National Aeronautics and
Space Administration

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April 17, 2014

Reply to Attn of: RE-14-046

Mr. John E. Kieling, Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Subject: 600 Area Perched Groundwater Extraction Pilot Test Interim Status Report

Enclosed is the 600 Area Perched Groundwater Extraction Pilot Test Interim Status Report required by NMED's January 16, 2013 approval of NASA's 600 Area Perched Groundwater Extraction Pilot Test Work Plan submitted on November 13, 2012. This submittal includes an Executive Summary as Enclosure 1, a paper copy of the report as Enclosure 2, and a CD-ROM with the report in PDF as Enclosure 3.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for known violations.

If you have any questions or comments concerning this submittal, please contact Tim Davis of my staff at 575–524–5024.

Radel Bunker-Farrah
Environmental Program Manager

3 Enclosures

cc:
Mr. Dan Comeau
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Executive Summary

This 600 Area Perched Groundwater Extraction Pilot Test Interim Status Report summarizes the results of perched groundwater extraction at the White Sands Test Facility (WSTF) 600 Area Closure (Closure). Perched groundwater extraction has been performed for one year in accordance with the 600 Area Perched Groundwater Extraction Pilot Test Work Plan, submitted by NASA on November 13, 2012 and approved by the New Mexico Environment Department on January 16, 2013. The objective of the pilot test was to determine if perched groundwater could be effectively removed using groundwater monitoring well 600-G-138, and if so, what impact the extraction of that groundwater would have on the concentrations of hazardous constituents in the soil vapor beneath the Closure. Periodic groundwater and soil vapor sampling was performed prior to, and during, the pilot test period to monitor the impact of perched groundwater extraction.

Between April 2013, when extraction was initiated, and March 2014 NASA extracted 1,870 gallons of contaminated groundwater from monitoring well 600-G-138. Extracted groundwater was transported to, and treated by, the Mid-plume Interception and Treatment System. Field data and chemical analytical results obtained from perched groundwater sampling indicate that contaminated perched groundwater is still present atop the bedrock beneath the Closure, thus the perceived source of soil vapor contaminants remains. Chemical analytical data from soil vapor monitoring at adjacent multiport soil vapor monitoring well 600-SGW-5 indicate that concentrations of volatile organic compounds in the soil vapor did not decline during the pilot test.

The removal of contaminated groundwater from WSTF source areas is part of NASA's long-term groundwater remediation strategy. Based on this, and the results of the pilot test, NASA recommends continued extraction of perched groundwater from monitoring well 600-G-138. Periodic groundwater and soil vapor monitoring will be continued as specified in the approved 600 Area Perched Groundwater Extraction Pilot Test Work Plan. NASA proposes to continue perched groundwater extraction for another year following submittal of this report. If perched groundwater is still present at that time, another status report will be submitted; otherwise, a final report will be submitted.

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National Aeronautics and
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Solid Waste Management Unit (SWMU) 14:

600 Area JP4 and JP5 Remote Test Sites

Investigation Report

April 2014

NM8800019434
NASA Johnson Space Center White Sands Test Facility
12600 NASA Road Las Cruces, New Mexico 88012

Solid Waste Management Unit (SWMU)14:

600 Area JP4 and JP5 Remote Test Sites

Investigation Report

April 2014

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

for

Radel Bunker-Farrah
Chief, NASA Environmental Office

5/1/14

Date

Executive Summary

Solid Waste Management Unit (SWMU) 14: 600 Area Jet Propulsion 4 and Jet Propulsion 5 Remote Test Sites (JP4/JP5 RTS) located at the National Aeronautics and Space Administration (NASA) White Sands Test Facility (WSTF) were used for JP-4 and JP-5 jet fuel fire tests conducted by the U.S. Navy and NASA Ames Research Center. Numerous fire tests were performed at the test sites between 1979 and 1989. NASA determined in a historical information summary (HIS) (NASA, 2013) that approximately 7,880 gallons of JP-4 fuel were burned at the JP4 RTS. Approximately 660 gallons of JP-4 fuel and approximately 13,530 gallons of JP-5 fuel were burned at the JP5 RTS. The HIS indicated that there were no recorded releases of jet fuel to soil adjacent to the concrete test pads at the two locations. Two previous environmental investigations were conducted in the area; a soil vapor investigation in 1989 and a soil boring investigation in 1994 and 1995. The initial investigation of soil vapor concluded that ethylbenzene and total hydrocarbons were present above the detection limits at one vapor sampling point in the JP5 RTS. In several soil samples collected during the soil boring investigation, trace amounts of methylene chloride were detected. In one sample from JP4 RTS and bis(2-ethylhexyl) phthalate (BEHP) was detected. Methylene chloride is a common laboratory contaminant, and BEHP is consistent with the use of a plastic sample catcher on the end of the core barrel sampler. They were not considered representative of the native soil conditions at the time.

The NASA WSTF Hazardous Waste Permit (Permit; NMED, 2009) requires the submittal of an investigation work plan (IWP) for SWMU 14 by December 30, 2014. NASA developed the IWP and completed the investigation early due to sanitary sewer system construction activities within the vicinity of the SWMU. NASA submitted an abbreviated investigation work plan to the New Mexico Environment Department (NMED) on August 27, 2013 (NASA, 2013). NMED approved the work plan on December 19, 2013.

NASA performed project planning and related activities between October 2013 and January 2014 and performed field investigation work in February 2014. The investigation included the installation of 12 soil borings to a depth of 30 ft at both test sites. Soil samples were collected at predetermined sample intervals (2 to 4 ft, 13 to 15 ft, and 28 to 30 ft) in each boring. Equipment rinsate samples were collected to ensure that no cross contamination between borings occurred. A total of 39 soil samples were collected during the investigation, including field duplicate samples. The soil samples were analyzed by a NELAP-accredited laboratory for total petroleum hydrocarbons (TPH), BTEX volatiles (benzene, toluene, ethylbenzene, and xylenes [total]), and polycyclic aromatic hydrocarbons (PAHs).

As part of the performance and acceptance criteria of the data quality objectives (DQOs) for this investigation, chemical analytical data were reviewed and compared to established NMED Residential Soil Screening Levels (RSSL) for the BTEX volatiles and PAHs (NMED, 2012). TPH concentrations were compared to NMED TPH Soil Screening Guidelines (NMED, 2012). TPH, BTEX, and PAH analytical results were all well below the applicable regulatory limits. NASA also reviewed available groundwater data from groundwater monitoring well JP-3, which is located approximately 300 ft east (downgradient) of the JP4 RTS. There were no JP4/JP5 RTS constituents detected in the groundwater at this well.

Based on the results of this investigation, NASA concludes that the jet fuel fire testing performed at the JP4/JP5 RTS did not adversely affect the soil or groundwater in the area of SWMU 14. Soil and groundwater monitoring at and near the SWMU show that there is no continuing risk to human health or the environment. NASA concludes that no further investigation or corrective action is required and recommends a “corrective action complete” status determination for SWMU 14: 600 Area JP4/JP5 RTS.

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List of Acronyms

µg	microgram
AOCs	Areas of Concern
BEHP	bis(2-ethylhexyl) phthalate
Bgs	Below ground surface
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
COPC	contaminant of potential concern
DQO	Data Quality Objective
EPA	Environmental Protection Agency
ft	feet
HAZWOPER	Hazardous Waste Operation and Emergency Response
HWB	Hazardous Waste Bureau
IDW	investigation-derived waste
JDMB	Jornada del Muerto Basin
JSC	Johnson Space Center
kg	kilogram
L	liter
MDL	method detection limit
mg	milligram
NASA	National Aeronautics and Space Administration
ND	not detected
NMED	New Mexico Environment Department
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSSL	NMED Residential Soil Screening Level
RTS	Remote Test Site
SAM	San Andres Mountains
SCS	Soil Conservation Service
SSL	soil screening level
SVOC	semi-volatile organic compound
SWMU	Solid Waste Management Unit
TPH	Total hydrocarbons
USCS	United Soil Classification System
USDA	United States Department of Agriculture
VOC	volatile organic compound
WSTF	White Sands Test Facility

1.0 Introduction

The National Aeronautics and Space Administration (NASA) Johnson Space Center (JSC) White Sands Test Facility (WSTF) has supported safety-related testing of space flight equipment and hazardous materials from 1964 to the present. Per the 1989 Environmental Protection Agency (EPA) 3008(h) Corrective Action Order, NASA was required to submit a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) work plan to assess contaminant and source characterization of hazardous constituents and hazardous wastes released to the environment. As a result of the work plan and subsequent submittal of the RFI report (NASA, 1996), NASA identified and investigated several Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs). The list of identified SWMUs and AOCs was incorporated into the NASA WSTF RCRA Hazardous Waste Permit (Permit), which was issued by the New Mexico Environment Department (NMED) in November 2009 (NMED, 2009[a]).

The 600 Area Jet Propulsion 4 and Jet Propulsion 5 Remote Test Sites (JP4/JP5 RTS) are identified as SWMU 14 in Attachment 22 of the Permit. Both test sites were used for jet fuel (JP-4 and JP-5 fuel) fire tests conducted by the U.S. Navy and NASA Ames Research Center between 1979 and 1989. The Permit requires the submittal of an Investigation Work Plan (IWP) for SWMU 14 by December 30, 2014. NASA elected to perform the investigation ahead of the Permit schedule because of sanitary sewer system construction activities within the vicinity of the SWMU. On August 27, 2013, NASA submitted the 600 Area JP4 and JP5 Remote Test Sites Abbreviated Investigation Work Plan (NASA, 2013) to NMED. NMED approved the IWP on December 19, 2013. NASA began project planning activities to support the investigation in October 2013 and performed the fieldwork required by the approved IWP in February 2014. Investigation activities included detailed site surveys, the installation of 12 soil borings utilizing a drilling rig equipped with hollow-stem augers, collection of soil samples at multiple depth intervals in each soil boring, sample management, soil and rinsate sample chemical analysis by an off-site laboratory, and soil characterization based on the results of the soil chemical analytical data. This report documents the results of the investigation and presents NASA's interpretation of those results.

1.1 Facility Location and Description

NASA WSTF is located 18 miles northeast of Las Cruces, New Mexico, and 65 miles north of El Paso, Texas (Figure 1). WSTF was constructed in 1964 at a remote location adjacent to the San Andres Mountains (SAM). The land occupied by WSTF is owned by the Department of the Army, and is used by NASA under a land use agreement with the Army. Access to the site is provided by a paved road that intersects U.S. Highway 70 one mile west of Organ, New Mexico. The primary activities at WSTF in support of the space program are:

- Development, qualification, refurbishment, and testing of spacecraft propulsion systems, subsystems, and ground support equipment.
- Investigation of flight hardware anomalies.
- Testing of materials and components.
- Performance of hazard and failure analyses.

Industrial areas of WSTF and general facilities within each are:

- 100 Area: Administrative offices, and firefighting, vehicle maintenance, warehousing facilities.
- 200 Area: Laboratories and clean rooms.
- 300 Area: Altitude chambers, engine test stands, and former wastewater treatment facilities.
- 400 Area: Altitude chamber, engine test stands, and former wastewater treatment facilities.
- 500 Area: Waste fuel treatment and storage.

- 600 Area: Groundwater supply wells, groundwater monitoring and remediation systems, sewage treatment facilities.
- 800 Area: Hazardous fluids and materials test cells.

1.2 Regulatory Requirements

Section VII of the Permit (NMED, 2009) requires that NASA conduct corrective action to address releases of hazardous waste or hazardous constituents from SWMUs and AOCs at the facility to protect human health and the environment. Section VII.H.1.a of the Permit requires that NASA submit an IWP that provides a schedule for implementation and completion of specific actions necessary to determine the nature and extent of contamination from the SWMU. After completion and implementation of the IWP, Section VII.H.3 of the Permit requires that NASA submit an Investigation Report (IR) which should be completed in accordance with Permit Attachment 20 (*Reporting Requirements)*. The IR is to include summaries of all activities and the results of such activities specified in the approved IWP.

1.3 600 Area JP4/JP5 RTS Location and Description

The JP4/JP5 RTS is located in the WSTF 600 Area which extends approximately four miles to the west of the WSTF industrial areas (Figure 2). The JP4/JP5 RTS consists of two historical testing areas: the JP4 RTS and the JP5 RTS. The testing areas are situated approximately 800 feet (ft) apart. The JP4 RTS was constructed first in 1979 and consists of a concrete pad that was situated between three, 90 ft tall, 2.5 ft diameter steel pipes that were used for additional heat sink. During the sanitary sewer construction activities in August 2013, these steel pipes were removed. The concrete pad at the JP4 RTS is approximately four inches thick and approximately 2,545 square ft in area. The JP5 RTS was constructed later in 1982 and consists of a concrete/metal fiber pad surrounded by a steel structure that was used to hoist netting for wind control during testing. The concrete/metal fiber pad is approximately ten inches thick and is approximately 8,965 square ft in area. Figures 3 through 6 show the condition of the JP4/JP5 RTS immediately prior to the investigation. Figures 7 and 8 provide aerial photographs of the test sites and show pertinent features associated with the sites and the investigation.

1.4 Purpose of Investigation

The objective of this investigation is to determine if historical jet fuel fire testing activities conducted at the 600 Area JP4/JP5 RTS resulted in contamination of the soil beneath or adjacent to the JP4 and JP5 test pads and to determine if the concentrations of contaminants of potential concern (COPC) in the soil exceed applicable regulatory levels of concern.

1.5 Type of Results Presented in the Report

The types of results presented in the report include the following:

- Field investigation results, including soil conditions/observations, a discussion of the drilling program, deviations from the IWP, soil sampling, field notes, and soil boring management.
- Soil investigation results, including soil analytical data summaries, contract laboratory final analytical data reports, data interpretations, and soil sample contaminant concentrations compared to evaluation criteria.

2.0 Background

2.1 WSTF Environmental Setting

2.1.1 Facility Geography, Climate, and Ecology

WSTF occupies over 60,000 acres along the western flank of the southern San Andreas Mountains (SAM), one of the most prominent north-south trending ranges in southwestern New Mexico. The SAM represent a typical uplifted mountain block separated by broad intermontaine basins characteristic of the Basin and Range province of the southwestern United States. WSTF is located on the alluvial-covered pediment slope between the SAM to the east, and the Jornada del Muerto Basin (JDMB) to the west.

The WSTF area is associated with a predominantly Chihuahuan Desert climate, which is characterized by abundant sunshine, low humidity, slight rainfall, and a large diurnal temperature variation. The mountainous terrain in the region influences the climate by blocking the incursion of moisture-laden maritime air masses.

Biotic resources at WSTF are typical of those found in the arid southwest, a desert area with low rainfall and sparse vegetation. The average rainfall of 10 inches per year makes it difficult to support agriculture without irrigation. WSTF can be characterized by a relatively low biodiversity in plant species.

Major vegetation at WSTF includes a combination of woody shrubs and grasses characteristic of the Chihuahuan Desert Shrub Biotic Community. These shrubs include Louisiana White Sage, Creosote Bush, Honey Mesquite, Tarbush, Broom Snakeweed, and Lotebush. Common grasses include Alkali Sacaton, Side-Oats Grama, Fluff Grass, Tobosa Grass, and Purple Three Awn. Numerous well developed arroyos are present but hidden from sight within the low profile topography and vegetation. Water flows in a westward direction towards the JDMB. The variety of plant species is low relative to that in better drained upland slopes that receive higher annual rainfall. Shrubs provide a microhabitat for warm season grasses and herptiles.

WSTF is considered to be a low affectability area. The facility receives little use by wildlife species because it has been physically altered by human disturbance or overgrazing. The area provides reduced topographic relief and vegetation diversity associated with food and cover.

2.1.2 WSTF Geologic Setting

WSTF is in the Mexican Highland Section of the Basin and Range Province and within a major tectonic feature – the Rio Grande Rift Zone. North-trending mountain ranges and intermountain basins characterize the Rift Zone, which extends from southern Colorado to northern Mexico. WSTF is located along the western flank of the SAM. The elevation of the adjacent plains is approximately 4,000 ft above mean sea level.

The uppermost alluvial soils upon which WSTF is located consist of silt, sand, gravel, boulders, and conglomerates locally cemented with calcium carbonate (caliche). Alluvial soils adjacent to the SAM range from 0 – 200 ft thick to more than 2,500 ft thick in the JDMB. Soils on WSTF's alluvial plains include stony loams and sandy loams associated with alluvial fans, arroyos, and gentle slopes. Runoff ranges from slow to rapid, and permeability is slow to moderately rapid. Soils within the JDMB area to the west of WSTF are characterized by slopes ranging from zero to 15 percent that dip west toward the axis of the basin. The Doña Ana-Reagan Association predominates within the JP Test Areas (USDA SCS, 1980). The Doña Ana Series consists of deep, well-drained soils that formed in mixed alluvium on fans

and piedmonts. The Reagan Series consists of well drained alluvial soils that formed on basin floors. Calcium carbonate concentrations typically range from 15 to 40 percent.

2.2 Facility Location and Historical Use

The 600 Area JP4/JP5 RTS are located approximately four miles to the west of the WSTF industrial areas within the central JDMB. The two areas are located adjacent to each other in an area characterized by a bedrock depth of over 2,000 ft, and a groundwater depth of approximately 380 ft. Both test sites were used for JP-4 and JP-5 jet fuel fire tests conducted by the U.S. Navy and NASA Ames Research Center between 1979 and 1989. Additional information pertaining to the historical site operations, facilities, hazardous chemical use, and hazardous waste management for the 600 Area JP4/JP5 RTS is provided in the 600 Area JP4/JP5 Historical Information Summary (HIS; NASA, 2013).

2.3 Current Structures in the 600 Area JP4/JP5 RTS

The current JP4 RTS consists of only the concrete pad and temporary barricade fencing. The three towers, which were used as heat sinks during the original testing, were removed in early August 2013 to facilitate installation of the sanitary sewer pipeline. The towers were inspected for asbestos prior to removal and were found to not contain asbestos material. After removal, the towers were re-used for other projects at WSTF.

The current JP5 RTS consists of the concrete pad and steel wind screen frame. The wind screen frame was used to hoist wind screens or curtains for wind effects fire testing. Vegetation such as large mesquite had overgrown the area, but was removed prior to soil sampling activities.

2.4 Previous Investigations

There have been two previous investigations for the JP4/JP5 RTS which were conducted as portions of larger WSTF site investigations. In the 1980s, there was a site-wide soil vapor investigation that encompassed the JP4/JP5 RTS and in the mid-1990s there was a soil boring investigation as part of the RFI.

2.4.1 1986-1988 JP4/JP5 RTS Shallow Soil Vapor Investigation

The JP4/JP5 RTS were investigated in Phase II of the WSTF site-wide soil vapor investigation. Phase II was performed between October 1986 and April 1988. The JP areas were evaluated for the presence and extent of aromatic and TPHs. Specific chemical parameters included benzene, toluene, ethylbenzene, and xylenes. A shallow soil vapor investigation final report was drafted which included a summary of the sampling techniques as well as a summary of analytical results of the investigation.

The study concluded that “in the JP-4 test area, soil gas analyses at all 4 sampling locations yielded concentrations below detectable limits for BTEX and TPH. In the JP-5 test area, one point only (JP5-S) exhibited above detection values of 0.5 µg/L of ethylbenzene and 10 µg/L of total hydrocarbons. All other samples exhibited levels below detectable limits.” (GCL, 1989)

2.4.2 1994 to 1995 JP4/JP5 RTS Soil Boring Investigation

The JP4/JP5 RTS were also targeted in Phase II of the SWMU soil boring investigation performed between October 1994 and June 1995 as part of the RFI. According to the RFI, the objectives of the soil borings were to obtain lithologic characteristics and physical properties of the soils to a depth of 30 ft, and to define the presence of any type of shallow soil contamination (NASA, 1996).

As reported in the 1996 RFI (NASA, 1996), a track mounted CME-55 or CME-75 hollow-stem auger drill rig equipped with a 5 ft continuous core sampling device and several different drill bits performed the soil borings. Soil recovery in the core barrel ranged from between 1.5 ft (30%) to 5 ft (100%). Each boring was plugged and abandoned with a concrete-bentonite grout. A brass cap stamped with the boring number and the coordinates was emplaced at ground surface at each plugged boring.

The phase II soil boring geotechnical samples were analyzed for moisture content, particle size distribution, porosity and dry bulk density, saturated and unsaturated hydraulic conductivity, cation exchange capacity, soil pH, total organic carbon content, and mineralogy. Soil chemical samples were analyzed for RCRA metals and volatile organic compounds (VOCs).

The soil boring investigation concluded that no VOCs, with the exception of methylene chloride, were detected in the JP4/JP5 RTS. Methylene chloride is a common laboratory contaminant and was disregarded as part of the JP4/JP5 RTS contamination. No semi-volatile constituents, with the exception of bis(2-ethylhexyl) phthalate (BEHP) in one sample at the JP4 RTS, were detected. BEHP was also detected in the equivalent method blank. This constituent is also a common laboratory contaminant or may have resulted from destruction of the plastic sample catchers used for the core barrel sampler. BEHP was not deemed to have resulted from activities in the area.

2.5 Nature and Extent of Contamination

According to the Permit, a SWMU is: "…any discernable unit or area at the Facility at which solid waste has been placed at any time, and from which the NMED determines there may be a risk of release of hazardous waste or constituents, irrespective of whether the unit was intended for the management of solid waste. Placement of solid waste includes, but is not limited to, any unit or area at which solid waste has been routinely and systematically placed." A review of the material safety data sheets (MSDS) and other available literature of the types of fuels (JP-4 jet fuel and JP-5 jet fuel) used at the JP4/JP5 RTS indicates that the main constituents that may be present in the soil are total petroleum hydrocarbons (TPH) – composed primarily of diesel range organics and gasoline range organics, BTEX volatile aromatic compounds (benzene, toluene, ethylbenzene, and xylenes [total]), and polycyclic aromatic hydrocarbons (PAHs). Compounds in these chemical classes were identified as COPCs for the JP4/JP5 RTS investigation.

Based on a review of available historical information, it was concluded that there were no confirmed releases of jet fuel to the environment at the JP4/JP5 RTS. Only two potential releases to the environment were identified: a fuel distribution line break from wind damage and cuts through the concrete pad at the JP4 RTS, made prior to concrete survivability fire testing in June 1981. There were no documented releases from either of these potential sources, and NASA WSTF personnel involved in the testing projects stated that there were no fuel releases to the environment during any JP4/JP5 RTS program. All jet fuel was contained on the concrete pads using the test apparatus or roughly circular berms constructed of sand, local soil, concrete, or steel. Historical records also indicated that jet fuel was released from the bermed areas, but was contained on the concrete test pads.

2.5.1 Groundwater Monitoring Well JP-3 Data

Groundwater monitoring well JP-3 was, until its recent conversion to a dual low-flow sampling system, a 1,000-ft deep MP-38 Westbay®[1] multiport monitoring well retrofit in 4" stainless steel casing. The well is used to monitor the Plume Front area and the effectiveness of the Plume Front Treatment System. JP-3 is

[1] Westbay is a registered trademark of Schlumberger Limited.

located approximately 300 ft west and downgradient of the JP4 RTS. Due to its proximal location and as an added level of diligence, NASA reviewed historical analytical data from this well to determine if any COPCs were present in the groundwater as a result of the activities at the JP4 RTS. The well has been sampled and analyzed for constituents similar to those of the JP4/JP5 RTS investigation including BTEX constituents and PAHs.

NASA reviewed chemical analytical data from JP-3 groundwater samples collected between 2000 (earliest sample year) and 2013 (latest sample year). There were no detections of PAHs in groundwater samples collected from this well. The data indicated there were trace amounts of benzene (maximum concentration of 1.6 µg/L), ethylbenzene (maximum concentration of 0.24 µg/L), and toluene (maximum concentration of 0.11 µg/L) in the groundwater at this location. These concentrations are below groundwater cleanup levels of 3.9 µg/L, 13 µg/L, and 750 µg/L, respectively. These constituents are detected in other Westbay wells and are believed to be associated with well materials or installation and sampling practices and may not be representative of groundwater conditions.

2.5.2 Vadose Zone Contamination

Results of the RFI soil boring investigation indicated that, with the exception of trace amounts of methylene chloride, no VOCs were present in the soil at either site. Methylene chloride is a common laboratory contaminant. BEHP was the only semi-volatile compound detected in one soil sample at the JP4 RTS. BEHP is a common plasticizer and, in some cases, laboratory contaminant. The historical detections of BEHP are potentially related to the plastic spoon catchers used for previous sampling or laboratory contaminants introduced during analysis.

Results of the JP4/JP5 RTS soil vapor survey performed in the 1980s indicate a concentration of 10 µg/L of total hydrocarbons in the southern-most soil vapor well associated with the JP5 RTS. There was less than 0.04 µg/L concentration at the JP4 RTS.

Soil vapor analyses at all samplings locations at the JP4/JP5 RTS yielded concentrations below quantifiable limits for BTEX and total hydrocarbon parameters. According to the shallow soil vapor investigation, there was no evidence of hydrocarbon contamination at the JP4/JP5 RTS. A summary of analytical results from the two investigations is provided in Appendix D of the 600 Area JP4/JP5 RTS HIS (NASA, 2013).

3.0 Scope of Activities

3.1 Data Quality Objectives

The data quality objectives (DQOs) of the project are used to establish performance or acceptance criteria. These criteria are used to develop the sampling framework. The DQOs consist of the information inputs (or information needed to make the final determination), the study boundary, and the performance or acceptance criteria.

3.1.1 Information Inputs

Primary inputs to the decision are analytical data generated from sampling performed during previous investigations. COPCs were identified based on the two previous investigations and the operational history of the JP4/JP5 RTS. The analytical methods used to quantify the presence of COPCs were selected in accordance with EPA SW-846. The COPCs and associated methods are presented in Table 1.

3.1.2 Spatial Extent of Investigation

This project addresses the investigation of the subsurface soils directly beneath the JP4 and JP5 concrete pads, as well as below four compass points immediately adjacent to each of the two pads. The target depth of the borings was determined by the subsurface distribution of soil lithologies beneath the JP4/JP5 RTS.

3.1.3 Performance or Acceptance Criteria

The concentrations of COPCs detected in JP4 and JP5 soil samples are compared to NMED Residential Soil Screening Levels (RSSL; June 2012) and NMED TPH Screening Guidelines (June 2012). The primary decision to be made following this investigation is whether additional investigation or corrective actions are warranted at the SWMU due to the presence of residual contamination sources. It must be determined whether corrective action can be considered complete or if additional corrective measures must be considered. If the concentrations of COPCs exceed established regulatory criteria, NASA will recommend moving to the corrective measures evaluation phase. Otherwise, NASA will request a "corrective action complete" status determination and recommend no further action. If the investigation fails to fully determine the nature and extent of contamination, additional site characterization may be required.

3.2 Conceptual Model

Soils on WSTF's alluvial plains include stony loams and sandy loams associated with alluvial fans, arroyos and gentle slopes. Runoff ranges from slow to rapid, and permeability is slow to moderately rapid. Soils within the JDMB area to the west of WSTF are characterized by slopes ranging from zero to 15 percent that dip west toward the axis of the basin. The Doña Ana-Reagan Association predominates within the JP Test Areas (USDA SCS, 1980). The Doña Ana Series consists of deep, well-drained soils that formed in mixed alluvium on fans and piedmonts. The Reagan Series consists of well drained alluvial soils that formed on basin floors. Calcium carbonate concentrations typically range from 15 to 40 percent.

Based on a review of the existing JP4/JP5 RTS lithology logs and the results of geotechnical and geochemical soil samples for the four existing soil borings obtained during the 1994 RFI soil boring investigation, the depth of drilling for the JP4/JP5 RTS soil borings is 30 ft below ground surface (bgs). The basis for this depth determination is as follows:

- The existing JP-4-1 and JP-4-2 boring logs from the JP4 RTS and the JP-5-1 and JP-5-2 boring logs from the JP5 RTS generated in 1994 identified soil horizons that are predominantly clays and silts, and relatively fine-grained in comparison to the sandy to gravelly soils that characterize WSTF to the east that are more proximal to the SAM. The finer-grained soil horizons can be correlated relatively well over distances of least 100 ft. in part due to the relatively high recovery of soil samples at the JP4 and JP5 RTS and also due to relatively shallow dips of the individual soil horizons, which are typically between three to 10 degrees and generally to the west.
- The relatively fine-grained clayey and silty soil horizons encountered within the upper 30 ft at both the JP4 and JP5 RTS have lower porosities and permeabilities relative to soils to the east. These soils are anticipated to be less conducive to the infiltration of contaminants to depth through the subsurface, particularly where clay horizons are present. At the JP4 RTS, coarser sand and gravel lithologies were identified in the intervals from 20 to 22.5 ft bgs in boring JP-4-1 and from 5.2 to 9.8 ft bgs and 20.2 to 22.5 ft bgs in boring JP-4-2. At the JP5 RTS, sands and gravels were identified in the intervals from 5.1 to 11.5 ft bgs and 17.2 to 20.5 ft bgs in boring JP-5-1 and from 8 to 12.5 ft bgs and 20 to 22.2 ft bgs in boring JP-5-2.

- The lowermost soil horizons identified in subsurface borings at both the JP4 and JP5 RTS were relatively fine-grained. At the JP4 RTS, the interval between 28 and 30 ft bgs in boring JP-4-1 and the interval between 25 and 30 ft bgs in boring JP-4-2 comprise clays and silts. At the JP5 RTS, the interval between 20.5 and 30 ft bgs in boring JP-5-1 and the interval between 22.2 and 30 ft bgs in boring JP-5-2 comprise clays and silts.
- No volatile organic compounds were reliably detected in the JP4 and JP5 RTS soil borings installed during the RFI. No semi-volatile compounds were reliably detected in the existing soil borings at either test site.

3.3 Summary of Investigation Activities

The 600 Area JP4/JP5 RTS Investigation included the following activities:

- Background information research (provided in the HIS).
- Implementation of site safety programs and appropriate health and safety measures for protecting personnel who performed field investigation activities.
- Preparing field investigation area (e.g., removing vegetation, clearing concrete pads, coring concrete pads, etc.).
- Installing boreholes and collecting soil samples for laboratory analysis.
- Laboratory analysis of soil samples.
- Review laboratory data.
- Complete investigation-derived waste management.

3.3.1 Background Information Research

Historical records were reviewed to fulfill the requirements of Permit Section VII.H.1.c and to develop the framework for the investigation sampling strategy. The records were compiled into the HIS (NASA, 2013) and submitted in conjunction with the 600 Area JP4/JP5 RTS IWP. The purpose of the HIS was to identify and list any NASA activities or environmental conditions that could have resulted in a release of hazardous constituents or wastes to the environment in the 600 Area JP4/JP5 RTS.

3.3.2 Implemented Health and Safety Measures

The “Safety and Health Plan (SHP) for Environmental Compliance Operations at NASA White Sands Test Facility” (Navarro Research and Engineering, 2013), along with an addendum specific to the 600 Area JP4/JP5 RTS Investigation, was prepared to identify physical and chemical hazards and mitigating measures associated with the site investigation. Field staff were trained as required by 29 CFR 1910.120(e) and (p), Hazardous Waste Operations and Emergency Response (HAZWOPER) for RCRA Corrective Actions and permitted units.

Physical hazards of the investigation fieldwork were related to hollow-stem auger drilling, working adjacent to a roadway, and working outdoors. Chemical hazards included potential exposure to the COPCs. Personal protective equipment (PPE), site controls, and personnel monitoring were designed to mitigate the identified hazards.

Site controls included establishment of HAZWOPER work zones (Exclusion Zone, Contamination Reduction Zone, and Support Zone that included a break area for eating or drinking), continuous

communications with NASA Dispatch (emergency services), traffic control signage, and escorted-only access for site visitors. Work PPE was a modified Level D.

3.3.3 Field Data Collection

Field data collected included soil samples, some geotechnical results, and equipment rinsate samples. The equipment rinsate samples were used to ensure effective decontamination of the drilling augers, split spoons, and soil sample collection equipment.

3.3.4 Drilling Activities

Drilling was conducted using a CME-75 drill rig and hollow-stem augers to advance the soil borings and a 24-inch split spoon with auto-hammer to collect soil samples at all 12 soil boring locations. To obtain soil samples from beneath the concrete pads, a coring drill with an 8-inch diameter diamond core bit was used to remove a portion of the concrete prior to using the hollow-stem auger.

At each test site, four soil borings were advanced to a depth of 30 ft around the perimeters of the concrete pads. These borings were placed offset from those installed during the 1994 investigation of the area. The borings through the concrete pads were installed within the areas where the bermed fuel trays were placed and where the concrete pad showed integrity issues. A total of six soil borings were installed at each RTS, for a total of 12 borings.

3.3.5 Sampling and Analyses

3.3.5.1 Soil Grab Samples

Soil grab samples were collected from core samples for the purposes of lithologic logging at each interval. The material was then replaced at the borehole with remaining cuttings. The remaining cuttings were then placed back into the borehole.

3.3.5.2 Soil Chemical Samples

Soil chemical samples were collected and analyzed for the COPCs identified in Table 1. Samples were placed in clean, laboratory-supplied containers and analyzed by National Environmental Laboratory Accreditation Program (NELAP)-accredited laboratories. Soil chemical results and analysis methods are presented in Sections 5 and 6.

According to the JP4/JP5 IWP, one soil core sample was required from each of three depth intervals: 2 ft to 4 ft, 13 ft to 15 ft, and 28 ft to 30 ft. Split spoon samples were placed into a decontaminated stainless steel bowl and using a decontaminated stainless steel spoon, the soil samples were collected into the sample containers.

3.3.6 Investigation Derived Waste Storage and Disposal

Per the JP4/JP5 IWP, all investigation derived waste (IDW) generated from the investigation was managed as a hazardous waste pending analytical results of the soil chemical analysis. Types of IDW generated were IDW-contaminated debris (disposable gloves, wipes, and plastic sheeting) and decontamination rinsate. Approximately 20 gallons of IDW-contaminated debris and approximately 60 gallons of rinsate were generated. The IDW-contaminated debris and rinsate were accumulated in compatible 55-gallon containers and managed in accordance with WSTF procedures and 40 CFR 262.34.

During the investigation, soil boring cuttings were replaced into the associated borehole after soil samples were collected. A review of soil chemical analytical data indicates that concentrations of COPCs in the soil do not exceed regulatory criteria; therefore the IDW generated has been characterized as non-hazardous solid waste. IDW contaminated debris will be dispositioned at a solid waste landfill. The decontamination rinsate is expected to be dispositioned at the NASA WSTF sewage lagoons pending approval.

4.0 Field Investigation Results

The following section provides information on the field investigation results including the drilling program used, field notes, sample locations/intervals and deviations, and lithology characteristics.

4.1 Drilling Program

4.1.1 Overview of Drilling Program

As identified in section 3.3.4, the type of equipment used for this investigation was a CME-75 drilling rig with auto-hammer capability, 5 ft hollow-stem augers, and 24 inch split spoons. The target depth for each soil boring was 30 ft bgs, which was determined based on previous soil boring investigations and available lithologic information. There was no auger refusal and no need for twin borings as was suggested in the JP4/JP5 RTS IWP. All borings reached target depth. Soil samples were collected by pushing the split spoons 18 inches into the formation using a drop hammer. Soil sample recoveries for all borings and sample intervals were all above 50%, with the exception of the four borings below the concrete pads (JP4-B-01 (0% – 90%), JP4-B-03 (10% – 70%), JP5-B-02 (25% - 50%), and JP5-B-04 (30% - 70%)).

4.1.2 Equipment Decontamination Procedures

Removing contaminants from sampling equipment minimizes the likelihood of sample cross contamination, reduces or eliminates transfer of contaminants to clean areas, and prevents the mixing of incompatible substances. Downhole drilling equipment and non-disposable soil sampling equipment was decontaminated between individual boreholes with a heated high pressure washer on a concrete decontamination pad. The decontamination rinsate was transferred to accumulation drums. Following the use of the heated high pressure washer, equipment was rinsed with purified water.

4.1.3 Lithologic Logging and Classification Methods

Lithologic logging was conducted by the on-site geologist, using soil samples collected at the predetermined depth intervals described in the IWP and applicable sections of this report. Geotechnical samples were initially collected continuously in 2-ft intervals at borehole JP5-B-04; however, due to time constraints it was determined to stop continuous split spoon sampling at a depth of 12 ft. From this point forward and for the remaining soil borings, geotechnical samples were collected only at the specified soil chemical sample intervals. Continuous lithologic logs to a depth of 30 ft are available from the four soil borings installed as part of the 1994 soil boring investigation.

The soil boring logs include general information name, location, dates, depths, and drilling details, a Unified Soil Classification System (USCS) description, core depth intervals and recoveries, sample locations with identification, and a lithologic description using standard USCS criteria. Lithologic logging results are provided in the soil boring logs in Appendix B.

4.1.4 Soil Sample Depths

As discussed in Section 3.3.4, the target depths for the investigation were 2 to 4 ft, 13 to 15 ft, and 28 to 30 ft. For borehole JP4-B-01 installed through the concrete test pad, the first sampling interval (2 to 4 ft) provided 30% soil recovery, which was insufficient for two sample volumes required for a duplicate sample. The boring was reentered to obtain additional soil sample volume for two samples. The split spoon achieved 40% soil recovery, which was sufficient for two soil sample volumes in the 4 to 6 ft depth interval. The second depth interval (13 to 15 ft) provided 0% sample recovery. The boring was again reentered to obtain adequate sample volume for the second soil sample interval. The split spoon achieved a 90% soil recovery in the 15 to 17 ft depth interval. It was observed in the field that the soil sample had a "sweet" odor. Soil samples were collected and analyzed from this interval. Because of the odor noted in JP4-B-01, it was determined that adjacent boring JP4-B-02 (also drilled through the concrete test pad) was to be sampled at the same depth interval of 15 to 17 ft as well. All other borings were sampled at the target depths specified in the IWP.

4.1.5 Field Notes

Comprehensive field notes were taken throughout the drilling and sample collection activities of this project. Field notes document personnel, times, dates, and locations of sampling activities as well as any notable observations. Field notes are presented in Appendix C.

5.0 Soil Chemical Analytical Results

5.1.1 Chemical Analytical Results

Chemical analytical results for soil samples are provided in Appendix A. Analytical laboratory reports are presented in Appendix D.

5.1.2 Quality Assurance and Quality Control

The JP4/JP5 IWP required the collection of quality control samples to ensure high quality data were generated during the investigation. Field duplicate samples were required to be collected at 10% of soil samples (3 to 4 duplicate samples). Three duplicate samples were collected at JP4-B-01 interval 4 to 6 ft; JP4-B-03 interval 28 to 30 ft; and JP5-B-05 interval 2 to 4 ft. In addition, equipment blanks were collected from downhole equipment prior to each boring installation.

6.0 Comparison to Regulatory Criteria

The soil sample analytical results are summarized below and compared to applicable regulatory criteria. For all measured analyte classes, concentrations are below the applicable regulatory criteria. Analytical data from equipment blank samples were evaluated to ensure cross contamination between borings had not occurred. There was no evidence of data quality issues.

6.1 TPHs

Diesel range organics (DRO) were detected in 15 of the 39 soil samples collected from 12 soil borings. Detections ranged from 14 mg/kg to 370 mg/kg. "J" flagged detections ranged from 4.2 mg/kg to 5.3 mg/kg.

Gasoline range organics (GRO) were detected in three of the 39 soil samples collected at 12 soil borings. Detections ranged from 19 mg/kg to 66 mg/kg.

The TPH (summation of DRO and GRO concentrations) ranged from 14 mg/kg to 436 mg/kg. TPH were detected in five of the six borings located at the JP4 pad. The highest detection of TPH was in the sample collected from the 15 to 17 ft interval at boring JP4-B-01. This detection coincides with the "sweet" odor observed during the field investigation. However, the sample collected at comparable depth in the adjacent boring JP4-B-02, which also exhibited the odor, contained only 15 mg/kg TPH. There appears to be no correlation between the odor observed in the field and higher than average concentrations of TPH.

All TPH values in samples collected from the JP4/JP5 RTS soil borings were below the NMED TPH Screening Guideline value of 1,000 mg/kg (Appendix A).

6.2 SVOC (PAHs)

Benzo(b)fluoranthene was detected at 0.023 mg/kg in one sample out of 39 soil samples collected at the 12 soil borings. The applicable RSSL for this analyte is 1.48 mg/kg.

Benzo(k)fluoranthene was detected at 0.009 mg/kg in one of the 39 soil samples collected from the 12 soil borings. This detection was "J" flagged indicating that the analyte was detected below the quantitation limit, but above the method detection limit of 0.008 mg/kg. The applicable RSSL for this analyte is 14.8 mg/kg.

Chrysene was detected at 0.0057 mg/kg in one sample out of 39 soil samples collected from the 12 soil borings. This detection was "J" flagged indicating that the analyte was detected below the quantitation limit, but above the method detection limit of 0.004 mg/kg.

Fluoranthene was detected at 0.024 mg/kg in one of the 39 soil samples collected from the 12 soil borings. The applicable RSSL for this analyte is 2,290 mg/kg.

Indeno(1,2,3-c,d)pyrene was detected at 0.007 mg/kg in one of the 39 soil samples collected from the 12 soil borings. This detection was "J" flagged indicating that the analyte was detected below the quantitation limit, but above the method detection limit of 0.007 mg/kg.

Naphthalene was detected in three samples out of the 39 soil samples collected from 12 soil borings. The concentrations detected ranged from 0.006 mg/kg to 0.2 mg/kg. Two of the three values were "J" flagged indicating that the analyte was detected below the quantitation limit, but above the method detection limit of 0.006 mg/kg. The third detection was 0.2 mg/kg, which is below the applicable RSSL of 4.30 mg/kg.

Phenanthrene was detected at 0.0083 mg/kg in one of the 39 soil samples collected from the 12 soil borings. This detection was "J" flagged indicating that the analyte was detected below the quantitation limit, but above the method detection limit of 0.006 mg/kg.

Pyrene was detected in two samples out of 39 soil samples collected at the 12 soil borings. The concentrations detected were 0.014 mg/kg and 0.0067 mg/kg. Both were "J" flagged indicating that the analyte was detected below the quantitation limit, but above the method detection limit of 0.005 mg/kg.

All PAH values detected in samples collected from the JP4/JP5 RTS soil borings were well below RSSLs (Appendix A).

6.3 Volatiles (BTEX)

Benzene was detected in six of the 39 soil samples collected at three of the 12 soil borings. Detected concentrations ranged from 0.004 mg/kg to 0.007 mg/kg. All six sample detections were "J" flagged,

indicating that the analyte was detected below the quantitation limit, but above the method detection limit of 0.002 mg/kg.

Toluene was detected at 0.004 mg/kg in one sample out of 39 soil samples collected from the 12 soil borings. This detection was "J" flagged, indicated that the analyte was detected below the quantitation limit, but above the method detection limit of 0.003 mg/kg.

All BTEX values detected in samples collected from the JP4/JP5 soil borings were well below RSSLs (Appendix A).

7.0 Conclusions and Recommendations

The comparison of soil chemical analytical results from soil samples collected at the JP4/JP5 RTS provided in Section 6.0 shows that the concentrations of TPHs, BTEX, and PAHs are all below the applicable regulatory criteria. In addition, groundwater analytical data from downgradient monitoring well JP-3 indicate that no JP4/JP5 COPCs are present in groundwater. Based on these results, NASA concludes that activities at the JP4/JP5 RTS have not created a continuing source of soil or groundwater contamination. COPC concentrations below the RSSLs and Screening Guidelines do not present a continuing risk to human health or the environment. Based on the performance and acceptance criteria provided in the NMED-approved work plan and summarized in Section 3.1.3, and the results of the soil chemical analysis, NASA concludes that additional corrective action is not warranted at the SWMU. Therefore, NASA recommends a "corrective action complete" status determination for SWMU 14: 600 Area JP4/JP5 RTS.

8.0 References

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Figures

Figure 1 **WSTF Location Map**

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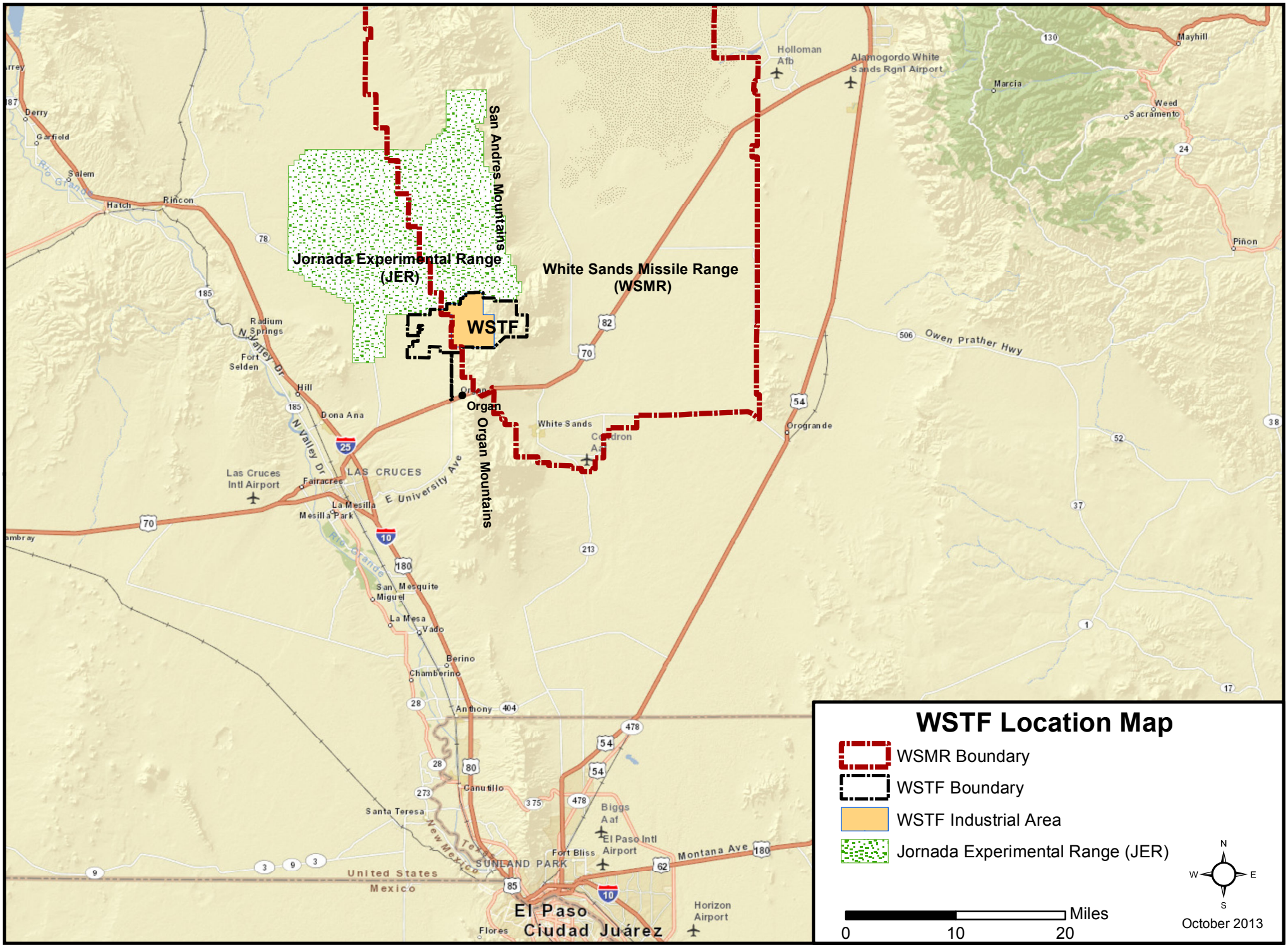
WSTF Location Map
WSMR Boundary
WSTF Boundary
WSTF Industrial Area
Jornada Experimental Range (JER)
Miles
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October 2013
Jornada Experimental Range (JER)
San Andres Mountains
White Sands Missile Range (WSMR)
WSTF
Organ
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Holloman Afb
Alamogordo White Sands Rgnl Airport
Mayhill
Marcia
Weed
Sacramento
Piñon
Owen Prather Hwy
Orogrande
White Sands
Cloudcroft Airport
Derry
Garfield
Salem
Hatch
Rincon
Radium Springs
Fort Selden
Hill
Dona Ana
N Valley Dr
LAS CRUCES
Las Cruces Intl Airport
Fairacres
La Mesilla
Mesilla Park
E University Ave
Rio Grande
San Miguel
Mesquite
La Mesa
Vado
Berino
Chamberino
Anthony
Canutillo
Santa Teresa
New Mexico
Texas
SUNLAND PARK
Fort Bliss
Biggs Aaf
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Mexico
El Paso
Ciudad Juárez
Flores
Horizon Airport

Figure 2 JP4 and JP5 SWMU Locations

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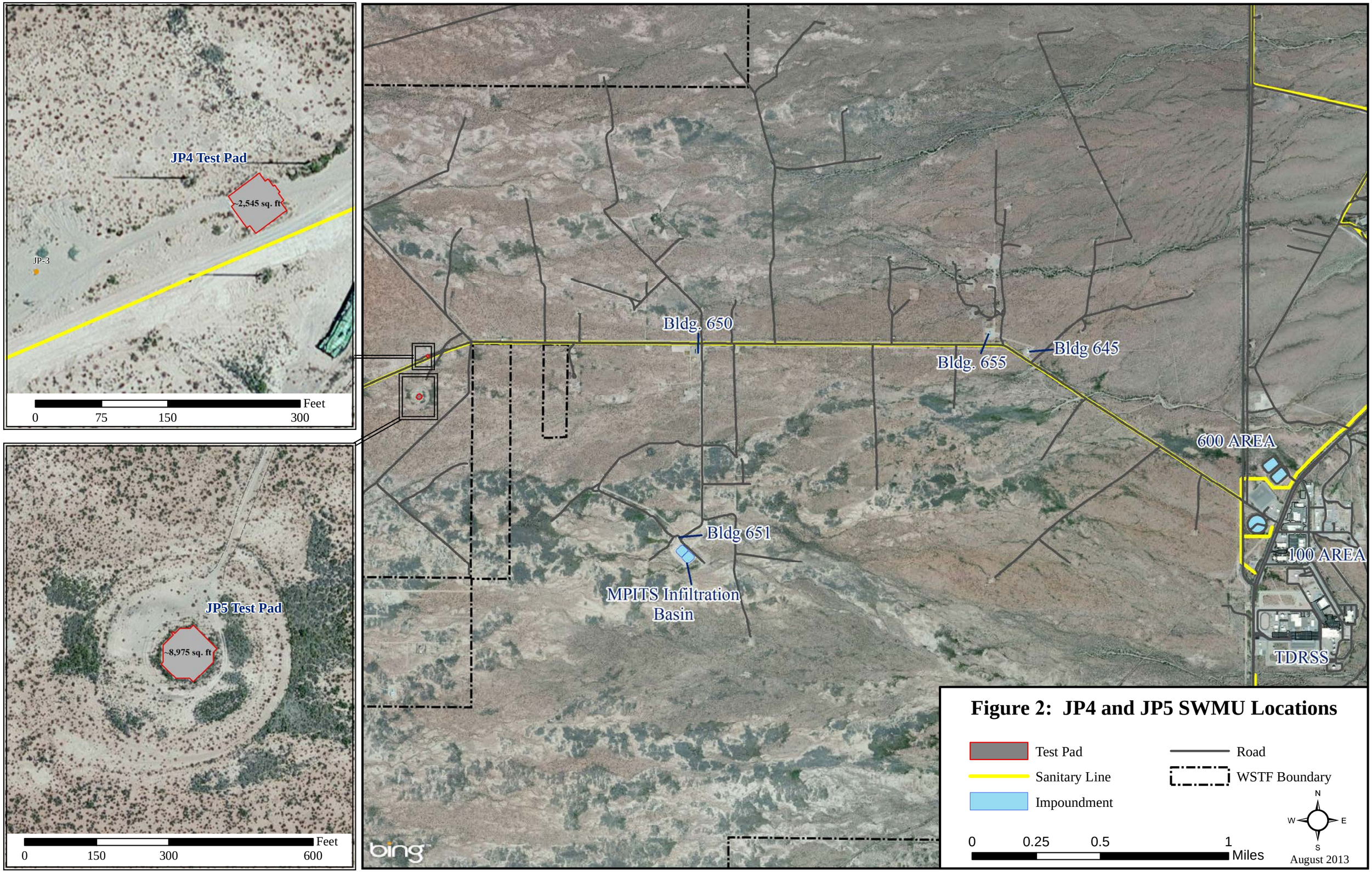

Figure 2: JP4 and JP5 SWMU Locations

Figure 3 JP4 Remote Test Site (facing north)

Figure 4 JP4 Remote Test Site Concrete Pad (facing NW with western-most pole in background)

Figure 5 **JP5 Remote Test Site**

Figure 6 JP5 Remote Test Concrete Pad (facing north)

Figure 7 JP4 Remote Test Site Aerial Map

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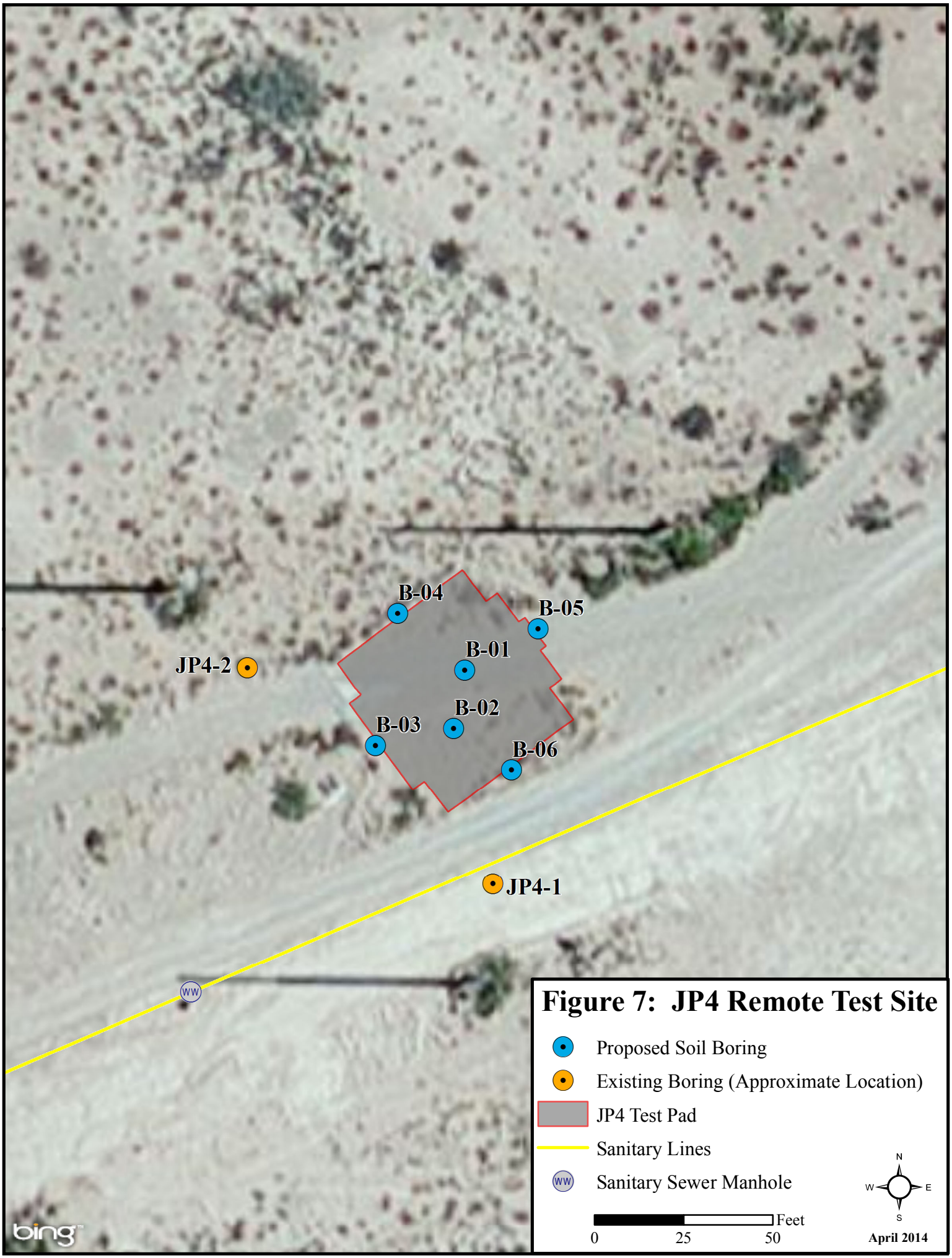

Figure 7: JP4 Remote Test Site

Figure 8 JP5 Remote Test Site Aerial Map

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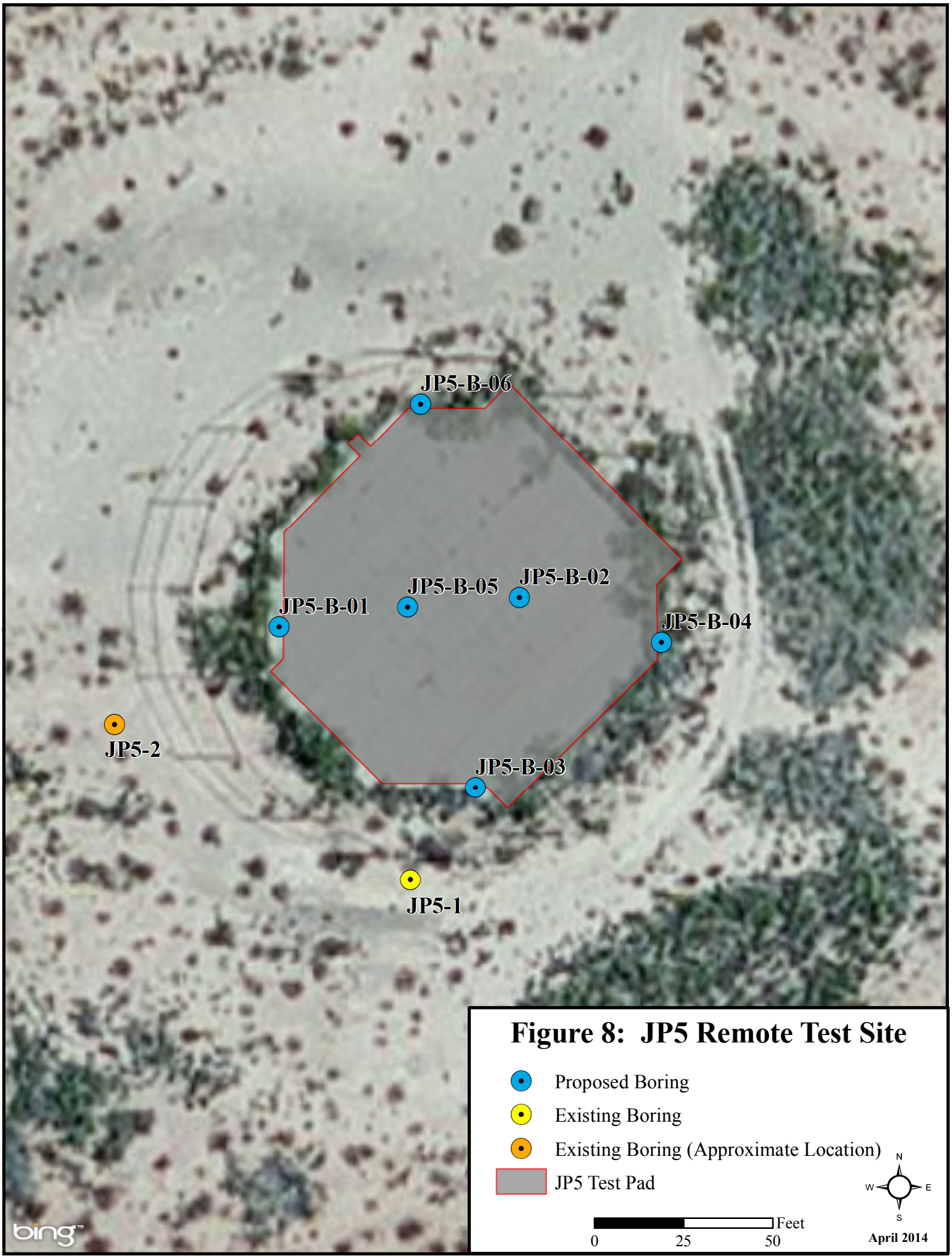

Figure 8: JP5 Remote Test Site

Tables

Table 1 Constituents of Potential Concern and EPA Method

Constituent of Potential Concern (COPC)	EPA SW-846 Method
Total Petroleum Hydrocarbons (TPH) • Diesel Range Organics (DROs) • Gasoline Range Organics (GROs)	EPA Method 8015C – *Nonhalogenated Organics by Gas Chromatography*
Volatile Organics (BTEX) • Benzene CAS # 71-43-2 • Toluene CAS # 108-88-3 • Ethylbenzene CAS # 100-41-4 • Xylenes (Total) CAS # 1330-20-7	EPA Method 8260B – *Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)*
Semi-volatile Organics (PAH) • Acenapthene CAS # 83-32-9 • Anthracene CAS # 120-12-7 • Benzo(a)anthracene CAS # 56-55-3 • Benzo(a)pyrene CAS # 53-32-8 • Benzo(b)fluoranthene CAS # 205-99-2 • Benzo(k)fluoranthene CAS # 207-08-9 • Chrysene CAS # 218-01-9 • Dibenz(a,h)anthracene CAS # 53-70-3 • Fluoranthene CAS # 206-44-0 • Fluorene CAS # 86-73-7 • Indeno(1,2,3-c,d)pyrene CAS # 193-39-5 • Naphthalene CAS # 91-20-3 • Phenanthrene CAS # 85-01-8 • Pyrene CAS # 129-00-0	EPA Method 8270C – *Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)*

Appendix A
Chemical Analytical Results

Borehole ID: JP5-B-01
Sample ID #: 1402251420 (a); 1402251434 (b); 1402251505 (c)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 13'- 15'	Result (mg/kg) (c) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)						
Diesel Range Organics	ND	ND	5.3 J	3.9	9.9	N/A
Gasoline Range Organics	ND	ND	ND	2.9	4.8	N/A
Motor Oil Range Organics	ND	ND	ND	50	50	N/A
Total Petroleum Hydrocarbons*	0	0	0	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)						
Benzene	ND	ND	ND	0.002	0.05	1.54E+01
Toluene	ND	ND	ND	0.003	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	0.003	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	0.058	0.10	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)						
Acenaphthene	ND	ND	ND	0.000	0.00	3.44E+03
Anthracene	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	0.006	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	0.0057 J	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	0.024	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	ND	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	0.0083 J	ND	0.006	0.02	1.83E+03
Pyrene	ND	0.014 J	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.
(b) = Second Sampling Depth Interval 13'-15'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP5-B-02
Sample ID #: 1402261026 (a); 1402261056 (b); 1402261127 (c)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 13'- 15'	Result (mg/kg) (c) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)						
Diesel Range Organics	ND	ND	ND	3.9	9.9	N/A
Gasoline Range Organics	ND	ND	ND	2.9	4.8	N/A
Motor Oil Range Organics	ND	ND	ND	50	50	N/A
Total Petroleum Hydrocarbons*	0	0	0	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)						
Benzene	ND	ND	0.0068 J	0.002	0.05	1.54E+01
Toluene	ND	ND	ND	0.003	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	0.003	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	0.058	0.10	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)						
Acenaphthene	ND	ND	ND	0.006	0.02	3.44E+03
Anthracene	ND	ND	ND	0.005	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	0.008	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	0.007	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	0.008	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	0.004	0.02	1.48E+01
Chrysene	ND	ND	ND	0.007	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	0.006	0.02	1.48E-01
Fluoranthene	ND	ND	ND	0.007	0.02	2.29E+03
Fluorene	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	0.006	0.02	1.48E+00
Naphthalene	ND	ND	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	0.005	0.02	1.83E+03
Pyrene	ND	ND	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.
(b) = Second Sampling Depth Interval 13'-15'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP5-B-03
Sample ID #: 1402251115 (a); 1402251300 (b); 1402251335 (c)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 13'- 15'	Result (mg/kg) (c) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)						
Diesel Range Organics	4.2 J	4.6 J	4.6 J	3.9	9.9	N/A
Gasoline Range Organics	ND	ND	ND	2.9	4.8	N/A
Motor Oil Range Organics	ND	ND	ND	50	50	N/A
Total Petroleum Hydrocarbons*	0	0	0	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)						
Benzene	0.0036 J	0.006 J	ND	0.002	0.05	1.54E+01
Toluene	ND	ND	ND	0.003	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	0.003	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	0.058	0.10	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)						
Acenaphthene	ND	ND	ND	0.000	0.00	3.44E+03
Anthracene	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	0.006	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	ND	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	ND	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	ND	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	0.006	0.02	1.83E+03
Pyrene	ND	ND	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.
(b) = Second Sampling Depth Interval 13'-15'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP5-B-04
Sample ID #: 1402241558 (a); 1402250944 (b); 1402251020 (c)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 13'- 15'	Result (mg/kg) (c) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)						
Diesel Range Organics	ND	4.5 J	ND	3.90	9.90	N/A
Gasoline Range Organics	ND	ND	ND	2.90	4.70	N/A
Motor Oil Range Organics	ND	ND	ND	50.0	50.0	N/A
Total Petroleum Hydrocarbons*	0	0	0	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)						
Benzene	0.0076 J	0.0071 J	0.0076 J	0.002	0.05	1.54E+01
Toluene	ND	ND	0.004 J	0.003	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	0.003	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	0.057	0.10	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)						
Acenaphthene	ND	ND	ND	0.000	0.00	3.44E+03
Anthracene	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	0.007	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	ND	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	ND	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	ND	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	0.006	0.02	1.83E+03
Pyrene	ND	ND	0.0067 J	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.
(b) = Second Sampling Depth Interval 13'-15'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP5-B-05
Sample ID #: 1402261442 (a); 1402261458 (b); 1402261522 (c); 1402261443 (d)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 13'- 15'	Result (mg/Kg) (c) 28'-30'	Result (mg/kg) (d) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)							
Diesel Range Organics	ND	ND	ND	ND	3.90	9.90	N/A
Gasoline Range Organics	ND	ND	ND	ND	2.90	4.70	N/A
Motor Oil Range Organics	ND	ND	ND	ND	50.0	50.0	N/A
Total Petroleum Hydrocarbons*	0	0	0	0	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)							
Benzene	ND	ND	ND	ND	0.002	0.05	1.54E+01
Toluene	ND	ND	ND	ND	0.003	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	ND	0.003	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	ND	0.057	0.10	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)							
Acenaphthene	ND	ND	ND	ND	0.006	0.02	3.44E+03
Anthracene	ND	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	ND	0.007	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	ND	ND	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	ND	ND	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	ND	ND	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	ND	0.006	0.02	1.83E+03
Pyrene	ND	ND	ND	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.
(b) = Second Sampling Depth Interval 13'-15'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP5-B-06
Sample ID #: 1402260826 (a); 1402260855 (b); 1402260927 (c)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 13'- 15'	Result (mg/kg) (c) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)						
Diesel Range Organics	ND	ND	ND	3.90	9.90	N/A
Gasoline Range Organics	ND	ND	ND	2.90	4.70	N/A
Motor Oil Range Organics	ND	ND	ND	50.0	50.0	N/A
Total Petroleum Hydrocarbons*	0	0	0	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)						
Benzene	ND	ND	ND	0.002	0.05	1.54E+01
Toluene	ND	ND	ND	0.003	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	0.003	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	0.057	0.10	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)						
Acenaphthene	ND	ND	ND	0.000	0.00	3.44E+03
Anthracene	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	0.007	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	ND	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	ND	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	ND	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	0.006	0.02	1.83E+03
Pyrene	ND	ND	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.
(b) = Second Sampling Depth Interval 13'-15'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP4-B-01
Sample ID #: 1402271008 (a); 1402271045 (b); 1402271105 (c); 1402271009 (d)

Analyte	Result (mg/kg) (a) 4'-6'	Result (mg/kg) (b) 15'-17'	Result (mg/kg) (c) 28'-30'	Result (mg/kg) (d) 4'-6'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)							
Diesel Range Organics	240	370	27	110	4.00	10.0	N/A
Gasoline Range Organics	34	66	ND	87	2.80	4.60	N/A
Motor Oil Range Organics	ND	ND	ND	ND	51.0	51.0	N/A
Total Petroleum Hydrocarbons*	274	436	27	197	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)							
Benzene	ND	ND	ND	ND	0.005	0.05	1.54E+01
Toluene	ND	ND	ND	ND	0.005	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	ND	0.005	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	ND	0.005	0.05	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)							
Acenaphthene	ND	ND	ND	ND	0.006	0.02	3.44E+03
Anthracene	ND	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	0.023	ND	ND	0.007	0.02	1.48E+00
Benzo(k)fluoranthene	ND	0.009 J	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	ND	ND	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	ND	ND	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	0.007 J	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	0.2	0.006 J	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	ND	0.006	0.02	1.83E+03
Pyrene	ND	ND	ND	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 4'-6'.
(b) = Second Sampling Depth Interval 15'-17'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP4-B-02
Sample ID #: 1402271522 (a); 1402271540 (b); 1402271600 (c)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 15'- 17'	Result (mg/kg) (c) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)						
Diesel Range Organics	120	15	ND	3.9	9.9	N/A
Gasoline Range Organics	19	ND	ND	2.9	4.7	N/A
Motor Oil Range Organics	ND	ND	ND	50	50	N/A
Total Petroleum Hydrocarbons*	139	15	0	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)						
Benzene	ND	ND	ND	0.005	0.05	1.54E+01
Toluene	ND	ND	ND	0.005	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	0.005	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	0.005	0.05	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)						
Acenaphthene	ND	ND	ND	0.000	0.00	3.44E+03
Anthracene	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	0.007	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	ND	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	ND	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	ND	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	0.006	0.02	1.83E+03
Pyrene	ND	ND	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.
(b) = Second Sampling Depth Interval 15'-17'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP4-B-03
Sample ID #: 1402280840 (a); 1402280838 (b); 1402280925 (c); 1402280926 (d)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 13'- 15'	Result (mg/kg) (c) 28'-30'	Result (mg/kg) (d) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)							
Diesel Range Organics	ND	ND	14	34	3.9	9.9	N/A
Gasoline Range Organics	ND	ND	ND	ND	2.9	4.7	N/A
Motor Oil Range Organics	ND	ND	ND	ND	50	50	N/A
Total Petroleum Hydrocarbons*	0	0	14	34	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)							
Benzene	ND	ND	ND	ND	0.005	0.05	1.54E+01
Toluene	ND	ND	ND	ND	0.005	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	ND	0.005	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	ND	0.005	0.05	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)							
Acenaphthene	ND	ND	ND	ND	0.006	0.02	3.44E+03
Anthracene	ND	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	ND	0.007	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	ND	ND	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	ND	ND	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	ND	ND	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	ND	0.006	0.02	1.83E+03
Pyrene	ND	ND	ND	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.

(b) = Second Sampling Depth Interval 13'-15'.

(c) = Third Sampling Depth Interval 28'-30'.

(d) = Duplicate Sample

ND = Analyte Not Detected at the Reporting Limit (RL).

J = Analyte detected below quantitation limits.

MDL = Method Detection Limit.

* = Summation of DRO, GRO, & MRO Values.

** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP4-B-04
Sample ID #: 1402281030 (a); 1402281045 (b); 1402281105 (c)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 13'- 15'	Result (mg/kg) (c) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)						
Diesel Range Organics	60	ND	ND	3.9	9.9	N/A
Gasoline Range Organics	ND	ND	ND	2.9	4.7	N/A
Motor Oil Range Organics	ND	ND	ND	50	50	N/A
Total Petroleum Hydrocarbons*	60	0	0	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)						
Benzene	ND	ND	ND	0.005	0.05	1.54E+01
Toluene	ND	ND	ND	0.005	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	0.005	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	0.005	0.05	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)						
Acenaphthene	ND	ND	ND	0.000	0.00	3.44E+03
Anthracene	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	0.007	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	ND	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	ND	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	ND	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	0.006	0.02	1.83E+03
Pyrene	ND	ND	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.
(b) = Second Sampling Depth Interval 13'-15'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP4-B-05
Sample ID #: 1402270840 (a); 1402270850 (b); 1402270915 (c)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 13'- 15'	Result (mg/kg) (c) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)						
Diesel Range Organics	ND	ND	ND	3.9	9.9	N/A
Gasoline Range Organics	ND	ND	ND	2.9	4.7	N/A
Motor Oil Range Organics	ND	ND	ND	50	50	N/A
Total Petroleum Hydrocarbons*	0	0	0	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)						
Benzene	ND	ND	ND	0.005	0.05	1.54E+01
Toluene	ND	ND	ND	0.005	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	0.005	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	0.005	0.05	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)						
Acenaphthene	ND	ND	ND	0.000	0.00	3.44E+03
Anthracene	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	0.007	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	ND	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	ND	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	ND	ND	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	0.006	0.02	1.83E+03
Pyrene	ND	ND	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.
(b) = Second Sampling Depth Interval 13'-15'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Borehole ID: JP4-B-06
Sample ID #: 1402271353 (a); 1402271410 (b); 1402271430 (c)

Analyte	Result (mg/kg) (a) 2'-4'	Result (mg/kg) (b) 13'- 15'	Result (mg/kg) (c) 28'-30'	MDL	RL	NMED RSSL (mg/kg)
EPA Method 8015C: Total Petroleum Hydrocarbons (DROs, GROs, & MROs)						
Diesel Range Organics	29	15	4.2 J	3.9	10	N/A
Gasoline Range Organics	ND	ND	ND	2.8	4.7	N/A
Motor Oil Range Organics	ND	ND	ND	50	50	N/A
Total Petroleum Hydrocarbons*	29	15	0	N/A	N/A	1,000**
EPA Method 8260B: Volatiles (BTEX)						
Benzene	ND	ND	ND	0.005	0.05	1.54E+01
Toluene	ND	ND	ND	0.005	0.05	5.27E+03
Ethylbenzene	ND	ND	ND	0.005	0.05	6.84E+01
Xylenes, Total	ND	ND	ND	0.005	0.05	8.14E+02
EPA Method 8270C: Polynuclear Aromatic Hydrocarbons (PAHs)						
Acenaphthene	ND	ND	ND	0.000	0.00	3.44E+03
Anthracene	ND	ND	ND	0.006	0.02	1.72E+04
Benzo(a)anthracene	ND	ND	ND	0.005	0.02	1.48E+00
Benzo(a)pyrene	ND	ND	ND	0.008	0.02	1.48E-01
Benzo(b)fluoranthene	ND	ND	ND	0.007	0.02	1.48E+00
Benzo(k)fluoranthene	ND	ND	ND	0.008	0.02	1.48E+01
Chrysene	ND	ND	ND	0.004	0.02	1.48E+02
Dibenz(a,h)anthracene	ND	ND	ND	0.007	0.02	1.48E-01
Fluoranthene	ND	ND	ND	0.006	0.02	2.29E+03
Fluorene	ND	ND	ND	0.007	0.02	2.29E+03
Indeno(1,2,3-c,d)pyrene	ND	ND	ND	0.007	0.02	1.48E+00
Naphthalene	ND	ND	0.006 J	0.006	0.02	4.30E+01
Phenanthrene	ND	ND	ND	0.006	0.02	1.83E+03
Pyrene	ND	ND	ND	0.005	0.02	1.72E+03

(a) = First Sampling Depth Interval 2'-4'.
(b) = Second Sampling Depth Interval 13'-15'.
(c) = Third Sampling Depth Interval 28'-30'.
(d) = Duplicate Sample
ND = Analyte Not Detected at the Reporting Limit (RL).
J = Analyte detected below quantitation limits.
MDL = Method Detection Limit.
* = Summation of DRO, GRO, & MRO Values.
** = Screening Value from NMED Risk Assessment Guidance for Site Investigations and Remediation (February 2012, updated June 2012 (mg/kg).

Appendix B
JP4/JP5 RTS Lithology Logs

LOCATION MAP: (NOT TO SCALE)

N

___¼___¼___¼___¼ S T__S R__E

SITE ID: NASA-WSTF LOCATION ID: JP-4-B-01

SITE COORDINATES (ft.) N: 552035.33 E: 1511226.10

GROUND ELEVATION (ft. MSL): 4438.65

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: RABA KISTNER : EL PASO

DATE STARTED: 2/27/14 DATE COMPLETED: 2/27/14

FIELD REPS.: G. GILES, A. SANCHEZ

COMMENTS: JP-4-B-01 LOCATED ON THE TEST PAD, THE FURTHER NORTH OF THE TWO BORINGS INSTALLED IN THE CENTRAL TEST PAD AREA.
- CME 75 HSA RIG WITH 4¼" ID AUGERS
- 24" SPLIT SPOONS, 1¼" ID, SAMPLES PUSHED 18" IN GENERAL ACCORD WITH ASTM D 1586-11 (AUTO-HAMMER USED).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE: % Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
0 2	—	—	—	—	— WATER: EQUIPMENT BLANKS	1402270952 ——— 0953 ——— 0954 ——— 0955	ML	CONCRETE SLAB (4" THICKNESS) CLAYEY SILT, LIGHT BROWN (5 YR 6/4), PRIMARILY SILT WITH CLAY, POORLY GRADED, MODERATELY SORTED, LOOSE, MOIST DUE TO RESIDUAL WATER FROM CEMENT PAD CORING.
2 4	CORE 12 12 10 BLOW COUNTS	30%	2	3.5	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	SAMPLES 1402271008 ——— 1009(DUP)	ML (VERY STIFF)	SILT WITH GRAVEL, LIGHT BROWN (5 YR 6/4) PRIMARILY SILT WITH FINE SAND AND <10% GRAVEL CLASTS. CLASTS COMPRISE BROKEN SUBANGULAR LIMESTONE. GAP GRADED, POORLY SORTED, NON-PLASTIC. SLIGHTLY MOIST DUE TO RESIDUAL WATER FROM CEMENT PAD CORING. NO VISIBLE STAINING OR ODOR.
4 6	CORE	40%	4	5.5	SOIL: SPLIT SPOON	SAMPLES COMPOSITED		@4' AS ABOVE, APPROXIMATELY 20% GRAVEL CLASTS, REPRESENTED BY BROKEN SUBANGULAR TO SUBROUNDED LIMESTONE AND SILTY LIMESTONE, LOOSE, DRY. NO VISIBLE STAINING OR ODOR.
13 15		0%			SOIL: SPLIT SPOON			NO RECOVERY - SPLIT SPOON OBSTRUCTED.
15 17	CORE 8 10 10 BLOW COUNTS	90%	15	16.5	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	1402271045	ML (VERY STIFF)	SILT, WITH FINE SAND, LIGHT BROWN (5 YR 5/6), POORLY GRADED, MODERATELY SORTED, LOW PLASTICITY, SLIGHTLY MOIST TO MOIST, NO VISIBLE STAINING BUT A STRONG "SWEET" ODOR.

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/ stop)	SAMPLE						LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
		% Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	
28 30	CORE 6 12 17 BLOW COUNTS	90%	28	29.5	SOIL: SPLIT SPOON 8015(L) 8270(D) 8260(L)	1402271105	ML (VERY STIFF)	SILTY CLAY, MEDIUM BROWN (5 YR 5/6), <10% GRAVEL CLASTS. CLASTS COMPRISE SUBANGULAR TO SUBROUNDED LIMESTONE, SILTSTONE, AND RHYOLITE. GAP GRADED, MODERATELY SORTED, NON-PLASTIC, SLIGHTLY MOIST TO DRY. NO STAINING OR ODOR.
TD								TOTAL DEPTH = 30'.

LOCATION MAP: (NOT TO SCALE)

N

___¼___¼___¼___¼ S T__S R__E

SITE ID: NASA-WSTF LOCATION ID: JP-4-B-02

SITE COORDINATES (ft.) N: 552018.99 E: 1511222.97

GROUND ELEVATION (ft. MSL): 4438.65

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: RABA KISTNER: EL PASO

DATE STARTED: 2/27/14 DATE COMPLETED: 2/27/14

FIELD REPS.: G. GILES, A. SANCHEZ

COMMENTS: JP-4-B-02 LOCATED ON THE TEST PAD. THIS IS THE SOUTHERN LOCATION FOR TWO BORINGS INSTALLED IN THE CENTRAL TEST PAD AREA.

- CME 75 HSA RIG WITH 4¼" ID AUGERS
- 24" SPLIT SPOONS, 1¼" ID, SAMPLES PUSHED 18" - IN GENERAL ACCORD WITH ASTM D1586-11 (Auto-Hammer USED).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE: % Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
0 2	—	—	—	—	— WATER: EQUIPMENT BLANKS	1402271512 1513 1514 1515	CL ML	CONCRETE SLAB (4" THICKNESS) CLAY, VERY PALE ORANGE (10 YR 8/2), <10% GRAVEL CLASTS, POORLY GRADED, MODERATELY SORTED, NON-PLASTIC, SLIGHTLY MOIST (LORING). @ 1', SILT, GRAYISH ORANGE (10 YR 7/4), 20% GRAVEL CLASTS, SUBANGULAR LIMESTONE, GAP GRADED, POORLY SORTED, NON-PLASTIC, SLIGHTLY MOIST, NO VISIBLE STAINING OR ODOR.
2 4	CORE 7 11 9 BLOW COUNTS	80%	2	3.5	SOIL: SPLIT SPOON 8015 (c) 8270 (D) 8260 (c)	1402271522	ML (VERY STIFF)	@ 2' AS ABOVE, LIGHT BROWN (5 YR 6/4), GRAVEL CLASTS ARE SUBANGULAR TO SUBROUNDED LIMESTONE AND RHYOLITE, ¼" - ¾" IN DIAMETER, GAP GRADED, NON-PLASTIC, SLIGHTLY MOIST, NO VISIBLE STAINING, SLIGHT ORGANIC ODOR.
15 17	CORE 8 6 8 BLOW COUNTS	75%	15	16.5	SOIL: SPLIT SPOON 8015 (c) 8270 (D) 8260 (c)	1402271540	ML (STIFF)	SILT, LIGHT BROWN (5 YR 5/6), GRAVEL CLASTS <10%, BROKEN TO SUBANGULAR LIMESTONE, POORLY GRADED, MODERATELY SORTED, NON-PLASTIC, SLIGHTLY MOIST, NO VISIBLE STAINING, DAMP ODOR.
28 30	CORE 12 18 35 BLOW COUNTS	80%	28	29.5	SOIL: SPLIT SPOON 8015 (c) 8270 (D) 8260 (c)	1402271600	ML (HARD)	CLAYEY SILT, LIGHT BROWN (5 YR 6/4), TRACE GRAVEL CLASTS, POORLY GRADED, MODERATELY SORTED, NON-PLASTIC, DRY TO SLIGHTLY MOIST, NO VISIBLE STAINING OR ODOR.
TD								TOTAL DEPTH = 30'

LOCATION MAP: (NOT TO SCALE)

N

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SITE ID: NASA-WSTF LOCATION ID: JP-4-B-03

SITE COORDINATES (ft.) N: 552014.21 E: 1511201.02

GROUND ELEVATION (ft. MSL): 4438.45

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: RABA KISTNER ; EL PASO

DATE STARTED: 2/28/14 DATE COMPLETED: 2/28/14

FIELD REPS.: G. GILES, A. SANCHEZ

COMMENTS: JP-4-B-03 LOCATED OUTSIDE AND ADJACENT TO THE CENTRAL WEST SIDE OF THE CONCRETE TEST PAD

- CME 75 HSA RIG WITH 4¼" ID AUGERS
- 24" SPLIT SPOONS, 1¼" ID, SAMPLES DRIVEN 18" IN GENERAL ACCORD WITH ASTM D1586-11 (AUTO-HAMMER USED).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE: % Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	LITHOLOGIC DESCRIPTION (LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES)
0 2	—	—	—	—	— WATER; EQUIPMENT BLANKS	1402280816 0817 0818 0819	CL	SILTY CLAY, LIGHT BROWN (5 YR 6/4), GRAVEL CLASTS <5%, POORLY GRADED, MODERATELY SORTED, NON-PLASTIC, DRY, NO VISIBLE STAINING OR ODOR.
2 4	CORE 13 17 20 BLOW COUNTS	70%	2	3.5	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	1402280840	GM (DENSE)	SILTY GRAVEL, LIGHT BROWN (5 YR 6/4), GRAVEL CLASTS ≈ 50% OF SAMPLE, CLASTS ARE SUBANGULAR TO SUBROUNDED LIMESTONE, RHYOLITE, AND OTHER FELSIC VOLCANICS, ¼" - 1½" IN DIAMETER, MODERATELY GRADED, POORLY SORTED, NON-PLASTIC, DRY, NO VISIBLE STAINING OR ODOR.
13 15	CORE 10 12 12 BLOW COUNTS	10%	13	14.5	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	1402280858	GM (MEDIUM DENSE)	SILTY GRAVEL, MODERATE BROWN (5 YR 4/4), 50% GRAVEL CLASTS, SUBANGULAR TO SUBROUNDED, LIMESTONE, SHALE, AND FELSIC VOLCANICS, ⅛"-½" IN DIAMETER, MODERATELY GRADED, POORLY SORTED, NON-PLASTIC, DRY TO SLIGHTLY MOIST, NO VISIBLE STAINING OR ODOR.
15 17	CORE 8 12 16 BLOW COUNTS	20%	15	16.5	SOIL: SPLIT SPOON	COMPOUNDED SAMPLES	GM (MEDIUM DENSE)	@15' SILTY SANDY GRAVEL, AS ABOVE, GRAVEL CLASTS APPROXIMATELY 30% WITH ABUNDANT SAND AND SILT, WELL GRADED, POORLY SORTED, NON-PLASTIC, DRY, NO STAINING OR ODOR.
28 30	CORE 46 22 16 BLOW COUNTS	60%	28	29.5	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	1402280925 0926 DUPLICATE SAMPLE	ML (HARD)	SILT, LIGHT BROWN (5 YR 6/4), 20% GRAVEL, GAP GRADED, POORLY SORTED, DRY, NO ODOR. @28.5 SILTY CLAYEY GRAVEL, GRAYISH ORANGE PINK (5 YR 7/2), 40% GRAVEL CLASTS, SUBANGULAR LIMESTONE, SHALE, & RHYOLITE, ⅛" - 1½", WELL GRADED, POORLY SORTED, NON-PLASTIC, DRY, NO ODOR. INCREASED CLAY AT BOTTOM.

TD

TOTAL DEPTH = 30'

NOTES:

- FROM 20'-25' GRAVELLY INTERVAL IMPEDES AUGER PROGRESS.
- FROM 25'-28' COARSE GRAVEL WITH CLASTS TO 2" IN DIAMETER.

LOCATION MAP: (NOT TO SCALE)

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SITE ID: NASA-WSTF LOCATION ID: JP-4-B-04

SITE COORDINATES (ft.) N: 552051.25 E: 151207.22

GROUND ELEVATION (ft. MSL): 4438.49

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: RABA KISTNER: EL PASO

DATE STARTED: 2/28/14 DATE COMPLETED: 2/28/14

FIELD REPS.: G. GILES, A. SANCHEZ

COMMENTS: JP-4-B-04 LOCATED OUTSIDE AND ADJACENT TO THE CENTRAL NORTH SIDE OF THE CONCRETE TEST PAD

- CME 75 HSA RIG WITH 4¼" ID AUGERS
- 24" SPLIT SPOON, 1¼" ID, SAMPLES PUSHED 18" IN GENERAL ACCORD WITH ASTM D1586-11 (Auto-Hammer Used).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE: % Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
0 2	—	—	—	—	— WATER: EQUIPMENT BLANKS	140228 1005 —— 1006 —— 1007 —— 1008	ML	CLAYEY SILT, LIGHT BROWN (5 YR 6/4), <5% GRAVEL CLASTS, POORLY GRADED, MODERATELY SORTED, NON-PLASTIC, DRY, NO VISIBLE STAINING OR ODOR.
2 4	CORE 21 24 19 BLOW COUNTS	60%	2	3.5	SOIL: SPLIT SPOON 8015 (c) 8270 (D) 8260 (c)	1402281030	ML (HARD)	SILT, LIGHT BROWN (5 YR 5/6), WELL GRADED, POORLY SORTED, NON-PLASTIC, DRY, NO STAINING OR ODOR. @ 3' CLAYEY SILT, LIGHT BROWN (5 YR 5/6) TO VERY PALE ORANGE (10 YR 8/2), <10% GRAVEL, SUBANGULAR LIMESTONE CLASTS TO ½", MODERATELY GRADED, POORLY SORTED, NON-PLASTIC, DRY, NO ODOR.
13 15	CORE 5 6 8 BLOW COUNTS	65%	13	14.5	SOIL: SPLIT SPOON 8015 (c) 8270 (D) 8260 (c)	1402281045	ML (FIRM)	SILT, MODERATE BROWN (5 YR 4/4), GRAVEL CLASTS COMPRISE 10%, SUBANGULAR TO SUBROUNDED LIMESTONE AND FELSIC VOLCANICS ⅛"–¼", GAP GRADED, POORLY SORTED, LOW PLASTICITY, DRY TO SLIGHTLY MOIST, NO VISIBLE STAINING OR ODOR.
28 30	CORE 10 18 21 BLOW COUNTS	100%	28	29.5	SOIL: SPLIT SPOON 8015 (c) 8270 (D) 8260 (c)	1402281105	ML (HARD)	CLAYEY SILT, MODERATE ORANGE PINK (5 YR 8/4), GRAVEL CLASTS <5%, POORLY GRADED, MODERATELY SORTED, NON-PLASTIC, DRY, NO VISIBLE STAINING OR ODOR.
TD								TOTAL DEPTH = 30'

LOCATION MAP: (NOT TO SCALE)

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SITE ID: NASA-WSTF LOCATION ID: JP-4-B-05

SITE COORDINATES (ft.) N: 552046.89 E: 1511246.58

GROUND ELEVATION (ft. MSL): 4438.57

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: RAJA KISTNER : EL PASO

DATE STARTED: 2/27/14 DATE COMPLETED: 2/27/14

FIELD REPS.: G. GILES, A. SANCHEZ

COMMENTS: JP-4-B-05 LOCATED OUTSIDE AND ADJACENT TO THE CENTRAL EAST SIDE OF THE CONCRETE TEST PAD.

- CME 75 HSA RIG WITH 4¼" ID AUGERS
- 24" SPLIT SPOONS, 1¼" ID, SAMPLES PUSHED 18" IN GENERAL ACCORD WITH ASTM D1586-11 (Auto-Hammer used).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE: % Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
0 2	—	—	—	—	— WATER: EQUIPMENT BLANKS	— 1402270825 0826 0827 0828	CL	SILTY CLAY, LIGHT BROWN (5 YR 5/6 TO MODERATE YELLOWISH BROWN (10 YR 5/4), <10% GRAVEL CLASTS, CLAY > SILT %, POORLY GRADED, NONPLASTIC, SOFT, DRY, NO ODOR.
2 4	CORE 9 10 12 BLOW COUNTS	80%	2	3.5	SOIL: SPLIT SPOON 8015 (c) 8270 (D) 8260 (c)	1402270840	ML (VERY STIFF)	SILT, WITH SOME FINE SAND, LIGHT BROWN (5 YR 5/6), 15% GRAVEL CLASTS ½" – 1" DIAMETER, ANGULAR TO SUBANGULAR, MODERATELY GRADED, NONPLASTIC, LOOSE, SLIGHTLY MOIST, NO VISIBLE STAINING OR ODOR.
13 15	CORE 7 9 11 BLOW COUNTS	70%	13	14.5	SOIL: SPLIT SPOON 8015 (c) 8270 (D) 8260 (c)	1402270850	ML (VERY STIFF)	SILT, WITH SOME FINE SAND, LIGHT BROWN (5 YR 5/6), <10% GRAVEL CLASTS, MODERATELY GRADED, MEDIUM STIFF, SLIGHTLY MOIST, NO VISIBLE STAINING OR ODOR.
28 30	CORE 29 70 50 BLOW COUNTS	70%	28	29.5	SOIL: SPLIT SPOON 8015 (c) 8270 (D) 8260 (c)	1402270915	CL (HARD)	SILTY CLAY, MODERATE ORANGE PINK (5 YR 8/4), GRAVEL CLASTS ≈ 5%, < ½" DIAMETER, SUBANGULAR TO SUBROUNDED, MODERATELY GRADED, MEDIUM STIFF, SLIGHTLY MOIST, NO VISIBLE STAINING OR ODOR.
TD								TOTAL DEPTH = 30'.

LOCATION MAP: (NOT TO SCALE)

N

___¼___¼___¼___¼ S T__S R__E

SITE ID: NASA-WSTF LOCATION ID: JP-4-B-06

SITE COORDINATES (ft.) N: 552007.38 E: 1511239.18

GROUND ELEVATION (ft. MSL): 4438.51

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: RABA KISTNER; EL PASO

DATE STARTED: 2/27/14 DATE COMPLETED: 2/27/14

FIELD REPS.: G. GILES, A. SANCHEZ

COMMENTS: JP-4-B-06 LOCATED OUTSIDE AND ADJACENT TO THE CENTRAL SOUTH SIDE OF THE CONCRETE TEST PAD

- CME 75 HSA RIG WITH 4 1/4" ID AUGERS
- 24" SPLIT SPOONS, 1 1/4" ID, SAMPLES PUSHED 18" - IN GENERAL ACCORD WITH ASTM D1586-11 (AUTO-HAMMER USED).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE: % Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
0 2	—	—	—	—	— WATER: EQUIPMENT BLANKS	1402271340 1341 1342 1343	CL	SILTY CLAY, DUSKY YELLOWISH BROWN (10 YR 2/2), <10% GRAVEL CLASTS, SUBANGULAR TO SUBROUNDED CLASTS 1/2"-1", LIMESTONE & FELSIC VOLCANICS, POORLY GRADED, MODERATELY SORTED, LOOSE, DRY, NO VISIBLE STAINING OR ODOR.
2 4	CORE 16 20 19 BLOW COUNTS	70%	2	3.5	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	1402271353	ML (HARD)	SILT WITH FINE SAND (10%) AND GRAVEL (10%), LIGHT BROWN (5 YR 6/4), ANGULAR (BROKEN) TO SUBANGULAR CLASTS 1/8"-1", GAP GRADED, POORLY SORTED, NON-PLASTIC, DRY TO SLIGHTLY MOIST, NO ODOR. @ 3' VERY PALE ORANGE (10 YR 8/2), DRY.
13 15	CORE 9 11 11 BLOW COUNTS	90%	13	14.5	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	1402271410	ML (VERY STIFF)	GRAVELLY SILT, LIGHT BROWN (5 YR 6/4), 40% GRAVEL CLASTS, SUBANGULAR LIMESTONE & FELSIC VOLCANICS 1/8"-1/2". @ 13.5', SILT, LIGHT BROWN (5 YR 5/6), 15% GRAVEL CLASTS AS ABOVE, GAP GRADED, POORLY SORTED, LOW PLASTICITY, DRY TO SLIGHTLY MOIST, NO VISIBLE STAINING OR ODOR.
28 30	CORE 13 23 42 BLOW COUNTS	100%	28	29.5	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	1402271430	ML (HARD) CL (HARD)	SILT, LIGHT BROWN (5 YR 6/4), 15% GRAVEL CLASTS, SUBANGULAR LIMESTONE 1/8"-1/4", GAP GRADED, POORLY SORTED. @ 29', SILTY CLAY, VERY PALE ORANGE (10 YR 8/2), POORLY GRADED, MODERATELY SORTED, NON-PLASTIC, DRY, NO VISIBLE STAINING OR ODOR.
TD								TOTAL DEPTH = 30'

NOTES:

- FROM 25'-27' VERY GRAVELLY AS REFLECTED BY VIBRATION ON CEMENT PAD. AUGERS HAVE TO BE REAMED UP & DOWN TO PENETRATE INTERVAL.

LOCATION MAP: (NOT TO SCALE)

N

___¼___¼___¼___¼ S T__S R__E

SITE ID: NASA-WSTF LOCATION ID: JP-5-B-01

SITE COORDINATES (ft.) N: 551191.43 E: 1511033.44

GROUND ELEVATION (ft. MSL): 4435.76

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: RABA KISTNER: EL PASO

DATE STARTED: 2/25/14 DATE COMPLETED: 2/25/14

FIELD REPS.: J. LAWRENCE, A. SANCHEZ

COMMENTS: JP-5-B-01 LOCATED OUTSIDE AND ADJACENT TO THE WEST SIDE OF THE CONCRETE TEST PAD

- CME 75 HSA RIG WITH 4¼" ID AUGERS
- 24" SPLIT SPOONS, 1¼" ID, SAMPLES PUSHED 18"
IN GENERAL ACCORD WITH ASTM D1586-11 (AUTO-HAMMER USED).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE						LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
		% Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	
0					WATER: EQUIPMENT BLANKS	1402251403 1404 1405 1406		
		75%	2	4	SOIL: SPLIT SPOON	1402251420	ML	BLOW COUNTS = 9/23/22, HARD, VERY PALE ORANGE (10 YR 8/2), FINE SILT, SOME CLAY, TR. VERY FINE SAND
8.5-10					8015(c) 8270(D) 8260(c)		ML	AS ABOVE, INCLUDES FINE TO COARSE GRAVEL.
		50%	13	15	SOIL: SPLIT SPOON	1402251434	SW	BLOW COUNTS = 8/24/20, DENSE, VERY PALE ORANGE (10 YR 8/2), WITH FINE SILTY SAND, SOME FINE GRAVEL
19-21.5					8015(c) 8270(D) 8260(c)			AS ABOVE, INCLUDES MEDIUM TO COARSE GRAVEL.
			28	30	SOIL: SPLIT SPOON	1402251505	ML	BLOW COUNTS = 18/19/34, HARD, GRAYISH ORANGE (10 YR 7/4), SILTY CLAY, TRACE VERY FINE SAND.
TD					8015(c) 8270(D) 8260(c)			TOTAL DEPTH = 30'.

LOCATION MAP: (NOT TO SCALE)

N

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SITE ID: NASA-WSTF LOCATION ID: JP-5-B-02

SITE COORDINATES (ft.) N: 557194.06 E: 1511064.74

GROUND ELEVATION (ft. MSL): 4435.73

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: RABA KISTNER : EL PASO

DATE STARTED: 2/26/14 DATE COMPLETED: 2/26/14

FIELD REPS.: J. LAWRENCE, A. SANCHEZ

COMMENTS: JP-5-B-02 LOCATED ON THE TEST PAD. THE FURTHER EAST OF THE TWO BORINGS INSTALLED IN THE CENTRAL TEST PAD AREA.

- CME 75 HSA RIG WITH 4¼" ID AUGERS
- 24" SPLIT SPOONS, 1¼" ID, SAMPLES PUSHED 18" IN GENERAL ACCORD WITH ASTM D1586-11 (AUTO-HAMMER USED).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/ stop)	SAMPLE						LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
		% Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	
0					WATER: EQUIPMENT BLANKS	1402261008 1009 1010 1011	ML	FIRM, PALE BROWN (5YR 5/2) CLAYEY SILT, SOME VFN-FN SAND
2	2'	50%	2	4	SOIL: SPLIT SPOON	1402261026	SW	BLOW COUNTS 14/19/26 DENSE GRAYISH ORANGE PINK (5YR 7/2) / MED GRAY (N5) FN-CRS GRAVELLY
5					8015(c) 8270(D) 8260(c)		ML	SAND, SL SILT VSTIFF, LT BROWN (5YR 6/4) SILT & CLAY, SOME VFN SAND
12	2'	25%	13	15	SOIL: SPLIT SPOON	1402261056	ML	BLOW COUNTS 23/21/17 HARD, LT BRN (5YR 6/4) SILT, SOME CLAY, TR/VFN SAND
17 19.5					8015(c) 8270(D) 8260(c)		ML	A/A, W/MED-CRS ALLUVIAL GRAVEL 17-19.5
	2'		28	30	SOIL: SPLIT SPOON	1402261127	ML	BLOW COUNTS 21/35/30 HARD MODERATE ORANGE PINK (5YR 8/4) SILT, SOME CLAY, TR/VFN SAND
					8015(c) 8270(D) 8260(c)			BORING TERMINATED @ 30' BGS

LOCATION MAP: (NOT TO SCALE)

N

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SITE ID: NASA-WSTF LOCATION ID: JP-5-B-03

SITE COORDINATES (ft.) N: 551181.52 E: 1511104.56

GROUND ELEVATION (ft. MSL): 4435.12

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: RABA KISTNER: EL PASO

DATE STARTED: 2/25/14 DATE COMPLETED: 2/25/14

FIELD REPS.: J. LAWRENCE, A. SANCHEZ

COMMENTS: JP-5-B-03 LOCATED OUTSIDE AND ADJACENT TO THE SOUTH SIDE OF THE CONCRETE TEST PAD.

- CME 75 HSA RIG WITH 4¼" ID AUGERS
- 24" SPLIT SPOONS, 1¼" ID, SAMPLES PUSHED 18" IN GENERAL ACCORD WITH ASTM D1586-11 (AUTO-HAMMER USED).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE						LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
		% Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	
0					WATER: EQUIPMENT BLANKS	1402251056 1057 1058 1059		
		60%	2	3	SOIL: SPLIT SPOON	1402251115	ML	BLOW COUNTS = 15/23/20 HARD, V. PALE ORANGE (10 YR 8/2) SILT & CLAY, TRACE VERY FINE SAND
10					8015 (c) 8270 (D) 8260 (c)		ML	HARD, V. PALE ORANGE (10 YR 8/2) CLAYEY SILT, SOME FINE SAND, TRACE FINE-COARSE GRAVEL
12		65%	13	15	SOIL: SPLIT SPOON	1402251300	ML	BLOW COUNTS = 11/19/14 HARD, MODERATE ORANGE PINK (5 YR 8/4) SILT & CLAY, W/ FINE SAND, TR. FINE GRAVEL
15/16					8015 (c) 8270 (D) 8260 (c)			AS ABOVE, INCLUDES 1"-1½" FINE GRAVEL TO SMALL COBBLES
17								AS ABOVE, MODERATE REDDISH ORANGE (10 R 6/6), CLAYEY SILT, TR. FINE SAND.
30			28	30	SOIL: SPLIT SPOON	1402251335	ML	BLOW COUNTS 42/39/50, HARD, GRAYISH ORANGE PINK (5 YR 7/2), SILT & CLAY, TRACE FINE SAND.
TD					8015 (c) 8270 (D) 8260 (c)			TOTAL DEPTH = 30' (BORING REFUSAL)

LOCATION MAP: (NOT TO SCALE)

N

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SITE ID: ~~NASA-WSTF~~ LOCATION ID: JP-5-B-04

SITE COORDINATES (ft.) N: 551140.87 E: 1511052.45

GROUND ELEVATION (ft. MSL): 4435.51

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: Raba Kistner : EL PASO

DATE STARTED: 2-24-14 DATE COMPLETED: 2/25/14

FIELD REPS.: J. Pearson, A. Sanchez

COMMENTS: JP-5-B-04 LOCATED OUTSIDE AND ADJACENT TO THE EAST SIDE OF THE CONCRETE TEST PAD.

- CME 75 HSA RIG WITH 4¼" ID AUGERS
- 24" SPLIT SPOONS, 1¼" ID, SAMPLES PUSHED 18" IN GENERAL ACCORD WITH ASTM D1586-11 (AUTO-HAMMER USED).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE						LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
		% Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	
2	AUGER		Ø	Ø	WATER: EQUIPMENT BLANKS	1402241539 1540 1541 1542	SM	Tan silty sand
4	SPLIT SPOON	65	3	4	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	1402241558	SC CL	32 blows for 02-04 ft 11-9-7 2-3 tan-brn sandy silt 3-4 light tan silty clay - clayey silt no plasticity
6	SPLIT SPOON	40	Ø	Ø			ML	9-11-13 blows 5YR 8/4 dry orange pink clayey silt with occasional limestone pebble to 1-1½ inch. Low moisture, no plasticity
8	SPLIT SPOON	30	Ø	Ø			ML SC	11-15-16 blows 5YR 6/4 light brn 6-7 fine silt 7-8 low moisture silty clay
10	SPLIT SPOON	65	Ø	Ø			MC GM	27-33-29 blows 10R 3/4 DK red-brn silty clay 10R 5/4 Pale red-brn silty gravel

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/ stop)	SAMPLE % Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES (BLOW COUNT MISSED)
10	SPLIT SPOON		∅	∅			GM	5YR 6/4 light brn silty gravel, limestone clasts
12		65					SM	silty sand w/ pebbles to ½ - 1 inch
25 FEB 2014								
13	SPLIT SPOON	70%	13	15	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	1402250944	ML	20/22/13 = BLOW COUNTS ~~DENSE~~, HARD, TAN SILT w/ VFN SAND (10YR 8/2), SOME ORGANICS (ROOTS)
15								
25								HARD, TAN SILT w/ FN SAND, VSL MED GRAVEL (10YR 8/2)
			28	30	SOIL: SPLIT SPOON 8015(c) 8270(D) 8260(c)	1402251020		BLOW COUNTS = 14/17/17 HARD, ^ SILT & CLAY (5YR 8/4) MOD, ORG - ABUK, TR/VFN SAND
30 TD								TOTAL DEPTH = 30'

LOCATION MAP: (NOT TO SCALE)

N

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SITE ID: NASA-WSTF LOCATION ID: JP-5-B-05

SITE COORDINATES (ft.) N: 551185.86 E: 1510997.36

GROUND ELEVATION (ft. MSL): 4435.26

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: RABA KISTNER: EL PASO

DATE STARTED: 2/26/14 DATE COMPLETED: 2/26/14

FIELD REPS.: J. LAWRENCE, A. SANCHEZ

COMMENTS: JP-5-B-05 LOCATED ON THE TEST PAD. THE FURTHER WEST OF THE TWO BORINGS INSTALLED IN THE CENTRAL TEST PAD AREA.

- CME 75 HSA RIG WITH 4¼" ID AUGERS
- 24" SPLIT SPOONS, 1¼" ID, SAMPLES PUSHED 18" IN GENERAL ACCORD WITH ASTM D1586-11 (AUTO-HAMMER USED).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE: % Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
1430 0					WATER: EQUIPMENT BLANKS	1402261420 1421 1422 1423		NOTE 0-12" CONCRETE 1'-2' WET FROM CORING OPS
7	2'	60	2	4	SOIL: SPLIT SPOON	1402261442 1443		BLOW COUNTS: 6/8/9 VSTIFF, LT BRN (5YR 6/4) CLAYEY SILT, TR/UFN SAND
7 8.5					DUPLICATE SAMPLE 8015(c) 8270(D) 8260(c)			MED DNS, LT BRN (5YR 6/4) MED-CRS SILTY GRAVEL, SOME FN-MED SAND
8.5	2'	60	13	15	SOIL: SPLIT SPOON	1402261458		BLOW COUNTS: 11/14/15 HARD, LT BRN (5YR 6/4) SILT, SOME CLAY, TR UFN SAND
30	2'		28	30	8015(c) 8270(D) 8260(c) SOIL: SPLIT SPOON	1402261522		BLOW COUNTS: 22/32/27 HARD, LT BRN (5YR 5/6) SILT, SOME CLAY, TR/UFN SAND
TD					8015(c) 8270(D) 8260(c)			TOTAL DEPTH = 30'

LOCATION MAP: (NOT TO SCALE)

N

___¼___¼___¼___¼ S T__S R__E

SITE ID: NASA-WSTF LOCATION ID: JP-5-B-06

SITE COORDINATES (ft.) N: 551248.31 E: 1511037.11

GROUND ELEVATION (ft. MSL): 4435.18

STATE: New Mexico COUNTY: Dona Ana

DRILLING METHOD: HOLLOW STEM AUGER (HSA)

DRILLING CONTR.: BABA KISTNER : EL PASO

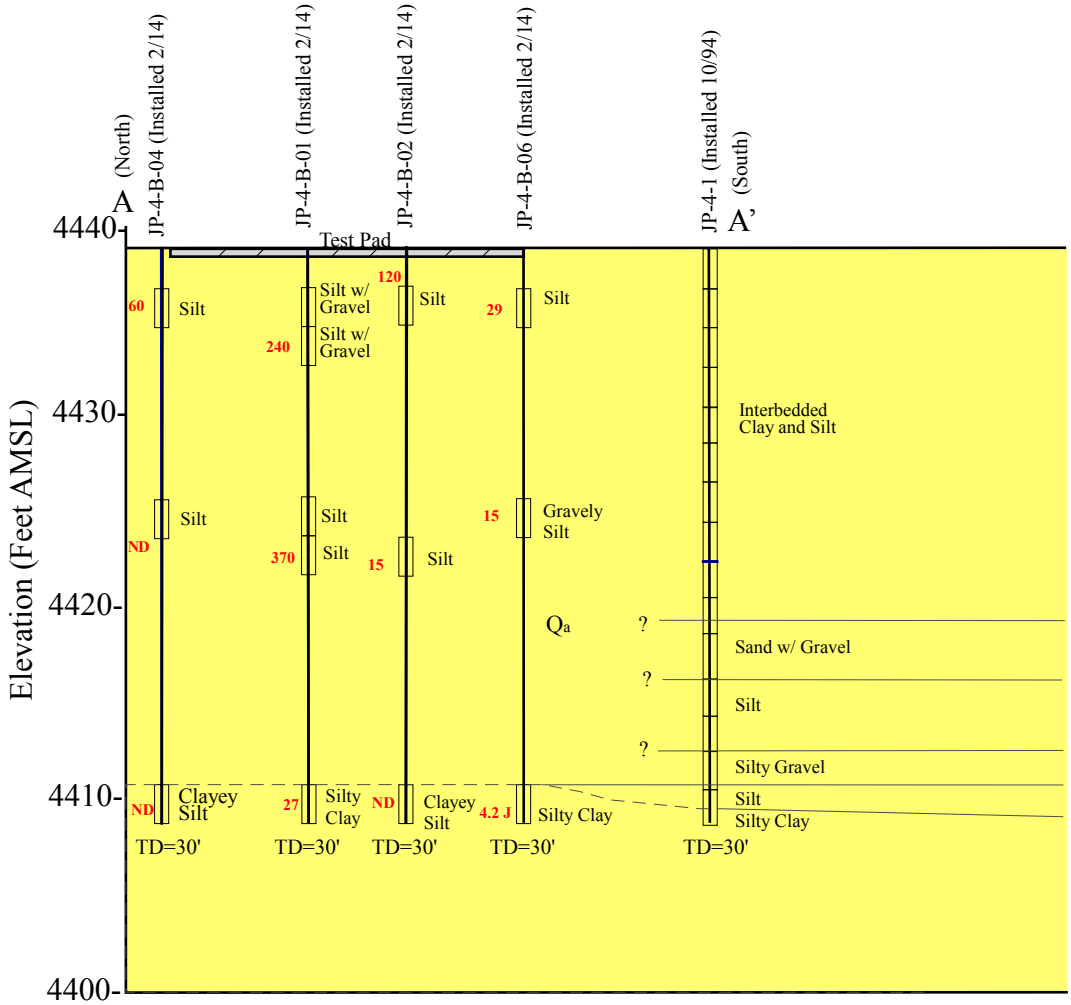
DATE STARTED: 2/26/14 DATE COMPLETED: 2/26/14

FIELD REPS.: J. LAWRENCE, A. SANCHEZ

COMMENTS: JP-5-B-06 LOCATED OUTSIDE AND ADJACENT TO THE NORTH SIDE OF THE CONCRETE TEST PAD.

-CME 75 HSA RIG WITH 4¼" ID AUGERS
-24" SPLIT SPOONS, 1¼" ID, SAMPLES PUSHED 18" IN GENERAL ACCORD WITH ASTM D1586-11 (AUTO-HAMMER USED).

DEPTH (ft. bgs)	LITH. (Core Length, Depths start/stop)	SAMPLE						LITHOLOGIC DESCRIPTION LITHOLOGY: COLOR, SORTING/GRADING, CONSISTENCY/DENSITY, GRAIN SIZE PROPORTIONS (%), ROUNDING/SHAPE, CONSOLIDATION/CEMENTATION, MOISTURE CONTENT, DISTINGUISHING FEATURES
		% Rec.	Sample Depth From	Sample Depth To	TYPE (Soil, Soil Gas, Soil Chemical, Soil Geotechnical, Hex. Chrom.)	WSTF 10-DIGIT SAMPLE NUMBER(S)	USCS Group	
0		50%	2	4	WATER: EQUIPMENT BLANKS SOIL: SPLIT SPOON	1402260802 0803 0804 0805 1402260826	ML	BLOW COUNTS 1/4/24/30 HARD, GRAYISH ORANGE PINK (5YR 7/2) SILT, SOME CLAY, TR/VFN SAND
12		50%	13	15	8015(C) 8270(D) 8260(C) SOIL: SPLIT SPOON	1402260855	SW	BLOW COUNTS 13/21/25 DENSE, GRAYISH ORANGE PINK (5YR 7/2) FA-MEA SAND W/ GRAVEL, TR/SILT
18					8015(C) 8270(D) 8260(C)		ML	DENSE, GRAYISH ORANGE PINK (5YR 7/12) VFN SANDY SILT, TR GRAVEL
23			28	30	SOIL: SPLIT SPOON	1402260927	ML	BLOW COUNTS 19/26/50/5.5 HARD, LT BRN (5YR 6/4) SILT, SOME CLAY TR/VFN SAND
TD					8015(C) 8270(D) 8260(C)			TOTAL DEPTH = 30' (BORING REFUSAL)



JP-4 Cross-Section A-A' (North-South)

Key

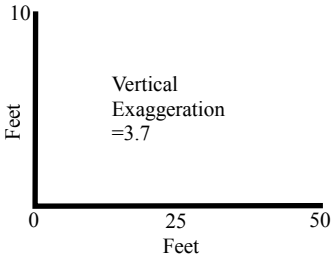
Split-spoon sample interval

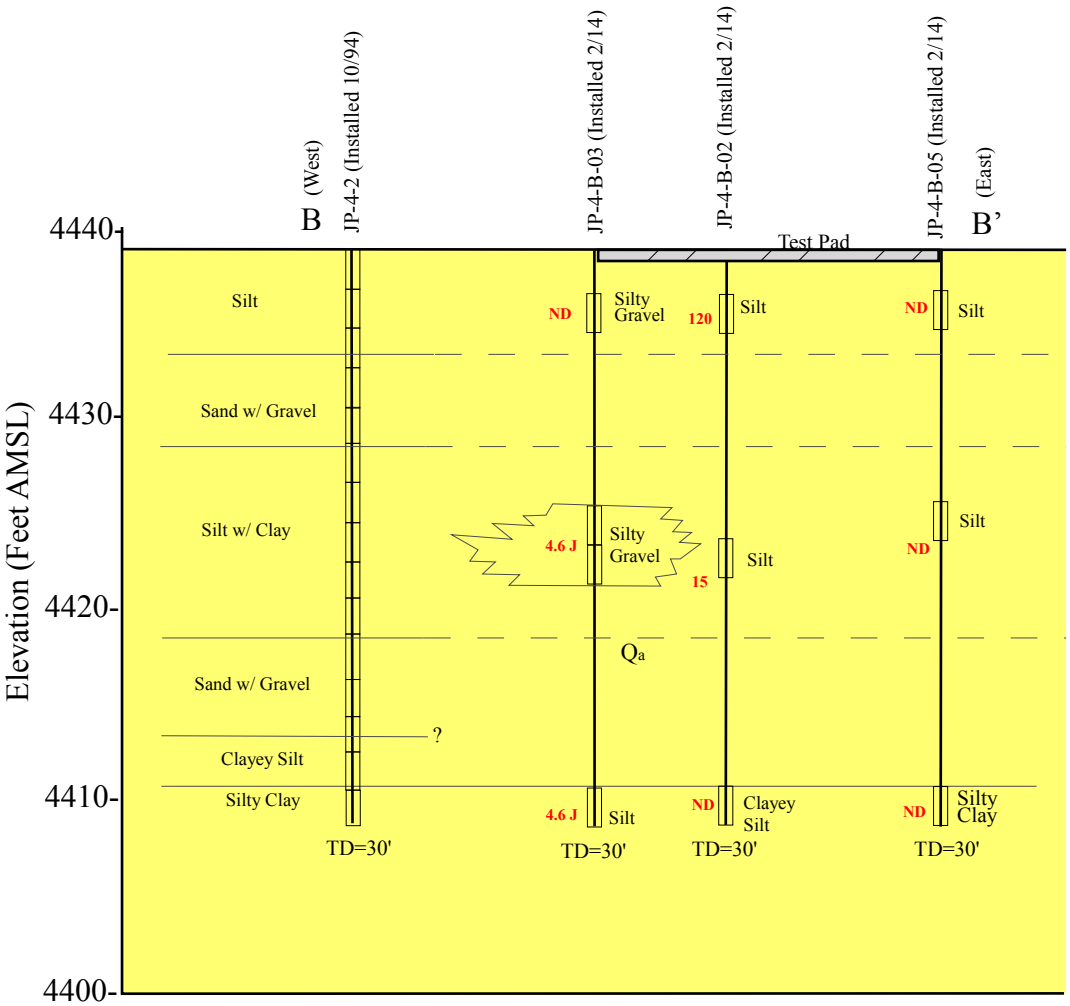
Qa Quaternary Alluvium. Upper Santa Fe Group

Soil Lithologic Contact (dashed = inferred, ? = unknown)

27 DRO analytical result (mg/kg), ND=Non Detect, J=J Flag

TD Total Depth





JP-4 Cross-Section B-B' (West-East)

Key

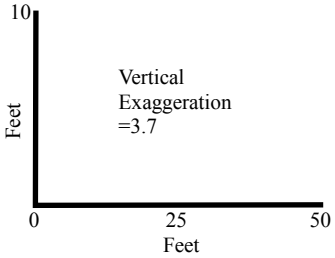
Split-spoon sample interval

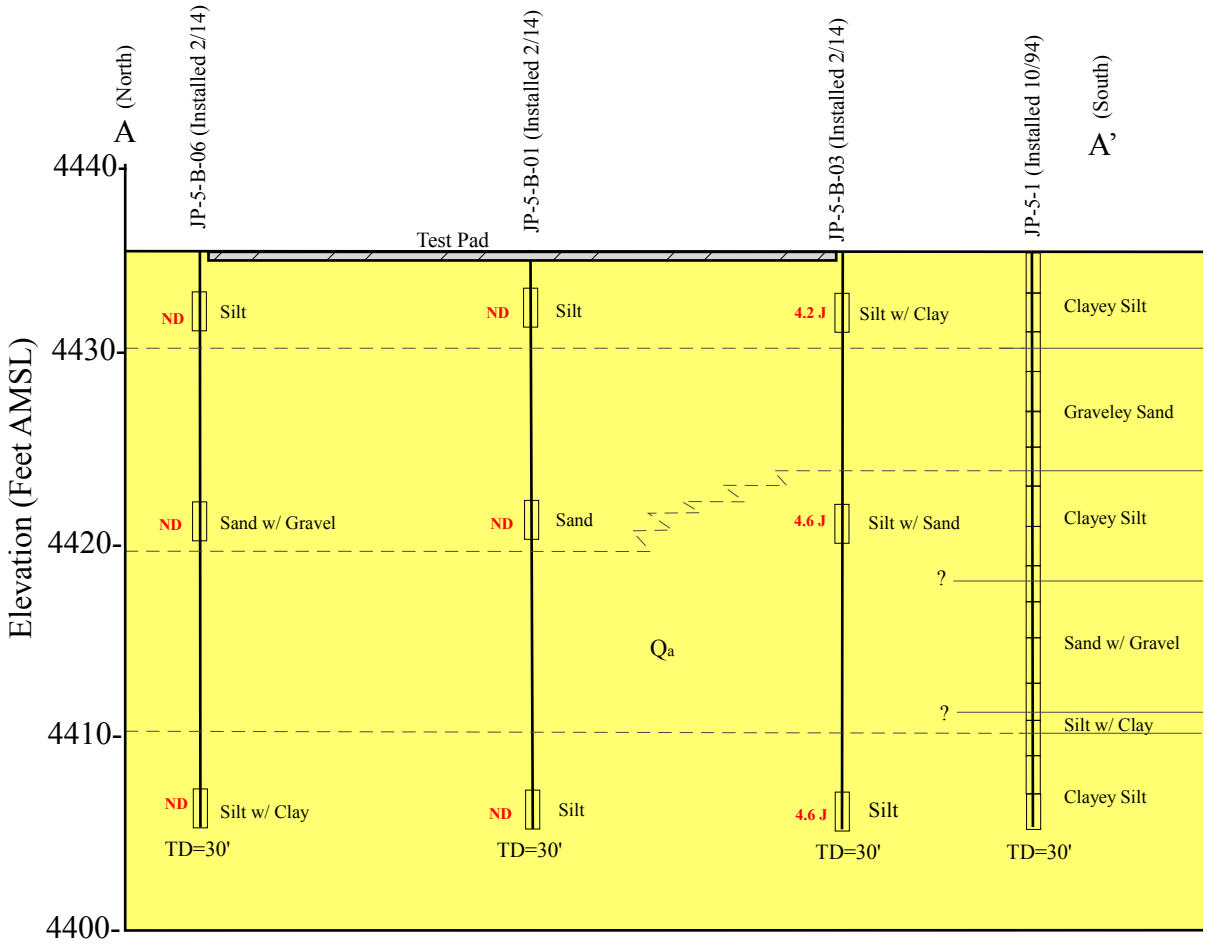
Qa Quaternary Alluvium. Upper Santa Fe Group

Soil Lithologic Contact (dashed = inferred, ? = unknown)

27 DRO analytical result (mg/kg), ND=Non Detect, J=J Flag

TD Total Depth

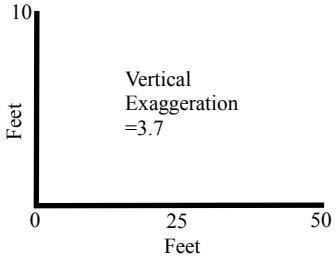


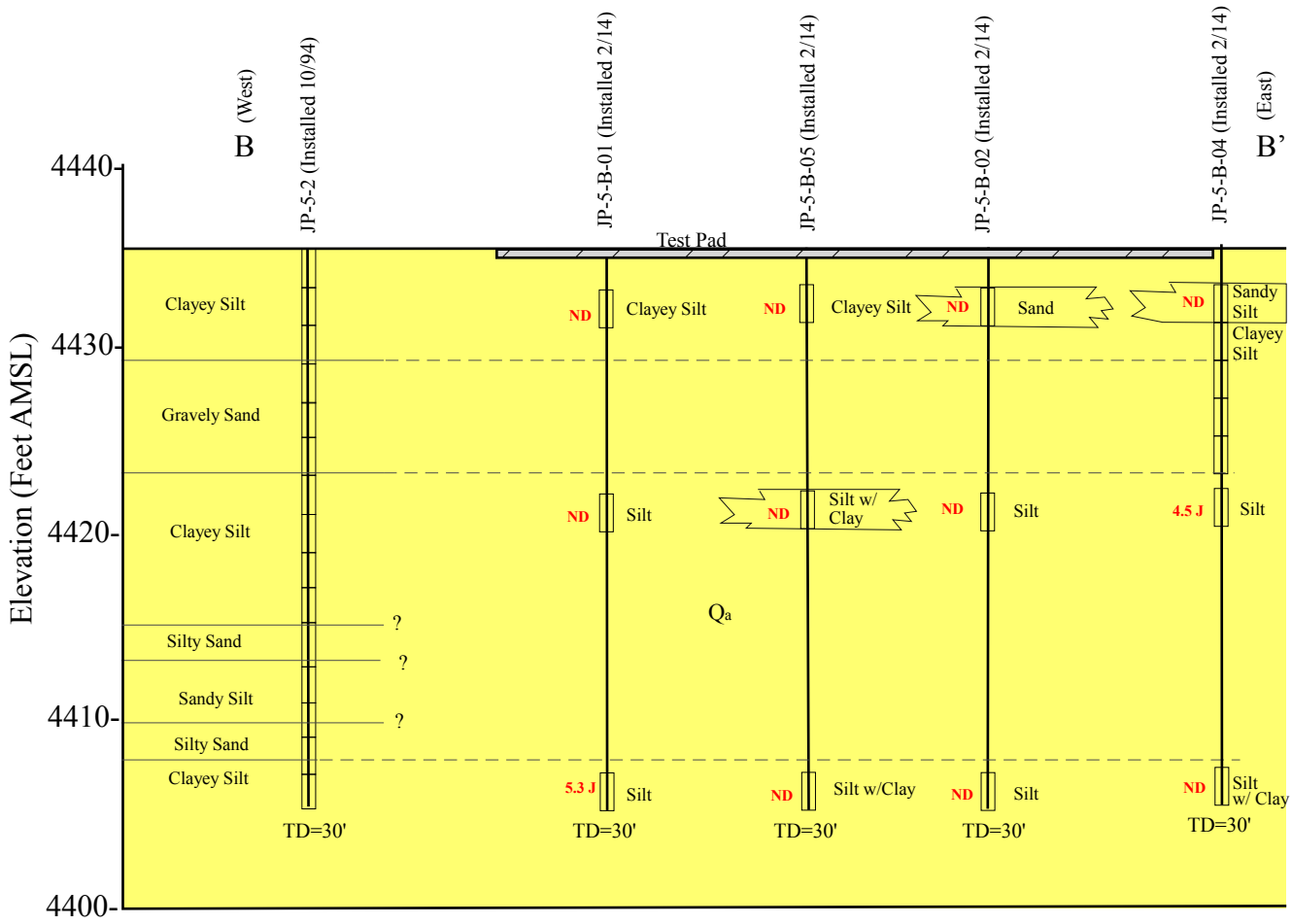


JP-5 Cross-Section A-A' (North-South)

Key

- Split-spoon sample interval
- Q_a — Quaternary Alluvium. Upper Santa Fe Group
- Soil Lithologic Contact (dashed = inferred, ? = unknown)
- 27 — DRO analytical result (mg/kg), ND=Non Detect, J=J Flag
- TD — Total Depth

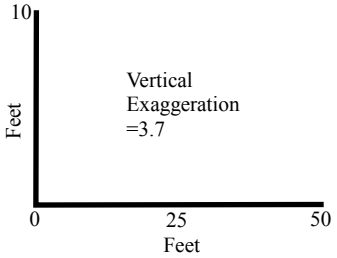


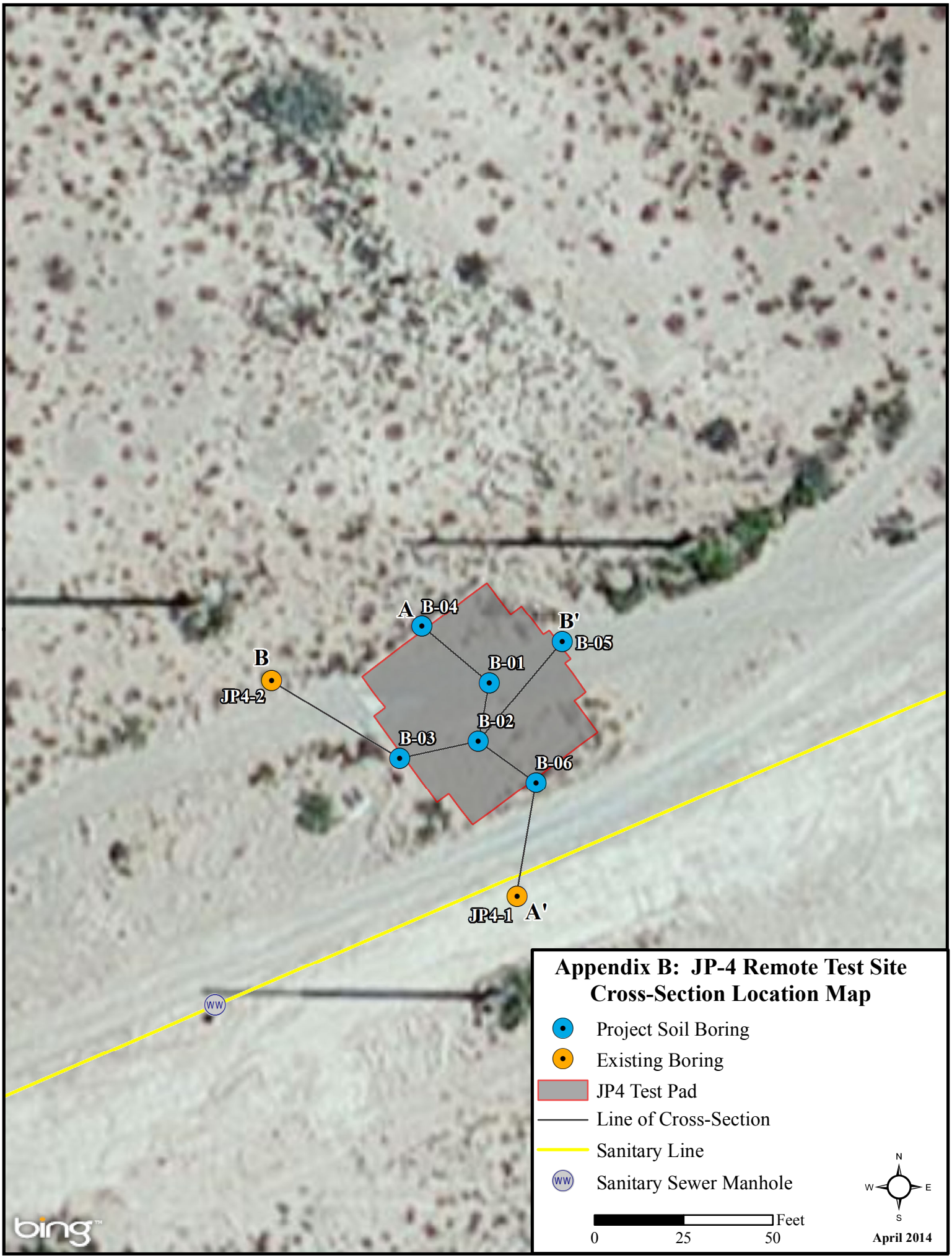


JP-5 Cross-Section B-B' (West-East)

Key

- Split-spoon sample interval
- Qa — Quaternary Alluvium. Upper Santa Fe Group
- Soil Lithologic Contact (dashed = inferred, ? = unknown)
- 27 — DRO analytical result (mg/kg), ND=Non Detect, J=J Flag
- TD — Total Depth




A
B-04
B'
B-05
B
B-01
JP4-2
B-02
B-03
B-06
JP4-1
A'
WW
bing
Appendix B: JP-4 Remote Test Site
Cross-Section Location Map
Project Soil Boring
Existing Boring
JP4 Test Pad
Line of Cross-Section
Sanitary Line
Sanitary Sewer Manhole
N
W
E
S
Feet
0
25
50
April 2014

A
JP5-B-06
JP5-B-05
JP5-B-02
JP5-B-01
JP5-B-04
B'
B
JP5-2
JP5-B-03
A'
JP5-1
Appendix B: JP-5 Remote Test Site
Cross-Section Location Map
Project Boring
Existing Boring
JP5 Test Pad
Line of Cross-Section
Feet
0
25
50
N
W
E
S
April 2014
bing

Appendix C
JP4/JP5 RTS Fieldnotes

Project JP-4 JP-5 Auger Drlg Notebook No. ISS #3

Continues from Page Ø

2-24-2014

Raba Kistner @ Forward Gate ~ 10:30 am. Geoff Giles + Antoinette Sanchez go to meet.

11:00 Safety Briefing at Gemini to go over H+S Plan, Project Hazards, goals.

11:40 Crew + Navarro Personnel go to Bldg. 637 Yard for rig inspection. Steve Patterson (SAFETY), John Pearson, Jim Lawrence go over rig. No issues.

12:30 - 13:00 Drill Crew takes lunch.

13:10 Crew visits Mid-Plume Bldg. to see access to restrooms + water for decon.

13:30 Decon Rig + augers @ BLDG 637. Wash off road dust.

14:00 Move rig + crew to JP-5 site. Setting up.

15:10 Field Tailgate Briefing.

1539 TAKE EQUIPMENT BLANK OF AUGER & SPLIT SPOON AT BOREHOLE JP5-B-04

SAMPLE ID	ANALYSIS	PRESERVATIVE	CONTAINER	LAB
140224 1539	SVOC (PAH)	ICE	2-1L AMBER	HALL
" " 1540	TPH 8015c GRO	HCL	2-40 mL VIAL	HALL
" " 1541	VOC 8260	HCL	" "	"
" " 1542	TPH 8015c DRO	ICE	" "	"

JP5-B-04

1547 BEGIN CONTINUOUS SPLIT-SPOON TO FIRST DEPTH. They will auger to 2' depth, then collect continuous split spoons (2 ft length) to total depth of 30'.

1555 FIRST DEPTH REACHED AND SAMPLE COLLECTED. GEOLOGIST REPORTED LITHOLOGY DESCRIPTION USING LITHOLOGY LOGS.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140224 1558	8015c, 8270D, 8260c	2-4oz JARS	ICE	HALL

DEPTH: 2'-3' (a)

1640 STOPPED CONTINUOUS SPLIT-SPOONS AT 12' DEPTH. WILL STOP FOR THE DAY. TAKE SAMPLES TO REFRIGERATOR w/ COC.

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Project JP-4 & JP-5 AUGER DRILLING Notebook No. 135 #3

Continues from Page

2/25/2014 TUESDAY

0800 J LAWRENCE (NAVARRO) DEPARTS OFFICE FOR JP-5
0820 JAL ARRIVES @ JP-5
0830 A SANCHEZ ARRIVES @ JP-5 DISCUSSES TODAY'S WORKS
0835 HEAVY EQUIPT & RABA KISTNER PERSONNEL (M. DUEÑEZ, A. VASQUEZ) ARRIVE, HEAVY EQUIPT BEGINS REMOVING MESQUITE BRUSH FROM BORING LOCATIONS.
0859 HEAVY EQ LEAVES JP-5
0920 JAL RETURNS TO JP-5; COMPLETED TAIL GATE SAFETY BRIEFING
0934 CONTINUING SPLIT-SPOON FOR 13'-15' DEPTH OF JP5-B-04
0935 COLLECTED/RETRIEVED SOIL SAMPLE

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140225 0944	8015c, 8270D, 8260c	2-4oz Jar	ICE	HALL

DEPTH: 13'-15' (b)
* TURNED RIG OFF PRIOR TO COLLECTING SAMPLE
0945 JAL COMPLETED LITHOLOGY LOG.
0950 BEGAN AUGERING DOWN TO NEXT DEPTH 28'-30' FOR SOIL RETRIEVAL.
1018 RETRIEVED SOIL SAMPLE SPLIT-SPOON.
COLLECTED SOIL SAMPLE
* TURNED DRILL RIG OFF PRIOR TO COLLECTING SAMPLE.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140225 1020	8015c, 8270D, 8260c	2-4oz Jar	ICE	HALL

DEPTH: 28'-30' (c)
1021 JAL COMPLETED LITHOLOGY LOG.

1025 MOBILIZED TO NEXT BOREHOLE JP5-B-03.
1051 TAKE EB OF NEXT SET OF AUGERS AND DECONTAMINATED SPLIT-SPOONS.
* TURNED DRILL RIG OFF PRIOR TO COLLECTING SAMPLE.

SAMPLE ID	ANALYSIS	PRESERVATIVE	CONTAINER	LAB
140225 1056	SVOC (PAH)	ICE	2-1L AMBER	HALL
140225 1057	TPH 8015c GRO	HCL	2-40 ml VIAL	~~HALL~~ JP5-B-03
140225 1058	VOC 8260	HCL	2-40 ml VIAL	~~HALL~~
140225 1059	TPH 8015c DRO	ICE	2-40 ml VIAL	HALL

103 BEGAN AUGERING TO FIRST DEPTH 2' TO OBTAIN SPLIT-SPOON OF 2'-4' DEPTH INTERVAL.

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1109 RETRIEVED SOIL SAMPLE SPLIT SPOON.
SHUT DOWN DRILL RIG.
COLLECTED COMPOSITE SOIL SAMPLE.

SAMPLE ID	ANALYSIS	PRESERVATIVE	CONTAINER	LAB
1402251115	8015c, 8270D, 8260c	ICE	2-4oz JAR	HALL

DEPTH: 2'-4' (a)
JAL COMPLETED LITHOLOGY LOG.
1117 BEGAN AUGERING TO NEXT DEPTH 12'. TO SAMPLE DEPTH INTERVAL 13'-15'.
TECHNICIANS LUNCH BREAK.
1130 STOPPED AUGER FOR LUNCH BREAK; ALL PERSONNEL EXIT SITE.

1250 ALL CREW RETURNED TO JP5 SITE.
1255 DRILLERS BEGAN SPLIT-SPOON HAMMER FOR SECOND DEPTH SOIL COLLECTION.
1256 RETRIEVED SOIL SAMPLE SPLIT-SPOON.
SHUT DOWN DRILL RIG.
COLLECTED COMPOSITE SOIL SAMPLE.

SAMPLE ID	ANALYSIS	PRESERVATIVE	CONTAINER	LAB
1402251300	8015c, 8270D, 8260c	ICE	2-4oz. Jar	HALL

DEPTH: 13'-15' (b)
1302 JAL COMPLETED LITHOLOGY LOGS.
1303 DRILLERS BEGAN AUGERING TO THIRD DEPTH 28'-30' (c).
1328 RETRIEVED SOIL SAMPLE SPLIT-SPOON.
SHUT DOWN DRILL RIG.
COLLECTED COMPOSITE SOIL SAMPLE.

SAMPLE ID	ANALYSIS	PRESERVATIVE	CONTAINER	LAB
1402251335	8015c, 8270D, 8260c	ICE	2-4 oz. Jar	HALL

DEPTH: 28'-30' (c)
1336 JAL COMPLETED LITHOLOGY LOGS.
1338 MOBILIZED TO NEXT BOREHOLE JP5-B-01.

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[illegible] — Signed — 2/28/14 — Date

FEB. 25, 2014

1353 COLLECT EQUIPMENT BLANKS OF NEXT SET OF AUGERS AND SPLIT-SPOONS.
SHUT DOWN RIG PRIOR TO SAMPLE COLLECTION.

SAMPLE ID	ANALYSIS	~~CONTAINER~~ PRESERVATIVE AS	~~PRESERVATIVE~~ CONTAINER AS	LAB
1402251403	SVOC (PAH)	ICE	2- 1L AMBER	HALL
1402251404	TPH 8015c GRO	HCL	2- 40mL Vial	"
1402251405	VOC 8260	HCL	2- 40mL Vial	
1402251406	TPH 8015c DRO	ICE	2- 40mL Vial	"

JP5-B-01

1411 DRILLERS BEGAN TO AUGER TO FIRST DEPTH SAMPLING INTERVAL 2'-4'.
RETRIEVED SOIL SAMPLE SPLIT-SPOON.
SHUT DOWN DRILL RIG PRIOR TO SOIL SAMPLE COLLECTION.
COLLECTED COMPOSITE SOIL SAMPLE.

SAMPLE ID	ANALYSIS	PRESERVATIVE	CONTAINER	LAB
1402251420	8015c, 8270D, 8260c	ICE	2-4oz. Jar	HALL

DEPTH: 2'-4' (a)
1421 JAL COMPLETED LITHOLOGY LOGS.
1422 DRILLERS BEGAN AUGERING TO SECOND DEPTH 13'-15' (b).
RETRIEVED SOIL SAMPLE SPLIT-SPOON.
SHUT DOWN DRILL RIG PRIOR TO SOIL SAMPLE COLLECTION.
COLLECTED COMPOSITE SOIL SAMPLE.

SAMPLE ID	ANALYSIS	PRESERVATIVE	CONTAINER	LAB
1402251434	8015c, 8270D, 8260c	ICE	2-4oz. JAR	HALL

DEPTH: 13'-15' (b)
1435 JAL COMPLETED LITHOLOGY NOTES.
1436 DRILLERS CONTINUED AUGERING TO ~~SECOND~~ THIRD DEPTH 28'-30'.
1500 RETRIEVED SOIL SAMPLE SPLIT-SPOON.
1501 SHUT DOWN DRILL RIG PRIOR TO SOIL SAMPLE COLLECTION.
COLLECTED COMPOSITE SOIL SAMPLE.

SAMPLE ID	ANALYSIS	PRESERVATIVE	CONTAINER	LAB
1402251505	8015c, 8270D, 8260c	ICE	2- 4oz JAR	HALL

DEPTH: 28'-30' (c)

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1510 COMPLETED BOREHOLE JP5-B-01.
WILL MOBILIZE TO 600 DECON. PAD TO DECON. AUGERS AND SPLIT-SPOONS.
IDW DECON. WATER COLLECTED IN ACCUMULATION DRUMS.

1535 A. SANCHEZ DEPARTS JP-5 FOR THE DAY. JAC TO REMAIN W/ RABA-KISTNER THROUGH EQPT DECON ACTIVITIES. LOGBOOK TRANSFERRED TO JAC.

1545 JAC & RABA-KISTNER DEPART JP-5 SITE.

1555 JAC ARRIVES @ 637/638 YARD; JUST BEHIND RABA-KISTNER. A. MONTEY & T KOLBY DRESSED.

1600 RABA-KISTNER CREW DECONS RIG

1620 DECON COMPLETED. T KOLBY, A MONTEY ATTEMPT TO PUMP DECON WATER INTO DRUM ...

1635 PUMP NOT WORKING... WILL ATTEMPT AGAIN TOMORROW. MONTEY & KOLBY DEPART

1640 JAC DEPARTS TO OFFICE.

Summary B JAC

- COMPLETED BORING JP-5-04
- STARTED & COMPLETED BORINGS: JP-5-B-01 & JP-5-B-03

Tomorrow

- CONTINUE BORINGS @ JP-5
- RELOCATE TO JP-4?

25 FEB 2014

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DATE: FEB. 26, 2014

TIME: 0730 °F CARRY 65

WEATHER: COOL, BREEZY WINDS OUT OF SE TO NW, OVERCAST

PERSONNEL: R-K (MANNY D. + ALBERTO VASQUEZ), A. SANCHEZ, J. LAWRENCE, A MONTES, T KANDY S. MAESTAS.

0740 TAILGATE SAFETY BRIEFING CONDUCTED.

0745 SET-UP EQUIPMENT AT JP5-B-06

0751 TAKING EQUIPMENT BLANKS OF FIRST SET OF AUGERS + SPLIT-SPOONS.

SAMPLE ID	ANALYSIS	PRESERVATIVE ~~CONTAINER~~ AS	CONTAINER ~~PRESERVATIVE~~ AS	LAB
1402260802	SVOC (PAH)	ICE	2-1L AMBER	HALL
1402260803	TPH 8015c GRO	HCL	2-40mL VIAL	"
1402260804	VOC 8260	HCL	"	[redacted]
1402260805	TPH 8015c DRO	ICE	"	"

0810 DRILLERS BEGAN CORING THROUGH CONCRETE USING THE CORING ATTACHMENT

0811 JAL RETURNED TO SITE.

0815 DRILLERS BEGAN AUGERING TO FIRST DEPTH 2'-4'. (a)

0817 S. MAESTAS RETURNED TO SITE.

0823 RETRIEVED SPLIT-SPOON FOR SOIL SAMPLING.

COLLECTED SOIL ~~SAMPLING AS~~ SAMPLES.

SAMPLE ID	ANALYSIS	PRESERVATIVE	CONTAINER	LAB
1402260826	8015c, 8270D, 8260c	ICE	2-4oz JAR	HALL

DEPTH: 2'-4' (a)

0832 DRILLERS COMPLETED CORING FIRST BOREHOLE THROUGH CONCRETE. OBSERVED SECOND SLAB BELOW

0839 DRILLERS BEGAN AUGERING TO SECOND DEPTH 13'-15' (b).

0850 RETRIEVED SPLIT-SPOON SAMPLE

SHUT DOWN RIG.

COLLECTED SOIL SAMPLES.

SAMPLE ID	ANALYSIS	PRESERVATIVE	CONTAINER	LAB
1402260855	8015c, 8270D, 8260c	ICE	2-4oz JARS	HALL

DEPTH: 13'-15' (b)

0856 JAL COMPLETED LITH. LOGS.

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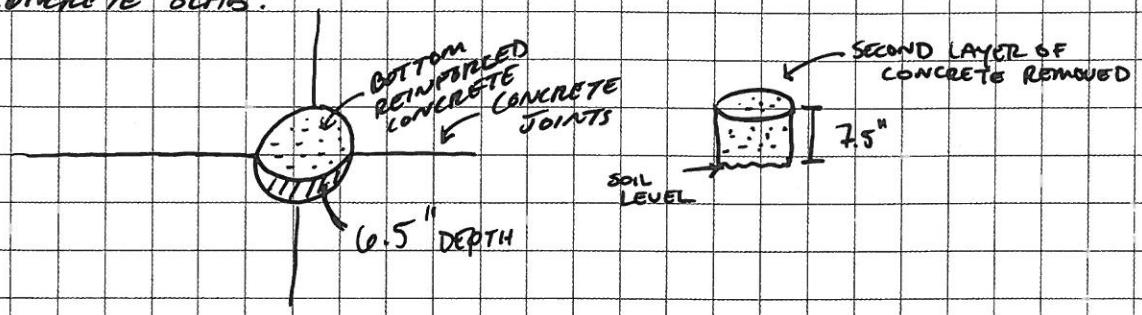
0901 DRILLERS BEGAN AUGERING TO THIRD DEPTH 28'-30' (c).
0905 DRILLERS CONTINUED ~~AUGERS~~ ~~CORING~~ CORING THROUGH BOTTOM SLAB. IT WAS OBSERVED THAT BENEATH THE TOP SLAB JOINTS, THERE WAS REINFORCED CONCRETE SLAB.



0926 DRILLERS RETRIEVED SPLIT-SPOON.
SHUT RIG OFF
COLLECTED SOIL SAMPLES.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB.
140226 0927	8015c, 8270D, 8260c	2-4oz. JAR	ICE	HALL

DEPTH: 28'-30' (c)

0928 JAL COMPLETED LITH LOGS.
0928 DRILLERS COMPLETED CORING THROUGH SECOND LAYER OF CONCRETE. SECOND LAYER WAS 7.5" THICK. REACHED SOIL.

0929 DRILLERS MOBILIZED TO BOREHOLE JP5-B-02.
1000 TECHNICIANS WILL TAKE EQUIPMENT BLANKS OF AUGERS & SPLITSPOONS.
SHUT RIG OFF.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140226 1008	SVOC (PAH)	2-1L AMBER	ICE	HALL
140226 1009	TPH 8015c GRO	2-40mL VIALS	HCL	HALL
140226 1010	VOC 8260	2-40mL VIALS	HCL	JP5-B-02
140226 1011	TPH 8015c DRO	2-40mL VIALS	ICE	HALL

1012 DRILLERS BEGAN AUGERING TO FIRST DEPTH 2'-4' (a).
RETRIEVED SPLIT-SPOON.
SHUT OFF RIG.
COLLECTED SOIL SAMPLES.

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SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402261026	8015c, 8270D, 8260c	2-4oz. JAR	ICE	HALL

DEPTH: 2'-4' (a)

1027 JAL COMPLETED LITHOLOGY LOGS.

1041 DRILLERS CONTINUED TO AUGER TO SECOND DEPTH 13'-15' (b).

1042 DRILLERS BEGAN CORING BOREHOLE JP5-B-05.

1055 RETRIEVED SPLIT-SPOON FOR SAMPLE COLLECTION.

SHUT DOWN RIG PRIOR TO SAMPLE COLLECTION. GENERATOR FOR CORING DEVICE IS STILL RUNNING HOWEVER SAMPLE COLLECTION IS LOCATED UPWIND FOR[illegible] FROM GENERATOR EXHAUST OUTPUT.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402261056	8015c, 8270D, 8260c	2-4oz. JARS	ICE	HALL

DEPTH: 13'-15' (b)

1057 JAL COMPLETED LITHOLOGY LOGS.

1100 DRILLERS COMPLETED CORING FOR BOREHOLE JP5-B-05.

1103 DRILLERS CONTINUED AUGERING TO NEXT DEPTH 28'-30' (c).

RETRIEVED SPLIT-SPOON FOR SAMPLE COLLECTION.

SHUT DOWN RIG PRIOR TO SAMPLE COLLECTION.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402261127	8015c, 8270D, 8260c	2-4oz JARS	ICE	HALL

DEPTH: 28'-30' (c)

1128 JAL COMPLETED LITHOLOGY LOGS.

COMPLETED BOREHOLE JP5-B-02.

1130 BREAK FOR LUNCH. WILL DECON AUGERS & SPLIT-SPOONS AFTER LUNCH.

1230 RETURNED TO 637 DECON YARD. DECONTAMINATED 3 FLIGHTS OF AUGERS. COLLECTED IDW DECON. WATER INTO CONTAINERS I.A.W. SAP 2013-026.

1355 RETURNED TO JP5 TEST SITE. RIG WILL MOBILIZE TO BOREHOLE JP5-B-05.

SWITCHED TO CARBOY G4.

1416 COLLECTED EQUIPMENT BLANKS FOR AUGERS & SPLIT-SPOONS.

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SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140226 1420	SVOC (PAH)	2-1L AMBER	ICE	HALL
140226 1421	TPH 8015c GRO	2-~~HCL~~ 40 mL VIALS	HCL	"
140226 1422	VOC 8260	~~HCL~~ 2-40 mL VIALS	HCL	JPS-B-05
140226 1423	TPH 8015c DRO	2-40 mL VIALS	ICE	"

1429 DRILLERS AUGERED TO FIRST DEPTH 2'-4' (a).
RETRIEVED SPLIT-SPOON
SHUT DOWN RIG PRIOR TO SOIL SAMPLE COLLECTION.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140226 1442	8015c, 8270D, 8260c	2-4oz. JARS	ICE	HALL
140226 1443 (d)	"	"	"	"

DEPTH: 2'-4' (a)
(d) = DUPLICATE
1444 JAL COMPLETED LITHOLOGY LOGS.
1445 DRILLERS CONTINUED TO AUGER TO NEXT DEPTH 13'-15' (b).
RETRIEVED SPLIT-SPOON.
SHUT DOWN RIG PRIOR TO SOIL SAMPLE COLLECTION.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140226 1458	8015c, 8270D, 8260c	2-4oz. JARS	ICE	HALL

DEPTH: 13'-15' (b)
1459 JAL COMPLETED LITHOLOGY LOGS.
1500 DRILLERS CONTINUED TO AUGER TO NEXT DEPTH, 28'-30' (c).
1520 RETRIEVED SPLIT-SPOON.
1521 SHUT DOWN RIG PRIOR TO SOIL SAMPLE COLLECTION.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140226 1522	8015c, 8270D, 8260c	2-4oz. JARS	ICE	HALL

DEPTH: 28'-30' (c)
1537 CREW WILL SHUT DOWN JP5 SITE AND REMOBILIZE TO JP4 SITE.
1630 R-K SET UP AT JP4 SITE. BEGAN COREING THROUGH CONCRETE.

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1650 COMPLETED CORING OF CONCRETE OF JP4 TEST SITE.

1700 MOBILIZED RIG TO 637 YARD DECON. PAD TO DECON. AUGER FLIGHTS IN THE MORNING.

JB 2/26/14

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DATE: FEBRUARY 27, 2014
LOCATION: 637 YARD DECON. PAD
TIME: 0700
PERSONNEL: R-K CREW, A. MONTES, T. KONDY, G. GILES, A. SANCHEZ
SCOPE: MOBILIZE TO JP4 PAD, START JP4-B-05

0740 AS
0715 DECONTAMINATING AUGERS + SPLIT-SPOONS
0730 MOBILIZE TO JP4 SITE.
0745 TAILGATE SAFETY BRIEFING CONDUCTED.
0800 SET-UP EXCLUSION AND CONTAMINATION REDUCTION ZONES.
0820 EQUIPMENT BLANKS OF AUGERS + SPLIT-SPOONS.

SAMPLE ID	ANALYSIS	CONTAINERS	PRESERVATIVE	LAB
1402270825	SVOC (PAH)	2-1L AMBER	ICE	HALL
1402270826	TPH 8015c GRO	2-40mL VIALS	HCL	"
1402270827	VOC 8260	2-40mL VIALS	HCL	JP4-B-05
1402270828	TPH 8015c DRO	2-40 mL VIALS	ICE	"

0829 DRILLERS BEGAN AUGERING TO FIRST DEPTH 2'-4' (a).
0830 RETRIEVED SPLIT-SPOON.
WIND COMING FROM BEHIND US (OUT OF EAST TO WEST); NO NEED TO SHUT DOWN RIG.
0835 AS

SAMPLE ID	ANALYSIS	CONTAINERS	PRESERVATIVE	LAB
1402270840	8015c, 8270D, 8260c	2-4oz. JARS	ICE	HALL

DEPTH: 2'-4' (a)
GG COMPLETED WITH LOGS.
0841 DRILLERS CONTINUED AUGERING TO SECOND DEPTH 13'-15' (b).
RETRIEVED SPLIT-SPOON.
0848 NO NEED TO SHUT DOWN RIG, WIND COMING BEHIND US. UPWIND.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402270850	8015c, 8270D, 8260c	2-4oz JARS	ICE	HALL

DEPTH: 13'-15' (b)

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0852 DRILLERS CONTINUED TO NEXT DEPTH 28'-30' (c).
RETRIEVED SPLIT-SPOON.
WIND IS BLOWING CROSS-WIND, NO NEED TO SHUT DOWN RIG.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402270915	8015c, 8270D, 8260c	2-4oz JAR	ICE	HALL

DEPTH: 28'-30' (c)
GG COMPLETED LITH LOGS
0933 DRILLERS MOBILIZED TO NEXT BOREHOLE JP4-B-01.
09340 TECHNICIANS DECONNED SPLIT-SPOONS (3).
TAKE EQUIPMENT BLANKS OF AUGERS & SPLIT-SPOONS.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402270952	SVOC(PAH)	2-1L AMBER	ICE	HALL
1402270953	TPH 8015c GRO	2-40mL VIALS	HCL	//
1402270954	VOC 8260c	2-40mL VIALS	HCL	JP4-B-01
1402270955	TPH 8015c DRO	2-40mL VIALS	ICE	//

0956 DRILLERS BEGAN AUGERING TO FIRST DEPTH 2'-4' (a).
RETRIEVED SPLIT-SPOON.
WIND IS BLOWING CROSS-WIND FROM DRILL RIG, NO NEED TO SHUT DOWN RIG. DID NOT RECEIVE ENOUGH SAMPLE RECOVERY, WILL HAMMER DOWN TO 6' DEPTH TO COLLECT ADDITIONAL SOIL SAMPLE VOLUME.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402271008	8015c, 8270, 8260c	2-4oz JAR	ICE	HALL
1402271009 (d)	//	//	//	//

GG COMPLETED LITH LOGS
DEPTH: ~~2'-4' (a)~~ & 4'-6' (a)
(d) = DUPLICATE
1010 DRILLERS CONTINUED TO AUGER TO NEXT DEPTH 13'-15' (b).
1037 RETRIEVED SPLIT-SPOON.
DID NOT CONTAIN SAMPLE. RE-ATTEMPTED SPLIT-SPOON. REACHED INTO 15'-17' DEPTH.
SOIL SAMPLE WAS HIGHLY ODIFEROUS OF PETROLEUM-BASED MATERIAL.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402271045	8015c, 8270D, 8260c	2-4oz. JAR	ICE	HALL

DEPTH: 15'-17' (b)

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1100 CONTINUED AUGERING TO THE NEXT DEPTH 28'-30' (c).
1103 RETRIEVED SPLIT-SPOON
SOIL HAD AN ODOR SIMILAR TO THE PREVIOUS DEPTH ONLY SLIGHTLY LIGHTER.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140227 1105	8015c, 8270D, 8260c	2-4 oz. JAR	ICE	HALL

DEPTH: 28'-30' (c)
GG COMPLETED LITH LOGS
1115 BREAK FOR LUNCH. MOBILIZE AUGERS TO DECON PAD @ 637 YARD.
1230 RETURN TO DECON PAD. DECON AUGERS + SPLIT-SPOONS.
1335 MOBILIZED TO JP4 SITE. RIG IS MOBILIZED TO BOREHOLE JP4-B-06
TAKE EQUIPMENT BLANKS OF AUGERS + SPLIT-SPOONS.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140227 1340	SVOC (PAH)	2-1L AMBER	ICE	HALL
140227 1341	TPH 8015c GRO	2-40mL VIALS	HCL	"
140227 1342	VOC 8260	2-40mL VIALS	HCL	JP4-B-06
140227 1343	TPH 8015c DRO	2-40mL VIALS	ICE	"

1343 DRILLERS AUGER TO FIRST DEPTH 2'-4' (a).
RETRIEVED SPLIT-SPOON.
NO NOTICABLE ODORS OR STAINS.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140227 1353	8015c, 8270D, 8260c	2-4oz JARS	ICE	HALL

GG COMPLETED LITH LOGS
1355 DRILLERS CONTINUED TO AUGER TO NEXT DEPTH 13'-15' (b).
RETRIEVED SPLIT-SPOON.
NO NOTICABLE ODORS; SOIL HAD SOME MOISTURE; NO STAINING.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140227 1410	8015c, 8270D, 8260c	2-4oz JARS	ICE	HALL

DEPTH: 13'-15' (b)
GG COMPLETED LITH LOGS

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1411 DRILLERS CONTINUED TO AUGER TO NEXT DEPTH 28'-30' (c).
RETRIEVED SPLIT-SPOON. NO NEED TO SHUT DOWN RIG AS WE ARE UPWIND
SOIL DID NOT HAVE ANY NOTICEABLE ODORS OR STAINING.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402271430	8015c, 8270D, 8260c	2-4oz. JAR	ICE	HALL

DEPTH 28'-30' (c)
GG COMPLETED LITH LOGS
1440 DRILLERS MOBILIZED TO NEXT BOREHOLE JP4-B-02.
1500 TECHNICIANS DECONNED SPLIT-SPOONS
TAKE EQUIPMENT BLANKS OF AUGERS + SPLIT-SPOONS.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402271512	SVOC (PAH)	2-1L AMBER	ICE	HALL
1402271513	TPH 8015c GRO	2-40mL VIALS	H[redacted]	"
1402271514	VOC 8260	2-40mL VIALS	HCL	"
1402271515	TPH 8015c DRO	2-40mL VIALS	ICE	

JP4-B-02

1516 DRILLERS BEGAN TO DRILL TO FIRST DEPTH 2'-4'. BASED ON OBSERVATION OF JP4-B-01, WE WILL ATTEMPT TO COLLECT SOIL SAMPLES AT THE SAME INTERVALS TO REPLICATE ANY ZONES WHERE SOIL MAY ALSO ~~HAE~~ HAVE ODOR.
RETRIEVED SPLIT-SPOON. NO NEED TO SHUT DOWN RIG AS WE ARE UPWIND.
~~SOIL DOES NOT HAVE ODOR~~; NO STAINING; SLIGHT MOISTURE
SOIL HAS SLIGHT ODOR

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402271522	8015c, 8270D, 8[illegible]0c	2-4oz. JAR	ICE	HALL

DEPTH: 2'-4' (a)
GG COMPLETED LITH LOGS
1523 DRILLERS CONTINUED TO ~~DRA~~ AUGER TO NEXT DEPTH 15' (b).
RETRIEVED SPLIT-SPOON. NO NEED TO SHUT DOWN RIG AS WE ARE UPWIND.
SOIL CONTAINED ODOR SIMILAR IN STRENGTH TO JP4-B-01. SLIGHT MOISTURE
~~SAMPLE~~ NO STAINING. THE ODOR WAS ORGANIC ~~IN~~ IN SMELL.

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SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402271540	8015c, 8270D, 8260c	2-4oz JARS	ICE	HALL

DEPTH: 15'-17' (b)

GG COMPLETED LITH LOGS.

1541 DRILLERS CONTINUED AUGERING TO NEXT DEPTH 28' (c).

RETRIEVED SPLIT-SPOON. NO NEED TO SHUT DOWN AS WE ARE UPWIND.

SOIL HAD VERY FAINT ODOR SIMILAR TO PREVIOUS DEPTH. NO SOIL STAINING. SLIGHT MOIST MOISTURE.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402271600	8015c, 8270D, 8260c	2-4oz JARS	ICE	HALL

DEPTH: 28'-30' (c)

GG COMPLETED LITH LOGS.

DRILLERS SHUT DOWN RIG. FINISHED FOR THE DAY. MANAGED ALL WASTE AT 637 YARD.

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DATE: FEBRUARY 28, 2014
LOCATION: 637 YARD + JP4 SITE
PERSONNEL: R-K CREW, G. GILES, A. SANCHEZ, T. KONDY, A. MONTES
WEATHER: COOL ~ 50°F, LIGHT CLOUDS, SLIGHT BREEZE
SCOPE OF WORK: JP4-B-04, JP4-B-03, DECON. (FINAL)

0700 DRILLERS AT 637 YARD DECONTAMINATING AUGER FLIGHTS + SPLIT-SPOONS.
0737 MOBILIZE TO JP4 TEST SITE.
0750 DRILLERS MOBILIZED TO JP4-B-03 BOREHOLE.
0800 TAILGATE SAFETY BRIEFING
EQUIPMENT BLANKS OF AUGERS + SPLIT-SPOON.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
140228 0816	SVOC (PAH)	2-1L AMBER	ICE	HALL
140228 0817	TPH 8015c GRO	2-40 mL VIALS	HCL	JP4-B-03
140228 0818	VOC 8260c	2-40 mL VIALS	HCL	"
140228 0819	TPH 8015c DRO	2-40 mL VIALS	ICE	"

0831 DRILLERS BEGAN AUGERING TO FIRST DEPTH.
RETRIEVED SPLIT-SPOON.
WE ARE UPWIND FROM RIG EXHAUST, NO NEED TO SHUT DOWN RIG.
NO NOTICEABLE ODORS DETECTED, NO SOIL STAINING OBSERVED.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402280840	8015c, 8270D, 8260c	2-4 oz. JARS	ICE	HALL

DEPTH: 2'-4' (a)
GG COMPLETED LITH. LOGS.
0843 DRILLERS CONTINUED TO AUGER TO NEXT DEPTH 13'-15' (b).
0850 RETRIEVED SPLIT-SPOON. DID NOT RECOVER ENOUGH SOIL. WILL RE-HAMMER FOR MORE SOIL.
0855 RETRIEVED SECOND SPLIT-SPOON. DID NOT RECOVER ENOUGH SAMPLE FOR DUPLICATE. WILL COLLECT DUPLICATE ON LAST DEPTH.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402280838	8015c, 8270D, 8260c	2-4 oz. JARS	ICE	HALL
140228	"	"	"	"

AS

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DEPTH: 13'-15' (b)
(b) = DUPLICATE AS

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0901 DRILLERS CONTINUED AUGERING TO NEXT DEPTH. 28'-30' (c).
0921 RETRIEVED SPLIT-SPOON.
NO NOTICEABLE ODORS OR STAINING.
GG COMPLETED LITH. LOGS.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402280925	8015c, 8270D, 8260c	2-4oz JARS	ICE	HALL
1402280926 (d)	8015c, 8270D, 8260c	1-4oz JAR	ICE	HALL

DEPTH: 28'-30'
(d) = duplicate
GG COMPLETED LITH. LOGS.
0930 DRILLERS MOBILIZED TO NEXT BOREHOLE JP4-B-04.
0958 EQUIPMENT BLANKS TAKEN OF AUGER + SPLIT-SPOONS.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402281005	SVOC (PAH)	2-1L AMBER	ICE	HALL
1402281006	TPH 8015c GRO	2-40 mL VIALS	HCL	"
1402281007	VOC 8260	2-40 mL VIALS	HCL	JP4-B-04
1402281008	TPH 8015c DRO	2-40 mL VIALS	ICE	"

1025 DRILLERS AUGERED TO FIRST DEPTH 2'-4' (a).
RETRIEVED SPLIT-SPOON. DID NOT SHUT DOWN RIG AS WE ARE UPWIND FROM EXH
NO SOIL STAINING OBSERVED. NO ODORS DETECTED.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402281030	8015c, 8270D, 8260c	2-4oz. JARS	ICE	HALL

DEPTH: 2'-4' (a)
GG COMPLETED LITH. LOGS.
1031 DRILLERS CONTINUED AUGERING TO NEXT DEPTH 13'-15' (b).
1040 RETRIEVED SPLIT-SPOON. DID NOT SHUT DOWN RIG AS WE ARE UPWIND FROM DRILL EXHAUST.
NO ODORS DETECTED. NO SOIL STAINING.
GG COMPLETED LITH. LOGS.

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SAMPLE ID	ANALYIS	CONTAINER	PRESERVATIVE	LAB
1402281045	8015c, 8270D, 8260c	2-4 oz JARS	ICE	HALL

DEPTH: 13'-15' (b)

1048 DRILLERS CONTINUED AUGERING TO NEXT DEPTH 28'-30' (c).
1102 RETRIEVED SPLIT-SPOON. SHUT OFF RIG.
NO ODORS DETECTED. NO SOIL STAINING OBSERVED.

SAMPLE ID	ANALYSIS	CONTAINER	PRESERVATIVE	LAB
1402281105	8015c, 8270D, 8260c	2-4 oz. JAR	ICE	HALL

DEPTH: 28'-30' (c)
GG COMPLETED LITH. LOGS.

COMPLETED JP4/JP5 RTS INVESTIGATION. FINAL AUGER, RIG, & SPLIT-SPOON DECON. AT 637 YARD. MANAGE WASTE I.A.W. SAP 2013-026

AS 2/28/14

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Appendix D
JP4/JP5 RTS Analytical Laboratory Reports

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 12, 2014

Antonette Sanchez
NASA_WSTF
P.O. Box 20
Las Cruces, NM 88004
TEL: (575) 524-5452
FAX

RE: PO#13EC092B OrderNo.: 1403058

Dear Antonette Sanchez:

Hall Environmental Analysis Laboratory received 26 sample(s) on 3/4/2014 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-001 **Matrix:** AQUEOUS

Client Sample ID: JP-4-B-05
Collection Date: 2/27/2014 8:25:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	3/5/2014 1:35:38 PM	12023
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	3/5/2014 1:35:38 PM	12023
Surr: DNOP	84.7	0	62.7-145		%REC	1	3/5/2014 1:35:38 PM	12023
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	3/5/2014 1:10:25 PM	R17126
Surr: BFB	94.6	0	80.4-118		%REC	1	3/5/2014 1:10:25 PM	R17126
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Acenaphthene	0.20	0.15	0.50	J	µg/L	1	3/5/2014 7:53:40 PM	12019
Fluorene	0.28	0.18	0.50	J	µg/L	1	3/5/2014 7:53:40 PM	12019
Phenanthrene	0.22	0.15	0.50	J	µg/L	1	3/5/2014 7:53:40 PM	12019
Anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Fluoranthene	ND	0.13	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Pyrene	ND	0.25	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Chrysene	ND	0.16	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/5/2014 7:53:40 PM	12019
Surr: N-hexadecane	67.4	0	23.5-135		%REC	1	3/5/2014 7:53:40 PM	12019
Surr: Benzo(e)pyrene	86.9	0	28.8-149		%REC	1	3/5/2014 7:53:40 PM	12019
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/7/2014 5:49:26 PM	R17183
Toluene	ND	0.44	1.0		µg/L	1	3/7/2014 5:49:26 PM	R17183
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/7/2014 5:49:26 PM	R17183
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/7/2014 5:49:26 PM	R17183
Surr: 1,2-Dichloroethane-d4	99.4	0	70-130		%REC	1	3/7/2014 5:49:26 PM	R17183
Surr: 4-Bromofluorobenzene	100	0	70-130		%REC	1	3/7/2014 5:49:26 PM	R17183
Surr: Dibromofluoromethane	103	0	70-130		%REC	1	3/7/2014 5:49:26 PM	R17183
Surr: Toluene-d8	93.0	0	70-130		%REC	1	3/7/2014 5:49:26 PM	R17183

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-002 **Matrix:** SOIL

Client Sample ID: JP-4-B-05A
Collection Date: 2/27/2014 8:40:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	ND	3.9	9.9		mg/Kg	1	3/6/2014 7:52:53 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/6/2014 7:52:53 PM	12024
Surr: DNOP	108	0	66-131		%REC	1	3/6/2014 7:52:53 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	3/5/2014 7:43:19 PM	12010
Surr: BFB	82.4	0	74.5-129		%REC	1	3/5/2014 7:43:19 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 11:30:22 AM	12028
Surr: N-hexadecane	61.4	0	33.8-110		%REC	1	3/6/2014 11:30:22 AM	12028
Surr: Benzo(e)pyrene	86.5	0	33.3-120		%REC	1	3/6/2014 11:30:22 AM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0051	0.047		mg/Kg	1	3/6/2014 4:16:08 PM	12010
Toluene	ND	0.0051	0.047		mg/Kg	1	3/6/2014 4:16:08 PM	12010
Ethylbenzene	ND	0.0050	0.047		mg/Kg	1	3/6/2014 4:16:08 PM	12010
Xylenes, Total	ND	0.014	0.093		mg/Kg	1	3/6/2014 4:16:08 PM	12010
Surr: Dibromofluoromethane	103	0	70-130		%REC	1	3/6/2014 4:16:08 PM	12010
Surr: 1,2-Dichloroethane-d4	101	0	70-130		%REC	1	3/6/2014 4:16:08 PM	12010
Surr: Toluene-d8	91.7	0	70-130		%REC	1	3/6/2014 4:16:08 PM	12010
Surr: 4-Bromofluorobenzene	96.8	0	70-130		%REC	1	3/6/2014 4:16:08 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Client Sample ID: JP-4-B-05B
Project: PO#13EC092B
Collection Date: 2/27/2014 8:50:00 AM
Lab ID: 1403058-003
Matrix: SOIL
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	ND	3.9	10		mg/Kg	1	3/6/2014 8:23:38 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/6/2014 8:23:38 PM	12024
Surr: DNOP	109	0	66-131		%REC	1	3/6/2014 8:23:38 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.8		mg/Kg	1	3/5/2014 10:34:28 PM	12010
Surr: BFB	83.3	0	74.5-129		%REC	1	3/5/2014 10:34:28 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 11:53:33 AM	12028
Surr: N-hexadecane	65.9	0	33.8-110		%REC	1	3/6/2014 11:53:33 AM	12028
Surr: Benzo(e)pyrene	79.1	0	33.3-120		%REC	1	3/6/2014 11:53:33 AM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 4:44:45 PM	12010
Toluene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 4:44:45 PM	12010
Ethylbenzene	ND	0.0051	0.048		mg/Kg	1	3/6/2014 4:44:45 PM	12010
Xylenes, Total	ND	0.014	0.096		mg/Kg	1	3/6/2014 4:44:45 PM	12010
Surr: Dibromofluoromethane	99.1	0	70-130		%REC	1	3/6/2014 4:44:45 PM	12010
Surr: 1,2-Dichloroethane-d4	94.6	0	70-130		%REC	1	3/6/2014 4:44:45 PM	12010
Surr: Toluene-d8	85.2	0	70-130		%REC	1	3/6/2014 4:44:45 PM	12010
Surr: 4-Bromofluorobenzene	99.2	0	70-130		%REC	1	3/6/2014 4:44:45 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Client Sample ID: JP-4-B-05C
Project: PO#13EC092B
Collection Date: 2/27/2014 9:15:00 AM
Lab ID: 1403058-004
Matrix: SOIL
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	ND	3.9	9.9		mg/Kg	1	3/6/2014 8:54:12 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/6/2014 8:54:12 PM	12024
Surr: DNOP	114	0	66-131		%REC	1	3/6/2014 8:54:12 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.8		mg/Kg	1	3/5/2014 11:02:58 PM	12010
Surr: BFB	83.5	0	74.5-129		%REC	1	3/5/2014 11:02:58 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 12:16:45 PM	12028
Surr: N-hexadecane	72.6	0	33.8-110		%REC	1	3/6/2014 12:16:45 PM	12028
Surr: Benzo(e)pyrene	90.7	0	33.3-120		%REC	1	3/6/2014 12:16:45 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 5:13:35 PM	12010
Toluene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 5:13:35 PM	12010
Ethylbenzene	ND	0.0051	0.048		mg/Kg	1	3/6/2014 5:13:35 PM	12010
Xylenes, Total	ND	0.014	0.096		mg/Kg	1	3/6/2014 5:13:35 PM	12010
Surr: Dibromofluoromethane	102	0	70-130		%REC	1	3/6/2014 5:13:35 PM	12010
Surr: 1,2-Dichloroethane-d4	99.1	0	70-130		%REC	1	3/6/2014 5:13:35 PM	12010
Surr: Toluene-d8	89.6	0	70-130		%REC	1	3/6/2014 5:13:35 PM	12010
Surr: 4-Bromofluorobenzene	94.2	0	70-130		%REC	1	3/6/2014 5:13:35 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-005 **Matrix:** AQUEOUS

Client Sample ID: JP-4-B-01
Collection Date: 2/27/2014 9:52:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	3/5/2014 1:57:45 PM	12023
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	3/5/2014 1:57:45 PM	12023
Surr: DNOP	90.5	0	62.7-145		%REC	1	3/5/2014 1:57:45 PM	12023
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	3/5/2014 1:40:28 PM	R17126
Surr: BFB	92.3	0	80.4-118		%REC	1	3/5/2014 1:40:28 PM	R17126
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Acenaphthene	ND	0.15	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Fluorene	0.22	0.18	0.50	J	µg/L	1	3/5/2014 10:15:11 PM	12019
Phenanthrene	0.34	0.15	0.50	J	µg/L	1	3/5/2014 10:15:11 PM	12019
Anthracene	0.22	0.16	0.50	J	µg/L	1	3/5/2014 10:15:11 PM	12019
Fluoranthene	ND	0.13	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Pyrene	ND	0.25	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Chrysene	ND	0.16	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/5/2014 10:15:11 PM	12019
Surr: N-hexadecane	52.3	0	23.5-135		%REC	1	3/5/2014 10:15:11 PM	12019
Surr: Benzo(e)pyrene	71.4	0	28.8-149		%REC	1	3/5/2014 10:15:11 PM	12019
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/7/2014 6:18:08 PM	R17183
Toluene	ND	0.44	1.0		µg/L	1	3/7/2014 6:18:08 PM	R17183
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/7/2014 6:18:08 PM	R17183
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/7/2014 6:18:08 PM	R17183
Surr: 1,2-Dichloroethane-d4	97.5	0	70-130		%REC	1	3/7/2014 6:18:08 PM	R17183
Surr: 4-Bromofluorobenzene	105	0	70-130		%REC	1	3/7/2014 6:18:08 PM	R17183
Surr: Dibromofluoromethane	101	0	70-130		%REC	1	3/7/2014 6:18:08 PM	R17183
Surr: Toluene-d8	93.2	0	70-130		%REC	1	3/7/2014 6:18:08 PM	R17183

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-006 **Matrix:** SOIL

Client Sample ID: JP-4-B-01A
Collection Date: 2/27/2014 10:08:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	240	4.0	10		mg/Kg	1	3/6/2014 9:24:57 PM	12024
Motor Oil Range Organics (MRO)	ND	51	51		mg/Kg	1	3/6/2014 9:24:57 PM	12024
Surr: DNOP	100	0	66-131		%REC	1	3/6/2014 9:24:57 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	34	2.8	4.6		mg/Kg	1	3/5/2014 11:31:31 PM	12010
Surr: BFB	118	0	74.5-129		%REC	1	3/5/2014 11:31:31 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
1-Methylnaphthalene	0.011	0.0056	0.020	J	mg/Kg	1	3/6/2014 12:39:58 PM	12028
2-Methylnaphthalene	0.0066	0.0059	0.020	J	mg/Kg	1	3/6/2014 12:39:58 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 12:39:58 PM	12028
Surr: N-hexadecane	81.3	0	33.8-110		%REC	1	3/6/2014 12:39:58 PM	12028
Surr: Benzo(e)pyrene	84.0	0	33.3-120		%REC	1	3/6/2014 12:39:58 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0051	0.046		mg/Kg	1	3/6/2014 5:42:17 PM	12010
Toluene	ND	0.0051	0.046		mg/Kg	1	3/6/2014 5:42:17 PM	12010
Ethylbenzene	ND	0.0049	0.046		mg/Kg	1	3/6/2014 5:42:17 PM	12010
Xylenes, Total	ND	0.014	0.092		mg/Kg	1	3/6/2014 5:42:17 PM	12010
Surr: Dibromofluoromethane	101	0	70-130		%REC	1	3/6/2014 5:42:17 PM	12010
Surr: 1,2-Dichloroethane-d4	96.7	0	70-130		%REC	1	3/6/2014 5:42:17 PM	12010
Surr: Toluene-d8	85.6	0	70-130		%REC	1	3/6/2014 5:42:17 PM	12010
Surr: 4-Bromofluorobenzene	78.1	0	70-130		%REC	1	3/6/2014 5:42:17 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-007 **Matrix:** SOIL

Client Sample ID: JP-4-B-01A DUP
Collection Date: 2/27/2014 10:09:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	110	3.9	10		mg/Kg	1	3/6/2014 9:55:42 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/6/2014 9:55:42 PM	12024
Surr: DNOP	73.9	0	66-131		%REC	1	3/6/2014 9:55:42 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	87	2.9	4.8		mg/Kg	1	3/6/2014 12:00:02 AM	12010
Surr: BFB	181	0	74.5-129	S	%REC	1	3/6/2014 12:00:02 AM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
1-Methylnaphthalene	0.0093	0.0056	0.020	J	mg/Kg	1	3/6/2014 1:03:09 PM	12028
2-Methylnaphthalene	0.014	0.0059	0.020	J	mg/Kg	1	3/6/2014 1:03:09 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 1:03:09 PM	12028
Surr: N-hexadecane	103	0	33.8-110		%REC	1	3/6/2014 1:03:09 PM	12028
Surr: Benzo(e)pyrene	89.2	0	33.3-120		%REC	1	3/6/2014 1:03:09 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0052	0.048		mg/Kg	1	3/6/2014 6:10:57 PM	12010
Toluene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 6:10:57 PM	12010
Ethylbenzene	ND	0.0051	0.048		mg/Kg	1	3/6/2014 6:10:57 PM	12010
Xylenes, Total	ND	0.014	0.096		mg/Kg	1	3/6/2014 6:10:57 PM	12010
Surr: Dibromofluoromethane	98.6	0	70-130		%REC	1	3/6/2014 6:10:57 PM	12010
Surr: 1,2-Dichloroethane-d4	93.2	0	70-130		%REC	1	3/6/2014 6:10:57 PM	12010
Surr: Toluene-d8	81.6	0	70-130		%REC	1	3/6/2014 6:10:57 PM	12010
Surr: 4-Bromofluorobenzene	77.2	0	70-130		%REC	1	3/6/2014 6:10:57 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-008 **Matrix:** SOIL

Client Sample ID: JP-4-B-01B
Collection Date: 2/27/2014 10:45:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	370	4.0	10		mg/Kg	1	3/6/2014 10:26:23 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/6/2014 10:26:23 PM	12024
Surr: DNOP	96.7	0	66-131		%REC	1	3/6/2014 10:26:23 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	66	29	47		mg/Kg	10	3/6/2014 12:28:30 AM	12010
Surr: BFB	141	0	74.5-129	S	%REC	10	3/6/2014 12:28:30 AM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	0.20	0.0056	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
1-Methylnaphthalene	1.0	0.028	0.10		mg/Kg	5	3/6/2014 8:01:01 PM	12028
2-Methylnaphthalene	0.89	0.029	0.10		mg/Kg	5	3/6/2014 8:01:01 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Benzo(b)fluoranthene	0.023	0.0065	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Benzo(k)fluoranthene	0.0090	0.0081	0.020	J	mg/Kg	1	3/6/2014 1:26:21 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 1:26:21 PM	12028
Benzo(g,h,i)perylene	0.0073	0.0058	0.020	J	mg/Kg	1	3/6/2014 1:26:21 PM	12028
Indeno(1,2,3-cd)pyrene	0.0070	0.0068	0.020	J	mg/Kg	1	3/6/2014 1:26:21 PM	12028
Surr: N-hexadecane	97.8	0	33.8-110		%REC	1	3/6/2014 1:26:21 PM	12028
Surr: Benzo(e)pyrene	111	0	33.3-120		%REC	1	3/6/2014 1:26:21 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.051	0.47		mg/Kg	10	3/6/2014 6:39:35 PM	12010
Toluene	ND	0.051	0.47		mg/Kg	10	3/6/2014 6:39:35 PM	12010
Ethylbenzene	ND	0.050	0.47		mg/Kg	10	3/6/2014 6:39:35 PM	12010
Xylenes, Total	ND	0.14	0.93		mg/Kg	10	3/6/2014 6:39:35 PM	12010
Surr: Dibromofluoromethane	102	0	70-130		%REC	10	3/6/2014 6:39:35 PM	12010
Surr: 1,2-Dichloroethane-d4	96.1	0	70-130		%REC	10	3/6/2014 6:39:35 PM	12010
Surr: Toluene-d8	94.9	0	70-130		%REC	10	3/6/2014 6:39:35 PM	12010
Surr: 4-Bromofluorobenzene	80.5	0	70-130		%REC	10	3/6/2014 6:39:35 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Client Sample ID: JP-4-B-01C
Project: PO#13EC092B
Collection Date: 2/27/2014 11:05:00 AM
Lab ID: 1403058-009
Matrix: SOIL
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	27	4.0	10		mg/Kg	1	3/6/2014 11:27:13 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/6/2014 11:27:13 PM	12024
Surr: DNOP	87.1	0	66-131		%REC	1	3/6/2014 11:27:13 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.8		mg/Kg	1	3/6/2014 3:50:51 PM	12010
Surr: BFB	93.8	0	74.5-129		%REC	1	3/6/2014 3:50:51 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	0.0063	0.0056	0.020	J	mg/Kg	1	3/6/2014 1:49:35 PM	12028
1-Methylnaphthalene	0.083	0.0056	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
2-Methylnaphthalene	0.067	0.0059	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 1:49:35 PM	12028
Surr: N-hexadecane	77.4	0	33.8-110		%REC	1	3/6/2014 1:49:35 PM	12028
Surr: Benzo(e)pyrene	90.3	0	33.3-120		%REC	1	3/6/2014 1:49:35 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 7:08:21 PM	12010
Toluene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 7:08:21 PM	12010
Ethylbenzene	ND	0.0051	0.048		mg/Kg	1	3/6/2014 7:08:21 PM	12010
Xylenes, Total	ND	0.014	0.097		mg/Kg	1	3/6/2014 7:08:21 PM	12010
Surr: Dibromofluoromethane	102	0	70-130		%REC	1	3/6/2014 7:08:21 PM	12010
Surr: 1,2-Dichloroethane-d4	101	0	70-130		%REC	1	3/6/2014 7:08:21 PM	12010
Surr: Toluene-d8	84.3	0	70-130		%REC	1	3/6/2014 7:08:21 PM	12010
Surr: 4-Bromofluorobenzene	89.3	0	70-130		%REC	1	3/6/2014 7:08:21 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-010 **Matrix:** AQUEOUS

Client Sample ID: JP-4-B-06
Collection Date: 2/27/2014 1:40:00 PM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	3/5/2014 3:04:44 PM	12023
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	3/5/2014 3:04:44 PM	12023
Surr: DNOP	80.8	0	62.7-145		%REC	1	3/5/2014 3:04:44 PM	12023
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	3/5/2014 2:10:26 PM	R17126
Surr: BFB	85.7	0	80.4-118		%REC	1	3/5/2014 2:10:26 PM	R17126
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Acenaphthene	ND	0.15	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Fluorene	ND	0.18	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Phenanthrene	ND	0.15	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Fluoranthene	ND	0.13	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Pyrene	ND	0.25	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Chrysene	ND	0.16	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/5/2014 10:38:21 PM	12019
Surr: N-hexadecane	47.0	0	23.5-135		%REC	1	3/5/2014 10:38:21 PM	12019
Surr: Benzo(e)pyrene	65.9	0	28.8-149		%REC	1	3/5/2014 10:38:21 PM	12019
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/7/2014 6:46:45 PM	R17183
Toluene	ND	0.44	1.0		µg/L	1	3/7/2014 6:46:45 PM	R17183
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/7/2014 6:46:45 PM	R17183
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/7/2014 6:46:45 PM	R17183
Surr: 1,2-Dichloroethane-d4	100	0	70-130		%REC	1	3/7/2014 6:46:45 PM	R17183
Surr: 4-Bromofluorobenzene	108	0	70-130		%REC	1	3/7/2014 6:46:45 PM	R17183
Surr: Dibromofluoromethane	103	0	70-130		%REC	1	3/7/2014 6:46:45 PM	R17183
Surr: Toluene-d8	96.6	0	70-130		%REC	1	3/7/2014 6:46:45 PM	R17183

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-011 **Matrix:** SOIL

Client Sample ID: JP-4-B-06A
Collection Date: 2/27/2014 1:53:00 PM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	29	3.9	10		mg/Kg	1	3/11/2014 9:09:21 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/11/2014 9:09:21 PM	12024
Surr: DNOP	85.4	0	66-131		%REC	1	3/11/2014 9:09:21 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.8	4.7		mg/Kg	1	3/6/2014 1:25:35 AM	12010
Surr: BFB	84.8	0	74.5-129		%REC	1	3/6/2014 1:25:35 AM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 2:12:51 PM	12028
Surr: N-hexadecane	73.0	0	33.8-110		%REC	1	3/6/2014 2:12:51 PM	12028
Surr: Benzo(e)pyrene	89.3	0	33.3-120		%REC	1	3/6/2014 2:12:51 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0051	0.047		mg/Kg	1	3/6/2014 7:37:12 PM	12010
Toluene	ND	0.0051	0.047		mg/Kg	1	3/6/2014 7:37:12 PM	12010
Ethylbenzene	ND	0.0050	0.047		mg/Kg	1	3/6/2014 7:37:12 PM	12010
Xylenes, Total	ND	0.014	0.093		mg/Kg	1	3/6/2014 7:37:12 PM	12010
Surr: Dibromofluoromethane	103	0	70-130		%REC	1	3/6/2014 7:37:12 PM	12010
Surr: 1,2-Dichloroethane-d4	97.9	0	70-130		%REC	1	3/6/2014 7:37:12 PM	12010
Surr: Toluene-d8	91.4	0	70-130		%REC	1	3/6/2014 7:37:12 PM	12010
Surr: 4-Bromofluorobenzene	89.8	0	70-130		%REC	1	3/6/2014 7:37:12 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Client Sample ID: JP-4-B-06B
Project: PO#13EC092B
Collection Date: 2/27/2014 2:10:00 PM
Lab ID: 1403058-012
Matrix: SOIL
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	15	3.9	9.9		mg/Kg	1	3/7/2014 12:28:04 AM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/7/2014 12:28:04 AM	12024
Surr: DNOP	84.5	0	66-131		%REC	1	3/7/2014 12:28:04 AM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.8	4.6		mg/Kg	1	3/6/2014 1:54:09 AM	12010
Surr: BFB	84.9	0	74.5-129		%REC	1	3/6/2014 1:54:09 AM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
1-Methylnaphthalene	0.0096	0.0056	0.020	J	mg/Kg	1	3/6/2014 2:36:05 PM	12028
2-Methylnaphthalene	0.0066	0.0059	0.020	J	mg/Kg	1	3/6/2014 2:36:05 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 2:36:05 PM	12028
Surr: N-hexadecane	80.1	0	33.8-110		%REC	1	3/6/2014 2:36:05 PM	12028
Surr: Benzo(e)pyrene	107	0	33.3-120		%REC	1	3/6/2014 2:36:05 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0051	0.046		mg/Kg	1	3/6/2014 8:06:03 PM	12010
Toluene	ND	0.0051	0.046		mg/Kg	1	3/6/2014 8:06:03 PM	12010
Ethylbenzene	ND	0.0049	0.046		mg/Kg	1	3/6/2014 8:06:03 PM	12010
Xylenes, Total	ND	0.014	0.093		mg/Kg	1	3/6/2014 8:06:03 PM	12010
Surr: Dibromofluoromethane	104	0	70-130		%REC	1	3/6/2014 8:06:03 PM	12010
Surr: 1,2-Dichloroethane-d4	98.8	0	70-130		%REC	1	3/6/2014 8:06:03 PM	12010
Surr: Toluene-d8	88.0	0	70-130		%REC	1	3/6/2014 8:06:03 PM	12010
Surr: 4-Bromofluorobenzene	94.2	0	70-130		%REC	1	3/6/2014 8:06:03 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-013 **Matrix:** SOIL

Client Sample ID: JP-4-B-06C
Collection Date: 2/27/2014 2:30:00 PM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	4.2	3.9	9.9	J	mg/Kg	1	3/7/2014 12:58:22 AM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/7/2014 12:58:22 AM	12024
Surr: DNOP	70.7	0	66-131		%REC	1	3/7/2014 12:58:22 AM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	3/6/2014 2:22:42 AM	12010
Surr: BFB	84.3	0	74.5-129		%REC	1	3/6/2014 2:22:42 AM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 2:59:19 PM	12028
Surr: N-hexadecane	74.3	0	33.8-110		%REC	1	3/6/2014 2:59:19 PM	12028
Surr: Benzo(e)pyrene	98.2	0	33.3-120		%REC	1	3/6/2014 2:59:19 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0052	0.047		mg/Kg	1	3/6/2014 8:34:42 PM	12010
Toluene	ND	0.0052	0.047		mg/Kg	1	3/6/2014 8:34:42 PM	12010
Ethylbenzene	ND	0.0050	0.047		mg/Kg	1	3/6/2014 8:34:42 PM	12010
Xylenes, Total	ND	0.014	0.094		mg/Kg	1	3/6/2014 8:34:42 PM	12010
Surr: Dibromofluoromethane	103	0	70-130		%REC	1	3/6/2014 8:34:42 PM	12010
Surr: 1,2-Dichloroethane-d4	98.9	0	70-130		%REC	1	3/6/2014 8:34:42 PM	12010
Surr: Toluene-d8	92.7	0	70-130		%REC	1	3/6/2014 8:34:42 PM	12010
Surr: 4-Bromofluorobenzene	93.7	0	70-130		%REC	1	3/6/2014 8:34:42 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-014 **Matrix:** AQUEOUS

Client Sample ID: JP-4-B-02
Collection Date: 2/27/2014 3:12:00 PM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	3/5/2014 3:26:58 PM	12023
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	3/5/2014 3:26:58 PM	12023
Surr: DNOP	85.6	0	62.7-145		%REC	1	3/5/2014 3:26:58 PM	12023
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	3/5/2014 2:40:40 PM	R17126
Surr: BFB	92.5	0	80.4-118		%REC	1	3/5/2014 2:40:40 PM	R17126
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Acenaphthene	ND	0.15	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Fluorene	ND	0.18	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Phenanthrene	ND	0.15	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Fluoranthene	ND	0.13	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Pyrene	ND	0.25	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Chrysene	ND	0.16	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/5/2014 11:01:36 PM	12019
Surr: N-hexadecane	53.7	0	23.5-135		%REC	1	3/5/2014 11:01:36 PM	12019
Surr: Benzo(e)pyrene	68.2	0	28.8-149		%REC	1	3/5/2014 11:01:36 PM	12019
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/7/2014 7:15:20 PM	R17183
Toluene	ND	0.44	1.0		µg/L	1	3/7/2014 7:15:20 PM	R17183
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/7/2014 7:15:20 PM	R17183
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/7/2014 7:15:20 PM	R17183
Surr: 1,2-Dichloroethane-d4	94.4	0	70-130		%REC	1	3/7/2014 7:15:20 PM	R17183
Surr: 4-Bromofluorobenzene	103	0	70-130		%REC	1	3/7/2014 7:15:20 PM	R17183
Surr: Dibromofluoromethane	99.5	0	70-130		%REC	1	3/7/2014 7:15:20 PM	R17183
Surr: Toluene-d8	96.9	0	70-130		%REC	1	3/7/2014 7:15:20 PM	R17183

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-015 **Matrix:** SOIL

Client Sample ID: JP-4-B-02A
Collection Date: 2/27/2014 3:22:00 PM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	120	4.0	10		mg/Kg	1	3/7/2014 10:54:21 AM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/7/2014 10:54:21 AM	12024
Surr: DNOP	74.7	0	66-131		%REC	1	3/7/2014 10:54:21 AM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	19	3.0	4.9		mg/Kg	1	3/5/2014 4:11:05 PM	12010
Surr: BFB	260	0	74.5-129	S	%REC	1	3/5/2014 4:11:05 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 3:22:32 PM	12028
Surr: N-hexadecane	140	0	33.8-110	S	%REC	1	3/6/2014 3:22:32 PM	12028
Surr: Benzo(e)pyrene	106	0	33.3-120		%REC	1	3/6/2014 3:22:32 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.049		mg/Kg	1	3/6/2014 9:03:20 PM	12010
Toluene	ND	0.0054	0.049		mg/Kg	1	3/6/2014 9:03:20 PM	12010
Ethylbenzene	ND	0.0052	0.049		mg/Kg	1	3/6/2014 9:03:20 PM	12010
Xylenes, Total	ND	0.014	0.098		mg/Kg	1	3/6/2014 9:03:20 PM	12010
Surr: Dibromofluoromethane	107	0	70-130		%REC	1	3/6/2014 9:03:20 PM	12010
Surr: 1,2-Dichloroethane-d4	103	0	70-130		%REC	1	3/6/2014 9:03:20 PM	12010
Surr: Toluene-d8	87.4	0	70-130		%REC	1	3/6/2014 9:03:20 PM	12010
Surr: 4-Bromofluorobenzene	80.7	0	70-130		%REC	1	3/6/2014 9:03:20 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-016 **Matrix:** SOIL

Client Sample ID: JP-4-B-02B
Collection Date: 2/27/2014 3:40:00 PM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	15	3.9	9.9		mg/Kg	1	3/11/2014 9:39:34 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/11/2014 9:39:34 PM	12024
Surr: DNOP	89.5	0	66-131		%REC	1	3/11/2014 9:39:34 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	4.8		mg/Kg	1	3/6/2014 4:19:21 PM	12010
Surr: BFB	87.0	0	74.5-129		%REC	1	3/6/2014 4:19:21 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 4:32:14 PM	12028
Surr: N-hexadecane	57.0	0	33.8-110		%REC	1	3/6/2014 4:32:14 PM	12028
Surr: Benzo(e)pyrene	75.6	0	33.3-120		%REC	1	3/6/2014 4:32:14 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 9:31:57 PM	12010
Toluene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 9:31:57 PM	12010
Ethylbenzene	ND	0.0051	0.048		mg/Kg	1	3/6/2014 9:31:57 PM	12010
Xylenes, Total	ND	0.014	0.097		mg/Kg	1	3/6/2014 9:31:57 PM	12010
Surr: Dibromofluoromethane	99.6	0	70-130		%REC	1	3/6/2014 9:31:57 PM	12010
Surr: 1,2-Dichloroethane-d4	96.4	0	70-130		%REC	1	3/6/2014 9:31:57 PM	12010
Surr: Toluene-d8	84.9	0	70-130		%REC	1	3/6/2014 9:31:57 PM	12010
Surr: 4-Bromofluorobenzene	94.6	0	70-130		%REC	1	3/6/2014 9:31:57 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Client Sample ID: JP-4-B-02C
Project: PO#13EC092B
Collection Date: 2/27/2014 4:00:00 PM
Lab ID: 1403058-017
Matrix: SOIL
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	10		mg/Kg	1	3/7/2014 1:29:00 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/7/2014 1:29:00 PM	12024
Surr: DNOP	92.1	0	66-131		%REC	1	3/7/2014 1:29:00 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	3/6/2014 3:19:44 AM	12010
Surr: BFB	83.4	0	74.5-129		%REC	1	3/6/2014 3:19:44 AM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 4:55:28 PM	12028
Surr: N-hexadecane	76.3	0	33.8-110		%REC	1	3/6/2014 4:55:28 PM	12028
Surr: Benzo(e)pyrene	105	0	33.3-120		%REC	1	3/6/2014 4:55:28 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0052	0.047		mg/Kg	1	3/6/2014 11:26:44 PM	12010
Toluene	ND	0.0052	0.047		mg/Kg	1	3/6/2014 11:26:44 PM	12010
Ethylbenzene	ND	0.0050	0.047		mg/Kg	1	3/6/2014 11:26:44 PM	12010
Xylenes, Total	ND	0.014	0.095		mg/Kg	1	3/6/2014 11:26:44 PM	12010
Surr: Dibromofluoromethane	103	0	70-130		%REC	1	3/6/2014 11:26:44 PM	12010
Surr: 1,2-Dichloroethane-d4	96.1	0	70-130		%REC	1	3/6/2014 11:26:44 PM	12010
Surr: Toluene-d8	86.7	0	70-130		%REC	1	3/6/2014 11:26:44 PM	12010
Surr: 4-Bromofluorobenzene	103	0	70-130		%REC	1	3/6/2014 11:26:44 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-018 **Matrix:** AQUEOUS

Client Sample ID: JP-4-B-03
Collection Date: 2/28/2014 8:16:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	3/6/2014 9:11:00 AM	12023
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	3/6/2014 9:11:00 AM	12023
Surr: DNOP	96.2	0	62.7-145		%REC	1	3/6/2014 9:11:00 AM	12023
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	3/5/2014 3:10:53 PM	R17126
Surr: BFB	94.1	0	80.4-118		%REC	1	3/5/2014 3:10:53 PM	R17126
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Acenaphthene	ND	0.15	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Fluorene	ND	0.18	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Phenanthrene	ND	0.15	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Fluoranthene	ND	0.13	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Pyrene	ND	0.25	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Chrysene	ND	0.16	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/5/2014 11:24:49 PM	12019
Surr: N-hexadecane	74.9	0	23.5-135		%REC	1	3/5/2014 11:24:49 PM	12019
Surr: Benzo(e)pyrene	96.1	0	28.8-149		%REC	1	3/5/2014 11:24:49 PM	12019
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/7/2014 7:44:00 PM	R17183
Toluene	ND	0.44	1.0		µg/L	1	3/7/2014 7:44:00 PM	R17183
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/7/2014 7:44:00 PM	R17183
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/7/2014 7:44:00 PM	R17183
Surr: 1,2-Dichloroethane-d4	95.8	0	70-130		%REC	1	3/7/2014 7:44:00 PM	R17183
Surr: 4-Bromofluorobenzene	102	0	70-130		%REC	1	3/7/2014 7:44:00 PM	R17183
Surr: Dibromofluoromethane	100	0	70-130		%REC	1	3/7/2014 7:44:00 PM	R17183
Surr: Toluene-d8	96.2	0	70-130		%REC	1	3/7/2014 7:44:00 PM	R17183

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-019 **Matrix:** SOIL

Client Sample ID: JP-4-B-03A
Collection Date: 2/28/2014 8:40:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	ND	3.9	10		mg/Kg	1	3/11/2014 10:09:53 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/11/2014 10:09:53 PM	12024
Surr: DNOP	80.6	0	66-131		%REC	1	3/11/2014 10:09:53 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	3/6/2014 3:48:13 AM	12010
Surr: BFB	83.9	0	74.5-129		%REC	1	3/6/2014 3:48:13 AM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 5:18:43 PM	12028
Surr: N-hexadecane	85.5	0	33.8-110		%REC	1	3/6/2014 5:18:43 PM	12028
Surr: Benzo(e)pyrene	102	0	33.3-120		%REC	1	3/6/2014 5:18:43 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0052	0.047		mg/Kg	1	3/6/2014 11:55:21 PM	12010
Toluene	ND	0.0052	0.047		mg/Kg	1	3/6/2014 11:55:21 PM	12010
Ethylbenzene	ND	0.0050	0.047		mg/Kg	1	3/6/2014 11:55:21 PM	12010
Xylenes, Total	ND	0.014	0.095		mg/Kg	1	3/6/2014 11:55:21 PM	12010
Surr: Dibromofluoromethane	102	0	70-130		%REC	1	3/6/2014 11:55:21 PM	12010
Surr: 1,2-Dichloroethane-d4	94.3	0	70-130		%REC	1	3/6/2014 11:55:21 PM	12010
Surr: Toluene-d8	89.1	0	70-130		%REC	1	3/6/2014 11:55:21 PM	12010
Surr: 4-Bromofluorobenzene	89.4	0	70-130		%REC	1	3/6/2014 11:55:21 PM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-020 **Matrix:** SOIL

Client Sample ID: JP-4-B-03B
Collection Date: 2/28/2014 8:58:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	ND	3.9	10		mg/Kg	1	3/11/2014 10:40:06 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/11/2014 10:40:06 PM	12024
Surr: DNOP	65.1	0	66-131	S	%REC	1	3/11/2014 10:40:06 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	4.9		mg/Kg	1	3/6/2014 4:16:41 AM	12010
Surr: BFB	83.3	0	74.5-129		%REC	1	3/6/2014 4:16:41 AM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 5:41:57 PM	12028
Surr: N-hexadecane	71.1	0	33.8-110		%REC	1	3/6/2014 5:41:57 PM	12028
Surr: Benzo(e)pyrene	94.2	0	33.3-120		%REC	1	3/6/2014 5:41:57 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.049		mg/Kg	1	3/7/2014 1:21:25 AM	12010
Toluene	ND	0.0054	0.049		mg/Kg	1	3/7/2014 1:21:25 AM	12010
Ethylbenzene	ND	0.0052	0.049		mg/Kg	1	3/7/2014 1:21:25 AM	12010
Xylenes, Total	ND	0.014	0.097		mg/Kg	1	3/7/2014 1:21:25 AM	12010
Surr: Dibromofluoromethane	102	0	70-130		%REC	1	3/7/2014 1:21:25 AM	12010
Surr: 1,2-Dichloroethane-d4	98.9	0	70-130		%REC	1	3/7/2014 1:21:25 AM	12010
Surr: Toluene-d8	88.2	0	70-130		%REC	1	3/7/2014 1:21:25 AM	12010
Surr: 4-Bromofluorobenzene	95.1	0	70-130		%REC	1	3/7/2014 1:21:25 AM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-021 **Matrix:** SOIL

Client Sample ID: JP-4-B-03C
Collection Date: 2/28/2014 9:25:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	14	3.9	10		mg/Kg	1	3/11/2014 11:10:24 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/11/2014 11:10:24 PM	12024
Surr: DNOP	79.4	0	66-131		%REC	1	3/11/2014 11:10:24 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.8		mg/Kg	1	3/5/2014 6:11:53 PM	12010
Surr: BFB	92.8	0	74.5-129		%REC	1	3/5/2014 6:11:53 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 6:05:05 PM	12028
Surr: N-hexadecane	69.2	0	33.8-110		%REC	1	3/6/2014 6:05:05 PM	12028
Surr: Benzo(e)pyrene	98.2	0	33.3-120		%REC	1	3/6/2014 6:05:05 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.048		mg/Kg	1	3/7/2014 1:50:13 AM	12010
Toluene	ND	0.0053	0.048		mg/Kg	1	3/7/2014 1:50:13 AM	12010
Ethylbenzene	ND	0.0051	0.048		mg/Kg	1	3/7/2014 1:50:13 AM	12010
Xylenes, Total	ND	0.014	0.097		mg/Kg	1	3/7/2014 1:50:13 AM	12010
Surr: Dibromofluoromethane	101	0	70-130		%REC	1	3/7/2014 1:50:13 AM	12010
Surr: 1,2-Dichloroethane-d4	96.1	0	70-130		%REC	1	3/7/2014 1:50:13 AM	12010
Surr: Toluene-d8	82.6	0	70-130		%REC	1	3/7/2014 1:50:13 AM	12010
Surr: 4-Bromofluorobenzene	90.6	0	70-130		%REC	1	3/7/2014 1:50:13 AM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-022 **Matrix:** SOIL

Client Sample ID: JP-4-B-03C DUP
Collection Date: 2/28/2014 9:25:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	34	3.9	10		mg/Kg	1	3/11/2014 11:40:46 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/11/2014 11:40:46 PM	12024
Surr: DNOP	74.2	0	66-131		%REC	1	3/11/2014 11:40:46 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	3/5/2014 6:42:08 PM	12010
Surr: BFB	92.1	0	74.5-129		%REC	1	3/5/2014 6:42:08 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 6:28:15 PM	12028
Surr: N-hexadecane	76.8	0	33.8-110		%REC	1	3/6/2014 6:28:15 PM	12028
Surr: Benzo(e)pyrene	91.2	0	33.3-120		%REC	1	3/6/2014 6:28:15 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0051	0.047		mg/Kg	1	3/7/2014 2:19:04 AM	12010
Toluene	ND	0.0051	0.047		mg/Kg	1	3/7/2014 2:19:04 AM	12010
Ethylbenzene	ND	0.0050	0.047		mg/Kg	1	3/7/2014 2:19:04 AM	12010
Xylenes, Total	ND	0.014	0.093		mg/Kg	1	3/7/2014 2:19:04 AM	12010
Surr: Dibromofluoromethane	105	0	70-130		%REC	1	3/7/2014 2:19:04 AM	12010
Surr: 1,2-Dichloroethane-d4	99.2	0	70-130		%REC	1	3/7/2014 2:19:04 AM	12010
Surr: Toluene-d8	88.8	0	70-130		%REC	1	3/7/2014 2:19:04 AM	12010
Surr: 4-Bromofluorobenzene	97.6	0	70-130		%REC	1	3/7/2014 2:19:04 AM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-023 **Matrix:** AQUEOUS

Client Sample ID: JP-4-B-04
Collection Date: 2/28/2014 10:05:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	3/6/2014 9:33:02 AM	12023
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	3/6/2014 9:33:02 AM	12023
Surr: DNOP	90.4	0	62.7-145		%REC	1	3/6/2014 9:33:02 AM	12023
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	3/5/2014 3:41:11 PM	R17126
Surr: BFB	93.4	0	80.4-118		%REC	1	3/5/2014 3:41:11 PM	R17126
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Acenaphthene	ND	0.15	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Fluorene	ND	0.18	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Phenanthrene	ND	0.15	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Fluoranthene	ND	0.13	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Pyrene	ND	0.25	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Chrysene	ND	0.16	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/5/2014 11:48:02 PM	12019
Surr: N-hexadecane	44.7	0	23.5-135		%REC	1	3/5/2014 11:48:02 PM	12019
Surr: Benzo(e)pyrene	63.3	0	28.8-149		%REC	1	3/5/2014 11:48:02 PM	12019
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/7/2014 8:12:34 PM	R17183
Toluene	ND	0.44	1.0		µg/L	1	3/7/2014 8:12:34 PM	R17183
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/7/2014 8:12:34 PM	R17183
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/7/2014 8:12:34 PM	R17183
Surr: 1,2-Dichloroethane-d4	95.8	0	70-130		%REC	1	3/7/2014 8:12:34 PM	R17183
Surr: 4-Bromofluorobenzene	101	0	70-130		%REC	1	3/7/2014 8:12:34 PM	R17183
Surr: Dibromofluoromethane	98.6	0	70-130		%REC	1	3/7/2014 8:12:34 PM	R17183
Surr: Toluene-d8	91.8	0	70-130		%REC	1	3/7/2014 8:12:34 PM	R17183

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-024 **Matrix:** SOIL

Client Sample ID: JP-4-B-04A
Collection Date: 2/28/2014 10:30:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	60	3.9	10		mg/Kg	1	3/12/2014 12:11:08 AM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/12/2014 12:11:08 AM	12024
Surr: DNOP	60.6	0	66-131	S	%REC	1	3/12/2014 12:11:08 AM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.8	4.7		mg/Kg	1	3/5/2014 7:12:24 PM	12010
Surr: BFB	94.1	0	74.5-129		%REC	1	3/5/2014 7:12:24 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 6:51:27 PM	12028
Surr: N-hexadecane	75.5	0	33.8-110		%REC	1	3/6/2014 6:51:27 PM	12028
Surr: Benzo(e)pyrene	97.3	0	33.3-120		%REC	1	3/6/2014 6:51:27 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0051	0.047		mg/Kg	1	3/7/2014 2:47:54 AM	12010
Toluene	ND	0.0051	0.047		mg/Kg	1	3/7/2014 2:47:54 AM	12010
Ethylbenzene	ND	0.0050	0.047		mg/Kg	1	3/7/2014 2:47:54 AM	12010
Xylenes, Total	ND	0.014	0.093		mg/Kg	1	3/7/2014 2:47:54 AM	12010
Surr: Dibromofluoromethane	103	0	70-130		%REC	1	3/7/2014 2:47:54 AM	12010
Surr: 1,2-Dichloroethane-d4	98.8	0	70-130		%REC	1	3/7/2014 2:47:54 AM	12010
Surr: Toluene-d8	91.0	0	70-130		%REC	1	3/7/2014 2:47:54 AM	12010
Surr: 4-Bromofluorobenzene	90.7	0	70-130		%REC	1	3/7/2014 2:47:54 AM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-025 **Matrix:** SOIL

Client Sample ID: JP-4-B-04B
Collection Date: 2/28/2014 10:45:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **JME**	
Diesel Range Organics (DRO)	ND	4.0	10		mg/Kg	1	3/12/2014 12:41:11 AM	12024
Motor Oil Range Organics (MRO)	ND	51	51		mg/Kg	1	3/12/2014 12:41:11 AM	12024
Surr: DNOP	63.4	0	66-131	S	%REC	1	3/12/2014 12:41:11 AM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	4.8		mg/Kg	1	3/5/2014 7:42:36 PM	12010
Surr: BFB	92.8	0	74.5-129		%REC	1	3/5/2014 7:42:36 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 7:14:38 PM	12028
Surr: N-hexadecane	82.6	0	33.8-110		%REC	1	3/6/2014 7:14:38 PM	12028
Surr: Benzo(e)pyrene	101	0	33.3-120		%REC	1	3/6/2014 7:14:38 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.048		mg/Kg	1	3/7/2014 3:16:42 AM	12010
Toluene	ND	0.0053	0.048		mg/Kg	1	3/7/2014 3:16:42 AM	12010
Ethylbenzene	ND	0.0052	0.048		mg/Kg	1	3/7/2014 3:16:42 AM	12010
Xylenes, Total	ND	0.014	0.097		mg/Kg	1	3/7/2014 3:16:42 AM	12010
Surr: Dibromofluoromethane	104	0	70-130		%REC	1	3/7/2014 3:16:42 AM	12010
Surr: 1,2-Dichloroethane-d4	97.7	0	70-130		%REC	1	3/7/2014 3:16:42 AM	12010
Surr: Toluene-d8	89.1	0	70-130		%REC	1	3/7/2014 3:16:42 AM	12010
Surr: 4-Bromofluorobenzene	94.6	0	70-130		%REC	1	3/7/2014 3:16:42 AM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1403058-026 **Matrix:** SOIL

Client Sample ID: JP-4-B-04C
Collection Date: 2/28/2014 11:05:00 AM
Received Date: 3/4/2014 9:00:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	10		mg/Kg	1	3/7/2014 4:26:57 PM	12024
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/7/2014 4:26:57 PM	12024
Surr: DNOP	69.6	0	66-131		%REC	1	3/7/2014 4:26:57 PM	12024
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	4.9		mg/Kg	1	3/5/2014 8:12:45 PM	12010
Surr: BFB	88.8	0	74.5-129		%REC	1	3/5/2014 8:12:45 PM	12010
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/6/2014 7:37:50 PM	12028
Surr: N-hexadecane	82.8	0	33.8-110		%REC	1	3/6/2014 7:37:50 PM	12028
Surr: Benzo(e)pyrene	102	0	33.3-120		%REC	1	3/6/2014 7:37:50 PM	12028
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.049		mg/Kg	1	3/7/2014 3:45:29 AM	12010
Toluene	ND	0.0054	0.049		mg/Kg	1	3/7/2014 3:45:29 AM	12010
Ethylbenzene	ND	0.0052	0.049		mg/Kg	1	3/7/2014 3:45:29 AM	12010
Xylenes, Total	ND	0.014	0.097		mg/Kg	1	3/7/2014 3:45:29 AM	12010
Surr: Dibromofluoromethane	100	0	70-130		%REC	1	3/7/2014 3:45:29 AM	12010
Surr: 1,2-Dichloroethane-d4	94.9	0	70-130		%REC	1	3/7/2014 3:45:29 AM	12010
Surr: Toluene-d8	85.5	0	70-130		%REC	1	3/7/2014 3:45:29 AM	12010
Surr: 4-Bromofluorobenzene	94.5	0	70-130		%REC	1	3/7/2014 3:45:29 AM	12010

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **MB-12024** SampType: **MBLK** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **12024** RunNo: **17130**
Prep Date: **3/5/2014** Analysis Date: **3/6/2014** SeqNo: **492768** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.6		10.00		95.8	66	131			

Sample ID **LCS-12024** SampType: **LCS** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **12024** RunNo: **17130**
Prep Date: **3/5/2014** Analysis Date: **3/6/2014** SeqNo: **492769** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	10	50.00	0	94.3	60.8	145			
Surr: DNOP	5.8		5.000		117	66	131			

Sample ID **1403058-015AMS** SampType: **MS** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **JP-4-B-02A** Batch ID: **12024** RunNo: **17161**
Prep Date: **3/5/2014** Analysis Date: **3/7/2014** SeqNo: **494028** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	200	10	50.40	116.7	170	47.4	148			S
Surr: DNOP	4.0		5.040		78.4	66	131			

Sample ID **1403058-015AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **JP-4-B-02A** Batch ID: **12024** RunNo: **17161**
Prep Date: **3/5/2014** Analysis Date: **3/7/2014** SeqNo: **494029** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	230	10	49.80	116.7	235	47.4	148	14.5	22.7	S
Surr: DNOP	4.4		4.980		88.5	66	131	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID	**MB-12023**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Diesel Range**					
Client ID:	**PBW**	Batch ID:	**12023**	RunNo:	**17113**					
Prep Date:	**3/5/2014**	Analysis Date:	**3/5/2014**	SeqNo:	**492069**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	0.84		1.000		84.1	62.7	145			

Sample ID	**LCS-12023**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Diesel Range**					
Client ID:	**LCSW**	Batch ID:	**12023**	RunNo:	**17113**					
Prep Date:	**3/5/2014**	Analysis Date:	**3/5/2014**	SeqNo:	**492070**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.9	1.0	5.000	0	118	78.6	146			
Surr: DNOP	0.44		0.5000		87.5	62.7	145			

Sample ID	**LCSD-12023**	SampType:	**LCSD**	TestCode:	**EPA Method 8015D: Diesel Range**					
Client ID:	**LCSS02**	Batch ID:	**12023**	RunNo:	**17113**					
Prep Date:	**3/5/2014**	Analysis Date:	**3/5/2014**	SeqNo:	**492071**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.7	1.0	5.000	0	113	78.6	146	4.49	26.5	
Surr: DNOP	0.42		0.5000		83.9	62.7	145	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **MB-12010** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **12010** RunNo: **17108**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492296** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	840		1000		84.1	74.5	129			

Sample ID **LCS-12010** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **12010** RunNo: **17108**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492297** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	5.0	25.00	0	112	71.7	134			
Surr: BFB	910		1000		90.6	74.5	129			

Sample ID **5ML RB** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **R17126** RunNo: **17126**
Prep Date: Analysis Date: **3/5/2014** SeqNo: **492436** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	860		1000		85.6	74.5	129			

Sample ID **2.5UG GRO LCS** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **R17126** RunNo: **17126**
Prep Date: Analysis Date: **3/5/2014** SeqNo: **492437** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	5.0	25.00	0	94.0	71.7	134			
Surr: BFB	970		1000		97.2	74.5	129			

Sample ID **1403058-015AMS** SampType: **MS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **JP-4-B-02A** Batch ID: **12010** RunNo: **17126**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492460** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	43	4.8	23.97	19.29	98.1	69.5	145			
Surr: BFB	2200		958.8		234	74.5	129			S

Sample ID **1403058-015AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **JP-4-B-02A** Batch ID: **12010** RunNo: **17126**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492467** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **1403058-015AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **JP-4-B-02A** Batch ID: **12010** RunNo: **17126**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492467** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	39	4.8	23.97	19.29	84.3	69.5	145	8.06	20	
Surr: BFB	2100		958.8		216	74.5	129	0	0	S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**PBW**	Batch ID:	**R17126**	RunNo:	**17126**
Prep Date:		Analysis Date:	**3/5/2014**	SeqNo:	**492408** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	17		20.00		85.6	80.4	118			

Sample ID	**2.5UG GRO LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**LCSW**	Batch ID:	**R17126**	RunNo:	**17126**
Prep Date:		Analysis Date:	**3/5/2014**	SeqNo:	**492409** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.47	0.050	0.5000	0	94.0	80	120			
Surr: BFB	19		20.00		97.3	80.4	118			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **mb-12010** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS** Batch ID: **12010** RunNo: **17155**
Prep Date: **3/4/2014** Analysis Date: **3/6/2014** SeqNo: **493331** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.52		0.5000		104	70	130			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		98.3	70	130			
Surr: Toluene-d8	0.42		0.5000		84.9	70	130			
Surr: 4-Bromofluorobenzene	0.50		0.5000		101	70	130			

Sample ID **lcs-12010** SampType: **LCS** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS** Batch ID: **12010** RunNo: **17155**
Prep Date: **3/4/2014** Analysis Date: **3/6/2014** SeqNo: **493332** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.050	1.000	0	107	70	130			
Toluene	0.92	0.050	1.000	0	91.6	60.1	120			
Surr: Dibromofluoromethane	0.51		0.5000		102	70	130			
Surr: 1,2-Dichloroethane-d4	0.50		0.5000		101	70	130			
Surr: Toluene-d8	0.46		0.5000		91.9	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		96.5	70	130			

Sample ID **1403058-019ams** SampType: **MS** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **JP-4-B-03A** Batch ID: **12010** RunNo: **17155**
Prep Date: **3/4/2014** Analysis Date: **3/7/2014** SeqNo: **493347** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.048	0.9533	0	109	62.6	140			
Toluene	0.93	0.048	0.9533	0	97.6	66.3	136			
Surr: Dibromofluoromethane	0.48		0.4766		100	70	130			
Surr: 1,2-Dichloroethane-d4	0.47		0.4766		99.0	70	130			
Surr: Toluene-d8	0.44		0.4766		91.8	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.4766		96.2	70	130			

Sample ID **1403058-019amsd** SampType: **MSD** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **JP-4-B-03A** Batch ID: **12010** RunNo: **17155**
Prep Date: **3/4/2014** Analysis Date: **3/7/2014** SeqNo: **493348** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.048	0.9524	0	107	62.6	140	2.27	20	
Toluene	0.87	0.048	0.9524	0	91.6	66.3	136	6.39	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **1403058-019amsd** SampType: **MSD** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **JP-4-B-03A** Batch ID: **12010** RunNo: **17155**
Prep Date: **3/4/2014** Analysis Date: **3/7/2014** SeqNo: **493348** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	0.48		0.4762		101	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.47		0.4762		98.9	70	130	0	0	
Surr: Toluene-d8	0.41		0.4762		86.8	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.45		0.4762		93.6	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **5mL rb** SampType: **MBLK** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW** Batch ID: **R17183** RunNo: **17183**
Prep Date: Analysis Date: **3/7/2014** SeqNo: **494417** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.8		10.00		97.6	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.8		10.00		98.0	70	130			

Sample ID **100ng lcs** SampType: **LCS** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW** Batch ID: **R17183** RunNo: **17183**
Prep Date: Analysis Date: **3/7/2014** SeqNo: **494419** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	108	70	130			
Toluene	20	1.0	20.00	0	100	80	120			
Surr: 1,2-Dichloroethane-d4	9.8		10.00		98.4	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		106	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID **b4** SampType: **MBLK** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW** Batch ID: **R17183** RunNo: **17183**
Prep Date: Analysis Date: **3/7/2014** SeqNo: **494480** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.8		10.00		98.2	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.1		10.00		90.9	70	130			

Sample ID **100ng lcs2** SampType: **LCS** TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW** Batch ID: **R17183** RunNo: **17183**
Prep Date: Analysis Date: **3/7/2014** SeqNo: **494482** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **100ng lcs2**	SampType: **LCS**		TestCode: **EPA Method 8260B: VOLATILES**		
Client ID: **LCSW**	Batch ID: **R17183**		RunNo: **17183**		
Prep Date:	Analysis Date: **3/7/2014**		SeqNo: **494482**	Units: **µg/L**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	112	70	130			
Toluene	19	1.0	20.00	0	95.4	80	120			
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.0	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.0	70	130			
Surr: Dibromofluoromethane	9.6		10.00		95.8	70	130			
Surr: Toluene-d8	9.2		10.00		91.8	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **mb-12028** SampType: **MBLK** TestCode: **EPA Method 8270C: PAHs**
Client ID: **PBS** Batch ID: **12028** RunNo: **17156**
Prep Date: **3/5/2014** Analysis Date: **3/6/2014** SeqNo: **493298** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.020								
1-Methylnaphthalene	ND	0.020								
2-Methylnaphthalene	ND	0.020								
Acenaphthylene	ND	0.020								
Acenaphthene	ND	0.020								
Fluorene	ND	0.020								
Phenanthrene	ND	0.020								
Anthracene	ND	0.020								
Fluoranthene	ND	0.020								
Pyrene	ND	0.020								
Benz(a)anthracene	ND	0.020								
Chrysene	ND	0.020								
Benzo(b)fluoranthene	ND	0.020								
Benzo(k)fluoranthene	ND	0.020								
Benzo(a)pyrene	ND	0.020								
Dibenz(a,h)anthracene	ND	0.020								
Benzo(g,h,i)perylene	ND	0.020								
Indeno(1,2,3-cd)pyrene	ND	0.020								
Surr: N-hexadecane	0.98		1.460		66.9	33.8	110			
Surr: Benzo(e)pyrene	0.32		0.3300		96.4	33.3	120			

Sample ID **lcs-12028** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS** Batch ID: **12028** RunNo: **17156**
Prep Date: **3/5/2014** Analysis Date: **3/6/2014** SeqNo: **493299** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.28	0.020	0.3300	0	83.7	42.5	118			
1-Methylnaphthalene	0.28	0.020	0.3300	0	85.5	43.5	122			
2-Methylnaphthalene	0.28	0.020	0.3300	0	85.4	41.1	122			
Acenaphthylene	0.26	0.020	0.3300	0	77.6	49.4	121			
Acenaphthene	0.25	0.020	0.3300	0	77.0	47.5	125			
Fluorene	0.25	0.020	0.3300	0	77.2	49.1	120			
Phenanthrene	0.26	0.020	0.3300	0	79.1	42.3	130			
Anthracene	0.26	0.020	0.3300	0	79.6	42.9	130			
Fluoranthene	0.28	0.020	0.3300	0	86.1	37	134			
Pyrene	0.27	0.020	0.3300	0	82.9	46.4	126			
Benz(a)anthracene	0.27	0.020	0.3300	0	80.7	50.6	126			
Chrysene	0.29	0.020	0.3300	0	86.6	36.8	123			
Benzo(b)fluoranthene	0.27	0.020	0.3300	0	81.3	47.2	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **lcs-12028** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS** Batch ID: **12028** RunNo: **17156**
Prep Date: **3/5/2014** Analysis Date: **3/6/2014** SeqNo: **493299** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	0.27	0.020	0.3300	0	82.8	40	122			
Benzo(a)pyrene	0.26	0.020	0.3300	0	78.0	44	118			
Dibenz(a,h)anthracene	0.27	0.020	0.3300	0	81.0	53.3	131			
Benzo(g,h,i)perylene	0.28	0.020	0.3300	0	84.8	46.7	129			
Indeno(1,2,3-cd)pyrene	0.28	0.020	0.3300	0	85.4	52	126			
Surr: N-hexadecane	1.0		1.460		71.2	33.8	110			
Surr: Benzo(e)pyrene	0.33		0.3300		101	33.3	120			

Sample ID **1403058-015Bms** SampType: **MS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-4-B-02A** Batch ID: **12028** RunNo: **17156**
Prep Date: **3/5/2014** Analysis Date: **3/6/2014** SeqNo: **493423** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.30	0.020	0.3302	0	91.7	39.8	108			
1-Methylnaphthalene	0.30	0.020	0.3302	0	91.3	42.1	116			
2-Methylnaphthalene	0.29	0.020	0.3302	0	89.1	34.8	122			
Acenaphthylene	0.25	0.020	0.3302	0	74.6	54.3	107			
Acenaphthene	0.24	0.020	0.3302	0	72.8	50.2	114			
Fluorene	0.24	0.020	0.3302	0	72.6	55.3	107			
Phenanthrene	0.34	0.020	0.3302	0	103	54.7	118			
Anthracene	0.31	0.020	0.3302	0	95.3	54.9	116			
Fluoranthene	0.35	0.020	0.3302	0	106	55.2	119			
Pyrene	0.31	0.020	0.3302	0	94.5	60.2	115			
Benz(a)anthracene	0.32	0.020	0.3302	0	96.5	61.9	120			
Chrysene	0.33	0.020	0.3302	0	99.5	42.5	117			
Benzo(b)fluoranthene	0.32	0.020	0.3302	0	96.7	57.4	124			
Benzo(k)fluoranthene	0.30	0.020	0.3302	0	91.1	52.6	107			
Benzo(a)pyrene	0.30	0.020	0.3302	0	89.7	55.7	106			
Dibenz(a,h)anthracene	0.32	0.020	0.3302	0	95.8	51.8	130			
Benzo(g,h,i)perylene	0.31	0.020	0.3302	0	93.7	59.2	114			
Indeno(1,2,3-cd)pyrene	0.32	0.020	0.3302	0	97.3	56.8	120			
Surr: N-hexadecane	1.6		1.461		107	33.8	110			
Surr: Benzo(e)pyrene	0.36		0.3302		109	33.3	120			

Sample ID **1403058-015Bmsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-4-B-02A** Batch ID: **12028** RunNo: **17156**
Prep Date: **3/5/2014** Analysis Date: **3/6/2014** SeqNo: **493427** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.30	0.020	0.3295	0	92.4	39.8	108	0.535	29.7	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **1403058-015Bmsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-4-B-02A** Batch ID: **12028** RunNo: **17156**
Prep Date: **3/5/2014** Analysis Date: **3/6/2014** SeqNo: **493427** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1-Methylnaphthalene	0.34	0.020	0.3295	0	104	42.1	116	12.5	20	
2-Methylnaphthalene	0.33	0.020	0.3295	0	101	34.8	122	12.7	21.2	
Acenaphthylene	0.31	0.020	0.3295	0	94.9	54.3	107	23.7	20	R
Acenaphthene	0.33	0.020	0.3295	0	98.8	50.2	114	30.0	20.5	R
Fluorene	0.34	0.020	0.3295	0	104	55.3	107	35.5	20	R
Phenanthrene	0.33	0.020	0.3295	0	99.5	54.7	118	4.12	22	
Anthracene	0.33	0.020	0.3295	0	99.5	54.9	116	4.12	26.6	
Fluoranthene	0.36	0.020	0.3295	0	109	55.2	119	2.21	23.7	
Pyrene	0.32	0.020	0.3295	0	96.5	60.2	115	1.78	29.3	
Benz(a)anthracene	0.31	0.020	0.3295	0	92.9	61.9	120	3.97	25.4	
Chrysene	0.32	0.020	0.3295	0	98.3	42.5	117	1.46	27.6	
Benzo(b)fluoranthene	0.33	0.020	0.3295	0	99.4	57.4	124	2.55	20	
Benzo(k)fluoranthene	0.34	0.020	0.3295	0	102	52.6	107	11.5	31.3	
Benzo(a)pyrene	0.33	0.020	0.3295	0	98.9	55.7	106	9.52	22.1	
Dibenz(a,h)anthracene	0.34	0.020	0.3295	0	103	51.8	130	7.18	21.2	
Benzo(g,h,i)perylene	0.33	0.020	0.3295	0	100	59.2	114	6.23	25.9	
Indeno(1,2,3-cd)pyrene	0.33	0.020	0.3295	0	101	56.8	120	3.54	20.4	
Surr: N-hexadecane	2.3		1.458		157	33.8	110	0	0	S
Surr: Benzo(e)pyrene	0.36		0.3295		108	33.3	120	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **mb-12019** SampType: **MBLK** TestCode: **EPA Method 8270C: PAHs**
Client ID: **PBW** Batch ID: **12019** RunNo: **17115**
Prep Date: **3/5/2014** Analysis Date: **3/5/2014** SeqNo: **492346** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.50								
1-Methylnaphthalene	ND	0.50								
2-Methylnaphthalene	ND	0.50								
Acenaphthylene	ND	0.50								
Acenaphthene	ND	0.50								
Fluorene	ND	0.50								
Phenanthrene	ND	0.50								
Anthracene	ND	0.50								
Fluoranthene	ND	0.50								
Pyrene	ND	0.50								
Benz(a)anthracene	ND	0.50								
Chrysene	ND	0.50								
Benzo(b)fluoranthene	ND	0.50								
Benzo(k)fluoranthene	ND	0.50								
Benzo(a)pyrene	ND	0.50								
Dibenz(a,h)anthracene	ND	0.50								
Benzo(g,h,i)perylene	ND	0.50								
Indeno(1,2,3-cd)pyrene	ND	0.50								
Surr: N-hexadecane	62		87.60		70.7	23.5	135			
Surr: Benzo(e)pyrene	19		20.00		96.4	28.8	149			

Sample ID **lcs-12019** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSW** Batch ID: **12019** RunNo: **17115**
Prep Date: **3/5/2014** Analysis Date: **3/5/2014** SeqNo: **492347** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	13	0.50	20.00	0	67.0	43.1	99.5			
1-Methylnaphthalene	14	0.50	20.00	0	70.9	44.3	107			
2-Methylnaphthalene	14	0.50	20.00	0	68.3	42.2	102			
Acenaphthylene	15	0.50	20.00	0	75.8	46.3	109			
Acenaphthene	15	0.50	20.00	0	75.5	47.4	111			
Fluorene	15	0.50	20.00	0	74.8	46.2	106			
Phenanthrene	15	0.50	20.00	0	74.6	48.7	115			
Anthracene	15	0.50	20.00	0	75.1	47.8	113			
Fluoranthene	16	0.50	20.00	0	78.0	46.7	110			
Pyrene	14	0.50	20.00	0	69.0	48.4	108			
Benz(a)anthracene	14	0.50	20.00	0	71.0	42.9	118			
Chrysene	15	0.50	20.00	0	75.5	28.8	117			
Benzo(b)fluoranthene	15	0.50	20.00	0	76.4	47.3	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **lcs-12019** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSW** Batch ID: **12019** RunNo: **17115**
Prep Date: **3/5/2014** Analysis Date: **3/5/2014** SeqNo: **492347** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	15	0.50	20.00	0	73.9	46	113			
Benzo(a)pyrene	15	0.50	20.00	0	72.7	53.1	96.1			
Dibenz(a,h)anthracene	16	0.50	20.00	0	79.7	44.3	115			
Benzo(g,h,i)perylene	15	0.50	20.00	0	74.3	44.4	121			
Indeno(1,2,3-cd)pyrene	15	0.50	20.00	0	75.8	47.5	115			
Surr: N-hexadecane	62		87.60		71.0	23.5	135			
Surr: Benzo(e)pyrene	18		20.00		88.4	28.8	149			

Sample ID **1403058-001Cms** SampType: **MS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-4-B-05** Batch ID: **12019** RunNo: **17115**
Prep Date: **3/5/2014** Analysis Date: **3/5/2014** SeqNo: **492354** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	12	0.50	20.00	0	59.2	45	110			
1-Methylnaphthalene	13	0.50	20.00	0	67.3	45	110			
2-Methylnaphthalene	13	0.50	20.00	0	66.4	45	110			
Acenaphthylene	12	0.50	20.00	0	61.2	45	110			
Acenaphthene	12	0.50	20.00	0.2000	60.5	45	110			
Fluorene	13	0.50	20.00	0.2800	64.5	45	110			
Phenanthrene	13	0.50	20.00	0.2200	62.9	45	110			
Anthracene	13	0.50	20.00	0	65.1	45	110			
Fluoranthene	13	0.50	20.00	0	64.3	45	110			
Pyrene	12	0.50	20.00	0	59.2	45	110			
Benz(a)anthracene	11	0.50	20.00	0	57.1	45	110			
Chrysene	12	0.50	20.00	0	58.2	45	110			
Benzo(b)fluoranthene	14	0.50	20.00	0	69.0	45	110			
Benzo(k)fluoranthene	15	0.50	20.00	0	73.0	45	110			
Benzo(a)pyrene	13	0.50	20.00	0	66.1	45	110			
Dibenz(a,h)anthracene	14	0.50	20.00	0	68.5	45	110			
Benzo(g,h,i)perylene	13	0.50	20.00	0	67.0	45	110			
Indeno(1,2,3-cd)pyrene	14	0.50	20.00	0	68.5	45	110			
Surr: N-hexadecane	51		87.60		57.8	23.5	135			
Surr: Benzo(e)pyrene	15		20.00		77.2	28.8	149			

Sample ID **1403058-001Cmsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-4-B-05** Batch ID: **12019** RunNo: **17115**
Prep Date: **3/5/2014** Analysis Date: **3/5/2014** SeqNo: **492355** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	11	0.50	20.00	0	56.2	45	110	5.20	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1403058**
12-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **1403058-001Cmsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-4-B-05** Batch ID: **12019** RunNo: **17115**
Prep Date: **3/5/2014** Analysis Date: **3/5/2014** SeqNo: **492355** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1-Methylnaphthalene	12	0.50	20.00	0	57.9	45	110	15.0	20	
2-Methylnaphthalene	12	0.50	20.00	0	59.8	45	110	10.5	20	
Acenaphthylene	10	0.50	20.00	0	50.2	45	110	19.7	20	
Acenaphthene	10	0.50	20.00	0.2000	51.3	45	110	16.2	20	
Fluorene	10	0.50	20.00	0.2800	50.7	45	110	23.4	20	R
Phenanthrene	10	0.50	20.00	0.2200	51.3	45	110	19.9	20	
Anthracene	11	0.50	20.00	0	54.1	45	110	18.5	20	
Fluoranthene	11	0.50	20.00	0	56.0	45	110	13.8	20	
Pyrene	11	0.50	20.00	0	54.6	45	110	8.08	20	
Benz(a)anthracene	11	0.50	20.00	0	56.6	45	110	0.880	20	
Chrysene	11	0.50	20.00	0	57.4	45	110	1.38	20	
Benzo(b)fluoranthene	11	0.50	20.00	0	54.2	45	110	24.0	20	R
Benzo(k)fluoranthene	10	0.50	20.00	0	51.9	45	110	33.8	20	R
Benzo(a)pyrene	10	0.50	20.00	0	52.1	45	110	23.7	20	R
Dibenz(a,h)anthracene	10	0.50	20.00	0	51.8	45	110	27.8	20	R
Benzo(g,h,i)perylene	10	0.50	20.00	0	52.5	45	110	24.3	20	R
Indeno(1,2,3-cd)pyrene	10	0.50	20.00	0	50.0	45	110	31.2	20	R
Surr: N-hexadecane	34		87.60		38.6	23.5	135	0	0	
Surr: Benzo(e)pyrene	11		20.00		54.0	28.8	149	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: NASA_WSTF Work Order Number: 1403058 RcptNo: 1

Received by/date: LM 03/04/14

Logged By: Anne Thorne 3/4/2014 9:00:00 AM Anne Thorne

Completed By: Anne Thorne 3/4/2014 Anne Thorne

Reviewed By: 3/4

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☑ No ☐ Not Present ☐
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? FedEx

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☑ No ☐ No VOA Vials ☐
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
2	1.4					

WSTF CHAIN OF CUSTODY RECORD

Date 2·27·14

Page 1 of

Laboratory / PO # 13EC092B

Address shipping questions to:

Attn: ☐ Lori Minnick ☐ Other Antonette L. Sanchez

(575) 524-5119 (575) 524-5497

Send Analytical Reports to:

Attn: ☐ Carlyn A. Tufts ☐ Other

carlyn.a.tufts@nasa.gov antonette.l.sanchez@nasa.gov

Special Instructions

Return coolers and reusable packaging materials within 14 as required in statement of work to:

Return Address:

NASA WSTF Environmental Department

12600 NASA Road; Bldg. 120

Las Cruces, NM 88012

Attn: Lori Minnick

Sample No.	Sample Location	# of Containers	Sample Type	TPH SW-846 Method 8015C (Modified)	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	TPH SW-846 Method 8015C	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	Comments
1402270825	JP.4.B.05	2	A		X					1403058 -001
0826	JP.4.B.05	2	A	X						-001
0827	JP.4.B.05	2	A			X				-001
0828	JP.4.B.05	2	A				X			-001
0840	JP.4.B.05A	2	S				X	X	X	-002
0850	JP.4.B.05B	2	S				X	X	X	-003
0915	JP.4.B.05C	2	S				X	X	X	-004
0952	JP.4.B.01	2	A		X					-005
0953	JP.4.B.01	2	A	X						-005
0954	JP.4.B.01	2	A			X				-005
0955	JP.4.B.01	2	A				X			-005

Relinquished By:	Date/Time:	Accepted By:	Date/Time:
	2·27·14 1236		2/27/14 12:38
	3/3/14 11:20		3·3·14 11:25
			03/04/14 0900 1.4°C

WSTF 381B (03/13)

WSTF CHAIN OF CUSTODY RECORD

Date 2·27·14

Page 1 of

Laboratory / PO # 13EC092B

Address shipping questions to:

Attn: ☐ Lori Minnick ☐ Other Antonette L. Sanchez

(575) 524-5119 (575) 524- 5497

Send Analytical Reports to:

Attn: ☐ Carlyn A. Tufts ☐ Other

carlyn.a.tufts@nasa.gov antonette.l.sanchez@nasa.gov

Analysis Requirements

Special Instructions

Return coolers and reusable packaging materials within 14 as required in statement of work to:

Return Address:

NASA WSTF Environmental Department

12600 NASA Road; Bldg. 120

Las Cruces, NM 88012

Attn: Lori Minnick

Sample No.	Sample Location	# of Containers	Sample Type ( )	Method / Analytes	TPH SW-846 Method 8015C (Modified)	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	TPH SW-846 Method 8015C	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C		Comments
1402271008	JP.4.B.01 A	2	S					x	x	x		1403058 -006
—— 1009 (DUP)	JP.4.B.01A	2	S					x	x	x		-007
—— 1045	JP.4.B.01 B	2	S					x	x	x		-008
—— 1105	JP.4.B.01 C	2	S					x	x	x		-009

Relinquished By:	Date/Time:		Accepted By:	Date/Time:	
	2·27·14	12:38		2/27/14	12:38
	3/3/14	11:20		3-3-14	11:25
				03/04/14	0900 2.4°C

WSTF 381B (03/13)

WSTF CHAIN OF CUSTODY RECORD

Date 2·27·14

Page 1 of

Laboratory / PO # 13EC092B

Address shipping questions to:

Attn: ☐ Lori Minnick ☐ Other Antonette L. Sanchez

(575) 524-5119 (575) 524- 5497

Send Analytical Reports to:

Attn: ☐ Carlyn A. Tufts ☐ Other

carlyn.a.tufts@nasa.gov antonette.l.sanchez@nasa.gov

Analysis Requirements

Special Instructions

Return coolers and reusable packaging materials within 14 as required in statement of work to:

Return Address:

NASA WSTF Environmental Department

12600 NASA Road; Bldg. 120

Las Cruces, NM 88012

Attn: Lori Minnick

Sample No.	Sample Location	# of Containers	Sample Type	TPH SW-846 Method 8015C (Modified)	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	TPH SW-846 Method 8015C	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	Comments
1402271340	JP.4.B.06	2	A		X					JP.4 14C03058-010
— 1341	JP.4.B.06	2	A	X						-010
— 1342	JP.4.B.06	2	A			X				~~-012~~ -010 03/04
— 1343	JP.4.B.06	2	A				X			-010
— 1353	JP.4.B.06A	2	S				X	X	X	-011
— 1410	JP.4.B.06B	2	S				X	X	X	-012
— 1430	JP.4.B.06C	2	S				X	X	X	-013
— 1512	JP.4.B.02	2	A		X					-014
— 1513	JP.4.B.02	2	A	X						-014
— 1514	JP.4.B.02	2	A			X				-014
— 1515	JP.4.B.02	2	A				X			-014

Relinquished By:	Date/Time:	Accepted By:	Date/Time:
	2·27·14 - 4:20		2/27/14 4:20
	3/3/14 11:20		3-3-14 11:25
			03/04/14 0900 14°C

WSTF 381B (03/13)

WSTF CHAIN OF CUSTODY RECORD

Date 2·27·14

Page 1 of

Laboratory / PO # 13EC092B

Address shipping questions to:

Attn: ☐ Lori Minnick ☐ Other Antonette L. Sanchez

(575) 524-5119 (575) 524-5497

Send Analytical Reports to:

Attn: ☐ Carlyn A. Tufts ☐ Other

carlyn.a.tufts@nasa.gov antonette.l.sanchez@nasa.gov

Special Instructions

Return coolers and reusable packaging materials within 14 as required in statement of work to:

Return Address:

NASA WSTF Environmental Department

12600 NASA Road; Bldg. 120

Las Cruces, NM 88012

Attn: Lori Minnick

Sample No.	Sample Location	# of Containers	Sample Type ( )	Analysis Requirements: Method / Analytes	TPH SW-846 Method 8015C (Modified) GRO	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	TPH SW-846 Method 8015C DRO	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C		Comments
1402271522 *	JP·4·B·02A	2	S					X	X	X		* MATRIX SPIKE 1/4/03 (SP-
1540	JP·4·B·02B	2	S					X	X	X		-01
1600	JP·4·B·02C	2	S					X	X	X		-01

Relinquished By:	Date/Time:	Accepted By:	Date/Time:
	2·27·14 4:20		2/27/14 4:20
	3/3/14 11:20		3-3-14 11:25
			03/04/14 0900 1.4°C

WSTF 381B (03/13)

WSTF CHAIN OF CUSTODY RECORD

Date 2·28·14

Page 1 of

Laboratory / PO # 13EC092B

Address shipping questions to:

Attn: ☐ Lori Minnick ☒ Other Antonette L. Sanchez

(575) 524-5119 (575) 524-5497

Send Analytical Reports to:

Attn: ☐ Carlyn A. Tufts ☒ Other

carlyn.a.tufts@nasa.gov antonette.l.sanchez@nasa.gov

Special Instructions

Return coolers and reusable packaging materials within 14 as required in statement of work to:

Return Address:

NASA WSTF Environmental Department

12600 NASA Road; Bldg. 120

Las Cruces, NM 88012

Attn: Lori Minnick

Sample No.	Sample Location	# of Containers	Sample Type	TPH SW-846 Method 8015C (Modified) GRO	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	TPH SW-846 Method 8015C DRO	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C		Comments
1402280816	JP-4-B-03	2	A		X						1403058 -018
0817	JP-4-B-03	2	A	X							-018
0818	JP-4-B-03	2	A			X					-018
0819	JP-4-B-03	2	A				X				-018
1402280840 *	JP-4-B-03A	2	S				X	X	X		* MATRIX SPIKE -019
0858	JP-4-B-03B	2	S				X	X	X		-020
0925	JP-4-B-03C	2	S				X	X	X		-021
0926 (DUP)	JP-4-B-03C	1	S				X	X	X		ONLY ONE JAR FILLED -022
1005	JP-4-B-04	2	A		X						-023
1006	JP-4-B-04	2	A	X							-023
1007	JP-4-B-04	2	A			X					-023
1008	JP-4-B-04	2	A				X				-023

Relinquished By:	Date/Time:	Accepted By:	Date/Time:
	2·28·14 11:40		2/28/14 11:40
	3/3/14 11:20		3-3-14 11:20
			03/04/14 0900 1.4°C

WSTF 381B (03/13)

WSTF INTERNAL SAMPLE CHAIN OF CUSTODY RECORD

Date: 2-28-14 Page 1 of 1

Sample Location: JP-4-B-04

Pertinent Notes (if any)

Sample Number	# of Containers	Sample Matrix*	TPH 8015C	SVOC PAH	VOC 8260C								
1402281030 (A)	2	S	X	X	X				14 03 058				-024
——— 1045 (B)	2	S	X	X	X								-025
——— 1105 (C)	2	S	X	X	X								-026

Analytical Requirement

Relinquished by:	Date / Time:	Accepted by:	Date / Time:
[signature]	2-28-14 11:40	[signature]	2/28/14 11:40
[signature]	3/3/14 11:20	D.K.	3-3-14 11:25
		[signature]	03/04/14 0900 1.4°c

* Sample Matrix Types: G – Gaseous; A – Aqueous; S – Solid; O – Other: _____

WSTF 381C (03/09)

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 11, 2014

Antonette Sanchez
NASA_WSTF
P.O. Box 20
Las Cruces, NM 88004
TEL: (575) 524-5452
FAX

RE: PO#13EC092B OrderNo.: 1402B25

Dear Antonette Sanchez:

Hall Environmental Analysis Laboratory received 13 sample(s) on 2/28/2014 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-001 **Matrix:** SOIL

Client Sample ID: JP-5-B-02A
Collection Date: 2/26/2014 10:26:00 AM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	4.0	10		mg/Kg	1	3/4/2014 10:13:10 AM	11965
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/4/2014 10:13:10 AM	11965
Surr: DNOP	111	0	66-131		%REC	1	3/4/2014 10:13:10 AM	11965
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	4.8		mg/Kg	1	3/4/2014 6:07:12 PM	11962
Surr: BFB	81.5	0	74.5-129		%REC	1	3/4/2014 6:07:12 PM	11962
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/5/2014 2:28:34 PM	11997
Surr: N-hexadecane	89.9	0	33.8-110		%REC	1	3/5/2014 2:28:34 PM	11997
Surr: Benzo(e)pyrene	108	0	33.3-120		%REC	1	3/5/2014 2:28:34 PM	11997
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.048		mg/Kg	1	3/5/2014 9:11:03 PM	11962
Toluene	ND	0.0053	0.048		mg/Kg	1	3/5/2014 9:11:03 PM	11962
Ethylbenzene	ND	0.0052	0.048		mg/Kg	1	3/5/2014 9:11:03 PM	11962
Xylenes, Total	ND	0.014	0.097		mg/Kg	1	3/5/2014 9:11:03 PM	11962
Surr: Dibromofluoromethane	106	0	70-130		%REC	1	3/5/2014 9:11:03 PM	11962
Surr: 1,2-Dichloroethane-d4	99.3	0	70-130		%REC	1	3/5/2014 9:11:03 PM	11962
Surr: Toluene-d8	82.7	0	70-130		%REC	1	3/5/2014 9:11:03 PM	11962
Surr: 4-Bromofluorobenzene	93.1	0	70-130		%REC	1	3/5/2014 9:11:03 PM	11962

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-002 **Matrix:** SOIL

Client Sample ID: JP-5-B-02B
Collection Date: 2/26/2014 10:56:00 AM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	4.0	10		mg/Kg	1	3/4/2014 11:19:33 AM	11965
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/4/2014 11:19:33 AM	11965
Surr: DNOP	98.0	0	66-131		%REC	1	3/4/2014 11:19:33 AM	11965
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	3/4/2014 7:32:47 PM	11962
Surr: BFB	82.5	0	74.5-129		%REC	1	3/4/2014 7:32:47 PM	11962
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/5/2014 3:38:13 PM	11997
Surr: N-hexadecane	80.0	0	33.8-110		%REC	1	3/5/2014 3:38:13 PM	11997
Surr: Benzo(e)pyrene	105	0	33.3-120		%REC	1	3/5/2014 3:38:13 PM	11997
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0051	0.047		mg/Kg	1	3/5/2014 9:39:44 PM	11962
Toluene	ND	0.0052	0.047		mg/Kg	1	3/5/2014 9:39:44 PM	11962
Ethylbenzene	ND	0.0050	0.047		mg/Kg	1	3/5/2014 9:39:44 PM	11962
Xylenes, Total	ND	0.014	0.094		mg/Kg	1	3/5/2014 9:39:44 PM	11962
Surr: Dibromofluoromethane	102	0	70-130		%REC	1	3/5/2014 9:39:44 PM	11962
Surr: 1,2-Dichloroethane-d4	98.0	0	70-130		%REC	1	3/5/2014 9:39:44 PM	11962
Surr: Toluene-d8	87.4	0	70-130		%REC	1	3/5/2014 9:39:44 PM	11962
Surr: 4-Bromofluorobenzene	97.5	0	70-130		%REC	1	3/5/2014 9:39:44 PM	11962

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-003 **Matrix:** SOIL

Client Sample ID: JP-5-B-02C
Collection Date: 2/26/2014 11:27:00 AM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	9.8		mg/Kg	1	3/4/2014 11:41:33 AM	11965
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	3/4/2014 11:41:33 AM	11965
Surr: DNOP	99.1	0	66-131		%REC	1	3/4/2014 11:41:33 AM	11965
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	4.9		mg/Kg	1	3/4/2014 8:01:18 PM	11962
Surr: BFB	82.9	0	74.5-129		%REC	1	3/4/2014 8:01:18 PM	11962
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/5/2014 4:01:25 PM	11997
Surr: N-hexadecane	78.2	0	33.8-110		%REC	1	3/5/2014 4:01:25 PM	11997
Surr: Benzo(e)pyrene	97.2	0	33.3-120		%REC	1	3/5/2014 4:01:25 PM	11997
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	0.0068	0.0054	0.049	J	mg/Kg	1	3/6/2014 12:32:15 AM	11962
Toluene	ND	0.0054	0.049		mg/Kg	1	3/6/2014 12:32:15 AM	11962
Ethylbenzene	ND	0.0052	0.049		mg/Kg	1	3/6/2014 12:32:15 AM	11962
Xylenes, Total	ND	0.014	0.098		mg/Kg	1	3/6/2014 12:32:15 AM	11962
Surr: Dibromofluoromethane	101	0	70-130		%REC	1	3/6/2014 12:32:15 AM	11962
Surr: 1,2-Dichloroethane-d4	95.3	0	70-130		%REC	1	3/6/2014 12:32:15 AM	11962
Surr: Toluene-d8	89.9	0	70-130		%REC	1	3/6/2014 12:32:15 AM	11962
Surr: 4-Bromofluorobenzene	97.9	0	70-130		%REC	1	3/6/2014 12:32:15 AM	11962

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-004 **Matrix:** AQUEOUS

Client Sample ID: JP-5-B-05
Collection Date: 2/26/2014 2:20:00 PM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	3/3/2014 12:55:02 PM	11966
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	3/3/2014 12:55:02 PM	11966
Surr: DNOP	102	0	62.7-145		%REC	1	3/3/2014 12:55:02 PM	11966
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	3/3/2014 5:13:14 PM	R17069
Surr: BFB	96.0	0	80.4-118		%REC	1	3/3/2014 5:13:14 PM	R17069
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Acenaphthene	ND	0.15	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Fluorene	ND	0.18	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Phenanthrene	ND	0.15	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Fluoranthene	ND	0.13	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Pyrene	ND	0.25	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Chrysene	ND	0.16	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/3/2014 5:11:47 PM	11973
Surr: N-hexadecane	46.2	0	23.5-135		%REC	1	3/3/2014 5:11:47 PM	11973
Surr: Benzo(e)pyrene	73.0	0	28.8-149		%REC	1	3/3/2014 5:11:47 PM	11973
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/6/2014 4:50:34 AM	R17124
Toluene	ND	0.44	1.0		µg/L	1	3/6/2014 4:50:34 AM	R17124
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/6/2014 4:50:34 AM	R17124
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/6/2014 4:50:34 AM	R17124
Surr: 1,2-Dichloroethane-d4	97.0	0	70-130		%REC	1	3/6/2014 4:50:34 AM	R17124
Surr: 4-Bromofluorobenzene	97.4	0	70-130		%REC	1	3/6/2014 4:50:34 AM	R17124
Surr: Dibromofluoromethane	97.7	0	70-130		%REC	1	3/6/2014 4:50:34 AM	R17124
Surr: Toluene-d8	95.6	0	70-130		%REC	1	3/6/2014 4:50:34 AM	R17124

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-005 **Matrix:** SOIL

Client Sample ID: JP-5-B-05A 1442
Collection Date: 2/26/2014 2:42:00 PM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	9.9		mg/Kg	1	3/4/2014 12:03:43 PM	11965
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	3/4/2014 12:03:43 PM	11965
Surr: DNOP	94.3	0	66-131		%REC	1	3/4/2014 12:03:43 PM	11965
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	3/4/2014 10:23:58 PM	11962
Surr: BFB	82.2	0	74.5-129		%REC	1	3/4/2014 10:23:58 PM	11962
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Benzo(k)fluoranthene	ND	0.0080	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Benzo(a)pyrene	ND	0.0075	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/5/2014 4:24:39 PM	11997
Surr: N-hexadecane	88.7	0	33.8-110		%REC	1	3/5/2014 4:24:39 PM	11997
Surr: Benzo(e)pyrene	114	0	33.3-120		%REC	1	3/5/2014 4:24:39 PM	11997
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0052	0.047		mg/Kg	1	3/6/2014 1:01:01 AM	11962
Toluene	ND	0.0052	0.047		mg/Kg	1	3/6/2014 1:01:01 AM	11962
Ethylbenzene	ND	0.0051	0.047		mg/Kg	1	3/6/2014 1:01:01 AM	11962
Xylenes, Total	ND	0.014	0.095		mg/Kg	1	3/6/2014 1:01:01 AM	11962
Surr: Dibromofluoromethane	102	0	70-130		%REC	1	3/6/2014 1:01:01 AM	11962
Surr: 1,2-Dichloroethane-d4	101	0	70-130		%REC	1	3/6/2014 1:01:01 AM	11962
Surr: Toluene-d8	91.7	0	70-130		%REC	1	3/6/2014 1:01:01 AM	11962
Surr: 4-Bromofluorobenzene	92.8	0	70-130		%REC	1	3/6/2014 1:01:01 AM	11962

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-006 **Matrix:** SOIL

Client Sample ID: JP-5-B-05A 1443
Collection Date: 2/26/2014 2:43:00 PM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	10		mg/Kg	1	3/4/2014 12:25:42 PM	11965
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/4/2014 12:25:42 PM	11965
Surr: DNOP	87.5	0	66-131		%REC	1	3/4/2014 12:25:42 PM	11965
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.8		mg/Kg	1	3/4/2014 10:52:30 PM	11962
Surr: BFB	82.6	0	74.5-129		%REC	1	3/4/2014 10:52:30 PM	11962
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/5/2014 4:47:52 PM	11997
Surr: N-hexadecane	77.4	0	33.8-110		%REC	1	3/5/2014 4:47:52 PM	11997
Surr: Benzo(e)pyrene	103	0	33.3-120		%REC	1	3/5/2014 4:47:52 PM	11997
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 1:29:48 AM	11962
Toluene	ND	0.0053	0.048		mg/Kg	1	3/6/2014 1:29:48 AM	11962
Ethylbenzene	ND	0.0051	0.048		mg/Kg	1	3/6/2014 1:29:48 AM	11962
Xylenes, Total	ND	0.014	0.097		mg/Kg	1	3/6/2014 1:29:48 AM	11962
Surr: Dibromofluoromethane	107	0	70-130		%REC	1	3/6/2014 1:29:48 AM	11962
Surr: 1,2-Dichloroethane-d4	103	0	70-130		%REC	1	3/6/2014 1:29:48 AM	11962
Surr: Toluene-d8	88.8	0	70-130		%REC	1	3/6/2014 1:29:48 AM	11962
Surr: 4-Bromofluorobenzene	95.8	0	70-130		%REC	1	3/6/2014 1:29:48 AM	11962

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-007 **Matrix:** SOIL

Client Sample ID: JB-5-B-05B
Collection Date: 2/26/2014 2:58:00 PM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	9.9		mg/Kg	1	3/4/2014 1:09:53 PM	11965
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	3/4/2014 1:09:53 PM	11965
Surr: DNOP	95.7	0	66-131		%REC	1	3/4/2014 1:09:53 PM	11965
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	5.0		mg/Kg	1	3/4/2014 11:21:01 PM	11962
Surr: BFB	82.3	0	74.5-129		%REC	1	3/4/2014 11:21:01 PM	11962
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/5/2014 5:11:06 PM	11997
Surr: N-hexadecane	92.7	0	33.8-110		%REC	1	3/5/2014 5:11:06 PM	11997
Surr: Benzo(e)pyrene	120	0	33.3-120	S	%REC	1	3/5/2014 5:11:06 PM	11997
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0054	0.050		mg/Kg	1	3/6/2014 1:58:32 AM	11962
Toluene	ND	0.0055	0.050		mg/Kg	1	3/6/2014 1:58:32 AM	11962
Ethylbenzene	ND	0.0053	0.050		mg/Kg	1	3/6/2014 1:58:32 AM	11962
Xylenes, Total	ND	0.015	0.099		mg/Kg	1	3/6/2014 1:58:32 AM	11962
Surr: Dibromofluoromethane	104	0	70-130		%REC	1	3/6/2014 1:58:32 AM	11962
Surr: 1,2-Dichloroethane-d4	97.5	0	70-130		%REC	1	3/6/2014 1:58:32 AM	11962
Surr: Toluene-d8	88.8	0	70-130		%REC	1	3/6/2014 1:58:32 AM	11962
Surr: 4-Bromofluorobenzene	93.6	0	70-130		%REC	1	3/6/2014 1:58:32 AM	11962

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-008 **Matrix:** SOIL

Client Sample ID: JP-05-B-05C
Collection Date: 2/26/2014 3:22:00 PM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	4.0	10		mg/Kg	1	3/4/2014 1:32:02 PM	11965
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/4/2014 1:32:02 PM	11965
Surr: DNOP	93.5	0	66-131		%REC	1	3/4/2014 1:32:02 PM	11965
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	5.0		mg/Kg	1	3/4/2014 11:49:30 PM	11962
Surr: BFB	81.3	0	74.5-129		%REC	1	3/4/2014 11:49:30 PM	11962
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/5/2014 5:34:21 PM	11997
Surr: N-hexadecane	74.7	0	33.8-110		%REC	1	3/5/2014 5:34:21 PM	11997
Surr: Benzo(e)pyrene	97.1	0	33.3-120		%REC	1	3/5/2014 5:34:21 PM	11997
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0055	0.050		mg/Kg	1	3/6/2014 2:27:16 AM	11962
Toluene	ND	0.0055	0.050		mg/Kg	1	3/6/2014 2:27:16 AM	11962
Ethylbenzene	ND	0.0053	0.050		mg/Kg	1	3/6/2014 2:27:16 AM	11962
Xylenes, Total	ND	0.015	0.10		mg/Kg	1	3/6/2014 2:27:16 AM	11962
Surr: Dibromofluoromethane	104	0	70-130		%REC	1	3/6/2014 2:27:16 AM	11962
Surr: 1,2-Dichloroethane-d4	101	0	70-130		%REC	1	3/6/2014 2:27:16 AM	11962
Surr: Toluene-d8	88.6	0	70-130		%REC	1	3/6/2014 2:27:16 AM	11962
Surr: 4-Bromofluorobenzene	97.0	0	70-130		%REC	1	3/6/2014 2:27:16 AM	11962

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-009 **Matrix:** AQUEOUS

Client Sample ID: JP-5-B-06
Collection Date: 2/26/2014 8:02:00 AM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	3/3/2014 1:17:05 PM	11966
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	3/3/2014 1:17:05 PM	11966
Surr: DNOP	105	0	62.7-145		%REC	1	3/3/2014 1:17:05 PM	11966
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	3/3/2014 5:43:32 PM	R17069
Surr: BFB	98.0	0	80.4-118		%REC	1	3/3/2014 5:43:32 PM	R17069
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Acenaphthene	ND	0.15	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Fluorene	ND	0.18	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Phenanthrene	ND	0.15	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Fluoranthene	ND	0.13	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Pyrene	ND	0.25	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Chrysene	ND	0.16	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/3/2014 5:34:57 PM	11973
Surr: N-hexadecane	61.4	0	23.5-135		%REC	1	3/3/2014 5:34:57 PM	11973
Surr: Benzo(e)pyrene	88.2	0	28.8-149		%REC	1	3/3/2014 5:34:57 PM	11973
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/6/2014 5:19:12 AM	R17124
Toluene	ND	0.44	1.0		µg/L	1	3/6/2014 5:19:12 AM	R17124
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/6/2014 5:19:12 AM	R17124
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/6/2014 5:19:12 AM	R17124
Surr: 1,2-Dichloroethane-d4	97.4	0	70-130		%REC	1	3/6/2014 5:19:12 AM	R17124
Surr: 4-Bromofluorobenzene	102	0	70-130		%REC	1	3/6/2014 5:19:12 AM	R17124
Surr: Dibromofluoromethane	101	0	70-130		%REC	1	3/6/2014 5:19:12 AM	R17124
Surr: Toluene-d8	92.6	0	70-130		%REC	1	3/6/2014 5:19:12 AM	R17124

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-010 **Matrix:** SOIL

Client Sample ID: JP-5-B-06A
Collection Date: 2/26/2014 8:26:00 AM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	10		mg/Kg	1	3/7/2014 3:58:46 AM	11965
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/7/2014 3:58:46 AM	11965
Surr: DNOP	67.1	0	66-131		%REC	1	3/7/2014 3:58:46 AM	11965
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	3/5/2014 12:17:59 AM	11962
Surr: BFB	81.8	0	74.5-129		%REC	1	3/5/2014 12:17:59 AM	11962
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/5/2014 5:57:35 PM	11997
Surr: N-hexadecane	75.5	0	33.8-110		%REC	1	3/5/2014 5:57:35 PM	11997
Surr: Benzo(e)pyrene	98.0	0	33.3-120		%REC	1	3/5/2014 5:57:35 PM	11997
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0051	0.047		mg/Kg	1	3/6/2014 2:55:58 AM	11962
Toluene	ND	0.0051	0.047		mg/Kg	1	3/6/2014 2:55:58 AM	11962
Ethylbenzene	ND	0.0050	0.047		mg/Kg	1	3/6/2014 2:55:58 AM	11962
Xylenes, Total	ND	0.014	0.093		mg/Kg	1	3/6/2014 2:55:58 AM	11962
Surr: Dibromofluoromethane	106	0	70-130		%REC	1	3/6/2014 2:55:58 AM	11962
Surr: 1,2-Dichloroethane-d4	101	0	70-130		%REC	1	3/6/2014 2:55:58 AM	11962
Surr: Toluene-d8	89.1	0	70-130		%REC	1	3/6/2014 2:55:58 AM	11962
Surr: 4-Bromofluorobenzene	94.3	0	70-130		%REC	1	3/6/2014 2:55:58 AM	11962

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-011 **Matrix:** SOIL

Client Sample ID: JP-5-B-06-B
Collection Date: 2/26/2014 8:55:00 AM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	9.9		mg/Kg	1	3/4/2014 2:16:07 PM	11965
Motor Oil Range Organics (MRO)	ND	49	49		mg/Kg	1	3/4/2014 2:16:07 PM	11965
Surr: DNOP	66.4	0	66-131		%REC	1	3/4/2014 2:16:07 PM	11965
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	3/5/2014 12:46:26 AM	11962
Surr: BFB	82.4	0	74.5-129		%REC	1	3/5/2014 12:46:26 AM	11962
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/5/2014 6:20:49 PM	11997
Surr: N-hexadecane	96.5	0	33.8-110		%REC	1	3/5/2014 6:20:49 PM	11997
Surr: Benzo(e)pyrene	112	0	33.3-120		%REC	1	3/5/2014 6:20:49 PM	11997
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0052	0.047		mg/Kg	1	3/6/2014 3:24:38 AM	11962
Toluene	ND	0.0052	0.047		mg/Kg	1	3/6/2014 3:24:38 AM	11962
Ethylbenzene	ND	0.0050	0.047		mg/Kg	1	3/6/2014 3:24:38 AM	11962
Xylenes, Total	ND	0.014	0.094		mg/Kg	1	3/6/2014 3:24:38 AM	11962
Surr: Dibromofluoromethane	107	0	70-130		%REC	1	3/6/2014 3:24:38 AM	11962
Surr: 1,2-Dichloroethane-d4	98.1	0	70-130		%REC	1	3/6/2014 3:24:38 AM	11962
Surr: Toluene-d8	89.9	0	70-130		%REC	1	3/6/2014 3:24:38 AM	11962
Surr: 4-Bromofluorobenzene	93.3	0	70-130		%REC	1	3/6/2014 3:24:38 AM	11962

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-012 **Matrix:** SOIL

Client Sample ID: JP-5-B-06-C
Collection Date: 2/26/2014 9:27:00 AM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	9.9		mg/Kg	1	3/4/2014 5:08:27 PM	11965
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/4/2014 5:08:27 PM	11965
Surr: DNOP	69.6	0	66-131		%REC	1	3/4/2014 5:08:27 PM	11965
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.8	4.6		mg/Kg	1	3/5/2014 1:15:01 AM	11962
Surr: BFB	81.7	0	74.5-129		%REC	1	3/5/2014 1:15:01 AM	11962
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/5/2014 6:44:00 PM	11997
Surr: N-hexadecane	101	0	33.8-110		%REC	1	3/5/2014 6:44:00 PM	11997
Surr: Benzo(e)pyrene	122	0	33.3-120	S	%REC	1	3/5/2014 6:44:00 PM	11997
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0050	0.046		mg/Kg	1	3/6/2014 3:53:17 AM	11962
Toluene	ND	0.0051	0.046		mg/Kg	1	3/6/2014 3:53:17 AM	11962
Ethylbenzene	ND	0.0049	0.046		mg/Kg	1	3/6/2014 3:53:17 AM	11962
Xylenes, Total	ND	0.014	0.092		mg/Kg	1	3/6/2014 3:53:17 AM	11962
Surr: Dibromofluoromethane	99.8	0	70-130		%REC	1	3/6/2014 3:53:17 AM	11962
Surr: 1,2-Dichloroethane-d4	96.7	0	70-130		%REC	1	3/6/2014 3:53:17 AM	11962
Surr: Toluene-d8	93.5	0	70-130		%REC	1	3/6/2014 3:53:17 AM	11962
Surr: 4-Bromofluorobenzene	94.7	0	70-130		%REC	1	3/6/2014 3:53:17 AM	11962

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402B25-013 **Matrix:** AQUEOUS

Client Sample ID: JP-5-B-02
Collection Date: 2/26/2014 10:08:00 AM
Received Date: 2/28/2014 9:45:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	3/3/2014 1:39:14 PM	11966
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	3/3/2014 1:39:14 PM	11966
Surr: DNOP	102	0	62.7-145		%REC	1	3/3/2014 1:39:14 PM	11966
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	3/3/2014 6:13:47 PM	R17069
Surr: BFB	96.0	0	80.4-118		%REC	1	3/3/2014 6:13:47 PM	R17069
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Acenaphthene	ND	0.15	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Fluorene	ND	0.18	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Phenanthrene	ND	0.15	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Fluoranthene	ND	0.13	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Pyrene	ND	0.25	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Chrysene	ND	0.16	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/3/2014 5:58:09 PM	11973
Surr: N-hexadecane	58.1	0	23.5-135		%REC	1	3/3/2014 5:58:09 PM	11973
Surr: Benzo(e)pyrene	87.2	0	28.8-149		%REC	1	3/3/2014 5:58:09 PM	11973
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/6/2014 5:47:48 AM	R17124
Toluene	ND	0.44	1.0		µg/L	1	3/6/2014 5:47:48 AM	R17124
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/6/2014 5:47:48 AM	R17124
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/6/2014 5:47:48 AM	R17124
Surr: 1,2-Dichloroethane-d4	99.1	0	70-130		%REC	1	3/6/2014 5:47:48 AM	R17124
Surr: 4-Bromofluorobenzene	98.8	0	70-130		%REC	1	3/6/2014 5:47:48 AM	R17124
Surr: Dibromofluoromethane	101	0	70-130		%REC	1	3/6/2014 5:47:48 AM	R17124
Surr: Toluene-d8	95.8	0	70-130		%REC	1	3/6/2014 5:47:48 AM	R17124

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **MB-11965** SampType: **MBLK** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **11965** RunNo: **17073**
Prep Date: **3/3/2014** Analysis Date: **3/4/2014** SeqNo: **491074** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.5		10.00		95.2	66	131			

Sample ID **LCS-11965** SampType: **LCS** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **11965** RunNo: **17073**
Prep Date: **3/3/2014** Analysis Date: **3/4/2014** SeqNo: **491080** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	47	10	50.00	0	94.4	60.8	145			
Surr: DNOP	3.6		5.000		71.3	66	131			

Sample ID **1402B25-001AMS** SampType: **MS** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **JP-5-B-02A** Batch ID: **11965** RunNo: **17073**
Prep Date: **3/3/2014** Analysis Date: **3/4/2014** SeqNo: **491180** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	55	10	50.00	0	111	47.4	148			
Surr: DNOP	5.1		5.000		103	66	131			

Sample ID **1402B25-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **JP-5-B-02A** Batch ID: **11965** RunNo: **17073**
Prep Date: **3/3/2014** Analysis Date: **3/4/2014** SeqNo: **491201** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	53	9.8	49.21	0	107	47.4	148	4.57	22.7	
Surr: DNOP	4.9		4.921		99.8	66	131	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID	**MB-11966**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Diesel Range**				
Client ID:	**PBW**	Batch ID:	**11966**	RunNo:	**17043**				
Prep Date:	**3/3/2014**	Analysis Date:	**3/3/2014**	SeqNo:	**490476**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.0		1.000		102	62.7	145			

Sample ID	**LCS-11966**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Diesel Range**				
Client ID:	**LCSW**	Batch ID:	**11966**	RunNo:	**17043**				
Prep Date:	**3/3/2014**	Analysis Date:	**3/3/2014**	SeqNo:	**490480**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.2	1.0	5.000	0	124	78.6	146			
Surr: DNOP	0.52		0.5000		105	62.7	145			

Sample ID	**LCSD-11966**	SampType:	**LCSD**	TestCode:	**EPA Method 8015D: Diesel Range**				
Client ID:	**LCSS02**	Batch ID:	**11966**	RunNo:	**17043**				
Prep Date:	**3/3/2014**	Analysis Date:	**3/3/2014**	SeqNo:	**490481**	Units:	**mg/L**		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.4	1.0	5.000	0	128	78.6	146	2.93	26.5	
Surr: DNOP	0.54		0.5000		107	62.7	145	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **MB-11962** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **11962** RunNo: **17086**
Prep Date: **2/28/2014** Analysis Date: **3/4/2014** SeqNo: **491635** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	810		1000		80.6	74.5	129			

Sample ID **LCS-11962** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **11962** RunNo: **17086**
Prep Date: **2/28/2014** Analysis Date: **3/4/2014** SeqNo: **491636** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	25.00	0	109	71.7	134			
Surr: BFB	920		1000		91.5	74.5	129			

Sample ID **1402B25-001AMS** SampType: **MS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **JP-5-B-02A** Batch ID: **11962** RunNo: **17086**
Prep Date: **2/28/2014** Analysis Date: **3/4/2014** SeqNo: **491638** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	21	4.9	24.32	0	84.6	69.5	145			
Surr: BFB	870		972.8		89.3	74.5	129			

Sample ID **1402B25-001AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **JP-5-B-02A** Batch ID: **11962** RunNo: **17086**
Prep Date: **2/28/2014** Analysis Date: **3/4/2014** SeqNo: **491639** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	24	4.9	24.30	0	98.4	69.5	145	15.0	20	
Surr: BFB	860		971.8		88.1	74.5	129	0	0	

Sample ID **MB-11984** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **11984** RunNo: **17086**
Prep Date: **3/3/2014** Analysis Date: **3/4/2014** SeqNo: **491651** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	810		1000		81.3	74.5	129			

Sample ID **LCS-11984** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **11984** RunNo: **17086**
Prep Date: **3/3/2014** Analysis Date: **3/4/2014** SeqNo: **491652** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: BFB	890		1000		88.7	74.5	129			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**PBW**	Batch ID:	**R17069**	RunNo:	**17069**
Prep Date:		Analysis Date:	**3/3/2014**	SeqNo:	**490943** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	19		20.00		95.3	80.4	118			

Sample ID	**2.5UG GRO LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**
Client ID:	**LCSW**	Batch ID:	**R17069**	RunNo:	**17069**
Prep Date:		Analysis Date:	**3/3/2014**	SeqNo:	**490944** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.50	0.050	0.5000	0	100	80	120			
Surr: BFB	21		20.00		103	80.4	118			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **mb-11962** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS** Batch ID: **11962** RunNo: **17124**
Prep Date: **2/28/2014** Analysis Date: **3/5/2014** SeqNo: **492384** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0066	0.050								J
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.53		0.5000		106	70	130			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		98.9	70	130			
Surr: Toluene-d8	0.45		0.5000		90.4	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.1	70	130			

Sample ID **lcs-11962** SampType: **LCS** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS** Batch ID: **11962** RunNo: **17124**
Prep Date: **2/28/2014** Analysis Date: **3/5/2014** SeqNo: **492385** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.050	1.000	0	111	70	130			
Toluene	0.91	0.050	1.000	0	90.5	60.1	120			
Surr: Dibromofluoromethane	0.51		0.5000		101	70	130			
Surr: 1,2-Dichloroethane-d4	0.48		0.5000		96.9	70	130			
Surr: Toluene-d8	0.44		0.5000		88.9	70	130			
Surr: 4-Bromofluorobenzene	0.51		0.5000		101	70	130			

Sample ID **1402b25-002ams** SampType: **MS** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **JP-5-B-02B** Batch ID: **11962** RunNo: **17124**
Prep Date: **2/28/2014** Analysis Date: **3/5/2014** SeqNo: **492388** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.047	0.9407	0	97.4	62.6	140			
Toluene	0.79	0.047	0.9407	0	83.6	66.3	136			
Surr: Dibromofluoromethane	0.50		0.4704		106	70	130			
Surr: 1,2-Dichloroethane-d4	0.47		0.4704		99.3	70	130			
Surr: Toluene-d8	0.41		0.4704		86.9	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.4704		97.4	70	130			

Sample ID **1402b25-002amsd** SampType: **MSD** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **JP-5-B-02B** Batch ID: **11962** RunNo: **17124**
Prep Date: **2/28/2014** Analysis Date: **3/6/2014** SeqNo: **492389** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.74	0.047	0.9398	0	78.9	62.6	140	21.1	20	R
Toluene	0.78	0.047	0.9398	0	82.6	66.3	136	1.28	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **1402b25-002amsd** SampType: **MSD** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **JP-5-B-02B** Batch ID: **11962** RunNo: **17124**
Prep Date: **2/28/2014** Analysis Date: **3/6/2014** SeqNo: **492389** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	0.47		0.4699		101	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.46		0.4699		98.2	70	130	0	0	
Surr: Toluene-d8	0.43		0.4699		90.6	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.45		0.4699		96.2	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **5mL rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R17124**	RunNo: **17124**
Prep Date:	Analysis Date: **3/5/2014**	SeqNo: **492356** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		112	70	130			
Surr: Dibromofluoromethane	11		10.00		107	70	130			
Surr: Toluene-d8	10		10.00		99.9	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R17124**	RunNo: **17124**
Prep Date:	Analysis Date: **3/5/2014**	SeqNo: **492358** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	114	70	130			
Toluene	21	1.0	20.00	0	104	82.2	124			
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **mb-11997** SampType: **MBLK** TestCode: **EPA Method 8270C: PAHs**
Client ID: **PBS** Batch ID: **11997** RunNo: **17115**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492331** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.020								
1-Methylnaphthalene	ND	0.020								
2-Methylnaphthalene	ND	0.020								
Acenaphthylene	ND	0.020								
Acenaphthene	ND	0.020								
Fluorene	ND	0.020								
Phenanthrene	ND	0.020								
Anthracene	ND	0.020								
Fluoranthene	ND	0.020								
Pyrene	ND	0.020								
Benz(a)anthracene	ND	0.020								
Chrysene	ND	0.020								
Benzo(b)fluoranthene	ND	0.020								
Benzo(k)fluoranthene	ND	0.020								
Benzo(a)pyrene	ND	0.020								
Dibenz(a,h)anthracene	ND	0.020								
Benzo(g,h,i)perylene	ND	0.020								
Indeno(1,2,3-cd)pyrene	ND	0.020								
Surr: N-hexadecane	1.1		1.460		74.3	33.8	110			
Surr: Benzo(e)pyrene	0.31		0.3300		94.6	33.3	120			

Sample ID **lcs-11997** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS** Batch ID: **11997** RunNo: **17115**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492332** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.31	0.020	0.3300	0	94.6	42.5	118			
1-Methylnaphthalene	0.32	0.020	0.3300	0	98.2	43.5	122			
2-Methylnaphthalene	0.32	0.020	0.3300	0	95.6	41.1	122			
Acenaphthylene	0.30	0.020	0.3300	0	90.0	49.4	121			
Acenaphthene	0.29	0.020	0.3300	0	89.2	47.5	125			
Fluorene	0.31	0.020	0.3300	0	92.5	49.1	120			
Phenanthrene	0.31	0.020	0.3300	0	93.0	42.3	130			
Anthracene	0.30	0.020	0.3300	0	92.2	42.9	130			
Fluoranthene	0.32	0.020	0.3300	0	95.9	37	134			
Pyrene	0.31	0.020	0.3300	0	94.7	46.4	126			
Benz(a)anthracene	0.30	0.020	0.3300	0	89.9	50.6	126			
Chrysene	0.32	0.020	0.3300	0	97.0	36.8	123			
Benzo(b)fluoranthene	0.30	0.020	0.3300	0	91.6	47.2	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **lcs-11997** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS** Batch ID: **11997** RunNo: **17115**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492332** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	0.32	0.020	0.3300	0	98.0	40	122			
Benzo(a)pyrene	0.31	0.020	0.3300	0	93.1	44	118			
Dibenz(a,h)anthracene	0.30	0.020	0.3300	0	91.7	53.3	131			
Benzo(g,h,i)perylene	0.31	0.020	0.3300	0	95.1	46.7	129			
Indeno(1,2,3-cd)pyrene	0.31	0.020	0.3300	0	94.3	52	126			
Surr: N-hexadecane	1.3		1.460		89.0	33.8	110			
Surr: Benzo(e)pyrene	0.38		0.3300		116	33.3	120			

Sample ID **1402B25-001Bms** SampType: **MS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-5-B-02A** Batch ID: **11997** RunNo: **17115**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492343** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.30	0.020	0.3296	0	90.4	39.8	108			
1-Methylnaphthalene	0.33	0.020	0.3296	0	102	42.1	116			
2-Methylnaphthalene	0.32	0.020	0.3296	0	97.5	34.8	122			
Acenaphthylene	0.30	0.020	0.3296	0	91.6	54.3	107			
Acenaphthene	0.33	0.020	0.3296	0	99.2	50.2	114			
Fluorene	0.33	0.020	0.3296	0	98.7	55.3	107			
Phenanthrene	0.31	0.020	0.3296	0	95.1	54.7	118			
Anthracene	0.31	0.020	0.3296	0	95.2	54.9	116			
Fluoranthene	0.32	0.020	0.3296	0	95.9	55.2	119			
Pyrene	0.32	0.020	0.3296	0	97.8	60.2	115			
Benz(a)anthracene	0.32	0.020	0.3296	0	96.6	61.9	120			
Chrysene	0.33	0.020	0.3296	0	101	42.5	117			
Benzo(b)fluoranthene	0.36	0.020	0.3296	0	108	57.4	124			
Benzo(k)fluoranthene	0.33	0.020	0.3296	0	102	52.6	107			
Benzo(a)pyrene	0.33	0.020	0.3296	0	101	55.7	106			
Dibenz(a,h)anthracene	0.35	0.020	0.3296	0	107	51.8	130			
Benzo(g,h,i)perylene	0.34	0.020	0.3296	0	103	59.2	114			
Indeno(1,2,3-cd)pyrene	0.34	0.020	0.3296	0	104	56.8	120			
Surr: N-hexadecane	1.3		1.458		85.8	33.8	110			
Surr: Benzo(e)pyrene	0.39		0.3296		117	33.3	120			

Sample ID **1402B25-001Bmsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-5-B-02A** Batch ID: **11997** RunNo: **17115**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492344** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.33	0.020	0.3301	0	98.6	39.8	108	8.82	29.7	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **1402B25-001Bmsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-5-B-02A** Batch ID: **11997** RunNo: **17115**
Prep Date: **3/4/2014** Analysis Date: **3/5/2014** SeqNo: **492344** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1-Methylnaphthalene	0.34	0.020	0.3301	0	102	42.1	116	0.465	20	
2-Methylnaphthalene	0.32	0.020	0.3301	0	96.0	34.8	122	1.40	21.2	
Acenaphthylene	0.33	0.020	0.3301	0	99.8	54.3	107	8.72	20	
Acenaphthene	0.36	0.020	0.3301	0	108	50.2	114	8.56	20.5	
Fluorene	0.34	0.020	0.3301	0	102	55.3	107	3.49	20	
Phenanthrene	0.31	0.020	0.3301	0	94.4	54.7	118	0.473	22	
Anthracene	0.33	0.020	0.3301	0	98.8	54.9	116	3.92	26.6	
Fluoranthene	0.37	0.020	0.3301	0	111	55.2	119	14.5	23.7	
Pyrene	0.32	0.020	0.3301	0	97.2	60.2	115	0.455	29.3	
Benz(a)anthracene	0.32	0.020	0.3301	0	97.3	61.9	120	0.896	25.4	
Chrysene	0.32	0.020	0.3301	0	96.9	42.5	117	4.42	27.6	
Benzo(b)fluoranthene	0.35	0.020	0.3301	0	107	57.4	124	0.302	20	
Benzo(k)fluoranthene	0.36	0.020	0.3301	0	108	52.6	107	6.05	31.3	S
Benzo(a)pyrene	0.32	0.020	0.3301	0	96.6	55.7	106	4.33	22.1	
Dibenz(a,h)anthracene	0.34	0.020	0.3301	0	104	51.8	130	3.28	21.2	
Benzo(g,h,i)perylene	0.32	0.020	0.3301	0	98.4	59.2	114	4.05	25.9	
Indeno(1,2,3-cd)pyrene	0.33	0.020	0.3301	0	99.5	56.8	120	4.40	20.4	
Surr: N-hexadecane	1.3		1.460		87.2	33.8	110	0	0	
Surr: Benzo(e)pyrene	0.38		0.3301		115	33.3	120	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **mb-11973** SampType: **MBLK** TestCode: **EPA Method 8270C: PAHs**
Client ID: **PBW** Batch ID: **11973** RunNo: **17072**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **491057** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.50								
1-Methylnaphthalene	ND	0.50								
2-Methylnaphthalene	ND	0.50								
Acenaphthylene	ND	0.50								
Acenaphthene	ND	0.50								
Fluorene	ND	0.50								
Phenanthrene	ND	0.50								
Anthracene	ND	0.50								
Fluoranthene	ND	0.50								
Pyrene	ND	0.50								
Benz(a)anthracene	ND	0.50								
Chrysene	ND	0.50								
Benzo(b)fluoranthene	ND	0.50								
Benzo(k)fluoranthene	ND	0.50								
Benzo(a)pyrene	ND	0.50								
Dibenz(a,h)anthracene	ND	0.50								
Benzo(g,h,i)perylene	ND	0.50								
Indeno(1,2,3-cd)pyrene	ND	0.50								
Surr: N-hexadecane	70		87.60		79.3	23.5	135			
Surr: Benzo(e)pyrene	25		20.00		125	28.8	149			

Sample ID **lcs-11973** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSW** Batch ID: **11973** RunNo: **17072**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **491058** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	19	0.50	20.00	0	97.4	43.1	99.5			
1-Methylnaphthalene	20	0.50	20.00	0	101	44.3	107			
2-Methylnaphthalene	22	0.50	20.00	0	108	42.2	102			S
Acenaphthylene	18	0.50	20.00	0	91.7	46.3	109			
Acenaphthene	19	0.50	20.00	0	94.5	47.4	111			
Fluorene	19	0.50	20.00	0	95.2	46.2	106			
Phenanthrene	19	0.50	20.00	0	93.2	48.7	115			
Anthracene	19	0.50	20.00	0	94.0	47.8	113			
Fluoranthene	20	0.50	20.00	0	102	46.7	110			
Pyrene	20	0.50	20.00	0	101	48.4	108			
Benz(a)anthracene	20	0.50	20.00	0	99.5	42.9	118			
Chrysene	20	0.50	20.00	0	100	28.8	117			
Benzo(b)fluoranthene	22	0.50	20.00	0	110	47.3	110			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402B25**
11-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **lcs-11973** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSW** Batch ID: **11973** RunNo: **17072**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **491058** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	21	0.50	20.00	0	106	46	113			
Benzo(a)pyrene	22	0.50	20.00	0	108	53.1	96.1			S
Dibenz(a,h)anthracene	22	0.50	20.00	0	108	44.3	115			
Benzo(g,h,i)perylene	20	0.50	20.00	0	101	44.4	121			
Indeno(1,2,3-cd)pyrene	21	0.50	20.00	0	107	47.5	115			
Surr: N-hexadecane	69		87.60		78.5	23.5	135			
Surr: Benzo(e)pyrene	25		20.00		124	28.8	149			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: NASA_WSTF Work Order Number: 1402B25 RcptNo: 1

Received by/date: AT 02/28/14

Logged By: Anne Thorne 2/28/2014 9:45:00 AM Anne Thorne

Completed By: Anne Thorne 2/28/2014 Anne Thorne

Reviewed By: 02/28/14

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☑ No ☐ Not Present ☐
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? FedEx

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☑ No ☐ No VOA Vials ☐
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

WSTF CHAIN OF CUSTODY RECORD

Date 2.26.14

Page 1 of

Laboratory / PO # 13EC092B

Address shipping questions to:

Attn: ☐ Lori Minnick ☐ Other Antonette L. Sanchez

(575) 524-5119 (575) 524-5497

Send Analytical Reports to:

Attn: ☐ Carlyn A. Tufts ☐ Other

carlyn.a.tufts@nasa.gov antonette.l.sanchez@nasa.gov

Analysis Requirements

Sample No.	Sample Location	# of Containers	Sample Type	TPH SW-846 Method 8015C (Modified)	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	TPH SW-846 Method 8015C	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C		Comments
1402261086 •	JP.5.B.02A	2	S				X	X	X		1402B25 -001
1402261056 •	JP.5.B.02B	2	S				X	X	X		-002
1402261127 •	JP.5.B.02C	2	S				X	X	X		-003
1402261420 ✓	JP.5.B.05	2	A		X						-004
— 1421 ✓	JP.5.B.05	2	A	X							-004
— 1422 ✓	JP.5.B.05	2	A			X					-004
— 1423 ✓	JP.5.B.05	2	A				X				-004
— 1442 •	JP.5.B.05A	2	S				X	X	X		-005
— 1443 •	JP.5.B.05A	2	S				X	X	X		-006
— 1458 •	JP.5.B.05B	2	S				X	X	X		-007
— 1522 •	JP.5.B.05C	2	S				X	X	X		-008

Special Instructions

Return coolers and reusable packaging materials within 14 day as required in statement of work to:

Return Address:

NASA WSTF Environmental Department

12600 NASA Road; Bldg. 120

Las Cruces, NM 88012

Attn: Lori Minnick

Relinquished By:	Date/Time:	Accepted By:	Date/Time:
[signature]	2/27/14 13:15	[signature]	2-27-14 12:17
			02/28/14 0945 1.0

WSTF 381B (03/13)

WSTF CHAIN OF CUSTODY RECORD

Date 2·26·14

Laboratory / PO # 13EC092B

Address shipping questions to:

Attn: ☐ Lori Minnick ☐ Other Antonette L. Sanchez

(575) 524-5119 (575) 524- 5497

Send Analytical Reports to:

Attn: ☐ Carlyn A. Tufts ☐ Other

carlyn.a.tufts@nasa.gov antonette.l.sanchez@nasa.gov

Analysis Requirements

Special Instructions

Return coolers and reusable packaging materials within 14 day as required in statement of work to:

Return Address:

NASA WSTF Environmental Department

12600 NASA Road; Bldg. 120

Las Cruces, NM 88012

Attn: Lori Minnick

Sample No.	Sample Location	# of Containers	Sample Type	TPH SW-846 Method 8015C (Modified)	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	TPH SW-846 Method 8015C	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	Comments
1402260802 ✓	JP·5·B·06	2	A		X					1402B25 -0089
—— 0803 ✓	JP·5·B·06	2	A	X						-0089
—— 0804 ✓	JP·5·B·06	2	A			X				-0089
—— 0805 ✓	JP·5·B·06	2	A				X			-0089
—— 0826 *	JP·5·B·06·A	2	S				X	X	X	~~-009~~ -010
—— 0855 *	JP·5·B·06·B	2	S				X	X	X	~~-010~~ -011
—— 0927 *	JP·5·B·06·C	2	S				X	X	X	~~-011~~ -012
—— 1008 ✓	JP·5·B·02	2	A		X					~~-012~~ -013
—— 1009 ✓	JP·5·B·02	2	A	X						~~-012~~ -013
—— 1010 ✓	JP·5·B·02	2	A			X				~~-012~~ -013
—— 1011 ✓	JP·5·B·02	2	A				X			~~-012~~ -013

Relinquished By:	Date/Time:	Accepted By:	Date/Time:
	2·26·14 13:14	2/26/14 13:14	
	2/27/14 13:15	2-27-14 1247	
			02/28/14 0945 1.0°

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 05, 2014

Antonette Sanchez
NASA_WSTF
P.O. Box 20
Las Cruces, NM 88004
TEL: (575) 524-5452
FAX

RE: PO#13EC092B OrderNo.: 1402A54

Dear Antonette Sanchez:

Hall Environmental Analysis Laboratory received 12 sample(s) on 2/27/2014 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-001 **Matrix:** AQUEOUS

Client Sample ID: JP-5-B-04
Collection Date: 2/24/2014 3:39:00 PM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	2/28/2014 4:26:23 PM	11935
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	2/28/2014 4:26:23 PM	11935
Surr: DNOP	110	0	62.7-145		%REC	1	2/28/2014 4:26:23 PM	11935
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	2/27/2014 5:05:26 PM	R17017
Surr: BFB	97.6	0	80.4-118		%REC	1	2/27/2014 5:05:26 PM	R17017
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
1-Methylnaphthalene	0.22	0.17	0.50	J	µg/L	1	3/3/2014 3:15:46 PM	11973
2-Methylnaphthalene	0.20	0.16	0.50	J	µg/L	1	3/3/2014 3:15:46 PM	11973
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Acenaphthene	0.34	0.15	0.50	J	µg/L	1	3/3/2014 3:15:46 PM	11973
Fluorene	0.30	0.18	0.50	J	µg/L	1	3/3/2014 3:15:46 PM	11973
Phenanthrene	0.18	0.15	0.50	J	µg/L	1	3/3/2014 3:15:46 PM	11973
Anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Fluoranthene	ND	0.13	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Pyrene	ND	0.25	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Chrysene	ND	0.16	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/3/2014 3:15:46 PM	11973
Surr: N-hexadecane	49.8	0	23.5-135		%REC	1	3/3/2014 3:15:46 PM	11973
Surr: Benzo(e)pyrene	73.1	0	28.8-149		%REC	1	3/3/2014 3:15:46 PM	11973
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/3/2014 11:58:55 AM	R17056
Toluene	ND	0.44	1.0		µg/L	1	3/3/2014 11:58:55 AM	R17056
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/3/2014 11:58:55 AM	R17056
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/3/2014 11:58:55 AM	R17056
Surr: 1,2-Dichloroethane-d4	96.5	0	70-130		%REC	1	3/3/2014 11:58:55 AM	R17056
Surr: 4-Bromofluorobenzene	104	0	70-130		%REC	1	3/3/2014 11:58:55 AM	R17056
Surr: Dibromofluoromethane	99.4	0	70-130		%REC	1	3/3/2014 11:58:55 AM	R17056
Surr: Toluene-d8	103	0	70-130		%REC	1	3/3/2014 11:58:55 AM	R17056

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-002 **Matrix:** SOIL

Client Sample ID: JP-5-B-04
Collection Date: 2/24/2014 3:58:00 PM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	9.9		mg/Kg	1	2/28/2014 10:57:13 AM	11934
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	2/28/2014 10:57:13 AM	11934
Surr: DNOP	84.0	0	66-131		%REC	1	2/28/2014 10:57:13 AM	11934
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	2/28/2014 10:56:32 AM	11937
Surr: BFB	81.6	0	74.5-129		%REC	1	2/28/2014 10:56:32 AM	11937
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/3/2014 10:14:18 AM	11939
Surr: N-hexadecane	73.1	0	33.8-110		%REC	1	3/3/2014 10:14:18 AM	11939
Surr: Benzo(e)pyrene	102	0	33.3-120		%REC	1	3/3/2014 10:14:18 AM	11939
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	0.0076	0.0021	0.047	J	mg/Kg	1	3/3/2014 5:43:32 PM	11937
Toluene	ND	0.0030	0.047		mg/Kg	1	3/3/2014 5:43:32 PM	11937
Ethylbenzene	ND	0.0027	0.047		mg/Kg	1	3/3/2014 5:43:32 PM	11937
Xylenes, Total	ND	0.057	0.095		mg/Kg	1	3/3/2014 5:43:32 PM	11937
Surr: Dibromofluoromethane	106	0	70-130		%REC	1	3/3/2014 5:43:32 PM	11937
Surr: 1,2-Dichloroethane-d4	101	0	70-130		%REC	1	3/3/2014 5:43:32 PM	11937
Surr: Toluene-d8	87.7	0	70-130		%REC	1	3/3/2014 5:43:32 PM	11937
Surr: 4-Bromofluorobenzene	98.8	0	70-130		%REC	1	3/3/2014 5:43:32 PM	11937

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-003 **Matrix:** SOIL

Client Sample ID: JP-5-B-04B
Collection Date: 2/25/2014 9:44:00 AM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	4.5	3.9	9.9	J	mg/Kg	1	2/28/2014 12:28:20 PM	11934
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	2/28/2014 12:28:20 PM	11934
Surr: DNOP	82.8	0	66-131		%REC	1	2/28/2014 12:28:20 PM	11934
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.8		mg/Kg	1	2/28/2014 1:47:55 PM	11937
Surr: BFB	82.0	0	74.5-129		%REC	1	2/28/2014 1:47:55 PM	11937
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/3/2014 10:37:26 AM	11939
Surr: N-hexadecane	67.7	0	33.8-110		%REC	1	3/3/2014 10:37:26 AM	11939
Surr: Benzo(e)pyrene	86.5	0	33.3-120		%REC	1	3/3/2014 10:37:26 AM	11939
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	0.0071	0.0021	0.048	J	mg/Kg	1	3/3/2014 6:12:17 PM	11937
Toluene	ND	0.0030	0.048		mg/Kg	1	3/3/2014 6:12:17 PM	11937
Ethylbenzene	ND	0.0027	0.048		mg/Kg	1	3/3/2014 6:12:17 PM	11937
Xylenes, Total	ND	0.057	0.095		mg/Kg	1	3/3/2014 6:12:17 PM	11937
Surr: Dibromofluoromethane	107	0	70-130		%REC	1	3/3/2014 6:12:17 PM	11937
Surr: 1,2-Dichloroethane-d4	102	0	70-130		%REC	1	3/3/2014 6:12:17 PM	11937
Surr: Toluene-d8	96.4	0	70-130		%REC	1	3/3/2014 6:12:17 PM	11937
Surr: 4-Bromofluorobenzene	94.1	0	70-130		%REC	1	3/3/2014 6:12:17 PM	11937

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-004 **Matrix:** SOIL

Client Sample ID: JP-5-B-04-C
Collection Date: 2/25/2014 10:20:00 AM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	10		mg/Kg	1	3/3/2014 9:09:20 AM	11934
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/3/2014 9:09:20 AM	11934
Surr: DNOP	103	0	66-131		%REC	1	3/3/2014 9:09:20 AM	11934
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	4.9		mg/Kg	1	2/28/2014 5:36:21 PM	11937
Surr: BFB	82.6	0	74.5-129		%REC	1	2/28/2014 5:36:21 PM	11937
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Pyrene	0.0067	0.0049	0.020	J	mg/Kg	1	3/3/2014 11:46:58 AM	11939
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/3/2014 11:46:58 AM	11939
Surr: N-hexadecane	71.1	0	33.8-110		%REC	1	3/3/2014 11:46:58 AM	11939
Surr: Benzo(e)pyrene	98.9	0	33.3-120		%REC	1	3/3/2014 11:46:58 AM	11939
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	0.0076	0.0022	0.049	J	mg/Kg	1	3/3/2014 7:38:40 PM	11937
Toluene	0.0043	0.0031	0.049	J	mg/Kg	1	3/3/2014 7:38:40 PM	11937
Ethylbenzene	ND	0.0028	0.049		mg/Kg	1	3/3/2014 7:38:40 PM	11937
Xylenes, Total	ND	0.059	0.099		mg/Kg	1	3/3/2014 7:38:40 PM	11937
Surr: Dibromofluoromethane	105	0	70-130		%REC	1	3/3/2014 7:38:40 PM	11937
Surr: 1,2-Dichloroethane-d4	102	0	70-130		%REC	1	3/3/2014 7:38:40 PM	11937
Surr: Toluene-d8	87.6	0	70-130		%REC	1	3/3/2014 7:38:40 PM	11937
Surr: 4-Bromofluorobenzene	97.7	0	70-130		%REC	1	3/3/2014 7:38:40 PM	11937

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-005 **Matrix:** AQUEOUS

Client Sample ID: JP-5-B-03
Collection Date: 2/25/2014 10:59:00 AM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	2/28/2014 4:48:46 PM	11935
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	2/28/2014 4:48:46 PM	11935
Surr: DNOP	116	0	62.7-145		%REC	1	2/28/2014 4:48:46 PM	11935
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	2/27/2014 5:35:38 PM	R17017
Surr: BFB	97.6	0	80.4-118		%REC	1	2/27/2014 5:35:38 PM	R17017
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Acenaphthene	0.26	0.15	0.50	J	µg/L	1	3/3/2014 4:25:21 PM	11973
Fluorene	0.30	0.18	0.50	J	µg/L	1	3/3/2014 4:25:21 PM	11973
Phenanthrene	ND	0.15	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Fluoranthene	ND	0.13	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Pyrene	ND	0.25	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Chrysene	ND	0.16	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/3/2014 4:25:21 PM	11973
Surr: N-hexadecane	54.4	0	23.5-135		%REC	1	3/3/2014 4:25:21 PM	11973
Surr: Benzo(e)pyrene	79.1	0	28.8-149		%REC	1	3/3/2014 4:25:21 PM	11973
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/3/2014 12:27:40 PM	R17056
Toluene	ND	0.44	1.0		µg/L	1	3/3/2014 12:27:40 PM	R17056
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/3/2014 12:27:40 PM	R17056
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/3/2014 12:27:40 PM	R17056
Surr: 1,2-Dichloroethane-d4	100	0	70-130		%REC	1	3/3/2014 12:27:40 PM	R17056
Surr: 4-Bromofluorobenzene	108	0	70-130		%REC	1	3/3/2014 12:27:40 PM	R17056
Surr: Dibromofluoromethane	101	0	70-130		%REC	1	3/3/2014 12:27:40 PM	R17056
Surr: Toluene-d8	97.6	0	70-130		%REC	1	3/3/2014 12:27:40 PM	R17056

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-006 **Matrix:** SOIL

Client Sample ID: JP-5-B-03A
Collection Date: 2/25/2014 11:15:00 AM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	4.2	3.9	9.9	J	mg/Kg	1	2/28/2014 1:29:34 PM	11934
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	2/28/2014 1:29:34 PM	11934
Surr: DNOP	81.8	0	66-131		%REC	1	2/28/2014 1:29:34 PM	11934
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.8		mg/Kg	1	2/28/2014 2:45:04 PM	11937
Surr: BFB	82.4	0	74.5-129		%REC	1	2/28/2014 2:45:04 PM	11937
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/3/2014 12:10:08 PM	11939
Surr: N-hexadecane	70.1	0	33.8-110		%REC	1	3/3/2014 12:10:08 PM	11939
Surr: Benzo(e)pyrene	91.1	0	33.3-120		%REC	1	3/3/2014 12:10:08 PM	11939
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	0.0069	0.0021	0.048	J	mg/Kg	1	3/3/2014 8:07:25 PM	11937
Toluene	ND	0.0030	0.048		mg/Kg	1	3/3/2014 8:07:25 PM	11937
Ethylbenzene	ND	0.0027	0.048		mg/Kg	1	3/3/2014 8:07:25 PM	11937
Xylenes, Total	ND	0.058	0.096		mg/Kg	1	3/3/2014 8:07:25 PM	11937
Surr: Dibromofluoromethane	103	0	70-130		%REC	1	3/3/2014 8:07:25 PM	11937
Surr: 1,2-Dichloroethane-d4	103	0	70-130		%REC	1	3/3/2014 8:07:25 PM	11937
Surr: Toluene-d8	87.9	0	70-130		%REC	1	3/3/2014 8:07:25 PM	11937
Surr: 4-Bromofluorobenzene	94.8	0	70-130		%REC	1	3/3/2014 8:07:25 PM	11937

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-007 **Matrix:** SOIL

Client Sample ID: JP-5-B-03B
Collection Date: 2/25/2014 1:00:00 PM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	4.6	4.0	10	J	mg/Kg	1	2/28/2014 3:02:12 PM	11934
Motor Oil Range Organics (MRO)	ND	51	51		mg/Kg	1	2/28/2014 3:02:12 PM	11934
Surr: DNOP	67.2	0	66-131		%REC	1	2/28/2014 3:02:12 PM	11934
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	2/28/2014 3:13:34 PM	11937
Surr: BFB	81.2	0	74.5-129		%REC	1	2/28/2014 3:13:34 PM	11937
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/3/2014 12:33:20 PM	11939
Surr: N-hexadecane	73.8	0	33.8-110		%REC	1	3/3/2014 12:33:20 PM	11939
Surr: Benzo(e)pyrene	102	0	33.3-120		%REC	1	3/3/2014 12:33:20 PM	11939
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	0.0060	0.0020	0.047	J	mg/Kg	1	3/3/2014 8:36:14 PM	11937
Toluene	ND	0.0029	0.047		mg/Kg	1	3/3/2014 8:36:14 PM	11937
Ethylbenzene	ND	0.0026	0.047		mg/Kg	1	3/3/2014 8:36:14 PM	11937
Xylenes, Total	ND	0.056	0.093		mg/Kg	1	3/3/2014 8:36:14 PM	11937
Surr: Dibromofluoromethane	104	0	70-130		%REC	1	3/3/2014 8:36:14 PM	11937
Surr: 1,2-Dichloroethane-d4	101	0	70-130		%REC	1	3/3/2014 8:36:14 PM	11937
Surr: Toluene-d8	93.5	0	70-130		%REC	1	3/3/2014 8:36:14 PM	11937
Surr: 4-Bromofluorobenzene	97.8	0	70-130		%REC	1	3/3/2014 8:36:14 PM	11937

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-008 **Matrix:** SOIL

Client Sample ID: JP-5-B-03C
Collection Date: 2/25/2014 1:35:00 PM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	4.6	3.9	10	J	mg/Kg	1	2/28/2014 4:03:48 PM	11934
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	2/28/2014 4:03:48 PM	11934
Surr: DNOP	86.0	0	66-131		%REC	1	2/28/2014 4:03:48 PM	11934
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	2/28/2014 3:42:05 PM	11937
Surr: BFB	83.8	0	74.5-129		%REC	1	2/28/2014 3:42:05 PM	11937
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/3/2014 12:56:36 PM	11939
Surr: N-hexadecane	73.2	0	33.8-110		%REC	1	3/3/2014 12:56:36 PM	11939
Surr: Benzo(e)pyrene	101	0	33.3-120		%REC	1	3/3/2014 12:56:36 PM	11939
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0021	0.047		mg/Kg	1	3/3/2014 9:05:01 PM	11937
Toluene	ND	0.0029	0.047		mg/Kg	1	3/3/2014 9:05:01 PM	11937
Ethylbenzene	ND	0.0027	0.047		mg/Kg	1	3/3/2014 9:05:01 PM	11937
Xylenes, Total	ND	0.056	0.094		mg/Kg	1	3/3/2014 9:05:01 PM	11937
Surr: Dibromofluoromethane	102	0	70-130		%REC	1	3/3/2014 9:05:01 PM	11937
Surr: 1,2-Dichloroethane-d4	95.9	0	70-130		%REC	1	3/3/2014 9:05:01 PM	11937
Surr: Toluene-d8	85.5	0	70-130		%REC	1	3/3/2014 9:05:01 PM	11937
Surr: 4-Bromofluorobenzene	97.0	0	70-130		%REC	1	3/3/2014 9:05:01 PM	11937

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-009 **Matrix:** AQUEOUS

Client Sample ID: JP-5-B-01
Collection Date: 2/25/2014 2:03:00 PM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	0.57	1.0		mg/L	1	2/28/2014 5:10:59 PM	11935
Motor Oil Range Organics (MRO)	ND	5.0	5.0		mg/L	1	2/28/2014 5:10:59 PM	11935
Surr: DNOP	120	0	62.7-145		%REC	1	2/28/2014 5:10:59 PM	11935
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	0.019	0.050		mg/L	1	2/27/2014 6:05:46 PM	R17017
Surr: BFB	92.0	0	80.4-118		%REC	1	2/27/2014 6:05:46 PM	R17017
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.18	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
1-Methylnaphthalene	ND	0.17	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
2-Methylnaphthalene	ND	0.16	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Acenaphthylene	ND	0.20	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Acenaphthene	ND	0.15	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Fluorene	ND	0.18	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Phenanthrene	ND	0.15	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Fluoranthene	ND	0.13	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Pyrene	ND	0.25	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Benz(a)anthracene	ND	0.16	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Chrysene	ND	0.16	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Benzo(b)fluoranthene	ND	0.19	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Benzo(k)fluoranthene	ND	0.22	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Benzo(a)pyrene	ND	0.18	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Dibenz(a,h)anthracene	ND	0.19	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Benzo(g,h,i)perylene	ND	0.19	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Indeno(1,2,3-cd)pyrene	ND	0.24	0.50		µg/L	1	3/3/2014 4:48:33 PM	11973
Surr: N-hexadecane	69.8	0	23.5-135		%REC	1	3/3/2014 4:48:33 PM	11973
Surr: Benzo(e)pyrene	97.7	0	28.8-149		%REC	1	3/3/2014 4:48:33 PM	11973
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.46	1.0		µg/L	1	3/3/2014 12:56:28 PM	R17056
Toluene	ND	0.44	1.0		µg/L	1	3/3/2014 12:56:28 PM	R17056
Ethylbenzene	ND	0.45	1.0		µg/L	1	3/3/2014 12:56:28 PM	R17056
Xylenes, Total	ND	1.4	1.5		µg/L	1	3/3/2014 12:56:28 PM	R17056
Surr: 1,2-Dichloroethane-d4	98.5	0	70-130		%REC	1	3/3/2014 12:56:28 PM	R17056
Surr: 4-Bromofluorobenzene	101	0	70-130		%REC	1	3/3/2014 12:56:28 PM	R17056
Surr: Dibromofluoromethane	100	0	70-130		%REC	1	3/3/2014 12:56:28 PM	R17056
Surr: Toluene-d8	103	0	70-130		%REC	1	3/3/2014 12:56:28 PM	R17056

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-010 **Matrix:** SOIL

Client Sample ID: JP-5-B-01-A
Collection Date: 2/25/2014 2:20:00 PM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	3.9	9.9		mg/Kg	1	3/4/2014 9:07:17 AM	11934
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/4/2014 9:07:17 AM	11934
Surr: DNOP	83.2	0	66-131		%REC	1	3/4/2014 9:07:17 AM	11934
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	2.9	4.7		mg/Kg	1	2/28/2014 4:10:33 PM	11937
Surr: BFB	82.0	0	74.5-129		%REC	1	2/28/2014 4:10:33 PM	11937
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/3/2014 1:19:48 PM	11939
Surr: N-hexadecane	71.0	0	33.8-110		%REC	1	3/3/2014 1:19:48 PM	11939
Surr: Benzo(e)pyrene	99.6	0	33.3-120		%REC	1	3/3/2014 1:19:48 PM	11939
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0021	0.047		mg/Kg	1	3/3/2014 9:33:50 PM	11937
Toluene	ND	0.0029	0.047		mg/Kg	1	3/3/2014 9:33:50 PM	11937
Ethylbenzene	ND	0.0027	0.047		mg/Kg	1	3/3/2014 9:33:50 PM	11937
Xylenes, Total	ND	0.057	0.094		mg/Kg	1	3/3/2014 9:33:50 PM	11937
Surr: Dibromofluoromethane	104	0	70-130		%REC	1	3/3/2014 9:33:50 PM	11937
Surr: 1,2-Dichloroethane-d4	97.7	0	70-130		%REC	1	3/3/2014 9:33:50 PM	11937
Surr: Toluene-d8	91.3	0	70-130		%REC	1	3/3/2014 9:33:50 PM	11937
Surr: 4-Bromofluorobenzene	98.9	0	70-130		%REC	1	3/3/2014 9:33:50 PM	11937

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-011 **Matrix:** SOIL

Client Sample ID: JP-5-B-01-B
Collection Date: 2/25/2014 2:34:00 PM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	ND	4.0	10		mg/Kg	1	3/3/2014 10:38:19 AM	11934
Motor Oil Range Organics (MRO)	ND	51	51		mg/Kg	1	3/3/2014 10:38:19 AM	11934
Surr: DNOP	73.2	0	66-131		%REC	1	3/3/2014 10:38:19 AM	11934
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	4.9		mg/Kg	1	2/28/2014 4:39:10 PM	11937
Surr: BFB	81.6	0	74.5-129		%REC	1	2/28/2014 4:39:10 PM	11937
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Phenanthrene	0.0083	0.0057	0.020	J	mg/Kg	1	3/3/2014 1:43:02 PM	11939
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Fluoranthene	0.024	0.0062	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Pyrene	0.014	0.0049	0.020	J	mg/Kg	1	3/3/2014 1:43:02 PM	11939
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Chrysene	0.0057	0.0036	0.020	J	mg/Kg	1	3/3/2014 1:43:02 PM	11939
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/3/2014 1:43:02 PM	11939
Surr: N-hexadecane	74.2	0	33.8-110		%REC	1	3/3/2014 1:43:02 PM	11939
Surr: Benzo(e)pyrene	101	0	33.3-120		%REC	1	3/3/2014 1:43:02 PM	11939
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0022	0.049		mg/Kg	1	3/3/2014 10:02:34 PM	11937
Toluene	ND	0.0031	0.049		mg/Kg	1	3/3/2014 10:02:34 PM	11937
Ethylbenzene	ND	0.0028	0.049		mg/Kg	1	3/3/2014 10:02:34 PM	11937
Xylenes, Total	ND	0.059	0.099		mg/Kg	1	3/3/2014 10:02:34 PM	11937
Surr: Dibromofluoromethane	102	0	70-130		%REC	1	3/3/2014 10:02:34 PM	11937
Surr: 1,2-Dichloroethane-d4	95.4	0	70-130		%REC	1	3/3/2014 10:02:34 PM	11937
Surr: Toluene-d8	83.1	0	70-130		%REC	1	3/3/2014 10:02:34 PM	11937
Surr: 4-Bromofluorobenzene	96.8	0	70-130		%REC	1	3/3/2014 10:02:34 PM	11937

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: NASA_WSTF
Project: PO#13EC092B
Lab ID: 1402A54-012 **Matrix:** SOIL

Client Sample ID: JP-5-B-01-C
Collection Date: 2/25/2014 3:05:00 PM
Received Date: 2/27/2014 9:05:00 AM

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE ORGANICS							Analyst: **BCN**	
Diesel Range Organics (DRO)	5.3	3.9	9.9	J	mg/Kg	1	3/3/2014 11:00:21 AM	11934
Motor Oil Range Organics (MRO)	ND	50	50		mg/Kg	1	3/3/2014 11:00:21 AM	11934
Surr: DNOP	78.2	0	66-131		%REC	1	3/3/2014 11:00:21 AM	11934
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **JMP**	
Gasoline Range Organics (GRO)	ND	3.0	4.9		mg/Kg	1	2/28/2014 5:07:47 PM	11937
Surr: BFB	83.2	0	74.5-129		%REC	1	2/28/2014 5:07:47 PM	11937
EPA METHOD 8270C: PAHS							Analyst: **JDC**	
Naphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
1-Methylnaphthalene	ND	0.0056	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
2-Methylnaphthalene	ND	0.0059	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Acenaphthylene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Acenaphthene	ND	0.0063	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Fluorene	ND	0.0072	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Phenanthrene	ND	0.0057	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Anthracene	ND	0.0060	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Fluoranthene	ND	0.0062	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Pyrene	ND	0.0049	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Benz(a)anthracene	ND	0.0051	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Chrysene	ND	0.0036	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Benzo(b)fluoranthene	ND	0.0065	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Benzo(k)fluoranthene	ND	0.0081	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Benzo(a)pyrene	ND	0.0076	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Dibenz(a,h)anthracene	ND	0.0073	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Benzo(g,h,i)perylene	ND	0.0058	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Indeno(1,2,3-cd)pyrene	ND	0.0068	0.020		mg/Kg	1	3/3/2014 2:06:13 PM	11939
Surr: N-hexadecane	73.9	0	33.8-110		%REC	1	3/3/2014 2:06:13 PM	11939
Surr: Benzo(e)pyrene	111	0	33.3-120		%REC	1	3/3/2014 2:06:13 PM	11939
EPA METHOD 8260B: VOLATILES							Analyst: **cadg**	
Benzene	ND	0.0021	0.049		mg/Kg	1	3/3/2014 11:57:52 PM	11937
Toluene	ND	0.0031	0.049		mg/Kg	1	3/3/2014 11:57:52 PM	11937
Ethylbenzene	ND	0.0028	0.049		mg/Kg	1	3/3/2014 11:57:52 PM	11937
Xylenes, Total	ND	0.058	0.097		mg/Kg	1	3/3/2014 11:57:52 PM	11937
Surr: Dibromofluoromethane	101	0	70-130		%REC	1	3/3/2014 11:57:52 PM	11937
Surr: 1,2-Dichloroethane-d4	93.0	0	70-130		%REC	1	3/3/2014 11:57:52 PM	11937
Surr: Toluene-d8	89.3	0	70-130		%REC	1	3/3/2014 11:57:52 PM	11937
Surr: 4-Bromofluorobenzene	95.0	0	70-130		%REC	1	3/3/2014 11:57:52 PM	11937

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **MB-11934** SampType: **MBLK** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **11934** RunNo: **17024**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **489838** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.1		10.00		91.1	66	131			

Sample ID **LCS-11934** SampType: **LCS** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **11934** RunNo: **17024**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **489866** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	58	10	50.00	0	115	60.8	145			
Surr: DNOP	5.4		5.000		107	66	131			

Sample ID **1402A54-002AMS** SampType: **MS** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **JP-5-B-04** Batch ID: **11934** RunNo: **17029**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **489874** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	51	10	49.85	0	102	47.4	148			
Surr: DNOP	3.8		4.985		76.4	66	131			

Sample ID **1402A54-002AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **JP-5-B-04** Batch ID: **11934** RunNo: **17029**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **489875** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	62	10	50.25	0	124	47.4	148	20.4	22.7	
Surr: DNOP	4.4		5.025		88.1	66	131	0	0	

Sample ID **MB-11965** SampType: **MBLK** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **PBS** Batch ID: **11965** RunNo: **17073**
Prep Date: **3/3/2014** Analysis Date: **3/4/2014** SeqNo: **491074** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.5		10.00		95.2	66	131			

Sample ID **LCS-11965** SampType: **LCS** TestCode: **EPA Method 8015D: Diesel Range Organics**
Client ID: **LCSS** Batch ID: **11965** RunNo: **17073**
Prep Date: **3/3/2014** Analysis Date: **3/4/2014** SeqNo: **491080** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID	**LCS-11965**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Diesel Range Organics**
Client ID:	**LCSS**	Batch ID:	**11965**	RunNo:	**17073**
Prep Date:	**3/3/2014**	Analysis Date:	**3/4/2014**	SeqNo:	**491080** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	3.6		5.000		71.3	66	131			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **MB-11935** SampType: **MBLK** TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW** Batch ID: **11935** RunNo: **17024**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **489945** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	1.0								
Motor Oil Range Organics (MRO)	ND	5.0								
Surr: DNOP	1.2		1.000		118	62.7	145			

Sample ID **LCS-11935** SampType: **LCS** TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW** Batch ID: **11935** RunNo: **17024**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **489946** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	5.5	1.0	5.000	0	110	78.6	146			
Surr: DNOP	0.55		0.5000		110	62.7	145			

Sample ID **LCSD-11935** SampType: **LCSD** TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSS02** Batch ID: **11935** RunNo: **17024**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **490196** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	6.2	1.0	5.000	0	124	78.6	146	11.6	26.5	
Surr: DNOP	0.61		0.5000		123	62.7	145	0	0	

Sample ID **MB-11966** SampType: **MBLK** TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW** Batch ID: **11966** RunNo: **17043**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **490476** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	1.0		1.000		102	62.7	145			

Sample ID **LCS-11966** SampType: **LCS** TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW** Batch ID: **11966** RunNo: **17043**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **490480** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	0.52		0.5000		105	62.7	145			

Sample ID **LCSD-11966** SampType: **LCSD** TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSS02** Batch ID: **11966** RunNo: **17043**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **490481** Units: **%REC**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	0.54		0.5000		107	62.7	145	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **MB-11937** SampType: **MBLK** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBS** Batch ID: **11937** RunNo: **17027**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **490053** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	800		1000		80.1	74.5	129			

Sample ID **LCS-11937** SampType: **LCS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSS** Batch ID: **11937** RunNo: **17027**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **490054** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	102	71.7	134			
Surr: BFB	890		1000		89.5	74.5	129			

Sample ID **1402A54-002AMS** SampType: **MS** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **JP-5-B-04** Batch ID: **11937** RunNo: **17027**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **490056** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	29	4.7	23.70	0	123	69.5	145			
Surr: BFB	850		947.9		89.8	74.5	129			

Sample ID **1402A54-002AMSD** SampType: **MSD** TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **JP-5-B-04** Batch ID: **11937** RunNo: **17027**
Prep Date: **2/27/2014** Analysis Date: **2/28/2014** SeqNo: **490057** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	28	4.7	23.65	0	117	69.5	145	5.96	20	
Surr: BFB	850		946.1		90.4	74.5	129	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**		
Client ID:	**PBW**	Batch ID:	**R17017**	RunNo:	**17017**		
Prep Date:		Analysis Date:	**2/27/2014**	SeqNo:	**489509**	Units:	**mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	19		20.00		96.2	80.4	118			

Sample ID	**2.5UG GRO LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**		
Client ID:	**LCSW**	Batch ID:	**R17017**	RunNo:	**17017**		
Prep Date:		Analysis Date:	**2/27/2014**	SeqNo:	**489510**	Units:	**mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.47	0.050	0.5000	0	93.6	80	120			
Surr: BFB	20		20.00		100	80.4	118			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **mb-11937** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS** Batch ID: **11937** RunNo: **17056**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **490989** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0096	0.050								J
Toluene	0.0050	0.050								J
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.51		0.5000		102	70	130			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		97.6	70	130			
Surr: Toluene-d8	0.48		0.5000		96.3	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.4	70	130			

Sample ID **lcs-11937** SampType: **LCS** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS** Batch ID: **11937** RunNo: **17056**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **490990** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.050	1.000	0	107	70	130			
Toluene	0.90	0.050	1.000	0	90.0	60.1	120			
Surr: Dibromofluoromethane	0.54		0.5000		107	70	130			
Surr: 1,2-Dichloroethane-d4	0.51		0.5000		101	70	130			
Surr: Toluene-d8	0.47		0.5000		93.9	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		103	70	130			

Sample ID **1402a54-003ams** SampType: **MS** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **JP-5-B-04B** Batch ID: **11937** RunNo: **17056**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **490993** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.92	0.048	0.9506	0.007064	95.8	62.6	140			
Toluene	0.81	0.048	0.9506	0	84.9	66.3	136			
Surr: Dibromofluoromethane	0.47		0.4753		99.2	70	130			
Surr: 1,2-Dichloroethane-d4	0.47		0.4753		98.6	70	130			
Surr: Toluene-d8	0.43		0.4753		90.1	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.4753		101	70	130			

Sample ID **1402a54-003amsd** SampType: **MSD** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **JP-5-B-04B** Batch ID: **11937** RunNo: **17056**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **490994** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.91	0.048	0.9524	0.007064	94.6	62.6	140	1.02	20	
Toluene	0.86	0.048	0.9524	0	89.9	66.3	136	5.89	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **1402a54-003amsd** SampType: **MSD** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **JP-5-B-04B** Batch ID: **11937** RunNo: **17056**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **490994** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	0.48		0.4762		100	70	130	0	0	
Surr: 1,2-Dichloroethane-d4	0.49		0.4762		103	70	130	0	0	
Surr: Toluene-d8	0.46		0.4762		97.2	70	130	0	0	
Surr: 4-Bromofluorobenzene	0.46		0.4762		96.8	70	130	0	0	

Sample ID **mb-11937** SampType: **MBLK** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **PBS** Batch ID: **R17056** RunNo: **17056**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **491002** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0096	0.050								J
Toluene	0.0050	0.050								J
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: Dibromofluoromethane	0.51		0.5000		102	70	130			
Surr: 1,2-Dichloroethane-d4	0.49		0.5000		97.6	70	130			
Surr: Toluene-d8	0.48		0.5000		96.3	70	130			
Surr: 4-Bromofluorobenzene	0.48		0.5000		95.4	70	130			

Sample ID **lcs-11937** SampType: **LCS** TestCode: **EPA Method 8260B: Volatiles**
Client ID: **LCSS** Batch ID: **R17056** RunNo: **17056**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **491003** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.1	0.050	1.000	0	107	70	130			
Toluene	0.90	0.050	1.000	0	90.0	60.1	120			
Surr: Dibromofluoromethane	0.54		0.5000		107	70	130			
Surr: 1,2-Dichloroethane-d4	0.51		0.5000		101	70	130			
Surr: Toluene-d8	0.47		0.5000		93.9	70	130			
Surr: 4-Bromofluorobenzene	0.52		0.5000		103	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **5mL rb**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBW**	Batch ID: **R17056**	RunNo: **17056**
Prep Date:	Analysis Date: **3/3/2014**	SeqNo: **490513** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSW**	Batch ID: **R17056**	RunNo: **17056**
Prep Date:	Analysis Date: **3/3/2014**	SeqNo: **490515** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	103	70	130			
Toluene	19	1.0	20.00	0	94.8	82.2	124			
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	10		10.00		105	70	130			
Surr: Toluene-d8	10		10.00		105	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **mb-11939** SampType: **MBLK** TestCode: **EPA Method 8270C: PAHs**
Client ID: **PBS** Batch ID: **11939** RunNo: **17072**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **491019** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.020								
1-Methylnaphthalene	ND	0.020								
2-Methylnaphthalene	ND	0.020								
Acenaphthylene	ND	0.020								
Acenaphthene	ND	0.020								
Fluorene	ND	0.020								
Phenanthrene	ND	0.020								
Anthracene	ND	0.020								
Fluoranthene	ND	0.020								
Pyrene	ND	0.020								
Benz(a)anthracene	ND	0.020								
Chrysene	ND	0.020								
Benzo(b)fluoranthene	ND	0.020								
Benzo(k)fluoranthene	ND	0.020								
Benzo(a)pyrene	ND	0.020								
Dibenz(a,h)anthracene	ND	0.020								
Benzo(g,h,i)perylene	ND	0.020								
Indeno(1,2,3-cd)pyrene	ND	0.020								
Surr: N-hexadecane	1.0		1.460		71.5	33.8	110			
Surr: Benzo(e)pyrene	0.35		0.3300		106	33.3	120			

Sample ID **lcs-11939** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS** Batch ID: **11939** RunNo: **17072**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **491020** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.31	0.020	0.3300	0	92.8	42.5	118			
1-Methylnaphthalene	0.32	0.020	0.3300	0	95.9	43.5	122			
2-Methylnaphthalene	0.34	0.020	0.3300	0	102	41.1	122			
Acenaphthylene	0.31	0.020	0.3300	0	92.8	49.4	121			
Acenaphthene	0.30	0.020	0.3300	0	91.8	47.5	125			
Fluorene	0.31	0.020	0.3300	0	93.9	49.1	120			
Phenanthrene	0.30	0.020	0.3300	0	90.6	42.3	130			
Anthracene	0.30	0.020	0.3300	0	91.7	42.9	130			
Fluoranthene	0.31	0.020	0.3300	0	93.9	37	134			
Pyrene	0.31	0.020	0.3300	0	95.4	46.4	126			
Benz(a)anthracene	0.32	0.020	0.3300	0	97.4	50.6	126			
Chrysene	0.32	0.020	0.3300	0	98.3	36.8	123			
Benzo(b)fluoranthene	0.34	0.020	0.3300	0	103	47.2	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **lcs-11939** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSS** Batch ID: **11939** RunNo: **17072**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **491020** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	0.35	0.020	0.3300	0	106	40	122			
Benzo(a)pyrene	0.32	0.020	0.3300	0	96.1	44	118			
Dibenz(a,h)anthracene	0.32	0.020	0.3300	0	97.1	53.3	131			
Benzo(g,h,i)perylene	0.32	0.020	0.3300	0	98.0	46.7	129			
Indeno(1,2,3-cd)pyrene	0.32	0.020	0.3300	0	96.6	52	126			
Surr: N-hexadecane	1.3		1.460		87.8	33.8	110			
Surr: Benzo(e)pyrene	0.39		0.3300		118	33.3	120			

Sample ID **1402A54-003Bms** SampType: **MS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-5-B-04B** Batch ID: **11939** RunNo: **17072**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **491055** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.21	0.020	0.3308	0	64.9	39.8	108			
1-Methylnaphthalene	0.23	0.020	0.3308	0	69.7	42.1	116			
2-Methylnaphthalene	0.24	0.020	0.3308	0	71.8	34.8	122			
Acenaphthylene	0.24	0.020	0.3308	0	71.5	54.3	107			
Acenaphthene	0.26	0.020	0.3308	0	78.5	50.2	114			
Fluorene	0.28	0.020	0.3308	0	83.7	55.3	107			
Phenanthrene	0.24	0.020	0.3308	0	72.2	54.7	118			
Anthracene	0.24	0.020	0.3308	0	73.9	54.9	116			
Fluoranthene	0.27	0.020	0.3308	0	82.3	55.2	119			
Pyrene	0.27	0.020	0.3308	0	80.8	60.2	115			
Benz(a)anthracene	0.27	0.020	0.3308	0	80.9	61.9	120			
Chrysene	0.27	0.020	0.3308	0	82.9	42.5	117			
Benzo(b)fluoranthene	0.29	0.020	0.3308	0	88.0	57.4	124			
Benzo(k)fluoranthene	0.31	0.020	0.3308	0	92.8	52.6	107			
Benzo(a)pyrene	0.28	0.020	0.3308	0	86.0	55.7	106			
Dibenz(a,h)anthracene	0.29	0.020	0.3308	0	89.0	51.8	130			
Benzo(g,h,i)perylene	0.27	0.020	0.3308	0	82.9	59.2	114			
Indeno(1,2,3-cd)pyrene	0.28	0.020	0.3308	0	86.0	56.8	120			
Surr: N-hexadecane	1.1		1.463		76.2	33.8	110			
Surr: Benzo(e)pyrene	0.36		0.3308		108	33.3	120			

Sample ID **1402A54-003Bmsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-5-B-04B** Batch ID: **11939** RunNo: **17072**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **491056** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	0.25	0.020	0.3299	0	75.6	39.8	108	14.8	29.7	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **1402A54-003Bmsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-5-B-04B** Batch ID: **11939** RunNo: **17072**
Prep Date: **2/27/2014** Analysis Date: **3/3/2014** SeqNo: **491056** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1-Methylnaphthalene	0.27	0.020	0.3299	0	80.4	42.1	116	14.0	20	
2-Methylnaphthalene	0.27	0.020	0.3299	0	82.2	34.8	122	13.2	21.2	
Acenaphthylene	0.22	0.020	0.3299	0	67.1	54.3	107	6.68	20	
Acenaphthene	0.24	0.020	0.3299	0	71.5	50.2	114	9.56	20.5	
Fluorene	0.25	0.020	0.3299	0	75.6	55.3	107	10.5	20	
Phenanthrene	0.26	0.020	0.3299	0	78.8	54.7	118	8.43	22	
Anthracene	0.25	0.020	0.3299	0	76.7	54.9	116	3.35	26.6	
Fluoranthene	0.28	0.020	0.3299	0	85.3	55.2	119	3.23	23.7	
Pyrene	0.26	0.020	0.3299	0	77.7	60.2	115	4.22	29.3	
Benz(a)anthracene	0.24	0.020	0.3299	0	73.7	61.9	120	9.54	25.4	
Chrysene	0.25	0.020	0.3299	0	75.8	42.5	117	9.31	27.6	
Benzo(b)fluoranthene	0.30	0.020	0.3299	0	90.1	57.4	124	2.12	20	
Benzo(k)fluoranthene	0.32	0.020	0.3299	0	96.6	52.6	107	3.68	31.3	
Benzo(a)pyrene	0.27	0.020	0.3299	0	82.7	55.7	106	4.10	22.1	
Dibenz(a,h)anthracene	0.30	0.020	0.3299	0	89.9	51.8	130	0.749	21.2	
Benzo(g,h,i)perylene	0.27	0.020	0.3299	0	83.3	59.2	114	0.219	25.9	
Indeno(1,2,3-cd)pyrene	0.28	0.020	0.3299	0	83.7	56.8	120	2.89	20.4	
Surr: N-hexadecane	0.98		1.460		67.0	33.8	110	0	0	
Surr: Benzo(e)pyrene	0.34		0.3299		102	33.3	120	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **mb-11973** SampType: **MBLK** TestCode: **EPA Method 8270C: PAHs**
Client ID: **PBW** Batch ID: **11973** RunNo: **17072**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **491057** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	ND	0.50								
1-Methylnaphthalene	ND	0.50								
2-Methylnaphthalene	ND	0.50								
Acenaphthylene	ND	0.50								
Acenaphthene	ND	0.50								
Fluorene	ND	0.50								
Phenanthrene	ND	0.50								
Anthracene	ND	0.50								
Fluoranthene	ND	0.50								
Pyrene	ND	0.50								
Benz(a)anthracene	ND	0.50								
Chrysene	ND	0.50								
Benzo(b)fluoranthene	ND	0.50								
Benzo(k)fluoranthene	ND	0.50								
Benzo(a)pyrene	ND	0.50								
Dibenz(a,h)anthracene	ND	0.50								
Benzo(g,h,i)perylene	ND	0.50								
Indeno(1,2,3-cd)pyrene	ND	0.50								
Surr: N-hexadecane	70		87.60		79.3	23.5	135			
Surr: Benzo(e)pyrene	25		20.00		125	28.8	149			

Sample ID **lcs-11973** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSW** Batch ID: **11973** RunNo: **17072**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **491058** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	19	0.50	20.00	0	97.4	43.1	99.5			
1-Methylnaphthalene	20	0.50	20.00	0	101	44.3	107			
2-Methylnaphthalene	22	0.50	20.00	0	108	42.2	102			S
Acenaphthylene	18	0.50	20.00	0	91.7	46.3	109			
Acenaphthene	19	0.50	20.00	0	94.5	47.4	111			
Fluorene	19	0.50	20.00	0	95.2	46.2	106			
Phenanthrene	19	0.50	20.00	0	93.2	48.7	115			
Anthracene	19	0.50	20.00	0	94.0	47.8	113			
Fluoranthene	20	0.50	20.00	0	102	46.7	110			
Pyrene	20	0.50	20.00	0	101	48.4	108			
Benz(a)anthracene	20	0.50	20.00	0	99.5	42.9	118			
Chrysene	20	0.50	20.00	0	100	28.8	117			
Benzo(b)fluoranthene	22	0.50	20.00	0	110	47.3	110			S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **lcs-11973** SampType: **LCS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **LCSW** Batch ID: **11973** RunNo: **17072**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **491058** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzo(k)fluoranthene	21	0.50	20.00	0	106	46	113			
Benzo(a)pyrene	22	0.50	20.00	0	108	53.1	96.1			S
Dibenz(a,h)anthracene	22	0.50	20.00	0	108	44.3	115			
Benzo(g,h,i)perylene	20	0.50	20.00	0	101	44.4	121			
Indeno(1,2,3-cd)pyrene	21	0.50	20.00	0	107	47.5	115			
Surr: N-hexadecane	69		87.60		78.5	23.5	135			
Surr: Benzo(e)pyrene	25		20.00		124	28.8	149			

Sample ID **1402A54-001Cms** SampType: **MS** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-5-B-04** Batch ID: **11973** RunNo: **17072**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **491065** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	20	0.50	20.00	0	101	45	110			
1-Methylnaphthalene	21	0.50	20.00	0.2200	105	45	110			
2-Methylnaphthalene	22	0.50	20.00	0.2000	106	45	110			
Acenaphthylene	18	0.50	20.00	0	88.5	45	110			
Acenaphthene	18	0.50	20.00	0.3400	86.7	45	110			
Fluorene	18	0.50	20.00	0.3000	90.6	45	110			
Phenanthrene	19	0.50	20.00	0.1800	95.8	45	110			
Anthracene	19	0.50	20.00	0	96.2	45	110			
Fluoranthene	20	0.50	20.00	0	100	45	110			
Pyrene	19	0.50	20.00	0	96.2	45	110			
Benz(a)anthracene	18	0.50	20.00	0	91.1	45	110			
Chrysene	19	0.50	20.00	0	93.2	45	110			
Benzo(b)fluoranthene	22	0.50	20.00	0	112	45	110			S
Benzo(k)fluoranthene	21	0.50	20.00	0	106	45	110			
Benzo(a)pyrene	20	0.50	20.00	0	99.9	45	110			
Dibenz(a,h)anthracene	23	0.50	20.00	0	113	45	110			S
Benzo(g,h,i)perylene	21	0.50	20.00	0	103	45	110			
Indeno(1,2,3-cd)pyrene	21	0.50	20.00	0	103	45	110			
Surr: N-hexadecane	61		87.60		69.8	23.5	135			
Surr: Benzo(e)pyrene	22		20.00		110	28.8	149			

Sample ID **1402A54-001Cmsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-5-B-04** Batch ID: **11973** RunNo: **17072**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **491066** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Naphthalene	22	0.50	20.00	0	109	45	110	7.89	20	

Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1402A54**
05-Mar-14

Client: NASA_WSTF
Project: PO#13EC092B

Sample ID **1402A54-001Cmsd** SampType: **MSD** TestCode: **EPA Method 8270C: PAHs**
Client ID: **JP-5-B-04** Batch ID: **11973** RunNo: **17072**
Prep Date: **3/3/2014** Analysis Date: **3/3/2014** SeqNo: **491066** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1-Methylnaphthalene	24	0.50	20.00	0.2200	117	45	110	10.9	20	S
2-Methylnaphthalene	24	0.50	20.00	0.2000	117	45	110	9.57	20	S
Acenaphthylene	19	0.50	20.00	0	93.7	45	110	5.71	20	
Acenaphthene	19	0.50	20.00	0.3400	94.5	45	110	8.45	20	
Fluorene	19	0.50	20.00	0.3000	95.2	45	110	4.87	20	
Phenanthrene	20	0.50	20.00	0.1800	96.9	45	110	1.13	20	
Anthracene	19	0.50	20.00	0	94.7	45	110	1.57	20	
Fluoranthene	22	0.50	20.00	0	108	45	110	7.20	20	
Pyrene	20	0.50	20.00	0	101	45	110	4.57	20	
Benz(a)anthracene	20	0.50	20.00	0	102	45	110	11.3	20	
Chrysene	21	0.50	20.00	0	103	45	110	10.3	20	
Benzo(b)fluoranthene	22	0.50	20.00	0	110	45	110	1.62	20	S
Benzo(k)fluoranthene	23	0.50	20.00	0	113	45	110	6.77	20	S
Benzo(a)pyrene	21	0.50	20.00	0	107	45	110	7.24	20	
Dibenz(a,h)anthracene	22	0.50	20.00	0	109	45	110	3.33	20	
Benzo(g,h,i)perylene	21	0.50	20.00	0	104	45	110	0.962	20	
Indeno(1,2,3-cd)pyrene	22	0.50	20.00	0	108	45	110	4.55	20	
Surr: N-hexadecane	58		87.60		66.4	23.5	135	0	0	
Surr: Benzo(e)pyrene	21		20.00		105	28.8	149	0	0	

Qualifiers:

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E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
O	RSD is greater than RSDlimit	P	Sample pH greater than 2.
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: NASA_WSTF Work Order Number: 1402A54 RcptNo: 1

Received by/date: AT 02/27/14

Logged By: Anne Thorne 2/27/2014 9:05:00 AM Anne Thorne

Completed By: Anne Thorne 2/27/2014 Anne Thorne

Reviewed By: 02/27/14

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☑ No ☐ Not Present ☐
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? FedEx

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☑ No ☐
9. Was preservative added to bottles? Yes ☐ No ☑ NA ☐
10. VOA vials have zero headspace? Yes ☑ No ☐ No VOA Vials ☐
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? Yes ☑ No ☐
    (Note discrepancies on chain of custody)
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? Yes ☑ No ☐
    (If no, notify customer for authorization.)

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)
Adjusted? _____
Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____
By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding: _____
Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

WSTF CHAIN OF CUSTODY RECORD

Date 2·24·14

Page 1 of -

Laboratory / PO # 13EC092B

Address shipping questions to:

Attn: ☐ Lori Minnick ☐ Other Antonette L. Sanchez

(575) 524-5119 (575) 524-5497

Send Analytical Reports to:

Attn: ☐ Carlyn A. Tufts ☐ Other

carlyn.a.tufts@nasa.gov antonette.l.sanchez@nasa.gov

Analysis Requirements

Special Instructions

Return coolers and reusable packaging materials within 14 d as required in statement of work to:

Return Address:

NASA WSTF Environmental Department

12600 NASA Road; Bldg. 120

Las Cruces, NM 88012

Attn: Lori Minnick

Sample No.	Sample Location	# of Containers	Sample Type	TPH SW-846 Method 8015C (Modified) DRO	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	TPH SW-846 Method 8015C GRO, DRO	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	Comments
1402241534	JP-5-B-04	2	A		X					1402A54 -001
1540	"	2	A				X			-001
1541	"	2	A			X				-001
1542	"	2	A	X						-001
1558	"	2	S				X	X	X	-002

Relinquished By:	Date/Time:	Accepted By:	Date/Time:
	2·24·14 1600	2/24/14 1600	
	2/26/14 12:25		2-24-14 12:27
			02/27/14 1.0° 0905

WSTF 381B (03/13)

WSTF CHAIN OF CUSTODY RECORD

Date 2·25·14

Laboratory / PO # 13EC092B

Address shipping questions to:

Attn: ☐ Lori Minnick ☐ Other Antonette L. Sanchez

(575) 524-5119 (575) 524-5497

Send Analytical Reports to:

Attn: ☐ Carlyn A. Tufts ☐ Other

carlyn.a.tufts@nasa.gov antonette.l.sanchez@nasa.gov

Analysis Requirements

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Return Address:

NASA WSTF Environmental Department

12600 NASA Road; Bldg. 120

Las Cruces, NM 88012

Attn: Lori Minnick

Sample No.	Sample Location	# of Containers	Sample Type	TPH SW-846 Method 8015C (Modified)	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	TPH SW-846 Method 8015C	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	Comments
1402250944	JP.5·B.04B	2	S				X	X	X	1402A54-003
1402251020	JP.5·B.04C	2	S				X	X	X	-004
1056	JP.5·B.03	2	A		X					-005
1057	JP.5·B.03	2	A	X						-005
1058	JP.5·B.03	2	A			X				-005
1059	JP.5·B.03	2	A				X			-005
1115	JP.5·B.03A	2	S				X	X	X	-006
1300	JP.5·B.03B	2	S				X	X	X	-007
1335	JP.5·B.03C	2	S				X	X	X	-008

Relinquished By:	Date/Time:	Accepted By:	Date/Time:
	2·25·14 1600	2/25/14 1600	
	2/26/14 12:25		2-26-14 12:27
	~~02/27/14 0905~~	02/27/14 0905	10°

A 02/27/14

A 02/27/14

WSTF 381B (03/13)

WSTF CHAIN OF CUSTODY RECORD

Date 2·25·14

Page 1 of

AS 02/27/14

Laboratory / PO # 13EC092B

Address shipping questions to:

Attn: ☐ Lori Minnick ☐ Other Antonette L. Sanchez

(575) 524-5119 (575) 524-5497

Send Analytical Reports to:

Attn: ☐ Carlyn A. Tufts ☐ Other

carlyn.a.tufts@nasa.gov antonette.l.sanchez@nasa.gov

Analysis Requirements

Special Instructions

Return coolers and reusable packaging materials within 14 d as required in statement of work to:

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NASA WSTF Environmental Department

12600 NASA Road; Bldg. 120

Las Cruces, NM 88012

Attn: Lori Minnick

Sample No.	Sample Location	# of Containers	Sample Type ( )	Analytes / Method: TPH SW-846 Method 8015C (Modified) GRO/DRO	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C	TPH SW-846 Method 8015C DRO/GRO	SVOC including PAH SW-846 Method 8270D (Modified)	VOC SW-846 Method 8260C		Comments
1402251403	JP.5.B.01	2	A		X						1402A54-009
1404	JP.5.B.01	2	A	X							-009 AS 02/27/14
1405	JP.5.B.01	2	A			X					-009
1406	JP.5.B.01	2	A				X				-009
1420	JP.5.B.01.A	2	S				X	X	X		-010
1434	JP.5.B.01.B	2	S				X	X	X		-011
1505	JP.5.B.01.C	2	S				X	X	X		-012

Relinquished By:	Date/Time:	Accepted By:	Date/Time:
	2·25·14 400	4:00 2/25/14	
	2/26/14 12:25		2-26-14 12:27
			02/27/14 0915

1.0

WSTF 381B (03/13)