UNCONTROLLED

FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (FFACO)
RECORD OF TECHNICAL CHANGE (ROTC)

Corrective Action Unit (CAU) Number: 329
CAU Description: Area 22 Desert Rock Airstrip Fuel Spill
CAU Owner: Industrial Sites - Defense Program (DP)

ROTC No. DOE/NV--641-ROTC 1 **Page** 1 of 8

Document Type Closure Report (CR) **Date** 06/29/2021

The following technical changes (including justification) are requested by:

Tiffany Gamero
Requestor Name

Long-Term Monitoring Activity Lead
Requestor Title

Description of Change:

1. This ROTC replaces the Use Restriction (UR) information listed in the documentation for CAU 329.

   UR forms have been updated to list all UR requirements, including but not limited to: post-closure site controls (signs, fencing, etc.), inspection and maintenance requirements, and Geographic Information Systems (GIS) coordinate information. The UR requirements and form(s) included in this ROTC represent the current corrective action requirements for each Corrective Action Site (CAS) in this CAU and supersede information concerning corrective action and post-closure requirements in existing documentation.

2. The UR boundary for CAS 22-44-01 was changed from a single coordinate with a 9 meter-diameter buffer to an area defined by separate vertices.
3. Downgrade to an Administrative UR and remove the requirements for soil gas monitoring.

Justification:

1. Some changes in the UR requirements from those found in closure documents have been subsequently modified in letters, memos, and inspection reports. This has resulted in difficulty in determining current post-closure requirements. A review of the post-closure requirements for this CAU has been conducted to ensure that all requirements have been identified and documented on the new UR form. The new UR form was developed to be inclusive of all requirements for long-term monitoring and standardize information contained in the URs consistent with current protocols.

2. Current protocol requires separate coordinates for vertices.

3. The UR was changed to an Administrative UR with the termination of soil gas monitoring in the Final Annual Post-Closure Inspection and

FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (FFACO)
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ROTC No. DOE/NV--641-ROTC 1 **Page** 2 of 8

Document Type Closure Report (CR) **Date** 06/29/2021

Description of Change:

Justification:

Monitoring Report For Corrective Action Unit 329: Area 22 Desert Rock Airstrip Fuel Spill, Nevada Test Site, Nevada, Revision 1, January 2007. NDEP approved this change in a 3/20/2007 letter. The UR changes are formally established under this ROTC.

Schedule Impacts:

No impacts to schedule.

ROTC applies to the following document(s):

- U.S. Department of Energy, Nevada Operations Office. 2000. Closure Report for Corrective Action Unit 329: Area 22 Desert Rock Airstrip Fuel Spill, Nevada Test Site, Nevada, Rev. 0, DOE/NV--641. Las Vegas, NV.
- Addendum for CAU 329 CR (DOE/NV--641), March 2005.
- Andres, C.D., Nevada Division of Environmental Protection, Bureau of Federal Facilities. 2007. Letter to K.J. Cabble (NNSA/NSO Environmental Restoration Project) titled "Approval Final Annual Post-Closure Inspection and Monitoring Report Corrective Action Unit (CAU) 329: Area 22 Desert Rock Airstrip Fuel Spill Federal Facility Agreement and Consent Order," 20 March. Las Vegas, NV.
- ERRATA Sheet for CAU 329 CR (DOE/NV--641), dated 08/10/2010.

FEDERAL FACILITY AGREEMENT AND CONSENT ORDER (FFACO)
RECORD OF TECHNICAL CHANGE (ROTC)

Corrective Action Unit (CAU) Number: 329
CAU Description: Area 22 Desert Rock Airstrip Fuel Spill
CAU Owner: Industrial Sites - Defense Program (DP)

ROTC No. DOE/NV--641-ROTC 1 **Page** 3 of 8

Document Type Closure Report (CR) **Date** 06/29/2021

Approvals:

Tiffany A. Gamero Digitally signed by Tiffany A. Gamero Date: 2021.07.07 12:11:49 -07'00' Date _____

Tiffany Gamero
Activity Lead
Environmental Management (EM) Nevada Program

Bill R. Wilborn Digitally signed by Bill R. Wilborn Date: 2021.07.07 14:04:56 -07'00' Date _____

Bill Wilborn
Deputy Program Manager, Operations
Environmental Management (EM) Nevada Program

Christine Andres Digitally signed by Christine Andres Date: 2021.07.10 16:15:22 -07'00' Date _____

Christine Andres
Chief, Bureau of Federal Facilities
Nevada Division of Environmental Protection (NDEP)

U.S. Department of Energy, Environmental Management Nevada Program
Use Restriction Information

General Information

Use Restriction (UR) Type(s): Administrative Only

Corrective Action Unit (CAU) Number & Description: 329 - Area 22 Desert Rock Airstrip Fuel Spill

Corrective Action Site (CAS) Number & Description: 22-44-01 - Fuel Spill

CAU/CAS Owner: Industrial Sites - DP

Note: N/A

Section I. *Federal Facility Agreement and Consent Order* (FFACO) UR

An FFACO UR is not identified for this site.

Section II. Administrative UR

Basis for Administrative UR

Summary Statement: This Administrative UR is established to protect workers should future land use result in increased exposure to site contaminants. Chemical contaminants are assumed to be present that exceed action levels under the Industrial Area (2,000 hours per year) exposure scenario.

Administrative UR Physical Description

Surveyed Area (UTM, Zone 11, NAD 83, meters):

UR Boundary	UR Point[1]	Easting[2]	Northing[2]
Admin Boundary	1	586,850	4,053,329
	2	586,835	4,053,329
	3	586,835	4,053,344
	4	586,850	4,053,344
	5	586,850	4,053,329

[1]UR Points are listed clockwise beginning at the southernmost point. If multiple points share the southernmost Northing coordinate, the easternmost point is listed as Point 1.

[2]UR coordinate values presented herein were transformed from the North American Datum of 1927, and rounded to the nearest meter; resultant coordinates may not reflect the original precision of values contained within the source GIS data set.

Boundary Applies to: Subsurface

U.S. Department of Energy, Environmental Management Nevada Program
Use Restriction Information

Starting Depth: 3 **Ending Depth:** 43

Depth Unit: Meters

Survey Source: GPS

Administrative UR Requirements

Administrative URs do not require onsite postings or other physical barriers, and they do not require periodic inspections or maintenance.

Site Controls:

This Administrative UR is recorded as described in **Section IV. Recordation Requirements** to restrict activities within the area defined by the coordinates listed above and depicted in the attached figure without prior notification of NDEP unless the activities are conducted under the provisions of 10 CFR, Part 835, Occupational Radiation Protection and 10 CFR, Part 851, Worker Safety and Health Program.

Section III. Supporting Documentation

UR Source Document(s)

ROTC 1 for CAU 329 CR (DOE/NV--641), dated 06/29/2021.

ERRATA Sheet for CAU 329 CR (DOE/NV--641), dated 08/10/2010.

Andres, C.D., Nevada Division of Environmental Protection, Bureau of Federal Facilities. 2007. Letter to K.J. Cabble (NNSA/NSO Environmental Restoration Project) titled "Approval Final Annual Post-Closure Inspection and Monitoring Report Corrective Action Unit (CAU) 329: Area 22 Desert Rock Airstrip Fuel Spill Federal Facility Agreement and Consent Order," 20 March. Las Vegas, NV.

Addendum for CAU 329 CR (DOE/NV--641), March 2005.

U.S. Department of Energy, Nevada Operations Office. 2000. Closure Report for Corrective Action Unit 329: Area 22 Desert Rock Airstrip Fuel Spill, Nevada Test Site, Nevada, Rev. 0, DOE/NV--641. Las Vegas, NV.

Attachments

- Administrative UR Boundary Map (UTM, Zone 11, NAD 83 meters)

U.S. Department of Energy, Environmental Management Nevada Program
Use Restriction Information

Section IV. Recordation Requirements

Recordation:

The above UR(s) are recorded in the:

- FFACO Database
- NNSA M&O Contractor GIS
- EM Nevada Program CAU/CAS Files

Section V. EM Nevada Program Approval

Tiffany A. Gamero Digitally signed by Tiffany A. Gamero Date: 2021.07.07 12:12:11 -07'00'

Date: _____

Tiffany Gamero

Activity Lead

EM Nevada Program

UR is effective upon acceptance by NDEP.

H:\329\GPS\CAS22-44-01_ADMINUR.mxd - 2/12/2020

CAU 329, CAS 22-44-01
Fuel Spill
Administrative UR Boundary

Explanation

- Administrative UR
- Light Duty Road

0 25 50 100 Meters

0 100 200 400 Feet

N

Source: Navarro GIS, 2020

Coordinate System: NAD 1983 UTM Zone 11N, Meter

Supplemental Information Figure

Additional supplemental information on site features was not present in previous iterations of this Use Restriction (UR), therefore a supplemental information figure is not attached. If additional information on site features is required for this site, please contact the *Federal Facility Agreement and Consent Order* (FFACO) Database Administrator.

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ERRATA SHEET

The Following Corrections and Clarifications Apply to: Closure Report (CR) for Corrective Action Unit (CAU) 329: Area 22 Desert Rock Airstrip Fuel Spill

DOE Document Number: DOE/NV--641

Revision: 0

Original Document Issuance Date: August 2000

This errata sheet was issued under cover letter from DOE on: August 10, 2010

In Appendix D, Use Restriction (UR) Form, the drawing of the use restricted area shows the incorrect coordinates for the use restricted area, the coordinates on the drawing do not match the approved UR Form. The coordinates have been verified and this Errata Sheet replaces the drawing of the use restricted area with an aerial photo showing the use restricted area and the correct coordinates that match the approved UR Form.


586,800
587,000
587,200
4,053,400
4,053,200
4,053,000
4,052,800
1st
Engineer
22-44-01
E: 586,921.64
N: 4,053,140.11
C:\Documents and Settings\All Users\Desktop\Master.mxd - 6/28/2010
Explanation
Use Restriction
NTS Road
Use Restriction
22-44-01 Fuel Spill
0 100 200 400 600
Feet
0 50 100 200
Meters
N
Source: NNES GIS, 2010; NNSA/NV, 2002
Coordinate System: UTM, NAD27, Zone 11N, Meters

Nevada
Environmental
Restoration
Project

DOE/NV--641

Closure Report for Corrective Action Unit 329: Area 22 Desert Rock Airstrip Fuel Spill, Nevada Test Site, Nevada

Controlled Copy No.: UNCONTROLLED
Revision No.: 0

August 2000

Approved for public release; further dissemination unlimited.

Environmental Restoration
Division

U.S. Department of Energy
Nevada Operations Office

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DOE/NV--641

CLOSURE REPORT FOR CORRECTIVE ACTION UNIT 329: AREA 22 DESERT ROCK AIRSTRIP FUEL SPILL, NEVADA TEST SITE, NEVADA

DOE Nevada Operations Office
Las Vegas, Nevada

Controlled Copy No.: UNCONTROLLED

Revision No.: 0

August 2000

Approved for public release; further dissemination unlimited.

CLOSURE REPORT FOR
CORRECTIVE ACTION UNIT 329:
AREA 22 DESERT ROCK AIRSTRIP FUEL SPILL,
NEVADA TEST SITE, NEVADA

Approved by: Signature Approved Date: 8/13/00

Janet Appenzeller-Wing, Project Manager
Industrial Sites Project

Approved by: Signature Approved Date: 8/13/00

Runore C. Wycoff, Division Director
Environmental Restoration Division

Table of Contents

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Table of Contents *(Continued)*

List of Figures

List of Tables

List of Acronyms and Abbreviations

bgs	Below ground surface
CAI	Corrective Action Investigation
CAS	Corrective Action Site
CAU	Corrective Action Unit
CFU/g	Colony-forming units per gram of dry soil
CFR	*Code of Federal Regulations*
CLP	Contract Laboratory Program
cm^2	Square centimeter(s)
COC	Contaminant(s) of concern
COPC	Contaminant(s) of potential concern
CR	Closure Report
CRDL	Contract-required detection limit
DOE/NV	U.S. Department of Energy, Nevada Operations Office
dpm	Disintegration(s) per minute
DQO	Data Quality Objective(s)
EPA	U.S. Environmental Protection Agency
FFACO	*Federal Facility Agreement and Consent Order*
FSL	Field-screening level
ft	Foot (feet)
gals	Gallon(s)
ICP	Inductively coupled plasma
IDW	Investigation-derived waste
in.	Inch(es)
ISMO	In-Situ Monitoring of Organics
LCS	Laboratory control sample(s)
MDL	Method detection limit
mi	Mile(s)

List of Acronyms and Abbreviations *(Continued)*

mg/kg	Milligram(s) per kilogram
MS/MSD	Matrix spike/matrix spike duplicate
NAC	*Nevada Administrative Code*
NDEP	Nevada Division of Environmental Protection
NIST	National Institute for Standards and Technology
NTS	Nevada Test Site
PAL	Preliminary action level(s)
PPE	Personal protective equipment
ppm	Part(s) per million
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
RPD	Relative percent difference
SAFER	Streamlined Approach for Environmental Restoration
SDG	Sample delivery group
SVOC	Semivolatile organic compound(s)
TPH	Total petroleum hydrocarbon(s)
VOC	Volatile organic compound(s)
UST	Underground Storage Tank
%R	Percent recovery

Executive Summary

This Closure Report has been prepared for Corrective Action Unit 329, Area 22 Desert Rock Airstrip Fuel Spill, in accordance with the *Federal Facility Agreement and Consent Order* (1996). The Corrective Action Unit consists of Corrective Action Site 22-44-01, Fuel Spill.

This report provides justification for closure of Corrective Action Unit 329 based on the results of investigative activities conducted in accordance with the *Streamlined Approach for Environmental Restoration Work Plan for Corrective Action Unit 329: Area 22 Desert Rock Airstrip Fuel Spill, Nevada Test Site, Nevada* (DOE/NV, 1999). Closure of the site requires the following actions:

- Review the current site conditions, including the nature and extent of contamination.
- Document closure of the Corrective Action Unit.

From April 27 through May 12, 2000, corrective action activities were performed as set forth in the Streamlined Approach for Environmental Restoration Work Plan (DOE/NV, 1999). The purpose of the corrective action activities is described as follows:

- Identify the presence, distribution, and nature of contaminants of potential concern at the Corrective Action Unit.
- Determine the vertical and lateral extent of contaminants of potential concern.
- Provide sufficient information and data to develop appropriate closure activities for the Corrective Action Unit.

The following is a brief summary of the corrective action activities and is provided as background information.

- Collected surface soil samples from background locations surrounding the site to establish radiological background values.
- Performed soil-gas sampling and analysis from several depths using previously installed soil gas sampling lines.
- Collect soil samples from one location using a rotosonic coring method:
  - Conducted field screening for radiological constituents, volatile organic compounds, and total petroleum hydrocarbons.

- Conducted visual field screening.
- Collected environmental samples for laboratory analyses.
- Collected soil samples for bioassessment and geotechnical analyses.

Analytes detected during the corrective action were evaluated against preliminary action levels to determine contaminants of concern for Corrective Action Unit 329. Analysis of the data generated from corrective action activities indicates the preliminary action levels were exceeded for total volatile organic compounds, total semivolatile organic compounds, and total petroleum hydrocarbons in the soil samples. Contaminants of concern were identified only within the vicinity of the former underground storage tank pit.

The evaluation of *Nevada Administrative Code* 459.9921-.999 (1) (a-k) (NAC, 1998c) supports the protection of groundwater from contaminants of concern at Corrective Action Unit 329 and no corrective action is required.

The U.S. Department of Energy, Nevada Operations Office provides the following recommendations:

- No corrective action is required at Corrective Action Unit 329.
- Annual monitoring will be conducted at the site for a period of five years to determine degradation rates.

Use restrictions are required to be placed on Corrective Action Unit 329 because the corrective action activities showed evidence of soil contamination.

1.0 Introduction

This Closure Report (CR) has been prepared for Corrective Action Unit (CAU) 329, Area 22 Desert Rock Airstrip Fuel Spill, in accordance with the *Federal Facility Agreement and Consent Order* (FFACO) that was agreed to by the U.S. Department of Energy, Nevada Operations Office (DOE/NV); the Nevada Division of Environmental Protection (NDEP); and the U.S. Department of Defense (FFACO, 1996). The CAU consists of Corrective Action Site (CAS) 22-44-01, Fuel Spill.

Corrective Action Unit 329 is located at the Nevada Test Site (NTS) Area 22 Desert Rock Airstrip. The NTS is approximately 65 miles (mi) northwest of Las Vegas, Nevada (Figure 1-1).

1.1 Purpose

This report provides justification for closure of CAU 329 based on the results of investigative activities conducted in accordance with the *Streamlined Approach for Environmental Restoration (SAFER) Work Plan for Corrective Action Unit 329: Area 22 Desert Rock Airstrip Fuel Spill, Nevada Test Site, Nevada* (DOE/NV, 1999).

1.2 Scope

The scope of this CR is to justify and recommend that no corrective action is required at CAU 329. Closure of this site requires the following actions:

- Review the current site conditions, including the nature and extent of contamination.
- Monitor site conditions for closure of the CAU.

1.3 CR Contents

This CR is divided into the following sections:

Section 1.0 - Introduction: summarizes the purpose, scope, and contents of this report.

Section 2.0 - Closure Activities: summarizes the corrective action activities, the results of the corrective action activities, and the justification for closure.

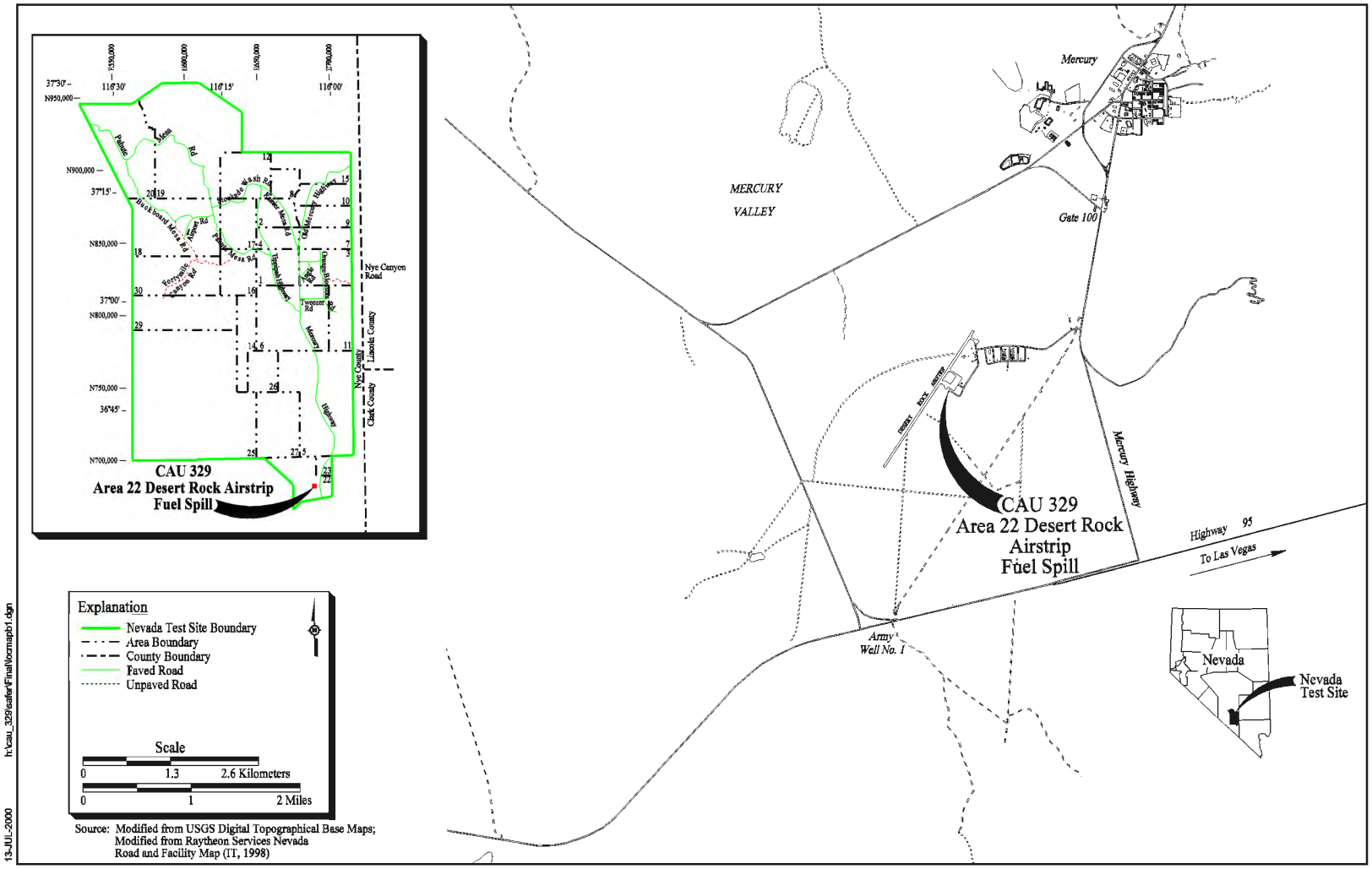

Figure 1-1
Corrective Action Unit 329, Area 22 Desert Rock Airstrip Fuel Spill Site Location Map, Nevada Test Site

Section 3.0 - Waste Disposition: identification of waste types encountered and the appropriate disposition.

Section 4.0 - Closure Verification results: description of verification activities and associated results.

Section 5.0 - References: provides a list of all referenced documents.

Appendix A: Corrective Action Report for CAU 329, Area 22 Desert Rock Airstrip Fuel Spill.

Appendix B: Preliminary Soil Gas Sampling Results

Appendix C: Bioassessment Report

Appendix D: Use Restriction Form

Appendix E: Closure Verification Analytical Results

Appendix F: Response to NDEP Comments

All work was performed in accordance with the following documents:

- *Streamlined Approach for Environmental Restoration Work Plan for Corrective Action Unit 329: Area 22 Desert Rock Airstrip Fuel Spill, Nevada Test Site, Nevada*, Rev. 0 (DOE/NV, 1999)
- *Industrial Sites Quality Assurance Project Plan*, Rev. 1, DOE/NV--372 (DOE/NV, 1996b)
- FFACO (FFACO, 1996)
- *Project Management Plan*, Rev. 0 (DOE/NV, 1994)

2.0 Closure Activities

The following sections describe and summarize the results of the corrective action activities conducted at CAU 329. For detailed corrective action activities results, please refer to Appendix A.

2.1 Description of Corrective Action Activities

From April 27 through May 12, 2000, corrective action activities were performed as set forth in the SAFER Work Plan (DOE/NV, 1999). The purpose of the corrective action activities is described as follows:

- Identify the presence, distribution, and nature of contaminants of potential concern (COPCs) at the CAU.
- Determine the vertical and lateral extent of COPCs.
- Provide sufficient information and data to support closure of the CAU.

The following summary of the corrective action activities is provided as background information:

- Collected surface soil samples from background locations surrounding the site to establish radiological background values.
- Performed soil-gas sampling and analysis from several depths using previously installed soil gas sampling lines:
  - Results are presented in Appendix B
- Collected soil samples from one location using a rotosonic coring method:
  - Conducted field screening for radiological constituents, volatile organic compounds (VOCs), and total petroleum hydrocarbons (TPH).
  - Conducted visual field screening.
  - Collected environmental samples for laboratory analyses for total VOCs, total semivolatile organic compounds (SVOCs), TPH gasoline, and TPH diesel.
  - Collected soil samples for bioassessment and geotechnical analyses.

2.1.1 Results

Analysis of the data generated from corrective action activities conducted at CAU 329, indicates the following:

- The preliminary action levels (PALs) for TPH were exceeded in soil samples collected from the CAU 329 site.
- The PALs for total VOCs and total SVOCs were not exceeded in soil samples collected from the CAU 329 site.
- The analytical results for the composited soil sample for gamma-emitting radionuclides collected from the CAU 329 site were consistent with naturally occurring background conditions.
- The geologic conditions from the CAU 329 site revealed soil consisting of alluvial fan material composed of poorly-sorted clay, silt, sand, with abundant gravel. A thin lens of caliche was present at one depth interval.
- The bioassessment results indicate that the soil conditions are less than optimal for successful bioremediation.

Details of the methods used and results found during the corrective action activities are presented in Appendix A. Based on these results, the corrective actions at the CAU 329 site have been adequately completed for closure.

2.1.2 Need for Corrective Action

Analytes detected during the corrective action activities were evaluated against PALs to determine contaminants of concern (COCs) for CAU 329. The COCs were identified within the vicinity of the former tank pit. The following evaluation of *Nevada Administrative Code* (NAC) 459.9973 (1) (a-k) (NAC, 1998) supports the protection of groundwater from COCs at CAU 329:

a. The depth to ground water is approximately 800 feet (ft) (DOE/NV, 1999). The vertical extent of the wetting front from residual saturation was 120 ft in 1989 (REECo, 1991). The vertical extent of contamination was determined to be less than 140 ft.

b. Army Well No. 1 is 2 mi south of the CAU. Groundwater in this area generally moves to the southwest (REECo, 1991). The likelihood of any impacts to the well is minimal based on the removal of the tank in 1992 and the lack of migration.

c. Surface geology and soils at CAU 329 consist of alluvial fan material composed of poorly-sorted clay, silt, sand, and gravel. See Figure A.2-2 for a more detailed description of the soil encountered during drilling activities. These types of soils are generally unstable and cohesionless; however, no problems were encountered during drilling and sampling activities.

d. Annual precipitation averages 5 inches (in.) and annual evaporation is between 58 and 66 in. (DOE/NV, 1996a). The high evaporation and low precipitation rates create a negative water balance for the area; therefore, no driving force associated with precipitation is available to mobilize COCs vertically.

e. A total of approximately 18,000 gallons (gals) of Jet-A and JP-4 were reportedly released in the late 1980s. JP-4 is a broad cut, naptha jet fuel similar to kerosene. The composition of JP-4 is approximately 65 percent gasoline and 35 percent light petroleum distillates. Actual fuel constituents will be determined by precursor crude oils and refining processes (McKenna et al., 1995). Jet-A is similar to JP-4. Both Jet-A and JP-4 are kerosene based turbine fuels for aircraft. Jet-A is a commercial fuel and JP-4 is a military fuel (Coordinating Research Council, Inc., 1988).

f. Based on field-screening results and laboratory analytical results, the vertical extent of contamination does not extend below 140 ft.

g. Presently, the CAU is located in a government-controlled facility. The NTS is a restricted area that is guarded on a 24-hour, 365-day-per-year basis; unauthorized personnel are not admitted to the facility. The area is identified for the development of a solar energy power-generation facility, and light industrial equipment and commercial manufacturing capability (DOE/NV, 1996a). The contaminated area was covered by approximately 18 ft of clean soil and gravel after the underground storage tank (UST) was removed, limiting inadvertent contact.

h. Contamination by fuel contaminants in the unsaturated zone exists in four phases: vapor in the pore spaces, sorbed to subsurface solids, dissolved in water, or as residual nonaqueous phase liquid. The nature and extent of transport are determined by the interactions among contaminant transport properties (e.g., density, vapor pressure, viscosity, and hydrophobicity) and the subsurface environment (e.g., geology). Typically, after a spill occurs, light nonaqueous phase liquids migrate vertically in the subsurface until residual saturation depletes the liquid (Federal Remediation Technologies Roundtable, 1997). The site has reached equilibrium and additional migration is not expected.

i. The subsurface contamination is located beneath 16 ft of clean soil and gravel. The location of the former UST is on the south side of the Desert Rock Airport. The UST has been removed but piping and other associated utilities remain in the area.

j. The potential for a hazard related to fire, vapor, or explosion is very low because the contamination is located beneath approximately 16 ft of clean soil and gravel. There are limited underground utilities in the area that could confine vapors. The contamination consists of

material that will burn (petroleum hydrocarbons), but would require exposure to fire or flame, neither of which are applicable to the buried contaminants at the CAU.

k. The piping system was last used on December 22, 1990, when operation was ceased due to electrical problems. Fuel remaining in the tank was removed through the fill port by aviation refueling trucks. A closure notification form was sent to NDEP stating that the tank was pumped out and last used on February 19, 1993. The UST was removed on January 27, 1994. These actions minimized the potential for future release at the site.

2.2 Deviations from SAFER Work Plan as Approved

There were no deviations from the approved SAFER Work Plan.

2.3 Corrective Action Schedule as Completed

The following corrective action activities were conducted:

- April 27, 2000 - Existing soil-gas monitoring points were sampled. Results were not adequate to complete closure activities. The DOE/NV and NDEP gave direction to drill the borehole.
- May 8 - 12, 2000 - Borehole DRA-0 was drilled in the vicinity of the former tank pit. The maximum depth drilled was 165 ft. The DOE/NV and NDEP determined that additional soil-gas monitoring points needed to be installed.
- June 30, 2000 - Initial sampling of new soil-gas monitoring points for VOCs, SVOCs, TPH, oxygen, carbon dioxide, nitrogen, and methane was conducted.

2.4 Site Plan/Survey Plat

The current site layout is shown in Appendix A on Figure A.2-1.

3.0 Waste Disposition

The verified sample results for CAU 329 indicate that the waste generated at the site contains only those chemical compounds associated with a petroleum hydrocarbon spill. No additional hazardous substances or radiological constituents were identified. The waste determination will be completed and submitted to Bechtel Nevada Waste Management for review. The waste will be disposed of as sanitary waste, except for the Hanby waste which will be disposed of as hazardous waste.

Contingent on approval, the waste is expected to be disposed of by August 31, 2000. Waste manifests and disposal documentation will be available subsequent to disposal.

4.0 Closure Verification Results

The newly installed soil-gas monitoring points in Borehole DRA-0 were sampled on June 30, 2000. Samples were collected for analysis of VOCs, SVOCs, TPH, oxygen, carbon dioxide, nitrogen, and methane. The monitoring points will be resampled in approximately 60 days to verify that the site has reached equilibrium and determine baseline monitoring conditions. The exact date will be coordinated with DOE/NV, NDEP, and subcontractors prior to conducting sampling activities. The sample locations, depths, and analysis are specified in Table 4-1.

Table 4-1
Soil Gas Monitoring

Borehole	Depth	Analysis
DRA-0	40, 80, 120	VOCs, SVOCs, TPH, oxygen, nitrogen, carbon dioxide, methane
DRA-3	50, 75, 120	VOCs, TPH, oxygen, nitrogen, carbon dioxide, methane

If analytical results for the second sampling event indicate that the site has reached equilibrium, the results will be used as baseline monitoring data. The equilibrium determination will be based on the analytical results for oxygen, nitrogen, carbon dioxide, and TPH. The results from the first monitoring event will be compared to the results of the second monitoring event. The primary indicator for equilibrium will be the TPH results. If there is less than a 50 percent change from the first monitoring event, it will be assumed that the site has reached equilibrium. The final decision will be determined based on the analytical results as discussed with DOE/NV and NDEP. The annual monitoring as specified in the SAFER Work Plan will be conducted in accordance with an approved schedule. Table 4-2 provides a proposed monitoring schedule. The exact monitoring dates will be coordinated with DOE/NV and NDEP. These dates will be determined based on DOE/NV, NDEP, and contractor availability. If the site has not reached equilibrium as determined from analytical results obtained during the baseline monitoring event, another monitoring event will be conducted in 60 days and the proposed monitoring schedule will be updated.

Table 4-2
CAU 329 Proposed Monitoring Schedule

Monitoring Event	Scheduled Date
Preliminary Monitoring	June 30, 2000
Baseline Monitoring	August 28 - 31, 2000[1,2]
1st Annual Monitoring	August 27 - 30, 2001[2]
2nd Annual monitoring	August 26 - 29, 2002[2]
3rd Annual Monitoring	August 25 - 28, 2003[2]
4th Annual Monitoring	August 23 - 26, 2004[2]
5th Annual Monitoring	August 29 - September 1, 2005[2]

[1]If the site has not reached equilibrium as determined from analytical results obtained during the baseline monitoring event another monitoring event, will be conducted in 60 days and the proposed monitoring schedule will be updated.
[2]Exact monitoring date to be determined based on DOE/NV, NDEP, and contractor availability.

4.1 Use Restrictions

Future use of any land related to this CAU is restricted from any activity that may alter or modify the contaminant controls as approved by the state, unless appropriate concurrence is obtained in advance. Appendix D contains a copy of the use restriction form identifying the surveyed location.

4.2 Recommendations

Based on the results of the closure activities no further action is required at the site. Therefore, DOE/NV provides the following recommendations:

- A Notice of Completion from NDEP is requested for the closure of CAU 329 (Desert Rock Airstrip Fuel Spill [CAS 22-44-01, Fuel Spill]).
- CAU 329 should be moved from Appendix III to Appendix IV of the FFACO.

5.0 References

Coordinating Research Council, Inc. 1988. *Aviation Fuel Properties,* CRC Report No. 530. Atlanta, GA.

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Appendix A

Corrective Action Report for CAU 329, Area 22 Desert Rock Airstrip Fuel Spill, Nevada Test Site, Nevada

A.1.0 Introduction

This appendix presents closure activities and analytical results for CAU 329, Area 22 Desert Rock Airstrip Fuel Spill, at the NTS. This CAU includes CAS 22-44-01, Fuel Spill (FFACO, 1996). The corrective action activities were conducted in accordance with the SAFER (DOE/NV, 1999), as developed under the FFACO (1996).

The Desert Rock Airstrip consisted of the single runway, several portable buildings, three USTs storing jet fuel, and plumbing to several refueling areas on the ramp. The 25,000-gal tank, 22-DRA-3, was installed in 1980 and was the only tank to have a recorded leak. The tank was bedded in sand and gravel; the base of the tank was 16 ft below the surface. This was confirmed during the drilling of Borehole DRA-0. Three spills (over 18,000 gals) of jet fuel were recorded at this tank from 1985 to 1989.

The CAS area is contaminated by fuel spills from the UST 22-DRA-3. The tank was emptied and removed by January 1994 and soil samples were collected as required by federal UST regulations (40 *Code of Federal Regulations* [CFR] Part 280) (CFR, 1998) and state UST regulations NAC 459.9921-459.999) (NAC, 1998b). Those samples indicate the presence of hydrocarbons in soil that exceed the State of Nevada action levels (NAC 459.9973) (NAC, 1998b). Additional information regarding the history of this site, planning, and the scope of the corrective action activities is presented in the SAFER Work Plan (DOE/NV, 1999) and will not be repeated in this report.

This CAU was investigated because process knowledge indicated that the subsurface soils in the vicinity of the UST 22-DRA-3 were impacted by releases containing COPCs generated by refueling activities associated with Desert Rock Airstrip operations. This report provides the results for sampling the contaminated soil and soil-gas for closure of the site under regulatory compliance.

A.1.1 Project Objectives

The primary objectives of the corrective action activities were as follows:

- Identify the presence and the vertical and lateral extent of COPCs.
- Provide sufficient information and data to support closure of the CAU.

The selection of soil sample locations for the site was based on site conditions and the strategy developed during the Data Quality Objectives (DQO) process as outlined in the SAFER Work Plan (DOE/NV, 1999).

A.1.2 Report Content

This report contains information and data in sufficient detail to support the selection of no further action in the CR. The contents of this report are as follows:

- Section A.1.0 describes the background, objectives, and the report content.
- Section A.2.0 provides information regarding the field activities and sampling methods.
- Section A.3.0 summarizes the results of the laboratory analyses from the sampling activities.
- Section A.4.0 discusses the quality assurance (QA) and quality control (QC) procedures that were followed and the results of the QA/QC activities.
- Section A.5.0 is a summary of the corrective action results for CAU 329.
- Section A.6.0 provides the cited references.

The complete field documentation and laboratory data, including Field Activity Daily Logs, Sample Collection Logs, Analyses Request/Chain-of-Custody Forms, soil sample descriptions, laboratory certificates of analyses, analytical results, and surveillance results are retained in project files.

A.2.0 Field Corrective Action and Sampling Activities

The following is a brief summary of the Corrective Action activities and is provided as background information:

- Collected surface soil samples from background locations surrounding the site to establish radiological background values.
- Performed soil-gas sampling and analysis from several depths using previously installed soil gas sampling lines:
  - Results are presented in Appendix B.
- Collected soil samples from one location using a rotosonic coring method:
  - Conducted field screening for radiological constituents, VOCs, and TPH.
  - Conducted visual field screening.
  - Collected environmental samples for laboratory analyses.
  - Collected soil samples for bioassessment and geotechnical analyses.

The field activities were conducted in several stages. Purging, sampling, and field-screening the existing soil-gas lines was conducted on April 27, 2000. Results are provided in Appendix B.

Advancing a rotosonic boring (DRA-0) to a depth of 165 ft below ground surface (bgs) occurred from May 8 through 12, 2000. The objectives of this boring were to collect soil samples for laboratory analyses and install soil-gas monitoring lines. During the field activities, soil removed from the boring was either drummed or returned nearest to its original location within the borehole. Soil-gas monitoring points were installed at 40 ft, 80 ft, and 120 ft bgs within the borehole. The soil gas points were centered in a 10-ft long sand pack. Materials were tremied into the borehole to prevent bridging during emplacement. The top of each interval was measured using a weighted tape measure to verify proper placement. Initial purging, sampling, and field screening of the new soil-gas monitoring lines installed in Boring DRA-0 occurred on June 30, 2000.

The field activities and sampling program was managed in accordance with the requirements set forth in the SAFER Work Plan (DOE/NV, 1999). The field activities were performed in accordance with an approved site-specific health and safety plan (IT, 2000). The samples were collected and documented by following approved sampling procedures. Quality control samples (e.g., field blanks, equipment rinsate blanks, trip blanks, and sample duplicates) were collected as required by the *Industrial Sites Quality Assurance Project Plan* (QAPP) (DOE/NV, 1996) and approved procedures. During field activities, waste minimization practices were followed according to approved procedures, including segregation of the waste by waste stream.

A.2.1 Site Descriptions and Conditions

The Desert Rock Airstrip is located about one-mile southwest of Mercury, Nevada, the main support area for the NTS (Figure 1-1). Corrective Action Unit 329, Area 22 Desert Rock Airstrip Fuel Spill (CAS 22-44-01) is located west of the control tower at the Desert Rock Airstrip in Area 22 of the NTS. Several fuel spills resulted from a leak from the transfer pump after seal-failure. The spills occurred approximately 675 ft west of the control tower. The remaining pipelines for the tank are approximately 54 ft north of the wooden shed and 10 ft east of the metal shed housing the pump manhole.

During the field activities, the weather conditions at the site were generally sunny and hot. Sampling activities were halted on one afternoon because of high wind gusts.

Soil conditions at the site were suitable for the purpose of sample collection. A caliche layer was encountered within Borehole DRA-0 at 58 to 60 ft bgs; however, no sampling horizons had to be adjusted due to difficult drilling conditions.

A.2.2 Soil-Gas Sampling

Soil-gas field screening was conducted prior to drilling activities to determine site conditions and the serviceability of existing soil-gas lines. The existing boreholes sampled include DRA-3, DRA-5, DRA-7, and DRA-8 (Figure A.2-1). Soil-gas lines for DRA-9 were still intact but were not field screened. The soil-gas was sampled to monitor natural attenuation in the contaminated area using the existing soil-gas sampling equipment. Additional soil-gas monitoring equipment was installed in

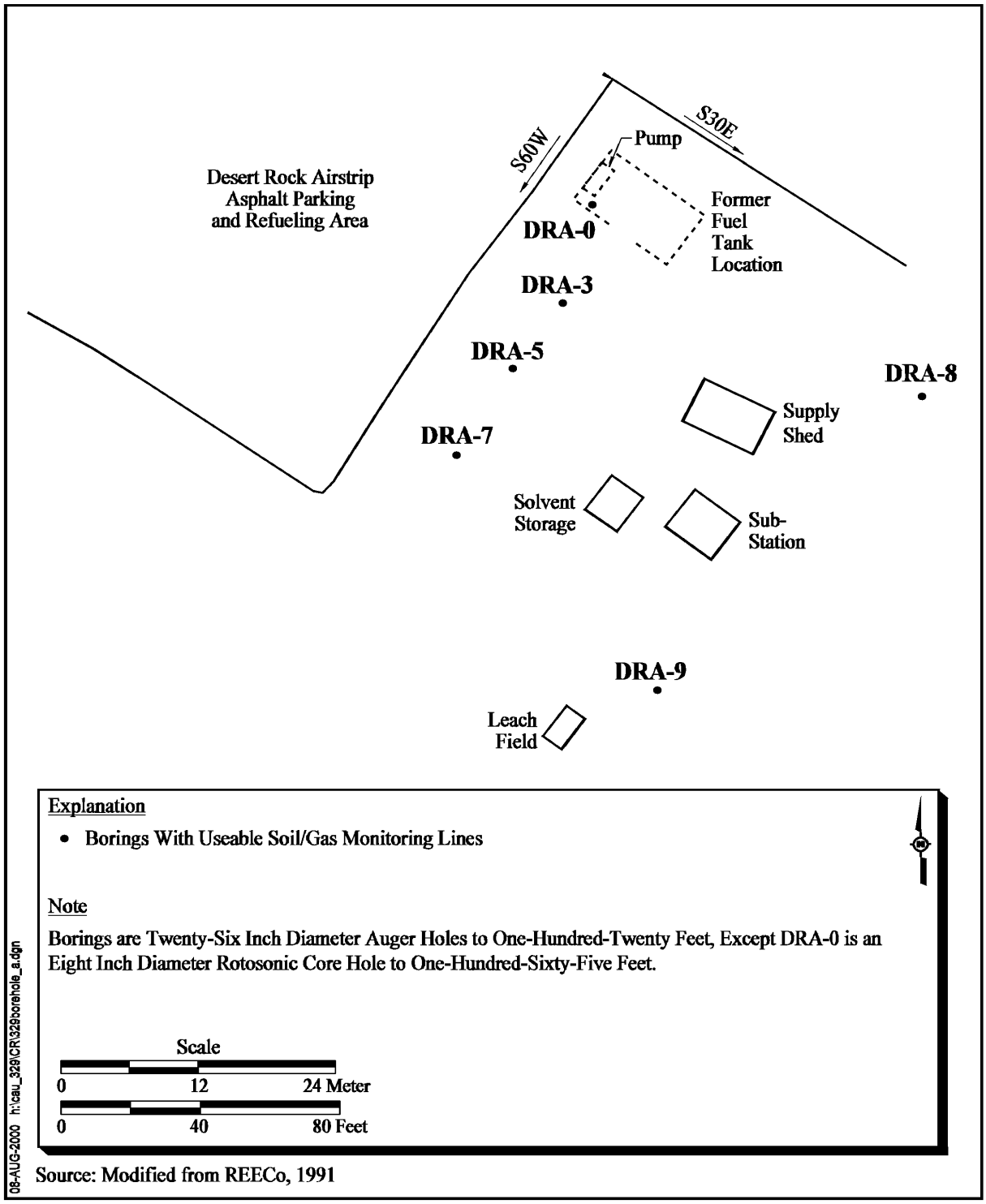

Figure A.2-1
Corrective Action Unit 329 Site Map Showing Location of Instrumented Boreholes

Borehole DRA-0 and soil-gas screening was performed after drilling and soil sampling was completed. Soil-gas was field screened using a Landtec GA 90™ analyzer for VOCs, oxygen, carbon dioxide, and methane. All sampling was conducted in accordance with the Decision Logic Diagram shown in Figure 1-2 of the SAFER Work Plan (DOE/NV, 1999). See Appendix B for additional information regarding the preliminary soil-gas survey results.

A.2.3 Rotosonic Soil Sampling

After soil-gas sampling, a borehole (DRA-0) was drilled through the location of the former 25,000-gal fuel tank (see Figure 2-1 of the SAFER Work Plan) with a rotary sonic drill rig (Figure A.2-2). The depth of the borehole was 165 ft bgs. Soil samples were collected at 20-ft intervals and field screened. After field screening, soil samples were placed into appropriate sample containers, sealed, and labeled. Upon completion of drilling DRA-0, selected samples were shipped to the laboratory and analyzed for total VOCs, total SVOCs, TPH-diesel oil, and TPH-gasoline. A composited sample was submitted for gamma-emitting radionuclides for waste management purposes. Bioassessment analysis was also performed on several soil samples.

A.2.4 Field Screening

Two consecutive "clean" samples, as measured by field-screening methods, were collected to define the lower limits of the impacted soils. Field screening and surveys were performed as specified in the SAFER Work Plan (DOE/NV, 1999). Soil samples were field screened every 20 ft by the sampling team for:

- VOCs using a Hnu® photoionization detector
- TPH screening using a colorimetric field testing kit manufactured by Hanby Environmental Laboratory Procedures, Inc., if VOC field-screening levels (FSLs) were exceeded
- Radiation using an NE Technologies Electra for alpha and beta emitters

Field-screening results were used to guide sample collection and analyses. The FSL for VOCs was 20 parts per million (ppm). The FSLs for radiation monitoring results were established as the average activity of 20 background samples plus two times the standard deviation of the average activity of the

Project Name: CAU 329 (Fuel Spill)
Project Number: 799422.00090005
Borehole Number: DRA-0
Logged By: Robert McCall
Drilled By: Boart-Longyear
Drilling Method: Roto Sonic

Date Started: 9-May-00
Date Completed: 11-May-00
Elevation: 984.01
Northing: 4053140.95
Easting: 586917.68
Total Depth: 165 (ft)

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Date: 08/14/2000
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Depth (ft)	Lithology	USCS	Lithologic Description	Well Construction	Sample Number	Field Screening VOCs (ppm)	Field Screening Hanby (ppm)	Field Screening Alpha\ Beta (dpm)
0 to -5		GW	Fill material consisting of 95% clean gravel (2.5y 8/2) and 5% fines (2.5y 6/2)					
-5 to -10		GW	Fill material (2.5y 8/2) consising of 50% course gravel and 50% fines.					
-10 to -15		GP	Fill material consisting of light brown course sand and gravel.					
-15 to -20		GM	Native soil consising of poorly graded gravel with silt, sand and cobbles. Light brown (5yr 7/1 to 4/1). Approximately 65% fine to course, hard, subrounded to subangular gravel. 25% fine grained, hard, subrounded, to subangular sand, 10% silt. First hydrocarbon odor observed at the fill material/native soil interface at 16 ft. depth.		DRA0001S (NA)	215	600	0/530
-20 to -25								
-25 to -30								
-30 to -35								
-35 to -40		GM			DRA0002S	185	400	20.3/629
-40 to -45			Poorly graded light brown (5yr 7/1) gravel with silt, sand, and cobbles. 50% fine to course subrounded gravel. 25% fine subrounded to subangular sand. 25% silt.					
-45 to -50								
-50 to -55		SM	Silty gravels becoming a silty sand mixture below 48 ft depth. Gravel, sand, clay mixture, light brown. 40% subrounded gravel. 30% subrounded to subangular sand. 30% silt to clay size. Strong hydrocarbon odor throughout.					
-55 to -60								
-60 to -65		GC			DRA0003S (NA)	200	800	20.6/727
-65 to -70		SM	Caliche layer mixed with silty gravels.					
-70 to -75			Clayey gravels. Light brown (5yr 5/4). 50% subrounded to subangular pebble/gravel/cobble size. 15% subrounded to subangular sand. 25% silt and 15% clay.					
-75 to -80								
-80 to -85		SC	Sands with fines, light brown (5yr 5/4). 40% subrounded to subangular sands. 40% silts and 20% clays becoming 40% clays below 74 ft depth.		DRA0004S	220	1500	20.3/720
-85 to -90								
-90 to -95		SC	Clayey sands mixture with fines, light brown (5yr 5/4). 5% subrounded to subangular gravels, 25% subrounded to subangular pebbles, 20% subrounded to subangular sands. 20% silts and 30% clays.					
-95 to -100								
-100 to -105		GM	Silty gravels. Gravel, sand, clay mixture, light brown. 5% cobbles, 20% subrounded gravel. 30% subrounded to subangular pebbles. 25% subrounded to subangular sands. 10% silt and 10% clay size. Strong hydrocarbon odor.		DRA0005S (NA)	150	200	0/720
-105 to -110								
-110 to -115								
-115 to -120								
-120 to -125		SC	Clayey sands mixture with fines, light brown (5yr 5/4). 10% subrounded to subangular gravels, 20% subrounded to subangular pebbles, 20% subrounded to subangular sands. 20% silts and 30% clays. Strong hydrocarbon odor to 130 ft. depth.		DRA0006S	200	1,000	0/670
-125 to -130								
-130 to -135		GM	Silty gravels. Gravel, sand, clay mixture, light brown. 15% cobbles, 20% subrounded gravel. 20% subrounded to subangular pebbles. 25% subrounded to subangular sands. 10% silt and 10% clay size. No hydrocarbon odor.		DRA0007S	4.3	0.0	0/697
-135 to -140								
-140 to -145								
-145 to -150								
-150 to -155		GM	Silty gravels. Gravel, sand, clay mixture, light brown (5yr 5/4). 45% subrounded to subangular gravel. 25% subrounded to subangular sands. 10% silt and 20% clay size. No hydrocarbon odor.		DRA0008S	3.3	NA	20.3/591
-155 to -160								
-160 to -165								

Figure A.2-2
DRA-0 Soil Boring Diagram

20 background samples. The FSL was established at 24 disintegrations per minute (dpm)/100 square centimeters (cm^2) for alpha and 973 dpm/100 cm^2 for beta.

The soil did not exceed FSLs for radiation; however, FSLs were exceeded for VOCs and TPH and the results are shown on Figure A.2-2.

A.2.5 Sample Collection

Soil sample collection was performed as specified in the SAFER Work Plan (DOE/NV, 1999). During drilling, the soil sample was transferred from the plastic core barrel liner to the sampling table, opened and screened for alpha, beta, and VOCs prior to collecting samples. Samples were collected in appropriate containers, temporarily marked with sample label information, sealed with custody tape, and placed in an iced cooler with a trip blank (if applicable). Volatile samples (VOCs, and headspace field screening) were collected immediately after the required radiation field screening. The remaining samples were collected after soil was homogenized in a stainless steel bowl.

After samples were identified as laboratory samples, labels with the sample number, sample collection date/time, sampling team members, container preservative, medium type, and requested analyses were attached to each of the containers. Each sample container was then wrapped in protective bubble wrap (if applicable), placed into a sealable bag, and stored in an iced cooler with a trip blank (if applicable). Sample media not submitted to the laboratory was disposed of in appropriate waste containers. Soil descriptions were recorded on a Sample Collection Log and are retained in project files.

A.2.6 Waste Management

Investigation-derived waste (IDW) was segregated into the following waste streams:

- Personal protective equipment (PPE) and sampling equipment that contacted potentially contaminated media
- Decontamination rinsate that contacted potentially contaminated media
- Plastic and minor amounts of soil from the decontamination pad

- Soil, absorbent material, and PPE contaminated with hydrocabons
- Absorbent material from drill rig oil spill
- Hanby waste

Soil and debris incidental to sample collection (e.g., soil cuttings, discarded sample media) was drummed for disposal. Hazardous waste (Hanby) generated during site operations was drummed and labeled as such. All waste was transferred to the Hazardous Waste Accumulation Area daily. The IDW was documented in the waste management logbook.

A.2.7 Geology

Surface geology and soils at CAU 329 consist of alluvial fan material composed of poorly-sorted clay, silt, sand, and gravel. See Figure A.2-2 for a more detailed description of the soil encountered during drilling activities. These types of soils are generally unstable and cohesionless; however, no problems were encountered during drilling and sampling activities.

A.2.8 Hydrology

Groundwater beneath CAU 329 is not expected to be impacted by COPC migration due to the depth to groundwater. Depth to groundwater in Mercury Valley ranges from 800 to 1,100 ft bgs (Winograd and Thordarson, 1975; Robie et al., 1995). Groundwater flow is generally to the southwest and may discharge at Ash Meadows (Laczniak et al., 1996). There are no perennial surface water sources that would impact the CAU 329 site. However, the site could potentially be impacted by ephemeral drainage due to localized flooding.

A.3.0 Corrective Action Results

The analytical results of samples collected from the CAU 329 corrective action activities have been compiled and evaluated to determine the presence and/or extent of contamination. The analytical results above the minimum reporting limits are summarized in the following subsections.

During corrective action activities, 12 samples were submitted to Paragon Analytical Services, Fort Collins, Colorado, for laboratory analysis. Radiological analyses were also performed by Paragon Analytical Services for waste management purposes only.

A list of the sample numbers and their relationship to the sample depths is presented in Table A.3-1. Two samples were collected for geotechnical analysis and three samples for bioassessment analysis. The geotechnical samples have not been submitted as coordinated with DOE/NV and NDEP. The bioassessment results are included in Appendix C. A Tier III review of at least five percent of the sample analytical data will be performed by TechLaw, Inc. in Lakewood, Colorado. The analytical parameters and laboratory analytical methods requested for the corrective action activities are presented in Table A.3-2.

The analytical parameters were selected through the application of site process knowledge according to the U.S. Environmental Protection Agency's (EPA's) *Guidance for the Data Quality Objectives Process* (EPA, 1994b). Preliminary action levels for off-site laboratory analytical methods were determined during the DQO process and are documented in the SAFER Work Plan (DOE/NV, 1999). Sampling activities were conducted to confirm or disprove assumptions (i.e., models outlined in SAFER Work Plan) made in the DQO process (DOE/NV, 1999).

A.3.1 Total Volatile Organic Compound Analytical Results

The total VOC analytical results detected above minimum reporting limits established in the SAFER Work Plan (DOE/NV, 1999), along with the associated PAL, are presented in Table A.3-3. The laboratory VOCs results indicate that contaminants were present below the PAL as established in the SAFER Work Plan for petroleum hydrocarbons (DOE/NV, 1999).

Table A.3-1
Samples Collected and Analyzed at the CAU 329 Corrective Action Activities

Borehole	Sample Number	Depth Below Ground Surface (ft)	Matrix	Sample Type	Analyses
DRA-0	DRA0001S	20-22.5	Soil	Environmental	Set 1
DRA-0	DRA0002S	40-42.5	Soil	Environmental/ Bioassessment	Set 1, 2
DRA-0	DRA0003S	60-62.5	Soil	MS/MSD Environmental	Set 1
DRA-0	DRA0004S	80-82.5	Soil	Environmental/ Bioassessment	Set 1, 2
DRA-0	DRA0006S	120-122.5	Soil	Environmental/ Bioassessment	Set 1, 2
DRA-0	DRA0007S	140-142.5	Soil	Environmental	Set 1
DRA-0	DRA666S	NA	Soil	Composite	gamma spectrometry
DRA-0	DRA00031S	61	Soil	Field Duplicate of DRA0003S Environmental	Set 1
DRA-0	DRA201	NA	Water	Field Blank	Set 1
DRA-0	DRA203	NA	Water	Equip. Rinsate - Core Barrel	Set 1
DRA-0	DRA204	NA	Water	Trip Blank	Set 1
DRA-0	DRA205	NA	Water	Source Blank	Set 1
DRA-0	DRA300S	65-66.5	Soil	Geotechnical	Set 3
DRA-0	DRA301S	125-126.5	Soil	Geotechnical	Set 3

Set 1: Analytical parameters are total VOC, total SVOC, TPH-Gasoline, TPH-Diesel/Oil.
Set 2: Analytical parameters are soil pH and moisture, background nutrient concentrations, microbial enumerations, and microbial stimulation test.
Set 3: Analytical parameters are initial moisture content, dry bulk density, calculated porosity, saturated hydraulic conductivity, unsaturated hydraulic conductivity, and particle size distribution.

MS/MSD = Matrix spike/matrix spike duplicate
NA = Not Applicable
VOC = Volatile organic compounds
TPH = Total petroleum hydrocarbons
SVOC = Semivolatile organic compounds

Table A.3-2
Laboratory Analytical Methods Used for Samples Collected at the CAU 329 Area 22 Desert Rock Airstrip Fuel Spill, Nevada Test Site

Analytical Parameter	Analytical Method
Total volatile organic compounds	EPA 8260B[a]
Total semivolatile organic compounds	EPA 8270C[a]
Total petroleum hydrocarbons - diesel range	EPA 8015B (modified)[a]
Total petroleum hydrocarbons - gasoline range	EPA 8015B (modified)[a]
Gamma-emitting radionuclides	L-E10.602.PC[b, c] SOP 739/713[b, d]
Bioassessment Parameters	**Method**
Soil pH and moisture	Laboratory specific
Background nutrient concentrations	
Microbial enumerations	
Microbial stimulation test	

[a]EPA *Test Methods for Evaluating Solid Waste*, Physical/Chemical Methods, 3rd Edition, Parts 1-4, SW-846 (EPA, 1996)
[b]Or equivalent laboratory method
[c]Bechtel Nevada, *Analytical Services Laboratory Procedures Manual* (BN, 1998)
[d]Paragon Analytics, Inc., *Standard Operating Procedures Manual* (PAI, 1998)

A.3.2 Total Semivolatile Organic Compound Analytical Results

The total SVOCs detected in soil above the minimum reporting limits established in the SAFER Work Plan (DOE/NV, 1999) are presented in Table A.3-4. The laboratory SVOCs results indicate that contaminants were present below the PAL as established in the SAFER Work Plan for petroleum hydrocarbons (DOE/NV, 1999).

A.3.3 Total Petroleum Hydrocarbon Results

The TPH detected in soil in the gasoline and diesel range above the minimum reporting limits established in the SAFER Work Plan are presented in Table A.3-5 (DOE/NV, 1999). The laboratory TPH results indicate that contaminants were present above the PAL as established in the SAFER Work Plan for petroleum hydrocarbons (DOE/NV, 1999).

Table A.3-3
Soil Sample Results for Volatile Organic Compounds Detected Above Minimum Reporting Limits, CAU 329 Desert Rock Airstrip Fuel Spill

Sample Location	Sample No.	Start Depth (ft)	End Depth (ft)	Contaminants of Potential Concern (µg/kg)											
				1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Ethylbenzene	(Cumene) Isopropylbenzene	M+P-Xylene	N-Butylbenzene	N-Propylbenzene	Naphthalene	O-Xylene	(p-cymene) P-Isopropyltoluene	Sec-Butylbenzene	Toluene
Preliminary Action Levels[a]				170,000	70,000	230,000	520,000	580,000	550,000	550,000	190,000	280,000	NI	410,000	520,000
DRA-0	DRA0001S	20	22.5	2,600	3,400	--	--	1,400	4,400	1,300 (J)[c]	--	--	3,200	2,600	--
	DRA0002S	40	42.5	17,000	7,700	1,800	1,500	5,700	7,200	4,200	4,600 (B)[d]	--	3,900	3,500	--
	DRA00031S	60	62.5	56,000	18,000	4,300	3,500	18,000	13,000	9,300	27,000 (B)[d]	2,700	6,900	6,600	--
	DRA0003S	60	62.5	76,000[b]	22,000	6,000	4,400	25,000	15,000	11,000	36,000 (B)[d]	2,500	7,500	7,500	--
	DRA0004S	80	82.5	15,000	21,000	6,500	4,900	8,200	16,000	13,000	43,000 (B)[d]	13,000	8,900	8,600	--
	DRA0006S	120	122.5	51,000	15,000	3,800	2,800	15,000	14,000	8,700	35,000 (B)[d]	8,100	7,100	6,300	1,700

[a]U.S. Environmental Protection Agency Region 9, *Industrial Preliminary Remediation Goals* (PRGs) (EPA, 1998)
[b]Diluted value
[c]Value above method detection limit (MDL) but below contract-required detection limit (CRDL)
[d]Blank contamination

µg/kg = Micrograms per kilogram
ft = Feet
NI = Not identified
-- = Not detected above minimum reporting limit

Table A.3-4
Soil Sample Results for Semivolatile Organic Compounds Detected Above Minimum Reporting Limits, CAU 329 Desert Rock Airstrip Fuel Spill

Sample Location	Sample No.	Start Depth (ft)	End Depth (ft)	Contaminants of Potential Concern (µg/kg)	
				2-Methylnaphthalene	Naphthalene
Preliminary Action Levels[a]				NI	190,000
DRA-0	DRA0002S	40	42.5	1,090	--
	DRA00031S	60	62.5	24,000 (J)[b, c]	9,900 (J)[b, c]
	DRA0003S	60	62.5	18,000	7,200
	DRA0004S	80	82.5	22,000 (J)[b, c]	11,000 (J)[b, c]
	DRA0006S	120	122.5	27,000 (J)[b, c]	14,000 (J)[b, c]

[a]U.S. Environmental Protection Agency Region 9, *Industrial Preliminary Remediation Goals* (PRGs) (EPA, 1998)
[b]Matrix effects may exist
[c]Surrogates diluted out

J = Estimated value
µg/kg = Micrograms per kilogram
ft = Feet
-- = Not detected above minimum reporting limit
NI = Not identified

A.3.4 Gamma Spectrometry Results

The gamma spectrometry results detected in soil above the minimum reporting limits, as specified in the SAFER Work Plan (DOE/NV, 1999), were not distinguishable from background concentrations listed in the *Off-Site Radiation Exposure Review Project* (McArthur and Miller, 1989) or the *Environmental Monitoring Report for the Proposed Ward Valley California Low-Level Radioactive Waste (LLRW) Facility* (Atlan-Tech, 1992).

A.3.5 Bioassessment Results

A bioassessment was performed on three soil samples to investigate the feasibility of using bioremediation at CAU 329 (Appendix C). Bioassessment is a series of tests designed to evaluate the physical, chemical, and microbial characteristics of a site. The bioassessment consisted of a determination of nutrient availability, pH, microbial population density, and the ability of the microbial populations to grow under enhanced conditions. Based on the results of the bioassessment,

Table A.3-5
Soil Sample Results for Total Petroleum Hydrocarbons Detected Above Minimum Reporting Limits, CAU 329 Desert Rock Airstrip Fuel Spill

Sample Location	Sample No.	Start Depth (ft)	End Depth (ft)	Contaminants of Potential Concern (mg/kg)			
				Gasoline Hydrocarbon Range	Gasoline	Diesel Hydrocarbon Range	Diesel-Range Organics
Preliminary Action Levels[a]					**100**		**100**
DRA-0	DRA0001S	20	22.5	C7-C13	660[b]	C8-C20	7,400
	DRA0002S	40	42.5	C7-C13	590[b]	C8-C20	4,500
	DRA00031S	60	62.5	C7-C13	1,200[b]	C8-C20	7,900
	DRA0003S	60	62.5	C7-C13	1,800[b]	C8-C20	9,100
	DRA0004S	80	82.5	C7-C13	1,700[b]	C8-C20	12,000
	DRA0006S	120	122.5	C7-C13	1,600[b]	C8-C22	10,000
	DRA0007S	140	142.5	--	--	--	--

[a]Nevada Department of Environmental Protection regulatory action level for total petroleum hydrocarbons (NAC, 1986b).
[b]The chromatograms for these samples displayed peak patterns similar to JP-5 standard.

mg/kg = Milligrams per kilogram
ft = Feet
-- = Not detected above minimum reporting limit

soil conditions are marginally suitable for bioremediation of contaminated soil at CAU 329. The results of the bioassessment are summarized below:

- The pH is slightly above the optimal range for bioremediation.
- The natural microbial populations for heterotrophs or hydrocarbon degraders were less than 100 colony-forming units per gram of dry soil (CFU/g), which is very low.
- Heterotrophic microbial populations reacted favorably to oxygen stimulation. Hydrocarbon degraders did not appear to respond to stimulation.
- Phosphate levels were moderate and ammonium levels were less than the method detection limit. The low ammonium concentrations may limit biodegradation.
- Moisture levels were moderate to high in the soil samples and should be adequate to support microbial activity.

A.4.0 Quality Assurance

The results of the QA/QC activities for the CAU 329, Area 22 Desert Rock Airstrip Fuel Spill corrective action sampling events are summarized in the following text. Detailed information regarding the QA program is contained in the Industrial Sites QAPP (DOE/NV, 1996).

Quality control results are typically judged in terms of precision, accuracy, representativeness, completeness, and comparability and are described in the following sections.

A.4.1 Precision

Precision is a quantitative measure of the variability of a group of measurements from their average value. Precision is assessed for inorganic analysis by collecting, preparing and analyzing duplicate field samples, and comparing the results with the original sample. Precision is also assessed by creating, preparing, analyzing, and comparing laboratory duplicates from one or more field samples in inorganic analyses and matrix spike/matrix spike duplicate (MS/MSD) samples for organic analyses. Precision is reported as relative percent difference (RPD), which is calculated as the difference between the measured concentrations of duplicate samples, divided by the average of the two concentrations, and multiplied by 100. Any deviation from these requirements has been documented and explained and the related data qualified accordingly. The qualification process is described in Section A.4.7.1.

A.4.2 Accuracy

Analytical accuracy is defined as the nearness of a measurement to the true or accepted reference value. It is the composite of the random and systematic components of the measurement system and measures bias in the measurement system. The random component of accuracy is measured and documented through the analyses of spiked samples. Sampling accuracy is assessed by evaluating the results of spiked samples and laboratory control samples. Accuracy measurements are calculated as percent recovery by dividing the measured sample concentration by the true concentration and multiplying the quotient by 100.

Field accuracy is assessed by confirming that the documents of record track the sample from origin, through transfer of custody, to disposal. The goal of field accuracy is for all samples to be collected from the correct locations at the correct time, placed in a correctly labeled container with the correct preservative, and sealed with custody tape to prevent tampering. All samples in this sampling event were properly collected and forwarded to the laboratories as described above.

A.4.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition (EPA, 1987). Sample representativeness was achieved through the implementation of a sampling program designed to ensure proper sampling locations, number of samples, and the use of validated analytical methods. Representativeness was assessed through analysis of duplicate samples. Representativeness of the samples taken in this sampling event was assured by collecting the specified number of samples (DOE/NV, 1999) and by analyzing them by the approved analytical methods shown in Table A.3-2.

A.4.4 Completeness

Completeness is defined as a percentage of measurements made that are judged to be valid. A sampling and analytical requirement of 80 percent completeness was established for this project (DOE/NV, 1996). The minimum 80 percent completeness was achieved.

The specified sampling locations were utilized as planned. All samples were collected as specified in the SAFER Work Plan (DOE/NV, 1999), and all sample containers reached the laboratory intact and properly preserved (when applicable).

A.4.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another (EPA, 1987). To ensure comparability, the CAU 329 field and sampling activities were performed and documented in accordance with approved procedures, and all samples were collected in accordance with the SAFER Work Plan (DOE/NV, 1999). Approved standardized methods and procedures were also used to analyze and report the data (e.g., Contract Laboratory

Program [CLP] and/or CLP-like data packages). This approach ensures that the data from this project can be compared to other data sets. Based on the minimum comparability requirements specified in the Industrial Sites QAPP (DOE/NV, 1996), all requirements were met.

Field (i.e., sample-handling) documentation, laboratory nonconformance reports, and the precision and accuracy of quality-control sample results were evaluated for their effect on the results of the associated environmental soil samples. The environmental sample results were then qualified according to processes outlined in the following sections. Documentation of the data qualifications resulting from these reviews is retained in the project files.

A.4.6 Tier I and Tier II Data Evaluations

All laboratory data from samples collected at CAU 329 have been evaluated for data quality according to the EPA Functional Guidelines (EPA, 1994a and 1999). These guidelines are implemented in a tiered process and are presented in the following text. No data rejected during the data evaluation process were used to draw the conclusions presented in the CR. Only valid data, whether estimated (i.e., J-qualified) or not, were used.

Changes resulting from the data evaluation process are documented in project files and are summarized in memoranda for each sample delivery group (SDG). These memoranda are maintained in project files.

A.4.6.1 Tier I Evaluation

Tier I evaluation for both chemical and radiological analyses examines (but is not limited to):

- Sample count/type consistent with chain of custody
- Analysis count/type consistent with chain of custody
- Correct sample matrix
- Significant problems stated in cover letter or case narrative
- Completeness of certificates of analysis
- Completeness of CLP or CLP-like packages
- Completeness of signatures, dates, and times on chain of custody
- Condition-upon-receipt variance form included
- Requested analyses performed on all samples
- Date received/analyzed given for each sample
- Correct concentration units indicated

- Electronic data transfer supplied
- Results reported for field and laboratory QC samples
- Whether or not the deliverable met the overall objectives of the project

A.4.6.2 Tier II Evaluation

Tier II evaluation for both chemical and radiological analyses examines (but is not limited to):

Chemical:

- Correct detection limits achieved
- Sample date, preparation date, and analysis date for each sample
- Holding time criteria met
- QC batch association for each sample
- Cooler temperature upon receipt
- Sample pH for aqueous samples, as required
- Detection limits properly adjusted for dilution, as required
- Blank contamination evaluated and applied to sample results/qualifiers
- MS/MSD percent recoveries (%R) and RPDs evaluated and applied to laboratory results/qualifiers
- Field duplicate RPDs evaluated using professional judgement and applied to laboratory results/qualifiers
- Laboratory duplicate RPDs evaluated and applied to laboratory results/qualifiers
- Surrogate %Rs evaluated and applied to laboratory results/qualifiers
- Laboratory control sample %R evaluated and applied to laboratory results/qualifiers
- Initial and continuing calibration evaluated and applied to laboratory results/qualifiers
- Internal standard evaluated and applied to laboratory results/qualifiers
- Recalculation of 10 percent of laboratory results from raw data
- Mass spectrometer tuning criteria
- Initial and continuing calibration verification
- Internal standard evaluation
- Organic compound quantitation
- Inductively coupled plasma (ICP) interference check sample evaluation
- Graphite furnace atomic absorption quality control
- ICP serial dilution effects

Radioanalytical:

- Correct detection limits achieved
- Blank contamination evaluated and applied to sample results/qualifiers
- Certificate of Analysis consistent with data package documentation
- Quality control sample results (duplicates, laboratory control samples, laboratory blanks) evaluated and applied to laboratory result qualifiers
- Sample results, error, and minimum detectable activity evaluated and applied to laboratory result qualifiers

- Detector system calibrated to National Institute for Standards and Technology (NIST) traceable sources
- Calibration sources preparation was documented, demonstrating proper preparation and appropriateness for sample matrix, emission energies, and concentrations
- Detector system response to daily, weekly, and monthly background and calibration checks for peak energy, peak centroid, peak full-width half-maximum, and peak efficiency
- Tracers NIST-traceable, appropriate for the analysis performed, and recoveries that met QC requirements
- Documentation of all QC sample preparation complete and properly performed
- Spectra lines, emissions, particle energies, peak areas, and background peak areas support the identified radionuclide and its concentration

A.4.6.3 Tier III

Data quality considerations that are included in EPA data review functional guidelines (EPA, 1994a and 1999) as a Tier III review include the additional evaluations:

Chemical:

- Recalculation of all laboratory results from raw data

Radioanalytical:

- QC sample results (e.g., calibration source concentration, percent recovery, and RPD) verified
- Radionuclides and their concentration appropriate considering their decay schemes, half-lives, and process knowledge and history of the facility and site
- Each identified line in spectra verified against emission libraries and calibration results
- Independent identification of spectra lines, area under the peaks, and quantification of radionuclide concentration in a random number of sample results

A Tier III review of at least five percent of the sample analytical data was performed by TechLaw, Inc. in Lakewood, Colorado. As a result of the Tier III review, there were no changes to the data contained in the analytical summary tables in Section A.3.0.

A.4.7 Quality Control Samples

There was one trip blank, one field blank, one equipment rinsate blank, one MS/MSD, one source blank, and one field duplicate collected and submitted for laboratory analysis as shown in Table A.3-1. The blanks and duplicates were assigned individual sample numbers and sent to the laboratory "blind." Additional samples were selected by the laboratory to be analyzed as laboratory

duplicates. Documentation related to the collection and analyses of these samples is retained in project files.

A.4.7.1 Field Quality Control Samples

Review of the field-collected blank analytical data for the corrective action sampling indicates that cross-contamination from field methods did not occur during sample collection. Field and equipment rinsate blanks were analyzed for the parameters listed in Table A.3-2 and trip blanks were analyzed for VOCs only. None of the results exceeded the minimum laboratory reporting limits specified in the SAFER Work Plan (DOE/NV, 1999).

During the sampling event, one field duplicate soil sample was sent as a blind sample to the laboratory to be analyzed for the corrective action parameters listed in Table A.3-2. For this sample, the duplicate results precision (i.e., RPDs between the environmental sample results and their corresponding field duplicate sample results) were evaluated to the guidelines set forth in EPA Functional Guidelines (EPA, 1994a and 1999). The EPA Functional Guidelines state that there are no required review criteria for field duplicate analyses comparability, but allow the data reviewer to exercise professional judgement. The RPD between the environmental samples results and their corresponding field duplicate sample results exceeded the 20 percent criteria stated in the Industrial Sites QAPP (DOE/NV, 1996) for some target analytes. The variability in the results between the environmental samples and their corresponding field duplicate sample could be attributed to nonhomogeneous samples and the difficulties associated with collecting identical field samples. It is expected that soil field duplicate results will have a greater variance than water matrices.

Lab duplicate RPDs are only performed on inorganic metals and mercury analyses. No metals analyses were requested for CAU 329.

One field sample was selected for use as MS/MSD samples. The percent recoveries of this sample (a measure of accuracy) and the relative percent differences in these sample results (a measure of precision) were compared to EPA Functional Guideline criteria (EPA, 1994a and 1999). The results were used to qualify associated environmental sample results accordingly.

The EPA Functional Guidelines for review of organic data state that no data qualification action is taken on the basis of MS/MSD results alone. The data reviewer exercises professional judgement in considering these results in conjunction with the results of laboratory control samples (LCSs) and other QC criteria in applying qualifications to the data.

A.4.7.2 Laboratory Quality Control Samples

Analysis of method QC blanks and surrogate spikes for organic analyses, method blanks, preparation blanks, initial and continuing calibration blanks for LCS were performed for each SDG by Paragon Analytics, Inc. The results of these analyses were used to qualify associated environmental sample results according to EPA Functional Guidelines (EPA, 1994a and 1999).

The EPA Functional Guidelines (EPA, 1994a and 1999) state that no qualification action is taken if a compound is found in an associated blank, but not in the sample or if a compound is found in the sample, but not in an associated blank. The action taken when a compound is detected in both the sample and the associated blank varies depending upon the analyte involved and is described in the "The 5X/10X Rule."

For most VOCs, SVOCs, TPH diesel, and gasoline, if an analyte is detected in the sample and was also detected in an associated blank, the result is qualified as undetected (U) if the sample concentration is less than five times (5X) the blank concentration.

For the common laboratory contaminants (e.g., methylene chloride, acetone, 2-butanone [methylethyl ketone or MEK and cyclohexane], and phthalate esters [especially bis(2-ethylhexyl)phthalate]), the factor is raised to ten times (10X) the blank concentration. The sample result is elevated to the quantitation limit if it is less than the quantitation limit or remains unaltered if the sample result is greater than or equal to the quantitation limit.

Surrogate spikes, or system monitoring compounds, are added to the environmental samples analyzed by chromatographic techniques for VOCs, SVOCs, TPH diesel and gasoline. Surrogate compounds are analytes that are not expected to be present in associated environmental samples, but behave the same as similar target compounds chromatographically. Known amounts of each surrogate are added prior to sample preparation and are carried throughout the preparation/analysis procedure. The

percent recoveries of these surrogate compounds give some measure of the anticipated recoveries of the target compounds whose chromatographic behavior they mimic.

If any surrogate percent recoveries are out of the acceptable range (which differs for each surrogate in each method), laboratory protocol calls for the sample to be reprepared and/or reanalyzed. When the surrogate recoveries are acceptable on the second run, only the second analysis results are reported. When both analyses yield the same unacceptable range, the results of both analyses are reported.

The evaluation of surrogate spike percent recovery results is not straightforward. The functional guidelines suggest several optional approaches, but require the data reviewer to exercise professional judgement in reviewing surrogate data and qualifying associated data as estimated (J or UJ, for detections or nondetections, respectively) or unusable (R). Documentation of data qualifications resulting from the application of these guidelines is retained in the project files as both hard copy and electronic media.

Laboratory control samples, also known as blank spikes, consist of known quantities of target compounds added to purified sand or deionized, distilled water and analyzed along with the environmental samples in the sample delivery group. The percent recoveries of the compounds in the LCS give a measure of laboratory accuracy. The functional guidelines call for the data reviewer to use professional judgement to qualify associated data according to established criteria. Documentation of data qualifications resulting from the application of these guidelines is retained in project files as both hard copy and electronic media.

A.4.8 Field Nonconformances

During the corrective action activities, one management surveillance was conducted by IT Corporation to verify that sampling activities were performed in accordance with applicable requirements. The results of the surveillance indicated no findings, deficiencies, or nonconformances with sampling activities. The requirements of the plans and procedures governing the activities at the site were adhered to throughout the corrective action activities.

A.4.9 Laboratory Nonconformances

Laboratory nonconformances are generally due to inconsistencies in analytical instrumentation operation, sample preparations, extractions, and fluctuations in internal standard and calibration results. No laboratory nonconformances were documented for this project.

A.5.0 Summary

Analysis of the data generated from corrective action activities conducted at Area 22 Desert Rock Airstrip Fuel Spill, CAU 329, indicates the following:

- The PALs for TPH were exceeded in soil samples collected from the CAU 329 site.
- The PALs for total VOCs and total SVOCs were not exceeded in soil samples collected from the CAU 329 site.
- The analytical results for the composited soil sample for gamma-emitting radionuclides collected from the CAU 329 site were consistent with naturally occurring background conditions.
- The geologic conditions from the CAU 329 site revealed soil consisting of alluvial fan material composed of poorly-sorted clay, silt, sand, with abundant gravel. A thin lense of caliche was present at one depth interval.
- The bioassessment results indicate that the soil conditions are less than optimal for successful bioremediation.

A.6.0 References

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Appendix B

Preliminary Soil Gas Sampling Results

(Pages B-2 through B-10 as provided by Bechtel Nevada)

A review of the soil-gas monitoring data for soil-gas monitoring points at DRA-3, DAR-5, DRA-7, and DRA-8 does not indicate contamination levels adequate to determine biodegradation rates at those locations. No VOC readings exceeded background concentrations. Methane results were nondetect. There was a decrease in oxygen and increase in carbon dioxide for the points located closest to the former tank pit, DRA-3. These changes could be caused by either chemical or biological reduction of the contamination; however, the results are generally consistent with bioremediation. The decrease in oxygen is probably a result of microbial degradation of the contamination. The increase in carbon dioxide is probably a result of microbial respiration. The monitoring results for DRA-3 indicate that in the vicinity of the edge of the plume there are reduced conditions.

Table B.1-1 summarizes the field-screening results performed on April 28, 2000, of existing soil-gas monitoring points at CAU 329.

Table B.1-1
Soil-Gas Monitoring Results

Borehole	Depth (ft bgs)	VOC (ppm)	O_2 (%)	CO_2 (%)
DRA-3	50[a] (C[b])	0.5	6.8	4.7
	75[a] (B[b])	1.6	5.0	2.4
	120[a] (E[b])	1.8	11.2	0.1
DRA-5	25	0.7	14.6	1.1
	50	1.4	13.4	0.7
	75	0.5	13.0	0.0
	120	1.4	14.9	0.0
DRA-7	25	1.6	17.5	0.3
	50	1.6	16.7	0.1
	75	3.2	16.5	0.0
	120	2.5	20.8	0.2
DRA-8	25	1.1	18.5	0.2
	50	1.4	18.0	0.0
	75	1.6	17.5	0.0
	120	1.4	18.6	0.0

[a]Depths are estimated based on vacuum pump results.
[b]Assigned letter designation. Previously installed depth tags were missing.

O_2 = Oxygen
CO_2 = Carbon Dioxide

Depth Determination of Unlabeled Gas Sample Lines Corrective Action Unit 329, Area 22 Desert Rock Airstrip Nevada Test Site, Nye County, Nevada

This study was conducted by Bechtel Nevada Environmental Restoration to determine the depth of burial of a set of gas sample lines at Borehole DRA-3 at the Desert Rock Airstrip. Stainless steel gas sample lines had been installed for subsurface gas sampling for the In-Situ Monitoring of Organics (ISMO) project conducted by Reynolds Electrical and Engineering Company at the Desert Rock Airstrip (Dozier, 1991). One-eighth inch (I.D.) stainless steel lines had been installed in boreholes at depths of 3, 6, 10, 25, 50, 75 and 120 feet (ft.) in 8 boreholes to evaluate vapor phase movement from a fuel spill associated with the buried tank. In subsequent years the under ground storage tank was removed from the ground and the site recovered with soil. In the process, the labels on the gas sample lines in Borehole DRA-3 were damaged so that the depth of burial was unknown. Because this borehole is close to the spill, gas samples from this borehole were needed to compare to the previous gas sampling to support characterization activities for site closure.

When compared to a calibration reference, the depth of burial of each gas sample line can be determined based on a comparison of pressure drop (head losses) measured at varying flow rates on each sample line. Head loss is dependent on the density and viscosity of the fluid, length and diameter of the tube, and the velocity of the fluid flowing through the tube. For DRA-3, all the sample lines are 1/8 inch inside diameter with known length. For any given low flow rate, the vacuum measured at the surface will be proportional to the length of the sample line as long as two conditions are met.

1) The gas flow rate from the soils into the gas sample line must have no measurable pressure loss. That is, the vacuum measured at the surface is the sum of both the head loss of the tubing and any restriction in flow due to the soil's gas permeability.

2) All tubing is uniform in inside diameter and has no constrictions or obstructions.

In the first case, the buried end of the sample tube is connected to a large area collector (4 in. x 0.5 in. diameter screened copper sample head). This collector was designed to prevent soil particles from being sucked into the sample line by providing a collection source area much larger than the diameter of the gas sample line, which decreased the velocity and, correspondingly, the pressure. As long as the flow rates are kept low, the first condition can be met.

In the second case these factors are largely unknown but will be the result of the tubing being crushed or bent during emplacement or by blockages within the tubing due to water or fine particles bridging within the tubing.

The system was calibrated using identical tubing and gas sample head as were emplaced in the ISMO project. A low vacuum gauge transducer (Omega 161PC01D) was calibrated in the laboratory (Fig 1) and attached to the inlet side of a Sierra Instruments model 841-06-1 Mass Flow controller operating from 0 to 500 cc/min. A metal bellows vacuum pump provided a source of up to 14 in. Hg for the mass flow controller. Using this system, calibration curves were developed using 1/8 inch stainless steel tubing in lengths of 6, 50, 100 and 150 ft. For each length of tubing the head loss (vacuum) was determined for flow rates of 474, 400, 350, 300, 250, 200, 150, 100, 50, and 25 cc/min (Fig 2). From these a family of calibration curves of Vacuum versus Depth was produced for each flow rate (Fig 3).

To verify the calibration results measurements were taken at boreholes with sample lines of known depth. Data were collected at DRA 5, DRA 7, and DRA 8 (Figures 3, 4, and 5). The known depths are plotted on the master calibration curves at each vacuum reading. The 75 ft. depth on DRA-8 had a variable pressure reading with visible water extracted from the tube and the results are not reported. Also note that DRA-7 at the 25 foot level has abnormally high vacuum readings. For an ideal case, the depth reading should fall along the vertical depth at each flow rate to which they correspond. In general, the field measurements indicate slightly higher vacuums (longer lengths) than observed in the laboratory calibration. The averaged depth values of each flow rate agree reasonably well with the actual depth and, when combined with the sequence of increasing vacuum with depth, provide a mechanism to determine depths for the unlabeled lines in DRA 3 (Figure 6).

Depth determination for the unlabeled lines in DRA 3 was determined in the same manner described previously for the verification lines. Each sample line was assigned a letter value and plotted on the master calibration curve (Fig 6). Sample line F was blocked and produced a full vacuum with no flow observed. It was assigned the depth of 25 ft by the process of elimination.

The survey results are provided in Table 1. Sample lines C and B are closer and higher in vacuum and closer together than generally observed in the verification runs but are within the proper sequence. It is suspected that C may have some restriction which has increased the overall vacuum. This can also be seen in the DRA 7 data where the 25 foot line was abnormally high in vacuum with an average computed depth of 71 ft.

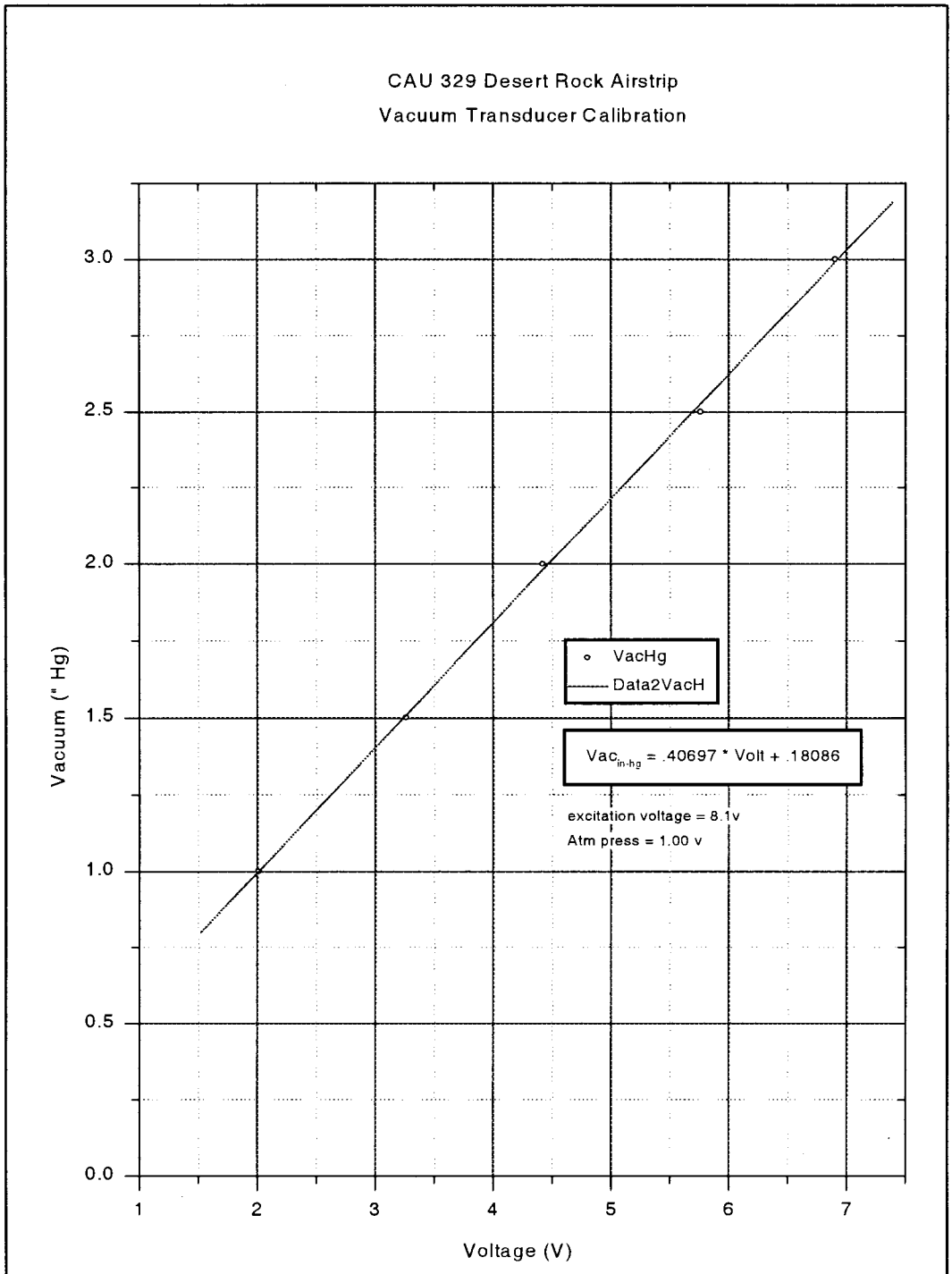

Figure 1 Vacuum Transducer Calibration

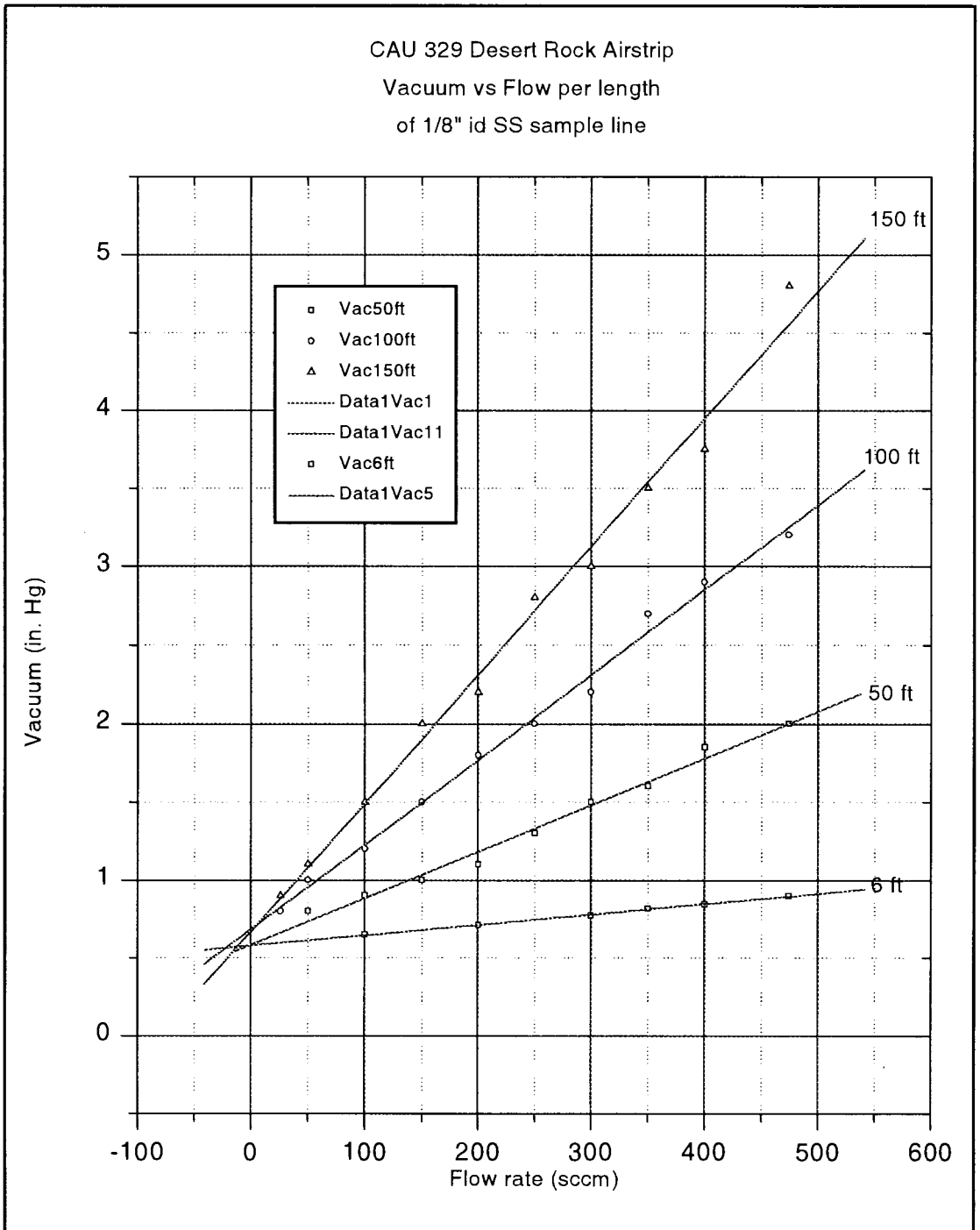

Figure 2 Vacuum vs Flow per Length

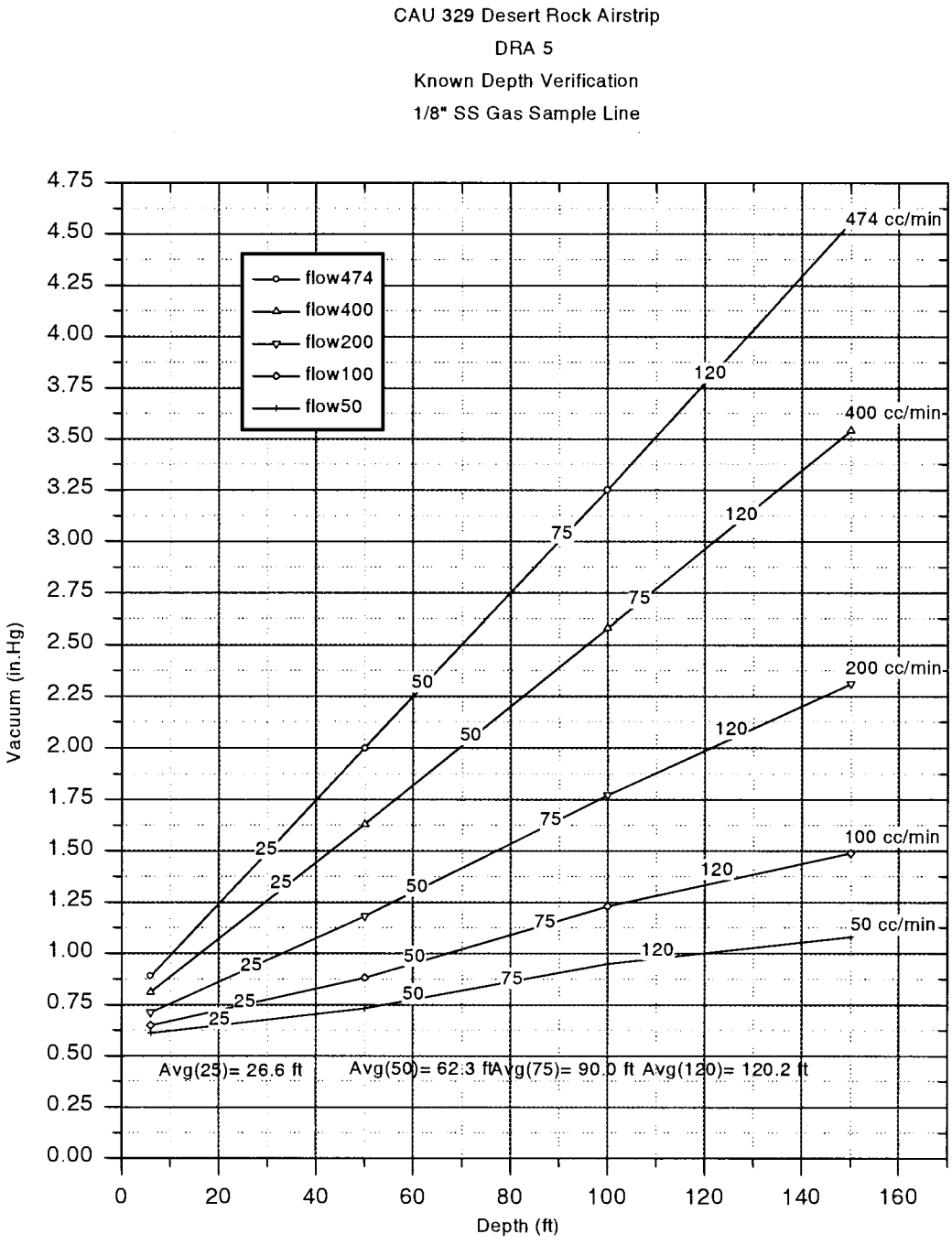

Figure 3 DRA 5 Known Depth Verification

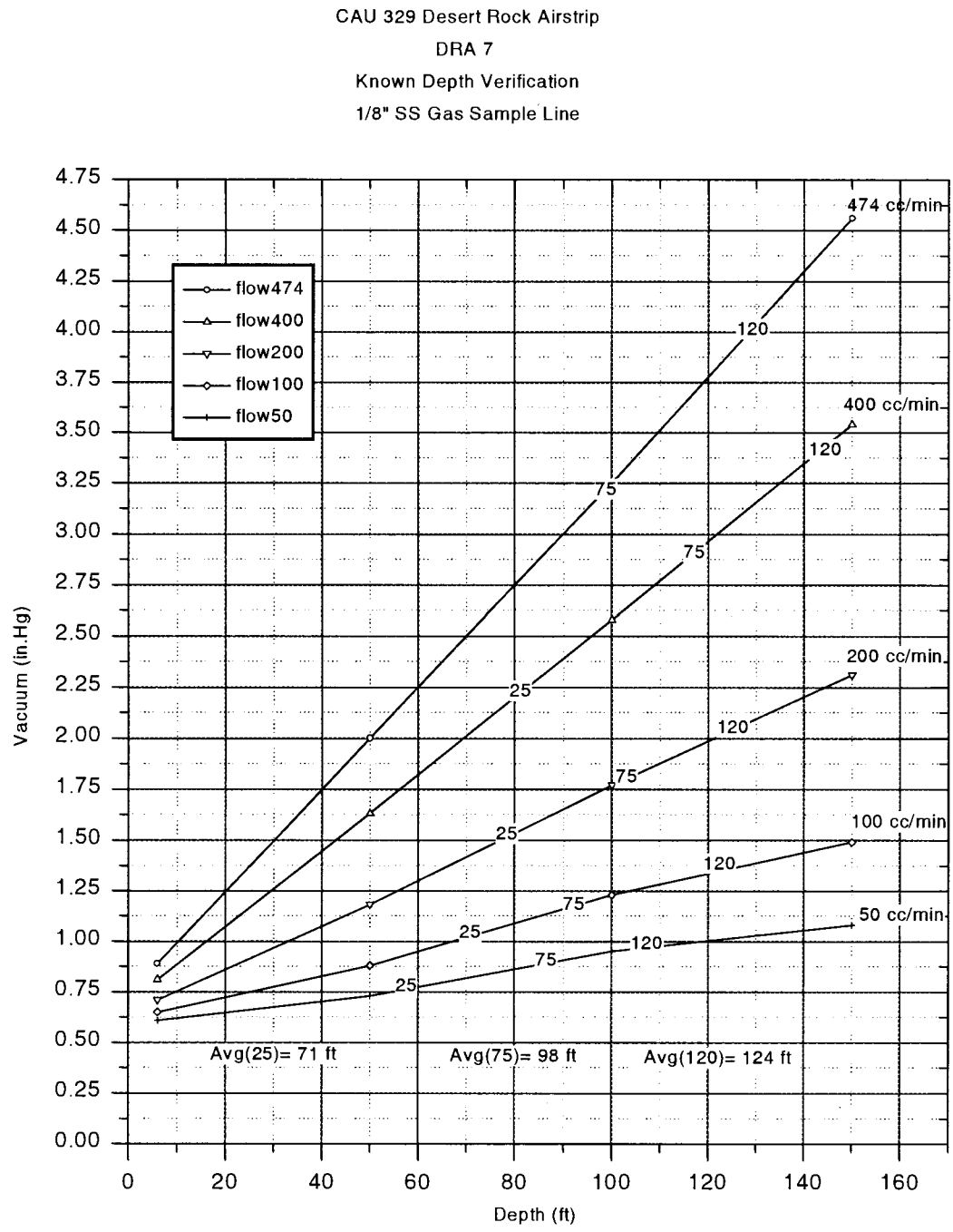

Figure 4 DRA 7 Known Depth Verification

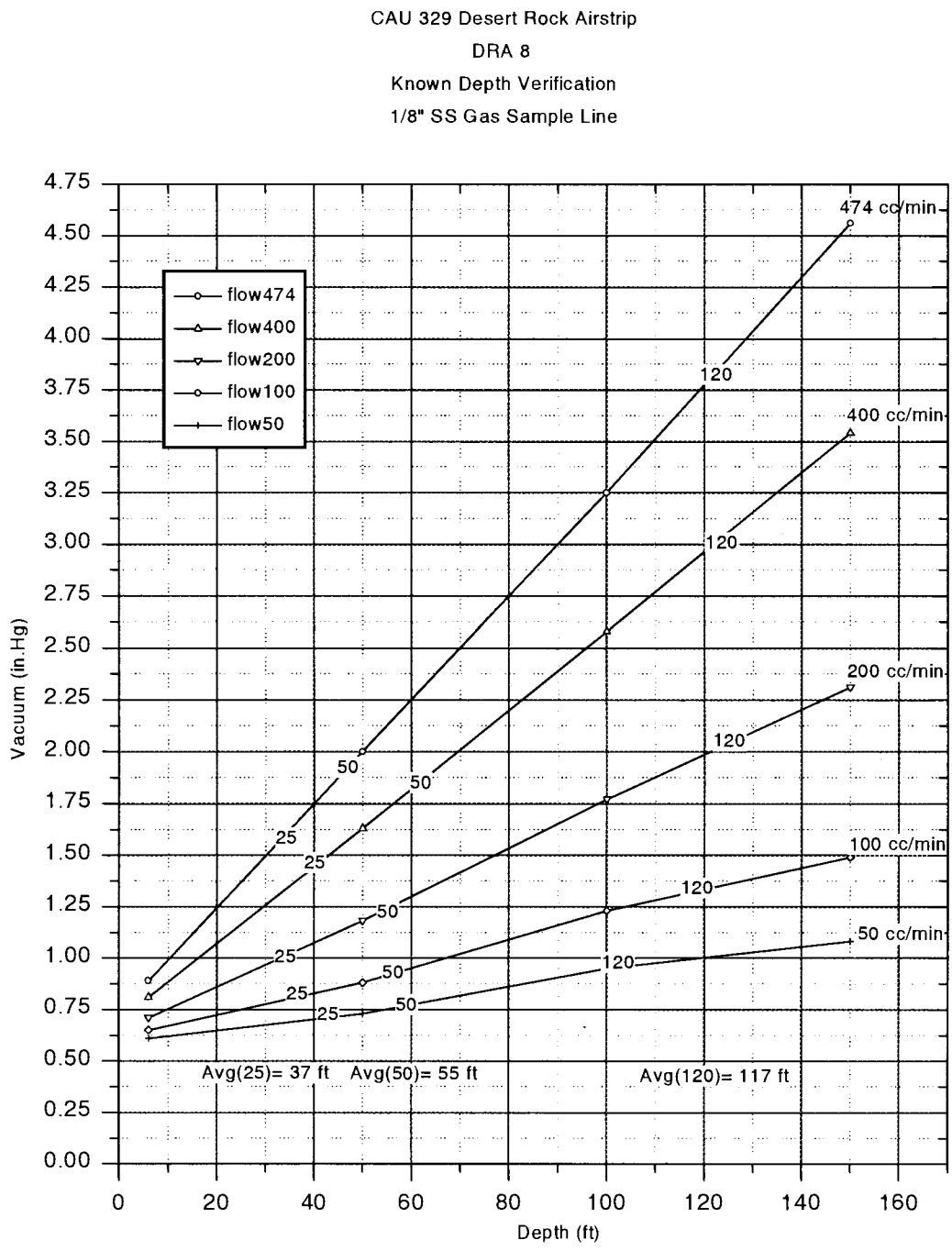

Figure 5 DRA 8 Known Depth Verification

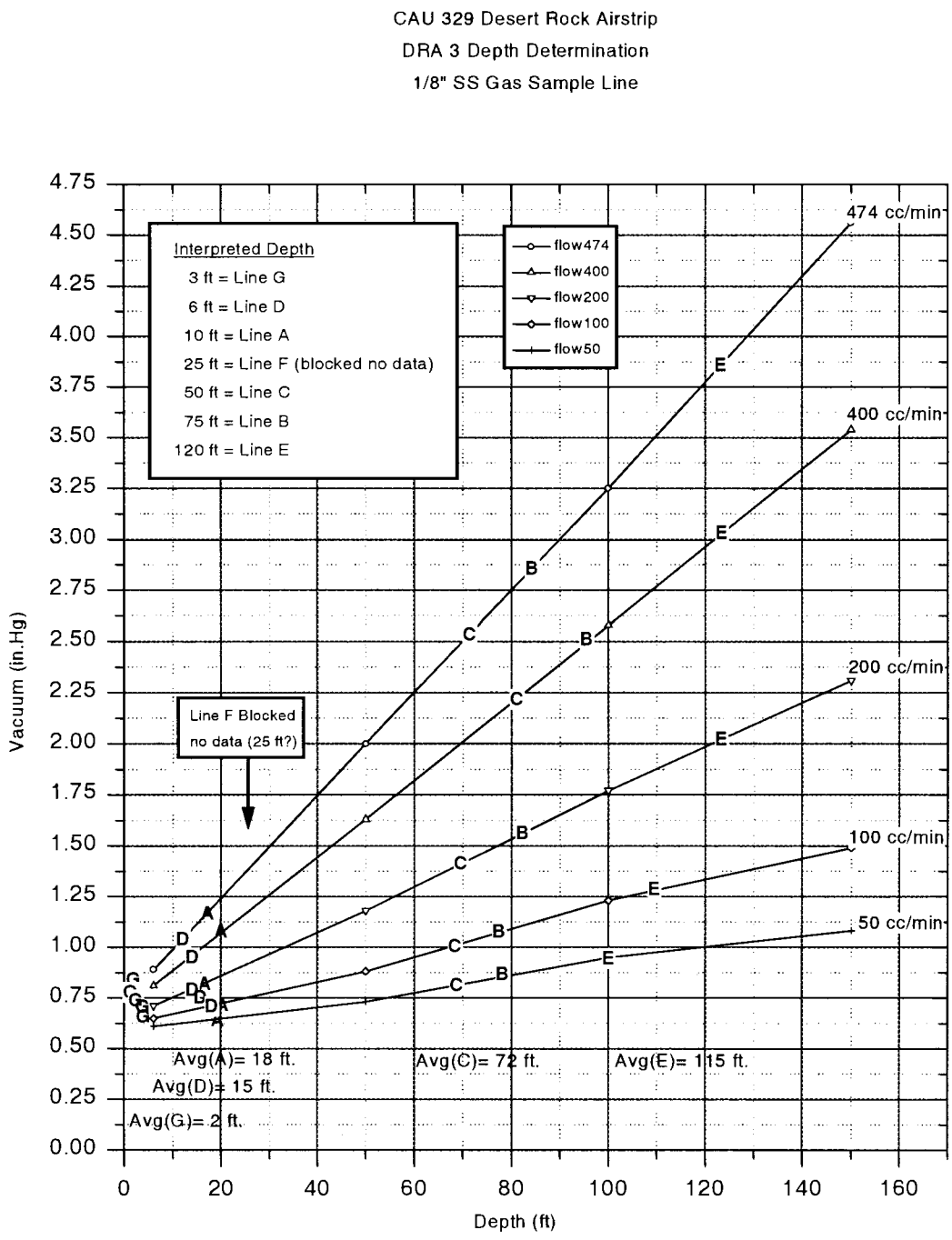

Figure 6 DRA 3 Depth Determination

TABLE 1 INTERPRETED DEPTH ASSIGNMENTS

LINE NUMBER	DEPTH (ft.)	AVERAGE COMPUTED DEPTH (ft.)
G	3	2
D	6	15
A	10	18
F	25	N/A
C	50	72
B	75	83
E	120	115

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Appendix C

Bioassessment Report

Bioassessment Report
Desert Rock Airstrip

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June 2000

C.1.0 Introduction

IT Corporation was contracted to conduct a site bioassessment on samples collected from the Desert Rock Airstrip site. The Biotechnology Applications Center received three soil samples on May 18, 2000. The samples were collected on May 9 and 10, 2000.

The Desert Rock Airstrip samples were collected from a borehole location near a former fuel tank location in the Asphalt Parking and Refueling Area. The subsurface soil had been impacted with aviation fuel. Samples were collected from 3 depths: 40 ft, 80 ft, and 120 ft bgs.

Bioremediation is an environmental remediation tool that uses bacteria to oxidize a wide variety of wastes. Bacteria can transform most natural and man-made organic compounds given appropriate environmental conditions and an adequate acclimation period. The biological conversion of organic compounds into biomass, carbon dioxide, and water, makes bioremediation an attractive remedial alternative.

In situ bioremediation using bioventing is useful for treating the vadose zone soil at many sites. During bioventing, remediation is promoted by supplying oxygen to the subsurface using blowers or vacuum pumps. Bioventing can effectively treat any biodegradable compound if bacteria are present in the soil with the metabolic capability to biodegrade the target compounds. In the case of petroleum products such as gasoline, jet fuel, diesel, and heating oils, bacteria are nearly always present but they may not be very active due to lack of oxygen, extreme pH, lack of nutrients, lack of moisture, or cold temperature.

C.2.0 Bioassessment Test Results

This bioassessment is a series of tests designed to evaluate the physical, chemical, and microbiological characteristics of a site that are likely to impact the successful application of bioventing. The bioassessment consists of residual nutrient determinations, pH, microbial population density, and the ability of the microbial populations to grow under enhanced conditions. Understanding and controlling these parameters is critical for designing and executing a successful land treatment system.

C.2.1 pH and Soil Moisture

The optimal pH for effective bioremediation is in the range of six to eight. A pH outside of this range may negatively affect microbial metabolism and contaminant biodegradation. Results of the laboratory pH measurements are reported in Table C.2-1. The pH of soil samples ranged from 8.2 to 9.2. A pH above 9 will begin to inhibit microbial activity and a pH above 9.5 is detrimental to microbial populations.

Table C.2-1
Desert Rock Airstrip
Nutrient Content, and pH, of Site Samples
IT Project No. 799422

Sample No.	Sample Depth (feet)	Matrix	Ammonia (mg/kg)[a]	Ortho-Phosphate (mg/kg)	Percent Soil Moisture	pH
DRA00025	40	Sandy Soil	<4	120	9.7	9.24
DRA00045	80	Sandy Soil	<4	230	14.1	8.67
DRA00065	120	Sandy Soil	<4	690	17.1	8.20

[a]mg/kg = Milligrams per kilograms for soil

The moisture content of the soil samples ranged from 9.7 to 17.2 percent (weight to weight). The moisture content of the soil will sustain microbial activity. The samples were characterized as sandy soil.

C.2.2 Background Nutrient Concentrations

Nutrients essential for bioremediation are nitrogen (as ammonium) and phosphorous (as orthophosphate). The existing nutrient concentrations in all samples are defined initially to determine the need for nutrient additions. Results of the analyses for these inorganic nutrients are shown in Table C.2-1. The ammonium concentrations in the three soil samples were below the detection limit of 4 milligrams per kilogram (mg/kg). This suggests that the lack of ammonium in the soil samples may limit the rate and effectiveness of remediation. Phosphate concentrations in the soil samples were moderate ranging from 120 to 690 mg/kg. Nutrient additions are recommended to avoid nutrient limited microbial activity and biodegradation. This can be accomplished by the addition of vapor phase ammonia to the subsurface.

C.2.3 Microbial Enumerations

In situ treatment requires the presence of hydrocarbon-degrading bacteria. To determine if appropriate bacteria were present, bacteria were quantified according to two categories. The first category includes heterotrophic bacteria, defined as those bacteria capable of growing on dilute, solidified nutrient medium. Heterotrophs represent a very general class of bacteria that are typically abundant in soil and groundwater. Quantification of this category provides a measure of the overall size and vigor of the bacterial population (Table C.2-2).

The second category includes hydrocarbon-degrading bacteria. These bacteria were quantified after growing in an environment where petroleum hydrocarbons were the only available carbon (or food) source. The petroleum hydrocarbon used as the carbon source for this test was Jet A aviation fuel. This test determines if the bacterial population has developed the ability to biodegrade the contaminant present in the soil samples.

The heterotrophic and hydrocarbon degrading populations were less than the detection limit of 100 CFU/g. The results indicate that under laboratory conditions, a viable microbial population was not detected in the soil samples.

Table C.2-2
Desert Rock Airstrip
Enumeration of the Microbial Population Density of Site Samples
IT Project No. 799422

Sample No.	Sample Depth (feet)	Matrix	Total Heterotrophs	Hydrocarbon Degraders
DRA00025	40	Sandy Soil	$<1.1 \times 10^2$ CFU/g	$<1.1 \times 10^2$ CFU/g
DRA00045	80	Sandy Soil	$<1.2 \times 10^2$ CFU/g	$<1.2 \times 10^2$ CFU/g
DRA00065	120	Sandy Soil	$<1.2 \times 10^2$ CFU/g	$<1.2 \times 10^2$CFU/g

C.2.4 Microbial Stimulation Test

A microbial stimulation test was performed to determine if enhanced *in situ* conditions will stimulate growth of indigenous bacteria up to densities that are adequate for biodegradation. This test involves introducing oxygen or oxygen plus nutrients to the soil slurries created from the soil samples. The results determine if oxygen will stimulate activity, and if nutrients provide an additional benefit. A positive response is indicated by a five-fold or greater change in microbial density.

Although initial bacterial densities for the heterotrophic population in the samples were less than the detection limit of 100 CFU/g, a small but positive response was observed in two of the soil samples upon oxygenation. Samples DRA00065 and DRA00045 increased from 100 CFU/g or less to 1,100 and 500 CFU/g, respectively (Table C.2-3). The addition of nutrients plus oxygenation stimulated microbial growth slightly beyond the effect of oxygenation alone in Sample DRA00065. Measurable hydrocarbon degraders were not detected in any of the treatments and, therefore, did not respond positively to stimulation. The positive response of the heterotrophic population to oxygenation indicates that the microbial population is oxygen limited and the addition of air to the subsurface should enhance the heterotrophic microbial population.

Table C.2-3
Desert Rock Airstrip
Stimulation of the Growth of Site Microbes by Enhanced Oxygenation and Nutrient Augmentation
IT Project No. 799422

Sample No.	Heterotrophs			Hydrocarbon Degraders		
	Initial	Oxygen[a]	Oxygen and Nutrients[b]	Initial	Oxygen	Oxygen and Nutrients
DRA00025	$<1 \times 10^2$	$<1 \times 10^2$	$<1 \times 10^2$	$<1 \times 10^2$	$<1 \times 10^2$	$<1 \times 10^2$
DRA00045	$<1 \times 10^2$	1×10^3	$<1 \times 10^2$	$<1 \times 10^2$	$<1 \times 10^2$	$<1 \times 10^2$
DRA00065	$<1 \times 10^2$	5×10^2	9×10^2	$<1 \times 10^2$	$<1 \times 10^2$	$<1 \times 10^2$

[a]The control treatment was vigorously shaken to provide oxygen to the microbes, but no nutrients were added in addition to those present in the sample material.
[b]Oxygen and nutrient treatments are oxygenated and nutrient augmented with 100 ppm of the microbial nutrient formulation Restore 375.

C.3.0 Summary and Conclusion

Results of the bioassessment indicate that the Desert Rock Airstrip soil conditions are less than optimal for successful bioremediation. The results of the bioassessment are summarized below:

- The pH is slightly above of the optimal range for bioremediation. A pH of 9.2 may have an inhibitory effect on microbial activity.
- The natural microbial populations for heterotrophs or hydrocarbon degraders were less than 100 CFU/g which is very low.
- Heterotrophic microbial populations reacted favorably to oxygen stimulation. One sample responded to nutrient and oxygen stimulation. Hydrocarbon degraders did not appear to respond to stimulation.
- Phosphate levels were moderate and ammonium levels were less than the method detection limit. The low ammonium concentration may limit biodegradation.
- Moisture levels were moderate to high in the soil samples and should be adequate to support microbial activity.

Site conditions are less than optimal for biodegradation but may not eliminate bioventing as a viable technology for site remediation. The pH was slightly high, ammonium was low, and the microbial population was low; however, the microbial population did respond to a limited degree to stimulation with oxygen and nutrients. The performance of a bioventing system should be confirmed using an *in situ* respiration test.

Appendix D

Use Restriction Form

CAU Use Restriction Information

CAU Number/Description: CAU 329/Area 22 Desert Rock Airstrip Fuel Spill

Applicable CAS Numbers/Descriptions: CAS 22-44-01/Fuel Spill

Contact (organization/project): DOE/NV Industrial Sites Project Manager

Surveyed Area (UTM coordinates; Zone 11, NAD 27): A 9 meter diameter circle with the center at Northing 4053140.951 Easting 586917.688

Survey Date: 6/15/2000 **Survey Method (GPS, etc.):** GPS

Site Monitoring Requirements: Soil gas monitoring

Required Frequency (quarterly, annually?): Annually

If Monitoring Has Started, Indicate Last Completion Date: June 30, 2000

Use Restrictions

The future use of any land related to this Corrective Action Unit (CAU), as described by the above surveyed location, is restricted from any DOE or Air Force activity that may alter or modify the containment control as approved by the state and identified in the CAU Closure Report or other CAU documentation unless appropriate concurrence is obtained in advance.

Comments: See the CAU 329 Closure Report for additional information on the condition of the site and any monitoring and/or inspection requirements.

Submitted By: /s/ Signature on file **Date:** 8/7/2000

cc with copy of survey map (paper and digital (.dgn) formats):
CAU Files (2 copies)

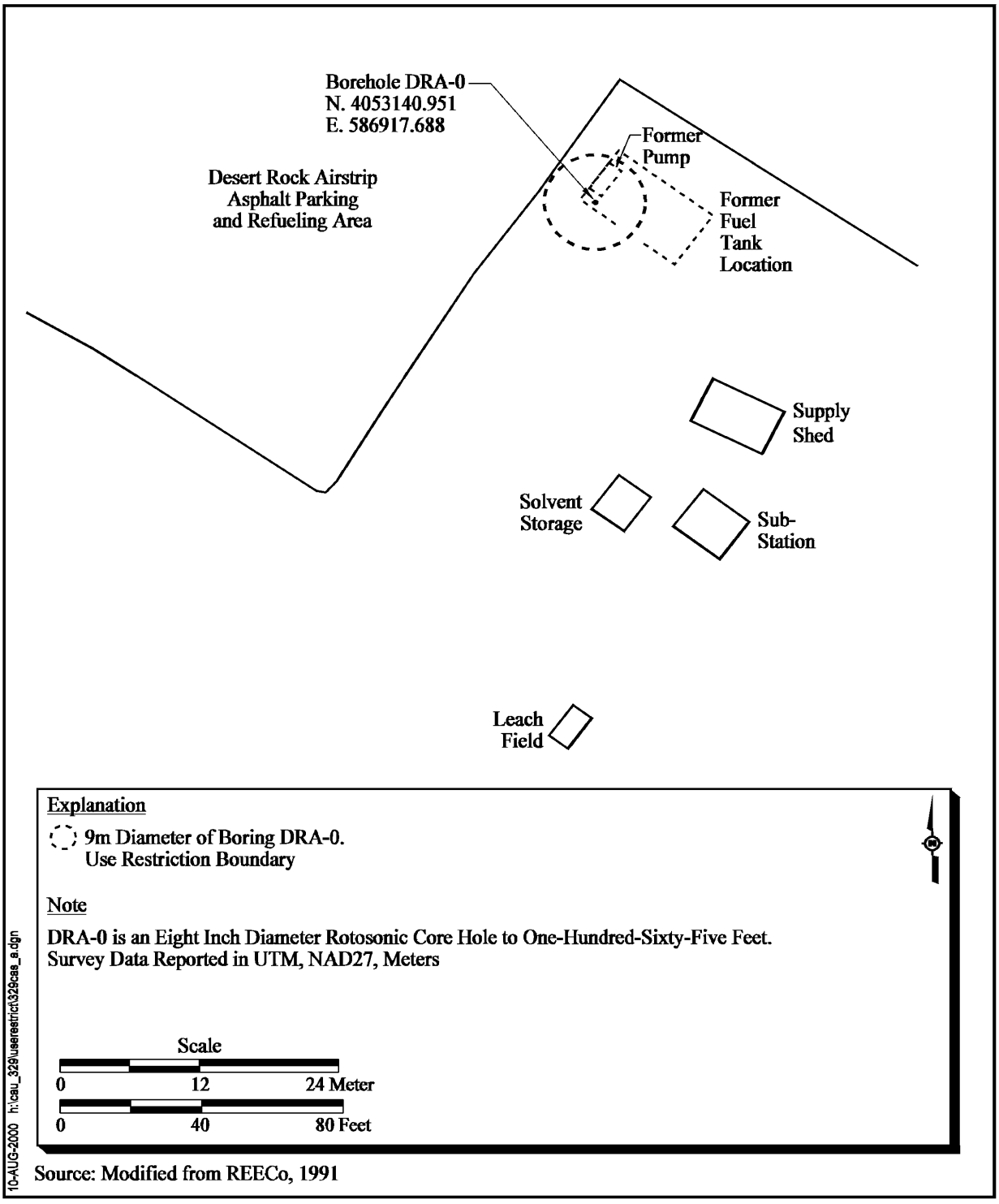

Figure D.1-1
Corrective Action Unit 329 Site Map Showing Location of Instrumented Boreholes

Appendix E

Closure Verification Analytical Results

GC/MS Volatiles

Method SW8260
Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0007S
Lab ID: 0005082-4

Sample Matrix: SOIL
% Moisture: 5
Date Collected: 11-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 5 G
Final Volume: 5 ML
Result Units: UG/KG
File Name: B8284

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	1	11	11	0.72	U	
74-87-3	CHLOROMETHANE	1	11	11	0.44	U	
75-01-4	VINYL CHLORIDE	1	11	11	0.66	U	
74-83-9	BROMOMETHANE	1	11	11	1.4	U	
75-00-3	CHLOROETHANE	1	11	11	0.74	U	
75-69-4	TRICHLOROFLUOROMETHANE	1	5.3	5.3	0.57	U	
75-35-4	1,1-DICHLOROETHENE	1	5.3	5.3	0.61	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	1	5.3	5.3	0.75	U	
67-64-1	ACETONE	1	21	21	7.8	U	
74-88-4	IODOMETHANE	1	5.3	5.3	0.48	U	
75-15-0	CARBON DISULFIDE	1	5.3	5.3	0.58	U	
75-09-2	METHYLENE CHLORIDE	1	6.2	5.3	0.82	B U	132
156-60-5	TRANS-1,2-DICHLOROETHENE	1	5.3	5.3	0.44	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	1	5.3	5.3	0.57	U	
75-34-3	1,1-DICHLOROETHANE	1	5.3	5.3	0.36	U	
108-05-4	VINYL ACETATE	1	21	21	2	U	
156-59-2	CIS-1,2-DICHLOROETHENE	1	5.3	5.3	0.35	U	
78-93-3	2-BUTANONE	1	21	21	1.8	U	
74-97-5	BROMOCHLOROMETHANE	1	5.3	5.3	0.47	U	
67-66-3	CHLOROFORM	1	5.3	5.3	0.42	U	
71-55-6	1,1,1-TRICHLOROETHANE	1	5.3	5.3	0.59	U	
594-20-7	2,2-DICHLOROPROPANE	1	5.3	5.3	0.76	U	
56-23-5	CARBON TETRACHLORIDE	1	5.3	5.3	0.63	U	
563-58-6	1,1-DICHLOROPROPENE	1	5.3	5.3	0.59	U	
107-06-2	1,2-DICHLOROETHANE	1	5.3	5.3	0.45	U	
71-43-2	BENZENE	1	5.3	5.3	0.46	U	
79-01-6	TRICHLOROETHENE	1	5.3	5.3	0.37	U	
78-87-5	1,2-DICHLOROPROPANE	1	5.3	5.3	0.43	U	
74-95-3	DIBROMOMETHANE	1	5.3	5.3	0.78	U	

CB

Data Package ID: *VL0005082-1*

LV 6.22-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0007S
Lab ID: 0005082-4

Sample Matrix: SOIL
% Moisture: 5
Date Collected: 11-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 5 G
Final Volume: 5 ML
Result Units: UG/KG
File Name: B8284

75-27-4	BROMODICHLOROMETHANE	1	5.3	5.3	0.51	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	1	5.3	5.3	0.52	U	
108-10-1	4-METHYL-2-PENTANONE	1	21	21	1.8	U	
108-88-3	TOLUENE	1	5.3	5.3	0.59	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	1	5.3	5.3	0.54	U	
79-00-5	1,1,2-TRICHLOROETHANE	1	5.3	5.3	0.4	U	
591-78-6	2-HEXANONE	1	21	21	2.8	U	
127-18-4	TETRACHLOROETHENE	1	5.3	5.3	0.87	U	
142-28-9	1,3-DICHLOROPROPANE	1	5.3	5.3	0.44	U	
124-48-1	DIBROMOCHLOROMETHANE	1	5.3	5.3	0.53	U	
106-93-4	1,2-DIBROMOETHANE	1	5.3	5.3	0.64	U	
544-10-5	1-CHLOROHEXANE	1	5.3	5.3	0.61	U	
108-90-7	CHLOROBENZENE	1	5.3	5.3	0.55	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	1	5.3	5.3	0.52	U	
100-41-4	ETHYLBENZENE	1	5.3	5.3	0.62	U	
136777-61-2	M+P-XYLENE	1	5.3	5.3	1.4	U	
95-47-6	O-XYLENE	1	5.3	5.3	0.79	U	
100-42-5	STYRENE	1	5.3	5.3	0.89	U	
75-25-2	BROMOFORM	1	5.3	5.3	0.44	U	
98-82-8	ISOPROPYLBENZENE	1	5.3	5.3	0.69	U	
96-18-4	1,2,3-TRICHLOROPROPANE	1	5.3	5.3	0.58	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	1	5.3	5.3	0.76	U	
108-86-1	BROMOBENZENE	1	5.3	5.3	0.72	U	
103-65-1	N-PROPYLBENZENE	1	5.3	5.3	0.73	U	
95-49-8	2-CHLOROTOLUENE	1	5.3	5.3	0.71	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	1	5.3	5.3	0.65	U	
106-43-4	4-CHLOROTOLUENE	1	5.3	5.3	0.78	U	
98-06-6	TERT-BUTYLBENZENE	1	5.3	5.3	0.64	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	1	5.3	5.3	0.73	U	
135-98-8	SEC-BUTYLBENZENE	1	5.3	5.3	0.8	U	
541-73-1	1,3-DICHLOROBENZENE	1	5.3	5.3	0.77	U	
99-87-6	P-ISOPROPYLTOLUENE	1	5.3	5.3	0.58	U	

Data Package ID: *VL0005082-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0007S
Lab ID: 0005082-4

Sample Matrix: SOIL
% Moisture: 5
Date Collected: 11-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 5 G
Final Volume: 5 ML
Result Units: UG/KG
File Name: B8284

106-46-7	1,4-DICHLOROBENZENE	1	5.3	5.3	0.61	U	
104-51-8	N-BUTYLBENZENE	1	5.3	5.3	0.72	U	
95-50-1	1,2-DICHLOROBENZENE	1	5.3	5.3	0.63	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	1	11	11	0.93	U	
120-82-1	1,2,4-TRICHLOROBENZENE	1	5.3	5.3	0.99	U	
87-68-3	HEXACHLOROBUTADIENE	1	5.3	5.3	1.3	U	
91-20-3	NAPHTHALENE	1	3.5	5.3	0.81	J	
87-61-6	1,2,3-TRICHLOROBENZENE	1	5.3	5.3	0.81	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	55		52.6	105	66 - 145
1868-53-7	DIBROMOFLUOROMETHANE	50.1		52.6	95	70 - 139
2037-26-5	TOLUENE-D8	51.2		52.6	97	76 - 125

Data Package ID: *VL0005082-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0001S
Lab ID: 0005082-6

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8286

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	100	2700	2700	180	U	
74-87-3	CHLOROMETHANE	100	2700	2700	110	U	
75-01-4	VINYL CHLORIDE	100	2700	2700	170	U	
74-83-9	BROMOMETHANE	100	2700	2700	350	U	
75-00-3	CHLOROETHANE	100	2700	2700	190	U	
75-69-4	TRICHLOROFLUOROMETHANE	100	1300	1300	150	U	
75-35-4	1,1-DICHLOROETHENE	100	1300	1300	160	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	100	1300	1300	190	U	
67-64-1	ACETONE	100	5400	5400	2000	U	
74-88-4	IODOMETHANE	100	1300	1300	120	U	
75-15-0	CARBON DISULFIDE	100	1300	1300	150	U	
75-09-2	METHYLENE CHLORIDE	100	1300 620	1300	210	J,B U	132 CB
156-60-5	TRANS-1,2-DICHLOROETHENE	100	1300	1300	110	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	100	1300	1300	150	U	
75-34-3	1,1-DICHLOROETHANE	100	1300	1300	91	U	
108-05-4	VINYL ACETATE	100	5400	5400	510	U	
156-59-2	CIS-1,2-DICHLOROETHENE	100	1300	1300	89	U	
78-93-3	2-BUTANONE	100	5400 1900	5400	460	J,B U	132 CB
74-97-5	BROMOCHLOROMETHANE	100	1300	1300	120	U	
67-66-3	CHLOROFORM	100	1300	1300	110	U	
71-55-6	1,1,1-TRICHLOROETHANE	100	1300	1300	150	U	
594-20-7	2,2-DICHLOROPROPANE	100	1300	1300	190	U	
56-23-5	CARBON TETRACHLORIDE	100	1300	1300	160	U	
563-58-6	1,1-DICHLOROPROPENE	100	1300	1300	150	U	
107-06-2	1,2-DICHLOROETHANE	100	1300	1300	120	U	
71-43-2	BENZENE	100	1300	1300	120	U	
79-01-6	TRICHLOROETHENE	100	1300	1300	94	U	
78-87-5	1,2-DICHLOROPROPANE	100	1300	1300	110	U	
74-95-3	DIBROMOMETHANE	100	1300	1300	200	U	

Data Package ID: *VL0005082-1*

RL 6.23.00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0001S
Lab ID: 0005082-6

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8286

75-27-4	BROMODICHLOROMETHANE	100	1300	1300	130	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	100	1300	1300	130	U	
108-10-1	4-METHYL-2-PENTANONE	100	5400	5400	460	U	
108-88-3	TOLUENE	100	1300	1300	150	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	100	1300	1300	140	U	
79-00-5	1,1,2-TRICHLOROETHANE	100	1300	1300	100	U	
591-78-6	2-HEXANONE	100	5400	5400	730	U	
127-18-4	TETRACHLOROETHENE	100	1300	1300	220	U	
142-28-9	1,3-DICHLOROPROPANE	100	1300	1300	110	U	
124-48-1	DIBROMOCHLOROMETHANE	100	1300	1300	130	U	
106-93-4	1,2-DIBROMOETHANE	100	1300	1300	160	U	
544-10-5	1-CHLOROHEXANE	100	1300	1300	160	U	
108-90-7	CHLOROBENZENE	100	1300	1300	140	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	100	1300	1300	130	U	
100-41-4	ETHYLBENZENE	100	610	1300	160	J	
136777-61-2	M+P-XYLENE	100	1400	1300	350		
95-47-6	O-XYLENE	100	630	1300	200	J	
100-42-5	STYRENE	100	1300	1300	230	U	
75-25-2	BROMOFORM	100	1300	1300	110	U	
98-82-8	ISOPROPYLBENZENE	100	400	1300	180	J	
96-18-4	1,2,3-TRICHLOROPROPANE	100	1300	1300	150	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	100	1300	1300	190	U	
108-86-1	BROMOBENZENE	100	1300	1300	180	U	
103-65-1	N-PROPYLBENZENE	100	1300	1300	190	J	
95-49-8	2-CHLOROTOLUENE	100	1300	1300	180	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	100	3400	1300	170		
106-43-4	4-CHLOROTOLUENE	100	1300	1300	200	U	
98-06-6	TERT-BUTYLBENZENE	100	1300	1300	160	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	100	2600	1300	190		
135-98-8	SEC-BUTYLBENZENE	100	2600	1300	200		
541-73-1	1,3-DICHLOROBENZENE	100	1300	1300	200	U	
99-87-6	P-ISOPROPYLTOLUENE	100	3200	1300	150		

Data Package ID: *VL0005082-1*

AL 6-23-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0001S
Lab ID: 0005082-6

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8286

106-46-7	1,4-DICHLOROBENZENE	100	1300	1300	160	U	
104-51-8	N-BUTYLBENZENE	100	4400	1300	180		
95-50-1	1,2-DICHLOROBENZENE	100	1300	1300	160	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	100	2700	2700	240	U	
120-82-1	1,2,4-TRICHLOROBENZENE	100	1300	1300	250	U	
87-68-3	HEXACHLOROBUTADIENE	100	1300	1300	320	U	
91-20-3	NAPHTHALENE	100	2000	1300	210	B U	132
87-61-6	1,2,3-TRICHLOROBENZENE	100	1300	1300	210	U	

AQ

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	61.3		53.7	114	66 - 145
1868-53-7	DIBROMOFLUOROMETHANE	48.8		53.7	91	70 - 139
2037-26-5	TOLUENE-D8	53.6		53.7	100	76 - 125

6.23.00

Data Package ID: *VL0005082-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0002S
Lab ID: 0005082-7

Sample Matrix: SOIL
% Moisture: 4.5
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8288

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	100	2600	2600	180	U	
74-87-3	CHLOROMETHANE	100	2600	2600	110	U	
75-01-4	VINYL CHLORIDE	100	2600	2600	160	U	
74-83-9	BROMOMETHANE	100	2600	2600	340	U	
75-00-3	CHLOROETHANE	100	2600	2600	180	U	
75-69-4	TRICHLOROFLUOROMETHANE	100	1300	1300	140	U	
75-35-4	1,1-DICHLOROETHENE	100	1300	1300	150	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	100	1300	1300	190	U	
67-64-1	ACETONE	100	5200	5200	1900	U	
74-88-4	IODOMETHANE	100	1300	1300	120	U	
75-15-0	CARBON DISULFIDE	100	1300	1300	140	U	
75-09-2	METHYLENE CHLORIDE	100	1300 660	1300	200	J,B U	132 CB
156-60-5	TRANS-1,2-DICHLOROETHENE	100	1300	1300	110	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	100	1300	1300	140	U	
75-34-3	1,1-DICHLOROETHANE	100	1300	1300	89	U	
108-05-4	VINYL ACETATE	100	5200	5200	500	U	
156-59-2	CIS-1,2-DICHLOROETHENE	100	1300	1300	86	U	
78-93-3	2-BUTANONE	100	5200 2100	5200	450	J,B U	132 CB
74-97-5	BROMOCHLOROMETHANE	100	1300	1300	120	U	
67-66-3	CHLOROFORM	100	1300	1300	100	U	
71-55-6	1,1,1-TRICHLOROETHANE	100	1300	1300	150	U	
594-20-7	2,2-DICHLOROPROPANE	100	1300	1300	190	U	
56-23-5	CARBON TETRACHLORIDE	100	1300	1300	160	U	
563-58-6	1,1-DICHLOROPROPENE	100	1300	1300	150	U	
107-06-2	1,2-DICHLOROETHANE	100	1300	1300	110	U	
71-43-2	BENZENE	100	1300	1300	120	U	
79-01-6	TRICHLOROETHENE	100	1300	1300	92	U	
78-87-5	1,2-DICHLOROPROPANE	100	1300	1300	110	U	
74-95-3	DIBROMOMETHANE	100	1300	1300	190	U	

Data Package ID: *VL0005082-1*

LL 6-23-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0002S
Lab ID: 0005082-7

Sample Matrix: SOIL
% Moisture: 4.5
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8288

75-27-4	BROMODICHLOROMETHANE	100	1300	1300	130	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	100	1300	1300	130	U	
108-10-1	4-METHYL-2-PENTANONE	100	5200	5200	450	U	
108-88-3	TOLUENE	100	1300	1300	150	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	100	1300	1300	130	U	
79-00-5	1,1,2-TRICHLOROETHANE	100	1300	1300	99	U	
591-78-6	2-HEXANONE	100	5200	5200	710	U	
127-18-4	TETRACHLOROETHENE	100	1300	1300	220	U	
142-28-9	1,3-DICHLOROPROPANE	100	1300	1300	110	U	
124-48-1	DIBROMOCHLOROMETHANE	100	1300	1300	130	U	
106-93-4	1,2-DIBROMOETHANE	100	1300	1300	160	U	
544-10-5	1-CHLOROHEXANE	100	1300	1300	150	U	
108-90-7	CHLOROBENZENE	100	1300	1300	140	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	100	1300	1300	130	U	
100-41-4	ETHYLBENZENE	100	1800	1300	150		
136777-61-2	M+P-XYLENE	100	5700	1300	340		
95-47-6	O-XYLENE	100	1300	1300	200	U	
100-42-5	STYRENE	100	1300	1300	220	U	
75-25-2	BROMOFORM	100	1300	1300	110	U	
98-82-8	ISOPROPYLBENZENE	100	1500	1300	170		
96-18-4	1,2,3-TRICHLOROPROPANE	100	1300	1300	140	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	100	1300	1300	190	U	
108-86-1	BROMOBENZENE	100	1300	1300	180	U	
103-65-1	N-PROPYLBENZENE	100	4200	1300	180		
95-49-8	2-CHLOROTOLUENE	100	1300	1300	180	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	100	7700	1300	160		
106-43-4	4-CHLOROTOLUENE	100	1300	1300	190	U	
98-06-6	TERT-BUTYLBENZENE	100	230	1300	160	J	
95-63-6	1,2,4-TRIMETHYLBENZENE	100	17000	1300	180		
135-98-8	SEC-BUTYLBENZENE	100	3500	1300	200		
541-73-1	1,3-DICHLOROBENZENE	100	1300	1300	190	U	
99-87-6	P-ISOPROPYLTOLUENE	100	3900	1300	140		

Data Package ID: *VL0005082-1*

6-23-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0002S
Lab ID: 0005082-7

Sample Matrix: SOIL
% Moisture: 4.5
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8288

106-46-7	1,4-DICHLOROBENZENE	100	1300	1300	150	U	
104-51-8	N-BUTYLBENZENE	100	7200	1300	180		
95-50-1	1,2-DICHLOROBENZENE	100	1300	1300	160	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	100	2600	2600	230	U	
120-82-1	1,2,4-TRICHLOROBENZENE	100	1300	1300	250	U	
87-68-3	HEXACHLOROBUTADIENE	100	1300	1300	310	U	
91-20-3	NAPHTHALENE	100	4600	1300	200	B	
87-61-6	1,2,3-TRICHLOROBENZENE	100	1300	1300	200	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	59.6		52.4	114	66 - 145
1868-53-7	DIBROMOFLUOROMETHANE	45.4		52.4	87	70 - 139
2037-26-5	TOLUENE-D8	53.1		52.4	101	76 - 125

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6-23-00

Data Package ID: *VL0005082-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8290

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	100	2800	2800	190	U	
74-87-3	CHLOROMETHANE	100	2800	2800	120	U	
75-01-4	VINYL CHLORIDE	100	2800	2800	180	U	
74-83-9	BROMOMETHANE	100	2800	2800	360	U	
75-00-3	CHLOROETHANE	100	2800	2800	200	U	
75-69-4	TRICHLOROFLUOROMETHANE	100	1400	1400	150	U	
75-35-4	1,1-DICHLOROETHENE	100	1400	1400	160	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	100	1400	1400	200	U	
67-64-1	ACETONE	100	5600	5600	2100	U	
74-88-4	IODOMETHANE	100	1400	1400	130	U	
75-15-0	CARBON DISULFIDE	100	1400	1400	150	U	
75-09-2	METHYLENE CHLORIDE	100	1400 ~~770~~	1400	220	J,B U	132 CB
156-60-5	TRANS-1,2-DICHLOROETHENE	100	1400	1400	120	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	100	1400	1400	150	U	
75-34-3	1,1-DICHLOROETHANE	100	1400	1400	95	U	
108-05-4	VINYL ACETATE	100	5600	5600	530	U	
156-59-2	CIS-1,2-DICHLOROETHENE	100	1400	1400	92	U	
78-93-3	2-BUTANONE	100	~~5600~~ 2100	5600	470	J,B U	132 CB
74-97-5	BROMOCHLOROMETHANE	100	1400	1400	130	U	
67-66-3	CHLOROFORM	100	1400	1400	110	U	
71-55-6	1,1,1-TRICHLOROETHANE	100	1400	1400	160	U	
594-20-7	2,2-DICHLOROPROPANE	100	1400	1400	200	U	
56-23-5	CARBON TETRACHLORIDE	100	1400	1400	170	U	
563-58-6	1,1-DICHLOROPROPENE	100	1400	1400	160	U	
107-06-2	1,2-DICHLOROETHANE	100	1400	1400	120	U	
71-43-2	BENZENE	100	1400	1400	120	U	
79-01-6	TRICHLOROETHENE	100	1400	1400	98	U	
78-87-5	1,2-DICHLOROPROPANE	100	1400	1400	110	U	
74-95-3	DIBROMOMETHANE	100	1400	1400	210	U	

Data Package ID: *VL0005082-1*

RL 6-23-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8290

75-27-4	BROMODICHLOROMETHANE	100	1400	1400	130	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	100	1400	1400	140	U	
108-10-1	4-METHYL-2-PENTANONE	100	5600	5600	470	U	
108-88-3	TOLUENE	100	1400	1400	160	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	100	1400	1400	140	U	
79-00-5	1,1,2-TRICHLOROETHANE	100	1400	1400	110	U	
591-78-6	2-HEXANONE	100	5600	5600	750	U	
127-18-4	TETRACHLOROETHENE	100	1400	1400	230	U	
142-28-9	1,3-DICHLOROPROPANE	100	1400	1400	120	U	
124-48-1	DIBROMOCHLOROMETHANE	100	1400	1400	140	U	
106-93-4	1,2-DIBROMOETHANE	100	1400	1400	170	U	
544-10-5	1-CHLOROHEXANE	100	1400	1400	160	U	
108-90-7	CHLOROBENZENE	100	1400	1400	150	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	100	1400	1400	140	U	
100-41-4	ETHYLBENZENE	100	6000	1400	160		
136777-61-2	M+P-XYLENE	100	25000	1400	360		
95-47-6	O-XYLENE	100	2500	1400	210		
100-42-5	STYRENE	100	1400	1400	240	U	
75-25-2	BROMOFORM	100	1400	1400	120	U	
98-82-8	ISOPROPYLBENZENE	100	4400	1400	180		
96-18-4	1,2,3-TRICHLOROPROPANE	100	1400	1400	150	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	100	1400	1400	200	U	
108-86-1	BROMOBENZENE	100	1400	1400	190	U	
103-65-1	N-PROPYLBENZENE	100	11000	1400	190		
95-49-8	2-CHLOROTOLUENE	100	1400	1400	190	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	100	22000	1400	170		
106-43-4	4-CHLOROTOLUENE	100	1400	1400	210	U	
98-06-6	TERT-BUTYLBENZENE	100	1400	1400	170	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	100	66000	1400	190	E	
135-98-8	SEC-BUTYLBENZENE	100	7500	1400	210		
541-73-1	1,3-DICHLOROBENZENE	100	1400	1400	200	U	
99-87-6	P-ISOPROPYLTOLUENE	100	7500	1400	150		

Data Package ID: *VL0005082-1*

Rc 6-23-00

GC/MS Volatiles

Method SW8260
Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8290

106-46-7	1,4-DICHLOROBENZENE	100	1400	1400	160	U	
104-51-8	N-BUTYLBENZENE	100	15000	1400	190		
95-50-1	1,2-DICHLOROBENZENE	100	1400	1400	170	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	100	2800	2800	250	U	
120-82-1	1,2,4-TRICHLOROBENZENE	100	1400	1400	260	U	
87-68-3	HEXACHLOROBUTADIENE	100	1400	1400	340	U	
91-20-3	NAPHTHALENE	100	36000	1400	220	B	
87-61-6	1,2,3-TRICHLOROBENZENE	100	1400	1400	220	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	67.8		55.9	121	66 - 145
1868-53-7	DIBROMOFLUOROMETHANE	48.1		55.9	86	70 - 139
2037-26-5	TOLUENE-D8	54.6		55.9	98	76 - 125

AL 6-23-00

Data Package ID: *VL0005082-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA00031S
Lab ID: 0005082-9

Sample Matrix: SOIL
% Moisture: 13.2
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8292

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	100	2900	2900	200	U	
74-87-3	CHLOROMETHANE	100	2900	2900	120	U	
75-01-4	VINYL CHLORIDE	100	2900	2900	180	U	
74-83-9	BROMOMETHANE	100	2900	2900	370	U	
75-00-3	CHLOROETHANE	100	2900	2900	200	U	
75-69-4	TRICHLOROFLUOROMETHANE	100	1400	1400	160	U	
75-35-4	1,1-DICHLOROETHENE	100	1400	1400	170	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	100	1400	1400	200	U	
67-64-1	ACETONE	100	5800	5800	2100	U	
74-88-4	IODOMETHANE	100	1400	1400	130	U	
75-15-0	CARBON DISULFIDE	100	1400	1400	160	U	
75-09-2	METHYLENE CHLORIDE	100	1400 I10	1400	220	J,B U	132 CB
156-60-5	TRANS-1,2-DICHLOROETHENE	100	1400	1400	120	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	100	1400	1400	160	U	
75-34-3	1,1-DICHLOROETHANE	100	1400	1400	98	U	
108-05-4	VINYL ACETATE	100	5800	5800	550	U	
156-59-2	CIS-1,2-DICHLOROETHENE	100	1400	1400	95	U	
78-93-3	2-BUTANONE	100	5800 1900	5800	490	J,B U	132 CB
74-97-5	BROMOCHLOROMETHANE	100	1400	1400	130	U	
67-66-3	CHLOROFORM	100	1400	1400	120	U	
71-55-6	1,1,1-TRICHLOROETHANE	100	1400	1400	160	U	
594-20-7	2,2-DICHLOROPROPANE	100	1400	1400	210	U	
56-23-5	CARBON TETRACHLORIDE	100	1400	1400	170	U	
563-58-6	1,1-DICHLOROPROPENE	100	1400	1400	160	U	
107-06-2	1,2-DICHLOROETHANE	100	1400	1400	120	U	
71-43-2	BENZENE	100	1400	1400	130	U	
79-01-6	TRICHLOROETHENE	100	1400	1400	100	U	
78-87-5	1,2-DICHLOROPROPANE	100	1400	1400	120	U	
74-95-3	DIBROMOMETHANE	100	1400	1400	210	U	

Data Package ID: *VL0005082-1*

RL 6-23-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA00031S
Lab ID: 0005082-9

Sample Matrix: SOIL
% Moisture: 13.2
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8292

75-27-4	BROMODICHLOROMETHANE	100	1400	1400	140	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	100	1400	1400	140	U	
108-10-1	4-METHYL-2-PENTANONE	100	5800	5800	490	U	
108-88-3	TOLUENE	100	1400	1400	160	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	100	1400	1400	150	U	
79-00-5	1,1,2-TRICHLOROETHANE	100	1400	1400	110	U	
591-78-6	2-HEXANONE	100	5800	5800	780	U	
127-18-4	TETRACHLOROETHENE	100	1400	1400	240	U	
142-28-9	1,3-DICHLOROPROPANE	100	1400	1400	120	U	
124-48-1	DIBROMOCHLOROMETHANE	100	1400	1400	140	U	
106-93-4	1,2-DIBROMOETHANE	100	1400	1400	180	U	
544-10-5	1-CHLOROHEXANE	100	1400	1400	170	U	
108-90-7	CHLOROBENZENE	100	1400	1400	150	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	100	1400	1400	140	U	
100-41-4	ETHYLBENZENE	100	4300	1400	170		
136777-61-2	M+P-XYLENE	100	18000	1400	370		
95-47-6	O-XYLENE	100	2700	1400	220		
100-42-5	STYRENE	100	1400	1400	240	U	
75-25-2	BROMOFORM	100	1400	1400	120	U	
98-82-8	ISOPROPYLBENZENE	100	3500	1400	190		
96-18-4	1,2,3-TRICHLOROPROPANE	100	1400	1400	160	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	100	1400	1400	210	U	
108-86-1	BROMOBENZENE	100	1400	1400	200	U	
103-65-1	N-PROPYLBENZENE	100	9300	1400	200		
95-49-8	2-CHLOROTOLUENE	100	1400	1400	190	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	100	18000	1400	180		
106-43-4	4-CHLOROTOLUENE	100	1400	1400	210	U	
98-06-6	TERT-BUTYLBENZENE	100	1400	1400	180	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	100	56000	1400	200		
135-98-8	SEC-BUTYLBENZENE	100	6600	1400	220		
541-73-1	1,3-DICHLOROBENZENE	100	1400	1400	210	U	
99-87-6	P-ISOPROPYLTOLUENE	100	6900	1400	160		

Data Package ID: *VL0005082-1*

LL 6-23-00

GC/MS Volatiles

Method SW8260
Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA00031S
Lab ID: 0005082-9

Sample Matrix: SOIL
% Moisture: 13.2
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8292

106-46-7	1,4-DICHLOROBENZENE	100	1400	1400	170	U	
104-51-8	N-BUTYLBENZENE	100	13000	1400	200		
95-50-1	1,2-DICHLOROBENZENE	100	1400	1400	170	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	100	2900	2900	250	U	
120-82-1	1,2,4-TRICHLOROBENZENE	100	1400	1400	270	U	
87-68-3	HEXACHLOROBUTADIENE	100	1400	1400	350	U	
91-20-3	NAPHTHALENE	100	27000	1400	220	B	
87-61-6	1,2,3-TRICHLOROBENZENE	100	1400	1400	220	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	72.8		57.6	126	66 - 145
1868-53-7	DIBROMOFLUOROMETHANE	49.3		57.6	86	70 - 139
2037-26-5	TOLUENE-D8	56.4		57.6	98	76 - 125

Data Package ID: *VL0005082-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0004S
Lab ID: 0005082-10

Sample Matrix: SOIL
% Moisture: 11.9
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8294

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	100	2800	2800	190	U	
74-87-3	CHLOROMETHANE	100	2800	2800	120	U	
75-01-4	VINYL CHLORIDE	100	2800	2800	180	U	
74-83-9	BROMOMETHANE	100	2800	2800	370	U	
75-00-3	CHLOROETHANE	100	2800	2800	200	U	
75-69-4	TRICHLOROFLUOROMETHANE	100	1400	1400	150	U	
75-35-4	1,1-DICHLOROETHENE	100	1400	1400	160	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	100	1400	1400	200	U	
67-64-1	ACETONE	100	5700	5700	2100	U	
74-88-4	IODOMETHANE	100	1400	1400	130	U	
75-15-0	CARBON DISULFIDE	100	1400	1400	160	U	
75-09-2	METHYLENE CHLORIDE	100	~~1400~~ 790	1400	220	J,B U	132 CB
156-60-5	TRANS-1,2-DICHLOROETHENE	100	1400	1400	120	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	100	1400	1400	150	U	
75-34-3	1,1-DICHLOROETHANE	100	1400	1400	96	U	
108-05-4	VINYL ACETATE	100	5700	5700	540	U	
156-59-2	CIS-1,2-DICHLOROETHENE	100	1400	1400	94	U	
78-93-3	2-BUTANONE	100	~~5700~~ 1900	5700	480	J,B U	132 CB
74-97-5	BROMOCHLOROMETHANE	100	1400	1400	130	U	
67-66-3	CHLOROFORM	100	1400	1400	110	U	
71-55-6	1,1,1-TRICHLOROETHANE	100	1400	1400	160	U	
594-20-7	2,2-DICHLOROPROPANE	100	1400	1400	200	U	
56-23-5	CARBON TETRACHLORIDE	100	1400	1400	170	U	
563-58-6	1,1-DICHLOROPROPENE	100	1400	1400	160	U	
107-06-2	1,2-DICHLOROETHANE	100	1400	1400	120	U	
71-43-2	BENZENE	100	1400	1400	120	U	
79-01-6	TRICHLOROETHENE	100	1400	1400	99	U	
78-87-5	1,2-DICHLOROPROPANE	100	1400	1400	120	U	
74-95-3	DIBROMOMETHANE	100	1400	1400	210	U	

Data Package ID: *VL0005082-1*

DL 6-23-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0004S
Lab ID: 0005082-10

Sample Matrix: SOIL
% Moisture: 11.9
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8294

75-27-4	BROMODICHLOROMETHANE	100	1400	1400	140	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	100	1400	1400	140	U	
108-10-1	4-METHYL-2-PENTANONE	100	5700	5700	480	U	
108-88-3	TOLUENE	100	1000	1400	160	J	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	100	1400	1400	140	U	
79-00-5	1,1,2-TRICHLOROETHANE	100	1400	1400	110	U	
591-78-6	2-HEXANONE	100	5700	5700	770	U	
127-18-4	TETRACHLOROETHENE	100	1400	1400	240	U	
142-28-9	1,3-DICHLOROPROPANE	100	1400	1400	120	U	
124-48-1	DIBROMOCHLOROMETHANE	100	1400	1400	140	U	
106-93-4	1,2-DIBROMOETHANE	100	1400	1400	170	U	
544-10-5	1-CHLOROHEXANE	100	1400	1400	160	U	
108-90-7	CHLOROBENZENE	100	1400	1400	150	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	100	1400	1400	140	U	
100-41-4	ETHYLBENZENE	100	6500	1400	170		
136777-61-2	M+P-XYLENE	100	8200	1400	370		
95-47-6	O-XYLENE	100	13000	1400	210		
100-42-5	STYRENE	100	1400	1400	240	U	
75-25-2	BROMOFORM	100	1400	1400	120	U	
98-82-8	ISOPROPYLBENZENE	100	4900	1400	190		
96-18-4	1,2,3-TRICHLOROPROPANE	100	1400	1400	160	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	100	1400	1400	200	U	
108-86-1	BROMOBENZENE	100	1400	1400	190	U	
103-65-1	N-PROPYLBENZENE	100	13000	1400	200		
95-49-8	2-CHLOROTOLUENE	100	1400	1400	190	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	100	21000	1400	180		
106-43-4	4-CHLOROTOLUENE	100	1400	1400	210	U	
98-06-6	TERT-BUTYLBENZENE	100	490	1400	170	J	
95-63-6	1,2,4-TRIMETHYLBENZENE	100	15000	1400	200		
135-98-8	SEC-BUTYLBENZENE	100	8600	1400	220		
541-73-1	1,3-DICHLOROBENZENE	100	1400	1400	210	U	
99-87-6	P-ISOPROPYLTOLUENE	100	8900	1400	160		

Data Package ID: *VL0005082-1*

LL 6-23-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0004S
Lab ID: 0005082-10

Sample Matrix: SOIL
% Moisture: 11.9
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8294

106-46-7	1,4-DICHLOROBENZENE	100	1400	1400	160	U	
104-51-8	N-BUTYLBENZENE	100	16000	1400	190		
95-50-1	1,2-DICHLOROBENZENE	100	1400	1400	170	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	100	2800	2800	250	U	
120-82-1	1,2,4-TRICHLOROBENZENE	100	1400	1400	270	U	
87-68-3	HEXACHLOROBUTADIENE	100	1400	1400	340	U	
91-20-3	NAPHTHALENE	100	43000	1400	220	B	
87-61-6	1,2,3-TRICHLOROBENZENE	100	1400	1400	220	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	73		56.8	129	66 - 145
1868-53-7	DIBROMOFLUOROMETHANE	48.2		56.8	85	70 - 139
2037-26-5	TOLUENE-D8	56.8		56.8	100	76 - 125

AC 6-23-00

Data Package ID: *VL0005082-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0006S
Lab ID: 0005082-2

Sample Matrix: SOIL
% Moisture: 14.2
Date Collected: 10-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8296

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	100	2900	2900	200	U	
74-87-3	CHLOROMETHANE	100	2900	2900	120	U	
75-01-4	VINYL CHLORIDE	100	2900	2900	180	U	
74-83-9	BROMOMETHANE	100	2900	2900	380	U	
75-00-3	CHLOROETHANE	100	2900	2900	200	U	
75-69-4	TRICHLOROFLUOROMETHANE	100	1500	1500	160	U	
75-35-4	1,1-DICHLOROETHENE	100	1500	1500	170	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	100	1500	1500	210	U	
67-64-1	ACETONE	100	5800	5800	2200	U	
74-88-4	IODOMETHANE	100	1500	1500	130	U	
75-15-0	CARBON DISULFIDE	100	1500	1500	160	U	
75-09-2	METHYLENE CHLORIDE	100	1500 ~~820~~	1500	230	J,B U	132 CB
156-60-5	TRANS-1,2-DICHLOROETHENE	100	1500	1500	120	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	100	1500	1500	160	U	
75-34-3	1,1-DICHLOROETHANE	100	1500	1500	99	U	
108-05-4	VINYL ACETATE	100	5800	5800	550	U	
156-59-2	CIS-1,2-DICHLOROETHENE	100	1500	1500	96	U	
78-93-3	2-BUTANONE	100	5800 ~~2200~~	5800	500	J,B U	132 CB
74-97-5	BROMOCHLOROMETHANE	100	1500	1500	130	U	
67-66-3	CHLOROFORM	100	1500	1500	120	U	
71-55-6	1,1,1-TRICHLOROETHANE	100	1500	1500	160	U	
594-20-7	2,2-DICHLOROPROPANE	100	1500	1500	210	U	
56-23-5	CARBON TETRACHLORIDE	100	1500	1500	170	U	
563-58-6	1,1-DICHLOROPROPENE	100	1500	1500	160	U	
107-06-2	1,2-DICHLOROETHANE	100	1500	1500	130	U	
71-43-2	BENZENE	100	1500	1500	130	U	
79-01-6	TRICHLOROETHENE	100	1500	1500	100	U	
78-87-5	1,2-DICHLOROPROPANE	100	1500	1500	120	U	
74-95-3	DIBROMOMETHANE	100	1500	1500	220	U	

Data Package ID: *VL0005082-1* AL 6-23-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0006S
Lab ID: 0005082-2

Sample Matrix: SOIL
% Moisture: 14.2
Date Collected: 10-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8296

75-27-4	BROMODICHLOROMETHANE	100	1500	1500	140	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	100	1500	1500	140	U	
108-10-1	4-METHYL-2-PENTANONE	100	5800	5800	500	U	
108-88-3	TOLUENE	100	1700	1500	160		
10061-02-6	TRANS-1,3-DICHLOROPROPENE	100	1500	1500	150	U	
79-00-5	1,1,2-TRICHLOROETHANE	100	1500	1500	110	U	
591-78-6	2-HEXANONE	100	5800	5800	790	U	
127-18-4	TETRACHLOROETHENE	100	1500	1500	240	U	
142-28-9	1,3-DICHLOROPROPANE	100	1500	1500	120	U	
124-48-1	DIBROMOCHLOROMETHANE	100	1500	1500	150	U	
106-93-4	1,2-DIBROMOETHANE	100	1500	1500	180	U	
544-10-5	1-CHLOROHEXANE	100	1500	1500	170	U	
108-90-7	CHLOROBENZENE	100	1500	1500	150	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	100	1500	1500	140	U	
100-41-4	ETHYLBENZENE	100	3800	1500	170		
136777-61-2	M+P-XYLENE	100	15000	1500	380		
95-47-6	O-XYLENE	100	8100	1500	220		
100-42-5	STYRENE	100	1500	1500	250	U	
75-25-2	BROMOFORM	100	1500	1500	120	U	
98-82-8	ISOPROPYLBENZENE	100	2800	1500	190		
96-18-4	1,2,3-TRICHLOROPROPANE	100	1500	1500	160	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	100	1500	1500	210	U	
108-86-1	BROMOBENZENE	100	1500	1500	200	U	
103-65-1	N-PROPYLBENZENE	100	8700	1500	200		
95-49-8	2-CHLOROTOLUENE	100	1500	1500	200	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	100	15000	1500	180		
106-43-4	4-CHLOROTOLUENE	100	1500	1500	220	U	
98-06-6	TERT-BUTYLBENZENE	100	1500	1500	180	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	100	51000	1500	200		
135-98-8	SEC-BUTYLBENZENE	100	6300	1500	220		
541-73-1	1,3-DICHLOROBENZENE	100	1500	1500	210	U	
99-87-6	P-ISOPROPYLTOLUENE	100	7100	1500	160		

Data Package ID: *VL0005082-1*

AL 6-23-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0006S
Lab ID: 0005082-2

Sample Matrix: SOIL
% Moisture: 14.2
Date Collected: 10-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: VL000522-2
QCBatchID: VL000522-2-1
Run ID: VL000522-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8296

106-46-7	1,4-DICHLOROBENZENE	100	1500	1500	170	U	
104-51-8	N-BUTYLBENZENE	100	14000	1500	200		
95-50-1	1,2-DICHLOROBENZENE	100	1500	1500	170	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	100	2900	2900	260	U	
120-82-1	1,2,4-TRICHLOROBENZENE	100	1500	1500	270	U	
87-68-3	HEXACHLOROBUTADIENE	100	1500	1500	350	U	
91-20-3	NAPHTHALENE	100	35000	1500	220	B	
87-61-6	1,2,3-TRICHLOROBENZENE	100	1500	1500	220	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	72.1		58.3	124	66 - 145
1868-53-7	DIBROMOFLUOROMETHANE	50.2		58.3	86	70 - 139
2037-26-5	TOLUENE-D8	58.7		58.3	101	76 - 125

NC
6-23-00

Data Package ID: *VL0005082-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8RR1

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 23-May-00
Date Analyzed: 23-May-00

Prep Batch: VL000523-2
QCBatchID: VL000523-2-1
Run ID: VL000523-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8310

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	200	5600	5600	380	U	
74-87-3	CHLOROMETHANE	200	5600	5600	230	U	
75-01-4	VINYL CHLORIDE	200	5600	5600	350	U	
74-83-9	BROMOMETHANE	200	5600	5600	730	U	
75-00-3	CHLOROETHANE	200	5600	5600	390	U	
75-69-4	TRICHLOROFLUOROMETHANE	200	2800	2800	300	U	
75-35-4	1,1-DICHLOROETHENE	200	2800	2800	320	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	200	2800	2800	400	U	
67-64-1	ACETONE	200	11000	11000	4100	U	
74-88-4	IODOMETHANE	200	2800	2800	260	U	
75-15-0	CARBON DISULFIDE	200	2800	2800	310	U	
75-09-2	METHYLENE CHLORIDE	200	12000	2800	440	B	
156-60-5	TRANS-1,2-DICHLOROETHENE	200	2800	2800	230	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	200	2800	2800	300	U	
75-34-3	1,1-DICHLOROETHANE	200	2800	2800	190	U	
108-05-4	VINYL ACETATE	200	11000	11000	1100	U	
156-59-2	CIS-1,2-DICHLOROETHENE	200	2800	2800	180	U	
78-93-3	2-BUTANONE	200	11000	11000	950	U	
74-97-5	BROMOCHLOROMETHANE	200	2800	2800	250	U	
67-66-3	CHLOROFORM	200	2800	2800	220	U	
71-55-6	1,1,1-TRICHLOROETHANE	200	2800	2800	310	U	
594-20-7	2,2-DICHLOROPROPANE	200	2800	2800	400	U	
56-23-5	CARBON TETRACHLORIDE	200	2800	2800	340	U	
563-58-6	1,1-DICHLOROPROPENE	200	2800	2800	310	U	
107-06-2	1,2-DICHLOROETHANE	200	2800	2800	240	U	
71-43-2	BENZENE	200	2800	2800	250	U	
79-01-6	TRICHLOROETHENE	200	2800	2800	200	U	
78-87-5	1,2-DICHLOROPROPANE	200	2800	2800	230	U	
74-95-3	DIBROMOMETHANE	200	2800	2800	410	U	

Data Package ID: *VL0005082-3*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8RR1

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 23-May-00
Date Analyzed: 23-May-00

Prep Batch: VL000523-2
QCBatchID: VL000523-2-1
Run ID: VL000523-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8310

75-27-4	BROMODICHLOROMETHANE	200	2800	2800	270	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	200	2800	2800	270	U	
108-10-1	4-METHYL-2-PENTANONE	200	11000	11000	950	U	
108-88-3	TOLUENE	200	2800	2800	310	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	200	2800	2800	280	U	
79-00-5	1,1,2-TRICHLOROETHANE	200	2800	2800	210	U	
591-78-6	2-HEXANONE	200	11000	11000	1500	U	
127-18-4	TETRACHLOROETHENE	200	2800	2800	460	U	
142-28-9	1,3-DICHLOROPROPANE	200	2800	2800	230	U	
124-48-1	DIBROMOCHLOROMETHANE	200	2800	2800	280	U	
106-93-4	1,2-DIBROMOETHANE	200	2800	2800	340	U	
544-10-5	1-CHLOROHEXANE	200	2800	2800	320	U	
108-90-7	CHLOROBENZENE	200	2800	2800	290	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	200	2800	2800	270	U	
100-41-4	ETHYLBENZENE	200	7200	2800	330		
136777-61-2	M+P-XYLENE	200	31000	2800	730		
95-47-6	O-XYLENE	200	3200	2800	420		
100-42-5	STYRENE	200	2800	2800	470	U	
75-25-2	BROMOFORM	200	2800	2800	230	U	
98-82-8	ISOPROPYLBENZENE	200	4900	2800	370		
96-18-4	1,2,3-TRICHLOROPROPANE	200	2800	2800	310	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	200	2800	2800	400	U	
108-86-1	BROMOBENZENE	200	2800	2800	380	U	
103-65-1	N-PROPYLBENZENE	200	13000	2800	390		
95-49-8	2-CHLOROTOLUENE	200	2800	2800	370	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	200	26000	2800	350		
106-43-4	4-CHLOROTOLUENE	200	2800	2800	410	U	
98-06-6	TERT-BUTYLBENZENE	200	2800	2800	340	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	200	76000	2800	390		
135-98-8	SEC-BUTYLBENZENE	200	8900	2800	420		
541-73-1	1,3-DICHLOROBENZENE	200	2800	2800	410	U	
99-87-6	P-ISOPROPYLTOLUENE	200	9100	2800	310		

Data Package ID: *VL0005082-3* AL 6-23-00

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8RR1

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 23-May-00
Date Analyzed: 23-May-00

Prep Batch: VL000523-2
QCBatchID: VL000523-2-1
Run ID: VL000523-2A
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 4 G
Final Volume: 10 ML
Result Units: UG/KG
File Name: B8310

106-46-7	1,4-DICHLOROBENZENE	200	2800	2800	320	U	
104-51-8	N-BUTYLBENZENE	200	19000	2800	380		
95-50-1	1,2-DICHLOROBENZENE	200	2800	2800	340	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	200	5600	5600	490	U	
120-82-1	1,2,4-TRICHLOROBENZENE	200	2800	2800	530	U	
87-68-3	HEXACHLOROBUTADIENE	200	2800	2800	670	U	
91-20-3	NAPHTHALENE	200	42000	2800	430	B	
87-61-6	1,2,3-TRICHLOROBENZENE	200	2800	2800	430	U	

Surrogate Recovery

B flag from the low level blank contamination.

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	65.6		55.9	117	66 - 145
1868-53-7	DIBROMOFLUOROMETHANE	48.9		55.9	88	70 - 139
2037-26-5	TOLUENE-D8	54.7		55.9	98	76 - 125

AC 6.23-00

Data Package ID: *VL0005082-3*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0007S
Lab ID: 0005082-4

Sample Matrix: SOIL
% Moisture: 5
Date Collected: 11-May-00
Date Extracted: 16-May-00
Date Analyzed: 19-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000519-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7817

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
110-86-1	PYRIDINE	1	350	350	130	U	
62-75-9	N-NITROSODIMETHYLAMINE	1	350	350	190	U	
62-53-3	ANILINE	1	880	880	190	U	
108-95-2	PHENOL	1	350	350	180	U	
111-44-4	BIS(2-CHLOROETHYL)ETHER	1	350	350	190	U	
95-57-8	2-CHLOROPHENOL	1	350	350	170	U	
541-73-1	1,3-DICHLOROBENZENE	1	350	350	150	U	
106-46-7	1,4-DICHLOROBENZENE	1	350	350	150	U	
95-50-1	1,2-DICHLOROBENZENE	1	350	350	140	U	
100-51-6	BENZYL ALCOHOL	1	350	350	240	U	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	1	350	350	170	U	
95-48-7	2-METHYLPHENOL	1	350	350	220	U	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	1	350	350	200	U	
106-44-5	4-METHYLPHENOL	1	350	350	170	U	
67-72-1	HEXACHLOROETHANE	1	350	350	170	U	
98-95-3	NITROBENZENE	1	350	350	140	U	
78-59-1	ISOPHORONE	1	350	350	160	U	
88-75-5	2-NITROPHENOL	1	350	350	180	U	
105-67-9	2,4-DIMETHYLPHENOL	1	350	350	220	U	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	1	350	350	160	U	
120-83-2	2,4-DICHLOROPHENOL	1	350	350	180	U	
65-85-0	BENZOIC ACID	1	1800	1800	140	U UJ	136, 117 AQ
120-82-1	1,2,4-TRICHLOROBENZENE	1	350	350	170	U	
91-20-3	NAPHTHALENE	1	350	350	130	U	
106-47-8	4-CHLOROANILINE	1	880	880	150	U	
87-68-3	HEXACHLOROBUTADIENE	1	350	350	180	U	
59-50-7	4-CHLORO-3-METHYLPHENOL	1	350	350	140	U	
91-57-6	2-METHYLNAPHTHALENE	1	350	350	150	U	
77-47-4	HEXACHLOROCYCLOPENTADIENE	1	350	350	240	U UJ	136, 117 AQ

Data Package ID: *SV0005082-1*

AL 6-23-00

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0007S
Lab ID: 0005082-4

Sample Matrix: SOIL
% Moisture: 5
Date Collected: 11-May-00
Date Extracted: 16-May-00
Date Analyzed: 19-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000519-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7817

88-06-2	2,4,6-TRICHLOROPHENOL	1	350	350	220	U	
95-95-4	2,4,5-TRICHLOROPHENOL	1	350	350	200	U	
91-58-7	2-CHLORONAPHTHALENE	1	350	350	180	U	
88-74-4	2-NITROANILINE	1	1800	1800	200	U	
131-11-3	DIMETHYL PHTHALATE	1	350	350	84	U	
606-20-2	2,6-DINITROTOLUENE	1	350	350	100	U	
208-96-8	ACENAPHTHYLENE	1	350	350	180	U	
99-09-2	3-NITROANILINE	1	1800	1800	120	U	
83-32-9	ACENAPHTHENE	1	350	350	180	U	
51-28-5	2,4-DINITROPHENOL	1	1800	1800	170	U	
100-02-7	4-NITROPHENOL	1	1800	1800	170	U	
132-64-9	DIBENZOFURAN	1	350	350	170	U	
121-14-2	2,4-DINITROTOLUENE	1	350	350	160	U	
84-66-2	DIETHYL PHTHALATE	1	350	350	180	U	
86-73-7	FLUORENE	1	350	350	180	U	
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	1	350	350	170	U	
100-01-6	4-NITROANILINE	1	1800	1800	190	U	
103-33-3	AZOBENZENE	1	350	350	180	U	
534-52-1	4,6-DINITRO-2-METHYLPHENOL	1	1800	1800	200	U	
86-30-6	N-NITROSODIPHENYLAMINE	1	350	350	160	U	
101-55-3	4-BROMOPHENYL PHENYL ETHER	1	350	350	170	U	
118-74-1	HEXACHLOROBENZENE	1	350	350	150	U	
58-90-2	2,3,4,6-TETRACHLOROPHENOL	1	1800	1800	160	U	
87-86-5	PENTACHLOROPHENOL	1	1800	1800	140	U	
85-01-8	PHENANTHRENE	1	350	350	140	U	
120-12-7	ANTHRACENE	1	350	350	160	U	
86-74-8	CARBAZOLE	1	350	350	150	U	
84-74-2	DI-N-BUTYL PHTHALATE	1	350	350	140	U	
206-44-0	FLUORANTHENE	1	350	350	150	U	
129-00-0	PYRENE	1	350	350	120	U	
85-68-7	BUTYL BENZYL PHTHALATE	1	350	350	150	U	
56-55-3	BENZO(A)ANTHRACENE	1	350	350	150	U	

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0007S
Lab ID: 0005082-4

Sample Matrix: SOIL
% Moisture: 5
Date Collected: 11-May-00
Date Extracted: 16-May-00
Date Analyzed: 19-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000519-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7817

91-94-1	3,3'-DICHLOROBENZIDINE	1	1800	1800	180	U	
218-01-9	CHRYSENE	1	350	350	130	U	
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1	350	350	170	U	
117-84-0	DI-N-OCTYL PHTHALATE	1	350	350	170	U	
205-99-2	BENZO(B)FLUORANTHENE	1	350	350	190	U	
207-08-9	BENZO(K)FLUORANTHENE	1	350	350	120	U	
50-32-8	BENZO(A)PYRENE	1	350	350	140	U	
193-39-5	INDENO(1,2,3-CD)PYRENE	1	350	350	210	U	
53-70-3	DIBENZO(A,H)ANTHRACENE	1	350	350	200	U	
191-24-2	BENZO(G,H,I)PERYLENE	1	350	350	95	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	2180		2630	83	19 - 113
321-60-8	2-FLUOROBIPHENYL	1340		1750	76	30 - 105
367-12-4	2-FLUOROPHENOL	1810		2630	69	25 - 100
4165-60-0	NITROBENZENE-D5	1430		1750	81	31 - 106
4165-62-2	PHENOL-D5	2110		2630	80	24 - 104
1718-51-0	TERPHENYL-D14	1290		1750	74	18 - 112

LC 6-23-00

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0001S
Lab ID: 0005082-6

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 20-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000519-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 5 ML
Result Units: UG/KG
File Name: P7830

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
110-86-1	PYRIDINE	1	1800	1800	640	U	
62-75-9	N-NITROSODIMETHYLAMINE	1	1800	1800	970	U	
62-53-3	ANILINE	1	4500	4500	970	U	
108-95-2	PHENOL	1	1800	1800	910	U	
111-44-4	BIS(2-CHLOROETHYL)ETHER	1	1800	1800	970	U	
95-57-8	2-CHLOROPHENOL	1	1800	1800	860	U	
541-73-1	1,3-DICHLOROBENZENE	1	1800	1800	750	U	
106-46-7	1,4-DICHLOROBENZENE	1	1800	1800	750	U	
95-50-1	1,2-DICHLOROBENZENE	1	1800	1800	700	U	
100-51-6	BENZYL ALCOHOL	1	1800	1800	1200	U	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	1	1800	1800	860	U	
95-48-7	2-METHYLPHENOL	1	1800	1800	1100	U	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	1	1800	1800	1000	U	
106-44-5	4-METHYLPHENOL	1	1800	1800	860	U	
67-72-1	HEXACHLOROETHANE	1	1800	1800	860	U	
98-95-3	NITROBENZENE	1	1800	1800	700	U	
78-59-1	ISOPHORONE	1	1800	1800	810	U	
88-75-5	2-NITROPHENOL	1	1800	1800	910	U	
105-67-9	2,4-DIMETHYLPHENOL	1	1800	1800	1100	U	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	1	1800	1800	810	U	
120-83-2	2,4-DICHLOROPHENOL	1	1800	1800	910	U	
65-85-0	BENZOIC ACID	1	9000	9000	700	U UJ	136,117 AQ
120-82-1	1,2,4-TRICHLOROBENZENE	1	1800	1800	860	U	
91-20-3	NAPHTHALENE	1	1800	1800	640	U	
106-47-8	4-CHLOROANILINE	1	4500	4500	750	U	
87-68-3	HEXACHLOROBUTADIENE	1	1800	1800	910	U	
59-50-7	4-CHLORO-3-METHYLPHENOL	1	1800	1800	700	U	
91-57-6	2-METHYLNAPHTHALENE	1	1800	1800	750	U	
77-47-4	HEXACHLOROCYCLOPENTADIENE	1	1800	1800	1200	U UJ	136,117 AQ

Data Package ID: *SV0005082-1*

AL 6-23-00

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0001S
Lab ID: 0005082-6

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 20-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000519-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 5 ML
Result Units: UG/KG
File Name: P7830

88-06-2	2,4,6-TRICHLOROPHENOL	1	1800	1800	1100	U	
95-95-4	2,4,5-TRICHLOROPHENOL	1	1800	1800	1000	U	
91-58-7	2-CHLORONAPHTHALENE	1	1800	1800	910	U	
88-74-4	2-NITROANILINE	1	9000	9000	1000	U	
131-11-3	DIMETHYL PHTHALATE	1	1800	1800	430	U	
606-20-2	2,6-DINITROTOLUENE	1	1800	1800	530	U	
208-96-8	ACENAPHTHYLENE	1	1800	1800	910	U	
99-09-2	3-NITROANILINE	1	9000	9000	590	U	
83-32-9	ACENAPHTHENE	1	1800	1800	910	U	
51-28-5	2,4-DINITROPHENOL	1	9000	9000	860	U	
100-02-7	4-NITROPHENOL	1	9000	9000	860	U	
132-64-9	DIBENZOFURAN	1	1800	1800	860	U	
121-14-2	2,4-DINITROTOLUENE	1	1800	1800	810	U	
84-66-2	DIETHYL PHTHALATE	1	1800	1800	910	U	
86-73-7	FLUORENE	1	1800	1800	910	U	
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	1	1800	1800	860	U	
100-01-6	4-NITROANILINE	1	9000	9000	970	U	
103-33-3	AZOBENZENE	1	1800	1800	910	U	
534-52-1	4,6-DINITRO-2-METHYLPHENOL	1	9000	9000	1000	U	
86-30-6	N-NITROSODIPHENYLAMINE	1	1800	1800	810	U	
101-55-3	4-BROMOPHENYL PHENYL ETHER	1	1800	1800	860	U	
118-74-1	HEXACHLOROBENZENE	1	1800	1800	750	U	
58-90-2	2,3,4,6-TETRACHLOROPHENOL	1	9000	9000	810	U	
87-86-5	PENTACHLOROPHENOL	1	9000	9000	700	U	
85-01-8	PHENANTHRENE	1	1800	1800	700	U	
120-12-7	ANTHRACENE	1	1800	1800	810	U	
86-74-8	CARBAZOLE	1	1800	1800	750	U	
84-74-2	DI-N-BUTYL PHTHALATE	1	1800	1800	700	U	
206-44-0	FLUORANTHENE	1	1800	1800	750	U	
129-00-0	PYRENE	1	1800	1800	590	U	
85-68-7	BUTYL BENZYL PHTHALATE	1	1800	1800	750	U	
56-55-3	BENZO(A)ANTHRACENE	1	1800	1800	750	U	

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0001S
Lab ID: 0005082-6

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 20-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000519-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 5 ML
Result Units: UG/KG
File Name: P7830

91-94-1	3,3'-DICHLOROBENZIDINE	1	9000	9000	910	U	
218-01-9	CHRYSENE	1	1800	1800	640	U	
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1	1800	1800	860	U	
117-84-0	DI-N-OCTYL PHTHALATE	1	1800	1800	860	U	
205-99-2	BENZO(B)FLUORANTHENE	1	1800	1800	970	U	
207-08-9	BENZO(K)FLUORANTHENE	1	1800	1800	590	U	
50-32-8	BENZO(A)PYRENE	1	1800	1800	700	U	
193-39-5	INDENO(1,2,3-CD)PYRENE	1	1800	1800	1100	U	
53-70-3	DIBENZO(A,H)ANTHRACENE	1	1800	1800	1000	U	
191-24-2	BENZO(G,H,I)PERYLENE	1	1800	1800	480	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	1590		2690	59	19 - 113
321-60-8	2-FLUOROBIPHENYL	1850		1790	103	30 - 105
367-12-4	2-FLUOROPHENOL	1310		2690	49	25 - 100
4165-60-0	NITROBENZENE-D5	5150	*	1790	288	31 - 106
4165-62-2	PHENOL-D5	2050		2690	76	24 - 104
1718-51-0	TERPHENYL-D14	1380		1790	77	18 - 112

* Surr % R above QC limits

LL 6-23-00

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0006S
Lab ID: 0005082-2

Sample Matrix: SOIL
% Moisture: 14.2
Date Collected: 10-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7867

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
110-86-1	PYRIDINE	10	3900	3900	1400	U UJ	041, 126 AQ
62-75-9	N-NITROSODIMETHYLAMINE	10	3900	3900	2100	U	
62-53-3	ANILINE	10	9700	9700	2100	U	
108-95-2	PHENOL	10	3900	3900	2000	U	
111-44-4	BIS(2-CHLOROETHYL)ETHER	10	3900	3900	2100	U	
95-57-8	2-CHLOROPHENOL	10	3900	3900	1900	U	
541-73-1	1,3-DICHLOROBENZENE	10	3900	3900	1600	U	
106-46-7	1,4-DICHLOROBENZENE	10	3900	3900	1600	U	
95-50-1	1,2-DICHLOROBENZENE	10	3900	3900	1500	U	
100-51-6	BENZYL ALCOHOL	10	3900	3900	2700	U	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	10	3900	3900	1900	U	
95-48-7	2-METHYLPHENOL	10	3900	3900	2400	U	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	10	3900	3900	2200	U	
106-44-5	4-METHYLPHENOL	10	3900	3900	1900	U	
67-72-1	HEXACHLOROETHANE	10	3900	3900	1900	U	
98-95-3	NITROBENZENE	10	3900	3900	1500	U	
78-59-1	ISOPHORONE	10	3900	3900	1700	U	
88-75-5	2-NITROPHENOL	10	3900	3900	2000	U	
105-67-9	2,4-DIMETHYLPHENOL	10	3900	3900	2400	U	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	10	3900	3900	1700	U	
120-83-2	2,4-DICHLOROPHENOL	10	3900	3900	2000	U	
65-85-0	BENZOIC ACID	10	19000	19000	1500	U	
120-82-1	1,2,4-TRICHLOROBENZENE	10	3900	3900	1900	U UJ	
91-20-3	NAPHTHALENE	10	14000	3900	1400	J	
106-47-8	4-CHLOROANILINE	10	9700	9700	1600	U UJ	J 117
87-68-3	HEXACHLOROBUTADIENE	10	3900	3900	2000	U	
59-50-7	4-CHLORO-3-METHYLPHENOL	10	3900	3900	1500	U UJ	
91-57-6	2-METHYLNAPHTHALENE	10	27000	3900	1600	J	041, 126
77-47-4	HEXACHLOROCYCLOPENTADIENE	10	3900	3900	2700	U UJ	136, 041, 126, AQ

Data Package ID: *SV0005082-1*

6-23-00

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0006S
Lab ID: 0005082-2

Sample Matrix: SOIL
% Moisture: 14.2
Date Collected: 10-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG

File Name: P7867

88-06-2	2,4,6-TRICHLOROPHENOL	10	3900	3900	2400	U	UJ	041, 126	AQ
95-95-4	2,4,5-TRICHLOROPHENOL	10	3900	3900	2200	U			
91-58-7	2-CHLORONAPHTHALENE	10	3900	3900	2000	U			
88-74-4	2-NITROANILINE	10	19000	19000	2200	U			
131-11-3	DIMETHYL PHTHALATE	10	3900	3900	930	U			
606-20-2	2,6-DINITROTOLUENE	10	3900	3900	1100	U			
208-96-8	ACENAPHTHYLENE	10	3900	3900	2000	U			
99-09-2	3-NITROANILINE	10	19000	19000	1300	U			,117
83-32-9	ACENAPHTHENE	10	3900	3900	2000	U			
51-28-5	2,4-DINITROPHENOL	10	19000	19000	1900	U			,117
100-02-7	4-NITROPHENOL	10	19000	19000	1900	U			
132-64-9	DIBENZOFURAN	10	3900	3900	1900	U			
121-14-2	2,4-DINITROTOLUENE	10	3900	3900	1700	U			
84-66-2	DIETHYL PHTHALATE	10	3900	3900	2000	U			
86-73-7	FLUORENE	10	3900	3900	2000	U			
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	10	3900	3900	1900	U			
100-01-6	4-NITROANILINE	10	19000	19000	2100	U			,117
103-33-3	AZOBENZENE	10	3900	3900	2000	U			
534-52-1	4,6-DINITRO-2-METHYLPHENOL	10	19000	19000	2200	U			
86-30-6	N-NITROSODIPHENYLAMINE	10	3900	3900	1700	U			
101-55-3	4-BROMOPHENYL PHENYL ETHER	10	3900	3900	1900	U			
118-74-1	HEXACHLOROBENZENE	10	3900	3900	1600	U			
58-90-2	2,3,4,6-TETRACHLOROPHENOL	10	19000	19000	1700	U			
87-86-5	PENTACHLOROPHENOL	10	19000	19000	1500	U			
85-01-8	PHENANTHRENE	10	3900	3900	1500	U			
120-12-7	ANTHRACENE	10	3900	3900	1700	U			
86-74-8	CARBAZOLE	10	3900	3900	1600	U			
84-74-2	DI-N-BUTYL PHTHALATE	10	3900	3900	1500	U			
206-44-0	FLUORANTHENE	10	3900	3900	1600	U			
129-00-0	PYRENE	10	3900	3900	1300	U			,117
85-68-7	BUTYL BENZYL PHTHALATE	10	3900	3900	1600	U			
56-55-3	BENZO(A)ANTHRACENE	10	3900	3900	1600	U	UJ	041, 126	AQ

Data Package ID: *SV0005082-1*

LL 6-23-00

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0006S
Lab ID: 0005082-2

Sample Matrix: SOIL
% Moisture: 14.2
Date Collected: 10-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG

File Name: P7867

91-94-1	3,3'-DICHLOROBENZIDINE	10	19000	19000	2000	U UJ	041,126	17 AQ
218-01-9	CHRYSENE	10	3900	3900	1400	U		
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	10	3900	3900	1900	U		
117-84-0	DI-N-OCTYL PHTHALATE	10	3900	3900	1900	U		
205-99-2	BENZO(B)FLUORANTHENE	10	3900	3900	2100	U		
207-08-9	BENZO(K)FLUORANTHENE	10	3900	3900	1300	U		
50-32-8	BENZO(A)PYRENE	10	3900	3900	1500	U		
193-39-5	INDENO(1,2,3-CD)PYRENE	10	3900	3900	2300	U		
53-70-3	DIBENZO(A,H)ANTHRACENE	10	3900	3900	2200	U		
191-24-2	BENZO(G,H,I)PERYLENE	10	3900	3900	1000	U UJ	041,126	AQ

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL *	0		2910	0	19 - 113
321-60-8	2-FLUOROBIPHENYL	0		1940	0	30 - 105
367-12-4	2-FLUOROPHENOL	0		2910	0	25 - 100
4165-60-0	NITROBENZENE-D5	0		1940	0	31 - 106
4165-62-2	PHENOL-D5	0		2910	0	24 - 104
1718-51-0	TERPHENYL-D14 *	0		1940	0	18 - 112

* Surr %R diluted out.

AL 6-23-00

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0002S
Lab ID: 0005082-7

Sample Matrix: SOIL
% Moisture: 4.5
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG

File Name: P7868

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
110-86-1	PYRIDINE	2	700	700	250	U	
62-75-9	N-NITROSODIMETHYLAMINE	2	700	700	380	U	
62-53-3	ANILINE	2	1700	1700	380	U	
108-95-2	PHENOL	2	700	700	360	U	
111-44-4	BIS(2-CHLOROETHYL)ETHER	2	700	700	380	U	
95-57-8	2-CHLOROPHENOL	2	700	700	340	U	
541-73-1	1,3-DICHLOROBENZENE	2	700	700	290	U	
106-46-7	1,4-DICHLOROBENZENE	2	700	700	290	U	
95-50-1	1,2-DICHLOROBENZENE	2	700	700	270	U	
100-51-6	BENZYL ALCOHOL	2	700	700	480	U	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	2	700	700	340	U	
95-48-7	2-METHYLPHENOL	2	700	700	440	U	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	2	700	700	400	U	
106-44-5	4-METHYLPHENOL	2	700	700	340	U	
67-72-1	HEXACHLOROETHANE	2	700	700	340	U	
98-95-3	NITROBENZENE	2	700	700	270	U	
78-59-1	ISOPHORONE	2	700	700	310	U	
88-75-5	2-NITROPHENOL	2	700	700	360	U	
105-67-9	2,4-DIMETHYLPHENOL	2	700	700	440	U	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	2	700	700	310	U	
120-83-2	2,4-DICHLOROPHENOL	2	700	700	360	U	
65-85-0	BENZOIC ACID	2	3500	3500	270	U	
120-82-1	1,2,4-TRICHLOROBENZENE	2	700	700	340	U	
91-20-3	NAPHTHALENE	2	700	700	250	U	
106-47-8	4-CHLOROANILINE	2	1700	1700	290	U UJ	117 AQ
87-68-3	HEXACHLOROBUTADIENE	2	700	700	360	U	
59-50-7	4-CHLORO-3-METHYLPHENOL	2	700	700	270	U	
91-57-6	2-METHYLNAPHTHALENE	2	1090	700	290		
77-47-4	HEXACHLOROCYCLOPENTADIENE	2	700	700	480	U UJ	136 AQ

Data Package ID: *SV0005082-1*

AC 6-23-00

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0002S
Lab ID: 0005082-7

Sample Matrix: SOIL
% Moisture: 4.5
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7868

88-06-2	2,4,6-TRICHLOROPHENOL	2	700	700	440	U		
95-95-4	2,4,5-TRICHLOROPHENOL	2	700	700	400	U		
91-58-7	2-CHLORONAPHTHALENE	2	700	700	360	U		
88-74-4	2-NITROANILINE	2	3500	3500	400	U		
131-11-3	DIMETHYL PHTHALATE	2	700	700	170	U		
606-20-2	2,6-DINITROTOLUENE	2	700	700	210	U		
208-96-8	ACENAPHTHYLENE	2	700	700	360	U		
99-09-2	3-NITROANILINE	2	3500	3500	230	U	UJ	117 AQ
83-32-9	ACENAPHTHENE	2	700	700	360	U		
51-28-5	2,4-DINITROPHENOL	2	3500	3500	340	U	UJ	117 AQ
100-02-7	4-NITROPHENOL	2	3500	3500	340	U		
132-64-9	DIBENZOFURAN	2	700	700	340	U		
121-14-2	2,4-DINITROTOLUENE	2	700	700	310	U		
84-66-2	DIETHYL PHTHALATE	2	700	700	360	U		
86-73-7	FLUORENE	2	700	700	360	U		
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	2	700	700	340	U		
100-01-6	4-NITROANILINE	2	3500	3500	380	U	UJ	117 AQ
103-33-3	AZOBENZENE	2	700	700	360	U		
534-52-1	4,6-DINITRO-2-METHYLPHENOL	2	3500	3500	400	U		
86-30-6	N-NITROSODIPHENYLAMINE	2	700	700	310	U		
101-55-3	4-BROMOPHENYL PHENYL ETHER	2	700	700	340	U		
118-74-1	HEXACHLOROBENZENE	2	700	700	290	U		
58-90-2	2,3,4,6-TETRACHLOROPHENOL	2	3500	3500	310	U		
87-86-5	PENTACHLOROPHENOL	2	3500	3500	270	U		
85-01-8	PHENANTHRENE	2	700	700	270	U		
120-12-7	ANTHRACENE	2	700	700	310	U		
86-74-8	CARBAZOLE	2	700	700	290	U		
84-74-2	DI-N-BUTYL PHTHALATE	2	700	700	270	U		
206-44-0	FLUORANTHENE	2	700	700	290	U		
129-00-0	PYRENE	2	700	700	230	U	UJ	117 AQ
85-68-7	BUTYL BENZYL PHTHALATE	2	700	700	290	U		
56-55-3	BENZO(A)ANTHRACENE	2	700	700	290	U		

Data Package ID: *SV0005082-1*

RC 6-23-00

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0002S
Lab ID: 0005082-7

Sample Matrix: SOIL
% Moisture: 4.5
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7868

91-94-1	3,3'-DICHLOROBENZIDINE	2	3500	3500	360	U	UJ	117
218-01-9	CHRYSENE	2	700	700	250	U		
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	2	700	700	340	U		
117-84-0	DI-N-OCTYL PHTHALATE	2	700	700	340	U		
205-99-2	BENZO(B)FLUORANTHENE	2	700	700	380	U		
207-08-9	BENZO(K)FLUORANTHENE	2	700	700	230	U		
50-32-8	BENZO(A)PYRENE	2	700	700	270	U		
193-39-5	INDENO(1,2,3-CD)PYRENE	2	700	700	420	U		
53-70-3	DIBENZO(A,H)ANTHRACENE	2	700	700	400	U		
191-24-2	BENZO(G,H,I)PERYLENE	2	700	700	190	U		

AQ

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	1130		2620	43	19 - 113
321-60-8	2-FLUOROBIPHENYL	1180		1750	68	30 - 105
367-12-4	2-FLUOROPHENOL	791		2620	30	25 - 100
4165-60-0	NITROBENZENE-D5	551		1750	32	31 - 106
4165-62-2	PHENOL-D5	1160		2620	44	24 - 104
1718-51-0	TERPHENYL-D14	936		1750	54	18 - 112

RC · 6-23-08

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7869

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
110-86-1	PYRIDINE	5	1900	1900	670	U	
62-75-9	N-NITROSODIMETHYLAMINE	5	1900	1900	1000	U	
62-53-3	ANILINE	5	4700	4700	1000	U	
108-95-2	PHENOL	5	1900	1900	950	U	
111-44-4	BIS(2-CHLOROETHYL)ETHER	5	1900	1900	1000	U	
95-57-8	2-CHLOROPHENOL	5	1900	1900	890	U	
541-73-1	1,3-DICHLOROBENZENE	5	1900	1900	780	U	
106-46-7	1,4-DICHLOROBENZENE	5	1900	1900	780	U	
95-50-1	1,2-DICHLOROBENZENE	5	1900	1900	730	U	
100-51-6	BENZYL ALCOHOL	5	1900	1900	1300	U	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	5	1900	1900	890	U	
95-48-7	2-METHYLPHENOL	5	1900	1900	1200	U	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	5	1900	1900	1100	U	
106-44-5	4-METHYLPHENOL	5	1900	1900	890	U	
67-72-1	HEXACHLOROETHANE	5	1900	1900	890	U	
98-95-3	NITROBENZENE	5	1900	1900	730	U	
78-59-1	ISOPHORONE	5	1900	1900	840	U	
88-75-5	2-NITROPHENOL	5	1900	1900	950	U	
105-67-9	2,4-DIMETHYLPHENOL	5	1900	1900	1200	U	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	5	1900	1900	840	U	
120-83-2	2,4-DICHLOROPHENOL	5	1900	1900	950	U	
65-85-0	BENZOIC ACID	5	9300	9300	730	U	
120-82-1	1,2,4-TRICHLOROBENZENE	5	1900	1900	890	U	
91-20-3	NAPHTHALENE	5	7200	1900	670		
106-47-8	4-CHLOROANILINE	5	4700	4700	780	U UJ	117 AQ
87-68-3	HEXACHLOROBUTADIENE	5	1900	1900	950	U	
59-50-7	4-CHLORO-3-METHYLPHENOL	5	1900	1900	730	U	
91-57-6	2-METHYLNAPHTHALENE	5	18000	1900	780		
77-47-4	HEXACHLOROCYCLOPENTADIENE	5	1900	1900	1300	U UJ	136 AQ

Data Package ID: *SV0005082-1*

6.23.00

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7869

88-06-2	2,4,6-TRICHLOROPHENOL	5	1900	1900	1200	U		
95-95-4	2,4,5-TRICHLOROPHENOL	5	1900	1900	1100	U		
91-58-7	2-CHLORONAPHTHALENE	5	1900	1900	950	U		
88-74-4	2-NITROANILINE	5	9300	9300	1100	U		
131-11-3	DIMETHYL PHTHALATE	5	1900	1900	450	U		
606-20-2	2,6-DINITROTOLUENE	5	1900	1900	550	U		
208-96-8	ACENAPHTHYLENE	5	1900	1900	950	U		
99-09-2	3-NITROANILINE	5	9300	9300	610	U	UJ	117
83-32-9	ACENAPHTHENE	5	1900	1900	950	U		
51-28-5	2,4-DINITROPHENOL	5	9300	9300	890	U	UJ	117
100-02-7	4-NITROPHENOL	5	9300	9300	890	U		
132-64-9	DIBENZOFURAN	5	1900	1900	890	U		
121-14-2	2,4-DINITROTOLUENE	5	1900	1900	840	U		
84-66-2	DIETHYL PHTHALATE	5	1900	1900	950	U		
86-73-7	FLUORENE	5	1900	1900	950	U		
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	5	1900	1900	890	U		
100-01-6	4-NITROANILINE	5	9300	9300	1000	U	UJ	117
103-33-3	AZOBENZENE	5	1900	1900	950	U		
534-52-1	4,6-DINITRO-2-METHYLPHENOL	5	9300	9300	1100	U		
86-30-6	N-NITROSODIPHENYLAMINE	5	1900	1900	840	U		
101-55-3	4-BROMOPHENYL PHENYL ETHER	5	1900	1900	890	U		
118-74-1	HEXACHLOROBENZENE	5	1900	1900	780	U		
58-90-2	2,3,4,6-TETRACHLOROPHENOL	5	9300	9300	840	U		
87-86-5	PENTACHLOROPHENOL	5	9300	9300	730	U		
85-01-8	PHENANTHRENE	5	1900	1900	730	U		
120-12-7	ANTHRACENE	5	1900	1900	840	U		
86-74-8	CARBAZOLE	5	1900	1900	780	U		
84-74-2	DI-N-BUTYL PHTHALATE	5	1900	1900	730	U		
206-44-0	FLUORANTHENE	5	1900	1900	780	U		
129-00-0	PYRENE	5	1900	1900	610	U	UJ	117
85-68-7	BUTYL BENZYL PHTHALATE	5	1900	1900	780	U		
56-55-3	BENZO(A)ANTHRACENE	5	1900	1900	780	U		

AQ AQ AQ AQ

Data Package ID: *SV0005082-1*

LC 6-23-00

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7869

91-94-1	3,3'-DICHLOROBENZIDINE	5	9300	9300	950	U	UJ	117
218-01-9	CHRYSENE	5	1900	1900	670	U		
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	5	1900	1900	890	U		
117-84-0	DI-N-OCTYL PHTHALATE	5	1900	1900	890	U		
205-99-2	BENZO(B)FLUORANTHENE	5	1900	1900	1000	U		
207-08-9	BENZO(K)FLUORANTHENE	5	1900	1900	610	U		
50-32-8	BENZO(A)PYRENE	5	1900	1900	730	U		
193-39-5	INDENO(1,2,3-CD)PYRENE	5	1900	1900	1100	U		
53-70-3	DIBENZO(A,H)ANTHRACENE	5	1900	1900	1100	U		
191-24-2	BENZO(G,H,I)PERYLENE	5	1900	1900	500	U		

AQ

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	750		2790	27	19 - 113
321-60-8	2-FLUOROBIPHENYL	974		1860	52	30 - 105
367-12-4	2-FLUOROPHENOL	716		2790	26	25 - 100
4165-60-0	NITROBENZENE-D5	252	*	1860	14	31 - 106
4165-62-2	PHENOL-D5	1110		2790	40	24 - 104
1718-51-0	TERPHENYL-D14	714		1860	38	18 - 112

* Surr %R above QC limits.

RL 6-23-00

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270
Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA00031S
Lab ID: 0005082-9

Sample Matrix: SOIL
% Moisture: 13.2
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7872

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
110-86-1	PYRIDINE	10	3800	3800	1400	U UJ	041,126 AQ
62-75-9	N-NITROSODIMETHYLAMINE	10	3800	3800	2100	U	
62-53-3	ANILINE	10	9600	9600	2100	U	
108-95-2	PHENOL	10	3800	3800	2000	U	
111-44-4	BIS(2-CHLOROETHYL)ETHER	10	3800	3800	2100	U	
95-57-8	2-CHLOROPHENOL	10	3800	3800	1800	U	
541-73-1	1,3-DICHLOROBENZENE	10	3800	3800	1600	U	
106-46-7	1,4-DICHLOROBENZENE	10	3800	3800	1600	U	
95-50-1	1,2-DICHLOROBENZENE	10	3800	3800	1500	U	
100-51-6	BENZYL ALCOHOL	10	3800	3800	2600	U	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	10	3800	3800	1800	U	
95-48-7	2-METHYLPHENOL	10	3800	3800	2400	U	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	10	3800	3800	2200	U	
106-44-5	4-METHYLPHENOL	10	3800	3800	1800	U	
67-72-1	HEXACHLOROETHANE	10	3800	3800	1800	U	
98-95-3	NITROBENZENE	10	3800	3800	1500	U	
78-59-1	ISOPHORONE	10	3800	3800	1700	U	
88-75-5	2-NITROPHENOL	10	3800	3800	2000	U	
105-67-9	2,4-DIMETHYLPHENOL	10	3800	3800	2400	U	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	10	3800	3800	1700	U	
120-83-2	2,4-DICHLOROPHENOL	10	3800	3800	2000	U	
65-85-0	BENZOIC ACID	10	19000	19000	1500	U	
120-82-1	1,2,4-TRICHLOROBENZENE	10	3800	3800	1800	U UJ	
91-20-3	NAPHTHALENE	10	9900	3800	1400	J	041,126
106-47-8	4-CHLOROANILINE	10	9600	9600	1600	U UJ	117,041,126 AQ
87-68-3	HEXACHLOROBUTADIENE	10	3800	3800	2000	U	041,126
59-50-7	4-CHLORO-3-METHYLPHENOL	10	3800	3800	1500	U UJ	
91-57-6	2-METHYLNAPHTHALENE	10	24000	3800	1600	J	041,126
77-47-4	HEXACHLOROCYCLOPENTADIENE	10	3800	3800	2600	U UJ	136,041,126 AQ

LL 6,300

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA00031S
Lab ID: 0005082-9

Sample Matrix: SOIL
% Moisture: 13.2
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7872

88-06-2	2,4,6-TRICHLOROPHENOL	10	3800	3800	2400	U	UJ	041,126
95-95-4	2,4,5-TRICHLOROPHENOL	10	3800	3800	2200	U		
91-58-7	2-CHLORONAPHTHALENE	10	3800	3800	2000	U		
88-74-4	2-NITROANILINE	10	19000	19000	2200	U		
131-11-3	DIMETHYL PHTHALATE	10	3800	3800	920	U		
606-20-2	2,6-DINITROTOLUENE	10	3800	3800	1100	U		
208-96-8	ACENAPHTHYLENE	10	3800	3800	2000	U		041,126
99-09-2	3-NITROANILINE	10	19000	19000	1300	U	UJ	117,041,126
83-32-9	ACENAPHTHENE	10	3800	3800	2000	U		041,126
51-28-5	2,4-DINITROPHENOL	10	19000	19000	1800	U	UJ	117,041,126
100-02-7	4-NITROPHENOL	10	19000	19000	1800	U		041,126
132-64-9	DIBENZOFURAN	10	3800	3800	1800	U		
121-14-2	2,4-DINITROTOLUENE	10	3800	3800	1700	U		
84-66-2	DIETHYL PHTHALATE	10	3800	3800	2000	U		
86-73-7	FLUORENE	10	3800	3800	2000	U		
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	10	3800	3800	1800	U		041,126
100-01-6	4-NITROANILINE	10	19000	19000	2100	U	UJ	117,041,126
103-33-3	AZOBENZENE	10	3800	3800	2000	U		041,126
534-52-1	4,6-DINITRO-2-METHYLPHENOL	10	19000	19000	2200	U		
86-30-6	N-NITROSODIPHENYLAMINE	10	3800	3800	1700	U		
101-55-3	4-BROMOPHENYL PHENYL ETHER	10	3800	3800	1800	U		
118-74-1	HEXACHLOROBENZENE	10	3800	3800	1600	U		
58-90-2	2,3,4,6-TETRACHLOROPHENOL	10	19000	19000	1700	U		
87-86-5	PENTACHLOROPHENOL	10	19000	19000	1500	U		
85-01-8	PHENANTHRENE	10	3800	3800	1500	U		
120-12-7	ANTHRACENE	10	3800	3800	1700	U		
86-74-8	CARBAZOLE	10	3800	3800	1600	U		
84-74-2	DI-N-BUTYL PHTHALATE	10	3800	3800	1500	U		
206-44-0	FLUORANTHENE	10	3800	3800	1600	U		041,126
129-00-0	PYRENE	10	3800	3800	1300	U	UJ	117,041,126
85-68-7	BUTYL BENZYL PHTHALATE	10	3800	3800	1600	U		041,126
56-55-3	BENZO(A)ANTHRACENE	10	3800	3800	1600	U	UJ	1 1

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA00031S
Lab ID: 0005082-9

Sample Matrix: SOIL
% Moisture: 13.2
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG

File Name: P7872

91-94-1	3,3'-DICHLOROBENZIDINE	10	19000	19000	2000	U	UJ	117,041,126 AQ
218-01-9	CHRYSENE	10	3800	3800	1400	U		041,126
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	10	3800	3800	1800	U		
117-84-0	DI-N-OCTYL PHTHALATE	10	3800	3800	1800	U		
205-99-2	BENZO(B)FLUORANTHENE	10	3800	3800	2100	U		
207-08-9	BENZO(K)FLUORANTHENE	10	3800	3800	1300	U		
50-32-8	BENZO(A)PYRENE	10	3800	3800	1500	U		
193-39-5	INDENO(1,2,3-CD)PYRENE	10	3800	3800	2300	U		
53-70-3	DIBENZO(A,H)ANTHRACENE	10	3800	3800	2200	U		
191-24-2	BENZO(G,H,I)PERYLENE	10	3800	3800	1000	U	UJ	041,126 AG

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL *	0		2880	0	19 - 113
321-60-8	2-FLUOROBIPHENYL	0		1920	0	30 - 105
367-12-4	2-FLUOROPHENOL	0		2880	0	25 - 100
4165-60-0	NITROBENZENE-D5	0		1920	0	31 - 106
4165-62-2	PHENOL-D5	0		2880	0	24 - 104
1718-51-0	TERPHENYL-D14 *	0		1920	0	18 - 112

* Surr %R diluted out.

CL 6-23-00

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0004S
Lab ID: 0005082-10

Sample Matrix: SOIL
% Moisture: 11.9
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7873

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
110-86-1	PYRIDINE	10	3800	3800	1400	U UJ	041, 126
62-75-9	N-NITROSODIMETHYLAMINE	10	3800	3800	2000	U	
62-53-3	ANILINE	10	9500	9500	2000	U	
108-95-2	PHENOL	10	3800	3800	1900	U	
111-44-4	BIS(2-CHLOROETHYL)ETHER	10	3800	3800	2000	U	
95-57-8	2-CHLOROPHENOL	10	3800	3800	1800	U	
541-73-1	1,3-DICHLOROBENZENE	10	3800	3800	1600	U	
106-46-7	1,4-DICHLOROBENZENE	10	3800	3800	1600	U	
95-50-1	1,2-DICHLOROBENZENE	10	3800	3800	1500	U	
100-51-6	BENZYL ALCOHOL	10	3800	3800	2600	U	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	10	3800	3800	1800	U	
95-48-7	2-METHYLPHENOL	10	3800	3800	2400	U	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	10	3800	3800	2200	U	
106-44-5	4-METHYLPHENOL	10	3800	3800	1800	U	
67-72-1	HEXACHLOROETHANE	10	3800	3800	1800	U	
98-95-3	NITROBENZENE	10	3800	3800	1500	U	
78-59-1	ISOPHORONE	10	3800	3800	1700	U	
88-75-5	2-NITROPHENOL	10	3800	3800	1900	U	
105-67-9	2,4-DIMETHYLPHENOL	10	3800	3800	2400	U	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	10	3800	3800	1700	U	
120-83-2	2,4-DICHLOROPHENOL	10	3800	3800	1900	U	
65-85-0	BENZOIC ACID	10	19000	19000	1500	U	
120-82-1	1,2,4-TRICHLOROBENZENE	10	3800 ✓	3800	1800	U UJ	
91-20-3	NAPHTHALENE	10	11000 ✓	3800	1400	J	
106-47-8	4-CHLOROANILINE	10	9500	9500	1600	U UJ	,117
87-68-3	HEXACHLOROBUTADIENE	10	3800	3800	1900	U	
59-50-7	4-CHLORO-3-METHYLPHENOL	10	3800	3800	1500	U UJ	
91-57-6	2-METHYLNAPHTHALENE	10	22000	3800	1600	J	041, 126
77-47-4	HEXACHLOROCYCLOPENTADIENE	10	3800	3800	2600	U UJ	136, 041, 126

AQ

AQ

Data Package ID: *SV0005082-1*

AL 6-23-00

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0004S
Lab ID: 0005082-10

Sample Matrix: SOIL
% Moisture: 11.9
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG
File Name: P7873

88-06-2	2,4,6-TRICHLOROPHENOL	10	3800	3800	2400	U	UJ	041, 126	AQ
95-95-4	2,4,5-TRICHLOROPHENOL	10	3800	3800	2200	U			
91-58-7	2-CHLORONAPHTHALENE	10	3800	3800	1900	U			
88-74-4	2-NITROANILINE	10	19000	19000	2200	U			
131-11-3	DIMETHYL PHTHALATE	10	3800	3800	910	U			
606-20-2	2,6-DINITROTOLUENE	10	3800	3800	1100	U			
208-96-8	ACENAPHTHYLENE	10	3800	3800	1900	U			
99-09-2	3-NITROANILINE	10	19000	19000	1200	U			,117
83-32-9	ACENAPHTHENE	10	3800	3800	1900	U			
51-28-5	2,4-DINITROPHENOL	10	19000	19000	1800	U			,117
100-02-7	4-NITROPHENOL	10	19000	19000	1800	U			
132-64-9	DIBENZOFURAN	10	3800	3800	1800	U			
121-14-2	2,4-DINITROTOLUENE	10	3800	3800	1700	U			
84-66-2	DIETHYL PHTHALATE	10	3800	3800	1900	U			
86-73-7	FLUORENE	10	3800	3800	1900	U			
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	10	3800	3800	1800	U			
100-01-6	4-NITROANILINE	10	19000	19000	2000	U			,117
103-33-3	AZOBENZENE	10	3800	3800	1900	U			
534-52-1	4,6-DINITRO-2-METHYLPHENOL	10	19000	19000	2200	U			
86-30-6	N-NITROSODIPHENYLAMINE	10	3800	3800	1700	U			
101-55-3	4-BROMOPHENYL PHENYL ETHER	10	3800	3800	1800	U			
118-74-1	HEXACHLOROBENZENE	10	3800	3800	1600	U			
58-90-2	2,3,4,6-TETRACHLOROPHENOL	10	19000	19000	1700	U			
87-86-5	PENTACHLOROPHENOL	10	19000	19000	1500	U			
85-01-8	PHENANTHRENE	10	3800	3800	1500	U			
120-12-7	ANTHRACENE	10	3800	3800	1700	U			
86-74-8	CARBAZOLE	10	3800	3800	1600	U			
84-74-2	DI-N-BUTYL PHTHALATE	10	3800	3800	1500	U			
206-44-0	FLUORANTHENE	10	3800	3800	1600	U			
129-00-0	PYRENE	10	3800	3800	1200	U			,117
85-68-7	BUTYL BENZYL PHTHALATE	10	3800	3800	1600	U			
56-55-3	BENZO(A)ANTHRACENE	10	3800	3800	1600	U	UJ	041, 126	AQ

Data Package ID: *SV0005082-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0004S
Lab ID: 0005082-10

Sample Matrix: SOIL
% Moisture: 11.9
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 30-May-00

Prep Batch: EX000516-3
QCBatchID: EX000516-3-1
Run ID: SV000530-2
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 30 G
Final Volume: 1 ML
Result Units: UG/KG

File Name: P7873

91-94-1	3,3'-DICHLOROBENZIDINE	10	19000	19000	1900	U	UJ	041, 126, 117
218-01-9	CHRYSENE	10	3800	3800	1400	U		041, 126
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	10	3800	3800	1800	U		
117-84-0	DI-N-OCTYL PHTHALATE	10	3800	3800	1800	U		
205-99-2	BENZO(B)FLUORANTHENE	10	3800	3800	2000	U		
207-08-9	BENZO(K)FLUORANTHENE	10	3800	3800	1200	U		
50-32-8	BENZO(A)PYRENE	10	3800	3800	1500	U		
193-39-5	INDENO(1,2,3-CD)PYRENE	10	3800	3800	2300	U		
53-70-3	DIBENZO(A,H)ANTHRACENE	10	3800	3800	2200	U		
191-24-2	BENZO(G,H,I)PERYLENE	10	3800	3800	1000	U	UJ	041, 126

AQ

AQ

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL *	0		2840	0	19 - 113
321-60-8	2-FLUOROBIPHENYL	0		1890	0	30 - 105
367-12-4	2-FLUOROPHENOL	0		2840	0	25 - 100
4165-60-0	NITROBENZENE-D5	0		1890	0	31 - 106
4165-62-2	PHENOL-D5	0		2840	0	24 - 104
1718-51-0	TERPHENYL-D14 *	0		1890	0	18 - 112

* Surr %R diluted out

AC 6-23-00

Data Package ID: *SV0005082-1*

Gasoline Range Organics

Method SW8015

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID:	DRA0007S
Lab ID:	0005082-4

Sample Matrix: SOIL
% Moisture: 5
Date Collected: 11-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: HCG000522-1
QCBatchID: HCG000522-1-1
Run ID: HCG000522-1G
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 5 G
Final Volume: 5 G
Result Units: MG/KG

5 mL MeOH

File Name: G0522G06

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE	1	0.53	0.53	0.053	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
13-10-5	2,3,4-TRIFLUOROTOLUENE	0.0889		0.105	84	69 - 119

RL 6.26.00

Data Package ID: *HCG0005082-2*

Gasoline Range Organics

Method SW8015

Method Blank

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Lab ID: HCG000522-2MB

Sample Matrix: SOIL
% Moisture: N/A
Date Collected: N/A
Date Extracted: 05/22/2000
Date Analyzed: 05/22/2000

Prep Batch: HCG000522-2
QCBatchID: HCG000522-2-1
Run ID: HCG000522-1G
Cleanup: NONE
Basis: N/A

Sample Aliquot: 5 G
Final Volume: 5 G 5mL MeOH
Result Units: MG/KG

File Name: G0522G09

CASNO	Target Analyte	DF	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE	1	0.5	0.5	0.05	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
13-10-5	2,3,4-TRIFLUOROTOLUENE	0.104 ✓		0.1	104 ✓	69 - 119

RC 6-26-00

Data Package ID: *HCG0005082-3*

Gasoline Range Organics

Method SW8015

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0002S
Lab ID: 0005082-7

Sample Matrix: SOIL
% Moisture: 4.5
Date Collected: 09-May-00
Date Extracted: 22-May-00
Date Analyzed: 22-May-00

Prep Batch: HCG000522-2
QCBatchID: HCG000522-2-1
Run ID: HCG000522-1G
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 5 G
Final Volume: 5 G 5 mL
Result Units: MG/KG MeOH

File Name: G0522G17

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE	100	590	52	5.2		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
13-10-5	2,3,4-TRIFLUOROTOLUENE	11.3		10.5	108	69 - 119

The chromatogram indicates the presence of hydrocarbons in the range of C7-C13. JP-5

AC 6-26-00

Data Package ID: *HCG0005082-3*

Gasoline Range Organics

Method SW8015

Method Blank

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Lab ID: HCG000523-1MB

Sample Matrix: SOIL
% Moisture: N/A
Date Collected: N/A
Date Extracted: 05/23/2000
Date Analyzed: 05/23/2000

Prep Batch: HCG000523-1
QCBatchID: HCG000523-1-1
Run ID: HCG000523-1G
Cleanup: NONE
Basis: N/A

Sample Aliquot: 5 G
Final Volume: 5 G 5 mL MeOH
Result Units: MG/KG
File Name: B0523G02

CASNO	Target Analyte	DF	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE	1	0.5	0.5	0.05	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
13-10-5	2,3,4-TRIFLUOROTOLUENE	0.105 ✓		0.1	105 ✓	69 - 119

M 6-26-00

Data Package ID: *HCG0005082-4*

Gasoline Range Organics

Method SW8015

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0006S
Lab ID: 0005082-2

Sample Matrix: SOIL
% Moisture: 14.2
Date Collected: 10-May-00
Date Extracted: 23-May-00
Date Analyzed: 23-May-00

Prep Batch: HCG000523-1
QCBatchID: HCG000523-1-1
Run ID: HCG000523-1G
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 5 G
Final Volume: 5 G 5 mL MeOH
Result Units: MG/KG

File Name: B0523G09

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE	500	1600	290	29		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
13-10-5	2,3,4-TRIFLUOROTOLUENE	63.6		58.3	109	69 - 119

The chromatogram indicates the presence of hydrocarbons in the range of C7-C13. JP-5

AL 6-26-00

Data Package ID: *HCG0005082-4*

Gasoline Range Organics

Method SW8015

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0001S
Lab ID: 0005082-6

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 09-May-00
Date Extracted: 23-May-00
Date Analyzed: 23-May-00

Prep Batch: HCG000523-1
QCBatchID: HCG000523-1-1
Run ID: HCG000523-1G
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 5 G
Final Volume: 5 G
Result Units: MG/KG

5 mL MeOH

File Name: B0523G08

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE	200	660	110	11		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
13-10-5	2,3,4-TRIFLUOROTOLUENE	24.2		21.5	113	69 - 119

The chromatogram indicates the presence of hydrocarbons in the range of C7-C13. JP-5

RL 6.26.00

Data Package ID: *HCG0005082-4*

Gasoline Range Organics

Method SW8015

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 23-May-00
Date Analyzed: 23-May-00

Prep Batch: HCG000523-1
QCBatchID: HCG000523-1-1
Run ID: HCG000523-1G
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 5 G
Final Volume: 5 G
Result Units: MG/KG

5mL MeOH

File Name: B0523G06

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE	1000	1800	560	56		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
13-10-5	2,3,4-TRIFLUOROTOLUENE	121		112	108	69 - 119

The chromatogram indicates the presence of hydrocarbons in the range of C7-C13. JP-5

6-26-00

Data Package ID: *HCG0005082-4*

Gasoline Range Organics

Method SW8015

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID:	DRA00031S
Lab ID:	0005082-9

Sample Matrix: SOIL
% Moisture: 13.2
Date Collected: 09-May-00
Date Extracted: 23-May-00
Date Analyzed: 23-May-00

Prep Batch: HCG000523-1
QCBatchID: HCG000523-1-1
Run ID: HCG000523-1G
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 5 G
Final Volume: 5 G
Result Units: MG/KG

5 mL MeOH

File Name: B0523G07

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE	500	1200	290	29		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
13-10-5	2,3,4-TRIFLUOROTOLUENE	62.7		57.6	109	69 - 119

The chromatogram indicates the presence of hydrocarbons in the range of C7-C13. JP-5

NL
6-26-00

Data Package ID: *HCG0005082-4*

Gasoline Range Organics

Method SW8015

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0004S
Lab ID: 0005082-10

Sample Matrix: SOIL
% Moisture: 11.9
Date Collected: 09-May-00
Date Extracted: 23-May-00
Date Analyzed: 23-May-00

Prep Batch: HCG000523-1
QCBatchID: HCG000523-1-1
Run ID: HCG000523-1G
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 5 G
Final Volume: 5 G
Result Units: MG/KG
5 mL matrix

File Name: B0523G05

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
8006-61-9	GASOLINE	1000	1700	570	57		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
13-10-5	2,3,4-TRIFLUOROTOLUENE	123		114	109	69 - 119

The chromatogram indicates the presence of hydrocarbons in the range of C7-C13. JP-5

RL 6-26-00

Data Package ID: *HCG0005082-4*

Diesel Range Organics

Method SW8015M

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0006S
Lab ID: 0005082-2

Sample Matrix: SOIL
% Moisture: 14.2
Date Collected: 10-May-00
Date Extracted: 16-May-00
Date Analyzed: 22-May-00

Prep Batch: EX000516-4
QCBatchID: EX000516-4-1
Run ID: HCD000519-1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 20 G
Final Volume: 5 ML
Result Units: MG/KG
File Name: D0519S44

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	10	10000	58	13		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
630-01-3	N-HEXACOSANE	5.95		7.28	82	54 - 146

The chromatogram indicates the presence of hydrocarbons in the range of C8-C22. Diesel

RC 6-26-00

Data Package ID: *HCD0005082-2*

Diesel Range Organics

Method SW8015M

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0007S
Lab ID: 0005082-4

Sample Matrix: SOIL
% Moisture: 5
Date Collected: 11-May-00
Date Extracted: 16-May-00
Date Analyzed: 22-May-00

Prep Batch: EX000516-4
QCBatchID: EX000516-4-1
Run ID: HCD000519-1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 20 G
Final Volume: 5 ML
Result Units: MG/KG
File Name: D0519S32

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	1	6.9	5.3	1.2	U	D25

AQ

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
630-01-3	N-HEXACOSANE	8.37		6.58	127	54 - 146

The chromatogram indicates the presence of hydrocarbons in the range of C8-C12.

LC
6-26-00

Data Package ID: *HCD0005082-2*

Diesel Range Organics

Method SW8015M

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID:	DRA0001S
Lab ID:	0005082-6

Sample Matrix: SOIL
% Moisture: 6.9
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 22-May-00

Prep Batch: EX000516-4
QCBatchID: EX000516-4-1
Run ID: HCD000519-1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 20 G
Final Volume: 5 ML
Result Units: MG/KG
File Name: D0519S45

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	10	7400	54	12		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
630-01-3	N-HEXACOSANE	6.25		6.71	93	54 - 146

The chromatogram indicates the presence of hydrocarbons in the range of C8-C20. Diesel

6-26-00

Data Package ID: *HCD0005082-2*

Diesel Range Organics

Method SW8015M

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0002S
Lab ID: 0005082-7

Sample Matrix: SOIL
% Moisture: 4.5
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 22-May-00

Prep Batch: EX000516-4
QCBatchID: EX000516-4-1
Run ID: HCD000519-1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 20 G
Final Volume: 5 ML
Result Units: MG/KG
File Name: D0519S46

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	10	4500	52	12		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
630-01-3	N-HEXACOSANE	5.87		6.54	90	54 - 146

The chromatogram indicates the presence of hydrocarbons in the range of C8-C20. Diesel

RL 6-26-00

Data Package ID: *HCD0005082-2*

Diesel Range Organics

Method SW8015M

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0003S
Lab ID: 0005082-8

Sample Matrix: SOIL
% Moisture: 10.5
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 22-May-00

Prep Batch: EX000516-4
QCBatchID: EX000516-4-1
Run ID: HCD000519-1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 20 G
Final Volume: 5 ML
Result Units: MG/KG
File Name: D0519S47

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	10	9100	56	12		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
630-01-3	N-HEXACOSANE	6.16		6.98	88	54 - 146

The chromatogram indicates the presence of hydrocarbons in the range of C8-C20. Diesel

RL 6-26-00

Data Package ID: *HCD0005082-2*

Diesel Range Organics

Method SW8015M

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA00031S
Lab ID: 0005082-9

Sample Matrix: SOIL
% Moisture: 13.2
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 22-May-00

Prep Batch: EX000516-4
QCBatchID: EX000516-4-1
Run ID: HCD000519-1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 20 G
Final Volume: 5 ML
Result Units: MG/KG
File Name: D0519S48

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	10	7900	58	13		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
630-01-3	N-HEXACOSANE	5.92		7.2	82	54 - 146

The chromatogram indicates the presence of hydrocarbons in the range of C8-C20. Diesel

Data Package ID: *HCD0005082-2*

Diesel Range Organics

Method SW8015M

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0005082
Client Name: IT Corporation Las Vegas
ClientProject ID: Desert Rock Airstrip Fuel Spill 799422.00090005

Field ID: DRA0004S
Lab ID: 0005082-10

Sample Matrix: SOIL
% Moisture: 11.9
Date Collected: 09-May-00
Date Extracted: 16-May-00
Date Analyzed: 22-May-00

Prep Batch: EX000516-4
QCBatchID: EX000516-4-1
Run ID: HCD000519-1
Cleanup: NONE
Basis: Dry Weight

Sample Aliquot: 20 G
Final Volume: 5 ML
Result Units: MG/KG
File Name: D0519S49

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	MDL	Result Qualifier	EPA Qualifier
68334-30-5	Diesel Range Organics	10	12000	57	12		

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
630-01-3	N-HEXACOSANE	6.09		7.09	86	54 - 146

The chromatogram indicates the presence of hydrocarbons in the range of C8-C20.

Diesel

Data Package ID: *HCD0005082-2*

Appendix F

Response to NDEP Comments

NEVADA ENVIRONMENTAL RESTORATION PROJECT
DOCUMENT REVIEW SHEET

1. Document Title/Number: Draft Closure Report for Corrective Action Unit 329: Area 22 Desert Rock Airstrip Fuel Spill, Nevada Test Site, Nevada	2. Document Date: July 2000
3. Revision Number: 0	4. Originator/Organization: IT Corporation
5. Responsible DOE/NV ERP Project Mgr.: Janet Appenzeller-Wing	6. Date Comments Due: July 28, 2000
7. Review Criteria: Full	
8. Reviewer/Organization/Phone No.: John A. Wong, NDEP, 486-2866	9. Reviewer's Signature:

10. Comment Number/ Location	11. Type*	12. Comment	13. Comment Response	14. Accept
1) Page ES-2, Last Paragraph, 2nd Bullet		Define the annual monitoring event (i.e., sample point depths to be sampled, the parameters to be analyzed for). Also, somewhere in the document, include a proposed tentative schedule for the annual monitoring events.	The proposed sample point depth and analytes were added in Table 4-1. The proposed monitoring schedule was added in Table 4-2.	Yes
2) Section 2.1.1, Page 5, 5th Bullet		What is intended by this statement? If this statement is accurate, is bioremediation an appropriate remedial alternative? This comment is also applicable to text contained on pages A-15, A-25, and C-6.	The bioassessment results indicate that bioremediation at the site is possible. However, the effectiveness of bioremediation without additional nutrients or oxygen will probably be marginal. It cannot be determined if bioremediation, either passive or active, is an appropriate remedial alternative without additional monitoring. The SAFER Work Plan specifies that the site will be monitored for 5 years. At that time, a determination will be made if the biodegradation rate is adequate to decrease contamination levels to <100 ppm within 30 years. If NDEP wants to evaluate the bioremediation results prior to 5 years, then DOE/NV will review the results of the closure activities, monitoring results, and evaluate other remediation alternatives when requested by NDEP. The effectiveness of the bioremediation and the potential cost/benefits of alternative remediation technologies will be evaluated.	Partial

NEVADA ENVIRONMENTAL RESTORATION PROJECT
DOCUMENT REVIEW SHEET

10. Comment Number/ Location	11. Type*	12. Comment	13. Comment Response	14. Accept
3) Section 3.0, Page 8		"...The waste will be disposed of as nonhazardous petroleum hydrocarbon waste, except for Hanby..."; soil sample results indicated that TPH concentrations in soil exceeded the PALs. Associated waste would therefore require disposal in an appropriate landfill, as opposed to being managed as nonhazardous material. Also, how are you defining "Hanby waste" and what is the reason for designating the Hanby waste as hazardous.	Petroleum hydrocarbons are not considered to be hazardous materials as defined by RCRA. The hydrocarbon contaminated soil will be disposed of in the appropriate landfill. The Hanby waste was generated when the Hanby test kit was used for TPH field screening. The Hanby waste is designated as hazardous because carbon tetrachloride is used for extraction as part of the Hanby test kit.	Partial
4) Section 4.0, Page 9, 1st Paragraph		Indicate the depths of the soil-gas monitoring points to be sampled.	Table 4-1 was added specifying the depths and analysis for annual monitoring. The DRA-0 soil gas monitoring points will be sampled at 40 ft, 80 ft, and 120 ft bgs. The DRA-3 soil gas monitoring points will also be sampled at 50 ft, 75 ft, and 120 ft bgs.	Yes
5) Section 4.0, Page 9, 1st Paragraph		How will the determination of equilibrium be made (i.e., explain the criteria that will be evaluated in making the determination of whether or not equilibrium is achieved)? Also, discuss the course of action to be taken in the event that equilibrium is not reached.	An explanation of the equilibrium determination was added to Section 4.0.	Yes
6) Page A-10, 2nd Paragraph		Results of radiological analyses should be discussed with respect to waste management decisions.	The 2nd sentence as changed to read "Radiological analyses were also performed by Paragon Analytical Services for waste management purposes only." The gamma spectrometry results were discussed in the Draft CR in Section A.3.4 and state that the results were not distinguishable from background concentrations. Section 3.0, 1st paragraph, 2nd sentence states "No additional hazardous substances or radiological constituents were identified."	Partial

NEVADA ENVIRONMENTAL RESTORATION PROJECT
DOCUMENT REVIEW SHEET

10. Comment Number/ Location	11. Type*	12. Comment	13. Comment Response	14. Accept
General Comment		Based on the results of the bioassessment report, as discussed in Appendix C, passive bioremediation (natural attenuation) may not be the most effective remediation strategy. Upon obtaining and evaluating soil-gas data for the next 2-3 monitoring events, it may be appropriate to reevaluate remediation strategies. Technologies and processes used for increasing subsurface oxygen levels and moisture, and decreasing pH in the subsurface, may need to be considered.	See response to Comment 2.	Partial

[a] Comment Types: M = Mandatory, S = Suggested.

Return Document Review Sheets to DOE/NV Environmental Restoration Division, Attn: QAC, M/S 505.

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