FINAL
Abbreviated Remedial Action Objective (RAO) and Remedial System Decommission Completion Report Environmental Restoration Program Site 7

152nd Airlift Wing
Nevada Air National Guard Base
Reno, Nevada

May 2009

ANG/CEVR
Andrews AFB, Maryland

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Nevada Air National Guard Base
Reno, Nevada

May 2009

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LIST OF ACRONYMS AND ABBREVIATIONS

ANG	Air National Guard
ANGB	Air National Guard Base
ASG	Automated Science Group, Inc.
ASTM	American Society for Testing and Materials
bgs	Below ground surface
BOD	Biological oxygen demand
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
COD	Chemical oxygen demand
DO	Dissolved oxygen
ERM	ERM-West, Inc.
ERP	Environmental Restoration Program
FAA	Federal Aviation Administration
GAC	Granular activated carbon
JP-4	Jet propulsion fuel No. 4
JP-8	Jet propulsion fuel No. 8
MCL	Maximum contaminant level
µg/L	Micrograms per liter
µS/cm	Micro Siemens per centimeter
mg/L	Milligrams per liter
MTBE	Methyl tertiary-butyl ether
NDEP	Nevada Division of Environmental Protection
NTU	Nephelmetric turbidity units
ORC	Oxygen-releasing compound
ORNL/ETS	Oak Ridge National Laboratories/Environmental Technologies Section
ORP	Oxygen-reduction potential
PID	Photoionization detector
ppm	Parts per million
PRG	Preliminary remediation goal
PVC	Polyvinyl chloride
RAO	Remedial action objective
RI	Remedial Investigation

LIST OF ACRONYMS AND ABBREVIATIONS

RPO	Remedial process optimization
SI	Site Investigation
SVOC	Semivolatile organic compound
TPH	Total petroleum hydrocarbons
TPH-av	Total petroleum hydrocarbons as aviation gas
TPH-d	Total petroleum hydrocarbons as diesel
TPH-g	Total petroleum hydrocarbons as gasoline
TPH-o	Total petroleum hydrocarbons as heavy oil
USEPA	United States Environmental Protection Agency
UST	Underground storage tank
VOC	Volatile organic compound

EXECUTIVE SUMMARY

ERM-West, Inc. (ERM) has prepared this *Final Abbreviated Remedial Action Objective (RAO) and Remedial System Decommission Completion Report* (Report) to summarize the results of field activities at Environmental Restoration Program (ERP) Site 7 at the 152nd Airlift Wing, Nevada Air National Guard Base (ANGB), in Reno, Nevada. The objectives of these field activities were to:

- Delineate the distribution and concentrations of the dissolved-phase hydrocarbon plume in and around ERP Site 7 at the Reno, Nevada, ANGB; and assess natural attenuation and oxygen demand in support of potential future remediation efforts at ERP Site 7; and

- Decommission the ERP Site 7 former groundwater extraction and treatment system (remedial system).

Activities for the field investigation at ERP Site 7 included collection of groundwater samples from six temporary wells and 19 permanent groundwater monitoring wells. Each groundwater sample was analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPH-g), aviation gas (TPH-av), heavy oil (TPH-o), and diesel fuel (TPH-d); and volatile organic compounds (VOCs), including methyl tertiary-butyl ether (MTBE). Temporary well samples were also analyzed for biological oxygen demand and chemical oxygen demand.

Visual and field screening of soils with a photoionization detector (PID) during the installation of the temporary wells suggest hydrocarbon impacts in soils at one location (GP-10). Diffuse vapor-phase impacts near the water table were recorded with the PID at the three borings located in areas with known groundwater impact, and no visual or PID-detectable impacts were recorded in off-site areas south of the Federal Aviation Administration control tower (GP-11 and GP-12). Impacts observed at GP-10 suggest a small lens of residual soil contamination at the water table.

Groundwater contaminant concentrations were screened against the current United States Environmental Protection Agency Region 9 maximum contaminant levels (MCLs) to define the area of impact. Although MTBE was detected in several screening-level and monitoring

well groundwater samples, the source of the MTBE is believed to originate from an off-site upgradient source and is not related to releases at Site 7.

Benzene and ethylbenzene were detected in the screening-level groundwater samples above the applicable MCLs. TPH-av, TPH-g, and xylenes were also detected in one or more screening-level groundwater samples. TPH-d and TPH-o were not detected.

Results from sampling of the permanent groundwater monitoring wells in October 2008 are summarized as follows:

- TPH-d and TPH-o were not detected in any groundwater monitoring well.
- TPH-av and TPH-g were detected in four wells. TPH-g concentrations ranged from 1.7 to 4.0 milligrams per liter (mg/L), and TPH-av concentrations ranged from 0.54 to 1.9 mg/L.
- Benzene was detected above the MCL of 5 micrograms per liter (µg/L) in four wells. The highest detection was 2,100 µg/L.

With the exception of MW-25, benzene concentrations have generally decreased between the May 2007 and October 2008 groundwater monitoring events, as shown below:

Well ID	May 2007 Concentration (µg/L)	October 2008 Concentration (µg/L)
MW-06	3.9	Nondetect
MW-07	290	230
MW-25	19	2,100
T-5	340	310
T-11	3,800	Nondetect
T-21	1,600	120
T-22	360	Nondetect
T-23	510	Nondetect

There were no detections of benzene or other constituents of concern in off-site areas during this investigation. The results of this and prior investigations show that petroleum impacts in groundwater have been delineated in ERP Site 7, except for northeast of the former underground storage tanks (USTs). One well to the south of the USTs has also had intermittent detections of benzene above the MCL.

Field-collected groundwater quality measurements of dissolved oxygen (DO) and oxygen-reduction potential (ORP) indicate that oxygen continues to be the limiting factor to the aerobic degradation of petroleum impacts at ERP Site 7. Low DO concentrations and negative ORP values were detected across most of the site, indicating that field conditions are generally anaerobic and reducing. Strongly reducing conditions correlate strongly with benzene, toluene, ethylbenzene, and total xylene detections.

This work also included decommissioning of the existing remedial system. Decommissioning of the remedial system involved disconnecting electricity and de-energizing the remedial system, disposing of waste materials and non-recyclable or re-usable component, decontaminating petroleum-impacted items, removing all items from the building associated with the remedial system, and discarding or transporting all removed items. The remedial system and all associated solid and liquid waste has been successfully removed.

SECTION 1.0

INTRODUCTION

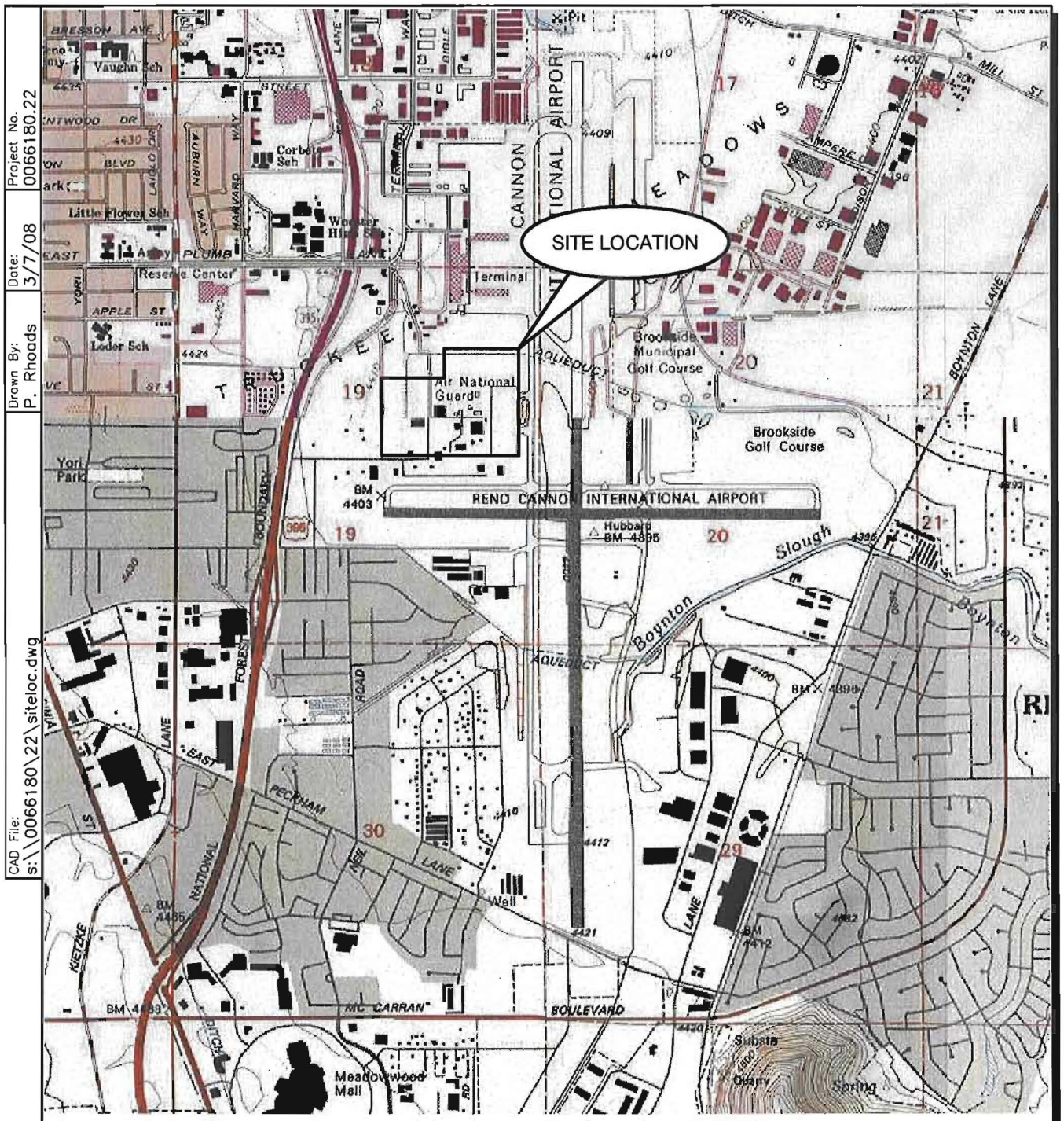
ERM-West, Inc. (ERM) has prepared this *Final Abbreviated Remedial Action Objective (RAO) and Remedial System Decommission Completion Report* (Report) to summarize the results of field activities at Environmental Restoration Program (ERP) Site 7 at the 152nd Airlift Wing, Nevada Air National Guard Base (ANGB), in Reno, Nevada (Figure 1-1). This work was performed on behalf of the Air National Guard (ANG) ERP under Contract DAHA92-01-D-0005, Delivery Order 0108. The ANG/ERP Branch is providing technical and project management oversight for this RAO on behalf of the ANG.

The Reno-Tahoe International Airport complex is approximately 5 miles southeast of downtown Reno, Nevada (Figure 1-1). The ANGB presently occupies approximately 60 acres of land in the southern portion of the northwestern quadrant of the airport complex. ERP Site 7 is located at the former Petroleum, Oil, and Lubricants Storage Area at the 152nd Airlift Wing; on the southern portion of the ANGB, adjacent to the Aircraft Parking Apron Area (Figure 1-2).

The purpose of this report is to summarize the RAO field activities implemented between October and December 2008 at the ANGB (Figure 1-2). The RAO was performed in accordance with the *Final Abbreviated Remedial Action Objective (RAO) and Remedial System Decommission Work Plan* (Work Plan) (ERM, 2008a).

1.1 Project Objectives and Scope

The following subsections summarize the objectives and scope of the Report, the field investigation conducted at ERP Site 7, and the decommissioning of the groundwater extraction and treatment system (remedial system) located at ERP Site 7.



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References:
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U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle,
Reno, Nevada
Version: 1978; Current: 1982

Figure 1-1
Reno ANG Location Map
152nd Airlift Wing
Nevada Air National Guard
Reno, Nevada

ERM 3/08

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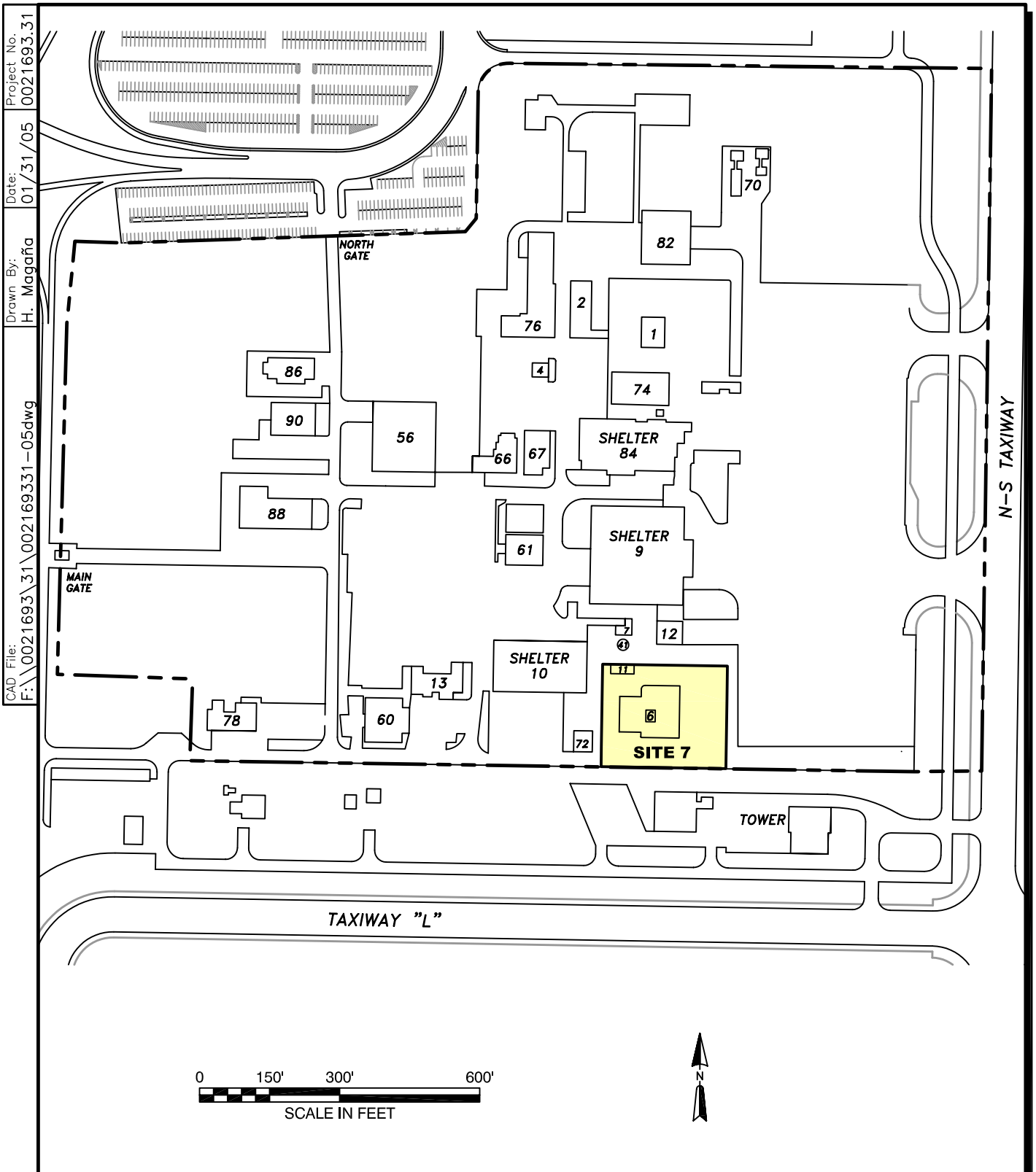

SOURCE: ORNL/ETS, 1994

LEGEND

	ERP Site
	Base Boundary
SITE 7	Former Petroleum, Oil, and Lubricants (POL) Storage Area

Figure 1-2
ERP Site 7 Location Map
152nd Airlift Wing
Nevada Air National Guard
Reno, Nevada

ERM 02/05

1.1.1 Objectives and Scope of the Report

The specific objectives of this Report are as follows:

- Describe the field methods and procedures, analytical program, and data evaluation completed during the field investigation;
- Summarize activities conducted as part of the remedial system decommissioning; and
- Document waste removal and other activities performed as part of the remedial system decommissioning.

1.1.2 Objectives and Scope of the Remedial Action Objective Field Investigation

The overall objective of the field investigation was to delineate the distribution and concentrations of the dissolved-phase hydrocarbon plume in and around ERP Site 7 at the Reno, Nevada, ANGB. In addition, the field investigation was intended to assess natural attenuation and oxygen demand in support of potential future remediation efforts at ERP Site 7. Investigation activities for the field investigation at ERP Site 7 included collection of groundwater samples from six temporary wells and 19 permanent groundwater monitoring wells.

1.1.3 Objectives and Scope of the Remedial System Decommissioning

The overall objective and scope of the remedial system decommissioning was to remove all aboveground components of the former groundwater extraction, treatment, and re-injection system; including equipment, piping, and used granular activated carbon (GAC).

1.3 Report Structure

This Report provides a description of the activities for the site assessment and is organized into eight sections and five appendices. Following this introduction, this Report is organized as follows:

- Section 2.0 discusses the history of ERP Site 7.

- Section 3.0 details the field activities conducted during October through December 2008.
- Section 4.0 presents an overview of quality assurance/quality control measures used during the October through December 2008 field event.
- Section 5.0 presents the findings for the October through December 2008 field event.
- Section 6.0 summarizes tasks performed to decommission the remedial system.
- Section 7.0 presents conclusions and recommendations.
- Section 8.0 lists references used in preparing this Report.

Appendix A contains borehole logs for soils identified in the site investigation. Appendix B provides the survey report for the borehole locations. Appendix C contains copies of the groundwater sampling logs. Appendix D contains the laboratory analytical results from the October 2008 sampling event. Appendix E contains the Quality Assurance/ Quality Control Data Review Report.

SECTION 2.0

SITE BACKGROUND

The following sections provide background information and summarize previous investigations conducted at the site.

2.1 Site Location

The Reno-Tahoe International Airport complex is approximately 5 miles southeast of downtown Reno, Nevada (Figure 1-1). The ANGB presently occupies approximately 60 acres of land in the southern portion of the northwestern quadrant of the airport complex.

2.2 Air National Guard Base Operations

In April 1948, the ANGB was established as the 192nd Fighter Squadron. This designation was changed to the 192nd Fighter Bomber Squadron in April 1951. The unit was re-designated as the 192nd Fighter Interceptor Squadron in June 1955 and retained this designation until April 1958, when the unit was renamed the 152nd Fighter Group. In February 1961, the 152nd Fighter Group acquired the designation of the 152nd Reconnaissance Group (Automated Science Group, Inc. [ASG], 1989). In 1996, the mission of the ANGB changed and it currently houses the 152nd Airlift Wing.

Initially, the ANGB was equipped with P-51 aircraft and was located at the Stead Army Air Base in Reno, Nevada. In 1953, the ANGB leased 29 acres of land at Hubbard Field (Reno-Tahoe International Airport) from the City of Reno. ANGB operations were moved from Stead Army Air Base to their present location in 1954. F-86A aircraft were assigned to the ANGB from 1956 until 1961, when the group converted to RB-57 aircraft. In 1965, the ANGB converted to RF-101 aircraft, which were flown until 1975, when the ANGB converted to RF-4C aircraft (ASG, 1989). Because of its change in mission in 1996, the ANGB now uses C-130 aircraft.

2.3 Site Release History

ERP Site 7 is the former Petroleum, Oil, and Lubricants Storage Area at the Reno ANGB. This area consisted of four 25,000-gallon underground storage tanks (USTs) holding jet propulsion fuel No. 4 (JP-4) for flight-line operations and ancillary equipment. These JP-4 USTs had been in the ground for over 30 years (ASG, 1989).

Numerous small JP-4 spills occurred around the refueling stand area of Building 42. Most of the spills occurred between 1973 and 1985, when the fuel trucks were top-loading vehicles. On several occasions, JP-4 spills of up to 1,000 gallons occurred in this area. A fuel spill of up to 300 gallons occurred in June 1986 when a bottom-loading shutoff valve on a refueling unit failed to operate properly. Other smaller spills of up to 100 gallons occurred during defueling of fuel trucks. Prior to the early 1980s, most of these spills were flushed into the soil/graveled areas surrounding the refueling stand (ASG, 1989).

2.4 Surrounding Land Uses

The land use to the south and west of the ANGB is industrial and residential. Immediately east and north of the ANGB is the Reno-Tahoe International Airport.

2.5 Previous Project Activities

The following subsections summarize previous investigations and remediation conducted at the site as part of the ERP at the ANGB.

2.5.1 Remedial Investigations

In June 1988, ASG conducted a Preliminary Assessment at the ANGB. It focused on past and present generation, use, handling, and disposal practices of hazardous waste and materials. Site 7 was one of eight sites identified in the Preliminary Assessment as potentially contaminated with hazardous materials/waste and was recommended for further ERP investigations.

A Site Investigation (SI) was conducted at the ANGB by Oak Ridge National Laboratories/Environmental Technologies Section (ORNL/ETS)

under agreement with the Hazardous Waste Remedial Action Program operated by Energy Systems, Inc., in Oak Ridge, Tennessee. The results of the SI were reported in April 1994. The SI recommended a Remedial Investigation (RI)/Feasibility Study for Site 7 due to the presence of soil contamination above Nevada Division of Environmental Protection (NDEP) remediation criteria for total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs); and groundwater contamination above NDEP remediation criteria for benzene.

ERM conducted an RI in 1995 and concluded that groundwater at Site 7 contained concentrations of benzene and bis(2-ethylhexyl)phthalate exceeding their respective action levels. It was suspected that the area of groundwater impacted by benzene might extend beyond the borders of the Reno ANGB. However, it was not anticipated that the benzene-impacted groundwater extended a significant distance south of the ANGB fence line. Based on the RI data, it was recommended that a Feasibility Study be performed to evaluate remedial alternatives for product removal and soil and groundwater remediation at the site.

2.5.2 Engineering Evaluation/Cost Analysis

An Engineering Evaluation/Cost Analysis (ERM, 1996) recommended the following two remedial actions for Site 7:

- Asphalt capping and floating product recovery; and
- Groundwater extraction with aboveground treatment and re-injection.

2.5.3 Groundwater Monitoring

A groundwater monitoring program was instituted at the ANGB in 1994 and continued until October 2003. Data collected during these sampling events have been summarized in quarterly monitoring reports prepared by ORNL/ETS and ERM. Groundwater samples were collected for analyses of TPH, VOCs, and SVOCs.

2.5.4 Remedial Actions

This section summarizes the remedial actions completed to date at ERP Site 7. A map showing the general areas of these prior remedial actions is included as Figure 2-1.

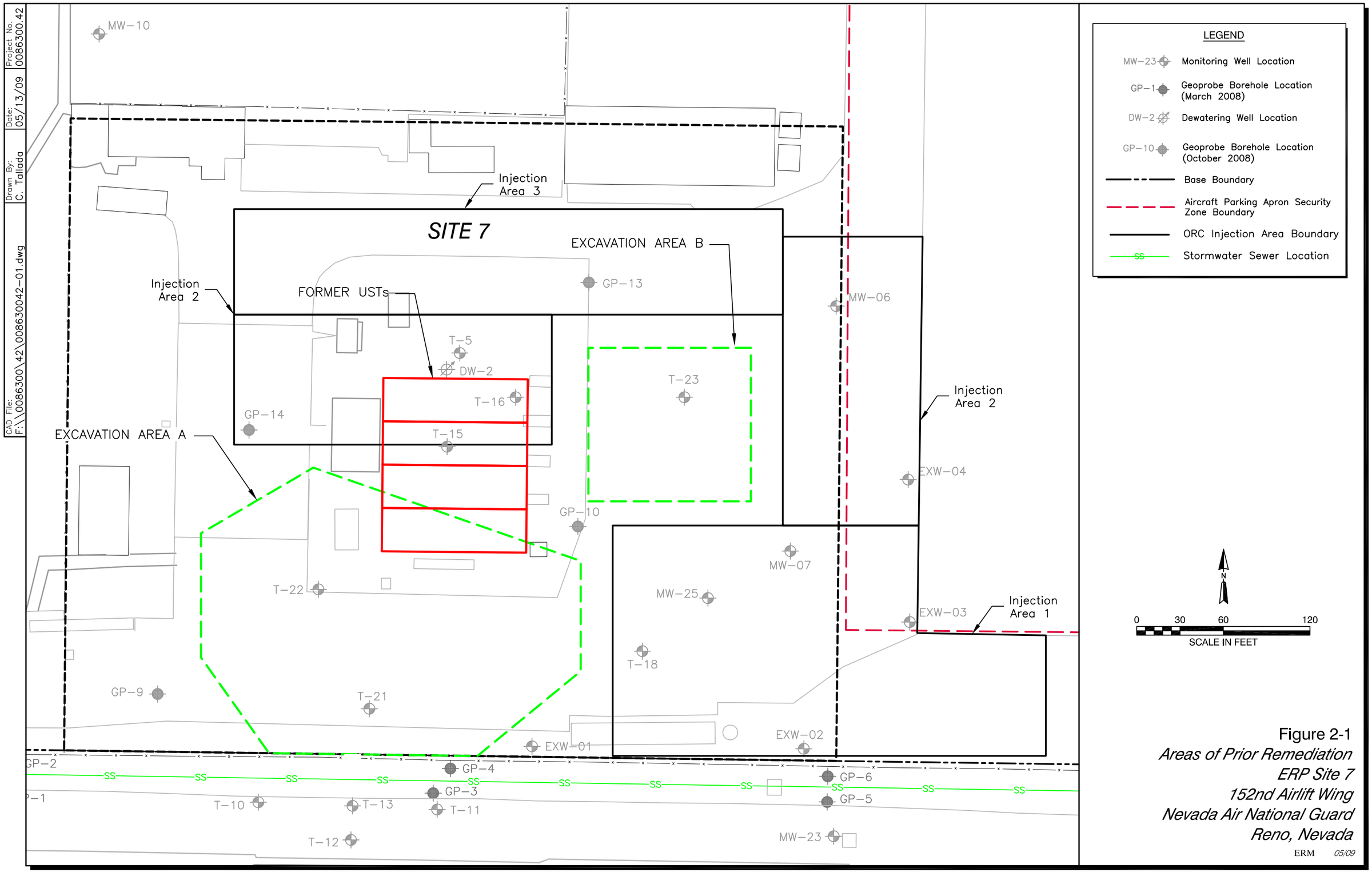

Figure 2-1
Areas of Prior Remediation
ERP Site 7
152nd Airlift Wing
Nevada Air National Guard
Reno, Nevada

Product Recovery and Groundwater Extraction and Treatment

In May through June 1995, a product removal and storage system, consisting of a pneumatic skimmer pump placed within well T-3 and an aboveground storage tank, was installed by ERM to treat groundwater impacted by petroleum hydrocarbons (ERM, 1999). To expedite product recovery, a second skimmer pump was installed in well T-8 in March 1997. The system was shut down in September 1998 due to decreasing product recovery rates.

In accordance with the Engineering Evaluation/Cost Analysis (ERM, 1996) recommendations, the NGB contracted with Abatement Environmental Resources to construct a new groundwater extraction, treatment, and injection system. Construction began in September 1997. ERM was contracted to operate and maintain the treatment system, which began operation in July 1998.

In early 2000, ERM concluded that the groundwater extraction, treatment, and injection system required modifications to effectively address the free product and impacted groundwater present at the site. ERM proposed system modifications to the ANG and subsequently completed those modifications in August 2000. The treatment system was restarted on 10 August 2000. Details of the treatment system modifications are discussed in the *System Modifications and Restart Summary Report* (ERM, 2000). During September and October 2003, groundwater extraction activities were terminated due to the decommissioning and removal of the four 25,000-gallon USTs at the site.

To verify that the estimated presence of free-phase product was the result of past releases and not from current fuel inventories, a sample of the product present in well T-4R was collected and analyzed in January 2001. Analytical results indicated that the product at ERP Site 7 is most likely JP-4, because the sample's flash point was much lower than that expected for jet propulsion fuel No. 8 (JP-8). However, the analysis suggested the possibility that the sample was a mixture of JP-4 and JP-8, due to the presence of highly volatile compounds and the absence of biodegradation.

To further assess the horizontal extent of the free product, four additional product monitoring wells (T-10 through T-13) were installed by ERM during August 2002 on Reno-Tahoe International Airport property adjacent to ERP Site 7. Subsequent water-level measurements (using a combined product- and water-level indicator) collected from the new

wells confirmed that no free-phase product is present in groundwater in this area.

Underground Storage Tank Removal

The four 25,000-gallon USTs were removed by the Reno ANG civil engineering group and a contractor (McGinley and Associates) in September and October 2003. To accommodate removal of the USTs, groundwater near the USTs was drawn down to approximately 12 feet below ground surface (bgs). The ANGB Civil Engineering group performed the dewatering by extracting approximately 110 gallons per minute from two newly installed groundwater extraction wells (DW-1 and DW-2).

As part of the UST removal work, monitoring wells T-1, T-3, T-6, and T-7 were destroyed due to the excavation activities. Four new wells (three vertical, T-14 through T-16; and one horizontal, TRW-1) were installed at ERP Site 7 by the contractor to replace these wells. Piping related to the groundwater extraction system was also damaged as part of the UST removals, effectively shutting down operation of the treatment system pending repair. The UST removal work did not include significant removal of impacted soil to address site contamination. Completion reports for this work are not currently available to ERM.

Remedial Process Optimization

In March 2004, a remedial process optimization (RPO) study was conducted by BB&E Consultants to evaluate the effectiveness of the current remedial approach conducted at ERP Site 7. The RPO study recommended that the optimal choice for future remediation at the site would be removal of the impacted soil in the source area with residual groundwater treatment through either chemical oxidant or enhanced bioremediation.

Remedial Design and Remedial Implementation

To support the RPO recommendations, a Remedial Design Pre-Design Study was conducted by ERM during September and October 2004. This phase consisted of sample collection from six existing monitoring wells (MW-06, MW-07, MW-23, MW 24R, MW-25, and MW-26) to assess current dissolved-phase concentrations in groundwater; and the installation of 10 temporary piezometers and four permanent monitoring wells (T-17 through T-20) to further assess the horizontal extent of free product at the site. These additional measurement points indicated that the free-product plume at the site extended further west than previously thought. In

addition, soil samples were collected from the 10 piezometer boring locations (at a depth of 2.5 feet) to assess impacts to overlying soil at the site. Results from the 2004 soil and groundwater sampling indicated that benzene concentrations exceeded United States Environmental Protection Agency (USEPA) Region 9 Preliminary Remediation Goals (PRGs) in three wells and one soil sample location.

To implement the selected remedial alternative outlined in the RPO study, ERM oversaw the removal of product-saturated soils at ERP Site 7. ERM excavated and disposed of approximately 6,000 cubic yards of jet-fuel-impacted soil in a period of 6 weeks. Over 300,000 gallons of water that infiltrated the excavation was also treated and disposed of under an existing National Pollutant Discharge Elimination System permit. Backfilling and compaction was completed immediately after excavation confirmation sampling, followed by complete site restoration in spring 2006.

The results of the soil excavation confirmation sampling showed that soils at the excavation limits are impacted with hydrocarbons and VOCs above the cleanup goals. Visual inspection and screening of the soils with a photoionization detector (PID) suggest that the bulk of the residual contamination is located within 1 to 2 feet of the water table and is representative of smear zone and capillary fringe impacts from the former plume of floating free-phase product and the existing dissolved-phase plume. Additional funding was not available at the time of this work to complete additional excavation to reach remedial goals at all excavation sidewalls. Additionally, excavation would not be technically feasible or practical in some directions because of the location of the flight apron, vicinity of building foundations, and proximity to previously excavated areas (ERM, 2009).

To address residual dissolved-phase impacts, ERM placed 1,425 pounds of oxygen-releasing compound (ORC) within the excavation backfill. In addition, during backfill operations, an impermeable layer was installed along the southern portion of ERP Site 7 to preclude migration of dissolved-phase impacts along the storm water utility line.

To address dissolved-phase impacts in the upgradient and downgradient areas of ERP Site 7 groundwater, ERM also placed an additional 5,400 pounds of ORC slurry via 180 direct-push injection locations at the site during spring 2006.

2.5.5 Remedial Performance Monitoring

Following the injection of ORC material, four quarterly groundwater monitoring events were conducted between August 2006 and May 2007. Biological indicators (oxygen and oxygen-reduction potential [ORP]) and decreases in concentrations of hydrocarbons after excavation and ORC injection activities in 2005 and 2006 indicated that the remediation was initially successful. By the final groundwater monitoring event in May 2007, benzene was the only constituent of concern that was still detected in groundwater monitoring wells at concentrations greater than the action levels, and biological indicators suggested that biological activity was slowing. Wells with high benzene levels in May 2007 were mainly located near the former USTs or the excavated areas south and west of the former USTs (ERM, 2008b).

2.5.6 Storm Sewer Line Investigation

In response to concerns from NDEP that the storm sewer line located to the south of ERP Site 7 had the potential to act as a conduit for movement of impacted groundwater, ERM conducted a storm sewer line assessment in March 2008 (ERM, 2008c). A total of eight borings were installed straddling the storm sewer line at four locations, and a groundwater sample was collected from each borehole. One sediment sample was also collected from the outfall of the storm sewer line. The results of this investigation showed one of the eight groundwater samples, located north of the storm water sewer line and south of the former USTs, contained benzene, toluene, ethylbenzene, and total xylenes (BTEX) at elevated concentrations consistent with local known groundwater impacts. Results indicated that impacted groundwater was not migrating along the storm sewer line.

SECTION 3.0

FIELD ACTIVITIES AND METHODS

This section describes the field activities performed during the October 2008 field event at the Reno ANGB. Investigation activities for the field investigation at ERP Site 7 included collection of groundwater samples from six temporary wells and 19 permanent groundwater monitoring wells. Boring and well locations are shown in Figure 3-1. All activities associated with decommissioning of the remedial system are described in Section 6.0.

3.1 Summary of Temporary Well Installation and Sampling Activities

Six temporary groundwater sampling points were installed and sampled on 29 and 30 October 2008. The field activities are detailed in the following subsections.

3.1.1 Subsurface Utility Clearance

The six proposed borehole locations were marked on the ground several weeks prior to performance to allow for subsurface utility clearance. The subsurface utility location procedures included the following:

- A construction permit was filed with the Reno-Tahoe Airport Authority on 15 October 2008;
- The Federal Aviation Administration (FAA) was contacted and the proposed field locations were reviewed and negotiated based upon subsurface utility locations;
- A utility clearance notification was filed with Underground Service Alert on 24 October 2008 as ticket # 560480;
- The physical drilling locations were screened for conductive utilities using electromagnetic detection techniques by Nevada Underground Locating on 29 October 2008; and

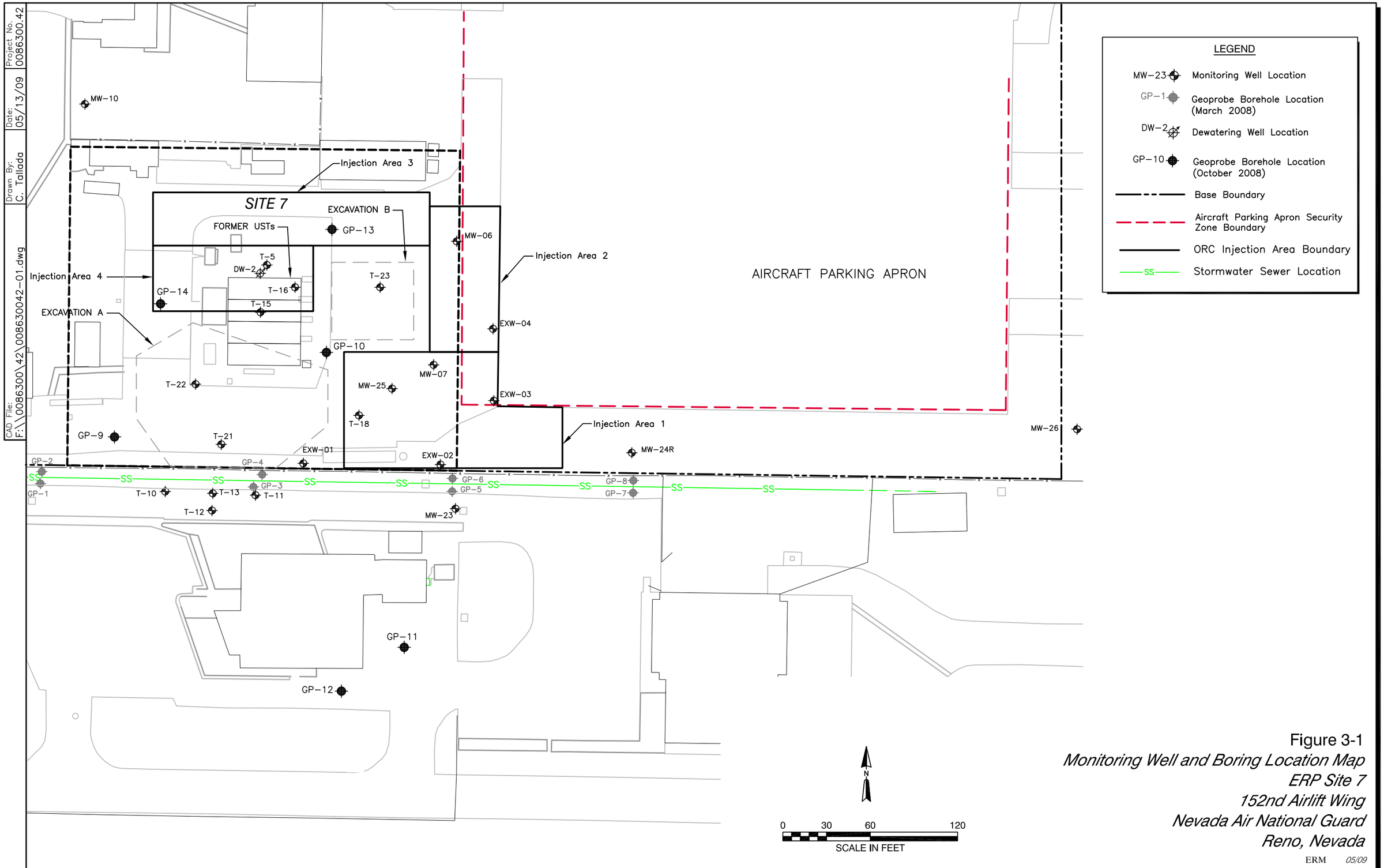

Figure 3-1
Monitoring Well and Boring Location Map
ERP Site 7
152nd Airlift Wing
Nevada Air National Guard
Reno, Nevada

ERM 05/09

- Each of the drilling locations was hand-cleared to a depth of 5 feet below ground surface (bgs) using hand tools prior to drilling.

Two of the boring locations proposed in the Draft Work Plan were found to conflict with utilities operated by the FAA. These two borings were relocated to areas without conflict, as indicated in the Final Work Plan.

3.1.2 Borehole Advancement

Six boreholes (GP-9 through GP-14) were advanced by Gregg Drilling of Martinez, California, at locations within ERP Site 7 and areas immediately south and southeast of the FAA control tower. The location of each borehole is noted in Figure 3-1. Borings were advanced by a combination of hand auger and direct-push drilling techniques. Borehole logs are provided in Appendix A.

Soils penetrated by the borings were classified according to the Unified Soil Classification System and American Society for Testing and Materials (ASTM) Designation D2488-00, *Description of Soils (Visual Manual Procedure)*. In addition, the soils were screened in the field for presence of VOCs using a PID using the headspace method.

Soil borings were advanced with the direct-push drilling rig to a completed depth of 12 to 16 feet bgs (Table 3-1). Each temporary well point was constructed of 0.75-inch-diameter, polyvinyl chloride (PVC) temporary well with a 5-foot-long screen with 0.010-inch slots. The temporary wells were discarded after each use.

Drill rods and the hand auger were decontaminated between each boring location by scrubbing with a brush and a liquinox soap solution and high-powered steam cleaning. Upon completion of the soil screening and groundwater sample collection, all equipment was removed from the borehole. The boreholes were abandoned by filling each hole with hydrated granular bentonite, and repairing the surface paving with black dyed concrete. All sample locations were surveyed upon completion of sampling activities.

3.1.3 Screening-Level Groundwater Sample Collection and Analysis

A screening-level groundwater sample was collected from each of the six temporary sample points. Groundwater was purged from each of the

TABLE 3-1

Summary of Screening-Level Groundwater Sampling Activities
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Boring Identification	Boring Location	Boring Method	Total Depth of Boring (feet bgs)	Boring Elevation (feet amsl)	Approx. Depth to Water [a] (feet bgs)	Approx. Sample Depth (feet bgs)	Duplicate Sample Collection	Comments and Deviations from Work Plan
GP-9	Southwest of the former USTs, west of monitoring well T-21	HA: 1 to 5 feet bgs DP: 5 to 12 feet bgs	12	4402.16	12.0	7 - 12		
GP-10	East of the former USTs, northwest of monitoring well MW-25	HA: 1 to 5 feet bgs DP: 5 to 16 feet bgs	16	4401.39	8.9	9 - 14		
GP-11	Southeast of the FAA building	HA: 1 to 5 feet bgs DP: 5 to 16 feet bgs	16	4403.26	11.2	11 - 16		Groundwater not purged prior to sampling due to slow recharge rate.
GP-12	South of the FAA building	HA: 1 to 5 feet bgs DP: 5 to 16 feet bgs	16	4403.64	10.6	11 - 16		GP-12 moved approx. 2 feet east due to refusal during HA. Groundwater not purged prior to sampling due to slow recharge rate.
GP-13	Northeast of the former USTs, northwest of monitoring well T-23	HA: 1 to 5 feet bgs DP: 5 to 16 feet bgs	16	4402.05	7.9	8 - 13	✓	GP-13 was moved approx. 3 feet west due to refusal during HA.
GP-14	Directly west of the former USTs, northwest of monitoring well T-22	HA: 1 to 5 feet bgs DP: 5 to 12 feet bgs	12	4404.35	8.6	7 - 12		

Notes and Key:

a = Measured depths to water based upon measurements collected in direct-push tooling, may not be reflective of the regional potentiometric surface.
amsl = Above mean sea level
Approx. = Approximate
bgs = Below ground surface
DP = Borehole advanced by direct-push drill rig
FAA = Federal Aviation Administration
HA = Borehole advanced by hand auger
UST = Underground storage tank

temporary sampling points using a peristaltic pump connected to disposable polyethylene tubing. To allow for the collection of water quality parameters from temporary sample points GP-9, GP-10, GP-13, and GP-14, the sample points were first purged through a flow-through, YSI-brand, multi-parameter, water quality meter. Groundwater was purged until the water quality parameters stabilized prior to the collection of the sample. Final groundwater quality measurements were recorded.

The samples at GP-11 and GP-12 were collected prior to the collection of the water quality parameters because lithologic observations suggested that the saturated zone at these borings was less extensive and conductive than was observed at the other borings. The water quality parameters at these borings were measured after sample collection. Both of these borings were purged until bubbles were observed in the tubing, suggesting that the boring was near to dry.

A groundwater sample was collected for each temporary sample point directly from the pump discharge into laboratory-supplied sample containers. Groundwater samples were analyzed for the constituents indicated on Table 3-2 and as follows:

- Purgeable TPH as gasoline by (TPH-g) USEPA Method 8015B;
- Extractable TPH as aviation gas (TPH-av), heavy oil (TPH-o), and diesel fuel (TPH-d) by USEPA Method 8015M, with an additional silica gel cleanup;
- VOCs, including methyl tertiary-butyl ether (MTBE), and TPH-g by USEPA Method 8260B;
- Biological oxygen demand (BOD) by USEPA Method 405.1; and
- Chemical oxygen demand (COD) by USEPA Method 410.4.

The groundwater samples were transported following chain-of-custody procedure to Alpha Analytical, Inc., of Sparks, Nevada, a Nevada-certified laboratory, for sample analysis.

3.2 Groundwater Monitoring Well Sampling Activities

The following subsections describe the groundwater monitoring well sampling activities conducted in October 2008.

TABLE 3-2
Summary of Samples and Analytical Parameters, October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Location/ Sample	Type	Sample Date	Parameters Analyzed			
			VOCs + MTBE	TPH-g, TPH-d, TPH-o, and TPH-av [1]	Biological oxygen demand	Chemical oxygen demand
		Analytical Method:	*8260B*	*8015M*	*405.1*	*410.4*
Direct-Push Borings						
GP-9	Groundwater	10/29/08	X	X	X	X
GP-10	Groundwater	10/29/08	X	X	X	X
GP-11	Groundwater	10/30/08	X	X	X	X
GP-12	Groundwater	10/30/08	X	X	X	X
GP-13	Groundwater	10/29/08	X	X	X	X
GP-13-D	Groundwater	10/29/08	X	X	X	X
GP-13-R	Groundwater	10/29/08	X	X	X	X
GP-14	Groundwater	10/29/08	X	X	X	X
Groundwater Monitoring Wells						
EXW-01	Groundwater	10/27/08	X	X		
EXW-02	Groundwater	10/27/08	X	X		
EXW-03	Groundwater	10/27/08	X	X		
EXW-04	Groundwater	10/28/08	X	X		
MW-06	Groundwater	10/30/08	X	X		
MW-07	Groundwater	10/28/08	X	X		
MW-10	Groundwater	10/28/08	X	X		
MW-23	Groundwater	10/30/08	X	X		
MW-24R	Groundwater	NS	X	X		
MW-25	Groundwater	10/27/08	X	X		
MW-26	Groundwater	10/28/08	X	X		
T-5	Groundwater	10/30/08	X	X		
T-10	Groundwater	10/30/08	X	X		
T-11	Groundwater	10/30/08	X	X		
T-12	Groundwater	10/30/08	X	X		
T-13	Groundwater	10/30/08	X	X		
T-18	Groundwater	10/27/08	X	X		
T-21	Groundwater	10/27/08	X	X		
T-21-D	Groundwater	10/27/08	X	X		
T-22	Groundwater	10/29/08	X	X		
T-23	Groundwater	10/30/08	X	X		
Field Quality Control Samples						
TB102708-1	Trip Blank	10/27/08	X	X		
TB102908-1	Trip Blank	10/29/08	X	X		
TB103008-1	Trip Blank	10/30/08	X	X		
T-21-102708-MS/MSD	Matrix Spike/Matrix Spike Duplicate	10/27/08	X	X		

TABLE 3-2
Summary of Samples and Analytical Parameters, October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Location/ Sample	Type	Sample Date	Parameters Analyzed			
			VOCs + MTBE	TPH-g, TPH-d, TPH-o, and TPH-av (1)	Biological oxygen demand	Chemical oxygen demand
T-21-FA	ASTM Type II Water Field Blank	10/27/08	X	X		
GP-13-102908-R	Equipment Rinsate Blank	10/29/08	X	X	X	X

Notes:
1 = Including silicon-gel cleanup
ASTM = American Society for Testing and Materials
BTEX = Benzene, toluene, ethylbenzene, and xylenes
CO_2 = Carbon dioxide
MTBE = Methyl tert-butyl ether
NS = Not sampled
TPH-av = Aviation fuel (jet fuel)-range petroleum hydrocarbons (C9-C22)
TPH-d = Disel-range petroleum hydrocarbons (C13-C22)
TPH-o = Heavy oil-range petroleum hydrocarbons (C22-C40+)
USEPA = United State Environmental Protection Agency Method number
VOC = Volatile organic compound

3.2.1 Water-Level Measurements

ERM measured static groundwater levels on 28 October 2008 at the monitoring wells selected for sampling. Groundwater monitoring well locations are provided in Figure 3-1. Well construction details are summarized on Table 3-3.

Water levels were measured to within 0.01 foot using an electronic water-level indicator. Water-level measurements were made from established reference points marked on top of each well casing, or at the northernmost point of the monitoring well if no reference mark was located. Table 3-4 summarizes the water-level measurements and the calculated groundwater elevations at ERP Site 7 monitoring wells since October 2005. Calculated groundwater elevations have been corrected for a prior error in the bench mark elevation used for the site in 2006. This error and the correction are discussed in more detail in Section 3.4.

An oily sheen was noted on the tip of the electronic water-level meter when it was removed from monitoring well T-5. An electronic dual-phase interface probe was lowered into the well to measure the thickness and determine the depth of any detectable floating product. The dual-phase interface probe did not detect any floating or "light" nonaqueous-phase liquids. A review of water-level records from 1999 through 2008 showed no occurrences of floating product in this well.

3.2.2 Groundwater Sampling

The monitoring wells sampled and parameters analyzed in October 2008 are listed on Table 3-2. The monitoring wells were purged and sampled in accordance with the Work Plan, following low-flow sampling protocol, using a peristaltic sample pump. Appendix C contains copies of the groundwater sampling logs.

Field-measured water quality parameters monitored during well purging included temperature, specific conductance, pH (acidity/alkalinity), turbidity, dissolved oxygen (DO) content, and ORP. Samples were collected after these parameters had stabilized for three successive readings.

TABLE 3-3

Well Construction Data
152nd Airlift Wing, Nevada Air National Guard
Reno/Tahoe International Airport
Reno, Nevada

Well Identifier	ERP Site Number	Date Completed	Measuring Point Elevation[c] (ft amsl)	Total Depth of Borehole (ft bgs)	Screened Interval (ft bgs)	Top of Filter Pack (ft bgs)
DW-2[a]	7	Nov-03	NS	NA	NA	NA
EXW-01	7	9/12/1997	4401.07	25.0	9 to 19	5.0
EXW-02	7	9/11/1997	4400.49	25.0	9 to 19	5.0
EXW-03	7	9/11/1997	4402.29	25.0	9 to 19	5.0
EXW-04	7	9/12/1997	4402.24	25.0	9 to 19	5.0
MW-06	7	11/14/1992	4401.74	16.0	4.5 to 14.5	2.5
MW-07	7	11/14/1992	4401.23	14.5	4 to 14	3.0
MW-10	7	11/16/1992	4403.58	16.0	3 to 13	2.5
MW-23	7	12/1/1992	4402.09	18.0	5 to 15	3.0
MW-24R	7	7/27/1999	4401.29	16.0	4.5 to 14.0	3.0
MW-25	7	12/5/1992	4401.09	14.5	3 to 13	1.5
MW-26	12	11/3/1993	4397.63	15.0	5 to 15	3.0
T-5	7	8/22/1995	4402.53	14.0	3.5 to 13.5	3.0
T-10	7	8/7/2002	4402.14	16.00	5.5 to 15.5	4.0
T-11	7	8/7/2002	4401.99	16.75	6.25 to 16.25	4.0
T-12	7	8/8/2002	4402.22	17.5	7 to 17	5.0
T-13	7	8/8/2002	4402.07	16.5	6 to 16	4.0
T-15[b]	7	12/8/2003	4401.92	10.0	4 to 10	2.0
T-16[b]	7	12/8/2003	4402.45	10.0	4 to 10	2.0
T-18	7	11/1/2004	4401.23	15.0	5 to 15	3.0
T-21	7	7/11/2006	4401.48	14.5	4 to 14	3.5
T-22	7	7/11/2006	4402.00	14.5	4 to 14	3.5
T-23	7	7/11/2006	4402.10	14.5	4 to 14	3.5

Notes and Key:

a = Dewatering well installed by McGinley and Associates in November 2003 to facilitate removal of USTs
b = Well installed by Schauer Excavation in backfill following removal of USTs
c = Reference point surveyed September 2006, but corrected for elevation survey discrepancy of
ft amsl = Feet above mean sea level
ft bgs = Feet below ground surface
Measuring point elevation = top of well casing
NA = Not available
NS = Not surveyed

TABLE 3-4

Groundwater Elevations
October 2005 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno/Tahoe International Airport
Reno, Nevada

Well ID	Surveyed Measuring Point (feet amsl)		Measurement Date	Depth to Water (feet bmp)	Groundwater Elevation (feet amsl)
EXW-01	4401.07	a	10/24/05	5.32	4395.75
			08/14/06	5.61	4395.46
			11/15/06	4.66	4396.41
			02/14/07	4.29	4396.78
			05/15/07	4.75	4396.32
			10/28/08	5.34	4395.73
EXW-02	4400.49	a	10/24/05	5.22	4395.27
			08/14/06	5.42	4395.07
			11/15/06	4.5	4395.99
			02/14/07	4.20	4396.29
			05/15/07	4.68	4395.81
			10/28/08	5.15	4395.34
EXW-03	4402.29	a	10/24/05	6.51	4395.78
			08/14/06	6.81	4395.48
			11/15/06	5.81	4396.48
			02/14/07	5.65	4396.64
			05/15/07	6.02	4396.27
			10/28/08	6.46	4395.83
EXW-04	4402.24	a	10/24/05	6.74	4395.50
			08/14/06	6.87	4395.37
			11/15/06	6.12	4396.12
			02/14/07	5.69	4396.55
			05/15/07	6.38	4395.86
			10/28/08	6.76	4395.48
MW-06	4401.74	a	10/24/05	5.33	4396.41
			08/14/06	5.70	4396.04
			11/15/06	4.59	4397.15
			02/14/07	4.23	4397.51
			05/15/07	4.81	4396.93
			10/28/08	5.32	4396.42
MW-07	4401.23	a	10/24/05	6.57	4394.66
			08/14/06	5.63	4395.60
			11/15/06	4.52	4396.71
			02/14/07	4.20	4397.03
			05/15/07	4.71	4396.52
			10/28/08	5.23	4396.00

TABLE 3-4

Groundwater Elevations
October 2005 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno/Tahoe International Airport
Reno, Nevada

Well ID	Surveyed Measuring Point (feet amsl)		Measurement Date	Depth to Water (feet bmp)	Groundwater Elevation (feet amsl)
MW-10	4403.58	a	10/24/05	6.57	4397.01
			08/14/06	7.05	4396.53
			11/15/06	5.58	4398.00
			02/14/07	5.12	4398.46
			05/15/07	5.81	4397.77
			10/28/08	6.46	4397.12
MW-23	4402.09	a	10/24/05	7.18	4394.91
			08/14/06	7.41	4394.68
			11/15/06	6.51	4395.58
			02/14/07	6.21	4395.88
			05/15/07	6.77	4395.32
			10/28/08	7.13	4394.96
MW-24R	4401.29	a	10/24/05	7.86	4393.43
			08/14/06	7.10	4394.19
			11/15/06	6.23	4395.06
			02/14/07	5.97	4395.32
			05/15/07	6.39	4394.90
			10/28/08	NM	---
MW-25	4401.09	a	10/24/05	5.24	4395.85
			08/14/06	5.52	4395.57
			11/15/06	4.50	4396.59
			02/14/07	4.22	4396.87
			05/15/07	4.67	4396.42
			10/28/08	5.18	4395.91
MW-26	4397.63		10/28/08	6.14	4391.49
T-5	4402.53	a	10/24/05	6.46	4396.07
			08/14/06	6.71	4395.82
			11/15/06	5.57	4396.96
			02/14/07	5.22	4397.31
			05/15/07	5.82	4396.71
			10/28/08	6.22	4396.31
T-10	4402.14	a	10/24/05	6.96	4395.18
			08/14/06	6.33	4395.81
			11/15/06	5.96	4396.18
			02/14/07	5.60	4396.54
			05/15/07	6.10	4396.04
			10/28/08	6.60	4395.54

TABLE 3-4

Groundwater Elevations
October 2005 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno/Tahoe International Airport
Reno, Nevada

Well ID	Surveyed Measuring Point (feet amsl)		Measurement Date	Depth to Water (feet bmp)	Groundwater Elevation (feet amsl)
T-11	4401.99	a	10/24/05	6.78	4395.21
			08/14/06	6.98	4395.01
			11/15/06	6.02	4395.97
			02/14/07	5.76	4396.23
			05/15/07	6.36	4395.63
			10/28/08	6.75	4395.24
T-12	4402.22	a	10/24/05	6.83	4395.39
			08/14/06	7.05	4395.17
			11/15/06	6.11	4396.11
			02/14/07	5.79	4396.43
			05/15/07	6.44	4395.78
			10/28/08	6.77	4395.45
T-13	4402.07	a	10/24/05	6.73	4395.34
			08/14/06	6.92	4395.15
			11/15/06	5.97	4396.10
			02/14/07	5.68	4396.39
			05/15/07	6.22	4395.85
			10/28/08	6.70	4395.37
T-15	4401.92	a	10/24/05	NM	---
			08/14/06	6.71	4395.21
			11/15/06	5.76	4396.16
			02/14/07	5.27	4396.65
			05/15/07	5.87	4396.05
			10/28/08	6.59	4395.33
T-16	4402.45	a	10/24/05	Dry	---
			08/14/06	7.05	4395.40
			11/15/06	6.10	4396.35
			02/14/07	5.61	4396.84
			05/15/07	6.21	4396.24
			10/28/08	6.44	4396.01
T-18	4401.23	a	10/24/05	5.83	4395.40
			08/14/06	6.10	4395.13
			11/15/06	5.10	4396.13
			02/14/07	4.80	4396.43
			05/15/07	5.26	4395.97
			10/28/08	5.80	4395.43

TABLE 3-4

Groundwater Elevations
October 2005 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno/Tahoe International Airport
Reno, Nevada

Well ID	Surveyed Measuring Point (feet amsl)		Measurement Date	Depth to Water (feet bmp)	Groundwater Elevation (feet amsl)
T-21	4401.48	b	10/24/05	---	---
			08/14/06	6.52	4394.96
			11/15/06	5.52	4395.96
			02/14/07	5.04	4396.44
			05/15/07	5.62	4395.86
			10/28/08	6.34	4395.14
T-22	4402.00	b	10/24/05	--	---
			08/14/06	7.04	4394.96
			11/15/06	6.00	4396.00
			02/14/07	5.63	4396.37
			05/15/07	6.19	4395.81
			10/28/08	6.75	4395.25
T-23	4402.10	a	10/24/05	--	---
			08/14/06	6.63	4395.47
			11/15/06	5.66	4396.44
			02/14/07	5.18	4396.92
			05/15/07	5.76	4396.34
			10/28/08	6.48	4395.62

Key:
a = Reference point surveyed September 2006, but corrected for elevation survey discrepancy of 6.6 feet per surveyor finding November 2008.
b = Reference point surveyed November 2008
Feet amsl = Above mean sea level
Feet bmp = Feet below measuring point
NM = Not measured

Samples were collected in laboratory-supplied, pre-preserved sample containers for the following parameters:

- Purgeable TPH-g by USEPA Method 8015B;
- Extractable TPH as TPH-av, TPH-o, and TPH-d by USEPA Method 8015M, with an additional silica gel cleanup; and
- VOCs, including MTBE, by USEPA Method 8260B.

Following sample collection, the filled sample containers were labeled and placed in coolers containing ice. The samples were transported under chain-of-custody procedures to Alpha Analytical, Inc., of Sparks, Nevada, a Nevada-certified laboratory, for sample analysis.

3.3 Field Investigation-Derived Waste

One 55-gallon drum of purged groundwater and decontamination liquids and less than one drum of soils were generated during the October 2008 field activities. The drums were labeled and marked with a description of the contents. The wastewater and soils are currently being profiled by the waste contractor using the analytical results from the sampling round, and will be transported off site for disposal.

3.4 Location and Elevation Survey

On 4 November 2008, Lumos and Associates of Carson City, Nevada, performed location and elevation surveys of each soil boring. The locations of the boreholes were tied into previously established permanent control points. Survey data are included in Appendix B.

In addition to surveying of the new boring locations, several existing wells were also surveyed to tie the new data to the existing elevation data set. Significant differences in elevation were noted between the new survey, relative to the dataset established in September 2006 that had been used in subsequent reports. A discrepancy had been noted in the September 2006 survey data set, so further efforts were made to identify the source of this discrepancy.

As a result of this research, it appears that in preparation of the two prior survey efforts, Lumos used an incorrect value for the elevation reference

point. This resulted in elevations for the entire survey set being shifted approximately 6.6 feet above the actual site elevation. To address this error, the survey elevation data collected following site restoration activities in September 2006 have been corrected, as indicated on Table 3-4. This error was applied to the site data universally, and as such, has not impacted site-specific data interpretation or conclusions drawn from this data.

3.5 Deviations from the Work Plan

Groundwater monitoring activities performed generally followed the protocol contained in Sections 6 and 7 of the Work Plan.

Deviations from the Work Plan during this field investigation included:

- Due to unexpected site security constraints on the first day of sample collection (27 October 2008), not all wells were accessible, so a full round of water levels could not be measured. Instead, a full round of levels was measured on the beginning of the second day of groundwater monitoring.

- Monitoring well MW-24R could not be located. A thick layer of fresh gravel has been placed over the general area where the well is located. Because VOC concentrations in this well have historically been nondetect, further activities to locate the well were not pursued.

- Due to field error, only one of the two planned duplicate samples was collected from the monitoring wells during the groundwater monitoring event.

- Analysis of TPH-g was added for all sample points based upon observations by the laboratory that the fuels did not match the TPH-av standard. The TPH-av standard is based upon a fuel more similar to JP-8 and, therefore, does not quantify the lighter purgeable volatile hydrocarbon fraction of the fuel that is present in the JP-4, known to have been released at the site.

SECTION 4.0

QUALITY ASSURANCE

Trip blanks, an equipment rinsate blank, and a field duplicate sample were submitted to the analytical laboratory to assess data quality resulting from the field sampling program.

4.1 Trip Blanks

One laboratory-prepared trip blank was included with each cooler containing samples designated for VOC analysis. A total of three trip blanks were collected.

4.2 Equipment Rinsate Blank

To evaluate appropriate decontamination of reusable sampling equipment during the screening-level groundwater sampling activities, one equipment blank was collected for VOC analysis during the October 2008 field event. The equipment blank of ASTM Type II water was collected from the direct-push sample tooling after collecting the groundwater sample at borehole GP-13. No equipment rinsate blank was necessary during the monitoring well groundwater sampling event because only disposable tubing was in contact with the groundwater sample. New tubing was used at each sampling location.

4.3 Field Duplicate

One duplicate was collected from the temporary well at location GP-13 during the screening-level groundwater sampling activities and one duplicate groundwater sample was collected from monitoring well T-21 during the monitoring well groundwater sampling event.

4.4 Field Blank

A field blank sample was collected at monitoring well T-21. The sample consisted of exposed ASTM Type II water to check for the presence of airborne chemicals potentially emanating from the well casing.

4.5 Quality Assurance and Quality Control Review Results

The data quality for samples included in the October 2008 groundwater monitoring event was reviewed following the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review,* October 1999. Appendix E summarizes the data quality review and provides the data qualifiers to be applied to the laboratory analytical data. Quality assurance analytical results are included on Table 4-1. All laboratory analytical data should be treated as usable for decision-making purposes.

TABLE 4-1
Quality Control Sample Results
October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Sample	Date	TPH-d	TPH-av	TPH-o	CM	VC	CE	BM	TCFM	1,1-DCE	DCM	trans-1,2-DCE	MTBE	1,1-DCA	cis-1,2-DCE	CF	1,2-DCA	1,1,1-TCA	CCL	BZ	1,2-DCP	TCE	BDCM	cis-1,3-DCP	trans-1,3-DCP	1,1,2-TCA	TOL	DBCM	PCE	CB	EB	XYL	BF	1,1,2,2-PCA	1,3-DCB	1,4-DCB	1,2-DCB
	MCL Screening Level	**NE**	**NE**	**NE**	**160 (2)**	**2 (1)**	**4.6 (2)**	**8.7 (2)**	**1300 (2)**	**7 (1)**	**5 (1)**	**100 (1)**	**13 (2)**	**810 (2)**	**70 (1)**	**0.17 (2)**	**5 (1)**	**200 (1)**	**5 (1)**	**5 (1)**	**5 (1)**	**5 (1)**	**0.18 (2)**	**0.4 (2)**	**0.4 (2)**	**5 (1)**	**1000 (1)**	**100 (1)**	**5 (1)**	**100 (1)**	**700 (1)**	**10000 (1)**	**8.5 (2)**	**0.055 (2)**	**600 (1)**	**75 (1)**	**600 (1)**
T-21-FA	10/27/08	NS	NS	NS	<4.0	<1.0	<1.0	<4.0	<1.0	<1.0	<4.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TB102708-01	10/27/08	NS	NS	NS	<2.0	<1.0	<1.0	<2.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TB102908-1	10/29/08	NS	NS	NS	<2.0	<1.0	<1.0	<2.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TB103008-1	10/30/08	NS	NS	NS	<2.0	<1.0	<1.0	<2.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
GP-13-R	10/29/08	< 500	< 500	< 500	<2.0	<1.0	<1.0	<2.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
Concentrations reported in micrograms per liter
(1) = EPA Region 9 Maximum Contaminant Level
(2) = EPA Region 9 Tap Water Preliminary Remediation Goal
NE = Not established
NS = Not sampled

Volatile Organic Compound Abbreviations

Abbrev.	Compound	Abbrev.	Compound
BDCM	Bromodichloromethane	t-1,2-DCE	trans-1,2-Dichloroethene
BF	Bromoform	DCM	Dichloromethane
BM	Bromomethane	1,2-DCP	1,2-Dichloropropane
BZ	Benzene	c-1,3-DCP	cis-1,3-Dichloropropene
CB	Chlorobenzene	t-1,3-DCP	trans-1,3-Dichloropropene
CCL	Carbon Tetrachloride	EB	Ethylbenzene
CE	Chloroethane	MTBE	Methyl tert-butyl ether
CF	Chloroform	1,1,2,2-PCA	1,1,2,2-Tetrachloroethane
CM	Chloromethane	PCE	Tetrachloroethene
DBCM	Dibromochloromethane	1,1,1-TCA	1,1,1-Trichloroethane
1,1-DCA	1,1-Dichloroethane	1,1,2-TCA	1,1,2-Trichloroethane
1,2-DCA	1,2-Dichloroethane	TCE	Trichloroethene
1,2-DCB	1,2-Dichlorobenzene	TCFM	Trichlorofluoromethane
1,3-DCB	1,3-Dichlorobenzene	TOL	Toluene
1,4-DCB	1,4-Dichlorobenzene	VC	Vinyl Chloride
1,1-DCE	1,1-Dichloroethene	XYL	Xylenes (total)
c-1,2-DCE	cis-1,2-Dichloroethene		

SECTION 5.0

INVESTIGATION FINDINGS AND ANALYSIS

This section summarizes the field information and analytical data collected from soil and groundwater while installing and sampling the six temporary well points (GP-9 through GP-14) and 19 on-site groundwater monitoring wells (EXW-01 through EXW-04, MW-06, MW-07, MW-10, MW-23, MW-25, MW-26, T-5, T-10 through T-13, T-18, T-21, T-22, and T-23). Sampling locations are provided in Figure 3-1 and summarized on Table 3-3.

5.1 Direct-Push Borehole Results

This section summarizes the results of the installation and sampling of the temporary well points GP-9 through GP-14.

5.1.1 Soil Screening Results

Borehole logs are provided in Appendix A. Lithology of boreholes located on site (GP-9, GP-10, GP-13, and GP-14) generally consisted of well-graded sand or gravely fill-like material from ground surface to approximately 5 feet bgs, underlain by approximately 2 to 4 feet of elastic silts. The elastic silts were underlain by poor- to well-graded sands. Saturated soils were first observed at depths ranging from 10 to 12 feet bgs. Additional layers of silt were encountered at 11.5 feet bgs in borehole GP-9 and at 14 feet bgs in borehole GP-10. These lithologic units are consistent with previously observed stratigraphy of alluvial deposits consisting of relatively thinly interbedded silts and sands, which result in a semi-confined shallow aquifer that appears to have limited interconnectivity in the shallowest of saturated depth intervals.

Volatile compounds in soil were noted in borings GP-9, GP-10, and GP-13 during field screening with a PID. As presented in the borehole logs (Appendix A), PID readings as high as 1,324; 1,134; and 1,558 parts per million (ppm) were detected in soil at GP-9, GP-10, and GP-13, respectively. The highest VOC detections in these boreholes were noted at the interface between silt and sand at 6.5 to 8 feet bgs. This depth also

corresponds to the top of the highest seasonal water fluctuation. Notable detections of volatile compounds were not observed during field screening of the soils with the PID at borings GP-11, GP-12, and GP-14.

Residual free-phase TPH was observed in an isolated sand layer at, or immediately above, the first observed groundwater within boring GP-10 (8 to 9 feet bgs). Dark hydrocarbon-like staining and a strong petroleum odor were also noted in the overlying silt at 5 to 7 feet bgs. As noted above, PID readings at boring GP-10 peaked at the 8- to 9-feet depth interval (1,134 ppm). The underlying silt at 9 feet bgs did not have hydrocarbon staining or odor, and the PID readings decreased to 153 ppm.

5.1.2 Screening-Level Groundwater Sampling Results

Laboratory analytical results for screening-level groundwater samples are provided in Appendix D and summarized on Table 5-1. The current USEPA Region 9 maximum contaminant levels (MCLs) have been selected as the action levels for compounds detected at the site. If an MCL does not exist for a detected compound, the results are compared to the tap water PRG (however, both the ANG and NDEP concur that the tap water PRGs are used for reference only and are not to be applied as an action level criterion for the site).

TPH-d and TPH-o were not detected in any screening-level groundwater samples. TPH-av and TPH-g were detected in location GP-10 at 120 and 99 milligrams per liter (mg/L), respectively. TPH-g was also detected in location GP-13 at 2.4 mg/L. No MCL or PRG has been established for TPH. TPH-av detections in screening-level and monitoring well groundwater samples are presented in Figure 5-1.

Benzene detections in screening-level and monitoring well samples are presented in Figure 5-2. The following analytical results were noted for VOCs in screening-level groundwater samples:

- VOCs benzene, ethylbenzene, xylenes, and MTBE were detected in one or more screening-level groundwater samples.
- Benzene concentrations exceeded the MCL of 5 micrograms per liter (µg/L) in GP-10 (20,000 µg/L) and GP-13 (280 µg/L). Benzene was also detected, but below the MCL, in GP-14.

TABLE 5-1

Selected Organic Compounds Analyzed in Screening-Level Groundwater
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Sample ID	Sample Date	TPH-g	TPH-d	TPH-av		TPH-o	MTBE		Benzene	Toluene		Ethyl-benzene	m,p-Xylene	o-Xylene	Total Xylenes
	Action Level	NE	NE	NE		NE	12 (b)		5.0 (a)	1,000 (a)		700 (a)	--	1,400 (b)	10,000 (a)
GP-9-GW-12	10/29/2008	< 500	< 500	< 500		< 500	<1.0		< 1.0	< 1.0		**5.8**	**28**	**3.9**	**31.9**
GP-10-GW-8.9	10/29/2008	**99,000**	< 25,000	**120,000**	*, i, s51, J	< 5,000	<100	c	**20,000**	< 100	c	**1,700**	**6,000**	**870**	**6,870**
GP-11-GW-11.2	10/30/2008	< 500	< 500	< 500		< 500	<1.0		< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
GP-12-GW-10.6	10/30/2008	< 500	< 500	< 500		< 500	<1.0		< 1.0	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0
GP-13-GW-7.85	10/29/2008	**2,400**	< 500	< 500		< 500	<1.0		**280**	< 1.0		**54**	**210**	< 1.0	**210**
GP-13-GW-7.85-D	10/29/2008	**2,200**	< 500	< 500		< 500	<1.0		**270**	< 1.0		**51**	**200**	< 1.0	**200**
GP-14-GW-8.57	10/29/2008	< 500	< 500	< 500		< 500	**6.2**		**2.3**	< 1.0		< 1.0	**1.5**	< 1.0	**1.5**

Notes and Key:
Concentrations reported in micrograms per liter (µg/L).
Volatile organic compounds analyzed by GC/MS United States Environmental Protection Agency (USEPA) Method SW8260B.
Total petroleum hydrocarbons analyzed by USEPA Method SW8015B.
Bold = Chemical concentration in excess of the laboratory method detection limit.
= Chemical concentration detected is greater than the screening level.
a = EPA Region 9 Maximum Contaminant Level - USEPA Master RSL Summary Table 12 September 2008
b = EPA Region 9 Tap Water Preliminary Remediation Goal (*Used for Screening Only*) - USEPA Master RSL Summary Table 12 September 2008
c = Reporting limits were increased due to high concentrations of target analytes.
< = Less than the laboratory reporting limit.
D = Duplicate sample
MCL = USEPA Maximum Contaminant Level
MTBE = Methyl-tert butyl ether
NE = Not established
TPH-g = Gasoline-range petroleum hydrocarbons (C4-C13)
TPH-av = Aviation fuel (jet fuel)-range petroleum hydrocarbons (C9-C22)
TPH-d = Disel-range petroleum hydrocarbons (C13-C22)

ERM Qualifiers:
J = Estimated detected result

Laboratory Qualifiers:
i = May include contributions from other products. Falls largely within the diesel range and is quantitated with TPH-d calibration.
* = Reported concentration may include some lighter-end hydrocarbons.
s51 = surrogate recovery could not be determined due to the presence of co-eluting hydrocarbons.

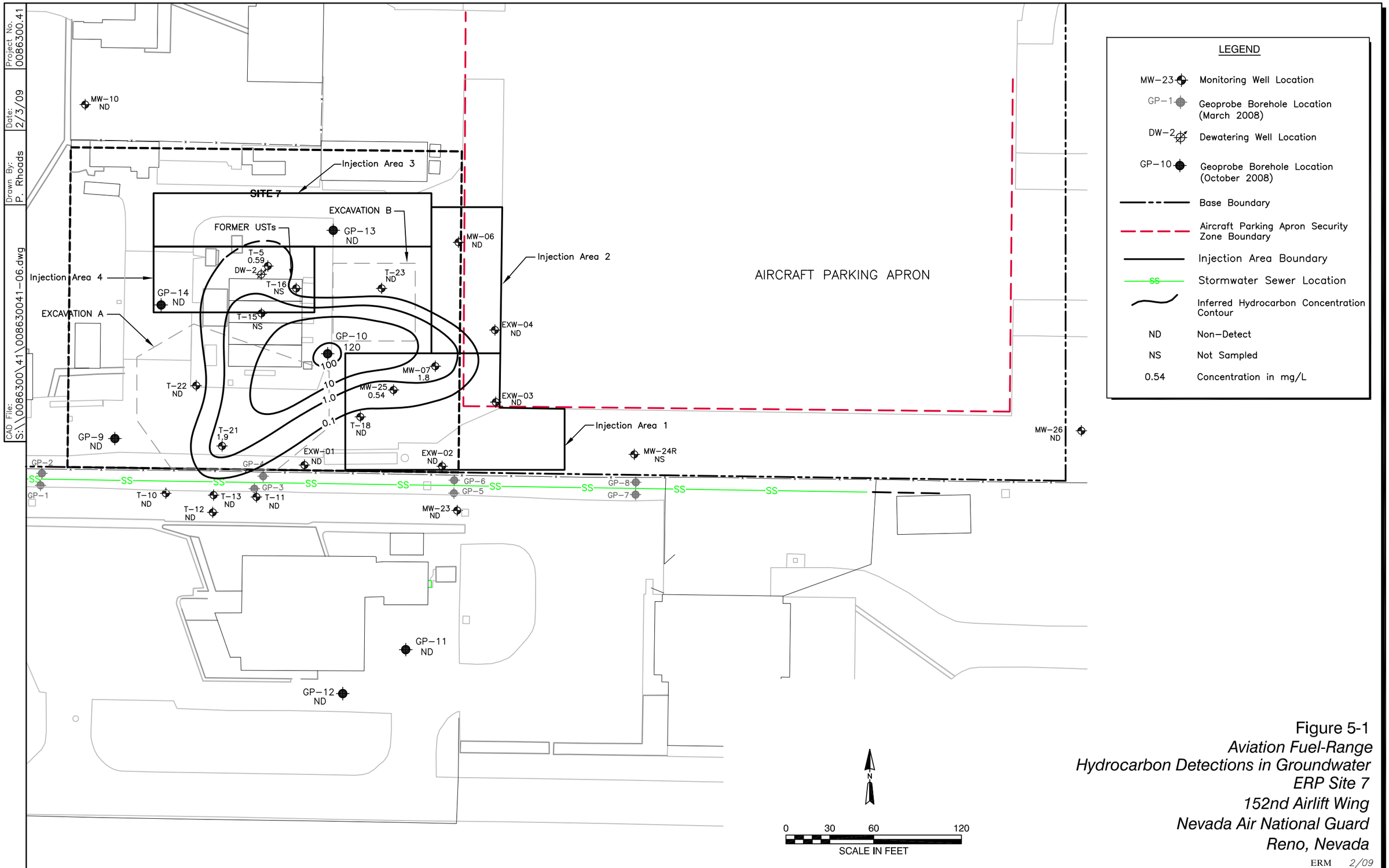

Figure 5-1
Aviation Fuel-Range Hydrocarbon Detections in Groundwater
ERP Site 7
152nd Airlift Wing
Nevada Air National Guard
Reno, Nevada

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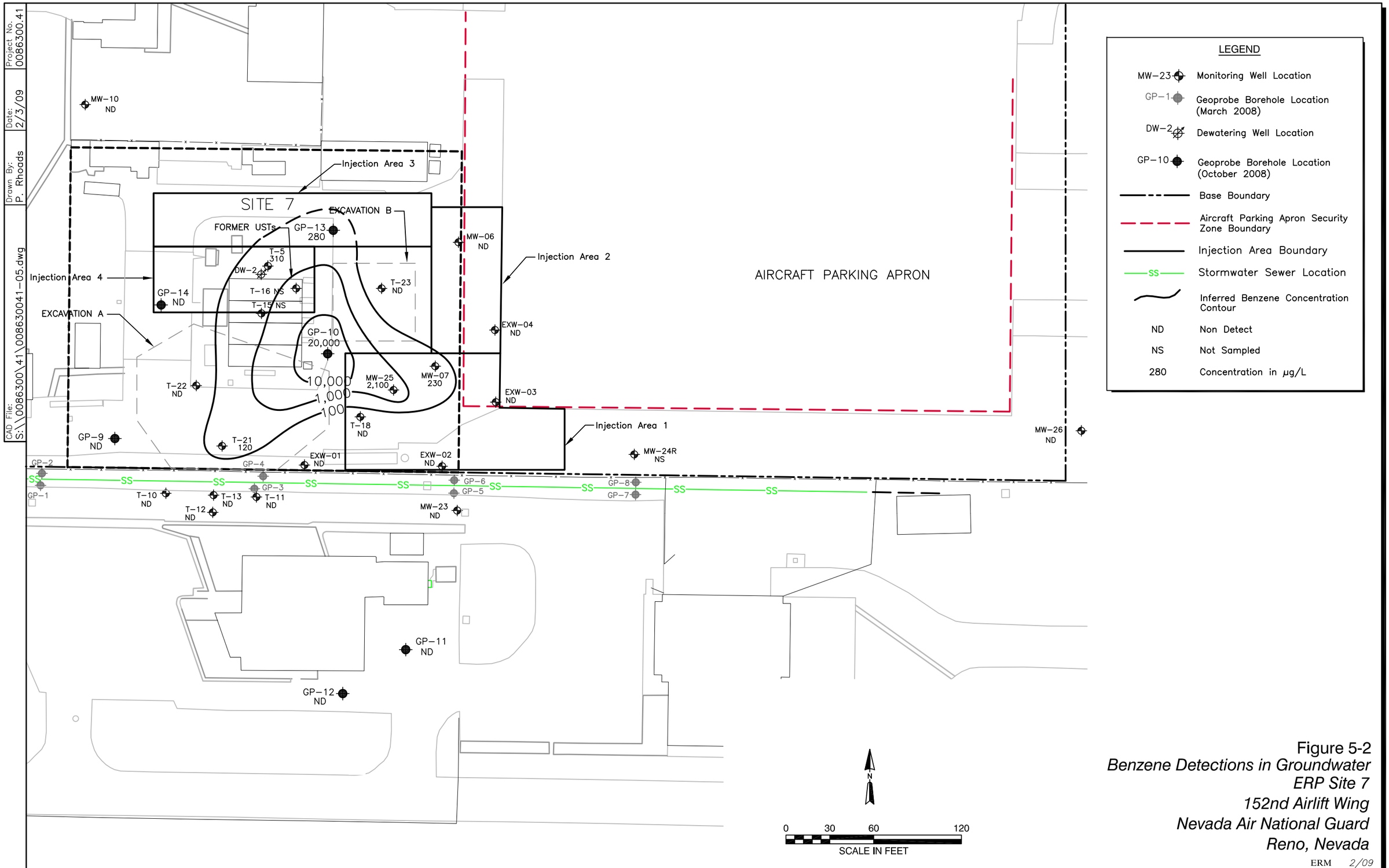

Figure 5-2
Benzene Detections in Groundwater
ERP Site 7
152nd Airlift Wing
Nevada Air National Guard
Reno, Nevada

ERM 2/09

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- Ethylbenzene concentrations in GP-10 (1,700 µg/L) exceeded the MCL of 700 µg/L. Ethylbenzene was also detected, below the MCL, in GP-9 and GP-13.

- Xylenes were detected in all four on-site temporary wells at concentrations below the MCL.

- No VOCs were detected in the off-site borings.

The high VOC detections at GP-10 suggest that this groundwater sample may have been influenced by drag-down of contaminants from the smear zone by the sample tooling. Site-wide groundwater conditions and the extensive prior soil removal actions suggest that these elevated detections are limited in extent (ERM, 2009).

5.1.3 Groundwater Quality Analysis

Field water quality parameters were collected from the soil borings as part of the water sample collection. The final field parameter values collected from the temporary wells are presented on Table 5-2. General observations in this data are as follows:

- Due to the abundance of fines in the formation, it was not possible to reduce the turbidity in the screening-level samples to less than 100 nephelometric turbidity units (NTUs). Final turbidity readings ranged from 209 to 1,394 NTU.

- Groundwater pH readings were all near neutral (7.0 to 8.0 pH units).

- Final conductivity readings ranged from 771 to 1,301 micro Siemens per centimeter (µS/cm) and did not exhibit a spatial trend in variation.

- Final DO readings were less than 1 mg/L in the on-site boreholes (GP-9, GP-10, GP-13, and GP-14) and were greater than 2 mg/L in the off-site boreholes (GP-11 and GP-12).

- All six boreholes had negative ORP values.

BOD values were below the detection limit in all sample locations, except GP-10, where the BOD value was greater than 60 mg/L (the laboratory only reported a minimum value for this sample). GP-10 also had the highest COD (190 mg/L). COD at the other three on-site boreholes, GP-9, GP-13, and GP-14, ranged from 18 to 31 mg/L. This is consistent with the

TABLE 5-2

Groundwater Natural Attenuation and Field Parameter Results
Screening-Level Groundwater
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Sample Location	Date Sampled	Temperature °C	pH	Conductivity µs/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential mV	Turbidity NTU	Biological Oxygen Demand mg/L		Chemical Oxygen Demand mg/L
GP-9	10/29/08	21.77	7.05	771	0.81	-49.3	568.0	<4.0		18
GP-10	10/29/08	22.74	7.07	1282	0.39	-453.7	1393.8	>60	*	190
GP-11	10/30/08	20.32	7.48	846	2.11	-57.8	209.0	<4.0		<5.0
GP-12	10/30/08	20.61	7.93	1066	2.93	-53.4	885.2	<4.0		9.1
GP-13	10/29/08	23.27	7.99	877	0.01	-137.2	970.4	<4.0		19
GP-13 (dup)	10/29/08	23.27	7.99	877	0.01	-137.2	970.4	<4.0		26
GP-14	10/29/08	23.44	7.06	1301	0.32	-60.5	224.1	<4.0		31

Key:
-- = data not included due to possible field error
* = Laboratory reported biological oxygen demand as "greater than 60 mg/L".
< = Less than the laboratory reporting limit.
°C = Degrees Celsius
µs/cm = Micro Siemens per centimeter
dup = duplicate sample
mg/L = Milligrams per liter
mV = Millivolts
NS = Not sampled
NTU = Nephelometric Turbidity Units

observed contaminant distribution and confirms that oxygen continues to be a limiting factor to the biological degradation of TPH and VOCs at the site.

5.2 Groundwater Monitoring Well Sampling Results

The following subsections present the groundwater monitoring well sampling results for the October 2008 event.

5.2.1 Water Levels

Figure 5-3 presents the potentiometric surface for water levels at Site 7 during the October 2008 event. Groundwater flow rate was calculated at 0.0057 feet per foot toward the southeast, consistent with prior groundwater flow trends.

5.2.2 Field-Measured Groundwater Quality Parameters

Final field parameter values for the samples collected from the permanent monitoring wells are presented on Table 5-3. Field logs are included as Appendix C. General observations regarding stabilized field parameters are as follow:

- Turbidity readings were generally below 10 NTUs, and all turbidity readings were below 100 NTUs.
- pH readings were all near neutral (6.0 to 8.0 pH units).
- Specific conductance readings ranged from 698 to 1,605 µS/cm, and did not exhibit a spatial trend in variation.
- DO readings were less than 1 mg/L in most wells, and were slightly greater than 1 mg/L in two additional wells.
- ORP measurements ranged from -278.8 to 95.8 millivolts, indicative of strongly reducing to slightly oxidizing conditions.

Monitoring wells T-22 and MW-06 had significantly elevated DO concentrations (5.13 and 7.87 mg/L, respectively) relative to saturation levels with atmospheric oxygen (generally 9 to 11 mg/L). Well T-22 had a negative ORP value (-195.7 millivolts), which suggests an instrument

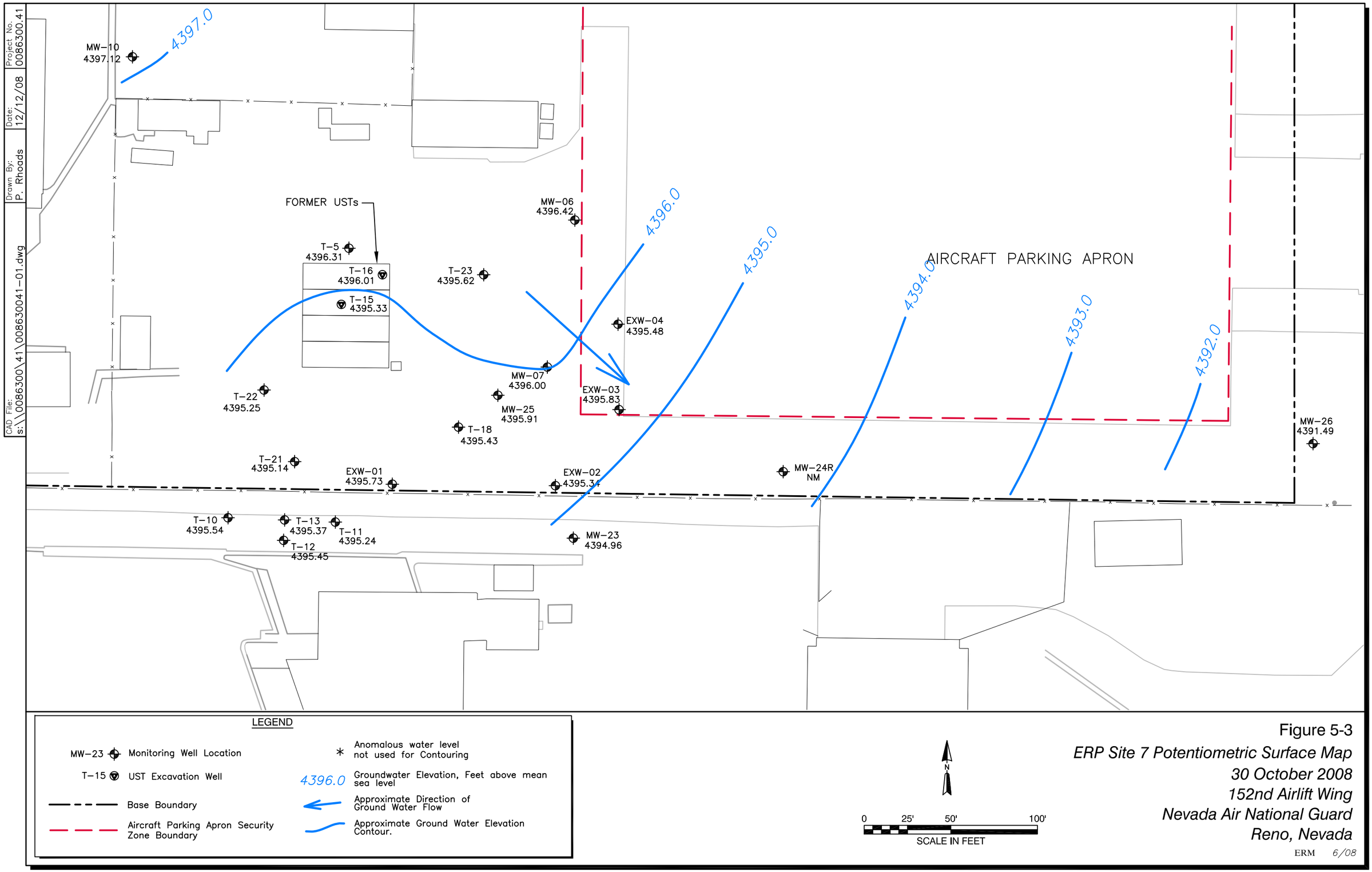


Figure 5-3
ERP Site 7 Potentiometric Surface Map
30 October 2008
152nd Airlift Wing
Nevada Air National Guard
Reno, Nevada

TABLE 5-3

Groundwater Natural Attenuation and Field Parameter Results
Groundwater Monitoring Wells
October 2005 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Monitoring Well	Date Sampled	Biochemical Oxygen Demand mg/L	Chemical Oxygen Demand mg/L	Temperature °C	pH	Conductivity µs/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential mV	Turbidity NTU
EXW-01	10/25/05	22	6.5	18.32	7.33	707	1.0	57.1	-0.5
	08/16/06	<6.0	5.4	17.06	7.23	672	0.8	13.2	-1.4
	11/16/06	NS	NS	17.67	7.54	656	1.1	-12.2	-0.8
	02/16/07	NS	NS	16.63	7.68	662	---	42	-0.8
	05/17/07	NS	NS	16.74	7.31	683	---	98.8	-0.7
	10/27/08	**NS**	**NS**	**19.36**	**7.37**	**752**	**0.14**	**-13.8**	**33.4**
EXW-02	10/25/05	<2.0	6.4	17.61	7.32	590	0.57	60.6	21.2
	08/15/06	<6.0	9.5	19.29	7.22	621	0.88	24.2	0.6
	11/17/06	NS	NS	18.40	7.73	550	3.02	51.5	0.3
	02/16/07	NS	NS	16.54	7.81	650	---	48.5	2.9
	05/17/07	NS	NS	18.75	7.40	694	---	144.1	-0.1
	10/27/08	**NS**	**NS**	**19.57**	**7.51**	**698**	**0.05**	**69.2**	**79.5**
EXW-03	10/25/05	<2.0	<5.0	19.18	7.49	719	1.29	69.0	5.4
	08/15/06	<6.0	<5.0	18.52	7.42	659	1.28	32.0	-0.9
	11/16/06	NS	NS	18.71	7.96	662	1.53	244.9	0.4
	02/15/07	NS	NS	16.06	7.81	645	---	44.5	-0.2
	05/17/07	NS	NS	18.10	7.15	683	---	157.6	-0.4
	10/27/08	**NS**	**NS**	**19.95**	**7.59**	**724**	**0.17**	**59.1**	**4.6**
EXW-04	10/25/05	<2.0	<5.0	19.35	7.51	720	0.98	68.3	0.2
	08/16/06	<6.0	<5.0	19.89	7.48	679	1.66	15.9	-1.4
	11/17/06	NS	NS	20.62	7.76	682	2.14	36.2	-1.0
	02/15/07	NS	NS	16.87	7.82	654	---	47.2	-0.3
	05/17/07	NS	NS	17.19	7.47	662	---	64.5	-1.0
	10/27/08	**NS**	**NS**	**19.76**	**7.57**	**739**	**0.29**	**18.6**	**35.4**
MW-06	10/25/05	9.0	19	20.45	6.66	1,281	0.30	2.0	5.9
(Dup)	10/25/05	4.0	27	20.45	6.66	1,281	0.30	2.0	5.9
	08/15/06	<6.0	23	20.59	9.15	829	17.88	146.8	8.8
(Dup)	08/15/06	<6.0	25	20.59	9.15	829	17.88	146.8	8.8
	11/16/06	NS	NS	20.19	11.38	690	17.00	130.6	301.0
	02/16/07	NS	NS	14.40	10.06	524	---	95.7	147.4
	05/16/07	NS	NS	16.11	8.81	773	---	146.9	88.4
	10/30/08	**NS**	**NS**	**20.97**	**7.29**	**1,098**	**7.87**	**82.6**	**13.0**
MW-07	10/26/05	5.0	35	19.99	6.82	1,320	0.41	26.8	2.1
	08/16/06	21	95	20.67	6.66	1,804	0.53	-137.3	1.2
	11/17/06	NS	NS	19.41	7.01	1,098	0.55	-273.4	-0.2
	02/16/07	NS	NS	14.49	7.48	516	---	-128.2	3.1
	05/17/07	NS	NS	18.84	6.15	984	---	-83.6	2.0
	10/27/08	**NS**	**NS**	**12.39**	**6.84**	**1,605**	**0.25**	**-127.6**	**28.8**
MW-10	**10/28/08**	**NS**	**NS**	**16.80**	**7.02**	**745**	**0.09**	**24.2**	**2.4**
MW-23	10/24/05	<2.0	18	18.58	6.90	1,254	0.32	40.0	0.2
	08/16/06	<6.0	14	18.12	6.94	1,093	0.56	52.3	-1.4
	11/17/06	NS	NS	18.59	7.11	1,183	0.91	-58.2	-0.4
	02/15/07	NS	NS	15.03	7.16	1,114	---	60.9	-0.2
	05/15/07	NS	NS	17.38	5.87	1,277	---	185.9	-0.7
	10/30/08	**NS**	**NS**	**20.58**	**6.91**	**1,228**	**1.10**	**-99.3**	**0.6**

TABLE 5-3

Groundwater Natural Attenuation and Field Parameter Results
Groundwater Monitoring Wells
October 2005 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Monitoring Well	Date Sampled	Biochemical Oxygen Demand mg/L	Chemical Oxygen Demand mg/L	Temperature °C	pH	Conductivity µs/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential mV	Turbidity NTU
MW-24R	10/25/05	5.0	20	18.53	6.92	1,276	0.37	57.5	4.2
	08/16/06	<6.0	16	18.17	6.93	1,215	0.47	6.3	-0.7
	11/16/06	NS	NS	19.11	7.47	1,187	1.21	218.9	0.9
	02/14/07	NS	NS	14.73	7.22	1,084	---	54.9	3.3
	05/17/07	NS	NS	17.04	6.33	1,177	---	127.8	-0.2
MW-25	10/26/05	8.0	64	19.63	6.72	1,327	0.41	-2.2	0.0
	08/15/06	6.7	57	19.87	6.66	1,349	1.15	-38.8	-3.6
	11/17/06	NS	NS	19.88	6.91	841	0.45	-249.6	0.2
	02/16/07	NS	NS	15.13	7.23	516	---	-62.5	1.4
	05/17/07	NS	NS	18.25	6.11	803	---	-92.2	-0.2
	10/27/08	**NS**	**NS**	**21.79**	**6.8**	**1,389**	**0.36**	**-155.3**	**2.1**
MW-26	**10/27/08**	**NS**	**NS**	**21.34**	**7.19**	**943**	**0.06**	**9.2**	**3.9**
T-5	10/26/05	37	190	17.60	6.66	1,058	0.34	6.5	9.4
	08/17/06	30	55	21.72	7.02	714	0.22	-311.3	0.2
	11/17/06	NS	NS	20.38	7.11	678	0.32	-320.2	0.9
	02/16/07	NS	NS	16.11	8.01	659	---	-113.5	6.2
	05/16/07	NS	NS	18.39	6.92	685	---	-275.9	0.6
	10/30/08	**NS**	**NS**	**21.15**	**6.84**	**717**	**0.43**	**-278.8**	**3.0**
T-10	**10/30/08**	**NS**	**NS**	**20.15**	**6.99**	**1,148**	**2.14**	**12.7**	**16.9**
T-11	10/24/05	<2.0	11	18.67	6.84	1,223	0.26	37.8	1.1
	08/16/06	13	41	17.33	6.85	880	0.52	-184.3	-0.9
	11/17/06	NS	NS	17.54	7.11	1,134	0.65	-252.6	0.8
	02/16/07	NS	NS	15.19	7.28	972	---	-27.9	8.0
	05/16/07	NS	NS	16.03	5.63	1,039	---	-94.1	0.0
	10/30/08	**NS**	**NS**	**19.30**	**6.77**	**1,167**	**0.64**	**-191.5**	**-0.7**
T-12	**10/30/08**	**NS**	**NS**	**18.62**	**7.06**	**993**	**0.70**	**-25.2**	**0.0**
T-13	10/24/05	<2.0	<5.0	18.80	7.04	997	0.29	36.9	21.4
	08/16/06	<6.0	14	17.20	7.34	864	0.61	50.5	-0.5
	11/17/06	NS	NS	17.43	7.59	851	1.02	65.3	1.3
	02/15/07	NS	NS	14.46	7.54	696	---	64.3	-0.1
	05/16/07	NS	NS	17.06	6.88	700	---	56.6	1.5
	10/30/08	**NS**	**NS**	**18.85**	**7.15**	**771**	**0.42**	**-54.1**	**2.1**
T-18	10/26/05	11	72	20.15	6.76	1,275	0.39	3.5	1.2
	08/15/06	<6.0	54	20.04	7.10	967	29.66	92.1	3.4
	11/16/06	NS	NS	19.60	8.81	764	32.13	185.9	19.2
	02/15/07	NS	NS	13.24	7.25	798	---	67.6	1.1
	05/17/07	NS	NS	16.23	7.21	817	---	95.9	2.0
	10/27/08	**NS**	**NS**	**23.06**	**6.95**	**1,115**	**1.12**	**95.8**	**4.3**
T-21	08/14/06	<6.0	29	26.05	6.92	675	0.51	-196.7	-0.8
	11/16/06	NS	NS	19.43	6.96	724	0.62	-231.1	-0.2
	02/15/07	NS	NS	8.83	7.40	623	---	-37.7	1.0
	05/18/07	NS	NS	16.96	6.85	882	---	-121.8	-0.5
	10/27/08	**NS**	**NS**	**22.70**	**6.72**	**1,018**	**0.02**	**-144.1**	**32.5**

TABLE 5-3

Groundwater Natural Attenuation and Field Parameter Results
Groundwater Monitoring Wells
October 2005 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Monitoring Well	Date Sampled	Biochemical Oxygen Demand mg/L	Chemical Oxygen Demand mg/L	Temperature °C	pH	Conductivity µs/cm	Dissolved Oxygen mg/L	Oxidation Reduction Potential mV	Turbidity NTU
T-22	08/14/06	13	37	21.03	7.04	715	0.36	-182.3	0.3
	11/16/06	NS	NS	20.09	7.34	760	0.36	-102	0.2
	02/14/07	NS	NS	12.22	7.27	746	---	-71.4	0.1
	05/18/07	NS	NS	17.64	6.98	808	---	-104.3	-0.6
	10/29/08	**NS**	**NS**	**21.10**	**7.24**	**810**	**5.13**	**-195.7**	**-1.1**
T-23	08/15/06	<6.0	26	25.65	7.83	606	0.49	-51.7	-1.8
	11/16/06	NS	NS	19.74	7.69	826	0.49	-221.1	0.5
	02/14/07	NS	NS	11.56	7.57	720	---	-63.5	0.3
	05/16/07	NS	NS	17.85	7.04	947	---	-99.1	-0.1
	10/30/08	**NS**	**NS**	**20.48**	**6.92**	**898**	**0.34**	**-234.9**	**-0.8**

Key:
-- = data not included due to possible field error
°C = Degrees Celsius
µs/cm = Microsiemens per centimeter
dup = duplicate sample
mg/L = Milligrams per liter
mV = Millivolts
NS = Not sampled

error, because it would not be commonly expected that strongly reducing conditions would not persist in the presence of elevated oxygen concentrations. The condition of the DO membrane was inspected and the calibration of the DO probe was confirmed following each of these measurements. Absent an obvious source of instrument or operator error, these elevated DO readings suggest continued contribution of oxygen by the ORC emplaced in the aquifer in 2006.

Significant interpretation or speculation about natural attenuation trends or the persistence of effects from ORC injections based upon this and prior DO data should be balanced with an understanding of the overall level of data quality that may be expected from a sensitive field instrument such as a membrane DO probe. ORC is a slow releasing compound that can provide molecular oxygen up to concentrations of 40 mg/L or more. Therefore, it can be extremely difficult for a field technician to determine if a DO probe is producing elevated readings at sites where ORC has been applied based upon a damaged membrane, the presence of bubbles or other conditions fouling the sensor, or if the probe is correctly reading actual site conditions. DO results should be paired with the field-collected redox data and evaluated with knowledge of contaminant distribution and trends when drawing conclusions regarding ongoing or future potential aerobic or anaerobic natural attenuation that may occur at the site.

5.2.3 Monitoring Well Groundwater Sampling Results

Analytical results for monitoring well groundwater samples are provided in Appendix D and summarized on Table 5-4. The following subsections summarize the laboratory results for each chemical constituent group.

5.2.3.1 Petroleum Hydrocarbon Analysis Results

TPH-d and TPH-o were not detected in any groundwater monitoring well. TPH-av and TPH-g were detected in wells MW-07, MW-25, T-5, and T-21. Detected TPH-av concentrations ranged from 0.54 to 1.9 mg/L. Detected TPH-g concentrations ranged from 1.7 to 4.0 mg/L.

The general distribution of TPH-av and TPH-g in groundwater is consistent with the observed distribution of VOCs. TPH-g was found to represent a higher mass fraction than TPH-av in the dissolved plume. This is consistent with the known historical release of JP-4, which has a

TABLE 5-4

Organic Compounds Detected in Groundwater Monitoring Well Samples
March 1998 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Monitoring Well	Date	TPH-g	TPH-av	MTBE	Chloroform	Benzene	Toluene	Ethylbenzene	Xylenes (total)
	Action Level	NE	NE	12 (b)	0.19 (b)	5.0 (a)	1,000 (a)	700 (a)	10,000 (a)
EXW-01	10/25/05	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	08/16/06	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/16/06	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	**1.2**
	02/16/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	05/17/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/27/08	<500	<500	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EXW-02	Mar-98	NA	NA	NA	ND	NA	NA	NA	NA
	Aug-98	NA	NA	NA	ND	NA	NA	NA	NA
	May-99	NA	NA	ND	ND	ND	ND	ND	ND
	Nov-99	NA	NA	ND	ND	ND	ND	ND	ND
	May-00	NA	NA	ND	ND	ND	ND	ND	ND
	Nov-00	NA	NA	ND	ND	ND	ND	ND	ND
	Sep-01	NA	NA	ND	ND	ND	ND	ND	ND
	10/25/05	NA	NA	**1.4**	<1.0	<1.0	<1.0	<1.0	<1.0
	08/15/06	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/17/06	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0
	02/16/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	05/17/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/27/08	<500	<500	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EXW-03	10/25/05	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	08/15/06	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/16/06	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0
	02/15/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	05/17/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/27/08	<500	<500	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
EXW-04	10/25/05	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	08/16/06	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/17/06	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0
	02/15/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	05/18/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/28/08	<500	<500	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-06	Mar-98	NA	NA	NA	ND	**25**	ND	**20**	**21**
	Aug-98	NA	NA	NA	ND	**77**	ND	**2.2**	**20**
	May-99	NA	NA	ND	ND	**13**	ND	**6.0**	**8.0**
	Nov-99	NA	NA	ND	ND	**22**	ND	**38**	**100**
	May-00	NA	NA	ND	ND	**11**	ND	**4.5**	**8.1**
	Nov-00	NA	NA	ND	ND	**14**	ND	**4.5**	**12**
	Sep-01	NA	NA	ND	ND	**4.5**	ND	ND	**2.8**
	Mar-02	NA	NA	ND	ND	**7.8**	ND	ND	**2.1**
	Oct-02	NA	NA	ND	ND	**27**	ND	**2.1**	**9.3**
	Apr-03	NA	NA	<0.50	ND	**49**	<0.50	**3.9**	**12**
	Oct-03	NA	NA	<1.0	ND	**15**	<1.0	**3.9**	**12**
	10/25/05	NA	NA	<1.0	<1.0	**36**	<1.0	<1.0	**3.7**
Dup	10/25/05	NA	NA	<1.0	<1.0	**27**	<1.0	<1.0	**2.5**
	08/15/06	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dup	08/15/06	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/16/06	NA	NA	NA	<1.0	**5.4**	<1.0	<1.0	**1.7**
	02/16/07	NA	NA	<1.0	<1.0	**2.2**	<1.0	<1.0	<1.0
	05/16/07	NA	NA	<1.0	<1.0	**3.9**	<1.0	<1.0	<1.0
	10/30/08	<500	<500	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

TABLE 5-4

Organic Compounds Detected in Groundwater Monitoring Well Samples
March 1998 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Monitoring Well	Date	TPH-g	TPH-av	MTBE	Chloroform	Benzene	Toluene	Ethylbenzene	Xylenes (total)
	Action Level	NE	NE	12 (b)	0.19 (b)	5.0 (a)	1,000 (a)	700 (a)	10,000 (a)
MW-07	Mar-98	NA	NA	NA	ND	**2200**	ND	ND	ND
	May-99	NA	NA	ND	ND	**200**	ND	ND	**49**
	Nov-99	NA	NA	ND	ND	**790**	ND	ND	**893**
	May-00	NA	NA	**19**	ND	**150**	ND	ND	**49**
	Nov-00	NA	NA	**14**	ND	**26**	ND	ND	**14**
	Sep-01	NA	NA	**5.0**	ND	**200**	ND	ND	**51**
	Mar-02	NA	NA	**3.8**	ND	**130**	ND	ND	**56**
	Oct-02	NA	NA	**3.0**	ND	**9.4**	ND	ND	**5.1**
	Apr-03	NA	NA	**5.1**	ND	**640**	<2.5 c	<5.0 c	**140**
	Oct-03	NA	NA	**3.2**	ND	**580**	<2.5 c	<5.0 c	**300**
	10/26/05	NA	NA	**1.7**	<2.0 d	**180**	<1.0 d	**20**	**26**
	08/16/06	NA	NA	<2.5 d	**17**	**470**	<2.5 d	**28**	**22**
	11/17/06	NA	NA	NA	<1.0	**30**	<1.0	**3.5**	**2.2**
	02/16/07	NA	NA	<1.0	<2.0	**190**	<1.0	**30**	**13**
	05/17/07	NA	NA	<5.0 d	<10 d	**290**	<5.0 d	**27**	**17**
	10/27/08	**1,800**	**1,800** i, NJ	<1.0	<2.0 e	**230**	<1.0	**3.4**	**1.9**
MW-10	10/28/08	<500	<500	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-23	Mar-98	NA	NA	NA	ND	ND	ND	ND	ND
	Aug-98	NA	NA	NA	ND	ND	ND	ND	ND
	May-99	NA	NA	**130**	ND	ND	ND	ND	ND
	Nov-99	NA	NA	**140**	ND	ND	ND	ND	ND
	May-00	NA	NA	**250**	ND	ND	ND	ND	ND
	Nov-00	NA	NA	**280**	ND	ND	ND	ND	ND
	Sep-01	NA	NA	**150**	ND	ND	ND	ND	ND
	Mar-02	NA	NA	**300**	ND	ND	ND	ND	ND
	Oct-02	NA	NA	**200**	ND	ND	ND	ND	ND
	Apr-03	NA	NA	**140**	ND	<0.50	<0.50	<0.50	<0.50
	Oct-03	NA	NA	**190**	ND	<1.0	<1.0	<1.0	<1.0
	10/24/05	NA	NA	**150**	<1.0	<1.0	<1.0	<1.0	<1.0
	08/16/06	NA	NA	**81**	<1.0	<1.0	<1.0	<1.0	<1.0
	11/17/06	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0
	02/15/07	NA	NA	**190**	<1.0	<1.0	<1.0	<1.0	<1.0
	05/16/07	NA	NA	**130**	<2.0 e	<1.0	<1.0	<1.0	<1.0
	10/30/08	<500	<500	**150**	<1.0	<1.0	<1.0	<1.0	<1.0
MW-24R	Mar-98	NA	NA	NA	ND	ND	ND	ND	ND
	Aug-98	NA	NA	NA	ND	ND	ND	ND	ND
	May-99	NA	NA	ND	ND	ND	ND	ND	ND
	Nov-99	NA	NA	ND	ND	ND	ND	ND	ND
	May-00	NA	NA	ND	ND	ND	ND	ND	ND
	Nov-00	NA	NA	ND	ND	ND	ND	ND	ND
	Sep-01	NA	NA	ND	ND	ND	ND	ND	ND
	Oct-02	NA	NA	ND	ND	ND	ND	ND	ND
	Apr-03	NA	NA	0.95	ND	<0.50	<0.50	<0.50	<0.50
	Oct-03	NA	NA	<1.0	ND	<1.0	<1.0	<1.0	<1.0
	10/25/05	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	08/16/06	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/16/06	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0
	02/14/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	05/17/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

TABLE 5-4

Organic Compounds Detected in Groundwater Monitoring Well Samples
March 1998 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Monitoring Well	Date	TPH-g	TPH-av	MTBE	Chloroform	Benzene	Toluene	Ethylbenzene	Xylenes (total)
	Action Level	NE	NE	12 (b)	0.19 (b)	5.0 (a)	1,000 (a)	700 (a)	10,000 (a)
MW-25	Mar-98	NA	NA	NA	ND	4,200	ND	ND	520
	Aug-98	NA	NA	NA	ND	6,200	ND	ND	680
	May-99	NA	NA	ND	ND	3,700	ND	ND	240
	Nov-99	NA	NA	260	ND	3,700	6.4	25	397.4
	May-00	NA	NA	72	ND	914	ND	ND	78
	Nov-00	NA	NA	490	ND	10,000	ND	ND	320
	Sep-01	NA	NA	280	ND	4,000	ND	ND	98
	Mar-02	NA	NA	64	ND	1,700	ND	15	ND
	Oct-02	NA	NA	90	ND	1,800	ND	ND	ND
	Apr-03	NA	NA	<1.0	ND	98	<1.0	24	3.6
	Oct-03	NA	NA	250	ND	3,600	<15 c	<15 c	48
	10/26/05	NA	NA	120	<50 d	5,200	<25 d	<25 d	<25 d
	08/15/06	NA	NA	49	<30 d	2,200	<15 d	<15 d	<15 d
	11/17/06	NA	NA	NA	<5.0	430	<2.5	3.1	12.5
	02/16/07	NA	NA	4.0	<5.0	590	<2.5	<2.5	<2.5
	05/17/07	NA	NA	<10 e	<20 e	19	<10 e	<10 e	<10 e
	10/27/08	4,000	540 i, NJ	72	<20 d	2,100	<10 d	<10 d	<10 d
MW-26	10/28/08	<500	<500	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
T-5	10/26/05	NA	NA	<20 d	<40 d	4,100	41	570	3,500
	08/17/06	NA	NA	2.8	<3.0	360	<1.5	69	510
	11/17/06	NA	NA	NA	<2.0	200	<1.0	60	280
	02/16/07	NA	NA	<1.0	<1.0	45	<1.0	14	39
	05/16/07	NA	NA	2.3	<3.0 d	340	<1.5 d	36	142
	10/30/08	1,800	590 i, NJ	1.8	<3.0 d	310	<1.5 d	45	143
T-10	10/30/08	<500	<500	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
T-11	10/24/05	NA	NA	8.9	<1.0	<1.0	<1.0	<1.0	<1.0
	08/16/06	NA	NA	37	<30 d	3,300	<15 d	99	82
	11/17/06	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0
	02/15/07	NA	NA	57	<1.0	4.3	<1.0	<1.0	<1.0
	05/16/07	NA	NA	53	<40 d	3,800	<20 d	22	200
	10/30/08	<500	<500	23	<1.0	<1.0	<1.0	<1.0	<1.0
T-12	10/30/08	<500	<500	1.9	<1.0	<1.0	<1.0	<1.0	<1.0
T-13	10/24/05	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	08/16/06	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/17/06	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0
	02/15/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	05/16/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/30/08	<500	<500	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
T-18	10/26/05	NA	NA	130	<50 d	9,100	<25 d	<25 d	320
	08/15/06	NA	NA	1.4	<1.0	<1.0	<1.0	<1.0	<1.0
	11/16/06	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0
	02/15/07	NA	NA	2.8	<1.0	<1.0	<1.0	<1.0	<1.0
	05/17/07	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	10/27/08	<500	<500	1.7	<1.0	<1.0	<1.0	<1.0	<1.0
T-21	08/14/06	NA	NA	3.5	<1.0	9.5	<1.0	7.6	11
	11/16/06	NA	NA	NA	<2.0	140	1.4	47	85
Dup	11/16/06	NA	NA	NA	<2.0	140	2.6	45	84
	02/15/07	NA	NA	15	<10	620	<5.0	43	5.9
	05/18/07	NA	NA	20	<2.0 d	1,600	<10 d	270	330
	10/27/08	1,700	1,700 i, NJ	5	<1.0	120	<1.0	2.6	14
Dup	10/27/08	1,500	1,900 i, NJ	4.7	<1.0	99	<1.0	2.4	13

TABLE 5-4

Organic Compounds Detected in Groundwater Monitoring Well Samples
March 1998 through October 2008
ERP Site 7
152nd Airlift Wing, Nevada Air National Guard
Reno, Nevada

Monitoring Well	Date	TPH-g	TPH-av	MTBE	Chloroform	Benzene	Toluene	Ethylbenzene	Xylenes (total)
	Action Level	NE	NE	12 (b)	0.19 (b)	5.0 (a)	1,000 (a)	700 (a)	10,000 (a)
T-22	08/14/06	NA	NA	**20**	<10 d	**1,300**	**5.8**	**300**	**502**
	11/16/06	NA	NA	NA	<1.0	**47**	<1.0	**8.3**	**1.1**
	02/14/07	NA	NA	**15**	<20	**1,700**	<10	**280**	**402**
Dup	02/14/07	NA	NA	**15**	<20	**1,700**	<10	**280**	**403**
	05/18/07	NA	NA	**4.7**	<4.0 d	**360**	<2.0 d	**120**	**200**
	10/29/08	<500	<500	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
T-23	08/15/06	NA	NA	<1.0	<1.0	**26**	<1.0	**5.6**	**2.4**
	11/16/06	NA	NA	NA	<1.0	**59**	<1.0	**2.0**	**1.7**
	02/14/07	NA	NA	<5.0	<10	**710**	<5.0	**210**	**350**
	05/16/07	NA	NA	<2.5 d	<5.0 d	**510**	<2.5 d	**170**	**160**
Dup	05/16/07	NA	NA	<2.5 d	<5.0 d	**480**	<2.5 d	**150**	**140**
	10/30/08	<500	<500	<1.0	**2.3**	<1.0	<1.0	<1.0	<1.0

Notes:
Concentrations reported in micrograms per liter
Bold = Chemical concentration in excess of the laboratory method detection limit.
= Chemical concentration detected is greater than the screening level.

(a) = EPA Region 9 Maximum Contaminant Level - USEPA Master RSL Summary Table 12 September 2008

(b) = EPA Region 9 Tap Water Preliminary Remediation Goal (*Used for Screening Only*) - USEPA Master RSL Summary Table 12 September 2008
(c) = Reporting limits were increased due to high dilution ratio of target analytes
(d) = Reporting limits were increased due to high concentrations of target analytes.
(e) = Reporting limits were increased due to foaming
< = Less than the laboratory reporting limit.
dup = Duplicate sample
MCL = USEPA Maximum Contaminant Level
MTBE = Methyl tert-butyl ether
NA = Not analyzed
ND = Nondetect
NE = No MCL or PRG established
TPH-av = Aviation fuel (jet fuel)-range petroleum hydrocarbons (C9-C22)
TPH-g = Gasoline-range petroleum hydrocarbons (C4-C13)
USEPA = United States Environmental Protection Agency

Laboratory Qualifiers:
i = May include contributions from other products. Falls largely within the diesel range and is quantitated with TPH-d calibration.

ERM Qualifiers:
NJ = Estimated value

The following compounds were analyzed for, but not detected:

Chloromethane	trans-1,2-Dichloroethene	Trichloroethene	Chlorobenzene
Vinyl Chloride	1,1-Dichloroethane	Bromodichloromethane	Bromoform
Chloroethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	1,1,2,2-Tetrachloroethane
Bromomethane	1,2-Dichloroethane	traNA-1,3-Dichloropropene	1,3-Dichlorobenzene
Trichlorofluoromethane	1,1,1-Trichloroethane	1,1,2-Trichloroethane	1,4-Dichlorobenzene
1,1-Dichloroethene	Carbon Tetrachloride	Dibromochloromethane	1,2-Dichlorobenzene
Dichloromethane	1,2-Dichloropropane	Tetrachloroethene	

Heavy oil-range petroleum hydrocarbons (C22-C40+)
Disel-range petroleum hydrocarbons (C13-C22)

significantly higher fraction of volatile compounds than the standard used for the laboratory analysis of TPH-av.

5.2.3.2 Volatile Organic Compounds

Benzene was detected above its MCL of 5 µg/L in four wells during October 2008, as follows:

Well ID	Concentration (µg/L)
MW-07	230
MW-25	2,100
T-5	310
T-21	120

Benzene was not detected in well T-11 in October 2008. Benzene concentrations in this well have varied from nondetect to 3,800 µg/L between the current sampling event and October 2005.

Ethylbenzene and xylenes were detected in three wells (MW-07, T-5, and T-21) during October 2008; however, all detected concentrations are below the MCLs. Chloroform was detected in one well (T-23) at 2.3 µg/L, above its PRG of 0.19 µg/L (no MCL is available for chloroform). Toluene was not detected.

MTBE was detected in seven wells (MW-23, MW-25, T-5, T-11, T-12, T-18, and T-21). Three of the detections exceeded the PRG of 12 µg/L for MTBE. No MCL has been established for MTBE. The source of the MTBE is believed to originate from an off-site upgradient location and is not related to releases at the Reno ANGB (ERM, 2002).

5.3 Contaminant Distribution and Trend Evaluation

This section includes a summary of data trends noted during this and prior groundwater monitoring events and site investigations conducted at ERP Site 7 between October 2005 and October 2008. Benzene has been noted as the primary chemical of concern at the site because it is the compound most frequently detected at concentrations greater than the MCL in groundwater monitoring wells and in temporary wells. Ethylbenzene and xylenes have been infrequently detected at concentrations above their MCLs; however, samples with ethylbenzene or

xylene concentrations exceeding the MCL also have benzene concentrations above the MCL. Likewise, samples with detections of TPH also had benzene detections.

MTBE concentrations did not correlate with benzene. MTBE impacts on the site have been attributed to an off-site source and do not require further consideration in this Report (ERM, 2002).

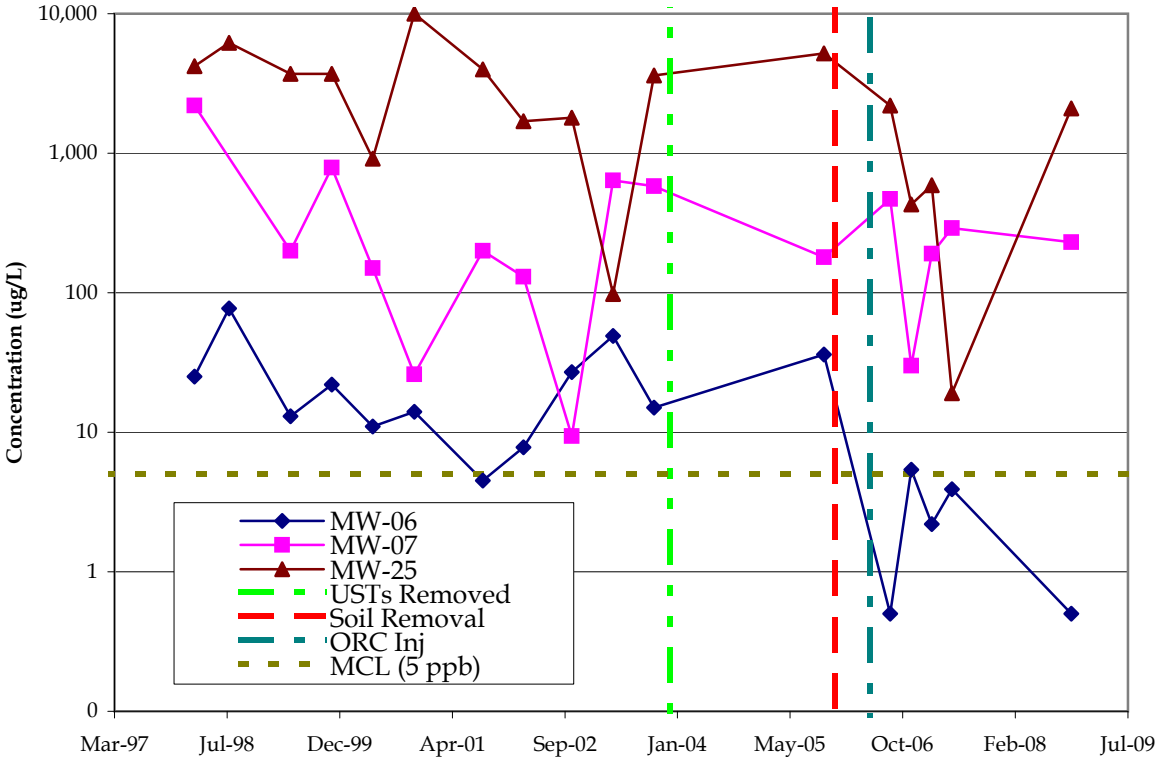
5.3.1 Benzene Distribution

Distribution of benzene detections in October 2008 are provided in Figure 5-2. The current benzene distribution shows that the extent of groundwater impacts has been delineated to the east, south, and west of the former USTs. It should be noted that prior sporadic detections south of the USTs (T-11) suggest that benzene impacts may periodically extend off site. Benzene impacts were noted in monitoring wells T-5 and GP-13, indicating that benzene impacts are not fully bounded northeast of the former USTs. This area has limited accessibility because it is part of the active flight apron.

The highest concentrations of benzene were noted in the screening-level groundwater sample collected from GP-10, located southeast of the former USTs (south of Excavation B). This sample is likely biased high as a result of significant soil impacts observed immediately above the water table. The results of the soil removal action conducted in 2005 suggest that the area of residual impacts in soils area GP-10 is limited in extent because significant surrounding soils were removed (ERM, 2009). Benzene was also noted to the northeast of the former USTs.

5.3.2 Benzene Trends over Time

Analysis of benzene distribution in groundwater monitoring wells over time indicates that concentrations have decreased significantly over time as a result of the various remediation activities. Wells MW-06, MW-07, MW-25, T-5, T-11, T-18, T-21, T-22, and T-23 contained detectable concentrations of benzene during one or more of the six groundwater monitoring events conducted between October 2005 and October 2008. Benzene concentrations in these nine wells are graphically presented in Figure 5-4. Trends in benzene concentration in these nine wells are summarized below:



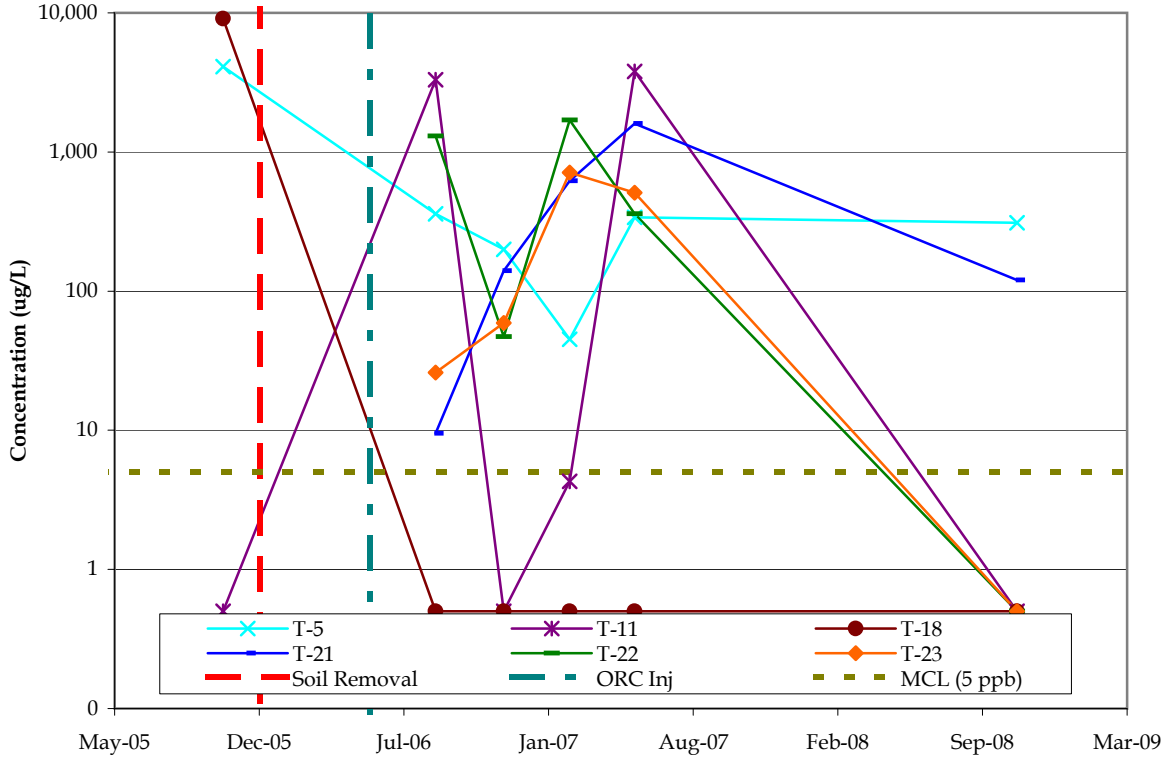


Figure 5-4
Historical Trends in Benzene Concentrations Detected in Groundwater
ERP Site 7
152nd Airlift Wing
Nevada Air National Guard
Reno, Nevada

- Concentrations of benzene in well MW-25, located downgradient of the former USTs, contained benzene at 5,200 µg/L in 2005 (prior to the ORC injections). Benzene concentrations in MW-25 decreased to 19 µg/L in May 2007, but have since rebounded to 2,100 µg/L.

- Wells MW-06 and T-18 are located to the east of the former USTs. Both wells historically contained benzene at concentrations above the MCL, but did not contain detectable concentrations of benzene during the October 2008 sampling event.

- Well T-5 is located directly north of the former USTs. Benzene was reported at 4,100 µg/L in 2005. Concentrations during the subsequent sampling events have remained at approximately 300 µg/L.

- Well MW-07, which is located in an area that was treated with ORC, had a baseline benzene concentration in 2005 of 180 µg/L, and has remained at similar concentrations following the ORC emplacement and injections.

- Wells T-21, T-22, and T-23 were installed within the excavation footprint following the completion of the backfill of the excavation in 2006. Therefore, pre-soil removal and ORC application benzene concentrations are not available for these wells. T-21 and T-22 are located downgradient of the former USTs and T-23 is located cross-gradient of the former USTs. Benzene concentrations have decreased significantly in these wells to concentrations of 120 µg/L in T-21 and nondetect in both T-22 and T-23.

- Benzene concentration in T-11 notably reduced from 3,800 µg/L in May 2007 to nondetect in October 2008. Of the six groundwater monitoring events conducted in 2005 through 2008, benzene concentrations have been nondetect for half, detected below the MCL for one, and higher than 3,000 µg/L in August 2006 and May 2007.

The sporadic detection of benzene in T-11 somewhat correlates with groundwater elevation. Prior to the October 2008 sampling event, the elevated detections of benzene at well T-11 in August 2006 and May 2007 corresponded with the two lowest water table measurements. This trend was suggestive of mobilization of contamination from a vadose zone source. The groundwater table in October 2008, however, was lower than in May 2007.

5.4 Natural Attenuation Trends

Natural attenuation parameters collected in screening-level and monitoring well groundwater samples during the October 2008 sampling event are presented on Tables 5-2 and 5-3, respectively.

The trends in DO and ORP data from October 2008 suggest that oxygen continues to be the limiting factor to the aerobic degradation of petroleum hydrocarbons and associated VOCs. The ORP measurements collected in most of the groundwater monitoring wells in October 2008 ranged from moderately oxidizing to moderately (or strongly) reducing throughout the site. The negative ORP measurements (indicative of reducing conditions) correlate strongly with the detection of BTEX compounds; while the positive ORP values correlate with areas with no detected VOCs.

DO concentrations on site were generally low (less than 1 mg/L) and correlated with negative ORP values. Only four monitoring wells and the two off-site boreholes contained DO concentrations greater than 1 mg/L.

Monitoring wells T-22 and T-23 contained highly reducing conditions in October 2008, but no or low VOC concentrations. These wells contained relatively high benzene concentrations during the previous groundwater monitoring event in May 2007, indicating persistent biological or chemical reducing conditions in the vicinity of these wells.

The overall trends in the DO and ORP data show low DO and reducing conditions in the areas known to be impacted by petroleum hydrocarbons and more aerobic and oxidizing conditions in the less contaminated areas, including off site.

BOD and COD were determined in each of the screening-level groundwater samples collected in October 2008. The highest BOD and COD values were reported at location GP-10, which had the highest VOC concentrations and observed residual smear zone contamination. High BOD at GP-10 is likely caused by the high availability of organic carbon for microbial activity, and a subsequently larger pool of microorganisms.

COD concentrations were higher in the on-site boreholes (18 to 31 mg/L) than in the off-site boreholes (nondetect to 9.1 mg/L). Higher COD generally correlates with more highly reducing environments (more negative ORP) and indicates higher concentrations of reduced metals and organic materials.

SECTION 6.0

GROUNDWATER EXTRACTION SYSTEM DECOMMISSION

This section describes the decommissioning of the groundwater remedial system performed in October through December 2008 at the Reno ANGB. All decommissioning tasks were performed using the procedures described in the Work Plan.

6.1 General Remedial System Decommissioning Approach

Decommissioning of the remedial system included dismantling and/or demolishing the system components in place and transporting these components off site for recycling, reuse, or disposal. Activities were coordinated with the Nevada ANGB environmental manager and the civil engineer to avoid adverse impacts to the ANGB operations.

Decommissioning activities included removing and de-energizing the remedial system electrical components, disconnecting aboveground equipment from underground portions of the groundwater extraction/injection system, decontaminating all groundwater-impacted portions of the remedial system, disposal of organic waste and solid waste, and transportation of reusable components of the remedial system to an off-site storage facility.

The equipment and wastes removed from the site as part of the decommissioning included:

- Aboveground conveyance piping and supports;
- Extraction and transfer pumps and related power sources;
- The sediment filters and associated wastes;
- The three 2,000-pound liquid-phase GAC vessels;
- Approximately 12,000 pounds of used GAC;

- An empty, aboveground storage tank used to contain waste oil;
- The oil-water separator and surge tank;
- The remedial system control panel and associated wiring; and
- All other aboveground remedial system-specific components.

The scope of work did not include removal of the subsurface infrastructure installed for this system. Much of the piping associated with the extraction wells in this system was removed as part of the UST and soil removal actions performed in 2003 and 2005. These conduits were cut at ground surface and permanently capped with concrete to prevent these utilities from becoming conduits for contamination of the subsurface.

Bolts of other supports that were cut from the floor of the building were cut as close as possible and filed or ground to eliminate sharp edges or tire puncture hazards.

6.2 General Health and Safety Considerations

All decommissioning activities performed by ERM personnel were consistent with ERM's *Site-Specific Health and Safety Plan*, provided in the Work Plan, and included the following health and safety precautions:

- Prior to performing any work that could potentially impact the system electrical supply, the remedial system was de-energized by a licensed electrician.
- All items weighing more than 50 pounds were lifted by teams of personnel or by a licensed forklift driver.
- Appropriate personal protection equipment, including chemical-resistant gloves and safety glasses, was donned while handling waste materials or other potentially chemical-impacted equipment.

6.3 Electrical System Modification

Prior to any other activities that could involve the remedial system's electrical wiring, the electrical supply was disconnected and modified to permanently de-energize the system. On 21 October 2008, the electrical

system was disconnected by Ron Chiaratti, a licensed electrician from Norris Electric. The electrician found that the base civil engineering department had already disconnected the power to the building. All electrical work was performed following lock-out/tag-out procedures.

The electrical work included the following components:

- De-energize the system;
- Disconnection of the remedial system control panel and associated electrical circuits; and
- Restoration of the power connection to the main electrical panel and all retained building components (lighting, heating, and auxiliary power).

6.4 Decontamination

System components that were visibly stained or had contact with petroleum-contaminated groundwater were decontaminated prior to removal or disposal. Decontamination was performed by scrubbing components with detergent and steam cleaning using a steam and hot water pressure washer. Decontamination was performed within the containment pad integrated in the treatment system building. The wash water was transferred from the sump and floor of the containment to temporary drums. The sump and drums were subsequently drained using a vacuum truck and the fluids were disposed as petroleum-contaminated waste water by Reno Drain Oil Service of Sparks, Nevada.

6.5 Removal and Disposal

To minimize the environmental impact of decommissioning the remedial system, ERM determined if system components could be reused or recycled. Reusable equipment was decontaminated on site and transported to an off-site storage facility. The reusable materials included the oil-water separator; the GAC vessels; and the operable pumps, valves, meters, sensors, and switches. These materials are now the property of ERM and will be reused, as possible, at other sites with petroleum hydrocarbon contamination; otherwise, they will be disposed or recycled at ERM's expense.

Recyclable materials were segregated into separate bins from non-recyclable materials. The recyclable materials included ferrous materials, including metal conduit, copper wiring, metal struts, and support members. The non-reusable or recyclable materials included the PVC pipe and other plastic materials; and the disposable components, including the particulate filters.

Recyclable and non-recyclable materials were removed by Waste Management, Inc. The GAC vessels, oil-water separator, and assorted pumps and switches were placed on a transport truck and driven to Sacramento, California, by Taylor Heavy Hauling of Sacramento, California.

6.6 Waste Profiling and Disposal

This subsection describes methods used in profiling and removing potentially contaminated wastes.

Procedures used for the collection of activated carbon samples and decontamination water followed Standard Operating Procedures outlined in the *Air National Guard Investigation Guidance* document (ANG, 2005) and ERM's *Final Quality Assurance Project Plan, Air National Guard Installation Restoration Program* (ERM, 1995); and in the Work Plan (ERM, 2008a).

6.6.1 Profiling and Disposal of Activated Carbon

On 25 September 2008, one sample was obtained from each of the six bags and three vessels of activated carbon for profiling. Each sample of activated carbon was collected using a garden-type, stainless-steel trowel. The trowel was decontaminated prior to collecting each sample. The top 12 inches of activated carbon was moved aside and a single grab sample was collected from each bag or vessel. Activated carbon samples were labeled and transported under chain-of-custody procedure to the carbon regeneration contractor. The GAC was profiled by Siemens Water Technologies of Redlands, California (Siemens) as nonhazardous and deemed suitable for regeneration and reuse.

The six bags of GAC were loaded onto a truck and the contents of the three treatment vessels were removed by Siemens using a vacuum truck. The GAC was transported to an off-site facility for regeneration through thermal desorption.

6.6.2 Profiling and Disposal of Decontamination Water

Decontamination water was removed by Reno Drain Oil Service as nonhazardous petroleum-contaminated waste. No profiling of the waste was performed based upon extensive operational knowledge of the system. The waste was removed and treated by Reno Drain Oil Service as petroleum-impacted water.

SECTION 7.0

CONCLUSIONS

This section provides conclusions on the field investigation and analytical results discussed in this Report. The objectives of the October 2008 field investigation were to:

1) Delineate the distribution and concentrations of the dissolved-phase hydrocarbon plume in and around ERP Site 7 at the Reno, Nevada, ANGB; and

2) Investigate natural attenuation and oxygen demand to support later assessment of further remedial alternatives.

Groundwater flow gradient and direction were found to be consistent with prior observations. Free-phase petroleum hydrocarbons (free product) were not noted in any monitoring wells or in any other soil sample. The results of investigation into the anomalous change in the survey elevations in 2006 with respect to prior survey data found that the survey performed in 2006 referenced an incorrect elevation for the survey bench mark. To address this error, the survey elevation data collected following site restoration activities in September 2006 have been corrected. This error was applied to the site data universally, and as such, has not impacted site-specific data interpretation or conclusions drawn from this data. If future site work requires surveying of elevations, it is recommended that all of the reference elevation points for the wells at ERP Site 7 be re-surveyed to provide for a complete and accurate survey data set.

Soil screening during investigative activities in October 2008 using visual observations and a PID identified an area of residual petroleum hydrocarbon impacts in soil at or just above the water table at boring GP-10, located between Excavations A and B. Results of prior soil excavations show that this area of observed soil impact is limited in extent. High PID readings were recorded at the water table at two additional boring locations (GP-9 and GP-13). No impacts were observed during screening of off-site soils.

TPH-g was analyzed in addition to TPH-av, TPH-d, and TPH-o range hydrocarbons due to observation by the laboratory that the site samples

did not match the standard for aviation fuel. Based upon these results, it appears the analysis of TPH-g and TPH-d range hydrocarbons is more appropriate than TPH-av and TPH-d for quantification of the hydrocarbon impacts in groundwater at the site. TPH-g should be substituted for THP-av analysis as part of future monitoring activities.

Benzene was noted as the primary chemical of concern in groundwater at the site. It was the compound most frequently detected at concentrations greater than the MCL. Samples with detectable concentrations of TPH or ethylbenzene also included benzene concentrations above the MCL. Based on analytical data collected in October 2008, impacts have been delineated except for northeast of the former USTs. Temporary borehole GP-13 was sited to delineate this area. However, benzene was detected at this location at a concentration greater than the MCL. Previous groundwater monitoring data from well T-11 suggest that benzene impacts may periodically extend off site, south of the storm water sewer line located along the southern boundary of ERP Site 7. However, benzene was not detected in T-11 in October 2008, nor was benzene detected in the two temporary wells installed off site (GP-11 and GP-12).

Field-collected groundwater quality measurements of DO and ORP indicate that oxygen continues to be the limiting factor to the aerobic degradation of petroleum impacts at ERP Site 7. Low DO concentrations and negative ORP values were detected throughout the areas of the site with identified groundwater impacts, indicating that field conditions are generally anaerobic and reducing. Strongly reducing conditions correlate with BTEX detections.

The remedial system decommissioning and associated waste removal was completed successfully.

SECTION 8.0

REFERENCES

Automated Science Group, Inc. 1989. *Installation Restoration Program Preliminary Assessment for the Nevada Air National Guard, 152nd Tactical Reconnaissance Group, Reno Cannon International Airport, Reno, Nevada.* Automated Science Group, Inc., Oak Ridge, Tennessee.

BB&E Consultants. 2004. *Draft Remedial Process Optimization Site Visit Report.*

ERM-West, Inc. (ERM). 1996. *Installation Restoration Program Final Engineering and Evaluation/Cost Report* (August 1996).

ERM. 2000. *System Modifications and Restart Summary Report* (August 2000).

ERM. 2002. *MTBE Investigation Technical Memorandum* (May 2002).

ERM. 2004. *Final Remedial Design Pre-Design Study Work Plan, Environmental Restoration Program Site 7.*

ERM. 2005. *Final Remedial Design Work Plan, ERP Site 7* (May 2005).

ERM. 2008a. *Final Abbreviated Remedial Action Objective (RAO) and Remedial System Decommission Work Plan* (October 2008).

ERM. 2008b. *Final May 2007 Quarterly Groundwater Monitoring and Remedial Progress Report, ERP Site 7* (November 2008).

ERM. 2008c. *Final Remedial Action Operations - Storm Sewer Line Assessment Report, ERP Site 7* (August 2008).

ERM. 2009. *Draft Remedial Implementation Report, ERP Site 7* (February 2009).

APPENDIX A

BOREHOLE LOGS

ERM
101 SW Main Street, Suite 804
Portland, OR 97204
Phone: (503) 488-5282
Fax: (503) 488-5142

LOG OF BOREHOLE: GP-9

Project Number: 86300
Project Name: Site 7 Abbreviated Remedial Action
Client Name: Air National Guard
Location: Reno Air National Guard Base, Site 7
Contractor: Gregg Drilling & Testing, Inc. (Martinez, California)
Drilling Method: Direct Push
Logged By: S. DeGrood

Notes:

Date Started: 10/29/2008
Date Completed: 10/29/2008
Total Depth: 12 feet
Borehole Diameter: 2 inches
Initial Water Level: 6.7 feet bgs

Depth (ft)	GRAPHIC LOG	USCS Code	PID (ppm)	Sample Interval	Soil Descriptions and Observations
					Asphalt
		SW-SM			WELL-GRADED SAND WITH SILT (SW-SM): gray (10YR5/1), fine sand to fine gravel, 10% fines, well-graded, subrounded, no odor, dry. Fill material.
		ML			SILT (ML): dark grayish brown (2.5Y4/2), medium plasticity, low toughness, no odor, damp.
5		MH	4.4		ELASTIC SILT (MH): dark grayish brown (2.5Y4/2), few black mottles, few very fine root hairs, medium plasticity, medium toughness, slight organic odor, damp.
		SP	∇ 1324		POORLY GRADED SAND (SP): reddish black (2.5YR2.5/1), fine sand, poorly graded, rounded, no odor, damp.
		SM	6.1		SILTY SAND (SM): reddish black (2.5YR2.5/1), fine sand, 20% fines, poorly graded, rounded, no odor, damp.
10		SP			POORLY GRADED SAND (SP): dark yellowish brown (10YR4/4), fine sand, poorly graded, rounded, no odor, moist. As above, except moisture increases to saturated at 10.5 feet bgs.
		ML			SILT WITH SAND (ML): dark grayish brown (2.5Y4/2), 20% fine sand, non-plastic, low toughness, no odor, saturated.
					Total Depth - 12 feet bgs
15					

BOREHOLE TO 20 FT PDX - - 2/3/09 11:02 - C:\PROGRAM FILES\GINT\PROJECTS\86300.41 RENO ANG BORELOGS.GPJ

ERM
101 SW Main Street, Suite 804
Portland, OR 97204
Phone: (503) 488-5282
Fax: (503) 488-5142

LOG OF BOREHOLE: GP-10

Project Number: 86300
Project Name: Site 7 Abbreviated Remedial Action
Client Name: Air National Guard
Location: Reno Air National Guard Base, Site 7
Contractor: Gregg Drilling & Testing, Inc. (Martinez, California)
Drilling Method: Direct Push
Logged By: S. DeGrood

Notes:

Date Started: 10/29/2008
Date Completed: 10/29/2008
Total Depth: 16 feet
Borehole Diameter: 2 inches
Initial Water Level: 8.9 feet bgs

Depth (ft)	GRAPHIC LOG	USCS Code	PID (ppm)	Sample Interval	Soil Descriptions and Observations
					Asphalt
		SW-SM			WELL-GRADED SAND WITH SILT (SW-SM): gray (10YR5/1), fine sand to fine gravel, 10% fines, well-graded, subrounded, no odor, dry. Fill material.
5		ML	568		SILT (ML): gray (10YR5/1), gray-green mottles of approximately 1-cm diameter, low plasticity, low toughness medium-soft, petroleum hydrocarbon odor, damp.
					No recovery, rock in sampling rod.
		SP	1134 ▽		POORLY GRADED SAND (SP): red and gray mottles, fine to medium sand, free product in voids, medium graded, heavy petroleum hydrocarbon odor.
		ML	153		SILT (ML): very dark gray (2.5Y3/1), 10% fine sand, non-plastic, low toughness, some petroleum hydrocarbon odor, wet.
10		SP	94.2		POORLY GRADED SAND (SP): dark grayish brown (2.5Y4/2), fine sand, poorly graded, slight petroleum hydrocarbon odor, wet.
					POORLY GRADED SAND (SP): very dark gray (10YR3/1), fine to medium sand, moderately graded, saturated. Some free product noted, but likely pulled down by drill rod.
15		ML			SILT (ML): very dark gray (10YR3/1), 10% fine sand, low plasticity, low toughness, saturated.
					Total Depth - 16 feet bgs

BOREHOLE TO 20 FT PDX - - 2/3/09 11:01 - C:\PROGRAM FILES\GINT\PROJECTS\86300.41 RENO ANG BORELOGS.GPJ

ERM
101 SW Main Street, Suite 804
Portland, OR 97204
Phone: (503) 488-5282
Fax: (503) 488-5142

LOG OF BOREHOLE: GP-11

Project Number: 86300
Project Name: Site 7 Abbreviated Remedial Action
Client Name: Air National Guard
Location: Reno Air National Guard Base, Site 7
Contractor: Gregg Drilling & Testing, Inc. (Martinez, California)
Drilling Method: Direct Push
Logged By: S. DeGrood

Notes:

Date Started: 10/30/2008
Date Completed: 10/30/2008
Total Depth: 16 feet
Borehole Diameter: 2 inches
Initial Water Level: 11.2 feet bgs

Depth (ft)	GRAPHIC LOG	USCS Code	PID (ppm)	Sample Interval	Soil Descriptions and Observations
					Asphalt
		SW-SM			WELL-GRADED SAND WITH SILT (SW-SM): gray (10YR5/1), fine sand to fine gravel, 10% fines, well-graded, subrounded, no odor, dry. Fill material.
5		ML	0.0		SILT (ML): brown (10YR4/3), non-plastic, low toughness, very stiff, no odor, dry.
					As above, except woody and root hair fragments increase to 5% at 8 feet bgs.
10			0.0		SILT (ML): grayish brown (2.5Y5/2), 0.5 centimeter mottles of dark greenish gray (Gley1 4/5G), 5% fine sand, medium plasticity, low toughness, soft, slight humic odor, damp.
		SP			POORLY GRADED SAND (SP): dark grayish brown (2.5Y4/2), fine sand, poorly graded, saturated.
		ML			SILT WITH SAND (ML): dark yellowish brown (10YR4/4), 15% fine sand, low plasticity, low toughness, medium soft, saturated.
15		SP			POORLY GRADED SAND (SP): dark grayish brown (2.5Y4/2), fine sand, poorly graded, saturated.
					Total Depth - 16 feet bgs

BOREHOLE TO 20 FT PDX - - 2/3/09 11:02 - C:\PROGRAM FILES\GINT\PROJECTS\86300.41 RENO ANG BORELOGS.GPJ

ERM
101 SW Main Street, Suite 804
Portland, OR 97204
Phone: (503) 488-5282
Fax: (503) 488-5142

LOG OF BOREHOLE: GP-12

Project Number: 86300
Project Name: Site 7 Abbreviated Remedial Action
Client Name: Air National Guard
Location: Reno Air National Guard Base, Site 7
Contractor: Gregg Drilling & Testing, Inc. (Martinez, California)
Drilling Method: Direct Push
Logged By: S. DeGrood

Notes:

Date Started: 10/30/2008
Date Completed: 10/30/2008
Total Depth: 16 feet
Borehole Diameter: 2 inches
Initial Water Level: 10.6 feet bgs

Depth (ft)	GRAPHIC LOG	USCS Code	PID (ppm)	Sample Interval	Soil Descriptions and Observations
					Asphalt
		SW-SM			WELL-GRADED SAND WITH SILT (SW-SM): gray (10YR5/1), fine sand to fine gravel, 10% fines, well-graded, subrounded, no odor, dry. Fill material.
5			0.0		SILT (ML): brown (10YR4/3), non-plastic, low toughness, soft, no odor, dry.
					As above, except moisture increases to damp at 7 feet bgs.
		ML			SILT (ML): brown (10YR4/3), non-plastic, low toughness, very stiff, no odor, dry.
10			0.0		
			0.0		SILT WITH SAND (ML): dark greenish gray (Gley1 4/10Y), 20% fine sand, low plasticity, low toughness, soft, some organic odor, saturated. Likely swamp material.
					No recovery, rock in sampling rod.
15					
					Total Depth - 16 feet bgs

BOREHOLE TO 20 FT PDX - - 2/3/09 11:02 - C:\PROGRAM FILES\GINT\PROJECTS\86300.41 RENO ANG BORELOGS.GPJ

ERM
101 SW Main Street, Suite 804
Portland, OR 97204
Phone: (503) 488-5282
Fax: (503) 488-5142

LOG OF BOREHOLE: GP-13

Project Number: 86300
Project Name: Site 7 Abbreviated Remedial Action
Client Name: Air National Guard
Location: Reno Air National Guard Base, Site 7
Contractor: Gregg Drilling & Testing, Inc. (Martinez, California)
Drilling Method: Direct Push
Logged By: S. DeGrood

Notes:

Date Started: 10/29/2008
Date Completed: 10/29/2008
Total Depth: 16 feet
Borehole Diameter: 2 inches
Initial Water Level: 7.9 feet bgs

Depth (ft)	GRAPHIC LOG	USCS Code	PID (ppm)	Sample Interval	Soil Descriptions and Observations
					Asphalt
		SW-SM			WELL-GRADED SAND WITH SILT (SW-SM): gray (10YR5/1), fine sand to fine gravel, 10% fines, well-graded, subrounded, no odor, dry. Fill material.
5		SP-SM	125		POORLY GRADED SAND WITH SILT (SP-SM): very dark grayish brown (10YR3/2), 10% silt, some wood fibers, fine sand with 3% coarse sand, slight petroleum hydrocarbon odor, damp.
			1558		2-inch lens of greenish-gray color with strong petroleum hydrocarbon odor.
		ML	40.1 ▽		SILT (ML): dark gray (2.5Y4/1), low plasticity, low toughness, stiff, slight petroleum hydrocarbon odor, damp.
		SW			WELL-GRADED SAND (SW): reddish gray (2.5YR6/1), fine to coarse sand, well-graded, no odor, dry.
10		SP	104		POORLY GRADED SAND (SP): dark reddish gray (2.5YR4/1), fine sand, poorly graded, no odor, damp. As above, except color changes to dark brown (10YR3/3) at 10 feet bgs.
15		SW			WELL-GRADED SAND (SW): very dark grayish brown (10YR3/2), fine to coarse sand, well-graded, no odor, saturated. WELL-GRADED SAND (SW): very dark grayish brown (10YR3/2), medium to coarse sand, 5% coarse gravel, well-graded, no odor, saturated.
					Total Depth - 16 feet bgs

BOREHOLE TO 20 FT PDX - - 2/3/09 11:02 - C:\PROGRAM FILES\GINT\PROJECTS\86300.41 RENO ANG BORELOGS.GPJ

ERM
101 SW Main Street, Suite 804
Portland, OR 97204
Phone: (503) 488-5282
Fax: (503) 488-5142

LOG OF BOREHOLE: GP-14

Project Number: 86300
Project Name: Site 7 Abbreviated Remedial Action
Client Name: Air National Guard
Location: Reno Air National Guard Base, Site 7
Contractor: Gregg Drilling & Testing, Inc. (Martinez, California)
Drilling Method: Direct Push
Logged By: S. DeGrood

Notes:

Date Started: 10/29/2008
Date Completed: 10/29/2008
Total Depth: 12 feet
Borehole Diameter: 2 inches
Initial Water Level: 8.6 feet bgs

Depth (ft)	GRAPHIC LOG	USCS Code	PID (ppm)	Sample Interval	Soil Descriptions and Observations
					Asphalt
		SW-SM			WELL-GRADED SAND WITH SILT (SW-SM): gray (10YR5/1), fine sand to fine gravel, 10% fines, well-graded, subrounded, no odor, dry. Fill material.
5					SILT (ML): gray (2.5Y5/1), low plasticity, low toughness, very stiff, no odor, damp.
		ML	125 ▽		SILT (ML): very dark gray (10YR3/1), 10% fine sand, some wood fibers, medium plasticity, medium toughness, stiff, some organic odor, moist.
					As above, except color changes to brown (7.5YR4/3) at 9 feet bgs.
10					SILT (ML): very dark gray (10YR3/1), 3% fine sand, some wood fibers, medium plasticity, medium toughness, stiff, some petroleum hydrocarbon odor, saturated.
		SP	197		POORLY GRADED SAND (SP): brown (7.5YR4/3), fine sand, silt decreases incrementally from 10% at 10 feet bgs to 5% at 11.5 feet bgs, some petroleum hydrocarbon odor, saturated.
					POORLY GRADED SAND (SP): light olive brown (2.5Y4/3), fine to medium sand, moderately graded, no odor, saturated.
					Total Depth - 12 feet bgs
15					

BOREHOLE TO 20 FT PDX - - 2/3/09 11:02 - C:\PROGRAM FILES\GINT\PROJECTS\86300.41 RENO ANG BORELOGS.GPJ

APPENDIX B

SURVEY REPORT

LUMOS
& ASSOCIATES

Dear Sirs:

Attached you will find a list of coordinates which have been tied to Air National Guard Control previously established as requested in your contract with Lumos and Associates.

1. Horizontal location is based upon control previously established by Tri-State Surveying by Real Time Kinematics (RTK) procedures. NANG 1 and NANG 2 were tied as checks and were found to be within 0.01'.All given coordinates are at ground location. Combined scale factor to grid is .9998216231 as provided by Tri- State Surveying.

2. Vertical location is based on Reno Tahoe Airport Bench Mark LCP-1 held at 4403.19' and were established on attached locations through a closed level loop with a closure of 0.01' and distributed equally through all turns of said loop.

3. Location of MW4, MW5, MW28, MW28 presented a unique challenge in that data provided by ERM was not relative to any coordinate system in area (information attached). Once we were able to decipher where 2 of the wells were by discussions with Air National Guard staff we established that coordinates were inverted relative to themselves after several efforts to try and make them work. Once we inverted coordinates we were able to calculate locations for MW4 and MW5, which fell under recently installed sidewalks and a concrete median for the main entrance. We then set up an appointment with Col. Peck for visual confirmation that these locations seemed reasonable.

In closing I have also included the daily field reports, which have detailed explanations and dates for fieldwork If you should have any questions please do not hesitate to call.

Sincerely,

Eric L. Hearon P.L.S.

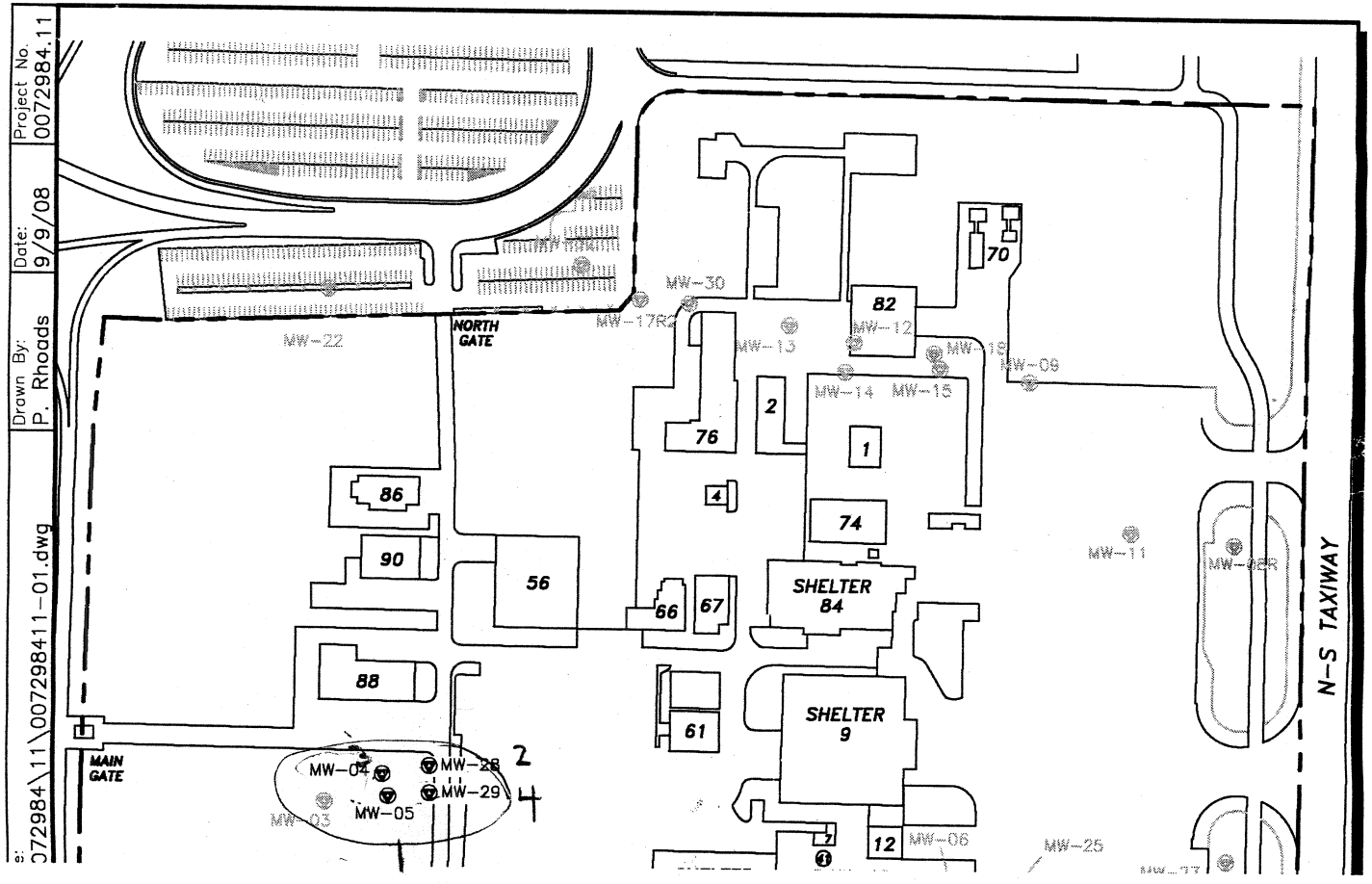
PROFESSIONAL LAND SURVEYOR - STATE OF NEVADA
ERIC L. HEARON
Exp. 06/30/09
12/2/08
No. 12138

1,14857337.643,2288281.802,NANG 2
2,14857337.744,2287948.529,NANG 1
53,14856974.914,2289026.125,4402.00,MW T-22
54,14856933.456,2289043.655,4401.48,MW T-21
55,14857050.692,2289026.036,4404.352,GP-14
56,14857095.290,2289138.702,4402.08,GP-13A
57,14857096.414,2289141.338,4402.05,GP-13
58,14856991.683,2289134.880,4401.39,GP-10
59,14856934.321,2288976.153,4402.16,GP-9
60,14856788.448,2289168.791,4403.26,GP-11
61,14856840.173,2289251.591,4403.19,FND CPS-LCP 1
62,14856765.181,2289112.454,4403.16,GP-12A
63,14856765.326,2289110.965,4403.64,GP-12

PROFESSIONAL LAND SURVEYOR - STATE OF NEVADA
ERIC L. HERRON
Exp. 06/30/09
12/02/08
No. 12138

Wells to be abandoned

Site 4 ??



2-1 83 6 2-3 77 5

4-1 67 2 4-3 81 7

Quantity	ELEV	Name	NAME(1)	Position X	Position Y	Position Z	WBZ
1		GISK-L32	MW-05	14850866	2291813	0	1
1		GISK-L32	MW-28	14850933	2291863	0	2
1		GISK-L32	MW-04	14850857	2291848	0	3
1		GISK-L32	MW-29	14850933	2291818	0	4

☐ 800 E. College Parkway
Carson City, NV 89706
(775) 883-7077
(775) 883-7114 (FAX)

☐ 5401 Longley Lane, Ste. 5
Reno, NV 89511
(775) 827-6111
(775) 827-6122 (FAX)

☐ 178 S. Maine Street
Fallon, NV 89406
(775) 423-2188
(775) 423-5657 (FAX)

SURVEY FIELD REPORT

Prepared for: ERM

DATE: 4 Nov 08	JOB NO: 6608.003
PROJECT: Reno-Tahoe Airport	
LOCATION:	
WORKING DAY: Tues	OWNER:
CONTRACTOR:	SUPERINTENDENT:
HOURS: 4.5	PAGE: 1 OF 1

Describe Work Requested:

Describe Work Completed This Date: We tied in 2 of the monitor wells to be abandoned using the latest coordinates provided (which are only to the nearest foot). We calibrated to what I believe are 28 and 29, which calculated @ 45.0' apart and measure @ 44.6'. However, these wells are aligned N and S and the coordinates given have the same Northing. This would indicate a 90° rotation, which was confirmed in the calibration. We tried rotating 90°, we tried intersecting distances, but we found nothing (using the metal detector) that would indicate the other two wells.

Reason for project not completed this date:

Party Chief: M Cage

Contractor:

Received on Site By:	Copies Mailed to:	In House Routing:
Contractor:		

White – File Copy Yellow- Inspector Copy Pink – Contractor Copy

☐ 800 E. College Parkway
Carson City, NV 89706
(775) 883-7077
(775) 883-7114 (FAX)

☐ 137 Keddie Street
Fallon, NV 89406
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☐ 5401 Longley Lane, Suite 15
Reno, NV 89511
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(775) 827-6122 (FAX)

☐ 1478-B 4th Street
Minden, NV 89423
(775) 782-6017
(775) 782-7051 (FAX)

SURVEY FIELD REPORT

DATE: 14 Nov 08	JOB NO: 6608.003
PROJECT: Reno Air Natl Guard	
LOCATION: Reno - Tahoe	
WORKING DAY: Fri	OWNER:
CONTRACTOR:	SUPERINTENDENT:
HOURS: 6.5	PAGE: ___ OF ___

Prepared for: ERM

Describe Work Requested: Used MW's 28 and 29 as control and coords provided by client to search for mw's 4 + 5. After conferring with Maj Peck, and setting up TS on fd wells, we searched for missing wells by angle and distance and determined they were both under existing concrete sidewalks. Maj Peck told us that he would contact state agencies and inform them that MW's 4 and 5 were no longer discoverable

Describe Work Completed This Date:

Reason for project not completed this date:

Party Chief: MG

Contractor:

Received on Site By:

Contractor:

Copies Mailed to:

In House Routing:

White – File Copy Yellow- Inspector Copy Pink – Contractor Copy

LUMOS AND ASSOCIATES

☐ 800 E. College Parkway
Carson City, NV 89706
(775) 883-7077
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☐ 5401 Longley Lane, Ste. 5
Reno, NV 89511
(775) 827-6111
(775) 827-6122 (FAX)

☐ 178 S. Maine Street
Fallon, NV 89406
(775) 423-2188
(775) 423-5657 (FAX)

SURVEY FIELD REPORT

DATE: 4 NOV 08	JOB NO: 6608.003
PROJECT: Reno-Tahoe Airpat	
LOCATION:	
WORKING DAY: Tues	OWNER:
CONTRACTOR:	SUPERINTENDENT:
HOURS: 4.5	PAGE: 1 OF 1

Prepared for: ERM

Describe Work Requested:

Describe Work Completed This Date: We tied in 2 of the monitor wells to be abandoned using the latest coordinates provided (which are only to the nearest foot). We calibrated to what I believe are 28 and 29, which calculated @ 45.0' apart and measure @ 44.6'. However, these wells are aligned N and S and the coordinates given have the same Northing. This would indicate a 90° rotation, which was confirmed in the calibration. We tried rotating 90°, we tried intersecting distances, but we found nothing (using the metal detector) that would indicate the other two wells.

Reason for project not completed this date:

Party Chief: M Cage

Contractor:

Received on Site By:

Contractor:

Copies Mailed to:

In House Routing:

White – File Copy Yellow- Inspector Copy Pink – Contractor Copy

Quantity	ELEV	Name	NAME(1)	Position X	Position Y	WBZ
1		GISK-L32	MW-04	4518796	727028.3	1
1		GISK-L32	MW-28	4518872	727042.4	2
1		GISK-L32	MW-29	4518872	726997.9	3
1		GISK-L32	MW-05	4518805	726992.5	4

APPENDIX C

GROUNDWATER SAMPLING LOGS

ERM - Field Notes	
Project Name: Nevada ANGB	Date: 10-30-08
Project Number: 0039202.32	Set up time: 1520
	Weather: Cloudy, ~65°F
	Field Staff: SHP, NV

Well # T-5 **Sample ID:**

Location: **IRP Site 7**	Construction Depth:	14.0 ft. bgs.	13.5-6.5= 7
Construction: 6" **PVC/flush**	Screened Interval:	3.5 - 13.5 ft. bgs.	13.5 - 3.5 = 10
Groundwater Zone: **Shallow**	Pump Intake Depth:	10	

Purge Start Time: 1530	Depth to Water: 6.25 Depth to product = X
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time: 1545	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1535	1500	21.39	6.75	725	0.73	-242.8	3	Clear.
1537	2100	21.34	6.76	720	0.47	-248.5	2.6	"
1539	2700	21.33	6.77	718	0.44	-258.8	2.8	"
1541	3300	21.29	6.79	718	0.50	-267.1	2.9	"
1543	3900	21.17	6.83	717	0.50	-275.8	2.9.	"
1545	4500	21.15	6.84	717	0.43	-278.8	3.0	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-Ext (D, ov)	1547	3 VOA	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Hydrocarbon odor. Oily sheen on DTW probe

Sampler Signature(s) :

ERM - Field Notes	
Project Name: Nevada ANGB	Date: 10/30/08
Project Number: 0039202.32	Set up time: ~~1312~~ 1440
	Weather: cloudy, ~65
	Field Staff: SHD/NV

Well # T-10 **Sample ID:**

Location: **IRP Site 7**	Construction Depth: 16.0 ft. bgs.
Construction: ___" **PVC/flush**	Screened Interval: 5.5-15.5 ft. bgs.
Groundwater Zone: **Shallow**	Pump Intake Depth: 11'

Purge Start Time: 1445	Depth to Water: 6.58
Discharge Rate: 300mL/min	Height of Water Column:
Purge End Time: 1459	Volume of one casing:

15.5
6.6
8.9
9
4.5
6.6
4.5
11.1

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1448	1500 ~4	20.31	7.03	1158	2.21	3.3	24.6	clear
1450	2200 7	20.39	7.01	1162	2.06	6.9	19.5	"
1453	3100 9	20.42	7.00	1165	2.14	9.4	27.0	"
1455	3700 11	20.34	7.00	1162	2.11	10.7	22.1	"
1457	4300 13	20.26	6.99	1156	2.08	11.7	19.2	"
1459	4900	20.15	6.99	1148	2.14	12.7	16.9	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-d EAV	1500	3 VOAs	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Sampler Signature(s) :

ERM - Field Notes
Project Name: Nevada ANGB
Project Number: 0039202.32

Date:	10/30/08
Set up time:	1312
Weather:	cloudy, ~65
Field Staff:	SHD/NV

Well # T-11

Sample ID:

Location: **IRP Site 7**		Construction Depth:	16.75 ft. bgs.
Construction: **2" PVC/flush**		Screened Interval:	6.25 - 16.25 ft. bgs.
Groundwater Zone: **Shallow**		Pump Intake Depth:	11'

Purge Start Time: 1316	Depth to Water: 6.72
Discharge Rate: 300 mL/min	Height of Water Column:
Purge End Time: 1330	Volume of one casing:

16.3
6.7
9.6
2
6.7
4.8
11.5

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1319	1500 5	19.79	6.82	1162	1.16	-170.1	-0.6	clear
1321	3000 7	19.57	6.77	1161	0.82	-180.2	-0.8	"
1323	3600 10	19.53	6.78	1163	0.79	-183.9	-0.8	"
1326	4500 12	19.42	6.77	1164	0.69	-187.4	-0.8	"
1328	5100	19.37	6.77	1166	0.63	-190.1	-0.8	"
1330	5600	19.30	6.77	1167	0.64	-191.5	-0.7	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 (3) 40 ml VOA w/HCL	none
TPH-D & TPH-GW	1331	3 VOAs	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)

Purged and sampled with low-flow pump and disposable polyetheylene tubing

Sampler Signature(s) :

ERM - Field Notes	Date: 10-30-08
Project Name: Nevada ANGB	Set up time: 1417
Project Number: 0039202.32	Weather: Cloudy ~60°F
	Field Staff: SHP, NV

Well # T-12 **Sample ID:**

Location: **IRP Site 7**		Construction Depth:	17.5 ft. bgs.
Construction: ___" **PVC/flush**		Screened Interval:	7.0-17.0 ft. bgs.
Groundwater Zone: **Shallow**		Pump Intake Depth:	12'

Purge Start Time: 1419	Depth to Water: 6.72
Discharge Rate: 300 mL/min	Height of Water Column:
Purge End Time:	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1422	1000 5	18.85	7.15	1001	1.46	-19.2	0.8	clear
1425	1900 6	18.90	7.10	1003	0.68	-21.6	0.2	"
1428	2800 8	18.84	7.08	1000	0.65	-23.7	0.3	"
1430	3400 10	18.75	7.07	997	0.65	-25.5	0.2	"
1432	4000 10	18.62	7.06	993	0.70	-25.2	0.0	

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)	1433	5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-dd -AK		3 VOAS	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Sampler Signature(s) :

ERM - Field Notes	Date: 1344 10/30/08
Project Name: Nevada ANGB	Set up time: 1344
Project Number: 0039202.32	Weather: Cloudy, sleet
	Field Staff:

Well # T-13 **Sample ID:**

Location: **IRP Site 7**		Construction Depth:	16.5 ft. bgs.
Construction: **2" PVC/flush**		Screened Interval:	6 - 16 ft. bgs.
Groundwater Zone: **Shallow**		Pump Intake Depth:	11.5'

16.0
6.7
9.3 46
2
6.7
9.6
11.3

Purge Start Time: 1349	Depth to Water: 6.65
Discharge Rate: 300 mL/min	Height of Water Column:
Purge End Time: 1409	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1352	1000 4	19.45	7.29	804	1.51	-72.1	2.0	clear
1356	2000 7	19.35	7.21	796	0.79	-63.0	0.8	"
1359	2900 10	19.02	7.18	780	0.66	-58.4	0.7	"
1402	3800 13	18.98	7.16	774	0.54	-56.2	0.7	"
1405	4700 15	18.92	7.15	771	0.45	-54.5	0.7	"
1407	5300 17	18.87	7.15	771	0.42	-54.3	0.1	"
1409	5900	18.85	7.15	771	0.42	-54.1	2.1	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-D + TPH-GW	1410	3 VOAs	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Sampler Signature(s) :

ERM - Field Notes	Date: 10-27-08
Project Name: Nevada ANGB	Set up time: 1345
Project Number: 0039202.32	Weather: Pt. Cloudy, ~80°F
	Field Staff: SHD, NV

Well # T-18 **Sample ID:**

Location: **IRP Site 7**	Construction Depth: 14'
Construction: **2" PVC/flush**	Screened Interval: unk
Groundwater Zone: **Shallow**	Pump Intake Depth: 10'

Purge Start Time: 1353	Depth to Water: 5.91'
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time: 1408	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1358	1500	23.24	6.91	1163	0.87	76.6	11.7	Turbid (Slightly)
1400	2100	23.16	6.9	1157	0.94	82.1	7	"
1402	2700	23.15	6.91	1147	0.98	85.3	6.9	"
1404	3300	23.17	6.92	1135	1.05	89	9.7	"
1406	3900	23.13	6.94	1121	1.1	92.4	4.9	"
1408	4500	23.06	6.95	1115	1.12	95.8	4.3	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-Ext (D, aV)	1410	3 VOAs	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Sampler Signature(s) :

ERM - Field Notes	Date: 10-27-08
Project Name: Nevada ANGB	Set up time: 1130
Project Number: 0039202.32	Weather: Sunny, ~80°F
	Field Staff: SHO, NV

Well # T-21 **Sample ID:** T-21 & T-21-D

Location: **IRP Site 7**		Construction Depth:	14.5 ft. bgs.
Construction: **2" PVC/flush**		Screened Interval:	4 - 14 ft. bgs.
Groundwater Zone: **Shallow**		Pump Intake Depth:	10

Purge Start Time: 1206	Depth to Water: 6.38
Discharge Rate: 350 mL/min	Height of Water Column:
Purge End Time: 1223	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1208 0	1000	22.63	6.70	1020	0.23	-144.6	5.4	Clear
1211 3	2000	22.68	6.71	1021	0.18	-146.4	7.1	"
1214 6	3050	22.69	6.71	1021	0.03	-145.2	24.6	" flecks of black in flow cell ~2mm diameter
1217 9	4100	22.69	6.72	1021	0.03	-143.1	22.9	"
1220 12	5150	22.69	6.72	1019	0.02	-142.7	41.1	"
1223	6200	22.70	6.72	1018	0.02	-144.1	32.5	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 (3) 40 ml VOA w/HCL	none
TPH-d & TPH-gv	1224	3 VOAs	X3 for MS/MSD
Duplicate	@ 1224		

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)

Purged and sampled with low-flow pump and disposable polyetheylene tubing

Trip Blank = TB102708-1 @ 1205

Field Blank = T-21-FA @ 1226

24
40
960 mL

Sampler Signature(s) :

350
3x

ERM - Field Notes	Date: 10/29/08
Project Name: Nevada ANGB	Set up time: 1006
Project Number: 0039202.32	Weather: clear, warm ~70
	Field Staff: SHD/NV

Well # T-22 **Sample ID:**

Location: **IRP Site 7**		Construction Depth:	14.5 ft. bgs.
Construction: **2" PVC/flush**		Screened Interval:	4 - 14 ft. bgs.
Groundwater Zone: **Shallow**		Pump Intake Depth:	10.5'

Purge Start Time: 1015, 1100	Depth to Water: 6.70
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time (1029) 1107	Volume of one casing:

14.0
6.7
7.3 3.6
2
6.7
3.6
10.3

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1024	2000	21.26	7.36	875	3.51	-174.2	-1.0	clear
1026	2600	21.22	7.28	812	4.84	-193.0	-1.0	
1028	3200	21.26	7.26	812	5.26	-202.5	-1.1	stopped to recalibrate DO at 1029
1030	3800							
1032	4400							
1034	5000							
1101	3800	21.12	7.25	813	5.69	-175.7	-1.2	Restarted at 1100
1103	4400	21.28	7.24	813	5.64	-185.8	-1.2	
1105	5000	21.22	7.24	811	5.43	-190.4	-1.1	
1107	5600	21.1	7.24	810	5.13	-195.7	-1.1	

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-ext (D,gw)	1109	3 VOA	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

water must be cleaner than the calibration range, hence negative NTU
Calibrated DO meter twice but still getting high values (refer field notes from 10/29/08)
HC odor

Sampler Signature(s) :

ERM - Field Notes	Date: 10-30-08
Project Name: Nevada ANGB	Set up time: 1400
Project Number: 0039202.32	Weather: Cloudy ~65°F
	Field Staff: SHD, NY

Well # T-23 **Sample ID:**

Location: **IRP Site 7**	Construction Depth:	14.5 ft. bgs.	14-6.5=7.5
Construction: **2" PVC/flush**	Screened Interval:	4 - 14 ft. bgs.	14-3.75=10.25
Groundwater Zone: **Shallow**	Pump Intake Depth:	10	

Purge Start Time: 1602	Depth to Water: 6.42
Discharge Rate: 300ml/min	Height of Water Column:
Purge End Time: 1615	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1607	1500	20.44	6.95	898	0.54	-222.9	-0.3	Clear
1609	2000	20.44	6.93	898	0.45	-228.7	-0.6	"
1611	2700	20.45	6.93	898	0.38	-232.8	-0.6	"
1613	3300	20.45	6.93	899	0.37	-234.2	-0.7	"
1615	3900	20.48	6.92	898	0.34	-234.9	-0.8	"
~~1617~~	~~4500~~							

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-ext (D, av)	1617	3 VOA	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)

Purged and sampled with low-flow pump and disposable polyetheylene tubing

water must be cleaner than the calibration range, hence turbidity is negative

Sampler Signature(s) :

ERM - Field Notes	
Project Name: Nevada ANGB	Date: 10-30-08
Project Number: 0039202.32	Set up time: 1622
	Weather: cloudy, ~65°F
	Field Staff: SHD, NV

Well # MW-06 **Sample ID:**

Location: **IRP Site 7**	Construction Depth:	16.0 ft. bgs.	14.5 - 5.25 = 9.25/2 = 4.75
Construction: **2" PVC/flush**	Screened Interval:	4.5 - 14.5 ft. bgs.	14.5 - 4.5 = 10
Groundwater Zone: **Shallow**	Pump Intake Depth:	10	

Purge Start Time: 1624, 1649	Depth to Water: 5.25
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time: 1638	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1629	1500	21.39	10.43	522	3.72	-197.6	29.4	Clear
1631	2100	21.53	10.24	522	4.59	-175.2	30.3	"
1633	2700	21.54	10.18	525	4.80	-166.8	28.9	"
1635	3300	21.55	9.97	547	6.76	-144	37.7	"
1637	3900	21.47	9.27	708	9.39	-89.1	45.3	"
~~1639~~ 1650	4500	20.73	8.47	873	8.38	-0.2	28.1	" → Recalibrated DO
1652	5100	20.79	7.68	1047	8.28	49.2	19.1	"
1654	5700	20.89	7.35	1087	8.10	71.8	17.6	"
~~1656~~ 1656	6300	20.97	7.29	1098	7.87	82.6	13.0	"

.148
.08
8.1
.08
7.2

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-ext (D, ov)	1658	3 VOA	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Temp = 20.21 ⇒ DO = 9.09 mg/L
~~Sat DO~~ Pressure = 648 ⇒ 85%
85% of 9.09 = 7.73 mg/L

Recalibrate DO meter at 1649
DO meter possibly not functioning properly.

Sampler Signature(s) :

ERM - Field Notes	Date: 10-27-08
Project Name: Nevada ANGB	Set up time: 1620
Project Number: 0039202.32	Weather: Pt. cloudy ~70°F
	Field Staff: SHO, NV

Well # MW-07 **Sample ID:**

Location: **IRP Site 7**		Construction Depth:	14.5 ft. bgs.
Construction: **2" PVC/flush**		Screened Interval:	4 - 14 ft. bgs.
Groundwater Zone: **Shallow**		Pump Intake Depth:	10'

Purge Start Time: 1629, 1431	Depth to Water: 5.36
Discharge Rate: 300 mL/min	Height of Water Column:
Purge End Time: 1642	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
	~~1500~~	~~21.41~~	~~6.85~~	~~1704~~	~~0.42~~	~~115.7~~	~~27.3~~	Black fluid, stopped re-set tubing re-start pump
16 ~~1331~~	1500	21.41	6.85	1704	0.42	-115.7	27.3	Clear, yellowish - tubing was at bottom of well
16 1335	2400	21.43	6.84	1679	0.31	-122.1	30.9	"
16 1337	3000	21.42	6.84	1659	0.31	-123.7	32.0	"
16 1339	3600	21.40	6.84	1636	0.28	-125.6	30.2	"
16 1341	4200	21.39	6.84	1611	0.25	-127.1	30.4	"
1642	4500	12.39	6.84	1605	0.25	-127.6	28.8	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)	~~1643~~	5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-d & TPH-gv	1643	3 VOAs	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Slight hydrocarbon odor.

Sampler Signature(s) :

ERM - Field Notes	
Project Name: Nevada ANGB	Date: 10/28/08
Project Number: 0039202.32	Set up time: 0858
	Weather: Slightly cloudy, ~55
	Field Staff: SHD / NV

Well # MW-10 **Sample ID:**

Location: **IRP Site 7**	Construction Depth: 16.0 ft. bgs.
Construction: ___" **PVC/flush**	Screened Interval: 3-13 ft. bgs.
Groundwater Zone: **Shallow**	Pump Intake Depth: 10'

Purge Start Time: 0909	Depth to Water: 6.55
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time: 0929	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
0917	1500	15.56	6.91	734	0.17	65.8	6.2	Clear
0919	2100	15.76	6.95	736	0.12	54.1	6.9	"
0921	2700	16.00	6.98	737	0.11	46.7	5.3	"
0923	3300	16.21	7.00	738	0.09	37.8	4.2	"
0925	3900	16.46	7.01	741	0.08	32.4	3.6	"
0927	4500	16.64	7.01	742	0.09	27.2	2.7	"
0929	5100	16.8	7.02	745	0.09	24.2	2.4	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(2)~~ 40 ml VOA w/HCL	none
TPH-ext (D, ov)	0931	3 VOA's	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

DO meter likely not functioning properly

Sampler Signature(s) :

ERM - Field Notes	
Project Name: Nevada ANGB	Date: 10/30/08
Project Number: 0039202.32	Set up time: 1221
	Weather: Cloudy, ~65
	Field Staff: SHD/NV

Well # MW-23 **Sample ID:**

Location: **IRP Site 7**	Construction Depth: 18.0 ft. bgs.
Construction: **2" PVC/flush**	Screened Interval: 5 - 15 ft. bgs.
Groundwater Zone: **Shallow**	Pump Intake Depth: 18'

Purge Start Time: 1227, 1257	Depth to Water: 7.08
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time: 1243, 1300	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1224	1500	20.69	6.94	1260	1.44	10.3	-0.3	clear
1236	2100	20.38	6.91	1245	1.20	9.2	-0.6	"
1238	2700	20.15	6.91	1235	1.11	-42.6	-0.7	"
1240	3300	20.0	6.9	1221	1.18	-112	-0.5	"
~~1244~~ 1258	3900	20.73	6.92	1240	1.3	-98.1	1.2	"
~~1246~~	4500	20.58	6.91	1228	1.1	-99.3	0.6	"
~~1260~~ 1300								

cal. DO on DO. stop to Recalibrate

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-ext (D, av)	1302	3 VOA	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)

Purged and sampled with low-flow pump and disposable polyetheylene tubing

Tried recalibrating DO meter.

Sampler Signature(s) :

ERM - Field Notes	
Project Name: Nevada ANGB	Date: 10/28/08
Project Number: 0039202.32	Set up time:
	Weather: Clear, ~70
	Field Staff: SHD/NV

Well # MW-24R **Sample ID:**

Location: **IRP Site 7**	Construction Depth: 16.0 ft. bgs.
Construction: **2" PVC/flush**	Screened Interval: 4.5 - 14.0 ft. bgs.
Groundwater Zone: **Shallow**	Pump Intake Depth:

Purge Start Time:	Depth to Water:
Discharge Rate:	Height of Water Column:
Purge End Time:	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-ext (D, aw)	NOT SAMPLED	3 VOA	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)

Purged and sampled with low-flow pump and disposable polyetheylene tubing

~~DO meter not functioning properly~~

Unable to locate due to gravel.

Sampler Signature(s) :

ERM - Field Notes
Project Name: Nevada ANGB
Project Number: 0039202.32

Date: 10-27-08
Set up time: 1543
Weather: Cloudy, ~65°F
Field Staff: SHD, NV

Well # MW-25

Sample ID: MW-25

Location: **IRP Site 7**	Construction Depth:	14.5 ft. bgs.	
Construction: **2" PVC/flush**	Screened Interval:	3 - 13 ft. bgs.	
Groundwater Zone: **Shallow**	Pump Intake Depth:	9'	

Purge Start Time: 1550	Depth to Water: 5.32
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time: 1605	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1555	1500	22.84	6.78	1360	0.48	-149.6	5.6	Turbid
1557	2100	22.75	6.78	1369	0.36	-151.7	4.1	"
1559	2700	22.56	6.78	1376	0.45	-152.8	3.0	"
1601	3300	22.32	6.79 ~~6.80~~	1380	0.33	-154.6	2.5	"
1603	3900	22.03	6.8	1384	0.3	-155.1	3.4	"
1605	4500	21.79	6.8	1389	0.36	-155.3	2.1	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-Ext (D, ov)	1608	3 VOA	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Tubing was slightly pink on outside when removing from well
Some organic smell

Sampler Signature(s) :

ERM - Field Notes	
Project Name: Nevada ANGB	Date: 10/28/08
Project Number: 0039202.32	Set up time: 1136
	Weather: Clear, ~70
	Field Staff: SHD/NV

Well # MW-26 **Sample ID:**

Location: **IRP Site 7**	Construction Depth:	Unknown 14.55
Construction: ___" **PVC/flush**	Screened Interval:	Unknown (
Groundwater Zone: **Shallow**	Pump Intake Depth:	13'

Purge Start Time: 1150	Depth to Water: 6.14
	Total Depth 14.55
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time: 1210	Volume of one casing:

14.55

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1156	1500	21.27	7.17	1008	0.21	13.2	15.1	Clear
1158	2100	21.25	7.16	995	0.14	11.5	14.8	"
~~1~~1200	2700	21.31	7.16	981	0.12	11.6	16.6	"
1202	3300	21.32	7.17	966	0.09	12.4	12.2	"
1204	3900	21.33	7.18	959	0.08	12.1	8.6	"
1206	4500	21.32	7.18	952	0.07	11.7	6.8	"
1208	5100	21.37	7.19	946	0.06	10.4	4.9	"
1210	5700	21.34	7.19	943	0.06	9.2	3.9	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-ext (D, av)	1212	3 VOA	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

DO meter not functioning properly

Sampler Signature(s) :

ERM - Field Notes	Date: 10/27/08
Project Name: Nevada ANGB	Set up time: 1310
Project Number: 0039202.32	Weather: Clear ~80°F
	Field Staff: SHD/NV

Well # EXW-01 **Sample ID:** EXW-01

Location: **IRP Site 7**	Construction Depth: 25.0 ft. bgs.
Construction: **6" PVC/flush**	Screened Interval: 9 - 19 ft. bgs.
Groundwater Zone: **Shallow**	Pump Intake Depth: 14

Purge Start Time: 1318	Depth to Water: 5.45
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time: 1333	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1323	1500	20.10	7.42	766	0.55	-18.8	0.6	Clear
1325	2100	19.91	7.4	761	0.33	-15.5	1.6	"
1327	2700	19.7	7.39	759	0.27	-14.4	10.7	"
1329	3300	19.61	7.38	756	0.22	-14.1	28.4	"
1331	3900	19.49	7.38	753	0.18	-14.1	38.4	"
1333	4500	19.36	7.37	752	0.14	-13.8	33.4	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)	1335	5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH - Ext. (D, aV)		3 VOA w. HCL	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Sampler Signature(s) :

ERM - Field Notes
Project Name: Nevada ANGB
Project Number: 0039202.32

Date: 10-27-08
Set up time: 1500
Weather: Cloudy ~70°F
Field Staff: SHO, NV

Well # EXW-02

Sample ID:

Location: **IRP Site 7**		Construction Depth:	25.0 ft. bgs.
Construction: **6" PVC/flush**		Screened Interval:	9 - 19 ft. bgs.
Groundwater Zone: **Shallow**		Pump Intake Depth:	14'

Purge Start Time: 1507	Depth to Water: 5.24
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time: 1524	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1512	1500	20.08	7.49	592	0.06	71.5	22.1	Cloudy
1514	2100	19.96	7.45	592	0.04	75.8	17.4	"
1516	2700	19.87	7.44	596	0.04	75.2	17.2	"
1518	3300	19.72	7.44	607	0.04	76.4	22.4	"
1520	3900	19.7	7.45	634	0.04	74.9	49.3	"
1522	4500	19.68	7.47	665	0.04	73	52.3	"
1524	5100	19.57	7.51	698	0.05	69.2	79.5	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)	1528	5 (3) 40 ml VOA w/HCL	none
TPH-ext (D, ov)		3 VOAs	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Sampler Signature(s) :

ERM - Field Notes	Date: 10-27-08
Project Name: Nevada ANGB	Set up time: 1420
Project Number: 0039202.32	Weather: pt. cloudy; ~75°F
	Field Staff: SHO, NX

Well # EXW-03

Sample ID:

Location: **IRP Site 7**		Construction Depth:	25.0 ft. bgs.
Construction: **6" PVC/flush**		Screened Interval:	9 - 19 ft. bgs.
Groundwater Zone: **Shallow**		Pump Intake Depth:	14

Purge Start Time: 1433	Depth to Water: 6.60
Discharge Rate: 300 ml/min.	Height of Water Column:
Purge End Time: 1448	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1438	1500	21.07	7.64	743	0.40	49.4	2.9	Clear
1440	2100	20.7	7.62	736	0.32	53.8	2.2	
1442	2700	20.41	7.6	732	0.24	56.3	2.3	
1444	3300	20.22	7.6	728	0.21	58.4	5.2	
1446	3900	20.07	7.59	726	0.18	58.9	4.8	
1448	4500	19.95	7.59	724	0.17	59.1	4.6	

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)	1450	5 (~~3~~) 40 ml VOA w/ HCL	none
TPH-ext (D, ov)		3 VOAs	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

Sampler Signature(s) :

ERM - Field Notes	Date: 10/28/08
Project Name: Nevada ANGB	Set up time: 1106
Project Number: 0039202.32	Weather: Clear, ~70
	Field Staff: NV/SHD

Well # EXW-04 **Sample ID:**

Location: **IRP Site 7**	Construction Depth: 25.0 ft. bgs.
Construction: **6" PVC/flush**	Screened Interval: 9 - 19 ft. bgs.
Groundwater Zone: **Shallow**	Pump Intake Depth: 14'

Purge Start Time: 1110	Depth to Water: 6.76.
Discharge Rate: 300 ml/min	Height of Water Column:
Purge End Time: 1127	Volume of one casing:

Time	Volume(m/L)	Temp.	pH	EC(µs/cm)	D.O.(mg/L)	Redox	Turbity (ntu)	Visual Observation/DTW
1117	1500	20.0	7.59	744	0.54	36.0	17.3	Slightly turbid
1119	2100	19.89	7.57	742	0.46	32.6	33.7	"
1121	2700	19.83	7.57	741	0.38	28.5	32.8	"
1123	3300	19.80	7.57	740	0.34	25.3	37.5	"
1125	3900	19.8	7.57	740	0.31	21.7	36.9	"
1127	4500	19.76	7.57	739	0.29	18.6	35.4	"

ANALYSES REQUIRED	SAMPLE TIME	CONTAINER AMOUNT AND TYPE	FILTRATION
VOCs 8260B (including MTBE)		5 ~~(3)~~ 40 ml VOA w/HCL	none
TPH-ext (D, ov)	1129	3 VOA	

PID reading when well cap opened:

Disposal method of purge water: **55 Gallon drum storage**

Decontamination procedure: **Liquinox scrub, ASTM Type II water final rinse.**

FIELD OBSERVATIONS (Well condition, repairs needed)
Purged and sampled with low-flow pump and disposable polyetheylene tubing

DO meter not functioning properly.

Sampler Signature(s) :

APPENDIX D

LABORATORY ANALYTICAL DATA

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378
Date Received : 10/28/08

Job#: 86300.31/Reno ANG RAO

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**T-21**	TPH-E (JFRO)	1.7	I	1.0 mg/L	10/27/08	10/29/08
Lab ID :	ERM08102942-02A	TPH-E (DRO)	ND		1.0 mg/L	10/27/08	10/29/08
		TPH-E (ORO)	ND		1.0 mg/L	10/27/08	10/29/08
		Surr: Nonane	104		(46-148) %REC	10/27/08	10/29/08
		TPH-P (GRO)	1.7		0.50 mg/L	10/27/08	11/04/08
		Surr: 1,2-Dichloroethane-d4	97		(70-130) %REC	10/27/08	11/04/08
		Surr: Toluene-d8	97		(70-130) %REC	10/27/08	11/04/08
		Surr: 4-Bromofluorobenzene	92		(70-130) %REC	10/27/08	11/04/08
Client ID :	**T-21-D**	TPH-E (JFRO)	1.9	I	1.0 mg/L	10/27/08	10/29/08
Lab ID :	ERM08102942-03A	TPH-E (DRO)	ND		1.0 mg/L	10/27/08	10/29/08
		TPH-E (ORO)	ND		1.0 mg/L	10/27/08	10/29/08
		Surr: Nonane	108		(46-148) %REC	10/27/08	10/29/08
		TPH-P (GRO)	1.5		0.50 mg/L	10/27/08	11/04/08
		Surr: 1,2-Dichloroethane-d4	94		(70-130) %REC	10/27/08	11/04/08
		Surr: Toluene-d8	98		(70-130) %REC	10/27/08	11/04/08
		Surr: 4-Bromofluorobenzene	94		(70-130) %REC	10/27/08	11/04/08
Client ID :	**EXW-01**	TPH-E (JFRO)	ND		0.50 mg/L	10/27/08	10/29/08
Lab ID :	ERM08102942-05A	TPH-E (DRO)	ND		0.50 mg/L	10/27/08	10/29/08
		TPH-E (ORO)	ND		0.50 mg/L	10/27/08	10/29/08
		Surr: Nonane	115		(46-148) %REC	10/27/08	10/29/08
		TPH-P (GRO)	ND		0.50 mg/L	10/27/08	10/30/08
		Surr: 1,2-Dichloroethane-d4	104		(70-130) %REC	10/27/08	10/30/08
		Surr: Toluene-d8	99		(70-130) %REC	10/27/08	10/30/08
		Surr: 4-Bromofluorobenzene	106		(70-130) %REC	10/27/08	10/30/08
Client ID :	**T-18**	TPH-E (JFRO)	ND		0.50 mg/L	10/27/08	10/29/08
Lab ID :	ERM08102942-06A	TPH-E (DRO)	ND		0.50 mg/L	10/27/08	10/29/08
		TPH-E (ORO)	ND		0.50 mg/L	10/27/08	10/29/08
		Surr: Nonane	110		(46-148) %REC	10/27/08	10/29/08
		TPH-P (GRO)	ND		0.50 mg/L	10/27/08	10/30/08
		Surr: 1,2-Dichloroethane-d4	101		(70-130) %REC	10/27/08	10/30/08
		Surr: Toluene-d8	100		(70-130) %REC	10/27/08	10/30/08
		Surr: 4-Bromofluorobenzene	106		(70-130) %REC	10/27/08	10/30/08
Client ID :	**EXW-03**	TPH-E (JFRO)	ND		0.50 mg/L	10/27/08	10/29/08
Lab ID :	ERM08102942-07A	TPH-E (DRO)	ND		0.50 mg/L	10/27/08	10/29/08
		TPH-E (ORO)	ND		0.50 mg/L	10/27/08	10/29/08
		Surr: Nonane	119		(46-148) %REC	10/27/08	10/29/08
		TPH-P (GRO)	ND		0.50 mg/L	10/27/08	10/30/08
		Surr: 1,2-Dichloroethane-d4	101		(70-130) %REC	10/27/08	10/30/08
		Surr: Toluene-d8	99		(70-130) %REC	10/27/08	10/30/08
		Surr: 4-Bromofluorobenzene	107		(70-130) %REC	10/27/08	10/30/08

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Client ID :	**EXW-02**	TPH-E (JFRO)	ND		0.50 mg/L	10/27/08	10/29/08
Lab ID :	ERM08102942-08A	TPH-E (DRO)	ND		0.50 mg/L	10/27/08	10/29/08
		TPH-E (ORO)	ND		0.50 mg/L	10/27/08	10/29/08
		Surr: Nonane	103		(46-148) %REC	10/27/08	10/29/08
		TPH-P (GRO)	ND		0.50 mg/L	10/27/08	10/30/08
		Surr: 1,2-Dichloroethane-d4	102		(70-130) %REC	10/27/08	10/30/08
		Surr: Toluene-d8	99		(70-130) %REC	10/27/08	10/30/08
		Surr: 4-Bromofluorobenzene	106		(70-130) %REC	10/27/08	10/30/08
Client ID :	**MW-25**	TPH-E (JFRO)	0.54	I	0.50 mg/L	10/27/08	10/29/08
Lab ID :	ERM08102942-09A	TPH-E (DRO)	ND		0.50 mg/L	10/27/08	10/29/08
		TPH-E (ORO)	ND		0.50 mg/L	10/27/08	10/29/08
		Surr: Nonane	116		(46-148) %REC	10/27/08	10/29/08
		TPH-P (GRO)	4.0		2.0 mg/L	10/27/08	11/04/08
		Surr: 1,2-Dichloroethane-d4	93		(70-130) %REC	10/27/08	11/04/08
		Surr: Toluene-d8	102		(70-130) %REC	10/27/08	11/04/08
		Surr: 4-Bromofluorobenzene	108		(70-130) %REC	10/27/08	11/04/08
Client ID :	**MW-07**	TPH-E (JFRO)	1.8	I	1.0 mg/L	10/27/08	10/29/08
Lab ID :	ERM08102942-10A	TPH-E (DRO)	ND		1.0 mg/L	10/27/08	10/29/08
		TPH-E (ORO)	ND		1.0 mg/L	10/27/08	10/29/08
		Surr: Nonane	129		(46-148) %REC	10/27/08	10/29/08
		TPH-P (GRO)	1.8		0.50 mg/L	10/27/08	11/04/08
		Surr: 1,2-Dichloroethane-d4	95		(70-130) %REC	10/27/08	11/04/08
		Surr: Toluene-d8	102		(70-130) %REC	10/27/08	11/04/08
		Surr: 4-Bromofluorobenzene	100		(70-130) %REC	10/27/08	11/04/08
Client ID :	**MW-10**	TPH-E (JFRO)	ND		0.50 mg/L	10/28/08	10/29/08
Lab ID :	ERM08102942-11A	TPH-E (DRO)	ND		0.50 mg/L	10/28/08	10/29/08
		TPH-E (ORO)	ND		0.50 mg/L	10/28/08	10/29/08
		Surr: Nonane	116		(46-148) %REC	10/28/08	10/29/08
		TPH-P (GRO)	ND		0.50 mg/L	10/28/08	11/04/08
		Surr: 1,2-Dichloroethane-d4	96		(70-130) %REC	10/28/08	11/04/08
		Surr: Toluene-d8	98		(70-130) %REC	10/28/08	11/04/08
		Surr: 4-Bromofluorobenzene	108		(70-130) %REC	10/28/08	11/04/08
Client ID :	**EXW-04**	TPH-E (JFRO)	ND		0.50 mg/L	10/28/08	10/29/08
Lab ID :	ERM08102942-12A	TPH-E (DRO)	ND		0.50 mg/L	10/28/08	10/29/08
		TPH-E (ORO)	ND		0.50 mg/L	10/28/08	10/29/08
		Surr: Nonane	107		(46-148) %REC	10/28/08	10/29/08
		TPH-P (GRO)	ND		0.50 mg/L	10/28/08	11/04/08
		Surr: 1,2-Dichloroethane-d4	97		(70-130) %REC	10/28/08	11/04/08
		Surr: Toluene-d8	97		(70-130) %REC	10/28/08	11/04/08
		Surr: 4-Bromofluorobenzene	108		(70-130) %REC	10/28/08	11/04/08
Client ID :	**MW-26**	TPH-E (JFRO)	ND		0.50 mg/L	10/28/08	10/29/08
Lab ID :	ERM08102942-13A	TPH-E (DRO)	ND		0.50 mg/L	10/28/08	10/29/08
		TPH-E (ORO)	ND		0.50 mg/L	10/28/08	10/29/08
		Surr: Nonane	110		(46-148) %REC	10/28/08	10/29/08
		TPH-P (GRO)	ND		0.50 mg/L	10/28/08	11/04/08
		Surr: 1,2-Dichloroethane-d4	97		(70-130) %REC	10/28/08	11/04/08
		Surr: Toluene-d8	99		(70-130) %REC	10/28/08	11/04/08
		Surr: 4-Bromofluorobenzene	108		(70-130) %REC	10/28/08	11/04/08

Alpha Analytical, Inc.

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Diesel Range Organics (DRO) C13-C22

Gasoline Range Organics (GRO) C4-C13

GRO concentration include lighter-end mixtures such as aviation fuel and JP-4. The JFRO range primarily includes jut fuels such as JP5-JP8.

I = JFRO may include contributions from other products. Because Jet Fuel falls largely within the diesel range it is quantitated with the DRO calibration.

Jet Fuel Range Organics (JFRO) C9-C22. JFRO determination is based on its chromatographic fingerprint.

Oil Range Organics (ORO) C22-C40+

This replaces the report originally signed 11/10/08, due to the addition of TPH (GRO), per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com

Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

2/11/09

Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-01A
Client I.D. Number: TB102708-01

Sampled: 10/27/08
Received: 10/28/08
Analyzed: 10/30/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	ND	1.0 µg/L
28	m,p-Xylene	ND	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	98	(75-128) %REC
36	Surr: Toluene-d8	100	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	107	(80-120) %REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/10/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-02A
Client I.D. Number: T-21

Sampled: 10/27/08
Received: 10/28/08
Analyzed: 11/04/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	4.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	4.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	4.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	5.0	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	120	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	2.6	1.0 µg/L
28	m,p-Xylene	14	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	96	(75-128) %REC
36	Surr: Toluene-d8	97	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	92	(80-120) %REC

Some Reporting Limits were increased due to high concentrations of target analytes.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/10/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-03A
Client I.D. Number: T-21-D

Sampled: 10/27/08
Received: 10/28/08
Analyzed: 11/04/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	4.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	4.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	4.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	4.7	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	99	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	2.4	1.0 µg/L
28	m,p-Xylene	13	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	93	(75-128) %REC
36	Surr: Toluene-d8	98	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	94	(80-120) %REC

Some Reporting Limits were increased due to high concentrations of target analytes.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/10/08
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-04A
Client I.D. Number: T-21-FA

Sampled: 10/27/08
Received: 10/28/08
Analyzed: 11/04/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	4.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	4.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	4.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	ND	1.0 µg/L
28	m,p-Xylene	ND	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	94	(75-128) %REC
36	Surr: Toluene-d8	99	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	107	(80-120) %REC

Some Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
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11/10/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-05A
Client I.D. Number: EXW-01

Sampled: 10/27/08
Received: 10/28/08
Analyzed: 10/30/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	ND	1.0 µg/L
28	m,p-Xylene	ND	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	104	(75-128) %REC
36	Surr: Toluene-d8	99	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	106	(80-120) %REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-06A
Client I.D. Number: T-18

Sampled: 10/27/08
Received: 10/28/08
Analyzed: 10/30/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	1.7	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	ND	1.0 µg/L
28	m,p-Xylene	ND	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	101	(75-128) %REC
36	Surr: Toluene-d8	100	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	106	(80-120) %REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-07A
Client I.D. Number: EXW-03

Sampled: 10/27/08
Received: 10/28/08
Analyzed: 10/30/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	ND	1.0 µg/L
28	m,p-Xylene	ND	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	101	(75-128) %REC
36	Surr: Toluene-d8	99	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	107	(80-120) %REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/10/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-08A
Client I.D. Number: EXW-02

Sampled: 10/27/08
Received: 10/28/08
Analyzed: 10/30/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	ND	1.0 µg/L
28	m,p-Xylene	ND	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	102	(75-128) %REC
36	Surr: Toluene-d8	99	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	106	(80-120) %REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
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11/10/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-09A
Client I.D. Number: MW-25

Sampled: 10/27/08
Received: 10/28/08
Analyzed: 11/04/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	80 µg/L
2	Vinyl chloride	ND	20 µg/L
3	Chloroethane	ND	20 µg/L
4	Bromomethane	ND	80 µg/L
5	Trichlorofluoromethane	ND	20 µg/L
6	1,1-Dichloroethene	ND	20 µg/L
7	Dichloromethane	ND	80 µg/L
8	trans-1,2-Dichloroethene	ND	20 µg/L
9	Methyl tert-butyl ether (MTBE)	72	10 µg/L
10	1,1-Dichloroethane	ND	20 µg/L
11	cis-1,2-Dichloroethene	ND	20 µg/L
12	Chloroform	ND	20 µg/L
13	1,2-Dichloroethane	ND	20 µg/L
14	1,1,1-Trichloroethane	ND	20 µg/L
15	Carbon tetrachloride	ND	20 µg/L
16	Benzene	2,100	10 µg/L
17	1,2-Dichloropropane	ND	20 µg/L
18	Trichloroethene	ND	20 µg/L
19	Bromodichloromethane	ND	20 µg/L
20	cis-1,3-Dichloropropene	ND	20 µg/L
21	trans-1,3-Dichloropropene	ND	20 µg/L
22	1,1,2-Trichloroethane	ND	20 µg/L
23	Toluene	ND	10 µg/L
24	Dibromochloromethane	ND	20 µg/L
25	Tetrachloroethene	ND	20 µg/L
26	Chlorobenzene	ND	20 µg/L
27	Ethylbenzene	ND	10 µg/L
28	m,p-Xylene	ND	10 µg/L
29	Bromoform	ND	20 µg/L
30	o-Xylene	ND	10 µg/L
31	1,1,2,2-Tetrachloroethane	ND	20 µg/L
32	1,3-Dichlorobenzene	ND	20 µg/L
33	1,4-Dichlorobenzene	ND	20 µg/L
34	1,2-Dichlorobenzene	ND	20 µg/L
35	Surr: 1,2-Dichloroethane-d4	93	(75-128) %REC
36	Surr: Toluene-d8	102	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	108	(80-120) %REC

Reporting Limits were increased due to high concentrations of target analytes.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/10/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-10A
Client I.D. Number: MW-07

Sampled: 10/27/08
Received: 10/28/08
Analyzed: 11/04/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	8.0 µg/L
2	Vinyl chloride	ND	2.0 µg/L
3	Chloroethane	ND	2.0 µg/L
4	Bromomethane	ND	8.0 µg/L
5	Trichlorofluoromethane	ND	2.0 µg/L
6	1,1-Dichloroethene	ND	2.0 µg/L
7	Dichloromethane	ND	8.0 µg/L
8	trans-1,2-Dichloroethene	ND	2.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	2.0 µg/L
11	cis-1,2-Dichloroethene	ND	2.0 µg/L
12	Chloroform	ND	2.0 µg/L
13	1,2-Dichloroethane	ND	2.0 µg/L
14	1,1,1-Trichloroethane	ND	2.0 µg/L
15	Carbon tetrachloride	ND	2.0 µg/L
16	Benzene	230	1.0 µg/L
17	1,2-Dichloropropane	ND	2.0 µg/L
18	Trichloroethene	ND	2.0 µg/L
19	Bromodichloromethane	ND	2.0 µg/L
20	cis-1,3-Dichloropropene	ND	2.0 µg/L
21	trans-1,3-Dichloropropene	ND	2.0 µg/L
22	1,1,2-Trichloroethane	ND	2.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	2.0 µg/L
25	Tetrachloroethene	ND	2.0 µg/L
26	Chlorobenzene	ND	2.0 µg/L
27	Ethylbenzene	3.4	1.0 µg/L
28	m,p-Xylene	1.9	1.0 µg/L
29	Bromoform	ND	2.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	2.0 µg/L
32	1,3-Dichlorobenzene	ND	2.0 µg/L
33	1,4-Dichlorobenzene	ND	2.0 µg/L
34	1,2-Dichlorobenzene	ND	2.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	95	(75-128) %REC
36	Surr: Toluene-d8	102	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	100	(80-120) %REC

Some Reporting Limits were increased due to sample foaming.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/10/08
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-11A
Client I.D. Number: MW-10

Sampled: 10/28/08
Received: 10/28/08
Analyzed: 11/04/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	ND	1.0 µg/L
28	m,p-Xylene	ND	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	96	(75-128) %REC
36	Surr: Toluene-d8	98	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	108	(80-120) %REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/10/08
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-12A
Client I.D. Number: EXW-04

Sampled: 10/28/08
Received: 10/28/08
Analyzed: 11/04/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	ND	1.0 µg/L
28	m,p-Xylene	ND	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	97	(75-128) %REC
36	Surr: Toluene-d8	97	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	108	(80-120) %REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/10/08
Report Date

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno ANG RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08102942-13A
Client I.D. Number: MW-26

Sampled: 10/28/08
Received: 10/28/08
Analyzed: 11/04/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	ND	1.0 µg/L
28	m,p-Xylene	ND	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	97	(75-128) %REC
36	Surr: Toluene-d8	99	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	108	(80-120) %REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/10/08
Report Date

Alpha Analytical, Inc.
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC Sample Preservation Report

Work Order: ERM08102942 **Project:** 86300.31/Reno ANG RAO

Alpha's Sample ID	Client's Sample ID	Matrix	pH
08102942-01A	TB102708-01	Aqueous	2
08102942-02A	T-21	Aqueous	2
08102942-03A	T-21-D	Aqueous	2
08102942-04A	T-21-FA	Aqueous	2
08102942-05A	EXW-01	Aqueous	2
08102942-06A	T-18	Aqueous	2
08102942-07A	EXW-03	Aqueous	2
08102942-08A	EXW-02	Aqueous	2
08102942-09A	MW-25	Aqueous	2
08102942-10A	MW-07	Aqueous	2
08102942-11A	MW-10	Aqueous	2
08102942-12A	EXW-04	Aqueous	2
08102942-13A	MW-26	Aqueous	2

11/10/08
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *11-Feb-09*

QC Summary Report

Work Order: 08102942

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081104\08110405.D** Batch ID: **MS10W1104B** Analysis Date: **11/04/2008 10:24**

Sample ID: **MBLK MS10W1104B** Units : **mg/L** Run ID: **MSD_10_081104A** Prep Date: **11/04/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.5								
Surr: 1,2-Dichloroethane-d4	0.00955		0.01		96	75	128			
Surr: Toluene-d8	0.00982		0.01		98	80	120			
Surr: 4-Bromofluorobenzene	0.0106		0.01		106	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081104\08110403.D** Batch ID: **MS10W1104B** Analysis Date: **11/04/2008 09:42**

Sample ID: **GLCS MS10W1104B** Units : **mg/L** Run ID: **MSD_10_081104A** Prep Date: **11/04/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.387	0.05	0.4		97	70	130			
Surr: 1,2-Dichloroethane-d4	0.0096		0.01		96	75	128			
Surr: Toluene-d8	0.00996		0.01		99.6	80	120			
Surr: 4-Bromofluorobenzene	0.00998		0.01		99.8	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081104\08110413.D** Batch ID: **MS10W1104B** Analysis Date: **11/04/2008 13:14**

Sample ID: **08103004-12AGS** Units : **mg/L** Run ID: **MSD_10_081104A** Prep Date: **11/04/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.93	0.25	2	0	97	60	131			
Surr: 1,2-Dichloroethane-d4	0.0496		0.05		99	75	128			
Surr: Toluene-d8	0.0486		0.05		97	80	120			
Surr: 4-Bromofluorobenzene	0.0508		0.05		102	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081104\08110414.D** Batch ID: **MS10W1104B** Analysis Date: **11/04/2008 13:35**

Sample ID: **08103004-12AGSD** Units : **mg/L** Run ID: **MSD_10_081104A** Prep Date: **11/04/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.9	0.25	2	0	95	60	131	1.934	2.0(20)	
Surr: 1,2-Dichloroethane-d4	0.0498		0.05		99.6	75	128			
Surr: Toluene-d8	0.0485		0.05		97	80	120			
Surr: 4-Bromofluorobenzene	0.0503		0.05		101	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *07-Nov-08*

QC Summary Report

Work Order: 08102942

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20901** Analysis Date: **10/29/2008 14:26**

Sample ID: **MBLK-20901** Units : **mg/L** Run ID: **FID_2_081029A** Prep Date: **10/29/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (JFRO)	ND	0.5								
TPH-E (DRO)	ND	0.5								
TPH-E (ORO)	ND	0.5								
Surr: Nonane	104		100		104	46	148			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20901** Analysis Date: **10/29/2008 14:00**

Sample ID: **LCS-20901** Units : **mg/L** Run ID: **FID_2_081029A** Prep Date: **10/29/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.39	0.5	2.5		95	65	130			
Surr: Nonane	105		100		105	46	148			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20901** Analysis Date: **10/29/2008 23:18**

Sample ID: **08102942-13AMS** Units : **mg/L** Run ID: **FID_2_081029A** Prep Date: **10/29/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.7	0.5	2.5	0	108	37	164			
Surr: Nonane	107		100		107	46	148			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20901** Analysis Date: **10/29/2008 23:43**

Sample ID: **08102942-13AMSD** Units : **mg/L** Run ID: **FID_2_081029A** Prep Date: **10/29/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.34	0.5	2.5	0	94	37	164	2.704	14.3(20)	
Surr: Nonane	107		100		107	46	148			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *07-Nov-08*

QC Summary Report

Work Order: 08102942

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081030\08103006.D** Batch ID: **MS10W1030A** Analysis Date: **10/30/2008 10:58**

Sample ID: **MBLK MS10W1030A** Units : **µg/L** Run ID: **MSD_10_081030A** Prep Date: **10/30/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloromethane	ND	2								
Vinyl chloride	ND	1								
Chloroethane	ND	1								
Bromomethane	ND	2								
Trichlorofluoromethane	ND	1								
1,1-Dichloroethene	ND	1								
Dichloromethane	ND	2								
trans-1,2-Dichloroethene	ND	1								
Methyl tert-butyl ether (MTBE)	ND	1								
1,1-Dichloroethane	ND	1								
cis-1,2-Dichloroethene	ND	1								
Chloroform	ND	1								
1,2-Dichloroethane	ND	1								
1,1,1-Trichloroethane	ND	1								
Carbon tetrachloride	ND	1								
Benzene	ND	1								
1,2-Dichloropropane	ND	1								
Trichloroethene	ND	1								
Bromodichloromethane	ND	1								
cis-1,3-Dichloropropene	ND	1								
trans-1,3-Dichloropropene	ND	1								
1,1,2-Trichloroethane	ND	1								
Toluene	ND	1								
Dibromochloromethane	ND	1								
Tetrachloroethene	ND	1								
Chlorobenzene	ND	1								
Ethylbenzene	ND	1								
m,p-Xylene	ND	1								
Bromoform	ND	1								
o-Xylene	ND	1								
1,1,2,2-Tetrachloroethane	ND	1								
1,3-Dichlorobenzene	ND	1								
1,4-Dichlorobenzene	ND	1								
1,2-Dichlorobenzene	ND	1								
Surr: 1,2-Dichloroethane-d4	10.1		10		101	75	128			
Surr: Toluene-d8	9.92		10		99	80	120			
Surr: 4-Bromofluorobenzene	10.7		10		107	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081030\08103005.D** Batch ID: **MS10W1030A** Analysis Date: **10/30/2008 10:37**

Sample ID: **LCS MS10W1030A** Units : **µg/L** Run ID: **MSD_10_081030A** Prep Date: **10/30/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
1,1-Dichloroethene	10.1	1	10		101	80	120			
Methyl tert-butyl ether (MTBE)	9.82	0.5	10		98	70	130			
Benzene	9.86	0.5	10		99	70	130			
Trichloroethene	9.51	1	10		95	70	130			
Toluene	9.45	0.5	10		95	80	120			
Chlorobenzene	10.1	1	10		101	70	130			
Ethylbenzene	10.2	0.5	10		102	80	120			
m,p-Xylene	9.91	0.5	10		99	70	130			
o-Xylene	9.84	0.5	10		98	70	130			
Surr: 1,2-Dichloroethane-d4	10		10		100	75	128			
Surr: Toluene-d8	9.57		10		96	80	120			
Surr: 4-Bromofluorobenzene	9.65		10		97	80	120			

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *07-Nov-08*

QC Summary Report

Work Order: 08102942

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081030\08103015.D** Batch ID: **MS10W1030A** Analysis Date: **10/30/2008 14:11**

Sample ID: **08102942-02AMS** Units : **µg/L** Run ID: **MSD_10_081030A** Prep Date: **10/30/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
1,1-Dichloroethene	52.4	2.5	50	0	105	66	132			
Methyl tert-butyl ether (MTBE)	58.1	1.3	50	4.99	106	62	139			
Benzene	142	1.3	50	120.4	44	70	130			M2
Trichloroethene	49.8	2.5	50	0	99.6	69	130			
Toluene	49.4	1.3	50	0	99	67	130			
Chlorobenzene	52.8	2.5	50	0	106	70	130			
Ethylbenzene	55.2	1.3	50	2.55	105	70	130			
m,p-Xylene	61.8	1.3	50	13.54	96	69	130			
o-Xylene	52.9	1.3	50	0	106	70	130			
Surr: 1,2-Dichloroethane-d4	49.2		50		98	75	128			
Surr: Toluene-d8	47.8		50		96	80	120			
Surr: 4-Bromofluorobenzene	47.7		50		95	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081030\08103016.D** Batch ID: **MS10W1030A** Analysis Date: **10/30/2008 14:32**

Sample ID: **08102942-02AMSD** Units : **µg/L** Run ID: **MSD_10_081030A** Prep Date: **10/30/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
1,1-Dichloroethene	53.9	2.5	50	0	108	66	132	52.35	2.8(20)	
Methyl tert-butyl ether (MTBE)	60.7	1.3	50	4.99	111	62	139	58.13	4.3(20)	
Benzene	141	1.3	50	120.4	42	70	130	142.2	0.7(20)	M2
Trichloroethene	51.4	2.5	50	0	103	69	130	49.82	3.0(20)	
Toluene	51	1.3	50	0	102	67	130	49.44	3.0(20)	
Chlorobenzene	54.6	2.5	50	0	109	70	130	52.8	3.3(20)	
Ethylbenzene	56.6	1.3	50	2.55	108	70	130	55.23	2.4(20)	
m,p-Xylene	62.4	1.3	50	13.54	98	69	130	61.78	1.0(20)	
o-Xylene	53.9	1.3	50	0	108	70	130	52.85	1.9(20)	
Surr: 1,2-Dichloroethane-d4	49.9		50		99.8	75	128			
Surr: Toluene-d8	47.7		50		95	80	120			
Surr: 4-Bromofluorobenzene	47.7		50		95	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

M2 = Matrix spike recovery was low, the method control sample recovery was acceptable.

NV AMENDED

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : ERM08102942

Report Due By : 5:00 PM On : 11-Nov-08

Billing Information :
ERM
2525 Natomas Park Drive

SACRAMENTO, CA 95813

Client:
ERM
2525 Natomas Park Drive

Sacramento, CA 95813

Report Attention	Phone Number	EMail Address
Brian Magee	(916) 924-9378 x	brian.magee@erm.com

EDD Required : **No**

Sampled by : Client

PO :

Client's COC # : 1426/1429 Job : 86300.31/Reno ANG RAO

Cooler Temp	Samples Received	Date Printed
4 °C	28-Oct-08	10-Feb-09

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/E_W	TPH/P_W	VOC_W						Sample Remarks
ERM08102942-01A	TB102708-01	AQ	10/27/08 12:05	2	0	10			8260/MTBE_Ns						Reno Trip Blanks (2) 10/14/08
ERM08102942-02A	T-21	AQ	10/27/08 12:24	24	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						MS/MSD
ERM08102942-03A	T-21-D	AQ	10/27/08 12:24	8	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						
ERM08102942-04A	T-21-FA	AQ	10/27/08 12:26	1	0	10			8260/MTBE_Ns						
ERM08102942-05A	EXW-01	AQ	10/27/08 13:35	8	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						
ERM08102942-06A	T-18	AQ	10/27/08 14:10	8	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						
ERM08102942-07A	EXW-03	AQ	10/27/08 14:50	8	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						
ERM08102942-08A	EXW-02	AQ	10/27/08 15:28	8	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						Voas labeled EXT-02, logged in per COC.
ERM08102942-09A	MW-25	AQ	10/27/08 16:08	8	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						
ERM08102942-10A	MW-07	AQ	10/27/08 16:43	8	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						

Comments: Samples brought in by client. Frozen ice. Samples brought in Tuesday 10/29/08 and kept cold and secure until login on Wednesday. Amended 2/10/09 @ 15:05 to add GRO to all samples where TPH Av was requested, per Randy's conv with client. LE :

	Signature	Print Name	Company	Date/Time
Logged in by:	Patricia Edrosa	Patricia Edrosa	Alpha Analytical, Inc.	2/10/09 15:05

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

NV AMENDED

Billing Information :
ERM
2525 Natomas Park Drive

SACRAMENTO, CA 95813

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : ERM08102942
Report Due By : 5:00 PM On : 11-Nov-08

Client:
ERM
2525 Natomas Park Drive

Sacramento, CA 95813

Report Attention	Phone Number	EMail Address
Brian Magee	(916) 924-9378 x	brian.magee@erm.com

EDD Required : **No**

Sampled by : Client

PO :

Client's COC # : 1426/1429 Job : 86300.31/Reno ANG RAO

Cooler Temp	Samples Received	Date Printed
4 °C	28-Oct-08	10-Feb-09

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	Requested Tests TPH/E_W	TPH/P_W	VOC_W						Sample Remarks
ERM08102942-11A	MW-10	AQ	10/28/08 09:31	8	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						
ERM08102942-12A	EXW-04	AQ	10/28/08 11:29	8	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						
ERM08102942-13A	MW-26	AQ	10/28/08 12:12	8	0	10	TPH/E_N	GAS-N	8260/MTBE_Ns						

Comments: Samples brought in by client. Frozen ice. Samples brought in Tuesday 10/29/08 and kept cold and secure until login on Wednesday. Amended 2/10/09 @ 15:05 to add GRO to all samples where TPH Av was requested, per Randy's conv with client. LE :

	Signature	Print Name	Company	Date/Time
Logged in by:	Latricia Edrosa	Latricia Edrosa	Alpha Analytical, Inc.	2/10/09 15:05

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
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Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

NV

Billing Information :
ERM
2525 Natomas Park Drive

SACRAMENTO, CA 95813

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : ERM08102942
Report Due By : 5:00 PM On : 11-Nov-08

Client:
ERM
2525 Natomas Park Drive

Sacramento, CA 95813

Report Attention	Phone Number	EMail Address
Brian Magee	(916) 924-9378 x	brian.magee@erm.com

EDD Required : **Yes**

Sampled by : Client

PO :

Client's COC # : 1426/1429 Job : 86300.31/Reno ANG RAO

Cooler Temp	Samples Received	Date Printed
4 °C	28-Oct-08	29-Oct-08

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/E_W	VOC_W							Sample Remarks
							Requested Tests								
ERM08102942-01A	TB102708-01	AQ	10/27/08 12:05	2	0	10		8260/MTBE_Ns							Reno Trip Blanks (2) 10/14/08
ERM08102942-02A	T-21	AQ	10/27/08 12:24	24	0	10	TPH/E_N	8260/MTBE_Ns							MS/MSD
ERM08102942-03A	T-21-D	AQ	10/27/08 12:24	8	0	10	TPH/E_N	8260/MTBE_Ns							
ERM08102942-04A	T-21-FA	AQ	10/27/08 12:26	1	0	10		8260/MTBE_Ns							
ERM08102942-05A	EXW-01	AQ	10/27/08 13:35	8	0	10	TPH/E_N	8260/MTBE_Ns							
ERM08102942-06A	T-18	AQ	10/27/08 14:10	8	0	10	TPH/E_N	8260/MTBE_Ns							
ERM08102942-07A	EXW-03	AQ	10/27/08 14:50	8	0	10	TPH/E_N	8260/MTBE_Ns							
ERM08102942-08A	EXW-02	AQ	10/27/08 15:28	8	0	10	TPH/E_N	8260/MTBE_Ns							Voas labeled EXT-02, logged in per COC.
ERM08102942-09A	MW-25	AQ	10/27/08 16:08	8	0	10	TPH/E_N	8260/MTBE_Ns							
ERM08102942-10A	MW-07	AQ	10/27/08 16:43	8	0	10	TPH/E_N	8260/MTBE_Ns							

Comments: Samples brought in by client. Frozen ice. Samples brought in Tuesday 10/29/08 and kept cold and secure until login on Wednesday. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Patricia Edrosa	Patricia Edrosa	Alpha Analytical, Inc.	10/29/08 11:07

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
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Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

NV

Billing Information :
ERM
2525 Natomas Park Drive

SACRAMENTO, CA 95813

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : ERM08102942
Report Due By : 5:00 PM On : 11-Nov-08

Client:
ERM
2525 Natomas Park Drive

Sacramento, CA 95813

Report Attention	Phone Number	EMail Address
Brian Magee	(916) 924-9378 x	brian.magee@erm.com

EDD Required : **Yes**

Sampled by : Client

PO :

Client's COC # : 1426/1429 Job : 86300.31/Reno ANG RAO

Cooler Temp	Samples Received	Date Printed
4 °C	28-Oct-08	29-Oct-08

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	TPH/E_W	VOC_W							Sample Remarks
ERM08102942-11A	MW-10	AQ	10/28/08 09:31	8	0	10	TPH/E_N	8260/MTBE_Ns							
ERM08102942-12A	EXW-04	AQ	10/28/08 11:29	8	0	10	TPH/E_N	8260/MTBE_Ns							
ERM08102942-13A	MW-26	AQ	10/28/08 12:12	8	0	10	TPH/E_N	8260/MTBE_Ns							

Comments: Samples brought in by client. Frozen ice. Samples brought in Tuesday 10/29/08 and kept cold and secure until login on Wednesday. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Latricia Ednosa	Latricia Ednosa	Alpha Analytical, Inc.	10/29/08 11:07

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

NV

ERM

CHAIN OF CUSTODY RECORD

NO: 1426

6650 S.W. REDWOOD LANE, SUITE 300 • PORTLAND, OR 97224 • (503) 542-8007 • FAX (503) 542-8017

PROJECT #	PROJECT NAME
86300.31	Reno ANG RAO

SAMPLER: (PRINT NAME)	(SIGNATURE)

RECEIVING LABORATORY: Alpha Analytical Reno, NV

REQUESTED PARAMETERS: VOC+ MTBE 8260B; TPH-d + TPH-gv 8015M; MS/MSD *

ERM08102942

SAMPLE I.D.	DATE	TIME	COMP	GRAB	SAMPLING METHOD	PRESERVATIVE	pH (Y/N)	SAMPLING VOLUME	# OF CONTAINERS	MATRIX: SOIL	MATRIX: WATER	MATRIX: GAS	VOC+ MTBE 8260B	TPH-d + TPH-gv 8015M	MS/MSD *						
~~Reno~~ TB102708-1	10-27-08	1205		X	Trip Blank	HCl	Y	40mL	2		X		X								-01A
T-21-	10-27-08	1224		X	Peri pump	HCl	Y	960mL	24		X		X	X	X						-02A
T-21-D		1224		X	Peri	HCL	Y	320mL	8		X		X	X							-03A
T-21-FA		1226		X	Field Blank	HCL	Y	40mL	1		X		X								-04A
EXW-01		1335		X	Peri	HCl	Y	320mL	8		X		X	X							-05A
T-18		1410 1355 NV		X	Peri	HCL	Y	320mL	8		X		X	X							-06A
EXW-03		1450		X	Peri	HCL	Y	320mL	8		X		X	X							-07A
EXW-02		1528		X	Peri	HCL	Y	320mL	8		X		X	X			VOAs labeled EXT-02				-08A
MW-25		1608		X	Peri	HCL	Y	320mL	8		X		X	X							-09A
MW-07		1643		X	Peri	HCL	Y	320mL	8		X		X	X							-10A

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
[signature]	10/28/08	1616	Elizabeth Adcox	10/28/08	1616

FIELD REMARKS: * Project-specific MS/MSD
Std TAT

briam.magee@erm.com

SEND REPORT TO: Brian Magee

REMARKS ON SAMPLE RECEIPT:
- [x] BOTTLE INTACT
- [x] PRESERVED
- [ ] CUSTODY SEALS
- [ ] SEALS INTACT
- [x] CHILLED
- [ ] SEE REMARKS

OTHER REMARKS:

WHITE - LABORATORY COPY CANARY - FIELD COPY PINK - DATABASE MANAGER GOLD - PROJECT FILE

ERM

CHAIN OF CUSTODY RECORD

NO: 1429

6650 S.W. REDWOOD LANE, SUITE 300 • PORTLAND, OR 97224 • (503) 542-8007 • FAX (503) 542-8017

PROJECT #	PROJECT NAME
86300.31	Reno ANG RAO

SAMPLER: (PRINT NAME)	(SIGNATURE)

RECEIVING LABORATORY: Alpha Analytical Reno, NV

SAMPLE I.D.	DATE	TIME	COMP	GRAB	SAMPLING METHOD	PRESERVATIVE	ICE (Y/N)	SAMPLING VOLUME	# OF CONTAINERS	MATRIX: SOIL	MATRIX: WATER	MATRIX: GAS	VOC + MTBE 8260B	TPH-d + TPH-av 8015M							
MW-10	10/28/08	0931		X	Peristaltic	HCL	Y	320 mL	8		X		X	X							-11A
EXW-04	↓	1129		X	↓	↓	Y	↓	8		X		X	X							-12A
MW-26	↓	1212		X	↓	↓	Y	↓	8		X		X	X							-13A

ERM08102942

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
[signature]	10/28/08	1616	Elizabeth Alcox [signature]	10/29/08	1616
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME

FIELD REMARKS:

REMARKS ON SAMPLE RECEIPT:
- [x] BOTTLE INTACT
- [x] PRESERVED
- [ ] CUSTODY SEALS
- [ ] SEALS INTACT
- [x] CHILLED
- [ ] SEE REMARKS

ERM REMARKS:

SEND REPORT TO: Brian Magee

WHITE - LABORATORY COPY CANARY - FIELD COPY PINK - DATABASE MANAGER GOLD - PROJECT FILE

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378
Date Received : 10/30/08

Job#: 86300.31/Reno RAO

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B

		Parameter	Concentration		Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**T-22**	TPH-E (JFRO)	ND		0.50 mg/L	10/29/08	10/30/08
Lab ID :	ERM08103051-02A	TPH-E (DRO)	ND		0.50 mg/L	10/29/08	10/30/08
		TPH-E (ORO)	ND		0.50 mg/L	10/29/08	10/30/08
		Surr: Nonane	111		(46-148) %REC	10/29/08	10/30/08
		TPH-P (GRO)	ND		0.50 mg/L	10/29/08	11/05/08
		Surr: 1,2-Dichloroethane-d4	95		(70-130) %REC	10/29/08	11/05/08
		Surr: Toluene-d8	99		(70-130) %REC	10/29/08	11/05/08
		Surr: 4-Bromofluorobenzene	109		(70-130) %REC	10/29/08	11/05/08
Client ID :	**GP-9-GW-12**	TPH-E (JFRO)	ND		0.50 mg/L	10/29/08	10/30/08
Lab ID :	ERM08103051-03A	TPH-E (DRO)	ND		0.50 mg/L	10/29/08	10/30/08
		TPH-E (ORO)	ND		0.50 mg/L	10/29/08	10/30/08
		Surr: Nonane	101		(46-148) %REC	10/29/08	10/30/08
		TPH-P (GRO)	ND		0.50 mg/L	10/29/08	11/05/08
		Surr: 1,2-Dichloroethane-d4	94		(70-130) %REC	10/29/08	11/05/08
		Surr: Toluene-d8	98		(70-130) %REC	10/29/08	11/05/08
		Surr: 4-Bromofluorobenzene	105		(70-130) %REC	10/29/08	11/05/08
Client ID :	**GP-10-GW-8.9**	TPH-E (JFRO)	120	* I	5.0 mg/L	10/29/08	10/30/08
Lab ID :	ERM08103051-04A	TPH-E (DRO)	ND		25 mg/L	10/29/08	10/30/08
		TPH-E (ORO)	ND		5.0 mg/L	10/29/08	10/30/08
		Surr: Nonane	0	S51	(46-148) %REC	10/29/08	10/30/08
		TPH-P (GRO)	99		20 mg/L	10/29/08	11/05/08
		Surr: 1,2-Dichloroethane-d4	93		(70-130) %REC	10/29/08	11/05/08
		Surr: Toluene-d8	99		(70-130) %REC	10/29/08	11/05/08
		Surr: 4-Bromofluorobenzene	109		(70-130) %REC	10/29/08	11/05/08
Client ID :	**GP-14-GW-8.57**	TPH-E (JFRO)	ND		0.50 mg/L	10/29/08	10/30/08
Lab ID :	ERM08103051-05A	TPH-E (DRO)	ND		0.50 mg/L	10/29/08	10/30/08
		TPH-E (ORO)	ND		0.50 mg/L	10/29/08	10/30/08
		Surr: Nonane	97		(46-148) %REC	10/29/08	10/30/08
		TPH-P (GRO)	ND		0.50 mg/L	10/29/08	11/05/08
		Surr: 1,2-Dichloroethane-d4	95		(70-130) %REC	10/29/08	11/05/08
		Surr: Toluene-d8	97		(70-130) %REC	10/29/08	11/05/08
		Surr: 4-Bromofluorobenzene	109		(70-130) %REC	10/29/08	11/05/08
Client ID :	**GP-13-GW-7.85**	TPH-E (JFRO)	ND		0.50 mg/L	10/29/08	10/30/08
Lab ID :	ERM08103051-06A	TPH-E (DRO)	ND		0.50 mg/L	10/29/08	10/30/08
		TPH-E (ORO)	ND		0.50 mg/L	10/29/08	10/30/08
		Surr: Nonane	142		(46-148) %REC	10/29/08	10/30/08
		TPH-P (GRO)	2.4		0.50 mg/L	10/29/08	11/05/08
		Surr: 1,2-Dichloroethane-d4	95		(70-130) %REC	10/29/08	11/05/08
		Surr: Toluene-d8	99		(70-130) %REC	10/29/08	11/05/08
		Surr: 4-Bromofluorobenzene	101		(70-130) %REC	10/29/08	11/05/08

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Client ID :	**GP-13-GW-7.85-D**	TPH-E (JFRO)	ND	0.50 mg/L	10/29/08	10/30/08
Lab ID :	ERM08103051-07A	TPH-E (DRO)	ND	0.50 mg/L	10/29/08	10/30/08
		TPH-E (ORO)	ND	0.50 mg/L	10/29/08	10/30/08
		Surr: Nonane	136	(46-148) %REC	10/29/08	10/30/08
		TPH-P (GRO)	2.2	0.50 mg/L	10/29/08	11/05/08
		Surr: 1,2-Dichloroethane-d4	93	(70-130) %REC	10/29/08	11/05/08
		Surr: Toluene-d8	99	(70-130) %REC	10/29/08	11/05/08
		Surr: 4-Bromofluorobenzene	99	(70-130) %REC	10/29/08	11/05/08
Client ID :	**GP-13-R**	TPH-E (JFRO)	ND	0.50 mg/L	10/29/08	10/30/08
Lab ID :	ERM08103051-08A	TPH-E (DRO)	ND	0.50 mg/L	10/29/08	10/30/08
		TPH-E (ORO)	ND	0.50 mg/L	10/29/08	10/30/08
		Surr: Nonane	112	(46-148) %REC	10/29/08	10/30/08
		TPH-P (GRO)	ND	0.50 mg/L	10/29/08	11/05/08
		Surr: 1,2-Dichloroethane-d4	95	(70-130) %REC	10/29/08	11/05/08
		Surr: Toluene-d8	99	(70-130) %REC	10/29/08	11/05/08
		Surr: 4-Bromofluorobenzene	107	(70-130) %REC	10/29/08	11/05/08

* Reported concentration may include some lighter-end hydrocarbons.

Diesel Range Organics (DRO) C13-C22

Gasoline Range Organics (GRO) C4-C13

GRO concentrations include lighter-end mixtures such as aviation fuel and JP-4. The JFRO range primarily includes jet fuels such as JP5-JP8.

I = JFRO may include contributions from other products. Because Jet Fuel falls largely within the diesel range it is quantitated with the DRO calibration.

Jet Fuel Range Organics (JFRO) C9-C22. JFRO determination is based on its chromatographic fingerprint.

Oil Range Organics (ORO) C22-C40+

S51 = Surrogate recovery could not be determined due to the presence of co-eluting hydrocarbons.

This replaces the report signed 11/12/08, due to a change in the analyte list, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com

Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

2/9/09

Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103051-03A
Client I.D. Number: GP-9-GW-12

Sampled: 10/29/08
Received: 10/30/08
Analyzed: 11/05/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	5.8	1.0 µg/L
28	m,p-Xylene	28	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	3.9	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	94	(75-128) %REC
36	Surr: Toluene-d8	98	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	105	(80-120) %REC

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/12/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103051-04A
Client I.D. Number: GP-10-GW-8.9

Sampled: 10/29/08
Received: 10/30/08
Analyzed: 11/05/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	800 µg/L	26	Chlorobenzene	ND	200 µg/L
2	Vinyl chloride	ND	200 µg/L	27	Ethylbenzene	1,700	100 µg/L
3	Chloroethane	ND	200 µg/L	28	m,p-Xylene	6,000	100 µg/L
4	Bromomethane	ND	800 µg/L	29	Bromoform	ND	200 µg/L
5	Trichlorofluoromethane	ND	200 µg/L	30	o-Xylene	870	100 µg/L
6	1,1-Dichloroethene	ND	200 µg/L	31	1,1,2,2-Tetrachloroethane	ND	200 µg/L
7	Dichloromethane	ND	800 µg/L	32	1,3-Dichlorobenzene	ND	200 µg/L
8	trans-1,2-Dichloroethene	ND	200 µg/L	33	1,4-Dichlorobenzene	ND	200 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	100 µg/L	34	1,2-Dichlorobenzene	ND	200 µg/L
10	1,1-Dichloroethane	ND	200 µg/L	35	Surr: 1,2-Dichloroethane-d4	93	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	200 µg/L	36	Surr: Toluene-d8	99	(80-120) %REC
12	Chloroform	ND	200 µg/L	37	Surr: 4-Bromofluorobenzene	109	(80-120) %REC
13	1,2-Dichloroethane	ND	200 µg/L				
14	1,1,1-Trichloroethane	ND	200 µg/L				
15	Carbon tetrachloride	ND	200 µg/L				
16	Benzene	20,000	100 µg/L				
17	1,2-Dichloropropane	ND	200 µg/L				
18	Trichloroethene	ND	200 µg/L				
19	Bromodichloromethane	ND	200 µg/L				
20	cis-1,3-Dichloropropene	ND	200 µg/L				
21	trans-1,3-Dichloropropene	ND	200 µg/L				
22	1,1,2-Trichloroethane	ND	200 µg/L				
23	Toluene	ND	100 µg/L				
24	Dibromochloromethane	ND	200 µg/L				
25	Tetrachloroethene	ND	200 µg/L				

Reporting Limits were increased due to high concentrations of target analytes.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/12/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103051-05A
Client I.D. Number: GP-14-GW-8.57

Sampled: 10/29/08
Received: 10/30/08
Analyzed: 11/05/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	1.5	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	6.2	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	95	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	97	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	109	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	2.3	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com

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11/12/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103051-06A
Client I.D. Number: GP-13-GW-7.85

Sampled: 10/29/08
Received: 10/30/08
Analyzed: 11/05/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	8.0 µg/L
2	Vinyl chloride	ND	2.0 µg/L
3	Chloroethane	ND	2.0 µg/L
4	Bromomethane	ND	8.0 µg/L
5	Trichlorofluoromethane	ND	2.0 µg/L
6	1,1-Dichloroethene	ND	2.0 µg/L
7	Dichloromethane	ND	8.0 µg/L
8	trans-1,2-Dichloroethene	ND	2.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	2.0 µg/L
11	cis-1,2-Dichloroethene	ND	2.0 µg/L
12	Chloroform	ND	2.0 µg/L
13	1,2-Dichloroethane	ND	2.0 µg/L
14	1,1,1-Trichloroethane	ND	2.0 µg/L
15	Carbon tetrachloride	ND	2.0 µg/L
16	Benzene	280	1.0 µg/L
17	1,2-Dichloropropane	ND	2.0 µg/L
18	Trichloroethene	ND	2.0 µg/L
19	Bromodichloromethane	ND	2.0 µg/L
20	cis-1,3-Dichloropropene	ND	2.0 µg/L
21	trans-1,3-Dichloropropene	ND	2.0 µg/L
22	1,1,2-Trichloroethane	ND	2.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	2.0 µg/L
25	Tetrachloroethene	ND	2.0 µg/L
26	Chlorobenzene	ND	2.0 µg/L
27	Ethylbenzene	54	1.0 µg/L
28	m,p-Xylene	210	1.0 µg/L
29	Bromoform	ND	2.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	2.0 µg/L
32	1,3-Dichlorobenzene	ND	2.0 µg/L
33	1,4-Dichlorobenzene	ND	2.0 µg/L
34	1,2-Dichlorobenzene	ND	2.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	94	(75-128) %REC
36	Surr: Toluene-d8	99	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	100	(80-120) %REC

Some Reporting Limits were increased due to high concentrations of target analytes.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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11/12/08
Report Date

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103051-07A
Client I.D. Number: GP-13-GW-7.85-D

Sampled: 10/29/08
Received: 10/30/08
Analyzed: 11/05/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	8.0 µg/L	26	Chlorobenzene	ND	2.0 µg/L
2	Vinyl chloride	ND	2.0 µg/L	27	Ethylbenzene	51	1.0 µg/L
3	Chloroethane	ND	2.0 µg/L	28	m,p-Xylene	200	1.0 µg/L
4	Bromomethane	ND	8.0 µg/L	29	Bromoform	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	2.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	2.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	2.0 µg/L
7	Dichloromethane	ND	8.0 µg/L	32	1,3-Dichlorobenzene	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	2.0 µg/L	33	1,4-Dichlorobenzene	ND	2.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L	34	1,2-Dichlorobenzene	ND	2.0 µg/L
10	1,1-Dichloroethane	ND	2.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	93	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	2.0 µg/L	36	Surr: Toluene-d8	99	(80-120) %REC
12	Chloroform	ND	2.0 µg/L	37	Surr: 4-Bromofluorobenzene	99	(80-120) %REC
13	1,2-Dichloroethane	ND	2.0 µg/L				
14	1,1,1-Trichloroethane	ND	2.0 µg/L				
15	Carbon tetrachloride	ND	2.0 µg/L				
16	Benzene	270	1.0 µg/L				
17	1,2-Dichloropropane	ND	2.0 µg/L				
18	Trichloroethene	ND	2.0 µg/L				
19	Bromodichloromethane	ND	2.0 µg/L				
20	cis-1,3-Dichloropropene	ND	2.0 µg/L				
21	trans-1,3-Dichloropropene	ND	2.0 µg/L				
22	1,1,2-Trichloroethane	ND	2.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	2.0 µg/L				
25	Tetrachloroethene	ND	2.0 µg/L				

Some Reporting Limits were increased due to high concentrations of target analytes.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

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11/12/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103051-08A
Client I.D. Number: GP-13-R

Sampled: 10/29/08
Received: 10/30/08
Analyzed: 11/05/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	95	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	99	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	107	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	ND	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
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11/12/08
Report Date

Alpha Analytical, Inc.
255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC Sample Preservation Report

Work Order: ERM08103051 **Project:** 86300.31/Reno RAO

Alpha's Sample ID	Client's Sample ID	Matrix	pH
08103051-01A	TB102908-1	Aqueous	2
08103051-02A	T-22	Aqueous	2
08103051-03A	GP-9-GW-12	Aqueous	2
08103051-04A	GP-10-GW-8.9	Aqueous	2
08103051-05A	GP-14-GW-8.57	Aqueous	2
08103051-06A	GP-13-GW-7.85	Aqueous	2
08103051-07A	GP-13-GW-7.85-D	Aqueous	2
08103051-08A	GP-13-R	Aqueous	2

11/12/08
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *09-Nov-08*

QC Summary Report

Work Order: 08103051

Method Blank

Type **MBLK** Test Code: **EPA Method 410.4 / SM5220D**

File ID: Batch ID: **W1103CD** Analysis Date: **11/03/2008 00:00**

Sample ID: **MBLK-W1103CD** Units : **mg/L** Run ID: **WETLAB_081103A** Prep Date: **11/03/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chemical Oxygen Demand (COD)	ND	5								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method 410.4 / SM5220D**

File ID: Batch ID: **W1103CD** Analysis Date: **11/03/2008 00:00**

Sample ID: **LCS-W1103CD** Units : **mg/L** Run ID: **WETLAB_081103A** Prep Date: **11/03/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chemical Oxygen Demand (COD)	49.6	5	50		99	90	110			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method 410.4 / SM5220D**

File ID: Batch ID: **W1103CD** Analysis Date: **11/03/2008 00:00**

Sample ID: **08103051-03AMS** Units : **mg/L** Run ID: **WETLAB_081103A** Prep Date: **11/03/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chemical Oxygen Demand (COD)	76.3	5	50	18.05	117	90	110			M1

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method 410.4 / SM5220D**

File ID: Batch ID: **W1103CD** Analysis Date: **11/03/2008 00:00**

Sample ID: **08103051-03AMSD** Units : **mg/L** Run ID: **WETLAB_081103A** Prep Date: **11/03/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chemical Oxygen Demand (COD)	77.1	5	50	18.05	118	90	110	76.31	1.0(20)	M1

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

M1 = Matrix spike recovery was high, the method control sample recovery was acceptable.

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778

(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

Date: *09-Nov-08*

QC Summary Report

Work Order: 08103051

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20909** Analysis Date: **10/30/2008 12:25**

Sample ID: **MBLK-20909** Units : **mg/L** Run ID: **FID_2_081030A** Prep Date: **10/30/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (JFRO)	ND	0.5								
TPH-E (DRO)	ND	0.5								
TPH-E (ORO)	ND	0.5								
Surr: Nonane	101		100		101	46	148			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20909** Analysis Date: **10/30/2008 12:00**

Sample ID: **LCS-20909** Units : **mg/L** Run ID: **FID_2_081030A** Prep Date: **10/30/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.37	0.5	2.5		95	65	130			
Surr: Nonane	106		100		106	46	148			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20909** Analysis Date: **10/30/2008 16:37**

Sample ID: **08103051-08AMS** Units : **mg/L** Run ID: **FID_2_081030A** Prep Date: **10/30/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.75	0.5	2.5	0	110	37	164			
Surr: Nonane	104		100		104	46	148			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20909** Analysis Date: **10/30/2008 17:02**

Sample ID: **08103051-08AMSD** Units : **mg/L** Run ID: **FID_2_081030A** Prep Date: **10/30/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.29	0.5	2.5	0	92	37	164	2.754	18.3(20)	
Surr: Nonane	98.3		100		98	46	148			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *09-Feb-09*

QC Summary Report

Work Order: 08103051

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081105\08110505.D** Batch ID: **MS10W1105B** Analysis Date: **11/05/2008 11:20**

Sample ID: **MBLK MS10W1105B** Units : **mg/L** Run ID: **MSD_10_081105A** Prep Date: **11/05/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.5								
Surr: 1,2-Dichloroethane-d4	0.00934		0.01		93	75	128			
Surr: Toluene-d8	0.0101		0.01		101	80	120			
Surr: 4-Bromofluorobenzene	0.0106		0.01		106	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081105\08110503.D** Batch ID: **MS10W1105B** Analysis Date: **11/05/2008 10:38**

Sample ID: **GLCS MS10W1105B** Units : **mg/L** Run ID: **MSD_10_081105A** Prep Date: **11/05/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.389	0.05	0.4		97	70	130			
Surr: 1,2-Dichloroethane-d4	0.00912		0.01		91	75	128			
Surr: Toluene-d8	0.0101		0.01		101	80	120			
Surr: 4-Bromofluorobenzene	0.0103		0.01		103	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081105\08110508.D** Batch ID: **MS10W1105B** Analysis Date: **11/05/2008 13:31**

Sample ID: **08110455-01AGS** Units : **mg/L** Run ID: **MSD_10_081105A** Prep Date: **11/05/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.81	0.25	2	0	91	60	131			
Surr: 1,2-Dichloroethane-d4	0.0467		0.05		93	75	128			
Surr: Toluene-d8	0.0499		0.05		99.7	80	120			
Surr: 4-Bromofluorobenzene	0.0524		0.05		105	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081105\08110509.D** Batch ID: **MS10W1105B** Analysis Date: **11/05/2008 13:52**

Sample ID: **08110455-01AGSD** Units : **mg/L** Run ID: **MSD_10_081105A** Prep Date: **11/05/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	1.77	0.25	2	0	89	60	131	1.811	2.1(20)	
Surr: 1,2-Dichloroethane-d4	0.0469		0.05		94	75	128			
Surr: Toluene-d8	0.0498		0.05		99.7	80	120			
Surr: 4-Bromofluorobenzene	0.0522		0.05		104	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *11-Nov-08*

QC Summary Report

Work Order: 08103051

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081105\08110505.D** Batch ID: **MS10W1105A** Analysis Date: **11/05/2008 11:20**

Sample ID: **MBLK MS10W1105A** Units : **µg/L** Run ID: **MSD_10_081105A** Prep Date: **11/05/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloromethane	ND	2								
Vinyl chloride	ND	1								
Chloroethane	ND	1								
Bromomethane	ND	2								
Trichlorofluoromethane	ND	1								
1,1-Dichloroethene	ND	1								
Dichloromethane	ND	2								
trans-1,2-Dichloroethene	ND	1								
Methyl tert-butyl ether (MTBE)	ND	1								
1,1-Dichloroethane	ND	1								
cis-1,2-Dichloroethene	ND	1								
Chloroform	ND	1								
1,2-Dichloroethane	ND	1								
1,1,1-Trichloroethane	ND	1								
Carbon tetrachloride	ND	1								
Benzene	ND	1								
1,2-Dichloropropane	ND	1								
Trichloroethene	ND	1								
Bromodichloromethane	ND	1								
cis-1,3-Dichloropropene	ND	1								
trans-1,3-Dichloropropene	ND	1								
1,1,2-Trichloroethane	ND	1								
Toluene	ND	1								
Dibromochloromethane	ND	1								
Tetrachloroethene	ND	1								
Chlorobenzene	ND	1								
Ethylbenzene	ND	1								
m,p-Xylene	ND	1								
Bromoform	ND	1								
o-Xylene	ND	1								
1,1,2,2-Tetrachloroethane	ND	1								
1,3-Dichlorobenzene	ND	1								
1,4-Dichlorobenzene	ND	1								
1,2-Dichlorobenzene	ND	1								
Surr: 1,2-Dichloroethane-d4	9.34		10		93	75	128			
Surr: Toluene-d8	10.1		10		101	80	120			
Surr: 4-Bromofluorobenzene	10.6		10		106	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081105\08110504.D** Batch ID: **MS10W1105A** Analysis Date: **11/05/2008 10:59**

Sample ID: **LCS MS10W1105A** Units : **µg/L** Run ID: **MSD_10_081105A** Prep Date: **11/05/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
1,1-Dichloroethene	9.13	1	10		91	80	120			
Methyl tert-butyl ether (MTBE)	8.37	0.5	10		84	70	130			
Benzene	9.15	0.5	10		92	70	130			
Trichloroethene	8.65	1	10		87	70	130			
Toluene	8.81	0.5	10		88	80	120			
Chlorobenzene	9.19	1	10		92	70	130			
Ethylbenzene	9.49	0.5	10		95	80	120			
m,p-Xylene	9.23	0.5	10		92	70	130			
o-Xylene	9.12	0.5	10		91	70	130			
Surr: 1,2-Dichloroethane-d4	9.33		10		93	75	128			
Surr: Toluene-d8	9.66		10		97	80	120			
Surr: 4-Bromofluorobenzene	9.9		10		99	80	120			

Alpha Analytical, Inc.

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Date: *11-Nov-08*

QC Summary Report

Work Order: 08103051

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081105\08110506.D** Batch ID: **MS10W1105A** Analysis Date: **11/05/2008 12:49**

Sample ID: **08110455-01AMS** Units : **µg/L** Run ID: **MSD_10_081105A** Prep Date: **11/05/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
1,1-Dichloroethene	43.9	2.5	50	0	88	66	132			
Methyl tert-butyl ether (MTBE)	33.4	1.3	50	0.67	65	62	139			
Benzene	44	1.3	50	0	88	70	130			
Trichloroethene	41	2.5	50	0	82	69	130			
Toluene	43.8	1.3	50	0	88	67	130			
Chlorobenzene	45.3	2.5	50	0	91	70	130			
Ethylbenzene	47.7	1.3	50	0	95	70	130			
m,p-Xylene	47.6	1.3	50	0	95	69	130			
o-Xylene	47.2	1.3	50	0	94	70	130			
Surr: 1,2-Dichloroethane-d4	40.5		50		81	75	128			
Surr: Toluene-d8	49		50		98	80	120			
Surr: 4-Bromofluorobenzene	50.4		50		101	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081105\08110507.D** Batch ID: **MS10W1105A** Analysis Date: **11/05/2008 13:10**

Sample ID: **08110455-01AMSD** Units : **µg/L** Run ID: **MSD_10_081105A** Prep Date: **11/05/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
1,1-Dichloroethene	45.3	2.5	50	0	91	66	132	43.94	3.0(20)	
Methyl tert-butyl ether (MTBE)	43.2	1.3	50	0.67	85	62	139	33.36	25.7(20)	R5
Benzene	46.2	1.3	50	0	92	70	130	44.03	4.9(20)	
Trichloroethene	42.9	2.5	50	0	86	69	130	40.97	4.6(20)	
Toluene	43.6	1.3	50	0	87	67	130	43.84	0.5(20)	
Chlorobenzene	46.9	2.5	50	0	94	70	130	45.26	3.6(20)	
Ethylbenzene	47.1	1.3	50	0	94	70	130	47.71	1.2(20)	
m,p-Xylene	45.5	1.3	50	0	91	69	130	47.63	4.5(20)	
o-Xylene	46.2	1.3	50	0	92	70	130	47.22	2.3(20)	
Surr: 1,2-Dichloroethane-d4	45.2		50		90	75	128			
Surr: Toluene-d8	47.9		50		96	80	120			
Surr: 4-Bromofluorobenzene	49.4		50		99	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

R5 = MS/MSD RPD exceed the laboratory control limit. Recovery met acceptance criteria.

Laboratory Report
Report ID: 94480

Sierra Environmental Monitoring, Inc.

Alpha Analytical

255 Glendale Avenue Suite 21
Sparks, NV 89431

Date: 11/5/2008
Client: ALP-855
Taken by: Client
PO #:

Dear Alpha Analytical,

It is the policy of Sierra Environmental Monitoring, Inc to strictly adhere to a comprehensive Quality Assurance Plan that insures the data presented in this report are both accurate and precise. Sierra Environmental Monitoring, Inc. maintains accreditation in the State of Nevada (NV-15) and the State of California (ELAP 2526).

The data presented in this report were obtained from the analysis of samples received under a chain of custody. Unless otherwise noted below, samples were received in good condition, properly preserved and within the hold time for the requested analyses. Any anomalies associated with the analysis of the samples have been flagged with appropriate explanation in the Analysis Report section of this Laboratory Report.

General Comments:

- There are no general comments for this report.

Individual Sample Comments:
- There are no specific comments that are associated with these samples.

Approved By: **Date:**

11/5/2008

Sierra Environmental Monitoring, Inc.

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.

John Kobza, Ph.D.
Laboratory Director

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John C. Seher
Special Consultant
Quality Assurance Manager

Laboratory Report
Report ID: 94480

Sierra Environmental Monitoring, Inc.

Alpha Analytical

255 Glendale Avenue Suite 21
Sparks, NV 89431

Date: 11/5/2008
Client: ALP-855
Taken by: Client
PO #:

Analysis Report

Sample ID:	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S200810-1792	ERM08103051-03 - GP-9-GW-12	10/29/2008	12:50 PM	10/30/2008

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
BOD-5	SM 5210 B	<4	mg/L	4	Kobza	10/30/2008	

Sample ID:	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S200810-1793	ERM08103051-04 - GP-10-GW-8.9	10/29/2008	2:28 PM	10/30/2008

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
BOD-5	SM 5210 B	>60	mg/L	4	Kobza	10/30/2008	

Sample ID:	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S200810-1794	ERM08103051-05 - GP-14-GW-8.57	10/29/2008	3:34 PM	10/30/2008

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
BOD-5	SM 5210 B	<4	mg/L	4	Kobza	10/30/2008	

Sample ID:	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S200810-1795	ERM08103051-06 - GP-13-GW-7.85	10/29/2008	4:37 PM	10/30/2008

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
BOD-5	SM 5210 B	<4	mg/L	4	Kobza	10/30/2008	

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John C. Seher
Special Consultant
Quality Assurance Manager

Laboratory Report
Report ID: 94480

Sierra Environmental Monitoring, Inc.

Alpha Analytical

255 Glendale Avenue Suite 21
Sparks, NV 89431

Date: 11/5/2008
Client: ALP-855
Taken by: Client
PO #:

Analysis Report

Sample ID:	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S200810-1796	ERM08103051-07 - GP-13-GW-7.85-D	10/29/2008	4:37 PM	10/30/2008

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
BOD-5	SM 5210 B	<4	mg/L	4	Kobza	10/30/2008	

Data Flag Legend:

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John C. Seher
Special Consultant
Quality Assurance Manager

Laboratory Report
Report ID: 94480

Sierra Environmental Monitoring, Inc.

Alpha Analytical

255 Glendale Avenue Suite 21
Sparks, NV 89431

Date: 11/5/2008
Client: ALP-855
Taken by: Client
PO #:

Quality Control Report

Parameter	*LCS, % Recovery*	*MS, % Recovery*	*MSD, % Recovery*	*RPD, %*	*Method Blank*
BOD-5	113.0			1.07	

Legend: ***LCS- Laboratory Control Standard*** ***MS- Matrix Spike*** ***MSD- Matrix Spike Duplicate*** ***RPD- Relative Percent Difference***

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John C. Seher
Special Consultant
Quality Assurance Manager

CHAIN-OF-CUSTODY RECORD

NV AMENDED

Billing Information :
ERM
2525 Natomas Park Drive

SACRAMENTO, CA 95813

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : ERM08103051
Report Due By : 5:00 PM On : 13-Nov-08

Client:
ERM
2525 Natomas Park Drive

Sacramento, CA 95813

Report Attention	Phone Number	EMail Address
Brian Magee	(916) 924-9378 x	brian.magee@erm.com

EDD Required : **No**

Sampled by : Client

PO :

Client's COC # : 1428 Job : 86300.31/Reno RAO

Cooler Temp	Samples Received	Date Printed
°C	30-Oct-08	**09-Feb-09**

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	BOD	COD_W	TPH/E_W	TPH/P_W	VOC_W				Sample Remarks
							Requested Tests								
ERM08103051-01A	TB102908-1	AQ	10/29/08 09:58	1	0	10					8260/MTBE_Ns				Reno TB, 10/14/08.
ERM08103051-02A	T-22	AQ	10/29/08 11:09	8	0	10			TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103051-03A	GP-9-GW-12	AQ	10/29/08 12:50	9	1	10	BOD	COD	TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103051-04A	GP-10-GW-8.9	AQ	10/29/08 14:28	9	1	10	BOD	COD	TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103051-05A	GP-14-GW-8.57	AQ	10/29/08 15:34	9	1	10	BOD	COD	TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103051-06A	GP-13-GW-7.85	AQ	10/29/08 16:37	9	1	10	BOD	COD	TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103051-07A	GP-13-GW-7.85-D	AQ	10/29/08 16:37	9	1	10	BOD	COD	TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103051-08A	GP-13-R	AQ	10/29/08 16:30	8	0	10			TPH/E_N	GAS-N	8260/MTBE_Ns				

Comments: Samples brought in by client. Frozen ice. BOD subbed to SEM. Amended 2/9/09 @ 11:47 to add TPH/P to all samples requesting TPH/AV, per Randy's conversation with client. LE :

	Signature	Print Name	Company	Date/Time
Logged in by:	Latricia Edrosa	Latricia Edrosa	Alpha Analytical, Inc.	2/9/09 11:47

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

NV

Billing Information :
ERM
2525 Natomas Park Drive

SACRAMENTO, CA 95813

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : ERM08103051
Report Due By : 5:00 PM On : 13-Nov-08

Client:
ERM
2525 Natomas Park Drive

Sacramento, CA 95813

Report Attention	Phone Number	EMail Address
Brian Magee	(916) 924-9378 x	brian.magee@erm.com

EDD Required : **Yes**

Sampled by : Client

Cooler Temp	Samples Received	Date Printed
°C	30-Oct-08	**30-Oct-08**

PO :

Client's COC # : 1428 Job : 86300.31/Reno RAO

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	BOD	COD_W	TPH/E_W	VOC_W					Sample Remarks
							Requested Tests								
ERM08103051-01A	TB102908-1	AQ	10/29/08 09:58	1	0	10				8260/MTBE_Ns					Reno TB, 10/14/08.
ERM08103051-02A	T-22	AQ	10/29/08 11:09	8	0	10			TPH/E_N	8260/MTBE_Ns					
ERM08103051-03A	GP-9-GW-12	AQ	10/29/08 12:50	9	1	10	BOD	COD	TPH/E_N	8260/MTBE_Ns					
ERM08103051-04A	GP-10-GW-8.9	AQ	10/29/08 14:28	9	1	10	BOD	COD	TPH/E_N	8260/MTBE_Ns					
ERM08103051-05A	GP-14-GW-8.57	AQ	10/29/08 15:34	9	1	10	BOD	COD	TPH/E_N	8260/MTBE_Ns					
ERM08103051-06A	GP-13-GW-7.85	AQ	10/29/08 16:37	9	1	10	BOD	COD	TPH/E_N	8260/MTBE_Ns					
ERM08103051-07A	GP-13-GW-7.85-D	AQ	10/29/08 16:37	9	1	10	BOD	COD	TPH/E_N	8260/MTBE_Ns					
ERM08103051-08A	GP-13-R	AQ	10/29/08 16:30	8	0	10			TPH/E_N	8260/MTBE_Ns					

Comments: Samples brought in by client. Frozen ice. BOD subbed to SEM. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Tara Jackerson	Tara Jackerson	Alpha Analytical, Inc.	10/30/08 840

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

ERM

CHAIN OF CUSTODY RECORD

NO: 1428

Page 1 of 1

6650 S.W. REDWOOD LANE, SUITE 300 • PORTLAND, OR 97224 • (503) 542-8007 • FAX (503) 542-8017

PROJECT #	PROJECT NAME
86300.31	Reno RAO ~~Site Investigation~~

SAMPLER: (PRINT NAME)	(SIGNATURE)

RECEIVING LABORATORY: Alpha Analytical Reno NV

REQUESTED PARAMETERS: ERM0810305J1

SAMPLE I.D.	DATE	TIME	COMP	GRAB	SAMPLING METHOD	PRESERVATIVE	ICE (Y/N)	SAMPLING VOLUME	# OF CONTAINERS	SOIL	WATER	GAS	VOC + MTBE 8260B	TPH-d + TPH-Ax 8015M	BOD 405.1	COD 410.4	~~Project-specific MS/MSD~~						
TB102908-1	10-29-08	0958		X	Triplblank	HCl	Y	40mL	1		X		X										-01
T-22		1109		X	Peristaltic		Y	320mL	8		X		X	X									-02
GP-9-GW-10		1250		X			Y	1570mL	10		X		X	X	X	X							-03
GP-10-GW-8.9		1428		X			Y	1570mL	10		X		X	X	X	X							-04
GP-14-GW-8.057		1534		X			Y	~~1570~~	10		X		X	X	X	X							-05
GP-13-GW-7.85		1637		X			Y		10		X		X	X	X	X							-06
GP-13-GW-7.85-D		1637		X			Y	—	10		X		X	X	X	X							-07
GP-13-R	—	1630		X	—	—	Y	320	8		X		X	X									-08

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
[signature]	10/30/08	0800	Elizabeth Adcox	10/30/08	0800
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME

FIELD REMARKS: Std TAT

REMARKS ON SAMPLE RECEIPT

- [x] BOTTLE INTACT
- [x] PRESERVED
- [ ] CUSTODY SEALS
- [ ] SEALS INTACT
- [x] CHILLED
- [ ] SEE REMARKS

ERM REMARKS:

SEND REPORT TO: Brian McGee

WHITE - LABORATORY COPY CANARY - FIELD COPY PINK - DATABASE MANAGER GOLD - PROJECT FILE

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378
Date Received : 10/31/08

Job#: 86300.31/ Reno RAO

Total Petroleum Hydrocarbons - Extractable (TPH-E) EPA Method SW8015B
Total Petroleum Hydrocarbons - Purgeable (TPH-P) EPA Method SW8015B

		Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID :	**GP-12-GW-10.6**	TPH-E (JFRO)	ND	0.50 mg/L	10/30/08	10/31/08
Lab ID :	ERM08103102-02A	TPH-E (DRO)	ND	0.50 mg/L	10/30/08	10/31/08
		TPH-E (ORO)	ND	0.50 mg/L	10/30/08	10/31/08
		Surr: Nonane	99	(46-148) %REC	10/30/08	10/31/08
		TPH-P (GRO)	ND	0.50 mg/L	10/30/08	11/06/08
		Surr: 1,2-Dichloroethane-d4	96	(70-130) %REC	10/30/08	11/06/08
		Surr: Toluene-d8	99	(70-130) %REC	10/30/08	11/06/08
		Surr: 4-Bromofluorobenzene	106	(70-130) %REC	10/30/08	11/06/08
Client ID :	**GP-11-GW-11.2**	TPH-E (JFRO)	ND	0.50 mg/L	10/30/08	10/31/08
Lab ID :	ERM08103102-03A	TPH-E (DRO)	ND	0.50 mg/L	10/30/08	10/31/08
		TPH-E (ORO)	ND	0.50 mg/L	10/30/08	10/31/08
		Surr: Nonane	102	(46-148) %REC	10/30/08	10/31/08
		TPH-P (GRO)	ND	0.50 mg/L	10/30/08	11/06/08
		Surr: 1,2-Dichloroethane-d4	96	(70-130) %REC	10/30/08	11/06/08
		Surr: Toluene-d8	100	(70-130) %REC	10/30/08	11/06/08
		Surr: 4-Bromofluorobenzene	106	(70-130) %REC	10/30/08	11/06/08
Client ID :	**MW-23**	TPH-E (JFRO)	ND	0.50 mg/L	10/30/08	10/31/08
Lab ID :	ERM08103102-04A	TPH-E (DRO)	ND	0.50 mg/L	10/30/08	10/31/08
		TPH-E (ORO)	ND	0.50 mg/L	10/30/08	10/31/08
		Surr: Nonane	105	(46-148) %REC	10/30/08	10/31/08
		TPH-P (GRO)	ND	0.50 mg/L	10/30/08	11/06/08
		Surr: 1,2-Dichloroethane-d4	98	(70-130) %REC	10/30/08	11/06/08
		Surr: Toluene-d8	97	(70-130) %REC	10/30/08	11/06/08
		Surr: 4-Bromofluorobenzene	108	(70-130) %REC	10/30/08	11/06/08
Client ID :	**T-11**	TPH-E (JFRO)	ND	0.50 mg/L	10/30/08	10/31/08
Lab ID :	ERM08103102-05A	TPH-E (DRO)	ND	0.50 mg/L	10/30/08	10/31/08
		TPH-E (ORO)	ND	0.50 mg/L	10/30/08	10/31/08
		Surr: Nonane	108	(46-148) %REC	10/30/08	10/31/08
		TPH-P (GRO)	ND	0.50 mg/L	10/30/08	11/06/08
		Surr: 1,2-Dichloroethane-d4	95	(70-130) %REC	10/30/08	11/06/08
		Surr: Toluene-d8	98	(70-130) %REC	10/30/08	11/06/08
		Surr: 4-Bromofluorobenzene	104	(70-130) %REC	10/30/08	11/06/08
Client ID :	**T-13**	TPH-E (JFRO)	ND	0.50 mg/L	10/30/08	10/31/08
Lab ID :	ERM08103102-06A	TPH-E (DRO)	ND	0.50 mg/L	10/30/08	10/31/08
		TPH-E (ORO)	ND	0.50 mg/L	10/30/08	10/31/08
		Surr: Nonane	105	(46-148) %REC	10/30/08	10/31/08
		TPH-P (GRO)	ND	0.50 mg/L	10/30/08	11/06/08
		Surr: 1,2-Dichloroethane-d4	98	(70-130) %REC	10/30/08	11/06/08
		Surr: Toluene-d8	100	(70-130) %REC	10/30/08	11/06/08
		Surr: 4-Bromofluorobenzene	108	(70-130) %REC	10/30/08	11/06/08

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Client ID :	**T-12**	TPH-E (JFRO)	ND		0.50 mg/L	10/30/08	10/31/08
Lab ID :	ERM08103102-07A	TPH-E (DRO)	ND		0.50 mg/L	10/30/08	10/31/08
		TPH-E (ORO)	ND		0.50 mg/L	10/30/08	10/31/08
		Surr: Nonane	105		(46-148) %REC	10/30/08	10/31/08
		TPH-P (GRO)	ND		0.50 mg/L	10/30/08	11/06/08
		Surr: 1,2-Dichloroethane-d4	96		(70-130) %REC	10/30/08	11/06/08
		Surr: Toluene-d8	98		(70-130) %REC	10/30/08	11/06/08
		Surr: 4-Bromofluorobenzene	107		(70-130) %REC	10/30/08	11/06/08
Client ID :	**T-10**	TPH-E (JFRO)	ND		0.50 mg/L	10/30/08	10/31/08
Lab ID :	ERM08103102-08A	TPH-E (DRO)	ND		0.50 mg/L	10/30/08	10/31/08
		TPH-E (ORO)	ND		0.50 mg/L	10/30/08	10/31/08
		Surr: Nonane	111		(46-148) %REC	10/30/08	10/31/08
		TPH-P (GRO)	ND		0.50 mg/L	10/30/08	11/06/08
		Surr: 1,2-Dichloroethane-d4	98		(70-130) %REC	10/30/08	11/06/08
		Surr: Toluene-d8	99		(70-130) %REC	10/30/08	11/06/08
		Surr: 4-Bromofluorobenzene	108		(70-130) %REC	10/30/08	11/06/08
Client ID :	**T-5**	TPH-E (JFRO)	0.59	I	0.50 mg/L	10/30/08	10/31/08
Lab ID :	ERM08103102-09A	TPH-E (DRO)	ND		0.50 mg/L	10/30/08	10/31/08
		TPH-E (ORO)	ND		0.50 mg/L	10/30/08	10/31/08
		Surr: Nonane	108		(46-148) %REC	10/30/08	10/31/08
		TPH-P (GRO)	1.8		0.50 mg/L	10/30/08	11/06/08
		Surr: 1,2-Dichloroethane-d4	93		(70-130) %REC	10/30/08	11/06/08
		Surr: Toluene-d8	96		(70-130) %REC	10/30/08	11/06/08
		Surr: 4-Bromofluorobenzene	100		(70-130) %REC	10/30/08	11/06/08
Client ID :	**T-23**	TPH-E (JFRO)	ND		0.50 mg/L	10/30/08	10/31/08
Lab ID :	ERM08103102-10A	TPH-E (DRO)	ND		0.50 mg/L	10/30/08	10/31/08
		TPH-E (ORO)	ND		0.50 mg/L	10/30/08	10/31/08
		Surr: Nonane	100		(46-148) %REC	10/30/08	10/31/08
		TPH-P (GRO)	ND		0.50 mg/L	10/30/08	11/06/08
		Surr: 1,2-Dichloroethane-d4	95		(70-130) %REC	10/30/08	11/06/08
		Surr: Toluene-d8	100		(70-130) %REC	10/30/08	11/06/08
		Surr: 4-Bromofluorobenzene	104		(70-130) %REC	10/30/08	11/06/08
Client ID :	**MW-6**	TPH-E (JFRO)	ND		0.50 mg/L	10/30/08	10/31/08
Lab ID :	ERM08103102-11A	TPH-E (DRO)	ND		0.50 mg/L	10/30/08	10/31/08
		TPH-E (ORO)	ND		0.50 mg/L	10/30/08	10/31/08
		Surr: Nonane	109		(46-148) %REC	10/30/08	10/31/08
		TPH-P (GRO)	ND		0.50 mg/L	10/30/08	11/06/08
		Surr: 1,2-Dichloroethane-d4	95		(70-130) %REC	10/30/08	11/06/08
		Surr: Toluene-d8	99		(70-130) %REC	10/30/08	11/06/08
		Surr: 4-Bromofluorobenzene	109		(70-130) %REC	10/30/08	11/06/08

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Diesel Range Organics (DRO) C13-C22

Gasoline Range Organics (GRO) C4-C13

GRO concentration include lighter-end mixtures such as aviation fuel and JP-4. The JFRO range primarily includes jut fuels such as JP5-JP8.

I = JFRO may include contributions from other products. Because Jet Fuel falls largely within the diesel range it is quantitated with the DRO calibration.

Jet Fuel Range Organics (JFRO) C9-C22. JFRO determination is based on its chromatographic fingerprint.

Oil Range Organics (ORO) C22-C40+

This replaces the report originally signed 11/24/08, due to the addition of TPH-P (GRO), per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer

Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com

Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

2/11/09

Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-01A
Client I.D. Number: TB103008-1

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	96	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	98	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	107	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	ND	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-02A
Client I.D. Number: GP-12-GW-10.6

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	96	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	99	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	106	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	ND	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-03A
Client I.D. Number: GP-11-GW-11.2

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	96	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	100	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	106	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	ND	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-04A
Client I.D. Number: MW-23

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	150	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	98	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	97	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	108	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	ND	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-05A
Client I.D. Number: T-11

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	23	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	95	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	98	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	104	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	ND	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-06A
Client I.D. Number: T-13

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	98	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	100	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	108	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	ND	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-07A
Client I.D. Number: T-12

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	1.9	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L
11	cis-1,2-Dichloroethene	ND	1.0 µg/L
12	Chloroform	ND	1.0 µg/L
13	1,2-Dichloroethane	ND	1.0 µg/L
14	1,1,1-Trichloroethane	ND	1.0 µg/L
15	Carbon tetrachloride	ND	1.0 µg/L
16	Benzene	ND	1.0 µg/L
17	1,2-Dichloropropane	ND	1.0 µg/L
18	Trichloroethene	ND	1.0 µg/L
19	Bromodichloromethane	ND	1.0 µg/L
20	cis-1,3-Dichloropropene	ND	1.0 µg/L
21	trans-1,3-Dichloropropene	ND	1.0 µg/L
22	1,1,2-Trichloroethane	ND	1.0 µg/L
23	Toluene	ND	1.0 µg/L
24	Dibromochloromethane	ND	1.0 µg/L
25	Tetrachloroethene	ND	1.0 µg/L
26	Chlorobenzene	ND	1.0 µg/L
27	Ethylbenzene	ND	1.0 µg/L
28	m,p-Xylene	ND	1.0 µg/L
29	Bromoform	ND	1.0 µg/L
30	o-Xylene	ND	1.0 µg/L
31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
32	1,3-Dichlorobenzene	ND	1.0 µg/L
33	1,4-Dichlorobenzene	ND	1.0 µg/L
34	1,2-Dichlorobenzene	ND	1.0 µg/L
35	Surr: 1,2-Dichloroethane-d4	96	(75-128) %REC
36	Surr: Toluene-d8	98	(80-120) %REC
37	Surr: 4-Bromofluorobenzene	107	(80-120) %REC

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-08A
Client I.D. Number: T-10

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	98	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	99	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	108	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	ND	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-09A
Client I.D. Number: T-5

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	12 µg/L	26	Chlorobenzene	ND	3.0 µg/L
2	Vinyl chloride	ND	3.0 µg/L	27	Ethylbenzene	45	1.5 µg/L
3	Chloroethane	ND	3.0 µg/L	28	m,p-Xylene	130	1.5 µg/L
4	Bromomethane	ND	12 µg/L	29	Bromoform	ND	3.0 µg/L
5	Trichlorofluoromethane	ND	3.0 µg/L	30	o-Xylene	13	1.5 µg/L
6	1,1-Dichloroethene	ND	3.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	3.0 µg/L
7	Dichloromethane	ND	12 µg/L	32	1,3-Dichlorobenzene	ND	3.0 µg/L
8	trans-1,2-Dichloroethene	ND	3.0 µg/L	33	1,4-Dichlorobenzene	ND	3.0 µg/L
9	Methyl tert-butyl ether (MTBE)	1.8	1.5 µg/L	34	1,2-Dichlorobenzene	ND	3.0 µg/L
10	1,1-Dichloroethane	ND	3.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	93	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	3.0 µg/L	36	Surr: Toluene-d8	96	(80-120) %REC
12	Chloroform	ND	3.0 µg/L	37	Surr: 4-Bromofluorobenzene	100	(80-120) %REC
13	1,2-Dichloroethane	ND	3.0 µg/L				
14	1,1,1-Trichloroethane	ND	3.0 µg/L				
15	Carbon tetrachloride	ND	3.0 µg/L				
16	Benzene	310	1.5 µg/L				
17	1,2-Dichloropropane	ND	3.0 µg/L				
18	Trichloroethene	ND	3.0 µg/L				
19	Bromodichloromethane	ND	3.0 µg/L				
20	cis-1,3-Dichloropropene	ND	3.0 µg/L				
21	trans-1,3-Dichloropropene	ND	3.0 µg/L				
22	1,1,2-Trichloroethane	ND	3.0 µg/L				
23	Toluene	ND	1.5 µg/L				
24	Dibromochloromethane	ND	3.0 µg/L				
25	Tetrachloroethene	ND	3.0 µg/L				

Reporting Limits were increased due to high concentrations of target analytes.

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com

Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-10A
Client I.D. Number: T-23

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	95	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	100	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	104	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	2.3	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
Sacramento, CA • (916) 366-9089 / Las Vegas, NV • (702) 736-7522 / info@alpha-analytical.com
Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813
Job#: 86300.31/ Reno RAO

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378

Alpha Analytical Number: ERM08103102-11A
Client I.D. Number: MW-6

Sampled: 10/30/08
Received: 10/31/08
Analyzed: 11/06/08

Volatile Organics by GC/MS
EPA Method SW8260B

	Compound	Concentration	Reporting Limit		Compound	Concentration	Reporting Limit
1	Chloromethane	ND	2.0 µg/L	26	Chlorobenzene	ND	1.0 µg/L
2	Vinyl chloride	ND	1.0 µg/L	27	Ethylbenzene	ND	1.0 µg/L
3	Chloroethane	ND	1.0 µg/L	28	m,p-Xylene	ND	1.0 µg/L
4	Bromomethane	ND	2.0 µg/L	29	Bromoform	ND	1.0 µg/L
5	Trichlorofluoromethane	ND	1.0 µg/L	30	o-Xylene	ND	1.0 µg/L
6	1,1-Dichloroethene	ND	1.0 µg/L	31	1,1,2,2-Tetrachloroethane	ND	1.0 µg/L
7	Dichloromethane	ND	2.0 µg/L	32	1,3-Dichlorobenzene	ND	1.0 µg/L
8	trans-1,2-Dichloroethene	ND	1.0 µg/L	33	1,4-Dichlorobenzene	ND	1.0 µg/L
9	Methyl tert-butyl ether (MTBE)	ND	1.0 µg/L	34	1,2-Dichlorobenzene	ND	1.0 µg/L
10	1,1-Dichloroethane	ND	1.0 µg/L	35	Surr: 1,2-Dichloroethane-d4	95	(75-128) %REC
11	cis-1,2-Dichloroethene	ND	1.0 µg/L	36	Surr: Toluene-d8	99	(80-120) %REC
12	Chloroform	ND	1.0 µg/L	37	Surr: 4-Bromofluorobenzene	109	(80-120) %REC
13	1,2-Dichloroethane	ND	1.0 µg/L				
14	1,1,1-Trichloroethane	ND	1.0 µg/L				
15	Carbon tetrachloride	ND	1.0 µg/L				
16	Benzene	ND	1.0 µg/L				
17	1,2-Dichloropropane	ND	1.0 µg/L				
18	Trichloroethene	ND	1.0 µg/L				
19	Bromodichloromethane	ND	1.0 µg/L				
20	cis-1,3-Dichloropropene	ND	1.0 µg/L				
21	trans-1,3-Dichloropropene	ND	1.0 µg/L				
22	1,1,2-Trichloroethane	ND	1.0 µg/L				
23	Toluene	ND	1.0 µg/L				
24	Dibromochloromethane	ND	1.0 µg/L				
25	Tetrachloroethene	ND	1.0 µg/L				

This report replaces the report originally signed 11/13/08, due to surrogates being reported, per client request.

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/24/08
Report Date

Alpha Analytical, Inc.

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(775) 355-1044 • (775) 355-0406 FAX • 1-800-283-1183

VOC Sample Preservation Report

Work Order: ERM08103102 **Project:** 86300.31/ Reno RAO

Alpha's Sample ID	Client's Sample ID	Matrix	pH
08103102-01A	TB103008-1	Aqueous	2
08103102-02A	GP-12-GW-10.6	Aqueous	2
08103102-03A	GP-11-GW-11.2	Aqueous	2
08103102-04A	MW-23	Aqueous	2
08103102-05A	T-11	Aqueous	2
08103102-06A	T-13	Aqueous	2
08103102-07A	T-12	Aqueous	2
08103102-08A	T-10	Aqueous	2
08103102-09A	T-5	Aqueous	2
08103102-10A	T-23	Aqueous	2
08103102-11A	MW-6	Aqueous	2

11/13/08
Report Date

Alpha Analytical, Inc.

255 Glendale Ave. • Suite 21 • Sparks, Nevada 89431-5778
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ANALYTICAL REPORT

ERM
2525 Natomas Park Drive
Sacramento, CA 95813

Attn: Brian Magee
Phone: (916) 924-9378
Fax: (916) 920-9378
Date Received : 10/31/08

Job#: 86300.31/ Reno RAO

Chemical Oxygen Demand
EPA Method 410.4 / SM5220D

	Parameter	Concentration	Reporting Limit	Date Sampled	Date Analyzed
Client ID : **GP-12-GW-10.6**					
Lab ID : ERM08103102-02A	Chemical Oxygen Demand (COD)	9.1	5.0 mg/L	10/30/08	11/03/08
Client ID : **GP-11-GW-11.2**					
Lab ID : ERM08103102-03A	Chemical Oxygen Demand (COD)	ND	5.0 mg/L	10/30/08	11/03/08

ND = Not Detected

Roger Scholl Randy Gardner Walter Hinchman

Roger L. Scholl, Ph.D., Laboratory Director • • Randy Gardner, Laboratory Manager • • Walter Hinchman, Quality Assurance Officer
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Alpha Analytical, Inc. currently holds appropriate and available NDEP certifications for the data reported - certification #NV16.

11/13/08
Report Date

Alpha Analytical, Inc.

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Date: *11-Feb-09*

QC Summary Report

Work Order: 08103102

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081106\08110605.D** Batch ID: **MS10W1106B** Analysis Date: **11/06/2008 11:35**

Sample ID: **MBLK MS10W1106B** Units : **mg/L** Run ID: **MSD_10_081106A** Prep Date: **11/06/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	ND	0.5								
Surr: 1,2-Dichloroethane-d4	0.00937		0.01		94	75	128			
Surr: Toluene-d8	0.00986		0.01		99	80	120			
Surr: 4-Bromofluorobenzene	0.0107		0.01		107	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081106\08110603.D** Batch ID: **MS10W1106B** Analysis Date: **11/06/2008 10:52**

Sample ID: **GLCS MS10W1106B** Units : **mg/L** Run ID: **MSD_10_081106A** Prep Date: **11/06/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	0.368	0.05	0.4		92	70	130			
Surr: 1,2-Dichloroethane-d4	0.00913		0.01		91	75	128			
Surr: Toluene-d8	0.0102		0.01		102	80	120			
Surr: 4-Bromofluorobenzene	0.0103		0.01		103	80	120			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081106\08110610.D** Batch ID: **MS10W1106B** Analysis Date: **11/06/2008 13:21**

Sample ID: **08103152-04AGS** Units : **mg/L** Run ID: **MSD_10_081106A** Prep Date: **11/06/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	3.6	0.25	2	1.626	99	60	131			
Surr: 1,2-Dichloroethane-d4	0.0487		0.05		97	75	128			
Surr: Toluene-d8	0.0494		0.05		99	80	120			
Surr: 4-Bromofluorobenzene	0.0499		0.05		99.7	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015B**

File ID: **C:\HPCHEM\MS10\DATA\081106\08110611.D** Batch ID: **MS10W1106B** Analysis Date: **11/06/2008 13:42**

Sample ID: **08103152-04AGSD** Units : **mg/L** Run ID: **MSD_10_081106A** Prep Date: **11/06/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-P (GRO)	3.52	0.25	2	1.626	95	60	131	3.597	2.2(20)	
Surr: 1,2-Dichloroethane-d4	0.0484		0.05		97	75	128			
Surr: Toluene-d8	0.0491		0.05		98	80	120			
Surr: 4-Bromofluorobenzene	0.0506		0.05		101	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *11-Nov-08*

QC Summary Report

Work Order: 08103102

Method Blank

Type **MBLK** Test Code: **EPA Method 410.4 / SM5220D**

File ID: Batch ID: **W1103CD** Analysis Date: **11/03/2008 00:00**

Sample ID: **MBLK-W1103CD** Units : **mg/L** Run ID: **WETLAB_081103A** Prep Date: **11/03/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chemical Oxygen Demand (COD)	ND	5								

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method 410.4 / SM5220D**

File ID: Batch ID: **W1103CD** Analysis Date: **11/03/2008 00:00**

Sample ID: **LCS-W1103CD** Units : **mg/L** Run ID: **WETLAB_081103A** Prep Date: **11/03/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chemical Oxygen Demand (COD)	49.6	5	50		99	90	110			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method 410.4 / SM5220D**

File ID: Batch ID: **W1103CD** Analysis Date: **11/03/2008 00:00**

Sample ID: **08103051-03AMS** Units : **mg/L** Run ID: **WETLAB_081103A** Prep Date: **11/03/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chemical Oxygen Demand (COD)	76.3	5	50	18.05	117	90	110			M1

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method 410.4 / SM5220D**

File ID: Batch ID: **W1103CD** Analysis Date: **11/03/2008 00:00**

Sample ID: **08103051-03AMSD** Units : **mg/L** Run ID: **WETLAB_081103A** Prep Date: **11/03/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chemical Oxygen Demand (COD)	77.1	5	50	18.05	118	90	110	76.31	1.0(20)	M1

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

M1 = Matrix spike recovery was high, the method control sample recovery was acceptable.

Alpha Analytical, Inc.

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Date: *11-Nov-08*

QC Summary Report

Work Order: 08103102

Method Blank

Type **MBLK** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20914** Analysis Date: **10/31/2008 12:09**

Sample ID: **MBLK-20914** Units : **mg/L** Run ID: **FID_1_081031A** Prep Date: **10/31/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (JFRO)	ND	0.5								
TPH-E (DRO)	ND	0.5								
TPH-E (ORO)	ND	0.5								
Surr: Nonane	101		100		101	46	148			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20914** Analysis Date: **10/31/2008 12:34**

Sample ID: **LCS-20914** Units : **mg/L** Run ID: **FID_1_081031A** Prep Date: **10/31/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.24	0.5	2.5		89	65	130			
Surr: Nonane	103		100		103	46	148			

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20914** Analysis Date: **10/31/2008 18:52**

Sample ID: **08103102-11AMS** Units : **mg/L** Run ID: **FID_1_081031A** Prep Date: **10/31/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.2	0.5	2.5	0	88	37	164			
Surr: Nonane	85.5		100		86	46	148			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8015 / E**

File ID: Batch ID: **20914** Analysis Date: **10/31/2008 19:17**

Sample ID: **08103102-11AMSD** Units : **mg/L** Run ID: **FID_1_081031A** Prep Date: **10/31/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
TPH-E (DRO)	2.36	0.5	2.5	0	95	37	164	2.198	7.2(20)	
Surr: Nonane	103		100		103	46	148			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

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Date: *11-Nov-08*

QC Summary Report

Work Order: 08103102

Method Blank

Type **MBLK** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081106\08110605.D** Batch ID: **MS10W1106A** Analysis Date: **11/06/2008 11:35**

Sample ID: **MBLK MS10W1106A** Units : **µg/L** Run ID: **MSD_10_081106A** Prep Date: **11/06/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
Chloromethane	ND	2								
Vinyl chloride	ND	1								
Chloroethane	ND	1								
Bromomethane	ND	2								
Trichlorofluoromethane	ND	1								
1,1-Dichloroethene	ND	1								
Dichloromethane	ND	2								
trans-1,2-Dichloroethene	ND	1								
Methyl tert-butyl ether (MTBE)	ND	1								
1,1-Dichloroethane	ND	1								
cis-1,2-Dichloroethene	ND	1								
Chloroform	ND	1								
1,2-Dichloroethane	ND	1								
1,1,1-Trichloroethane	ND	1								
Carbon tetrachloride	ND	1								
Benzene	ND	1								
1,2-Dichloropropane	ND	1								
Trichloroethene	ND	1								
Bromodichloromethane	ND	1								
cis-1,3-Dichloropropene	ND	1								
trans-1,3-Dichloropropene	ND	1								
1,1,2-Trichloroethane	ND	1								
Toluene	ND	1								
Dibromochloromethane	ND	1								
Tetrachloroethene	ND	1								
Chlorobenzene	ND	1								
Ethylbenzene	ND	1								
m,p-Xylene	ND	1								
Bromoform	ND	1								
o-Xylene	ND	1								
1,1,2,2-Tetrachloroethane	ND	1								
1,3-Dichlorobenzene	ND	1								
1,4-Dichlorobenzene	ND	1								
1,2-Dichlorobenzene	ND	1								
Surr: 1,2-Dichloroethane-d4	9.37		10		94	75	128			
Surr: Toluene-d8	9.86		10		99	80	120			
Surr: 4-Bromofluorobenzene	10.7		10		107	80	120			

Laboratory Control Spike

Type **LCS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081106\08110604.D** Batch ID: **MS10W1106A** Analysis Date: **11/06/2008 11:13**

Sample ID: **LCS MS10W1106A** Units : **µg/L** Run ID: **MSD_10_081106A** Prep Date: **11/06/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
1,1-Dichloroethene	9.93	1	10		99	80	120			
Methyl tert-butyl ether (MTBE)	9.13	0.5	10		91	70	130			
Benzene	10.1	0.5	10		101	70	130			
Trichloroethene	9.44	1	10		94	70	130			
Toluene	9.52	0.5	10		95	80	120			
Chlorobenzene	10.1	1	10		101	70	130			
Ethylbenzene	10.4	0.5	10		104	80	120			
m,p-Xylene	9.98	0.5	10		99.8	70	130			
o-Xylene	9.96	0.5	10		99.6	70	130			
Surr: 1,2-Dichloroethane-d4	9.36		10		94	75	128			
Surr: Toluene-d8	9.46		10		95	80	120			
Surr: 4-Bromofluorobenzene	9.58		10		96	80	120			

Alpha Analytical, Inc.

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Date: *11-Nov-08*

QC Summary Report

Work Order: 08103102

Sample Matrix Spike

Type **MS** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081106\08110608.D** Batch ID: **MS10W1106A** Analysis Date: **11/06/2008 12:38**

Sample ID: **08103152-04AMS** Units : **µg/L** Run ID: **MSD_10_081106A** Prep Date: **11/06/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
1,1-Dichloroethene	48.3	2.5	50	0	97	66	132			
Methyl tert-butyl ether (MTBE)	45.7	1.3	50	0	91	62	139			
Benzene	226	1.3	50	164.2	123	70	130			
Trichloroethene	49.6	2.5	50	0	99	69	130			
Toluene	55.6	1.3	50	6.74	98	67	130			
Chlorobenzene	52.6	2.5	50	0	105	70	130			
Ethylbenzene	106	1.3	50	46.13	120	70	130			
m,p-Xylene	56.6	1.3	50	5.87	101	69	130			
o-Xylene	51.2	1.3	50	1.2	99.9	70	130			
Surr: 1,2-Dichloroethane-d4	49.2		50		98	75	128			
Surr: Toluene-d8	46.7		50		93	80	120			
Surr: 4-Bromofluorobenzene	47.2		50		94	80	120			

Sample Matrix Spike Duplicate

Type **MSD** Test Code: **EPA Method SW8260B**

File ID: **C:\HPCHEM\MS10\DATA\081106\08110609.D** Batch ID: **MS10W1106A** Analysis Date: **11/06/2008 12:59**

Sample ID: **08103152-04AMSD** Units : **µg/L** Run ID: **MSD_10_081106A** Prep Date: **11/06/2008**

Analyte	Result	PQL	SpkVal	SpkRefVal	%REC	LCL(ME)	UCL(ME)	RPDRefVal	%RPD(Limit)	Qual
1,1-Dichloroethene	42.8	2.5	50	0	86	66	132	48.27	12.1(20)	
Methyl tert-butyl ether (MTBE)	45.6	1.3	50	0	91	62	139	45.71	0.2(20)	
Benzene	217	1.3	50	164.2	107	70	130	226	3.8(20)	
Trichloroethene	45.1	2.5	50	0	90	69	130	49.57	9.4(20)	
Toluene	51.7	1.3	50	6.74	90	67	130	55.63	7.4(20)	
Chlorobenzene	49.5	2.5	50	0	99	70	130	52.63	6.2(20)	
Ethylbenzene	100	1.3	50	46.13	108	70	130	106.3	5.8(20)	
m,p-Xylene	52.2	1.3	50	5.87	93	69	130	56.56	8.0(20)	
o-Xylene	47.7	1.3	50	1.2	93	70	130	51.17	7.0(20)	
Surr: 1,2-Dichloroethane-d4	49.5		50		99	75	128			
Surr: Toluene-d8	47		50		94	80	120			
Surr: 4-Bromofluorobenzene	48		50		96	80	120			

Comments:

Calculations are based off of raw (non-rounded) data. However, for reporting purposes, all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Laboratory Report
Report ID: 94504

Sierra Environmental Monitoring, Inc.

Alpha Analytical

255 Glendale Avenue Suite 21
Sparks, NV 89431

Date: 11/7/2008
Client: ALP-855
Taken by: Client
PO #:

Dear Alpha Analytical,

It is the policy of Sierra Environmental Monitoring, Inc to strictly adhere to a comprehensive Quality Assurance Plan that insures the data presented in this report are both accurate and precise. Sierra Environmental Monitoring, Inc. maintains accreditation in the State of Nevada (NV-15) and the State of California (ELAP 2526).

The data presented in this report were obtained from the analysis of samples received under a chain of custody. Unless otherwise noted below, samples were received in good condition, properly preserved and within the hold time for the requested analyses. Any anomalies associated with the analysis of the samples have been flagged with appropriate explanation in the Analysis Report section of this Laboratory Report.

General Comments:

- There are no general comments for this report.

Individual Sample Comments:

- There are no specific comments that are associated with these samples.

Approved By: **Date:**

Sierra Environmental Monitoring, Inc. 11/7/2008

This report is applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the exclusive use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.

John Kobza, Ph.D.
Laboratory Director

1135 Financial Blvd.
Reno, NV 89502-2348
Phone (775) 857-2400
FAX (775) 857-2404

John C. Seher
Special Consultant
Quality Assurance Manager

Laboratory Report
Report ID: 94504

Sierra Environmental Monitoring, Inc.

Alpha Analytical

255 Glendale Avenue Suite 21
Sparks, NV 89431

Date: 11/7/2008
Client: ALP-855
Taken by: Client
PO #:

Analysis Report

Sample ID:	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S200810-1847	ERM08103102-02 - GP-12-GW-10.6	10/30/2008	10:46 AM	10/31/2008

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
BOD-5	SM 5210 B	<4	mg/L	4	Kobza	10/31/2008	

Sample ID:	Customer Sample ID	Date Sampled	Time Sampled	Date Received
S200810-1848	ERM08103102-03 - GP-11-GW-11.2	10/30/2008	11:10 AM	10/31/2008

Parameter	Method	Result	Units	Reporting Limit	Analyst	Date Analyzed	Data Flag
BOD-5	SM 5210 B	<4	mg/L	4	Kobza	10/31/2008	

Data Flag Legend:

John Kobza, Ph.D.
Laboratory Director

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John C. Seher
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Quality Assurance Manager

Laboratory Report
Report ID: 94504

Sierra Environmental Monitoring, Inc.

Alpha Analytical

255 Glendale Avenue Suite 21
Sparks, NV 89431

Date: 11/7/2008
Client: ALP-855
Taken by: Client
PO #:

Quality Control Report

Parameter	*LCS, % Recovery*	*MS, % Recovery*	*MSD, % Recovery*	*RPD, %*	*Method Blank*
BOD-5	108.0			1.59	

Legend: ***LCS- Laboratory Control Standard*** ***MS- Matrix Spike*** ***MSD- Matrix Spike Duplicate*** ***RPD- Relative Percent Difference***

John Kobza, Ph.D.
Laboratory Director

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Reno, NV 89502-2348
Phone (775) 857-2400
FAX (775) 857-2404

John C. Seher
Special Consultant
Quality Assurance Manager

Billing Information :
ERM
2525 Natomas Park Drive

SACRAMENTO, CA 95813

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

NVAMENDED

WorkOrder : ERM08103102

Report Due By : 5:00 PM On : 14-Nov-08

Client:
ERM
2525 Natomas Park Drive

Sacramento, CA 95813

Report Attention	Phone Number	EMail Address
Brian Magee	(916) 924-9378 x	brian.magee@erm.com

EDD Required : **No**

Sampled by : Client

PO :

Client's COC # : 1427, 1423 Job : 86300.31/ Reno RAO

Cooler Temp	Samples Received	Date Printed
4 °C	31-Oct-08	**10-Feb-09**

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	BOD	COD_W	TPH/E_W	TPH/P_W	VOC_W				Sample Remarks
							Requested Tests								
ERM08103102-01A	TB103008-1	AQ	10/30/08 10:40	1	0	10					8260/MTBE_Ns				Reno Trip Blank 10/14/08
ERM08103102-02A	GP-12-GW-10.6	AQ	10/30/08 10:46	9	1	10	BOD	COD	TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103102-03A	GP-11-GW-11.2	AQ	10/30/08 11:10	9	1	10	BOD	COD	TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103102-04A	MW-23	AQ	10/30/08 13:02	8	0	10			TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103102-05A	T-11	AQ	10/30/08 13:31	8	0	10			TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103102-06A	T-13	AQ	10/30/08 14:10	8	0	10			TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103102-07A	T-12	AQ	10/30/08 14:33	8	0	10			TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103102-08A	T-10	AQ	10/30/08 15:00	8	0	10			TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103102-09A	T-5	AQ	10/30/08 15:47	8	0	10			TPH/E_N	GAS-N	8260/MTBE_Ns				
ERM08103102-10A	T-23	AQ	10/30/08 16:17	8	0	10			TPH/E_N	GAS-N	8260/MTBE_Ns				

Comments: Samples brought in by client. Frozen ice. BOD subbed to SEM. Amended 2/10/09 @ 15:05 to add GRO to all samples where TPH Av was requested, per Randy's conv with client. LE :

	Signature	Print Name	Company	Date/Time
Logged in by:	Patricia Edrosa	Patricia Edrosa	Alpha Analytical, Inc.	2/10/09 15:05

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

NV AMENDED

Billing Information :
ERM
2525 Natomas Park Drive

SACRAMENTO, CA 95813

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : ERM08103102
Report Due By : 5:00 PM On : 14-Nov-08

Client:
ERM
2525 Natomas Park Drive

Sacramento, CA 95813

Report Attention	Phone Number	EMail Address
Brian Magee	(916) 924-9378 x	brian.magee@erm.com

EDD Required : **No**

Sampled by : Client

PO :

Client's COC # : 1427, 1423 Job : 86300.31/ Reno RAO

Cooler Temp	Samples Received	Date Printed
4 °C	31-Oct-08	**10-Feb-09**

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	BOD	COD_W	TPH/E_W	TPH/P_W	VOC_W				Sample Remarks
							Requested Tests								
ERM08103102-11A	MW-6	AQ	10/30/08 16:58	8	0	10			TPH/E_N	GAS-N	8260/MTBE_Ns				

Comments: Samples brought in by client. Frozen ice. BOD subbed to SEM. Amended 2/10/09 @ 15:05 to add GRO to all samples where TPH Av was requested, per Randy's conv with client. LE :

	Signature	Print Name	Company	Date/Time
Logged in by:	Latricia Edrosa	Latricia Edrosa	Alpha Analytical, Inc.	2/10/09 15:05

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

CHAIN-OF-CUSTODY RECORD

NV

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

WorkOrder : ERM08103102
Report Due By : 5:00 PM On : 14-Nov-08

Billing Information :
ERM
2525 Natomas Park Drive

SACRAMENTO, CA 95813

Client:
ERM
2525 Natomas Park Drive

Sacramento, CA 95813

Report Attention	Phone Number	EMail Address
Brian Magee	(916) 924-9378 x	brian.magee@erm.com

EDD Required : Yes

Sampled by : Client

PO :

Client's COC # : 1427, 1423 Job : 86300.31/ Reno RAO

Cooler Temp	Samples Received	Date Printed
4 °C	31-Oct-08	31-Oct-08

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	BOD	COD_W	TPH/E_W	VOC_W					Sample Remarks
ERM08103102-01A	TB103008-1	AQ	10/30/08 10:40	1	0	10				8260/MTBE_Ns					Reno Trip Blank 10/14/08
ERM08103102-02A	GP-12-GW-10.6	AQ	10/30/08 10:46	9	1	10	BOD	COD	TPH/E_N	8260/MTBE_Ns					
ERM08103102-03A	GP-11-GW-11.2	AQ	10/30/08 11:10	9	1	10	BOD	COD	TPH/E_N	8260/MTBE_Ns					
ERM08103102-04A	MW-23	AQ	10/30/08 13:02	8	0	10			TPH/E_N	8260/MTBE_Ns					
ERM08103102-05A	T-11	AQ	10/30/08 13:31	8	0	10			TPH/E_N	8260/MTBE_Ns					
ERM08103102-06A	T-13	AQ	10/30/08 14:10	8	0	10			TPH/E_N	8260/MTBE_Ns					
ERM08103102-07A	T-12	AQ	10/30/08 14:33	8	0	10			TPH/E_N	8260/MTBE_Ns					
ERM08103102-08A	T-10	AQ	10/30/08 15:00	8	0	10			TPH/E_N	8260/MTBE_Ns					
ERM08103102-09A	T-5	AQ	10/30/08 15:47	8	0	10			TPH/E_N	8260/MTBE_Ns					
ERM08103102-10A	T-23	AQ	10/30/08 16:17	8	0	10			TPH/E_N	8260/MTBE_Ns					

Comments: Samples brought in by client. Frozen ice. BOD subbed to SEM. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Elizabeth Adcox	Elizabeth Adcox	Alpha Analytical, Inc.	10-31-08 8:39

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

Billing Information :
ERM
2525 Natomas Park Drive

SACRAMENTO, CA 95813

CHAIN-OF-CUSTODY RECORD

Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21 Sparks, Nevada 89431-5778
TEL: (775) 355-1044 FAX: (775) 355-0406

NV

WorkOrder : ERM08103102
Report Due By : 5:00 PM On : 14-Nov-08

Client:
ERM
2525 Natomas Park Drive

Sacramento, CA 95813

Report Attention	Phone Number	EMail Address
Brian Magee	(916) 924-9378 x	brian.magee@erm.com

EDD Required : Yes

Sampled by : Client

PO :

Client's COC # : 1427, 1423 Job : 86300.31/ Reno RAO

Cooler Temp	Samples Received	Date Printed
4 °C	31-Oct-08	31-Oct-08

QC Level : S3 = Final Rpt, MBLK, LCS, MS/MSD With Surrogates

Alpha Sample ID	Client Sample ID	Matrix	Collection Date	No. of Bottles Alpha	Sub	TAT	BOD	COD_W	TPH/E_W	VOC_W					Sample Remarks
ERM08103102-11A	MW-6	AQ	10/30/08 16:58	8	0	10			TPH/E_N	8260/MTBE_Ns					

Comments: Samples brought in by client. Frozen ice. BOD subbed to SEM. :

	Signature	Print Name	Company	Date/Time
Logged in by:	Elizabeth Adcox	Elizabeth Adcox	Alpha Analytical, Inc.	10-31-08 8:39

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.
The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.
Matrix Type : AQ(Aqueous) AR(Air) SO(Soil) WS(Waste) DW(Drinking Water) OT(Other) Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

ERM

CHAIN OF CUSTODY RECORD

NO: 1427

6650 S.W. REDWOOD LANE, SUITE 300 • PORTLAND, OR 97224 • (503) 542-8007 • FAX (503) 542-8017

PROJECT #	PROJECT NAME
86300.31	Reno RAO

SAMPLER: (PRINT NAME)	(SIGNATURE)

RECEIVING LABORATORY: Alpha Analytical Reno, NV

Rm 8103102

	SAMPLE I.D.	DATE	TIME	COMP	GRAB	SAMPLING METHOD	PRESERVATIVE	FILTER (Y/N)	SAMPLING VOLUME	# OF CONTAINERS	SOIL	WATER	GAS	VOC+MTBE 8260B	TPH-d + TPH-Av 8015M	BOD 405.1	COD 410.4
-01	TB103008-1	10-30-08	1040		X	Trip blank	HCl	Y	40mL	1		X		X			
-02	GP-12-GW-1	10-6	1046		X	Peri	HCl	Y	1570mL	10		X		X	X	X	X
-03	GP-11-GW-1	10-2	1110		X	Peri	HCl	Y	1570mL	10		X		X	X	X	X
-04	MW-23		1302		X	Peri	HCl	Y	320mL	8		X		X	X		
-05	[illegible]-T-11		1331		X	Peri	HCl	Y	320mL	8		X		X	X		
-06	T-13		1710		X	Peri	HCl	Y	320mL	8		X		X	X		
-07	T-12		1433		X	Peri	HCl	Y	320mL	8		X		X	X		
-08	T-10		1500		X	Peri	HCl	Y	320mL	8		X		X	X		
-09	T-5		1547		X	↓	HCl	Y	320mL	8		X		X	X		
-10	T-23		1617		X	—	HCl	Y	320mL	8		X		X	X		

REQUESTED PARAMETERS

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
[signature]	10/31/08	0754	Carpbeth Adcox	10/31/08	704
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME

FIELD REMARKS: Std TAT

REMARKS ON SAMPLE RECEIPT

- [x] BOTTLE INTACT
- [x] PRESERVED
- [ ] CUSTODY SEALS
- [ ] SEALS INTACT
- [x] CHILLED
- [ ] SEE REMARKS

SEND REPORT TO: Brian Magee

WHITE - LABORATORY COPY CANARY - FIELD COPY PINK - DATABASE MANAGER GOLD - PROJECT FILE

ERM

CHAIN OF CUSTODY RECORD

NO: 1423

Page 2 of 2

6650 S.W. REDWOOD LANE, SUITE 300 • PORTLAND, OR 97224 • (503) 542-8007 • FAX (503) 542-8017

PROJECT #	PROJECT NAME
86300.31	Reno RAO

SAMPLER (PRINT NAME)	(SIGNATURE)

RECEIVING LABORATORY: Alpha Analytical, Reno, NV

SAMPLE I.D.	DATE	TIME	COMP	GRAB	SAMPLING METHOD	PRESERVATIVE	ICE (Y/N)	SAMPLING VOLUME	# OF CONTAINERS	MATRIX: SOIL	MATRIX: WATER	MATRIX: GAS	REQUESTED PARAMETERS: VOC + MTBE 8260B	REQUESTED PARAMETERS: TPH-d + TPH-Av 8015M
-11 MW-6	10-30-08	1658		X	Peri	HCl	X	320	8		X		X	X

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
[signature]	10/31/08	0759	Carpeth Adcox	10/31/08	7:54
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY	DATE	TIME

FIELD REMARKS: Std TAT

REMARKS ON SAMPLE RECEIPT:
- [x] BOTTLE INTACT
- [x] PRESERVED
- [ ] CUSTODY SEALS
- [ ] SEALS INTACT
- [x] CHILLED
- [ ] SEE REMARKS

SEND REPORT TO: Brian Magee

WHITE - LABORATORY COPY CANARY - FIELD COPY PINK - DATABASE MANAGER GOLD - PROJECT FILE

APPENDIX E

QUALITY ASSURANCE/QUALITY CONTROL DATA REVIEW REPORT

APPENDIX E — QUALITY ASSURANCE/QUALITY CONTROL DATA REVIEW AND VALIDATION

Analytical data are the basis for evaluating the environmental conditions at the Reno Air National Guard Base (Reno ANGB). It is essential that the data are accurate and reflect actual conditions.

To ensure data quality was acceptable for decision-making purposes, ERM-West, Inc. (ERM) reviewed laboratory analytical results for the Reno ANGB groundwater samples collected in October 2008. The objective of the data review was to identify limitations on the use of the data and results that should not be used for decision-making purposes. The quality of the data was assessed and any necessary qualifiers were applied following the United States Environmental Protection Agency (*USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review,* October 1999 and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review,* October 2004.

ERM reviewed Alpha Analytical data packages 08102942, 08103051 and 08103102 for compliance with the following Level II quality assurance/quality control (QA/QC) project and method-prescribed criteria:

- **Holding Time and Sample Preservation:** The period of time between collection of the sample and preparation/analysis of the sample. Analyses performed for this project have method-prescribed holding times as well as temperature and chemical preservation requirements.
- **Blank Samples:** The preparation and analysis of reagent (contaminant-free) water. Blank samples for this investigation included method blanks, trip blanks, field blanks, and equipment rinsate blanks. Detections in a blank sample indicate laboratory and/or transportation or field contamination.
- **Spike Samples:** The preparation and analysis of an environmental sample or a sample of reagent water spiked with target compounds at known concentrations. The results of the blank spike analysis measure laboratory accuracy, and results from the environmental sample spike measure potential interference from the matrix.

- **Surrogate Spikes:** The addition of compounds similar to target compounds of interest that are added to sample aliquots for organic analysis. Surrogate spikes measure possible interference from the sample matrix for the analysis of target compounds.
- **Duplicate Samples:** The preparation and analysis of an additional aliquot of the sample. The results from duplicate analysis measure potential heterogeneity of contaminants in the sample.

Potential USEPA data qualifiers used during the review process are as follows:

U (Nondetected): The analyte was reported as detected by the laboratory, but the reported concentrations should be considered nondetected at the concentration of the validated result.

J (Estimated): The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.

N (Tentative identification): The analysis indicated the presence of an analyte for which there was presumptive evidence to make only a tentative identification.

NJ (Estimated tentative identification): The analysis indicated the presence of an analyte that was tentatively identified and the associated numerical value represents its approximate concentration.

UJ (Estimated, nondetected): The analyte was not detected above the reported sample quantitation limit; however, the reported quantitation limit was approximate and may or may not have represented the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R (Rejected): The sample results were rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte could not be verified.

No sample results were rejected. All of the data are acceptable as qualified, and can be used for decision-making purposes. The following discussion addresses each of the QA/QC components listed above and the results for each of the components.

HOLDING TIME AND PRESERVATION

The USEPA has established a maximum sample holding time for each analysis. The USEPA has also established chemical and temperature preservation requirements for those analyses that may be subject to chemical degradation. Holding times and sample temperatures extending beyond the USEPA maximum or samples that are not properly preserved can negatively affect sample integrity (e.g., loss of volatile compounds, biodegradation) and are qualified depending on the severity of the exceedence and compounds of concern.

ERM has reviewed the analytical results for the Reno ANGB groundwater monitoring event for compliance with the method-prescribed preparation and analysis holding times as well as preservation requirements. All of the sample preparation and analysis holding times were met. All of the sample shipments arrived at the laboratory within the temperature requirements of 2 – 6 degrees Celsius (°C).

BLANK SAMPLES

A blank sample consists of contaminant-free reagent water and is prepared and analyzed in the same manner as the samples. The purpose of a blank sample is to determine the presence and magnitude of possible contamination resulting from laboratory, shipping, or other sample-handling activities. If target compounds are detected in a blank sample, then all associated data must be carefully evaluated to determine whether those results have been similarly impacted, or the blank problem is an isolated occurrence not representative of other data.

The three types of blank samples analyzed with the Reno ANGB groundwater monitoring event were method blanks and trip blanks. These blank samples are described below.

- Method blanks were prepared by the laboratory by taking an aliquot of reagent water through all preparation and analysis steps. A method blank was prepared and analyzed with each batch of environmental samples. Method blanks are evaluated for potential laboratory-related contamination of project samples.
- Trip blanks were prepared by the laboratory by filling a vial with an aliquot of reagent water and sealing it with a Teflon-lined lid. Trip blanks are evaluated for potential volatile compound contamination

of samples during collection and transportation to the laboratory. The trip blanks travel from the laboratory to the field with the empty sample containers and return to the laboratory with the filled containers.

The method blank and trip blank sample results were nondetected for each of the target analytes. None of the data were qualified based on blank results.

SPIKE SAMPLES

A spike sample is a QC sample that is prepared and analyzed by the laboratory to demonstrate proper analysis, detection, and quantification of target compounds. A spike sample result is assessed by its percent recovery, which is reported as the amount of the compound detected divided by the amount spiked into the sample. The percent recovery is then compared to an established limit range. The two types of spike samples analyzed with the project samples were matrix spikes (MS) and blank spikes.

MS samples consist of an aliquot of an environmental sample that is spiked with known concentrations of a subset of target compounds. A matrix spike duplicate (MSD) sample is a second spiked sample prepared and analyzed with the MS sample. MS samples are used to monitor potential interference from the sample matrix for target compounds. A low MS recovery may indicate low-biased sample results; a high MS recovery may indicate high-biased sample results.

Blank spike samples, which are commonly referred to as laboratory control samples (LCS), consist of an aliquot of reagent water spiked with known concentrations of target compounds. The LCS sample monitors laboratory accuracy without the bias of a sample matrix. LCS recoveries outside of acceptable limits may indicate poor laboratory accuracy.

The LCS results were within control limits. Four MS recoveries were out of control limits for various compounds; however, since the sample data could be verified by an associated LCS recovery, or the spike sample was prepared using a non-client sample, none of the data were qualified as a result of the MS outliers. The MS/MSD results that did not meet control criteria are shown in Table E-1.

SURROGATE SPIKES

A surrogate spike is used to assess interference from the sample matrix during the analysis. Surrogate spike results are assessed by %R, based on the concentration of surrogate in the sample divided by the known amount of surrogate added to the sample aliquot.

The surrogate recoveries were compared to the laboratory-generated limits of acceptance with one exception. The laboratory noted that the surrogate recovery for one sample analyzed for total extractable petroleum hydrocarbons (TPH-E) was above laboratory acceptance limits. The detected compound for this analysis, jet fuel range organics (JFRO), was qualified as estimated (J). The outlying surrogate recovery is shown in Table E-2.

FIELD DUPLICATE SAMPLES

A field duplicate sample is a second aliquot of a sample that is collected, prepared, and analyzed in the same manner as the primary sample. Field duplicate sample analysis is performed to measure the precision of the method and to assess possible matrix heterogeneity. A relative percent difference (RPD) is calculated for detected field duplicate results.

Although field duplicates are useful for evaluating sample homogeneity, the USEPA has not established control criteria for field duplicate samples; therefore sample data are not qualified in the basis of field duplicate imprecision. In addition, RPDs calculated using concentrations less than five times the reporting limit do not accurately represent precision due to inherent variability in low level detections.

For the Reno ANGB groundwater monitoring event, two field duplicate pairs were collected and submitted for analysis. ERM calculated an RPD for each of the reported detections in the sample pairs. The RPDs were all less than 25 percent, thus indicating sample homogeneity. The results are summarized in Table E-3.

TPH EVALUATION

The laboratory noted that detected results for JFRO in six samples may include contributions from other hydrocarbons. ERM qualified the affected samples as tentatively identified and estimated (NJ) as shown in Table E-4.

OVERALL ASSESSMENT

No data required rejection. All of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during the groundwater monitoring event is acceptable for the preparation of technically defensible documents.

TABLE E-1

Spike Recoveries Outside of Acceptable Limits
Groundwater Monitoring Samples
Reno Air National Guard
Reno, Nevada

Lab Package	Spike Sample ID	Associated Sample	Compound	Recovery (%)	Limit (%)	RPD	RPD Limit	Sample Result	ERM Qualifier
08102942	T-21 MS/MSD	NA	Benzene	44/42	70-130	4.7	20	NA	--
08103051	GP-9-GW-12 MS/MSD	NA	COD	117/118	90-110	1.0	20	NA	--
08103051	Batch MS/MSD	NA	Methyl tert-butyl ether	65/85	62-139	25.7	20	NA	--
08103102	GP-9-GW-12 MS/MSD	NA	COD	117/118	90-110	1.0	20	NA	--

Data packages reviewed: 08102942, 08103051, 08103102

Key:
MS/MSD = Matrix spike/matrix spike duplicate
RPD = Relative percent difference
COD = Chemical oxygen demand
Batch = Spike sample was prepared using a non-client sample
NA = Not applicable; qualification of sample data not required

TABLE E-2

Surrogate Recovery Results out of Acceptable Limits
Groundwater Monitoring Samples
Reno Air National Guard
Reno, Nevada

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	ERM Qualifier
08103051	GP-10-GW-8.9	TPH-E	Nonane	NR	46-148	J

Data packages reviewed: 08102942, 08103051, 08103102

Key:
TPH-E = Total petroleum hydrocarbons - extractable (includes jet fuel, diesel, and motor oil)
J = Estimated detected result
NR = Value not reported; laboratory noted recovery above acceptance limits

TABLE E-3

Field Duplicate Results and Calculated Relative Percent Differences
Groundwater Monitoring Samples
Reno Air National Guard
Reno, Nevada

Lab Package	Sample/Duplicate ID	Compound	Concentration Sample	Concentration Duplicate	Report Limit	Units	RPD (%)
08102942	T-21/T-21-D	Methyl tert-butyl ether	5.0	4.7	4.0	µg/L	6.2
08102942	T-21/T-21-D	Benzene	120	99	4.0	µg/L	19
08102942	T-21/T-21-D	Ethylbenzene	2.6	2.4	5.0	µg/L	8.0
08102942	T-21/T-21-D	m,p-Xylene	14	13	10	µg/L	7.4
08102942	T-21/T-21-D	TPH-P	1.7	1.5	0.5	mg/L	13
08103051	GP-13-GW-7.85/GP-13-GW-7.85-D	Benzene	280	270	1.0	µg/L	3.6
08103051	GP-13-GW-7.85/GP-13-GW-7.85-D	Ethylbenzene	54	51	1.0	µg/L	5.7
08103051	GP-13-GW-7.85/GP-13-GW-7.85-D	m,p-Xylene	210	200	1.0	µg/L	4.9
08103051	GP-13-GW-7.85/GP-13-GW-7.85-D	TPH-P	2.4	2.2	0.5	mg/L	8.7

Data packages reviewed: 08102942, 08103051, 08103102

Key:
TPH-P = Total petroleum hydrocarbons - purgeable (gasoline range organics)
RPD = Relative percent difference
µg/L = Micrograms per liter
mg/L = Milligrams per liter

TABLE E-4

Suspect TPH Results
Groundwater Monitoring Samples
Reno Air National Guard
Reno, Nevada

Lab Package	Sample ID	Method	Compound	Reported Concentration	ERM Qualifier	Laboratory Notation
08102942	T-21	TPH-E	JFRO	1.7 mg/L	NJ	May include contributions from other products Quantitated with DRO calibration
08102942	T-21-D	TPH-E	JFRO	1.9 mg/L	NJ	May include contributions from other products Quantitated with DRO calibration
08102942	MW-25	TPH-E	JFRO	0.54 mg/L	NJ	May include contributions from other products Quantitated with DRO calibration
08102942	MW-07	TPH-E	JFRO	1.8 mg/L	NJ	May include contributions from other products Quantitated with DRO calibration
08103051	GP-10-GW-8.9	TPH-E	JFRO	120 mg/L	NJ	May include some lighter-end hydrocarbons Quantitated with DRO calibration
08103102	T-5	TPH-E	JFRO	0.59 mg/L	NJ	May include contributions from other products Quantitated with DRO calibration

Data packages reviewed: 08102942, 08103051, 08103102

Key:
TPH-E = Total petroleum hydrocarbons - extractable (includes jet fuel, diesel, and motor oil)
JFRO = Jet fuel range organics
DRO = Diesel range organics
mg/L = Milligrams per liter
NJ = Estimated value