
E-1001 Dis. Temp. at TI-1002	96	(deg. F.)	E-1001 Dis. Temp. at TI-1002	90°	(deg. F.)
E-1001 Dis. Press. at PI-1002	3	(psig)	E-1001 Dis. Press. at PI-1002	3.5	(psig)
FI-1001 Air flow	89	(cfm)	FI-1001 Air flow	105	(cfm)

Comments/Maintenance Performed: AF = 6" WC
Oil Change & Lube
Reset/Adjusted Air flow to 119cfm

Air filter = 6" WC
Oil Change & Lube

Monitoring Wells

Well #	Pressure (in. of water)	PID (ppm)	SWL (ft.)	Comments
MW-1				
MW-2				
MW-3				
MW-4				
MW-5				
MW-6				
MW-7				
MW-8				
MW-9				

NOTES:

Functional Performance Checklist

Checklist Item	Initails	Date
Subsurface		
No piping/well pneumatic leaks		
Water level rise within specification tolerances		
Monitoring point compositions within expected ranges (if measured)		
Monitoring point pressures and temperatures within expected ranges		
Blowers		
Start/stop from all control mechanisms	JAB	6/22
Operating points match blower curve specification for flow rate vs. pressure through start-up	JAB	6/22
Current draw and voltage balance match specifications for all phases	JAB	6/22
No excessive vibration/noise/temperature rise	JAB	6/22
Systems		
Air treatment system (heat exchangers) performance meets specifications	JAB	6/22
Control system operates within set parameters	JAB	6/22
Monitoring systems/instruments hold calibration	JAB	6/22

Contract No. N68950-00-D-0200

Weekly Checklist
Biosparge System - Building 1600A

TolTest No. 41791.01

Date: 7/21/04 Time: 7:30 A Inspected By: T. Boos

Biosparge System

Well #	North		Well #	South	
Main Voltage Check		(voltage range)	Main Voltage Check		(voltage range)
TSH-1001 Setpoint		(deg. F.)	TSH-1001 Setpoint		(deg. F.)
TSH-1002 Setpoint		(deg. F.)	TSH-1002 Setpoint		(deg. F.)
K-1001 Dis. Temp. at TI-1001	206	(deg. F.)	K-1001 Dis. Temp. at TI-1001	158	(deg. F.)
K-1001 Dis. Press. at PI-1001	7	(psig)	K-1001 Dis. Press. at PI-1001	4.5	(psig)
E-1001 Dis. Temp. at TI-1002	108	(deg. F.)	E-1001 Dis. Temp. at TI-1002	98	(deg. F.)
E-1001 Dis. Press. at PI-1002	2.5	(psig)	E-1001 Dis. Press. at PI-1002	3	(psig)
FI-1001 Air flow	126	(cfm)	FI-1001 Air flow	114	(cfm)

Comments/Maintenance Performed:	
Air Filter = 6.5" WC	Air filter = 6.5" WC
Oil Change & Lube	Oil Change & Lube

Monitoring Wells

Well #	Pressure (in. of water)	PID (ppm)	SWL (ft.)	Comments
MW-1				
MW-2				
MW-3				
MW-4				
MW-5				
MW-6				
MW-7				
MW-8				
MW-9				

NOTES:

Functional Performance Checklist

Checklist Item	Initails	Date
Subsurface		
No piping/well pneumatic leaks		
Water level rise within specification tolerances		
Monitoring point compositions within expected ranges (if measured)		
Monitoring point pressures and temperatures within expected ranges		
Blowers		
Start/stop from all control mechanisms	TAB	7/21
Operating points match blower curve specification for flow rate vs. pressure through start-up	TAB	7/21
Current draw and voltage balance match specifications for all phases	TAB	7/21
No excessive vibration/noise/temperature rise	TAB	7/21
Systems		
Air treatment system (heat exchangers) performance meets specifications	TAB	7/21
Control system operates within set parameters	TAB	7/21
Monitoring systems/instruments hold calibration	TAB	7/21