SUPPLEMENTAL REMEDIAL INVESTIGATION WORK PLAN (DRAFT)

INVESTIGATION/MONITORING PETROLEUM IMPACTS

SHOSHONE-PAIUTE TRIBES OF DUCK VALLEY

U.S. Bureau of Indian Affairs

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LIST OF ACRONYMS

amsl	Above mean sea level
AOC	Administrative Order on Consent
AST	Aboveground storage tank
bgs	Below ground surface
BIA	United States Bureau of Indian Affairs
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
CSM	Conceptual site model
DECRM	Division of Environmental and Cultural Resource Management
DSE	Daughtery Sprague Environmental, Inc.
DVIR	Duck Valley Indian Reservation
DW	Drinking water
EECA	Engineering Evaluation/Cost Analysis
ENA	Eastern Nevada Agency
EPA	Environmental Protection Agency
ESC	ESC Lab Sciences
FPH	Free-phase hydrocarbons
HASP	Health and Safety Plan
IHS	Indian Health Services
JSA	Job Safety Analysis
MCL	Maximum contaminant level
MDL	Method detection limit
mg/kg	Milligrams per kilogram
mg/L	Milligrams per Liter
MNA	Monitored natural attenuation
NTP	Notice to Proceed
QAPP	Quality Assurance Project Plan
QA/QC	Quality assurance/quality control
PAH	Polycyclic aromatic hydrocarbons
ORP	Oxidation Reduction Potential
PID	Photoionization detector
PRG	Preliminary Remediation Goals
PVC	Polyvinyl chloride
RI	Remedial Investigation
RSL	Regional screening level
SAP	Sampling and Analysis Plan
SOW	Statement of Work
SDWA	Safe Drinking Water Act

SRK	Steffen Robertson and Kirsten Consultants
TCE	Trichloroethylene
TPHd	Total petroleum hydrocarbons—diesel range organics
TPHg	Total petroleum hydrocarbons—gasoline range organics
TOC	Top of casing
Tribes	Shoshone-Paiute Tribes of Duck Valley
TAT	turn-around time
µg/L	Micrograms per liter
USCS	Unified Soils Classification System
VOCs	Volatile organic compounds
WRO	Western Regional Office

1.0 INTRODUCTION

This work plan describes the objectives, available historical information, and technical tasks required to determine the nature and extent of petroleum contamination in the subsurface soils and groundwater in the community of Owyhee, Elko County, Nevada, on the Duck Valley Indian Reservation (DVIR) of North-Central Nevada.

The work plan addresses the completion of additional remedial investigations related to the continued presence in the shallow groundwater-bearing unit and surface and subsurface soils of petroleum hydrocarbons associated with the prior operations at the Bureau of Indian Affairs (BIA) Road Shop (Facility) and leaking underground heating oil fuel distribution lines. Additional data and information needs to be collected to complete the characterization of the nature and extent of these hydrocarbons to allow remedial options to be evaluated.

On June 16, 1995, the Environmental Protection Agency (EPA) Region 9 issued Administrative Order on Consent (AOC) Docket No. UIC-EO-95-001 to the BIA. The AOC addresses releases at or associated with the Facility and the resulting environmental contamination affecting or potentially affecting former drinking water (DW) wells which had served the community of Owyhee, Nevada, on the DVIR. To support the remaining provisions of the AOC, the BIA entered into a contract with Akana.

2.0 SITE DESCRIPTION

2.1 Site Location

The Site is approximately 90 miles north of Elko, Nevada, just south of the Idaho-Nevada border, on Nevada State Highway 225. The town of Owyhee, Nevada, is approximately 5,400 feet above mean sea level (amsl). The land to the east rises sharply to an elevation of approximately 6,700 feet amsl. The DVIR is located within the Snake River drainage basin, just north of the Great Basin (see Figure 1).

2.2 Setting

The DVIR is in a valley consisting of a rectangular area approximately 22 miles long and 20 miles wide straddling the Nevada/Idaho border. The land is tribally owned and was established in 1877. Tribal headquarters is in Owyhee, in the southeastern part of the reservation. The Owyhee Community Layout Map is provided on Figure 2.

2.3 Population Base

According to the Shoshone-Paiute Tribes of Duck Valley (Tribes') website, current tribal membership is 2,300, with approximately 1,700 members living on the reservation. Farming and

ranching are the mainstays for the Tribes. The DVIR is composed of 289,819 acres held in trust by the United States government.

2.4 Historical Contamination

In 1985, a 16,000-gallon aboveground storage tank (AST) located east of Highway 225, near the old power plant (See Figure 3), released 8,000 gallons of heating oil through leaks in the subgrade pipeline system used to carry fuel to consumers. The AST has since been removed. In 1987, an oil-like odor was discovered in two municipal water wells located to the west of the former Eastern Nevada Agency (ENA) Roads Shop Facility (See Figure 3). The municipal water wells were at that time used as the community source for drinking water.

In March 1998, Indian Health Services (IHS) reported that the Owyhee public drinking water contained a petroleum-like taste. The Tribes conducted nine test pit excavations to depths of 12 to 15 feet below ground surface (bgs). The pits were located east, west, and north of the tribal maintenance building (See Figures 3 and 4). Free-phase hydrocarbons (FPH) were observed in two pits located north of the tribal maintenance building between DW wells 1 and 3. Soils were excavated along the buried pipeline to groundwater, and free-phase hydrocarbons were encountered beneath the pipeline fittings. Soil samples collected from underneath the pipeline contained 11,000 to 12,000 milligrams per kilogram (mg/kg) of total petroleum hydrocarbons (TPH) in the diesel range (TPHd).

DW wells 1 and 2 were taken out of service sometime between 1988 and 1990. DW Well 3 continued to pump groundwater for the community supply until at least 1996. All the former DW wells were abandoned in place in 2008. The Well Driller's Plugging Reports are provided in Appendix A.

The DW wells were sampled numerous times between 1988 and 1995 by the Tribes, BIA, and the EPA. Site investigations determined that further characterization of soil and groundwater impacts should be conducted and that the heating oil pipelines near the municipal water wells should be removed.

EPA issued an AOC in 1995 to the BIA for Safe Drinking Water Act (SDWA) violations. The AOC, in part, directed BIA to immediately cease use and close the shallow injection well located at the Roads Shop Maintenance Facility. These actions were included among six (6) total provisions and fifty-four (54) individual requirements stipulated by the AOC. In response to the AOC, the Bureau of Reclamation assisted BIA with the development of a work plan to facilitate removal of impacted soils, removal of pipelines and drains, sampling and analysis of soil and groundwater, characterization of contaminant impacts to soil and groundwater, and long-term monitoring of groundwater contamination. A copy of the AOC is provided in Appendix B.

Extensive investigation work and remedial actions have been performed to eliminate the soil source of the groundwater impacts. In addition, groundwater monitoring has been occurring since 2005. As a result, many of the requirements of the AOC have been completed, but a few outstanding requirements still exist.

The provisions of the AOC that still need to be addressed are Paragraph II.D.39, regarding site characterization and Paragraphs II.E.40, 44, and 45, regarding site remediation. Appendix C provides a table that was presented to the EPA in a letter from the BIA dated September 29, 2016, indicating the status of the corrective actions associated with the AOC.

3.0 WORK PLAN OBJECTIVES AND CONTENT

The objectives for this Project are: (1) to further characterize and delineate TPH-impacted soil and groundwater within the town of Owyhee, and (2) to satisfy the provisions set forth in the 1995 AOC. The remaining provisions of the 1995 AOC that need to be addressed are:

Paragraph II.D.39, regarding site characterization and extent of soil contamination:

> Additional soil data are needed to better understand the extent of hydrocarbon impacts to soils and groundwater in the area of the former power plant and south of the tribal natural resources building, surrounding the area of MW-23 and MW-24 (See Figure 4). Impacted unsaturated and saturated (below water table) soils had to be left in place in several locations along the route of the former fuel distribution pipeline due to presence of water lines, sewer lines, structures, or other obstructions. To address this need, an additional 20 soil borings will be installed during the next phase of investigation, with five (5) of these borings converted to permanent monitoring wells. Selected soil samples from these borings will be analyzed for TPHd, total petroleum hydrocarbons-gasoline range organics (TPHg), volatile organic compounds (VOCs), and polycyclic aromatic hydrocarbons (PAH).

Paragraphs II.E.40, 44, and 45, regarding Site Remediation:

> The BIA has effectively remediated most of the hydrocarbon impacted soils; however, the lateral extent of groundwater contamination needs additional characterization. This work plan includes the installation of four (4) downgradient monitoring wells and one (1) upgradient monitoring well located south of the school maintenance yard and MW-1 (See Figure 4).
>
> New wells must be installed downgradient of the groundwater plumes to provide a downgradient measure of in situ biodegradation, act as sentinel wells between the plumes and the irrigation canal, and allow a more complete potentiometric surface to be developed for the area of contaminated groundwater. The work plan provides for data

from a new well installed further upgradient of MW-1 to be used to evaluate the presence of electron acceptors in native groundwater to support either passive monitored natural attenuation or active enhanced in situ biodegradation as remediation technologies to employ at the site.

The work plan includes the analyses of groundwater samples through quarterly groundwater monitoring for a period of one year. Groundwater samples collected from monitoring wells will be analyzed for TPHd, TPHg, VOCs, and PAHs during this phase of investigation.

Appendix C provides a table that was presented to the EPA in a letter from the BIA dated September 29, 2016, indicating the status of the corrective actions associated with the AOC.

Work described herein entails the assessment of current groundwater conditions and the installation of additional soil borings and monitoring wells. The findings of the assessment will assist in the preparation of a Remedial Design Plan,

3.1 Content of Work Plan

Akana will prepare and submit draft and final copies of the Supplemental Remedial Investigation Work Plan to communicate and formalize project objectives, approach, methods, notification procedures, schedule, and regulatory requirements. This Work Plan includes the following components:

- Site description
- Nature and extent of contamination
- Project overview and objectives
- Previous investigations
- Environmental setting
- Summary of current conditions
- Supplemental data needs
- Scope of work for additional investigations
- Sampling and Analysis Plan (SAP)
- Health and Safety Plan (HASP)
- Quality Assurance Project Plan (QAPP)

3.2 Timeline

The revised Work Plan was submitted to the BIA Western Regional Office (WRO) for a thirty (30) day review period. A final draft of the Work Plan will be submitted to the EPA and the Tribes for a thirty (30) day review period. Akana and the BIA will make the necessary edits,

then distribute an electronic copy of the final draft Work Plan to EPA and the Tribes and plan the date for the kickoff meeting and initial site visit.

Akana will distribute hard copies of the final draft work plan at the kickoff meeting, scheduled to occur on August 17, 2017, at 10:00 am Mountain Time. Akana will submit by mail one (1) hard copy and one (1) electronic copy of the final work plan to the Division of Environmental and Cultural Resource Management (DECRM), and three (3) hard copies and three (3) electronic copies of the final work plan to the Tribes and EPA.

3.3 Presentation of Work Plan

Akana will travel to Owyhee, Nevada, to attend, facilitate, and conduct a project meeting with BIA and Tribal officials. The purpose of the meeting will be to discuss the work activities and deliverables, the project logistics, and the project schedule. During this meeting, Akana will present a Microsoft PowerPoint chronological overview of environmental assessment and remedial activities completed by BIA, provide a summary of informational and data needs to be gathered by the Akana during the next one (1) year assessment period, and provide a summary of potential short- and long-term requirements for environmental monitoring and remediation. Akana will present a Conceptual Site Model (CSM) during the presentation and discussion, and based on available information, identify potential risks from contaminant releases to human health or natural resources.

During the meeting, Akana will provide participants with hard copies of the final draft work plan and shall make an estimated twelve (12) copies available to the participants attending the meeting. The chronological overview presentation shall complement the discussion of the scope and deliverables of this contract, as outlined in the final draft work plan. The duration of the meeting shall be approximately three (3) hours.

Following the meeting, Akana and any interested stakeholders will conduct a site visit. Akana assumes a single eight (8) hour work day for the meeting and site visit. Observations, notes, photographs, and other information collected during this site visit and documented during periodic teleconferences shall be utilized by Akana for revision and finalization of the Final Draft Work Plan.

Following the completion of the planning activities, Akana and its subcontractors will begin the supplemental field work. A detailed description of the scope of work for the supplemental field investigation is provided in Sections 7.0 and 8.0.

4.0 PREVIOUS INVESTIGATIONS

4.1 Nature and Extent of Contamination

In February 1985, 8,000 gallons of heating oil were delivered to a 16,000-gallon AST located approximately 75 feet east of Highway 225, near an old power plant (Figure 3). Five days later, and before the 8,000 gallons should have been consumed, the tank was empty, suggesting that the pipeline that carried the fuel to consumers had leaked. Use of the heating oil pipeline was discontinued that year, but the 16,000-gallon AST continued to store heating oil, which was transferred by truck to heating oil tanks.

4.2 Monitoring Well System

Previous investigation activities of the groundwater included the installation of 23 monitoring wells associated with the release of heating oil from the heating oil distribution pipelines and with other releases from gasoline and diesel underground storage tanks, former gasoline and diesel ASTs, a former injection well, and a discharge pipe at the former BIA road shop maintenance yard See Figure 3: The Contaminant Source and Release Area Map.

Groundwater in the area occurs in shallow alluvial aquifers. The depth to groundwater recorded in monitoring wells between 2005 and 2013 ranged from approximately 3 to 20 feet bgs. Various investigations of the source areas were completed from 1988 to 2013.

4.3 Previous Investigations and Findings

A chronology of historical events and historical investigations is provided in Appendix D.

5.0 ENVIRONMENTAL SETTING

5.1 General Setting

The investigation area is located within the old town of Owyhee, Nevada, on the DVIR of north-central Nevada.

5.2 Climate

Summers tend to be hot and dry, and winters cold and wet. Temperatures range from sub-zero to 100 °F. Precipitation averages 16 inches annually. Heavy snowfall is common at higher elevations. Surface water supplies depend entirely on precipitation received in the Owyhee River Basin, which surrounds the reservation.

5.3 Physiography

Based on the review of BIA Report-61, "Status of Mineral Resources Information for DVIR Owyhee County, Idaho and Elko County, Nevada," the southeastern part of the DVIR lies on

the northwest flank of the Bull Run (Centennial) Mountains and borders the Humboldt National Forest and Mountain City mining district. The western and northern parts of the reservation border the Owyhee desert and southern edge of the Snake River Plain. Landforms within the reservation consist of residual or erosional mountains in the southeast and lower lava plateaus in the west and north. Duck Valley is carved into the uppermost lavas by the Owyhee River.

Altitudes range from 7,536 to 4,980 feet amsl. The entire area is included in the Owyhee uplands section of the Columbia Plateau Physiographic Province. The Owyhee River and its tributaries form the principal drainage system. Most streams flow north and south into the Owyhee River, which itself flows northwest. Streams in the southern part of the reservation flow southwest to the South Fork of the Owyhee River. Many streams are only active during the spring runoff or periods of heavy rain.

5.4 Land Use

Farming and ranching are the mainstays for the Tribes. The DVIR is composed of 289,819 acres held in trust by the United States government. Numerous structures are spread throughout the central valley of the reservation, with a high degree of wildland interface. The majority of structures on the reservation are located in three subdivisions. The town of Owyhee is the primary subdivision for activities and gatherings and contains a hospital, police station/correctional facility, post office, schools, a telephone company, education offices, a senior citizen center, Great Basin College, and the tribal courthouse and community center. Most of the structures are residential but many are tribal governmental institutions, with intermixed commercial buildings.

The Tribes manage three rainbow trout fisheries: Lake Billy Shaw, Mountain View Reservoir, and Sheep Creek Reservoir. The Tribes operate and maintain several camping areas at Wild Horse Reservoir, located 30 miles south of the reservation boundary. The reservoir itself is managed by the Nevada Division of Wildlife.

5.5 Population

Current tribal membership is estimated at 2,300 members, with approximately 1,700 members living on the reservation. Native American members of the community are primarily bilingual, speaking a combination of English and either Shoshone or Paiute languages.

5.6 DVIR Water Supply

Based on review of the Tribe's 2016 Public Water System Consumer Confidence Report, which is required by the SDWA, the public water supplies serving Owyhee, Newtown, and Thomas Loop are under the supervision of the Tribes' Water and Sanitation Department.

The source of drinking water on the DVIR is from groundwater public supply wells. The DVIR is served by two separate water supplies: Owyhee Well 3 supplies the town of Owyhee and along Highway 225 to the rodeo grounds turn-off, with Owyhee Well 2 as a backup well. Newtown well 1 and well 3 supply the Newtown area, Thomas Loop, and Highway 51, with Newtown Well 2 as a backup. Figure 5 shows the locations of the current DVIR municipal drinking water wells.

According to the report, each system operates separately. However, there is reportedly a valve that can be opened to provide water to the Newtown system from the Owyhee system, if needed.

Pumps bring the water from the aquifer, where it is then stored in ASTs prior to distribution. Water is distributed under pressure through an underground piping system. Service lines are attached to the main lines to deliver water to residences and other structures within the community.

The report also summarizes water quality data collected in 2015. The report indicates that no harmful contaminants were detected in the water samples, that water quality in the public supply wells is excellent, and that no contamination associated with the former release of heating oil and gasoline is present in the current DW wells. The report indicates the BIA has cleaned up much of the contamination in the town of Owyhee and that more cleanup work will be occurring in the following years. A copy of the 2016 Public Water System Consumer Confidence Report, which includes a map showing the location of the public water wells, is provided in Appendix E.

6.0 CURRENT CONDITIONS

6.1 Regional Geology and Hydrogeology

Rock formations on the reservation were formed during four different periods of geologic history that cover a time span of about 330 million years. The oldest are sedimentary and metamorphic rocks of Paleozoic age (sandstone, siltstone, phyllite, quartz mica schist, and slate), which are exposed only in the southeast corner of the reservation. These oldest formations were folded, faulted, and intruded at depth by stocks of granitic rock (granodiorite and quartz monzonite) of Cretaceous age. The stocks were fractured, and mineralized along the fractures with gold-quartz veins, also of Cretaceous age. The entire assemblage was then uplifted and the upper part eroded, exposing the granitic and older rocks at the surface.

After a lapse of perhaps 50 million years, the erosion surface was covered by a third group of rocks (volcanic tuffs, lava flows, and interbedded sediments) of Tertiary age. Total thickness of these volcanic rocks exceeds 3,000 feet (914 m). This third group of formations is divided into older and younger volcanics, because a second interval of mineralization of middle Tertiary age

hydrothermally altered the older volcanic rocks in many parts of a zone trending northeastward in Township 46 North, Range 52 East. The altered rocks are bleached, stained with iron oxide, and opalized. Younger volcanic rocks are not altered.

The latest volcanic rock to be deposited is the basalt of the Banbury Formation which is about 7 million years old. In Idaho, this formation has been mapped as Snake River basalt. In the southern part of the reservation, much of the volcanic rock has been eroded, again exposing parts of the granitic and older formations. In the northern part, Banbury basalt is nearly flat-lying and forms most of the surface at higher altitudes, but in Duck Valley, part of the basalt is eroded to form the fourth group of formations (older and younger alluvium), mostly of Quaternary age.

On the east and western areas of the reservation, a series of Tertiary lava flows covered the erosional surface. The lava flows were subsequently eroded. The Owyhee River Plain in the north-central and central portions of the reservation is an erosional feature filled with Quaternary aged gravel, sand, and silt.

According to Harrill and Prudic (1998) the U.S. Geological Survey (USGS) has identified 20 groundwater flow systems and 282 hydrographic areas within the Great Basin Region of the southwestern United States. Of these, 14 of the flow systems and 252 of the hydrographic areas are located wholly or partially within Nevada. Four flow systems are located in Elko County—three within the Great Basin (Humboldt River, Great Salt Lake Basin, and Central Region), with the fourth within the Snake River Plain. Within these four flow systems, there are 50 hydrographic areas in the county. The 8 hydrographic areas currently under evaluation by Elko County in partnership with the USGS are within the Humboldt River flow, specifically identified by the USGS as the Upper Humboldt River Basin.

Although most flow systems are confined to one or two areas in the Basin and Range area, several areas are linked together in an extended groundwater flow system in places. In most areas, flow passes through the basin-fill sediments that cover the valley floors, as in the Humboldt system. However, where carbonate rocks underlie the basins, data indicate that some basins are hydrologically linked by the carbonate rocks and large quantities of groundwater flow through them and discharge through the overlying basin-fill sediments to large springs. Because few wells are drilled into the carbonate rocks, data are scarce and several assumptions have been made to account for flow in these rocks. A geologic map is provided on Figure 6.

6.2 Site Geology and Hydrogeology

Akana reviewed available well driller's logs for domestic and municipal wells located within Owyhee and noted that alluvial deposits were between 100 feet and 450 feet in thickness. The alluvial deposits consist of a mixture of gravels, clays, sands, and basalt boulders, which are indicative of near talus slope erosional deposits and fluvial deposits.

Local hydrogeology on the DVIR consists of varying types of Quaternary alluvial deposits. These deposits range in thickness, composition, and hydraulic conductivity. The general area of the DVIR yields substantial amounts of groundwater from these shallow deposits for municipal, domestic, and irrigational water use.

6.3 Hydrology

The Snake River Basin covers 5,230 square miles in parts of Elko and Humboldt counties and includes eight hydrographic areas. The Snake River Basin extends into Oregon and Idaho to the north and Utah to the east. The topography of the drainage area within each hydrographic area controls the movement of groundwater at a regional scale. The distribution of recharge and discharge is evidence of interbasin flow.

According to past investigations, the Owyhee River Basin in the area of investigation can be classified into three hydrologic units:

- A perched and unconfined aquifer associated with recent alluvial and colluvial deposits (5 to 20 feet in depth)
- An intermediate, partially confined aquifer within valley-fill deposit consisting of cobbles and terrace deposits located beneath a fine-grained aquitard aquifer (40 to 120 feet in depth)
- A deep aquifer beneath the valley-fill deposits consisting primarily of fractured basalt and rhyolite deposits (greater than 200 feet in depth)

Because of the topographic effect of the mountains, the amount of precipitation increases as the altitude increases. Conversely, the amount of evapotranspiration decreases as altitude increases, as a consequence of lower temperatures at higher altitudes.

Figures 5 and 6 consist of a hydrogeological map showing the DVIR public water supply wells and the geologic map showing the geologic surface units.

6.4 Natural Water Quality

Water Quality Status reports prepared by various agencies such as USGS, USEPA, Nevada and Idaho Departments of Natural Resources, and others indicate that the overall quality of the Owyhee River Basin surface water is good. The water quality in the main stem of the Owyhee River below the DVIR is excellent and suitable to be included in the National Wild and Scenic River System. The DVIR and its related natural and manmade nonpoint sources appear to have some effect on surface water quality within the DVIR. Nonpoint sources include livestock grazing, agricultural runoff, septic tank drainage, and solid waste in the area. These sources

raise the levels of nutrients, solids, turbidity, trace metals, and bacteria in the water within the DVIR. However, the Tribes are continually working to improve water quality through grants.

In general, groundwater quality is very good, as reported in Section 5.6.

6.5 Sources of Contamination

The review of historical site information and data available in existing reports indicates that soil contaminated with petroleum hydrocarbons has been largely removed during previous excavation efforts at the Facility and along the heating fuel pipeline between the 16,000-gallon tank, the Facility, and several other BIA buildings in the vicinity of the Facility. Some areas of affected soils could not be removed due to obstructions such as roads, buildings, or underground utility lines.

The historical soil data are summarized in Tables 1 through 4. The remaining sources of soil contamination are shown on Figures 3 and 4. A summary of the historical excavation areas and approximate volumes removed are provided in the table below:

Summary of Historical Soil Excavation Volumes

Source (TPH)	Area	Sample Locations	Volume Removed (cubic yds^3)
Heating Oil Pipeline	West side of Highway 225, near tribal resources building	L18-01/L33 L18-02	5
	(2002) West of Highway 225, along northern border of D Street	L-18	24
	West side of Highway 225 near houses #308-#312	L15 and L16	0
	East of Highway 225 near old power plant	L29 L17 L17B L13 L13A L30 L31	400 5 25 650-800 25 55 75

Source (TPH)	Area	Sample Locations	Volume Removed (cubic yds^3)
	Along residential street west of Highway 225, northwest of house #3115	L7 L36	500-600 15
	(2002) Along residential street west of Highway 225, south of house #312	L-7 north and south of C Street (L-7S, L-7N, L-7C)	1,348
	Northeast of road shop building and north of tribal maintenance building	L1 L2 L34	0 0 375
	(2002) Northeast of ENA Road Shop building and north of tribal maintenance building	(L-34S and L-34)N	560
Discharge Pipeline	BIA road shop yard	D4, D5, D7, D10, D8, D9 (outlet)	115 50
Road Shop Yard	Along west side of the road shop building	S1-S6	90
	East side of road shop building: former 500 gal AST	S7	5
	East side of building; former 280 gal AST	S8	5
	South side of building; former 500 gal AST	S9	5
	Drummed oil leakage area	S10	10

Source (TPH)	Area	Sample Locations	Volume Removed (cubic yds^3)
	Tar spillage area	S11	10
	Surface staining from equipment	S12	40
USTs	East of Road shop building	U3-U6	25
	East of Highway 225 near old power plant	U7-U10	60
	Near house 3115	U12-U13	300
ASTs	Road shop yard; former 1000 gal AST	A1-A4	25

In addition to the volume of soils excavated in 1996 and 1999 (3,083 cubic yards), approximately 1,932 cubic yards of hydrocarbon-affected soils were excavated and removed in 2002 as part of a road resurfacing project in the areas of L-7, L-18, and L-34. The total soil volume removed during historical removal actions is estimated to be around 5,020 cubic yards of hydrocarbon-impacted soils.

6.5.1 Surface Soil Contamination

TPH-contaminated soil remains in the area along GAH-nee Road between what is now called Justice Road, BIA Road, and College Way (L7 on Figures 3 and 4). TPH-contaminated soils appear to remain in the area of MW-22 and MW-10 east of Highway 225 (L13, L13A, L17, L17B, and L29 on Figure 3). TPH-contaminated soils also appear to remain in the area of MW-23 and MW-24 (L15 and L16 on Figure 3), the area between MW-6 and MW-8 (L34 on Figure 3), and near MW-16, located near the former IHS Hospital. MW-16, MW-17, and MW-18 were plugged and abandoned in 2008. There has not been an EPA remedial action level established for TPH in the soil. The State of Nevada has established an action level for TPHg and TPHd at a concentration of 100 mg/kg.

6.5.2 Subsurface Soil Contamination

Several past projects have been completed during which TPH-contaminated soils have been removed. However, contaminated unsaturated and saturated (below water table) soils had to be left in place in several locations along the route of the former fuel pipeline because of the presence of water lines, sewer lines, structures, or other obstructions (See Figures 3 and 4).

Initial observations of the presence of floating free product on top of the groundwater table during historical excavations and during operation of the former DW wells indicate that residual petroleum hydrocarbons are also retained within the saturated zone and capillary fringe. Residual hydrocarbons from the heating oil distribution pipeline appear to be present at a depth of 6 feet bgs in the area near the former excavation of L-33, which is located west of Highway 225 and south of the tribal resource building. Residual hydrocarbons remain present in the soils of former excavations L15 and L16, located west of Highway 225 near houses #308-#312. Hydrocarbons also remain in the area of the former L29 excavation, located east of Highway 225 near the old power plant; the former L34 excavation, located northeast of the ENA Roads Shop building and north of the tribal maintenance building; and the former L7 excavation area, located south of MW-26 under the roadway. See Figures 3.

The presence of residual concentrations of petroleum hydrocarbons in subsurface soils along the former fuel distribution pipeline may create the potential for petroleum hydrocarbons to continue to leach to, or be in contact with, shallow groundwater.

6.6 Groundwater Contamination

6.6.1 Groundwater Impacts

Based on historical groundwater quality information, petroleum hydrocarbons remain in groundwater on and nearby the Facility. The 2013 groundwater monitoring data indicated that the area encompassing MW-8, MW-9, MW-11, and MW-13 continues to have detections of TPHg and TPHd. There have not been remedial action levels established for TPHg or TPHd in the groundwater. A TPHd and TPHg plume, as well as the benzene, ethylbenzene, toluene, and xylenes (BTEX) plume, exists in the area of MW-10, MW-22, MW-23, and MW-24.

It is also apparent that low levels of petroleum hydrocarbons—less than 0.5 milligrams per liter (mg/L)—are present in groundwater within a larger areal extent than previously mapped. This is partly due to use of laboratory reporting limits greater than 0.5 mg/L to analyze previous samples. The presence of these constituents in shallow groundwater indicates the continuing dissolution and migration of petroleum hydrocarbons in area groundwater. The historical groundwater data have been summarized in Tables 5 through 9.

6.6.2 Groundwater Flow Direction

Groundwater in the area of the Facility and pipeline occurs in a shallow alluvial aquifer. The depth to groundwater recorded in monitoring wells between 2005 and 2013 ranged from approximately 3 feet to 20 feet bgs. The direction of groundwater flow in the central area of Owyhee has historically been to the west-northwest at a gradient of approximately 0.006 feet per foot. A trough-like feature in the potentiometric surface, with a northwest-southeast trend, has also been observed in this area.

6.6.3 April 2016 Preliminary Groundwater Monitoring Results

Akana staff visited the site from April 25 through 29, 2016, to assess the condition of the existing monitoring wells, document the existing groundwater quality, and perform groundwater sampling of the monitoring wells. These monitoring wells had not been sampled since April 2013.

Akana assessed the condition of the 27 existing monitoring wells and, due to the condition of three (3) of the wells, was only able to collect water samples from 24 wells for field and laboratory analyses. The laboratory analyses included TPHg and TPHd using EPA Method 8015D, and VOCs using EPA Method 8260B. The samples were submitted to ESC Lab Sciences, in Nashville, Tennessee, for analysis.

A summary of the well conditions observed during this visit and a data results summary follows.

Twenty-four of the 27 monitoring wells are in good condition for continued monitoring and sampling (See Figure 7). The exceptions are listed below.

- MW-1 was observed to be set below surface grade and was covered with water and sediment, so it was not sampled.
- MW-3 could not be located due to the presence of debris and equipment at its reported location. MW-3 was not included in the list of monitoring wells to be sampled during the preliminary groundwater sampling event. However, the location of the well was searched to assess its current condition.
- MW-30 appears to have been destroyed due to the construction of a new residential structure and could not be located.
- Because MW-30 may have been destroyed, a sample was collected from MW-13 and placed on hold with the laboratory to provide a downgradient monitoring point for MW-11. Regarding MW-13, it had been unclear whether the well still existed or if it had

been repaired. Akana confirmed the well had been repaired and was not plugged and abandoned.

2016 Groundwater Flow Direction

The general flow direction appears to be to the northwest, with a steep gradient change at Highway 225. West of Highway 225, there is a steep elevation change toward the canal and the Owyhee River Basin. Due to inconsistent top of casing (TOC) elevation data, a potentiometric map could not be generated. Survey work is planned for the next phase of investigation to resolve this issue (see Section 7.1.2).

Current Groundwater Concentrations

The data from the April 2016 sampling event are provided in Tables 5 through 8. These data are illustrated on Figures 8 through 13.

Total Petroleum Hydrocarbon

TPHg was not detected at concentrations greater than 1.0 mg/L in any of the monitoring wells sampled during April 2016. TPHd was detected in MW-9, MW-11, MW-13, MW-22, MW-23, MW-24, MW-26, and MW-28 at concentrations of 4.1 mg/L, 7.31 mg/L, 1.52 mg/L, 2.39 mg/L, 5.73 mg/L, 9.21 mg/L, 1.1 mg/L, and 1.31 mg/L, respectively. TPHd residuals appear to be from continued leaching of TPH-contaminated soils. A TPHd plume is present in and around the area of MW-9, in MW-11, MW-28, and MW-13, in the area of MW-10, and in the area around MW-23 and MW-24. The TPH isoconcentration map for April 2016 is provided on Figure 7 and the data are summarized in Table 5.

Trichloroethylene

Trichloroethylene (TCE) was detected in MW-10 at a level of 0.989 micrograms per liter (μg/L), below the EPA maximum contaminant level (MCL) of 5 μg/L, but above the EPA Region 9 tap water Regional Screening Level (RSL) of 0.49 μg/L.

Historically, TCE has been detected in MW-10 since 2002, but at concentrations below the EPA MCL. TCE has not been detected in any other monitoring wells. However, in many instances the reported method detection limit for TCE was higher than the MCL or TCE had not been analyzed, so whether TCE is present in the groundwater at other areas of the site is unknown. A source for TCE has not been identified. A TCE isoconcentration map is provided on Figure 8 and the data are summarized in Table 6.

Benzene, Toluene, Ethylbenzene, Xylenes, and Naphthalene

Benzene was detected in MW-24 at a level of 24.7 µg/L, above the EPA MCL of 5 µg/L and the EPA Region 9 tap water RSL of 0.46 µg/L.

Historically, benzene has not been detected in other monitoring wells, except for MW-23. The concentration of benzene in MW-24 appears to be relatively stable. A Benzene isoconcentration map is provided on Figure 9 and the data are summarized in Table 6.

Ethylbenzene was detected in MW- 23 at a level of 11.70 µg/L and in MW-24 at a level of 47.2 µg/L, below the EPA MCL of 700 µg/L, but above the EPA Region 9 tap water RSL of 1.5 µg/L.

Historically, ethylbenzene has not been detected in other monitoring wells, except MW-8 and MW-22. The concentrations of ethylbenzene in MW-23 and MW-24 do not appear to show an overall trend. The ethylbenzene isoconcentration map is provided as Figure 10 and the data are summarized in Table 6.

Toluene was detected in MW-23 at a level of 41.4 µg/L and in MW-24 at a level of 1.44 µg/L, below the EPA MCL of 1,000 µg/L. The toluene isoconcentration map is provided as Figure 11 and the data are summarized in Table 6.

Total xylenes were detected in MW-24 at a level of 130 µg/L, below both the EPA MCL of 10,000 µg/L and the EPA Region 9 tap water RSL of 190 µg/L. The total xylenes isoconcentration map is provided on Figure 12 and the data are summarized in Table 6.

Naphthalene was detected in MW-23 at a level of 97.2 µg/L, in MW-24 at a level of 289 µg/L, and in MW-28 at a level of 1.08 µg/L, with all reported concentrations above the EPA Region 9 tap water RSL of 0.17 µg/L. The EPA has not established an MCL for naphthalene.

Historically, naphthalene has been detected in these monitoring wells and others, but the April 2016 concentrations appear to be in a decreasing trend, except for MW-24, which shows an increasing trend since April 2013. To date, no additional polycyclic aromatic hydrocarbon (PAH) analysis of the groundwater has been completed. The naphthalene isoconcentration map is provided on Figure 13 and the data are summarized in Table 7.

A copy of the April 2016 laboratory report is provided in Appendix F.

7.0 SUPPLEMENTAL DATA NEEDS

7.1 Data Gaps Identified

Akana performed an evaluation of the data gaps to assess the need for additional field work and data analyses based on the remaining compliance provisions from the 1995 AOC and best management practices. The results of that evaluation are summarized below.

7.1.1 Remaining Soil Contamination Sources

The historical site information and data available in existing reports indicate that during previous excavation efforts, approximately 5,100 cubic yards of soil contaminated with petroleum hydrocarbons have been removed from the Facility and along the heating fuel distribution pipelines located between the former 16,000-gallon heating oil storage tank, the Facility, and several other BIA buildings in the vicinity of the Facility. The historical soil data are summarized in Tables 1 through 4.

The available soil sampling results are inadequate to fully delineate the extent of the impact to surface and subsurface soils in several areas. The remaining contaminated soils are a continuing source of dissolved petroleum hydrocarbons in shallow groundwater.

Specifically, the following areas of remaining potential soil contamination are known:

- The L7 excavation area beneath roads north of MW-26 and east of MW-11
- The L34 excavation area beneath the roadway north of the former tribal maintenance building
- The L18 excavation area south of the tribal resources building
- The L29 excavation area northwest of the old power plant
- The area of SB-1, SB-2, and SB-3 north of the former Facility Road building and near former DW wells 1, 2, and 3

During the installation of monitoring wells in 2008, select soil samples were collected from the bottom of the borings for wells MW-22, MW-23, MW-24, and MW-28. These samples contained TPHg concentrations ranging from 43 to 630 mg/kg and TPHd concentrations ranging from 97 to 310 mg/kg. These samples were also analyzed for TCE, but not for other VOCs or PAHs. Additionally, no soil samples were collected near ground surface or from the capillary fringe in these borings.

Additional soil data are needed to better understand the extent of the impact to soils and groundwater from hydrocarbons in these areas. That information will be needed to design an

appropriate remediation system. An additional 20 soil borings will be installed during this next phase of investigation.

The BIA has never operated gasoline ASTs or USTs at the DVIR. The remaining gasoline or BTEX plumes may be the result of historical tribal operations. However, the BIA has proactively assisted the Tribes in the removal of multiple USTs and ASTs and has excavated and removed gasoline-impacted soils throughout the community during subsurface investigations of the ENA Road Shop and heating oil distribution pipeline.

Of the above soil data gaps, Akana does not recommend any additional characterization work in the L7 and L34 areas, or in the vicinity of the former DW wells (near MW-28). Although it is known that contaminated subsurface soils remain in those areas, collecting additional soil TPH data is not critical to selection of appropriate remedial alternatives.

7.1.2 Hydrogeology

Several data gaps exist in the available site and area-wide hydrogeology information that preclude definitive characterization of the groundwater flow system. The gaps are described below.

- It appears that the TOC elevations of the monitoring wells have not been consistently surveyed during previous investigations, nor has a consistent measuring point been established at each well to be used between contractors performing monitoring. The effects of this issue include:
  - The potentiometric map presented in the Daugherty Sprague Environmental, Inc. (DSE) 2013 report is difficult to compare with previous maps. Akana recommends that a new topographical survey be done of all the monitoring wells before any additional ones are abandoned.
  - The lack of TOC control creates uncertainty in: (1) determination of the groundwater flow direction and gradient, (2) evaluation of seasonality effects, (3) determination of the relationship between flow and direction with onset and cessation of irrigation practices in the area and with flow rates in the nearby irrigation canal, and (4) determination of the extent of the recharge/discharge relationship between the canal and shallow groundwater.

  Although the overall direction of groundwater flow can be assumed to follow the general hydrologic direction along the longitudinal axis of the valley, the above factors may change the localized groundwater flow directions and gradients. This may influence selection of remediation approaches and estimation of the time to achieve

cleanup levels. A more complete assessment of these factors than is available in existing reports must be included.

- The bottom elevation of, and maximum water surface elevation in, the adjacent irrigation canal have not been surveyed. Therefore, an assessment cannot be made of the gaining or losing characteristics of the canal relative to shallow groundwater. The evaluation of the canal as a potential pathway for migration of contaminated groundwater to ecological receptors will be dependent on this information.

- No geologic cross sections have been developed to show shallow aquifer stratigraphy, the nature of lateral and vertical sediment heterogeneity, or the thickness and depth of higher versus lower permeability zones, pinch-outs, or other large changes in lithology or sediment facies that may influence horizontal and vertical groundwater flow directions. This information is critical to developing a CSM of the aquifer system and the distribution of contaminants in local groundwater.

- The flow characteristics of the regional (valley-wide) groundwater aquifer system have not been described. The local groundwater zones are part of the valley hydrologic flow system. The CSM must include at least a general description of this system to guide an assessment of the potential effect of shallow groundwater-zone contamination on the regional aquifer system. Additionally, this assessment can summarize available geologic information to help identify potential locations for installation of any future community water wells.

- There are only brief references to the presence of vertical hydraulic gradients within the shallow groundwater zone or between the uppermost and the underlying aquifers (e.g., Steffen Robertson and Kirsten Consulting [SRK] report, May 2001). This information will be needed to support the observation that the reduction in groundwater concentrations of contaminants over time is due to natural attenuation processes and not vertical migration to other groundwater zones.

- The existing aquifer information (field and literature) appears to be sufficient for a semi-quantitative determination of shallow groundwater flow rates. This allows for an initial time of remediation to be estimated. If the geologic cross sections indicate a fairly heterogeneous lithology in the contaminated zones, aquifer and slug tests may be considered at a future time to allow more accurate estimations of remediation time frames.

7.1.3 Shallow Groundwater Quality

Since 1988, a wealth of data regarding concentrations of petroleum hydrocarbons, chlorinated solvents, and other compounds of concern in the shallow groundwater zone has been collected

from the former DW Wells, and current and former monitoring wells. The historic and recent groundwater data for the contaminants of interest are summarized in Tables 5 through 9.

Limited additional data and information will need to be collected to complete the characterization of the nature and extent of the compounds of interest in shallow groundwater and allow remedial options to be evaluated with credible supporting information. Additionally, the available water quality data, and future data, should be reviewed based on the augmented hydrogeology data and information, as described above.

The additional water quality data needs are as follows:

- It appears that the lateral extent of shallow groundwater containing relatively low levels (less than 0.5 mg/L) of TPHg and TPHd is larger than previously mapped. For example, wells MW-15, MW-30, MW-1, and MW-14 show evidence of the presence of TPH in the 2013 data, the 2016 data, or both, when they did not in the previous sampling events. This is predominantly due to laboratory detection and reporting limits of greater than 0.5 mg/L having been used for much of the historical laboratory analyses. A larger contaminated groundwater plume may potentially enlarge the extent of the area requiring institutional controls, if institutional controls become a site closure requirements. Future groundwater samples for TPH analyses should be analyzed with a detection limit less than 0.5 mg/L. The recent (2016) samples were analyzed with a limit of 0.1 mg/L, which should be required of the laboratory for future sampling events.

- It is not clear if the historical fluctuations in TPH concentrations in some wells are associated with: (1) effects of seasonality on sampling, (2) varying degrees of leaching from soils due to changes in local precipitation and infiltration, (3) higher groundwater levels associated with greater stream flows in Owyhee River at times of higher regional precipitation and recharge, or (4) some combination of the above. The historical and future data need to be evaluated in conjunction with accurate TOC data.

- Data indicate that in situ biodegradation of petroleum hydrocarbons is occurring in shallow ground, but previous reports concluded that aerobic biodegradation of the petroleum hydrocarbons is limited by an apparent lack of dissolved oxygen. As a result, the estimated rate of in situ biodegradation has been reduced from aerobic to the lower anaerobic values. Data from a more suitably placed upgradient well and more focused data evaluation are needed to support this conclusion and plan a future remediation strategy to reduce cleanup time frames. Well MW-1 has been used as the upgradient well in previous qualitative evaluations of the occurrence of in situ biodegradation of petroleum hydrocarbons in shallow groundwater. However, TPHd was detected in this well at 0.27 mg/L during the 2013 sampling event. This well was not sampled in the April 2016 event due to access issues and may have to be rehabilitated or replaced. A

new well installed further upgradient will allow a more accurate evaluation of the presence of electron acceptors in native groundwater to support use of either passive monitored natural attenuation or active enhanced in situ biodegradation as remediation technologies at this site.

- Four new wells must be installed downgradient and cross gradient of the groundwater plumes to provide a downgradient measure of in situ biodegradation, act as sentinel wells between the plumes and the irrigation canal, and allow a more complete potentiometric surface to be developed for the area of contaminated groundwater. In addition, the presence of benzene and toluene above the EPA MCLs in MW-24 and the presence of TCE in MW-10 above the EPA MCL indicate that lateral delineation of contaminants in the groundwater is not complete.

- During the April 2016 preliminary sampling event, field reconnaissance of many of the existing monitoring wells indicated that a competent surface sanitary seal appears to be absent at these wells (there were no concrete seals to surface). A review of well log information indicated that these wells should have been constructed with either a cement or bentonite seal to the ground surface. The apparent lack of such a seal to a depth of approximately 10 inches bgs creates uncertainty regarding the credibility of existing groundwater data.

- Future groundwater sampling events must include sufficient numbers of quality assurance/quality control (QA/QC) samples, including duplicate, field blank, and trip blank samples. These QA/QC samples are not required in the current Statement of Work (SOW).

- Four additional quarterly groundwater sampling events are needed for the following reasons:

  - New comprehensive TOC survey data will be available, which may also include irrigation canal elevations as described previously.

  - Groundwater sampling by DSE in 2013 was conducted using Hydrasleeve™ sampling methodology. The use of this system was rationalized as reducing the cost of the project and the volume of purge water. Akana's initial review of this technology indicates that its use may lead to underestimation of the concentrations of contaminants.

  - In reviewing the groundwater concentrations reported in the DSE 2013 report, Akana noticed that several TPHd concentrations had been incorrectly reported from the laboratory report (by two orders of magnitude in one case). These errors have been corrected in the updated historical data tables that Akana has generated for this

project. These errors create uncertainty regarding the care taken in the field work completed in 2013.

- The water quality data must be reviewed in conjunction with the QA/QC results for a complete assessment of the significance of the laboratory results.

7.2 Conceptual Site Model

A draft CSM indicating potential human and ecological receptors is provided on Figure 14. An updated CSM will be submitted with the RI Report after more investigation work has been completed and evaluated. The CSM diagram represents the connection between the contaminant sources, release mechanisms, exposure pathways and routes, and potential human health and ecological receptors.

7.3 Remedial Goals

Remedial action standards must be established to enable selection of constituents of concern and to design and develop a Remedial Design Plan. Potential remedial goals such as EPA Region 9 Preliminary Remediation Goals (PRGs), EPA Regional Screening Levels (RSLs), state of Nevada standards, other federal and state standards, and standards used for other tribal sites will be evaluated as part of remedial investigations in this project to facilitate discussions among project stakeholders and achieve compliance with the outstanding provisions of the AOC.

7.3.1 EPA Regional Screening Levels and EPA PRGs for Residential Soils

The EPA RSLs are presented in generic tables on the EPA website and may not reflect site-specific conditions. They are updated yearly as new toxicology information is obtained. The Region 9 RSLs listed in historical data tables included in this work plan, as well as in the summary table below, were extracted from the EPA May 2016 generic RSL tables.

The generic Region 9 RSLs are based upon human health risk and do not address ecological risk. Screening levels are listed for chemical-specific concentrations in air, drinking water, and soil that may warrant additional investigation. EPA emphasizes that the Region 9 RSLs are not cleanup standards but are used as an assessment tool early in the assessment process and are likely to serve as PRGs during early stages of assessment.

EPA PRGs are risk-based concentrations that are intended to assist in initial screening-level evaluations and cleaning up contaminated sites. Currently, the PRGs are the same as the Region 9 RSLs until the determination is made to calculate site-specific PRGs. The decision to use PRGs at a site will be driven by the potential benefits of having generic risk-based concentrations in the absence of site-specific risk assessment. PRGs were originally used to provide initial cleanup

goals for individual chemicals, given specific medium and land-use combinations. The PRGs can be used for:

- Setting health-based limits for chemicals of potential concern
- Screening sites to determine whether further evaluation is appropriate
- Identifying sites, or portion of sites, which warrant no further action or investigation
- Setting initial cleanup goals when site-specific data are lacking
- Calculating cumulative risks associated with multiple contaminants

Site-specific PRGs can be derived based on specific information about a site, and therefore the generic Region 9 RSLs and PRGs are less likely to apply.

7.3.2 State of Nevada Soil Action Levels

Action levels or cleanup levels published in 2009 by the state of Nevada Department of Environmental Protection (NDEP) are taken from EPA Regional Residential Soil Screening Level tables for residential receptors. This has been confirmed through discussion with a Corrective Action project manager with the NDEP. The action level/cleanup level value for TPH of 100 mg/kg has been derived by the NDEP for soil closure conditions. The NDEP suggests that when all constituents of concern in the groundwater are below action levels, or in this case, MCLs, the site can be issued a No Further Action determination.

The two tables shown below list the constituents of concern in the soil and shallow groundwater at the DVIR site and include a list of published federal and state residential standards for each constituent, for discussion purposes.

Akana proposes that the state of Nevada standards for TPH in the soil and groundwater be used as the final closure criteria for TPH contamination in the soil and groundwater. Akana also proposes that EPA Region 9 RSLs, which are the same values as the residential PRGs, be adopted for the final closure criteria for other hydrocarbons in the soil, unless site-specific values are evaluated. Finally, Akana proposes that the EPA MCLs be used as the closure criteria for hydrocarbons in the groundwater.

Cleanup Standards for Soil Constituents of Concern

Constituents of Concern in the Soil (mg/kg)	EPA Region 9 Screening Levels for Residential Soil (mg/kg)	EPA Preliminary Remediation Goals for Residential Soils (mg/kg)	NDEP derived Action Level and Cleanup Level, 2009 (mg/kg)	Risk Based SSL for Protection of Groundwater (mg/kg)
TPHd	Not Established	Not Established	100	Not Established

TPHg	Not Established	Not Established	100	Not Established
Benzene	1.2	1.2	0.03	0.00023
Toluene	4900	4900	120	0.76
Ethylbenzene	5.8	5.8	5.7	0.0017
Total Xylenes	580	580	210	0.019
TCE	0.94	0.94	0.06	0.00018
1,2,4-Trimethylbenzene	0.94	0.94	67	0.00018
4-Isopropyltoluene	0.94	0.94	Not Listed	0.00018
Naphthalene	3.8	17	3.9	0.00054
2-Methynapthalene	240	240	310	0.19
Bis 2-ethylhexylphthalate	39	Not Established	35	1.3

Historical soil data as well as applicable federal and state standards are summarized in Tables 1 through 4.

Cleanup Standards for Groundwater Constituents of Concern

Constituents of Concern in the Groundwater	EPA Tap Water Screening Levels	EPA MCLs	Nevada Standards
TPHd (mg/L)	Not Established	Not Established	10
TPHg (mg/L)	Not Established	Not Established	10
TCE (µg/L)	0.49	5	MCL
Benzene (µg/L)	0.46	5	MCL
Toluene (µg/L)	1,100	1,000	MCL
Ethylbenzene (µg/L)	1.5	700	MCL
Total Xylenes (µg/L)	190	10,000	MCL
1,2,4-Trimethylbenzene (µg/L)	15	Not Established	Not Listed

Constituents of Concern in the Groundwater	EPA Tap Water Screening Levels	EPA MCLs	Nevada Standards
1,2,3 Trichlorobenzene (µg/L)	7.0	Not Established	Not Listed
Naphthalene (µg/L)	0.17	Not Established	Not Listed
Dinoseb (µg/L)	0.015	0.007	MCL

Historical groundwater data as well as applicable federal and state standards are summarized in Tables 4 through 8.

7.4 Potential Receptor Evaluation

Potential human health and ecological receptors that may be at risk from exposure to contaminants remaining in soil and groundwater at the site must be identified and evaluated. This evaluation must be conducted in conjunction with establishing site cleanup goals. It is clear that DW is a primary source of human exposure to contaminants in site groundwater. However, exposure to contaminants in soil, potential for continued leaching, potential impacts to the irrigation canal, potential downward migration of dissolved compounds in groundwater, contaminated irrigation of vegetation, potential construction worker exposure to impacted soils remaining from past releases, and other exposure pathways must be evaluated to quantify human health and ecological risks. The typical exposure pathways that may be applicable to the site are presented in the table below. The preliminary CSM is provided as Figure 14.

Based on review of the preliminary CSM, potential receptor exposures pathways for residential land use are as follows:

Typical Exposure Pathways by Medium

Medium	Residential Land Use
Groundwater	Ingestion from drinking Former DW wells have been plugged, but future use still exits that may require a deed restriction against use of groundwater in the area downgradient of the ENA Road Yard
	Inhalation of vapors From impacted soils and groundwater underneath a residence
	Dermal adsorption from bathing Pathway incomplete at this time
Soil	Ingestion
	Inhalation of particles (construction worker)
	Inhalation of volatiles (construction worker)
	Exposure to ground water contaminated by soil leachate
	Ingestion via plant, meat, or dairy products
Surface Water	Ingestion from drinking
	Dermal adsorption
	Ingestion during swimming
	Ingestion of contaminated fish
	Mammals

The results of the next phase of investigation and one year of groundwater monitoring will help determine exposure pathways that are complete.

7.5 Regulatory Process

Upon BIA review of the draft work plan and draft RI Report, Akana will incorporate edits as necessary and provide final draft documents for submittal to the stakeholders, including EPA Region 9 and the Tribes. Final reports shall be submitted within 30 days following stakeholder review. The contractor shall incorporate into the final reports to the greatest extent practical and as appropriate, any comments, concerns, or recommendations provided by the stakeholders during this period.

8.0 SCOPE OF ADDITIONAL SUPPLEMENTAL INVESTIGATIONS

The SOW was modified in June and July 2016 based on conversations with the BIA, review of historical documents, and detailed review of the status of the remaining provisions to be addressed in the AOC. This modification request did not include new tasks. However, the scopes of activities within several of the tasks required revisions and those changes are incorporated into each individual task below.

8.1 Phase I Project Planning

8.1.1 Records Review and Stakeholder Outreach (Task 1)

Akana has completed the records review and initial teleconference as described in Task 1 of the SOW. In February 2016; a file review of records at the BIA WRO was conducted in Phoenix, Arizona. Digital copies were made of all files pertaining to the Duck Valley investigation and shipped to Akana's office for a complete desktop review. Akana has completed Task 1 in accordance with BIA contact specifications.

8.1.2 Administrative Order/Compliance Status and Data Gap Analysis (Task 2)

In 2016, Akana conducted a review of the files to verify the completion status of Provisions I and II set forth in the AOC, for each of the thirty-one (31) compliance requirements (Paragraphs 17 through 45). Akana reviewed prior investigations and data, then compared them to the AOC for data gap analysis. For each requirement that was not completed or for which the completion status could not be verified or was otherwise indeterminate, Akana identified and incorporated needed work to complete the assessment and remedial planning documents. The results of the detailed AOC review are incorporated into this work plan, and the data gaps identified are outlined in Section 7.0.

Akana's review of the AOC requirements and subsequent reassessment of the contract SOW included assisting the BIA in responding to the EPA letter dated May 31, 2016. BIA incorporated analysis of the status of compliance with the AOC in a letter to the EPA dated September 29, 2016. In this letter, the BIA communicated to EPA that sufficient documentation

exists to demonstrate that (1) BIA has satisfied the requirements of the 1995 Order, with the exception of paragraphs 39, 40, 44, and 45, the DVIR of north-central Nevada.

Akana has prepared this work plan to address the remaining corrective actions and implement necessary additional field investigations as soon as all stakeholders have reached an agreement on the scope of the effort. Akana has completed Task 2 in accordance with BIA contact specifications.

8.1.3 Initial Site Visit and Kickoff Meeting (Task 3)

This task includes conducting a site visit and holding a kickoff meeting with federal and tribal officials and personnel. Activities to date during this project indicate a strong need to meticulously develop the information to be presented to the stakeholders during the meeting, requiring additional prior coordination with BIA and EPA. In accordance with BIA contract specifications, Akana shall distribute an electronic copy of the final draft work plan to the stakeholders prior to the kickoff meeting and initial site visit. Akana anticipates the site kickoff meeting occurring on August 17, 2017. At the kickoff meeting, Akana will distribute an estimated twelve (12) hard copies of the final draft project work plan.

Akana will facilitate and conduct the project kickoff meeting with federal and tribal officials and personnel to discuss the work activities, deliverables, logistics, and project schedule. The meeting, when scheduled, will take place at the tribal headquarters office. At the meeting, Akana will conduct a PowerPoint presentation providing a chronological overview of past environmental assessment and remedial activity, and review of compliance with the provisions of the AOC. Akana will also present a draft CSM and potential risk pathway summary, as presented in the draft project work plan.

Following the kick off meeting, Akana, BIA, and interested parties shall conduct a site visit and walk-through of Owhyee during the afternoon following the meeting. Observations, notes, photographs, and other information collected during this task and documented during periodic teleconferences shall be utilized by the contractor for revision and finalization of the work plan.

8.1.4 Preliminary Groundwater Sampling (Task 4)

Akana performed a groundwater sampling event April 25 through April 29, 2016, to assess and document the condition of existing groundwater quality monitoring wells and collect groundwater samples. Twenty-three (23) existing groundwater monitoring wells (MW 1, 5R, 6-12, 14, 15, 19-30) were sampled for TPH and VOCs. Samples were submitted to ESC Lab Sciences and analyzed using the following test methods:

- EPA Method 8260B

- EPA Method 8015D for TPH-GRO (Gasoline Range Organics) and TPH-DRO (Diesel Range Organics)

The results of this groundwater sampling event are included in Section 6.0. Until the 2016 sampling event, the existing monitoring wells had not been sampled since 2013. The location of the existing monitoring wells is provided on Figure 2. All historical soil and groundwater data are summarized in Tables 1 through 9, with depth to groundwater on Figure 7 and current isoconcentration maps provided as Figures 7 through 13.

The SAP detailing the procedures followed during the groundwater sampling event is provided in Appendix G. The standard operating procedures for Unified Soils Classification System Logging is provided in Appendix H. The QAPP is provided in Appendix I.

8.1.5 Project Work Plan (Task 5)

This task includes developing a project work plan to guide field activities, data analysis, and reporting of investigation findings. The work plan also includes field sampling, health and safety, and other protocols. It is subject to review and approval by EPA prior to implementation.

Akana will deliver a Final Work Plan for the project. The Work Plan will include, but not be limited to:

- Site Description
- Nature and Extent of Contamination
- Project Overview and Objectives
- Project Schedule
- Previous Investigations
- Environmental Setting
- Summary of Current Conditions
- Supplemental Data Needs
- Scope of Work for Additional Investigations
- Soil and Groundwater SAP
- Unified Soils Classification System (USCS) Logging Procedures
- HASP
- QAPP

8.2 Phase II Field Investigation and Assessment Reporting

8.2.1 Monitoring Well Installation, Soil Sampling and Analysis (Task 6)

The field investigation will involve the installation and development of five (5) new monitoring wells and a subsurface soil investigation including 20 new borings. Services include acquiring

well installation permits from the Nevada Division of Water Resources and proper disposal of all investigation derived waste.

Task 6 includes:

- Soil sampling for laboratory analyses of TPH, VOCs, and PAHs
- Additional soil sampling and analytical testing to address data gaps identified during site data review
- Collection of QA/QC soil and groundwater samples for laboratory analyses
- Resurvey of the TOC of the existing and new monitoring wells using a licensed public land surveyor (See Task 7 for additional details)
- Performance of the first quarterly groundwater sampling event and well water level elevation survey (See Task 8 for additional detail)

The field activities will be conducted in accordance with the approved, final project Work Plan. The revised scope of field activities is described below.

Monitoring Well Installation

This task includes installing five new wells, designated as MW-31 through MW-35. The wells shall be constructed in accordance with ASTM *Standard Guide for Design and Installation of Groundwater Monitoring Wells* (D5092 -04), utilizing a truck-mounted, direct-push probe bored to a maximum depth of twenty (20) feet bgs. New wells will include one upgradient of the site and MW-1, one downgradient of wells MW-23 and MW-24, and three upgradient of the canal. Wells shall be placed at specific locations identified in the approved, final project Work Plan. Figure 4 depicts the locations of the proposed new monitoring wells. No monitoring wells will be plugged and abandoned during the completion of this task.

The new wells shall be 2 inches in diameter and constructed using flush-threaded, Schedule 40 polyvinyl chloride (PVC) casing and 0.020-inch machine-slotted PVC well screen. A sand filter pack shall be placed in the annular space surrounding the screen, extending approximately 2 feet above the top of the screen. A bentonite annular seal shall be placed above the filter pack, and then cemented to ground surface. The wellheads shall be completed at the ground surface with lockable, compression-type well caps and flush-mounted, traffic-rated, locking well vaults with bolt-down lids. Each well shall be developed by surging and bailing water from the well casing to remove sediment from the filter pack. The northing, easting, and TOC elevations for each of the new wells shall be surveyed following completion, and a completion report shall be prepared for each well. Completion reports shall be included in the RI Report (Task 9).

Soil Sampling and Analysis

Akana will use direct push methods and hollow stem auger drilling methods to advance a maximum of twenty (20) borings (instead of 48 as in the original contract) to a maximum depth of twenty (20) feet bgs as follows:

- Five (5) soil borings will be advanced to a depth of 20 feet bgs at the locations of the proposed new monitoring wells to evaluate presence of petroleum hydrocarbons in soils before completing them as wells. At each location, discrete soil samples will be collected at every five-foot interval, at lithologic discontinuities, or at the water table interface (up to four [4] samples/boring) for laboratory analyses of TPHd and TPHg. Specific samples will be selected for laboratory analyses of VOCs based on field olfactory and visual observations and/or highest concentration of VOCs using calibrated photo-ionization detector (PID). One (1) sample per boring with the highest concentration of TPH or VOCs will also be analyzed for PAHs. Finally, one (1) trip blank sample will be retained for laboratory analyses of VOCs and one (1) duplicate of the sample with the assumed highest TPH concentration will be analyzed in the laboratory. It is assumed that twenty (20) samples will be analyzed for TPH, ten (10) samples for VOCs, and five (5) samples for PAHs.

- Six (6) soil borings will be advanced to a depth of 20 ft. bgs in the vicinity of wells MW-23 and MW-24 to investigate the presence of TPH-contaminated soils left behind following historical soil removal activities in that area. At each location, discrete soil samples will be collected at every five-foot interval, at lithologic discontinuities, or at the water table interface (up to four [4] samples/boring) for laboratory analyses of TPHd and TPHg. Specific samples will be selected for laboratory analyses of VOCs based on field olfactory and visual observations and/or highest concentration of VOCs using calibrated PID. One (1) sample per boring with the highest concentration of TPH will also be analyzed for PAHs. Finally, two (2) trip blank samples will be retained for laboratory analyses of VOCs, and two (2) duplicate samples with the assumed highest TPH concentrations will be analyzed in the laboratory. It is assumed that twenty-four (24) samples will be analyzed for TPH, twelve (12) samples for VOCs, and six (6) samples for PAHs.

- Nine (9) soil borings will be advanced to a depth of 20 ft. bgs in the area of the former power house, the former 16,000-gallon heating oil AST, and the former heating oil distribution lines to investigate presence of TPH-contaminated soils left behind following historical soil removal activities in that area. At each location, discrete soil samples will be collected at every five-foot interval, at lithologic discontinuities, or at the water table interface (up to four [4] samples/boring) for laboratory analyses of TPH as diesel and gasoline. Specific samples will be selected for laboratory analyses of VOCs based on field olfactory and visual observations and/or highest concentration of VOCs

using calibrated PID. One (1) sample per boring with the highest concentration of TPH will also be analyzed for PAHs. Finally, two (2) trip blank samples will be retained for laboratory analyses of VOCs, and two (2) duplicate samples with the assumed highest TPH concentrations will be analyzed in the laboratory. It is assumed that thirty-six (36) samples will be analyzed for TPH, eighteen (18) samples for VOCs, and nine (9) samples for PAHs.

Borings shall be located in accordance with locations identified in the Final Work Plan. Figure 4 depicts the locations of the proposed 20 new hydrocarbon investigation borings.

Soil samples shall be classified according to the USCS, and physical soil characteristics (including moisture content, consistency, odor, color, and other parameters), drilling difficulty, sample recovery, and soil type shall be noted.

Soil samples shall be submitted to a certified laboratory for analysis. Results of the soil investigation shall be included and incorporated into the RI Report, developed pursuant to Task 9 of this SOW.

The SAP detailing drilling and soil and groundwater sampling procedures is provided in Appendix G. The SOP for USCS logging procedures in detailed in Appendix H. The QAPP is provided in Appendix I. The Table below summarizes the analytical methods, required preservatives, and holding times.

Summary of Sample Containers, Preservatives and Holding Times

Test Description	Method(s)	Recommended Quantity	Preservation	Holding Time
Volatile Organic Compounds (VOCs)—10-Day Turn-around-time (TAT)				
VOCs (water)	8260B	3 x 40 ml glass	Cool ≤6 °C, HCL	7 days/14 days preserved
VOCs (soil)	8260B	2 - 4 oz jars	Cool ≤6 °C	14 days
Total Petroleum Hydrocarbons (TPH)—10-Day TAT				
TPH-DRO - GRO (water)	8015D	3 x 40 ml glass	Cool ≤6 °C, HCL	14 days
TPH-DRO - GRO (soil)	8015D	2 - 4 oz jars	Cool ≤6 °C	14 days

Test Description	Method(s)	Recommended Quantity	Preservation	Holding Time
Polycyclic Aromatic Hydrocarbons (PAH)—10-Day TAT				
PAHs (soil)	8310/ 8270 SIM	1 - 4oz glass jar	Cool <6 °C, none	14 days
PAH SIM (water)	8270C SIM	3 x 40 ml amber vials	Cool <6 °C, none	7 days
Naturally-Occurring Electron Acceptors 10 Day TAT (5 samples)				
Nitrate	300.0	125mL plastic	Cool <6 °C, none	48 hours
Sulfate	300.0	1 Liter, plastic	Cool <6 °C, none	28 days
Total Alkalinity	2320 B	1 Liter, plastic	Cool <6 °C, none	14 days
TDS	2540C	1 Liter, plastic	Cool <6 °C, none	7 days
Dissolved Iron	200.7	500mL plastic	Cool <6 °C, none	7 days
Dissolved Manganese	200.7		Cool <6 °C, none	7 days

8.2.2 Quarterly Elevation Surveys (Task 7)

After the five (5) new monitoring wells have been installed and during the same mobilization as Task 6, Akana will resurvey the TOC of the existing and new monitoring wells, using a licensed public land surveyor. The surveyor will collect elevation data for the top of each well casing, the top of ground surface, and survey in the location of each of the 21 soil boring locations, so that an accurate site map can be produced. Akana personnel will complete three additional elevation surveys during field mobilization for quarterly groundwater monitoring events as outlined in Task 8.

Akana will determine groundwater flow direction and seasonal flow variations through performance of four (4) consecutive quarterly elevation surveys during the (1) year groundwater monitoring period. Akana field personnel shall remove well head caps and allow the well casing pressure to equilibrate to atmospheric pressure prior to measuring the static water level. The depth to groundwater and total water column depth shall be measured using TOC elevation as a reference point. Measurements shall be obtained from each of the new and existing wells (a total of thirty [30] wells) from a designated point located on the north side of

each monitoring well. Results of the elevation surveys shall be presented in the RI Report (Task 9).

8.2.3 Quarterly Groundwater Monitoring (Task 8)

This task includes conducting quarterly groundwater sampling, measuring well water levels, and performing laboratory analyses of the collected samples.

Akana will perform four (4) consecutive groundwater sampling and water level monitoring events of the existing and new monitoring wells. The first quarter sampling event will be conducted during Task 6 activities.

Task 8 now also includes collection and laboratory analyses of QA/QC groundwater samples and sampling and analyses of five monitoring wells for occurrence and concentrations of naturally occurring electron acceptors. The sampling program will be conducted in accordance with the Final Work Plan.

The revised sampling program is as follows:

- Measure depth to water in all thirty (30) wells. Four wells have been plugged and abandoned (MW-4, MW-16, MW-17, and MW-18), one destroyed (MW-30), and 5 new monitoring wells will be installed (MW31 through MW-35).
- Sample the existing and new monitoring wells, except wells MW-1, MW-2, MW-19, MW-20, or MW-21 (a total of twenty-seven [27] wells) and analyze the samples for TPHg and TPHd by EPA Method SW 8015B, VOCs by EPA Method SW 8260B, and PAHs by EPA Method SW 8310.
- Analyze one trip blank sample for VOCs and collect one duplicate sample from one (1) monitoring well, based on historic detections of TPH.
- Analyze samples from the new upgradient well (designated MW-31), the new well downgradient of MW-15 (designated MW-34), and existing wells MW-28, MW-22, and MW-23 (a total of five [5] wells) for concentrations of naturally occurring electron acceptors, to aid in the analysis of in situ biodegradation of petroleum hydrocarbons. These wells were selected to represent conditions upgradient, within, and downgradient of the two main plumes of contaminated groundwater. The samples will be analyzed in the field for odor, turbidity, dissolved oxygen concentration, oxidation reduction potential, conductivity, and pH, and in the laboratory for nitrate, sulfate, total alkalinity, total dissolved solids, dissolved iron, and dissolved manganese.

Results of the groundwater monitoring events will be included in the Task 9 report.

8.2.4 Remedial Investigation Report (Task 9)

In Task 9, Akana will develop draft and final copies of a RI Report that will present the data, information, and findings of the field investigation activities to aid in development of remedial design alternatives. Accordingly, Akana shall prepare and submit draft and final RI Reports following completion of one year of groundwater monitoring.

Only one comprehensive report will be produced to include and incorporate the historical and recent soil and groundwater investigation results. The RI Report shall summarize in detail the assessment-related activities, methods, and results for the field work required for interpretation of the nature and extent of groundwater contamination and the movement and attenuation of contaminants since 2002. Additionally, the RI Report shall include data and information, a discussion of cleanup goals applicable to the site, discussions of human health and ecological sensitive receptors, and risk evaluation. It shall include figures, tabulated analytical data, summary tables, and evaluation and interpretation of analytical results.

The draft RI Report shall be distributed to stakeholders electronically for editing and markup. Upon receipt of draft documents, stakeholders shall have a minimum sixty (60) -calendar-day review and comment period. The final RI Report shall be submitted within thirty (30) days following the stakeholder review. Akana shall incorporate into the final RI Report, to the greatest extent practical, and as appropriate, any comments, concerns, or recommendations provided by the stakeholders during this period.

Akana will submit by mail one (1) hard and one (1) electronic copy of the final RI Report to DECRM, and three (3) hard and three (3) electronic copies of the RI Report to the Tribes and EPA Region 9. The RI Report deliverable shall be submitted within ninety (90) calendar days of the completion of the fourth groundwater monitoring event.

8.3 Phase III Remedial Planning and Technical Assistance and Support

8.3.1 Remedial Design Plan (Task 10)

Akana will prepare and submit draft and final Remedial Design Plan documents upon completion of the field work and following submittal of the final RI Report (Task 9). The Remedial Design Plan shall include, but not be limited to, the following components:

- Identification of criteria contaminants in soil and groundwater
- RSLs for criteria contaminants
- Remedial treatment goals for criteria contaminants (if different than RSLs)
- Technical analysis and overview of remedial alternatives and limitations
- Capital and operational life cycle cost estimation
- Evaluation and selection of preferred remedy(s)

- Short- and long-term groundwater sampling and analysis requirements
- Installation/abandonment of groundwater monitoring wells
- Draft and final Remedial Design Plan, specifications, and schedule

Akana plans to use a streamlined process to complete the Remedial Design Plan, following EPA guidance for conducting non-time-critical removal actions. The Remedial Design Plan will be drafted following the format for an Engineering Evaluation/Cost Analysis (EECA). As part of this process, Akana will limit the number of alternatives evaluated to include (1) no action, monitored natural attenuation, in situ chemical oxidation, (2) in situ bioremediation, and (3) groundwater pump and treat. Cost estimates prepared for the EECA will be used for comparative analysis and are not intended to be detailed engineering cost estimates.

The draft Remedial Design Plan shall be distributed to stakeholders electronically for editing and markup. Upon receipt of the draft plan, stakeholders shall have a minimum sixty (60) calendar days for review and comment. The final Remedial Design Plan shall be submitted within thirty (30) days following the stakeholder review. Akana shall incorporate into the final plan, to the greatest extent practical, and as appropriate, any comments, concerns, or recommendations provided by the stakeholders during this period.

Akana will submit by mail one (l) hard and one (l) electronic copy of the final Remedial Design Plan to DECRM, and three (3) hard and three (3) electronic copies of the final plan to the Tribes and EPA Region 9.

8.3.2 Remedial Implementation Work Plan (Task 11)

Upon finalization of the Remedial Design Plan, Akana shall submit electronic and hard copies of an RI Work Plan, developed to execute the approved remedial approach for addressing hydrocarbon-contaminated soil and groundwater within the community of Owyhee. The RI Work Plan shall include specifications and work requirements necessary to fully implement all aspects of the approved Remedial Design, including specifications and work requirements for the procurement, construction, installation, maintenance, and monitoring of remedial equipment, supplies and materials, soil excavation, removal and disposal, and short- and long-term groundwater monitoring of natural attenuation and/or effectiveness of remedial techniques(s) and treatment system(s). The RI Work Plan shall include, but not be limited to, the following components:

- Bid-ready SOW and technical specifications for one (1) base and four (4) optional performance periods in Request for Bid format
- Racer ® or equivalent engineering cost estimate
- HASP/QAPP
- Tables, figures and attachments

The draft RI Work Plan shall be distributed to stakeholders electronically for markup. Upon receipt of the draft document, stakeholders shall have a minimum thirty (30-calendar-day review and comment period. The final RI Work Plan shall be submitted within thirty (30) days following the stakeholder review. Akana will incorporate into the final plan, to the greatest extent practical, and as appropriate, any comments, concerns, or recommendations provided by the stakeholders during this period.

Akana will submit by mail one (1) hard and one (1) electronic copy of the final RI Work Plan to DECRM, and three (3) hard and three (3) electronic copies of the final plan to the Tribes and EPA Region 9.

8.3.3 Teleconferences Meetings and Support (Task 12)

Akana will attend and conduct a one (1) eight (8) hour technical meeting in Owyhee, Nevada. Akana will prepare and present the results of field investigations, draft remedial alternatives, and proposed treatment plans during the technical meeting.

In addition, Akana will shall attend and conduct a minimum of seven (7) teleconferences during the performance period of this requirement and prepare and present materials for each teleconference as requested by BIA or other participating stakeholders.

9.0 HEALTH AND SAFETY PLAN

Akana has prepared a site-specific HASP (Appendix J) which addresses potential physical and chemical hazards associated with the field work. All personnel will have appropriate safety training. Personal protective equipment will consist of hard hats, safety glasses, and steel-toed shoes. Tailgate safety meetings will be held at the start of each day. While performing field work, a Job Safety Analysis (JSA) will be prepared. Aspects of the work evaluated in the JSA include, but are not limited to:

- Weather conditions
- Temperature
- Hydration
- Slips, trips, and falls
- Aggressive wildlife
- Road hazards

10.0 PROJECT SCHEDULE

The schedule to complete the work is shown on the Gantt chart provided in Appendix K.

11.0 REFERENCES

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EPA Region 9. 2016. Region 9 Regional Soil Screening Levels.

TABLES

(44 Pages)

Table 1
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Soil Results Summary

Sample ID	Sample Location	Sample Collection Date	DRO (mg/kg)	GRO (mg/kg)
SECOR Pipeline/UST/AST Removal and Subsurface Investigation May through September 1999				
House 3115 UST				
U12-31-13'	U12-03	6/30/1999	**4900**	NA
U12-3@l13'	U12-03	6/30/1999	NA	NA
SOPE-USTR-0001-14.0'	U12-02	5/22/1999	**1200**	NA
SOPE-USTR-0002-14.0'	U13-03	5/22/1999	NA	**620**
Jail UST				
SOPE-USTJ-0001-08.0'	U1	5/25/1999	**3**	NA
SOPE-USTJ-0002-08.0'	U2	5/25/1999	**60**	NA
Power Plant UST				
SOPE-USTP-0001-22.0	U7	5/22/1999	NA	**30**
SOPE-USTP-0004-22.0	U10	5/22/1999	NA	**180**
Road Shop Yard				
SOPE-RDYA-0002-05.0	S1	9/20/1999	<5	NA
SOPE-RDYA-0003-05.0	S2	9/20/1999	<5	NA
SOPE-RDYA-0004-05.0	S3	9/20/1999	<5	NA
SOPE-RDYA-0005-05.0	S4	9/20/1999	**32**	NA
SOPE-RDYA-0006-05.0	S5	9/20/1999	<5	NA
SOPE-RDYA-0007-05.0	S6	9/20/1999	<5	NA
SOPE-ASTH-0001-1.5	S7	11/3/1999	**41**	NA
SOPE-ASTl-0001-1.5	SB	11/3/1999	**46**	NA
SOPE-RDYA-0008-00.6	S10	6/8/1999	**7**	NA
SOPE-RDYA-0009-00.8	S11	9/20/1999	**26**	NA
SOPE-RDYA-0014-00.8	S12	6/8/1999	**210**	NA
Road Shop UST				
SOPE-USTS-0001-06.5	U3	6/9/1999	**320**	NA
SOPE-USTS-0002-06.5	U4	6/9/1999	**63**	NA
SOPE-USTS-0003-06.5	U5	6/9/1999	**6**	NA
SOPE-USTS-0004-06.5	U6	6/9/1999	**50**	NA
Used Oil AST				
SOPE-ASTU-0001-00.8	S-9	6/8/1999	**10**	NA
Road Shop Discharge Pipe Outlet and Line				
SOPE/SOVA-OVRP-0001-04. 5	D4	6/8/1999	**3****	NA
SOPE/SOVA-OSRA-0001-04.5	5	6/8/1999	**110**	NA
SOVA/SOPE-DSRC-0001-05.0	7	6/4/1999	**5200**	NA
SOIW-5.0		5/25/1999	**4600**	NA
INJW@7.5', SOVA-INJW-0003-07.5	DB	6/4/1999	**18**	NA
SOVA/SOPE-INJW-0001-06.0		6/4/1999	**3100**	NA
SOVA/SOPE-INJW-0002/0004-07.5	D9	6/4/1999	**24**	NA
SOPE-INJW-0003-07.0		6/4/1999	**3-**	NA
SOPE/SOVA-MSDSRC-0002-04. 5	D10	6/8/1999	**450**	NA
SOVA/SOPE-MDDSRC-0003-04.5	D11	6/8/1999	**44**	NA
SOPE-INJW-0003-XX.X	0-XX	6/8/1999	**4****	NA

Table 1
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Soil Results Summary

Sample ID	Sample Location	Sample Collection Date	DRO (mg/kg)	GRO (mg/kg)
Road Shop AST				
SOPP-ASTS-0001-07 .0	A1	6/8/1999	NA	<6
SOPP-ASTS-0002-07.0	A2	6/8/1999	NA	<6
SOPP-ASTS-0003-08.0	A3	9/20/1999	NA	<10
SOPP-ASTS-0004-08.0	A4	9/20/1999	NA	<10
Pipeline				
SOPE-OILA-0001-02.5	L1	5/21/1999	**4200**	NA
SOPE-OILB-0001-5.0	L2	5/21/1999	NA	<6
SOPE-OILF-0001-03. 0	L6	5/21/1999	**6**	NA
SOPE-OILH-0001-02.5	LB	5/21/1999	**5**	NA
SOPE-OILl-0001-02.5	L9	5/20/1999	<5	NA
SOPE-OILL-0001-02.5	L12	5/20/1999	**38**	NA
SOPE-OIL0-0001-02.5	L15	5/21/1999	**1100**	NA
SOPE-OILP-0001-02. 5	L16	5/20/1999	**110**	NA
SOPE-OILQ-0001-06.0	L17	6/3/1999	**3****	NA
SOPE-OILR-0001-02.5	L18-02	6/25/1999	**410**	NA
SOPE-OILS-0001-02.0	L19-01	6/24/1999	**3****	NA
SOPE-OILAA-0001-01.5	L27	6/25/1999	**3****	NA
SOPE-OILBB-0001-01.0	L28	6/25/1999	**26**	NA
L7 Excavation				
SOPE-OILG-0001-03.0	L7-01	6/22/1999	**120**	NA
SOPE-OILG-0002-21.0	L7-01	6/22/1999	<5	NA
SOPE-OILG-0003-05.5	L7-03	6/23/1999	**3 ****	NA
SOPE-OILG-0004-14.5	L7-03	6/23/1999	**3****	NA
L7-5@9.0'	L7-05	6/23/1999	**2300**	NA
L7-6@9.0'	L7-06	6/23/1999	**760**	NA
SOPE-OILG-0005-XX. X	L7-XX	6/22/1999	**290**	NA
Additional Excavation of Impacted Soil of the L-7 area beneath the roads; Secor in 2002				
L7 S75@14'	L7	2002	**76**	**54**
L& S65 @ 14'	L7	2002	**240**	NM
L& S65 @ 16'	L7	2002	**250**	NM
L7 S65W @ 6'	L7	2002	ND	NM
L7 S40 @18'	L7	2002	ND	NM
L7 S20 @ 19'	L7	2002	ND	NM
L7 S20W @ 6'	L7	2002	ND	NM
L7 N10 @ 9'	L7	2002	**1,800**	NM
L7 N10 @ 18'	L7	2002	ND	NM
L7 N40E @ 9'	L7	2002	ND	ND
L7 N30W @ 8'	L7	2002	**560**	ND
L7 N40 @ 18'	L7	2002	ND	ND
L7 N75 @ 16'	L7	2002	ND	ND
L7 N80 @ 6'	L7	2002	ND	ND
L7 CN10 @ 11'	L7	2002	**250**	ND
L7 CN45 @ 11'	L7	2002	ND	ND
L7 CE20S @5'	L7	2002	ND	ND
L7 CNE30 @ 9'	L7	2002	ND	ND

Table 1
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Soil Results Summary

Sample ID	Sample Location	Sample Collection Date	DRO (mg/kg)	GRO (mg/kg)
L13 Excavation				
L13 WWALL@4.5'	L13-01	6/3/1999	**21**	NA
L13 WWALL@8.5		6/3/1999	**32**	NA
L13 SWALL@4.5'	L13-02	6/3/1999	**120**	NA
L13 SWALL@10'		6/3/1999	<10	NA
L13 SWALL@15'		6/3/1999	<10	NA
L13 EWALL@4.5'	L13-03	6/3/1999	**32**	NA
L13 EWALL@9'		6/3/1999	<10	NA
L13 NEWALL@4.5'	L13-04	6/3/1999	<10	NA
L13 NEWALL@10'		6/3/1999	<10	NA
SOPE-OILM-0004-12.0	L13-05	6/3/1999	**5**	NA
SOPE-OILM-0003-10.0	L13-06	6/2/1999	**4****	NA
SOPE-OILM-0002-07 .5	L13-07	6/2/1999	**3****	NA
SOPE-OILM-0001-05.0	L13-08	6/2/1999	**5**	NA
L13NE-5.0	L13-09	6/2/1999	**6**	NA
L13NW-5.0	L13-10	6/2/1999	<5	NA
L13A Excavation				
PHN-1@5.0'	L13A-01	7/7/1999	**3700**	NA
PHN-2@10.0'	L13A-02	7/7/1999	**18**	NA
PHW-1@10.0'	13A-03	7/7/1999	**6100**	NA
PHE-1@10.0'	L13A-04	7/7/1999	**26,000**	NA
PHF-1(Q)16.0'	L13A-05	7/7/1999	**6900**	NA
PHS-1@16.0'	13A-06	7/7/1999	**7500**	NA
L29 Excavation				
SOEX3-WST-13.5	L29-02	5/25/1999	**6100**	**780**
SOEX3-W-13.5	L29-04	5/25/1999	**3800**	**540**
SOEX3-NEB 18.5	L29-07	5/25/1999	**2700**	**480**
SOEX3-STB-19.0	L29-01	5/25/1999	**6300**	**620**
SOEX3-N-13.5	L29-06	5/25/1999	**17**	**40**
SOEX3-NWB-18.5	L29-05	5/25/1999	**7000**	**710**
SOEX3-SW-13.5	L29-03	5/25/1999	**4600**	**750**
SOEX3-EST-13.5	L29-08	5/25/1999	**13,000**	**880**
SOEX3-ST-5.5	L29-09	5/25/1999	**5**	<30
SOEX3-E-13.5	L29-10	5/25/1999	**13**	<6

Table 1
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Soil Results Summary

Sample ID	Sample Location	Sample Collection Date	DRO (mg/kg)	GRO (mg/kg)
L29A Excavation				
EX3EAST-TP-15.0'	L29A-01	7/13/1999	<5	NA
EX3EAST-TP-21.5'	L29A-02	7/13/1999	<5	NA
L30 Excavation				
SOEX2-WB-6.0	L30-01	6/2/1999	**4****	NA
SOEX2-EB-9.0	L30-02	6/2/1999	**3****	NA
SOEX2-ES-6.0	L30-03	6/2/1999	**3****	NA
L31 Excavation				
SOEX1-B-10.0	L31-01	5/25/1999	**7**	NA
SOEX1-N-7.0	L31-02	5/25/1999	**390**	NA
SOEX1-E-7.0	L31-03	5/25/1999	**660**	NA
SOEX1-S-7.0	L31-04	5/25/1999	**150**	NA
SOEX1-W-7.0	L31-05	5/25/1999	**920**	NA
L32 Excavation				
L7NORTH-TP-10.5'	L32-01	7/8/1999	<5	NA
L33 Excavation				
NH0-1	L33-01	7/7/1999	**280**	NA
L34 Excavation				
TYEX.WWL-1-10.0'	L34-01	7/8/1999	<5	NA
TYEX-1-SOFL-1-14'	L34-02	7/8/1999	<5	NA
TYEX-NWWL-1-10.0'	L34-03	7/8/1999	**1,600**	NA
TYEX-SEWL-1-10.0'	L34-04	7/8/1999	**3****	NA
TYEX-NEWL-1-8.0'	L34-05	7/8/1999	**6,100**	NA
TYEX-NWL-1-8.0'	L34-06	7/8/1999	**730**	NA
TYEX-SWL-10.0	L34-07	7/13/1999	**490**	NA

Table 1
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Soil Results Summary

Sample ID	Sample Location	Sample Collection Date	DRO (mg/kg)	GRO (mg/kg)
Additional Excavation of Impacted Soil of the L-34 area beneath the roads; Secor in 2002				
L34 20 @ 6'	L34	2002	ND	ND
L34 20 @ 12'	L34	2002	**12**	ND
L34 E26 @6'	L34	2002	ND	ND
L34 E @ 4'	L34	2002	ND	ND
L34 E20 @ 12'	L34	2002	**1,900**	**410**
L34 NW @ 12'	L34	2002	ND	ND
L34 NW Wall @ 12'	L34	2002	ND	ND
L34 NE 50 @ 12'	L34	2002	**4,000**	**910**
L34 NE 70 @ 12'	L34	2002	**1,400**	**470**
L34 NE 70 E Wall @ 9'	L34	2002	ND	ND
L34 NE 70 N Wall @ 9'	L34	6/24/1905	ND	ND
L35 Excavation				
SOPE-TP01-0001-13.0	L35-01	7/1/1999	**4****	NA
L36 Excavation				
SOPE-TP02-0001-13.0	L36-01	7/1/1999	**120**	NA
L17 Excavation				
L17 WSTW@5'	L17-01	6/3/1999	<10	NA
L17 WSTN@2.5'	L17-02	6/3/1999	**320**	NA
L17A Excavation				
L17NORTH2-TP-14.5	L17A-01	7/13/1999	<5	NA
L17NORTH2-TP-21.5	L17A-02	7/13/1999	<5	NA
L17B Excavation				
L17North-TP-8.0'	L178-01	7/8/1999	**28**	NA
L17North-TP-22.0'	L178-02	7/8/1999	**560**	NA
L18 Excavation - Additional Excavation of Impacted Soil beneath the roads; Secor in 2002				
L18 S @2.5;	L18	2002	**38 (oil)**	ND
L 18 E @ 2.5'	L18	2002	**57 (oil)**	ND
L18 W @ 2,5'	L18	2002	**ND**	ND
L18 N @ 2.5'	L18	2002	**15-d, 28 (oil)**	ND
L18 @ 4'	L18	2002	**15 (oil)**	ND

Table 1
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Soil Results Summary

Sample ID	Sample Location	Sample Collection Date	DRO (mg/kg)	GRO (mg/kg)
SRK UST/AST Removal, Monitor Well Installation and Subsurface Investigation October 2000				
Soil Boring/Monitoring Drilling Program				
MW-1 - 10'		10/26/2000	ND	ND
MW-2 - 1'		10/25/2000	**524**	ND
MW-2 - 6.5'		10/26/2000	**48**	ND
MW-3 - 7'		10/25/2000	**19**	ND
MW-4 - 7'		10/24/2000	**27**	ND
MW-5 - 8'		10/24/2000	**34**	ND
MW-6 - 9'		10/26/2000	**565**	ND
MW-6 dup - 9'		10/26/2000	**657**	ND
MW-7 - 9.5'		10/26/2000	**11**	ND
MW-8 - 9.5'		10/27/2000	**53**	ND
MW-9 - 11.5'		10/28/2000	ND	ND
MW-10 - 2'		10/23/2000	**38**	ND
MW-10 - 25.7'		10/23/2000	**1080**	**10.5**
MW-11 - 9.3'		10/28/2000	**1510**	**7.1**
MW-12 - 9.5'		10/27/2000	**15**	ND
MW-13 - 9'		10/28/2000	ND	ND
MW-14 - 10'		10/28/2000	ND	ND
MW-15 - 9.5'		10/27/2000	ND	ND
MW-16 - 14'		10/29/2000	ND	ND
MW-17 - 14.3'		10/29/2000	**10**	ND
MW-17 - 17'		10/29/2000	**30**	ND
MW-18 - 19.4'		10/30/2000	**43**	ND
SB-1 - 11'		10/30/2000	**12**	ND
SB-2 - 11'		10/30/2000	**785**	**11.5**
SB-2 dup - 11'		10/30/2000	**524**	**8.8**
SB-3 - 10'		10/30/2000	ND	ND
MW-2/MW-5 composite - 0.1'		10/26/2000	**544**	ND
Former HIS Hospital UST Samples				
Tank #1 North End		10/26/2000	**3900**	ND
Tank #1 South End		10/26/2000	**6100**	ND
Tank #2 North End		10/26/2000	**750**	ND
Tank #2 South End		10/26/2000	**560**	ND

Table 1
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Soil Results Summary

Sample ID	Sample Location	Sample Collection Date	DRO (mg/kg)	GRO (mg/kg)
SECOR Irrigation Shop Soil Investigation - October 2004				
RSA-1		9/29/2004	<4.4	<1.3
RSA-2		9/29/2004	**33**	**0.32J**
RSA-3		9/29/2004	**16**	**0.5J**
RSA-4		9/29/2004	**67**	**0.51J**
RSA-5		9/29/2004	**180**	**0.61J**
RSA-6		9/29/2004	<4.8	<1.4
RSA-DUP		9/29/2004	**17**	<1.4
IS-1		10/1/2004	NA	NA
IS-2		10/1/2004	NA	NA
IS-3		10/1/2004	**1400**	NA
IS-4		10/1/2004	NA	NA
IS-5		10/1/2004	NA	NA
IS-6		10/1/2004	NA	NA
IS-7		10/1/2004	NA	NA
IS-8		10/1/2004	NA	NA
IS-9		10/1/2004	NA	NA
IS-10		10/1/2004	NA	NA
IS-DUP		10/1/2004	NA	NA
Stantec Monitor Well Installation, Soil Sampling, Abandonment and Monitoring Activities August 2008				
MW-22@25'		8/6/2008	**630**	**100**
MW-23@20'		8/7/2008	**390**	**310**
MW-24@20'		8/7/2008	**200**	**270**
MW-28@20'		8/10/2008	**250**	**97**
MW-30@20'		8/10/2008	**43**	ND
Akana Investigation and Monitoring Petroleum Impacts - August 2016				
USEPA PRGs for Residential Soil (mg/kg)			**NE**	**NE**
USEPA PRGs for Industrial Soil (mg/kg)			**NE**	**NE**
USEPA Risk Based SSL (mg/kg)			**NE**	**NE**
CA Soil RBSL - Groundwater is Current of Potential Drinking Water Source (mg/kg)			**100**	**100**
CA Soil RBSL - Groundwater is not a Current of Potential Drinking Water Source (mg/kg)			**500**	**400**

Notes:
mg/kg - milligrams per kilogram
TPHd Total Petroleum Hydrocarbons as Diesel
TPHg Total Petroleum Hydrocarbons as Gasoline
J - Result is less than the reporting limit, but greater than or equal to the method detection limit. The concentration represents an estimated value.
"<" indicates that the compounds was not detected at the indicated laboratory Reporting Limit.
ND - Not Detected
NE - Not Established
NA- Not Analyzed
NM- Not Measured
PRGs - Preliminary Remediation Goals
RBSL - Risk Based Screening Level
Bold face type indicates detections.
Shading indicates values exceeded the CA Soil RBSL for Potential Drinking Water Source

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Table 2
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
VOC Soil Results Summary

Sample ID	Sample Collection Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TCE (mg/kg)	1, 2, 4-Trimethylbenzene (mg/kg)	4-Isopropyltoluene (mg/kg)
SECOR Pipeline/UST/AST Removal and Subsurface Investigation - May through September 1999								
House 3115 UST								
U12-31-13'	6/30/1999	NA	NA	NA	NA	NA	NA	NA
U12-3@l13'	6/30/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-USTR-0001-14.0'	5/22/1999	<5	<5	<5	<10	NA	NA	NA
SOPE-USTR-0002-14.0'	5/22/1999	<5	<5	<5	<10	NA	NA	NA
Jail UST								
SOPE-USTJ-0001-08.0'	5/25/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-USTJ-0002-08.0'	5/25/1999	NA	NA	NA	NA	NA	NA	NA
Power Plant UST								
SOPE-USTP-0001-22.0	5/22/1999	<0.06	<0.06	<0.06	<0.1	NA	NA	NA
SOPE-USTP-0004-22.0	5/22/1999	<0.06	<0.06	<0.06	**0.2**	NA	NA	NA
Road Shop Yard								
SOPE-RDYA-0002-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0003-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0004-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0005-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0006-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0007-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-ASTH-0001-1.5	11/3/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-ASTl-0001-1.5	11/3/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0008-00.6	6/8/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0009-00.8	9/20/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0014-00.8	6/8/1999	NA	NA	NA	NA	NA	NA	NA
Road Shop UST								
SOPE-USTS-0001-06.5	6/9/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-USTS-0002-06.5	6/9/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-USTS-0003-06.5	6/9/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-USTS-0004-06.5	6/9/1999	NA	NA	NA	NA	NA	NA	NA
Used Oil AST								
SOPE-ASTU-0001-00.8	6/8/1999	<0.3	<0.3	<0.3	<0.3	NA	NA	NA
Road Shop Discharge Pipe Outlet and Line								
SOPE/SOVA-OVRP-0001-04. 5	6/8/1999	<0.3	<0.3	<0.3	<0.3	NA	NA	NA
SOPE/SOVA-OSRA-0001-04.5	6/8/1999	<0.3	<0.3	<0.3	<0.3	NA	NA	NA
SOVA/SOPE-DSRC-0001-05.0	6/4/1999	<0.3	<0.3	<0.3	**1.4**	NA	NA	NA
SOIW-5.0	5/25/1999	<7	<7	<7	<14	NA	NA	NA
INJW@7.5', SOVA-INJW-0003-07.5	6/4/1999	<0.3	<0.3	<0.3	<0.3	NA	NA	NA
SOVA/SOPE-INJW-0001-06.0	6/4/1999	<0.3	<0.3	<0.3	**0.6**	NA	NA	NA
SOVA/SOPE-INJW-0002/0004-07.5	6/4/1999	<0.3	<0.3	<0.3	<0.3	NA	NA	NA
SOPE-INJW-0003-07.0	6/4/1999	NA	NA	NA	NA	NA	NA	NA
SOPE/SOVA-MSDSRC-0002-04. 5	6/8/1999	<0.3	<0.3	<0.3	<0.3	NA	NA	NA

Table 2
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
VOC Soil Results Summary

Sample ID	Sample Collection Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TCE (mg/kg)	1, 2, 4-Trimethylbenzene (mg/kg)	4-Isopropyltoluene (mg/kg)
SOVA/SOPE-MDDSRC-0003-04.5	6/8/1999	<0.3	<0.3	<0.3	<0.3	NA	NA	NA
SOPE-INJW-0003-XX.X	6/8/1999	NA	NA	NA	NA	NA	NA	NA
Road Shop AST								
SOPP-ASTS-0001-07 .0	6/8/1999	<0.06	<0.06	<0.06	<0.1	NA	NA	NA
SOPP-ASTS-0002-07.0	6/8/1999	<0.06	<0.06	<0.06	<0.1	NA	NA	NA
SOPP-ASTS-0003-08.0	9/20/1999	<0.02	<0.02	<0.02	<0.02	NA	NA	NA
SOPP-ASTS-0004-08.0	9/20/1999	<0.02	<0.02	<0.02	<0.02	NA	NA	NA
Pipeline								
SOPE-OILA-0001-02.5	5/21/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILB-0001-5.0	5/21/1999	<0.06	<0.06	<0.06	<0.1	NA	NA	NA
SOPE-OILF-0001-03. 0	5/21/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILH-0001-02.5	5/21/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILl-0001-02.5	5/20/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILL-0001-02.5	5/20/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OIL0-0001-02.5	5/21/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILP-0001-02. 5	5/20/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILQ-0001-06.0	6/3/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILR-0001-02.5	6/25/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILS-0001-02.0	6/24/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILAA-0001-01.5	6/25/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILBB-0001-01.0	6/25/1999	NA	NA	NA	NA	NA	NA	NA
L7 Excavation								
SOPE-OILG-0001-03.0	6/22/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILG-0002-21.0	6/22/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILG-0003-05.5	6/23/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILG-0004-14.5	6/23/1999	NA	NA	NA	NA	NA	NA	NA
L7-5@9.0'	6/23/1999	NA	NA	NA	NA	NA	NA	NA
L7-6@9.0'	6/23/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILG-0005-XX. X	6/22/1999	NA	NA	NA	NA	NA	NA	NA
L13 Excavation								
L13 WWALL@4.5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA
L13 WWALL@8.5	6/3/1999	NA	NA	NA	NA	NA	NA	NA
L13 SWALL@4.5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA
L13 SWALL@10'	6/3/1999	NA	NA	NA	NA	NA	NA	NA
L13 SWALL@15'	6/3/1999	NA	NA	NA	NA	NA	NA	NA
L13 EWALL@4.5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA
L13 EWALL@9'	6/3/1999	NA	NA	NA	NA	NA	NA	NA
L13 NEWALL@4.5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA
L13 NEWALL@10'	6/3/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILM-0004-12.0	6/3/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILM-0003-10.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA

Table 2
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
VOC Soil Results Summary

Sample ID	Sample Collection Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TCE (mg/kg)	1, 2, 4-Trimethylbenzene (mg/kg)	4-Isopropyltoluene (mg/kg)
SOPE-OILM-0002-07 .5	6/2/1999	NA	NA	NA	NA	NA	NA	NA
SOPE-OILM-0001-05.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA
L13NE-5.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA
L13NW-5.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA
L13A Excavation								
PHN-1@5.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA
PHN-2@10.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA
PHW-1@10.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA
PHE-1@10.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA
PHF-1(Q)16.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA
PHS-1@16.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA
L29 Excavation								
SOEX3-WST-13.5	5/25/1999	<0.2	<0.2	**2.8**	**16**	NA	NA	NA
SOEX3-W-13.5	5/25/1999	<0.2	<0.2	**0.6**	**6.3**	NA	NA	NA
SOEX3-NEB 18.5	5/25/1999	<0.3	<0.3	**0.6**	**4.4**	NA	NA	NA
SOEX3-STB-19.0	5/25/1999	<0.2	<0.2	**1**	**5.1**	NA	NA	NA
SOEX3-N-13.5	5/25/1999	<0.2	<0.2	<0.2	<0.5	NA	NA	NA
SOEX3-NWB-18.5	5/25/1999	<0.2	<0.2	**2**	**7.5**	NA	NA	NA
SOEX3-SW-13.5	5/25/1999	<0.2	<0.2	**1**	**15**	NA	NA	NA
SOEX3-EST-13.5	5/25/1999	<6	<6	<6	**7****	NA	NA	NA
SOEX3-ST-5.5	5/25/1999	<0.3	<0.3	<0.3	<0.6	NA	NA	NA
SOEX3-E-13.5	5/25/1999	<0.06	<0.06	<0.06	<0.1	NA	NA	NA
EX3EAST-TP-15.0'	7/13/1999	NA	NA	NA	NA	NA	NA	NA
EX3EAST-TP-21.5'	7/13/1999	NA	NA	NA	NA	NA	NA	NA
L29A Excavation								
EX3EAST-TP-15.0'	7/13/1999	NA	NA	NA	NA	NA	NA	NA
EX3EAST-TP-21.5'	7/13/1999	NA	NA	NA	NA	NA	NA	NA
L30 Excavation								
SOEX2-WB-6.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA
SOEX2-EB-9.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA
SOEX2-ES-6.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA
L31 Excavation								
SOEX1-B-10.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA
SOEX1-N-7.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA
SOEX1-E-7.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA
SOEX1-S-7.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA
SOEX1-W-7.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA
L32 Excavation								
L7NORTH-TP-10.5'	7/8/1999	NA	NA	NA	NA	NA	NA	NA
L33 Excavation								
NH0-1	7/7/1999	NA	NA	NA	NA	NA	NA	NA

Table 2
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
VOC Soil Results Summary

Sample ID	Sample Collection Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TCE (mg/kg)	1, 2, 4-Trimethylbenzene (mg/kg)	4-Isopropyltoluene (mg/kg)
L34 Excavation								
TYEX.WWL-1-10.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA
TYEX-1-SOFL-1-14'	7/8/1999	NA	NA	NA	NA	NA	NA	NA
TYEX-NWWL-1-10.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA
TYEX-SEWL-1-10.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA
TYEX-NEWL-1-8.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA
TYEX-NWL-1-8.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA
TYEX-SWL-10.0	7/13/1999	NA	NA	NA	NA	NA	NA	NA
L35 Excavation								
SOPE-TP01-0001-13.0	7/1/1999	NA	NA	NA	NA	NA	NA	NA
L36 Excavation								
SOPE-TP02-0001-13.0	7/1/1999	NA	NA	NA	NA	NA	NA	NA
L17 Excavation								
L17 WSTW@5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA
L17 WSTN@2.5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA
L17A Excavation								
L17NORTH2-TP-14.5	7/13/1999	NA	NA	NA	NA	NA	NA	NA
L17NORTH2-TP-21.5	7/13/1999	NA	NA	NA	NA	NA	NA	NA
L17B Excavation								
L17North-TP-8.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA
L17North-TP-22.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA
SRK UST/AST Removal, Monitor Well Installation and Subsurface Investigation - October 2000								
MW-1 - 10'	10/26/2000	ND	ND	ND	ND	NA	ND	ND
MW-2 - 1'	10/25/2000	ND	ND	ND	ND	NA	ND	ND
MW-2 - 6.5'	10/26/2000	ND	ND	ND	ND	NA	ND	ND
MW-3 - 7'	10/25/2000	ND	ND	ND	ND	NA	ND	ND
MW-4 - 7'	10/24/2000	ND	ND	ND	ND	NA	ND	ND
MW-5 - 8'	10/24/2000	ND	ND	ND	ND	NA	ND	ND
MW-6 - 9'	10/26/2000	ND	ND	ND	ND	NA	ND	ND
MW-6 dup - 9'	10/26/2000	ND	ND	ND	ND	NA	ND	ND
MW-7 - 9.5'	10/26/2000	ND	ND	ND	ND	NA	ND	ND
MW-8 - 9.5'	10/27/2000	ND	ND	ND	ND	NA	ND	ND
MW-9 - 11.5'	10/28/2000	ND	ND	ND	ND	NA	ND	ND
MW-10 - 2'	10/23/2000	ND	ND	ND	ND	NA	ND	ND
MW-10 - 25.7'	10/23/2000	ND	ND	ND	ND	NA	ND	ND
MW-11 - 9.3'	10/28/2000	ND	ND	ND	ND	NA	ND	ND

Table 2
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
VOC Soil Results Summary

Sample ID	Sample Collection Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TCE (mg/kg)	1, 2, 4-Trimethylbenzene (mg/kg)	4-Isopropyltoluene (mg/kg)
MW-12 - 9.5'	10/27/2000	ND	ND	ND	ND	NA	ND	ND
MW-13 - 9'	10/28/2000	ND	ND	ND	ND	NA	ND	ND
MW-14 - 10'	10/28/2000	ND	ND	ND	ND	NA	ND	ND
MW-15 - 9.5'	10/27/2000	ND	ND	ND	ND	NA	ND	ND
MW-16 - 14'	10/29/2000	ND	ND	ND	ND	NA	ND	ND
MW-17 - 14.3'	10/29/2000	ND	ND	ND	ND	NA	ND	ND
MW-17 - 17'	10/29/2000	ND	ND	ND	ND	NA	ND	ND
MW-18 - 19.4'	10/30/2000	ND	ND	ND	ND	NA	ND	ND
SB-1 - 11'	10/30/2000	ND	ND	ND	ND	NA	ND	ND
SB-2 - 11'	10/30/2000	ND	ND	ND	ND	NA	ND	ND
SB-2 dup - 11'*	10/30/2000	ND	ND	ND	ND	NA	**0.24**	**0.2**
SB-3 - 10'	10/30/2000	ND	ND	ND	ND	NA	ND	ND
MW-2/MW-5 composite - 0.1'	10/26/2000	ND	ND	ND	ND	NA	ND	ND
SECOR Irrigation Shop Soil Investigation - October 2004								
RSA-1	9/29/2004	NA	NA	NA	NA	NA	NA	NA
RSA-2	9/29/2004	NA	NA	NA	NA	NA	NA	NA
RSA-3	9/29/2004	NA	NA	NA	NA	NA	NA	NA
RSA-4	9/29/2004	NA	NA	NA	NA	NA	NA	NA
RSA-5	9/29/2004	NA	NA	NA	NA	NA	NA	NA
RSA-6	9/29/2004	NA	NA	NA	NA	NA	NA	NA
RSA-DUP	9/29/2004	NA	NA	NA	NA	NA	NA	NA
IS-1	10/1/2004	NA	NA	NA	NA	NA	NA	NA
IS-2	10/1/2004	NA	NA	NA	NA	NA	NA	NA
IS-3	10/1/2004	NA	NA	NA	NA	NA	NA	NA
IS-4	10/1/2004	NA	NA	NA	NA	NA	NA	NA
IS-5	10/1/2004	NA	NA	NA	NA	NA	NA	NA
IS-6	10/1/2004	NA	NA	NA	NA	NA	NA	NA
IS-7	10/1/2004	NA	NA	NA	NA	NA	NA	NA
IS-8	10/1/2004	NA	NA	NA	NA	NA	NA	NA
IS-9	10/1/2004	NA	NA	NA	NA	NA	NA	NA
IS-10	10/1/2004	NA	NA	NA	NA	NA	NA	NA
IS-DUP	10/1/2004	NA	NA	NA	NA	NA	NA	NA
Stantec Monitor Well Installation, Soil Sampling, Abandonment and Monitoring Activities - August 2008								
MW-22@25'	8/6/2008	NA	NA	NA	NA	<0.04	NA	NA
MW-23@20'	8/7/2008	NA	NA	NA	NA	<0.4	NA	NA
MW-24@20'	8/7/2008	NA	NA	NA	NA	<0.02	NA	NA
MW-28@20'	8/10/2008	NA	NA	NA	NA	<0.04	NA	NA
MW-30@20'	8/10/2008	NA	NA	NA	NA	<0.02	NA	NA

Table 2
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
VOC Soil Results Summary

Sample ID	Sample Collection Date	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	TCE (mg/kg)	1, 2, 4-Trimethylbenzene (mg/kg)	4-Isopropyltoluene (mg/kg)
Akana Investigation and Monitoring Petroleum Impacts - August 2016								
USEPA PRGs for Residential Soil (mg/kg)		**1.2**	**4900**	**5.8**	**580**	**0.94**	**0.94**	**0.94**
USEPA PRGs for Industrial Soil (mg/kg)		**5.1**	**47000**	**25**	**2500**	**6**	**6**	**6**
USEPA Risk Based SSL (mg/kg)		**0.00023**	**0.76**	**0.0017**	**0.019**	**0.00018**	**0.00018**	**0.00018**

Notes:
mg/kg - milligrams per kilogram
J - Result is less than the reporting limit, but greater than or equal to the method detection limit. The concentration represents an estimated value.
"<" indicates that the compounds was not detected at the indicated laboratory Reporting Limit.
ND - Not Detected
NE- Not Established
NA- Not Analyzed
PRGs - Preliminary Remediation Goals
RBSL - Risk Based Screening Level
Bold face type indicates detections.

Shading indicates values exceeded the EPA Risk Based Soil Screening Level (SSL) for protection of groundwater

U.S. Bureau of Indian Affairs
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
PAH Soil Results Summary
Table 3

Sample ID	Sample Collection Date	Naphthalene (mg/kg)	1-Methylnaphthalene (mg/kg)	2-Methylnaphthalene (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Benzo(g,h,i)perylene (mg/kg)	bis 2-ethylhexylphthalate (mg/L)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
SECOR Pipeline/UST/AST Removal and Subsurface Investigation - May through September 1999																				
House 3115 UST																				
U12-31-13'	6/30/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
U12-3@13'	6/30/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-USTR-0001-14.0'	5/22/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-USTR-0002-14.0'	5/22/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Jail UST																				
SOPE-USTJ-0001-08.0'	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-USTJ-0002-08.0'	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Power Plant UST																				
SOPE-USTP-0001-22.0	5/22/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-USTP-0004-22.0	5/22/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Road Shop Yard																				
SOPE-RDYA-0002-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0003-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0004-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0005-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0006-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0007-05.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-ASTH-0001-1.5	11/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-ASTI-0001-1.5	11/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0008-00.6	6/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0009-00.8	9/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-RDYA-0014-00.8	6/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Road Shop UST																				
SOPE-USTS-0001-06.5	6/9/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-USTS-0002-06.5	6/9/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-USTS-0003-06.5	6/9/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-USTS-0004-06.5	6/9/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Used Oil AST																				
SOPE-ASTU-0001-00.8	6/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Road Shop Discharge Pipe Outlet and Line																				
SOPE/SOVA-OVRP-0001-04. 5	6/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SOPE/SOVA-OSRA-0001-04.5	6/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SOVA/SOPE-DSRC-0001-05.0	6/4/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SOIW-5.0	5/25/1999	ND	ND	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
INJW@7.5', SOVA-INJW-0003-	6/4/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SOVA/SOPE-INJW-0001-06.0	6/4/1999	ND	ND	8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SOVA/SOPE-INJW-0002/0004-07.5	6/4/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SOPE-INJW-0003-07.0	6/4/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SOPE/SOVA-MSDSRC-0002-04. 5	6/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SOVA/SOPE-MDDSRC-0003-04.5	6/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SOPE-INJW-0003-XX.X	6/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Road Shop AST																				
SOPP-ASTS-0001-07 .0	6/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPP-ASTS-0002-07.0	6/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPP-ASTS-0003-08.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPP-ASTS-0004-08.0	9/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pipeline																				
SOPE-OILA-0001-02.5	5/21/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILB-0001-5.0	5/21/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILF-0001-03. 0	5/21/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILH-0001-02.5	5/21/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILI-0001-02.5	5/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILL-0001-02.5	5/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILO-0001-02.5	5/21/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILP-0001-02. 5	5/20/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILQ-0001-06.0	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILR-0001-02.5	6/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILS-0001-02.0	6/24/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILAA-0001-01.5	6/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILBB-0001-01.0	6/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L7 Excavation																				
SOPE-OILG-0001-03.0	6/22/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILG-0002-21.0	6/22/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILG-0003-05.5	6/23/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILG-0004-14.5	6/23/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L7-5@9.0'	6/23/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L7-6@9.0'	6/23/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILG-0005-XX. X	6/22/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13 Excavation																				
L13 WWALL@4.5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13 WWALL@8.5	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13 SWALL@4.5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13 SWALL@10'	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13 SWALL@15'	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13 EWALL@4.5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13 EWALL@9'	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13 NEWALL@4.5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13 NEWALL@10'	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILM-0004-12.0	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILM-0003-10.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILM-0002-07 .5	6/2/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOPE-OILM-0001-05.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13NE-5.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13NW-5.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L13A Excavation																				
PHN-1@5.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHN-2@10.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHW-1@10.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHE-1@10.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHF-1(Q)16.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PHS-1@16.0'	7/7/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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PAH Soil Results Summary
Table 3

Sample ID	Sample Collection Date	Naphthalene (mg/kg)	1-Methylnaphthalene (mg/kg)	2-Methylnaphthalene (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Benzo(g,h,i)perylene (mg/kg)	bis 2-ethylhexylphthalate (mg/L)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
L29 Excavation																				
SOEX3-WST-13.5	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX3-W-13.5	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX3-NEB 18.5	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX3-STB-19.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX3-N-13.5	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX3-NWB-18.5	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX3-SW-13.5	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX3-EST-13.5	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX3-ST-5.5	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX3-E-13.5	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EX3EAST-TP-15.0'	7/13/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EX3EAST-TP-21.5'	7/13/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L29A Excavation																				
EX3EAST-TP-15.0'	7/13/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
EX3EAST-TP-21.5'	7/13/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L30 Excavation																				
SOEX2-WB-6.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX2-EB-9.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX2-ES-6.0	6/2/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L31 Excavation																				
SOEX1-B-10.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX1-N-7.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX1-E-7.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX1-S-7.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SOEX1-W-7.0	5/25/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L32 Excavation																				
L7NORTH-TP-10.5'	7/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L33 Excavation																				
NH0-1	7/7/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L34 Excavation																				
TYEX.WWL-1-10.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TYEX-1-SOFL-1-14'	7/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TYEX-NWWL-1-10.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TYEX-SEWL-1-10.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TYEX-NEWL-1-8.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TYEX-NWL-1-8.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TYEX-SWL-10.0	7/13/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L35 Excavation																				
SOPE-TP01-0001-13.0	7/1/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L36 Excavation																				
SOPE-TP02-0001-13.0	7/1/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L17 Excavation																				
L17 WSTW@5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L17 WSTN@2.5'	6/3/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L17A Excavation																				
L17NORTH2-TP-14.5	7/13/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L17NORTH2-TP-21.5	7/13/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L17B Excavation																				
L17North-TP-8.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
L17North-TP-22.0'	7/8/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SRK UST/AST Removal, Monitor Well Installation and Subsurface Investigation - October 2000																				
MW-1 - 10'	10/26/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-2 - 1'	10/25/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-2 - 6.5'	10/26/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-3 - 7'	10/25/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-4 - 7'	10/24/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-5 - 8'	10/24/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-6 - 9'	10/26/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-6 dup - 9'	10/26/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-7 - 9.5'	10/26/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-8 - 9.5'	10/27/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-9 - 11.5'	10/28/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-10 - 2'	10/23/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-10 - 25.7'	10/23/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-11 - 9.3'	10/28/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-12 - 9.5'	10/27/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-13 - 9'	10/28/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-14 - 10'	10/28/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-15 - 9.5'	10/27/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-16 - 14'	10/29/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-17 - 14.3'	10/29/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-17 - 17'	10/29/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-18 - 19.4'	10/30/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-1 - 11'	10/30/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-2 - 11'	10/30/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-2 dup - 11'	10/30/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-3 - 10'	10/30/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-2/MW-5 composite - 0.1'	10/26/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

U.S. Bureau of Indian Affairs
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
PAH Soil Results Summary
Table 3

Sample ID	Sample Collection Date	Naphthalene (mg/kg)	1-Methylnaphthalene (mg/kg)	2-Methylnaphthalene (mg/kg)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Benzo(g,h,i)perylene (mg/kg)	bis 2-ethylhexylphthalate (mg/L)	Chrysene (mg/kg)	Dibenz(a,h)anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno(1,2,3-cd)pyrene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
SECOR Irrigation Shop Soil Investigation - October 2004																				
RSA-1	9/29/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**35**	NA	NA	NA	NA	NA	NA	NA
RSA-2	9/29/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**120**	NA	NA	NA	NA	NA	NA	NA
RSA-3	9/29/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<.360	NA	NA	NA	NA	NA	NA	NA
RSA-4	9/29/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<.370	NA	NA	NA	NA	NA	NA	NA
RSA-5	9/29/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.088 J**	NA	NA	NA	NA	NA	NA	NA
RSA-6	9/29/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.350	NA	NA	NA	NA	NA	NA	NA
RSA-DUP	9/29/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.190 J**	NA	NA	NA	NA	NA	NA	NA
IS-1	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.083 J**	NA	NA	NA	NA	NA	NA	NA
IS-2	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.140 J**	NA	NA	NA	NA	NA	NA	NA
IS-3	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
IS-4	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
IS-5	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
IS-6	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
IS-7	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
IS-8	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
IS-9	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
IS-10	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
IS-DUP	10/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
Stantec Monitor Well Installation, Soil Sampling, Abandonment and Monitoring Activities - August 2008																				
MW-22@25'	8/6/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-23@20'	8/7/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-24@20'	8/7/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-28@20'	8/10/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-30@20'	8/10/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Akana Investigation and Monitoring Petroleum Impacts - August 2016																				
USEPA PRGs for Residential Soil (mg/kg)		**3.8**	**18**	**240**	**3600**	**NE**	**18,000**	**0.16**	**0.016**	**0.16**	**1.6**	**NE**	**NE**	**16**	**0.016**	**2,400**	**2,400**	**0.16**	**NE**	**1800**
USEPA PRGs for Industrial Soil (mg/kg)		**17**	**73**	**3,000**	**45,000**	**NE**	**230,000**	**2.9**	**0.29**	**2.9**	**29**	**NE**	**NE**	**290**	**0.29**	**30,000**	**30,000**	**2.9**	**NE**	**23,000**
USEPA Risk Based SSL (mg/kg)		**0.00054**	**0.006**	**0.19**	**5.5**	**NE**	**58**	**0.0042**	**0.004**	**0.041**	**0.4**	**NE**	**1.3**	**1.2**	**0.013**	**89**	**5.4**	**0.13**	**NE**	**13**

Notes:
mg/kg - milligrams per kilogram
J - Result is less than the reporting limit, but greater than or equal to the method detection limit. The concentration represents an estimated value.
"<" indicates that the compounds was not detected at the indicated laboratory Reporting Limit.
ND - Not Detected
NE - Not Established
NA- Not Analyzed
PRGs - Preliminary Remediation Goals
RBSL - Risk Based Screening Level

Bold face type indicates detections.

Shading indicates values exceeded the EPA Risk Based Soil Screening Level (SSL) for protection of groundwater

Table 4
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
Herbicides and Dioxins Soil Results Summary

Sample ID	Sample Collection Date	Herbicides by EPA Method 8151			Dioxins/Furans by Calux	Dioxins/Furans By EPA 8290	
		2,4,5-TP (Silvex) (mg/kg)	MCPA (mg/kg)	MCPP (mg/kg)	TEQ of PCDD and PCDF (pg/g)	2,3,7,8-TCDD (pg/g)	TEQ to 2,3,7,8-TCDD (pg/g)
SECOR Pipeline/UST/AST Removal and Subsurface Investigation - May through September 1999							
Road Shop Building							
RSB-1	2004	<0.023	<9.1	<9.1	14.42 *	<0.11	0.269
RSB-2	2004	**0.0035 J**	<9.7	**0.790 J**		NA	NA
RSB-3	2004	<0.025	**3.9 J**	<9.8	0.92 *	NA	NA
RSB-4	2004	<0.025	**4.0 J**	<9.6		NA	NA
RSB-5	2004	<0.025	**1.4 J**	<10.0	1.46 *	NA	NA
RSB-6	2004	<0.024	<9.5	<9.5		NA	NA
RSB-DUP	2004	**0.0014 J**	**0.910 J**	<10.0	1.69	NA	NA
Akana Investigation and Monitoring Petroleum Impacts - August 2016							
USEPA RSLs for Residential Soil		**510**	**32**	**63**		**0.0**	
USEPA RSLs for Industrial Soil		**6600**	**410**	**820**		**0.22**	
USEPA PRGs for Residential Soil		**490**	**31**	**61**	**3.90**	**3.9**	**3.9**
USEPA PRGs for Industrial Soil		**4900**	**310**	**620**	**16.0**	**16.0**	**16.0**
USEPA Risk Based SSL		**0.0061**	**0.002**	**0.0047**	**NE**	**0.00059**	**NE**

Notes:
J - Result is less than the reporting limit, but greater than or equal to the method detection limit. The concentration represents an estimated value
"<" indicates that the compounds was not detected at the indicated laboratory Reporting Limit.
ND - Not Detected
NE - Not Established
NA- Not Analyzed
PRGs - Preliminary Remediation Goals
RBSL - Risk Based Screening Level
mg/kg - milligrams per kilogram
pg/g = micrograms per kilogram = nanograms per kilogram = parts per trillion
ppt = parts per trillion
TEQ = toxic equalivant Quotient
PCDD/PCDF = sum of all polychlorinated dibenzo-dioxins and polychlorinated dibenzo-furans

Table 5
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Groundwater Results

Well ID	Sample Collection Date	TPHg (mg/L)	TPHd (mg/L)
MW-1	11/2/2000	<0.02	NA
	9/6/2002	<0.50	<0.50
	9/27/2004	<0.50	<0.50
	11/9/2004	<0.50	<0.50
	3/3/2005	<0.50	<0.50
	6/1/2005	<0.50	<0.50
	10/16/2007	<0.50	<0.50
	9/25/2008	<0.50	<0.50
	12/11/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.27**
	4/28/2016	NS	**NS**
MW-2	11/2/2000	<0.04	NA
	9/6/2002	<5.0	<5.0
	9/27/2004	<5.0	<5.0
	11/9/2004	<5.0	<5.0
	3/3/2005	<5.0	<5.0
	6/1/2005	<5.0	<5.0
	10/16/2007	<5.0	<5.0
	9/25/2008	<5.0	<5.0
	12/11/2008	<5.0	<5.0
	5/5/2009	<5.0	<5.0
	4/9/2013	<5.0	<5.0
	4/28/2016	NS	NS
MW-3	11/2/2000	<0.04	NA
	9/6/2002	<5.0	<5.0
	9/27/2004	<5.0	<5.0
	11/9/2004	<5.0	<5.0
	3/3/2005	<5.0	<5.0
	6/1/2005	<5.0	<5.0
	10/16/2007	<5.0	<5.0
	9/25/2008	<5.0	<5.0
	12/11/2008	<5.0	<5.0
	5/5/2009	<5.0	<5.0
	4/9/2013	<5.0	<5.0
	4/28/2016	NS	NS
MW-4	P&A - 8/10/2008	-	-

Table 5
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Groundwater Results

Well ID	Sample Collection Date	TPHg (mg/L)	TPHd (mg/L)
MW-5	P&A - 8/10/2008	-	-
MW-5R	9/27/2008	<0.50	<0.50
	12/10/2008	<0.50	<0.50
	5/6/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.12**
	4/27/2016	<0.0314	**0.0472**
MW-6	11/2/2000	**0.17**	NA
	9/6/2002	**1.5**	**0.85**
	9/27/2004	**0.74**	**2.5**
	11/9/2004	**1.1**	**0.71**
	3/3/2005	**1.3**	**1.2**
	6/2/2005	**0.66**	**1.3**
	10/16/2007	<0.50	**0.7**
	9/25/2008	<0.50	**1.5**
	12/10/2008	**0.65**	**0.74**
	5/6/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.84**
	4/28/2016	<0.0314	**0.232**
MW-7	11/2/2000	<0.04	NA
	9/6/2002	<0.50	<0.50
	9/27/2004	<0.50	<0.50
	11/9/2004	<0.50	<0.50
	3/3/2005	<0.50	<0.50
	6/2/2005	<0.50	<0.50
	10/16/2007	<0.50	<0.50
	9/25/2008	<0.50	<0.50
	12/10/2008	<0.50	<0.50
	5/6/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.53**
	4/27/2016	<0.0314	**0.12**

Table 5
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Groundwater Results

Well ID	Sample Collection Date	TPHg (mg/L)	TPHd (mg/L)
MW-8	11/2/2000	**0.06**	NA
	11/2/2000 DUP	**0.27**	NA
	9/6/2002	**0.73**	**2.5**
	9/27/2004	**0.86**	**12**
	11/9/2004	**2.4**	**33**
	3/3/2005	**2.8**	**36**
	6/2/2005	<0.50	**1.2**
	10/17/2007	<0.50	<0.50
	9/26/2008	<0.50	**0.75**
	12/10/2008	**2.6**	**7.6**
	5/5/2009	<0.50	**0.8**
	4/9/2013	<0.013	**1.2**
	4/28/2016	<0.0314	**0.123**
MW-9	11/2/2000	**0.1**	NA
	9/6/2002	<0.50	<0.50
	9/27/2004	<0.50	<0.50
	11/9/2004	<0.50	<0.50
	3/3/2005	<0.50	<0.50
	6/2/2005	<0.50	<0.50
	10/17/2007	<0.50	<0.50
	9/26/2008	<0.50	<0.50
	12/10/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.91**
	4/28/2016	<0.0314	**4.1**
MW-10	11/2/2000	**0.06**	NA
	9/6/2002	<0.50	**0.55**
	9/27/2004	<0.50	**1.8**
	11/9/2004	**0.74**	**6.4**
	3/3/2005	<0.50	**1.8**
	6/3/2005	<0.50	**1.1**
	10/17/2007	<0.50	<0.50
	9/27/2008	<0.50	<0.50
	12/10/2008	<0.50	<0.50
	5/6/2009	<0.50	<0.50
	4/9/2013*	<0.013/ <0.013	**0.770/ <0.650**
	4/27/2016	<0.0314	**0.426**

Table 5
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Groundwater Results

Well ID	Sample Collection Date	TPHg (mg/L)	TPHd (mg/L)
MW-11	11/2/2000	**0.05**	NA
	9/6/2002	**4.9**	**50**
	9/27/2004	**2**	**67**
	11/9/2004	**1.3**	**14**
	3/3/2005	**1.6**	**88**
	6/2/2005	**0.73**	**21**
	10/17/2007	<0.50	**140**
	9/25/2008	Well Not Located	
	12/10/2008	**1.3**	**32**
	5/6/2009	**0.7**	**29**
	4/9/2013	**0.014J**	**120**
	4/28/2016	**0.0761 J**	**7.31**
MW-12	11/2/2000	<0.04	NA
	9/6/2002	<0.50	<0.50
	9/27/2004	<0.50	<0.50
	11/9/2004	<0.50	<0.50
	3/3/2005	<0.50	<0.50
	6/2/2005	<0.50	<0.50
	10/16/2007	<0.50	<0.50
	9/25/2008	<0.50	<0.50
	12/10/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.1**
	4/27/2016	<0.0314	**0.0928**
MW-13	11/2/2000	**0.03**	NA
	9/6/2002	**1.1**	**0.94**
	9/27/2004	**0.54**	**1.3**
	11/9/2004	<0.50	<0.50
	3/3/2005	<0.50	<0.50
	6/2/2005	**0.69**	**1.3**
	10/16/2007	<0.50	**0.66**
	9/25/2008	**0.56**	**0.55**
	12/10/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
	4/9/2013	NS	NS
	4/28/2016	<0.0314	**1.52**

Table 5
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Groundwater Results

Well ID	Sample Collection Date	TPHg (mg/L)	TPHd (mg/L)
MW-14	11/2/2000	<0.02	NA
	9/6/2002	<0.50	<0.50
	9/27/2004	<0.50	<0.50
	11/9/2004	<0.50	<0.50
	3/3/2005	<0.50	<0.50
	6/2/2005	<0.50	<0.50
	10/17/2007	<0.50	<0.50
	9/27/2008	<0.50	<0.50
	12/11/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.91**
	4/27/2016	<0.0314	**0.0405 J**
MW-15	11/2/2000	<0.02	NA
	9/6/2002	<0.50	<0.50
	9/27/2004	<0.50	<0.50
	11/9/2004	<0.50	<0.50
	3/3/2005	<0.50	<0.50
	6/1/2005	<0.50	<0.50
	10/17/2007	<0.50	<0.50
	9/27/2008	<0.50	<0.50
	12/11/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.29**
	4/27/2016	<0.0314	<0.0247
MW-16	8/11/2008	P&A	
MW-17	8/11/2008	P&A	
MW-18	8/11/2008	P&A	
MW-19	9/27/2008	**5.2**	<0.50
	12/11/2008	**6**	<0.50
	5/6/2009	**3.5**	<0.50
	4/9/2013	**0.032J**	**0.67**
	4/27/2016	**0.466**	**0.184**

Table 5
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Groundwater Results

Well ID	Sample Collection Date	TPHg (mg/L)	TPHd (mg/L)
MW-20	9/27/2008	<0.50	<0.50
	12/11/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
	4/9/2013	**0.013J**	**0.8**
	4/27/2016	<0.0314	**0.059 J**
MW-21	9/27/2008	<0.50	<0.50
	12/11/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.31**
	4/27/2016	<0.0314	**0.0582 J**
MW-22	9/27/2008	**0.71**	**11**
	12/10/2008	**1.5**	**25**
	5/6/2009	**0.86**	**4**
	4/9/2013	**0.015J**	**11 (a)**
	4/28/2016	<0.0314	**2.39**
MW-23	9/27/2008	**2.1**	**1**
	12/10/2008	**14**	**120**
	5/6/2009	**4.3**	**16**
	4/9/2013	**0.11**	**17 (a)**
	4/28/2016	**0.554**	**5.73**
MW-24	9/27/2008	**2.7**	**2.2**
	12/10/2008	**7.7**	**19**
	5/6/2009	**6.8**	**33**
	4/9/2013	**0.66**	**20 (a)**
	4/28/2016	**0.799 J3**	**9.21**
MW-25	9/27/2008	<0.50	<0.50
	12/11/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
MW-25	4/9/2013	<0.013	**0.32**
	4/27/2016	<0.0314	**0.137**
MW-26	9/27/2008	<0.50	<0.50
	12/11/2008	<0.50	<0.50
	5/5/2009	<0.50	**0.92**
	4/9/2013	<0.013	**0.99**
	4/27/2016	<0.0314	**1.1**

Table 5
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
TPH Groundwater Results

Well ID	Sample Collection Date	TPHg (mg/L)	TPHd (mg/L)
MW-27	9/27/2008	<0.50	<0.50
	12/11/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
	4/9/2013*	<0.013/ <0.013	**0.094/ <0.290**
	4/27/2016	<0.0314	**0.0684 J**
MW-28	9/27/2008	<0.50	**0.72**
	12/11/2008	<0.50	**0.71**
	5/5/2009	<0.50	**0.65**
	4/9/2013	<0.013	**1.8 (a)**
	4/28/2016	0.0656	**1.31**
MW-29	9/27/2008	<0.50	<0.50
	12/11/2008	<0.50	**0.99**
	5/6/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.47**
	4/27/2016	<0.0314	**0.129**
MW-30	9/27/2008	<0.50	<0.50
	12/11/2008	<0.50	<0.50
	5/5/2009	<0.50	<0.50
	4/9/2013	<0.013	**0.26**
	4/28/2016	NS	**NS**
Region 9 EPA Tap Water Screening Levels		**NE**	**NE**
ASTM E1739 Tier 1 Screening Level		**10**	**10**
Region 9 EPA MCL (mg/L)		**NE**	**NE**

Notes:

mg/L - milligrams per Liter

TPHd Total Petroleum Hydrocarbons as Diesel

TPHg Total Petroleum Hydrocarbons as Gasoline

J - Result is less than the reporting limit, but greater than or equal to the method detection limit. The concentration represents an estimated value.

"<" indicates that the compounds was not detected at the indicated laboratory Reporting Limit.

P&A Plugged and abandoned

ND Not Detected

NE Not Established

NA Not Analyzed

Bold face type indicates a detected value.

(a) These values were corrected from what was reported by DSE, Inc.

Shading indicates value exceeds one or more of the water quality standards listed.

Table 6
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
VOC Groundwater Results Summary

Well ID	Sample Collection Date	TCE (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	2-Butonone (MEK) (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	tert-Butylbenzene (µg/L)	Isopropylbenzene (µg/L)	4-Isopropyltoluene (µg/L)	n-Propylbenzene (µg/L)	1, 2, 4-Trimethylbenzene (µg/L)	1, 2, 3-Trichlorobenzene (µg/L)	1, 3, 5-Trimethylbenzene (µg/L)
MW-1	11/2/2000	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/6/2002	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/1/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/16/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/25/2008	NA	<1.0		<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-2	11/2/2000	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/6/2002	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/1/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/16/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/25/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-3	11/2/2000	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/6/2002	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/1/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/16/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/25/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-4	P&A - 8/10/2008	-	-	-	-	-	-	-	-		-	-	-	-		-
MW-5	P&A - 8/10/2008	-	-	-	-	-	-	-	-		-	-	-	-		-
MW-5R	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/10/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/6/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	0.360 J	<0.387
MW-6	11/2/2000	<1.0	<1.0	<1.0	**1.82**	**5.0**	ND	**3.52**	ND	ND	**2.28**	ND	ND	**56.3**	ND	**20.6**
	9/6/2002	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/2/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/16/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/25/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/6/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/28/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387

Table 6
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
VOC Groundwater Results Summary

Well ID	Sample Collection Date	TCE (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	2-Butonone (MEK) (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	tert-Butylbenzene (µg/L)	Isopropylbenzene (µg/L)	4-Isopropyltoluene (µg/L)	n-Propylbenzene (µg/L)	1, 2, 4-Trimethylbenzene (µg/L)	1, 2, 3-Trichlorobenzene (µg/L)	1, 3, 5-Trimethylbenzene (µg/L)
MW-7	11/2/2000	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/6/2002	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/2/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/16/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/25/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/6/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-8	11/2/2000	<25.0	<25.0	<25.0	<25.0	<25.0	ND	**48.5**	ND	ND	ND	ND	ND	**396**	ND	**97**
	11/2/2000 DUP*	<25.0	<25.0	<25.0	<25.0	<25.0	ND	ND	ND	ND	ND	ND	ND	**5.1**	ND	**19.4**
	9/6/2002	<1.0	<1.0	<1.0	**6**	**5.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	**2**	**2.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	**6.7**	**18.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	**3.2**	**4.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/2/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/17/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/26/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/2008	NA	<1.0	<1.0	**2.3**	**6.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/28/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-9	11/2/2000	<1.0	<1.0	<1.0	<1.0	<1.0	**192**	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/6/2002	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/2/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/17/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/26/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/28/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-10	11/2/2000	<5.0	<5.0	<5.0	<5.0	<5.0	ND	ND	ND	ND	ND	ND	ND	**23.3**	ND	**6.6**
	9/6/2002	**1.3**	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	**1.2**	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	**1.4**	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	**1.6**	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/3/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/17/2007	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2008	**1.3**	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/2008	**1.7**	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/6/2009	**1.5**	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013*	NA	<0.062/ <0.062	<0.054/ <0.054	<0.050/ <0.050	<0.184/ <0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	**0.989 J**	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387

Table 6
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
VOC Groundwater Results Summary

Well ID	Sample Collection Date	TCE (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	2-Butonone (MEK) (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	tert-Butylbenzene (µg/L)	Isopropylbenzene (µg/L)	4-Isopropyltoluene (µg/L)	n-Propylbenzene (µg/L)	1, 2, 4-Trimethylbenzene (µg/L)	1, 2, 3-Trichlorobenzene (µg/L)	1, 3, 5-Trimethylbenzene (µg/L)
MW-11	11/2/2000	<25.0	<25.0	<25.0	<25.0	<25.0	ND	**79.5**	**116**	ND	ND	**190**	**40**	**75.5**	ND	ND
	9/6/2002	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/2/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/17/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/25/2008	Well Not Located														
	12/10/2008	NA	NA	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/6/2009	NA	NA	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	NS	<0.062	<0.054	<0.050	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/28/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	**0.421 J**	**0.168**	**0.0532 J**	<0.326	<0.350	**0.0463**	<0.373	<0.230	<0.387
MW-12	11/2/2000	NA	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/6/2002	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/2/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/16/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/25/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-13	11/2/2000	<5.0	<5.0	<5.0	<5.0	<5.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/6/2002	<1.0	<1.0	<1.0	<1.0	**1.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/2/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/16/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/25/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/10/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/28/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	**0.461 J**	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-14	11/2/2000	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/6/2002	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/2/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/17/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	<0.062	**0.060J**	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-15	11/2/2000	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/6/2002	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2004	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/9/2004	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/3/2005	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/1/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/17/2007	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NS	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387

Table 6
Duck Valley Indian Reservation
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VOC Groundwater Results Summary

Well ID	Sample Collection Date	TCE (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	2-Butonone (MEK) (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	tert-Butylbenzene (µg/L)	Isopropylbenzene (µg/L)	4-Isopropyltoluene (µg/L)	n-Propylbenzene (µg/L)	1, 2, 4-Trimethylbenzene (µg/L)	1, 2, 3-Trichlorobenzene (µg/L)	1, 3, 5-Trimethylbenzene (µg/L)
MW-16	8/11/2008	P&A	-	-	-	-	-	-	-		-	-	-	-		-
MW-17	8/11/2008	P&A	-	-	-	-	-	-	-		-	-	-	-		-
MW-18	8/11/2008	P&A	-	-	-	-	-	-	-		-	-	-	-		-
MW-19	9/27/2008	NA	<2.0	<2.0	<2.0	<2.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/11/2008	NA	<2.0	<2.0	<2.0	<2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/6/2009	NA	<2.0	<2.0	<2.0	<2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	**1.16**	**0.855**	<0.399	<0.326	<0.350	**0.351**	<0.373	<0.230	<0.387
MW-20	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-21	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-22	9/27/2008	<2.0	<1.0	<1.0	**1.1**	**7.5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/10/2008	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/6/2009	<1.0	<1.0	<1.0	**1.7**	**9.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	**0.12J**	**0.17J**	**0.17J**	**0.48J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/28/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-23	9/27/2008	<2.0	<1.0	<1.0	**17**	**60**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/10/2008	<20	<10	<10	**20**	**83**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/6/2009	<2.0	<1.0	<1.0	**19**	**73**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	**0.54**	**0.30J**	**2.8**	**10.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/28/2016	<0.398	<0.331	<0.360	**11.7**	**41.4**	<3.93	**2.49**	**5.03**	**1.46**	**7.32**	**1.53**	**10.8**	**105**	**37.1**	**19**
MW-24	9/27/2008	<4.0	**32**	**3.4**	**40**	**220**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/10/2008	<20	**34**	<10	**71**	**280**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/6/2009	<10	**43**	**5.1**	**94**	**370**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	**25**	**2.1**	**30**	**86**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/28/2016	<0.398	**24.7**	**1.44**	**47.2**	**130**	<3.93	**4.71**	**4.36**	**1.3**	**9.01**	**3.14**	**15.2**	**186**	**57.3**	**0.669 J**
MW-25	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	**1.92**	<0.230	<0.387
MW-26	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387

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Well ID	Sample Collection Date	TCE (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	2-Butonone (MEK) (µg/L)	n-Butylbenzene (µg/L)	sec-Butylbenzene (µg/L)	tert-Butylbenzene (µg/L)	Isopropylbenzene (µg/L)	4-Isopropyltoluene (µg/L)	n-Propylbenzene (µg/L)	1, 2, 4-Trimethylbenzene (µg/L)	1, 2, 3-Trichlorobenzene (µg/L)	1, 3, 5-Trimethylbenzene (µg/L)
MW-27	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013*	NA	<0.062/ <0.062	<0.054/ <0.054	<0.050/ <0.050	<0.184/ <0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-28	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/28/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	**0.498 J**	**1.14**	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-29	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/6/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	<0.398	<0.331	<0.360	<0.384	<1.06	<3.93	<0.361	<0.365	<0.399	<0.326	<0.350	<0.349	<0.373	<0.230	<0.387
MW-30	9/27/2008	NA	<1.0	<1.0	<1.0	<1.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/11/2008	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	5/5/2009	NA	<1.0	<1.0	<1.0	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2013	NA	<0.062	<0.054	<0.050	<0.184	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/27/2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Region 9 EPA Tap Water Regional Screening Levels (µg/L)		**0.49**	**0.46**	**1,100**	**1.5**	**190**	**NE**	**1000**	**2000**	**690**	**NE**	**NE**	**660**	**15**	**7.0**	**120**
Region 9 EPA MCL (µg/L)		**5**	**5**	**1,000**	**700**	**10,000**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

Notes:

µg/L micro-grams per liter
* Field Duplicate collected on this date
J - Result is less than the reporting limit, but greater than or equal to the method detection limit. The concentration represents an estimated value.
"<" indicates that the compounds was not detected at the indicated laboratory Reporting Limit.
P&A Plugged and abandoned
ND Not Detected
NE Not Established
NA Not Analyzed
NS Not sampled
Bold face type indicates detections.
Shading indicates value exceeds one or more of the water quality standards listed.

Table 7
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts

Well ID	Sample Collection Date	Naphthalene (µg/L)
MW-1	11/2/2000	NA
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/1/2005	<10.0
	10/16/2007	<2.0
	9/25/2008	<2.0
	12/11/2008	<2.0
	5/5/2009	<2.0
	4/9/2013	<0.088
	4/28/2016	NS
MW-2	11/2/2000	NA
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/1/2005	NA
	10/16/2007	<2.0
	9/25/2008	<2.0
	12/11/2008	<2.0
	5/5/2009	<2.0
	4/9/2013	NS
	4/28/2016	NS
MW-3	11/2/2000	NA
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/1/2005	NA
	10/16/2007	<2.0
	9/25/2008	<2.0
	12/11/2008	<2.0
	5/5/2009	<2.0
	4/9/2013	NS
	4/28/2016	NS
MW-4	P&A -8/10/2008	-
MW-5	P&A -8/10/2008	-

Table 7
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts

Well ID	Sample Collection Date	Naphthalene (µg/L)
MW-5R	9/27/2008	<2.0
	12/10/2008	<2.0
	5/6/2009	<2.0
	4/9/2013	<0.088
	4/27/2016	<1.0
MW-6	11/2/2000	NA
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/2/2005	<10.0
	10/16/2007	<2.0
	9/25/2008	<2.0
	12/10/2008	**5.1**
	5/6/2009	<2.0
	4/9/2013	**0.10J**
	4/28/2016	<1.0
MW-7	11/2/2000	ND
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/2/2005	NA
	10/16/2007	<2.0
	9/25/2008	<2.0
	12/10/2008	<2.0
	5/6/2009	<2.0
	4/9/2013	<0.088
	4/27/2016	<1.0

Table 7
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts

Well ID	Sample Collection Date	Naphthalene (µg/L)
MW-8	11/2/2000	NA
	11/2/2000 DUP	NA
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/2/2005	**28**
	10/17/2007	**5.4**
	9/26/2008	**5.6**
	12/10/2008	**68**
	5/5/2009	**4.3**
	4/9/2013	<0.088
	4/28/2016	<1.0
MW-9	11/2/2000	ND
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/2/2005	NA
	10/17/2007	<2.0
	9/26/2008	<4.0
	12/10/2008	**2.6**
	5/5/2009	<2.0
	4/9/2013	<0.088
	4/28/2016	<1.0
MW-10	11/2/2000	**94.8**
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/3/2005	<10.0
	10/17/2007	<2.0
	9/27/2008	<2.0
	12/10/2008	<2.0
	5/6/2009	<2.0
	4/9/2013*	**0.19J/ <0.088**
	4/27/2016	<1.0

Table 7
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts

Well ID	Sample Collection Date	Naphthalene (µg/L)
MW-11	11/2/2000	ND
	9/6/2002	NA
	9/27/2004	<100.0
	11/9/2004	NA
	3/3/2005	NA
	6/2/2005	<20.0
	10/17/2007	**2.1**
	9/25/2008	Well Not Located
	12/10/2008	**9**
	5/6/2009	<2.0
	4/9/2013	**0.30J**
	4/28/2016	<1.0
MW-12	11/2/2000	ND
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/2/2005	NA
	10/16/2007	<2.0
	9/25/2008	<2.0
	12/10/2008	<2.0
	5/5/2009	<2.0
	4/9/2013	<0.088
	4/27/2016	<1.0
MW-13	4/28/2016	<1.0
MW-14	11/2/2000	ND
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/2/2005	<10.0
	10/17/2007	<2.0
	9/27/2008	<2.0
	12/11/2008	<2.0
	5/5/2009	<2.0
	4/9/2013	<0.088
	4/27/2016	<1.0

Table 7
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts

Well ID	Sample Collection Date	Naphthalene (µg/L)
MW-15	11/2/2000	ND
	9/6/2002	NA
	9/27/2004	<10.0
	11/9/2004	NA
	3/3/2005	NA
	6/1/2005	NA
	10/17/2007	<2.0
	9/27/2008	<2.0
	12/11/2008	<2.0
	5/5/2009	<2.0
	4/9/2013	<0.088
	4/27/2016	<1.0
MW-16	8/11/2008	P&A
MW-17	8/11/2008	P&A
MW-18	8/11/2008	P&A
MW-19	9/27/2008	**30**
	12/11/2008	<16.0
	5/6/2009	<16.0
	4/9/2013	<0.088
	4/27/2016	<1.0
MW-20	9/27/2008	<2.0
	12/11/2008	<8.0
	5/5/2009	<2.0
	4/9/2013	<0.088
	4/27/2016	<1.0
MW-21	9/27/2008	<2.0
	12/11/2008	<4.0
	5/5/2009	<2.0
	4/9/2013	<0.088
	4/27/2016	<1.0
MW-22	9/27/2008	**42**
	12/10/2008	**12**
	5/6/2009	**43**
	4/9/2013	**4.5**
	4/28/2016	**<1.0**

Table 7
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts

Well ID	Sample Collection Date	Naphthalene (µg/L)
MW-23	9/27/2008	**110**
	12/10/2008	**320**
	5/6/2009	**150**
	4/9/2013	**27**
	4/28/2016	**97.2**
MW-24	9/27/2008	**82**
	12/10/2008	**600**
	5/6/2009	**570**
	4/9/2013	**230D**
	4/28/2016	**289**
MW-25	9/27/2008	<2.0
	12/11/2008	<2.0
	5/5/2009	<2.0
	4/9/2013	<0.088
	4/27/2016	<1.0
MW-26	9/27/2008	**2.9**
	12/11/2008	<2.0
	5/5/2009	<2.0
	4/9/2013	<0.088
	4/27/2016	<1.0
MW-27	9/27/2008	<2.0
	12/11/2008	<2.0
	5/5/2009	<2.0
	4/9/2013*	<0.088/ <0.088
	4/27/2016	<1.0
MW-28	9/27/2008	**5.3**
	12/11/2008	**4.4**
	5/5/2009	<2.0
	4/9/2013	**0.18J**
	4/28/2016	**1.08**
MW-29	9/27/2008	<2.0
	12/11/2008	**2.2**
	5/6/2009	<2.0
	4/9/2013	<0.088
	4/27/2016	<1.0

Table 7
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts

Well ID	Sample Collection Date	Naphthalene (µg/L)
MW-30	9/27/2008	<2.0
	12/11/2008	<2.0
	5/5/2009	<2.0
	4/9/2013	<0.088
	4/28/2016	NS
Region 9 EPA Tap water Regional Screening Levels (µg/L):		**0.17**
Region 9 EPA MCLs (µg/L):		**NE**

Notes:
µg/L micro-grams per liter
*Field Duplicate collected on this date

J - Result is less than the reporting limit, but greater than or equal to the method detection limit. The concentration represents an estimated value.

"<" indicates that the compounds was not detected at the indicated laboratory Reporting Limit.

P&A Plugged and abandoned

ND Not detected

NE Not established

NA Not Analyzed

NS Not sampled

Bold face type indicates detections.

Shading indicates value exceeds one or more of the water quality standards listed.

Table 8
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
Dinoseb Groundwater Results Summary

Well ID	Sample Collection Date	Dinoseb (mg/L)
MW-1	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/1/2005	ND
	10/16/2007	NS
	9/25/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	<0.000015
	4/28/2016	NS
MW-2	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/1/2005	ND
	10/16/2007	NS
	9/25/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	NS
	4/28/2016	NS
MW-3	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/1/2005	ND
	10/16/2007	NS
	9/25/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	NS
	4/28/2016	NS
MW-4	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/1/2005	ND
	10/16/2007	ND
	9/25/2008	NS
	P&A - 8/10/2008	NS

Table 8
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
Dinoseb Groundwater Results Summary

Well ID	Sample Collection Date	Dinoseb (mg/L)
MW-5	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/1/2005	ND
	10/16/2007	ND
	9/25/2008	NS
	P&A - 8/10/2008	NS
MW-5R	9/27/2008	NS
	12/10/2008	NS
	5/6/2009	NS
	4/9/2013	<0.000015
	4/27/2016	NA
MW-6	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/2/2005	ND
	10/16/2007	NS
	9/25/2008	NS
	12/10/2008	NS
	5/6/2009	NS
	4/9/2013	<0.000015
	4/28/2016	NA
MW-7	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/2/2005	ND
	10/16/2007	NS
	9/25/2008	NS
	12/10/2008	NS
	5/6/2009	NS
	4/9/2013	<0.000015
	4/27/2016	NA
MW-8	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/2/2005	ND
	10/17/2007	NS
	9/26/2008	NS
	12/10/2008	NS
	5/5/2009	NS
	4/9/2013	<0.00015
	4/28/2016	NA

Table 8
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
Dinoseb Groundwater Results Summary

Well ID	Sample Collection Date	Dinoseb (mg/L)
MW-9	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/2/2005	ND
	10/17/2007	NS
	9/26/2008	NS
	12/10/2008	NS
	5/5/2009	NS
	4/9/2013	<0.00015
	4/28/2016	NA
MW-10	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/3/2005	ND
	10/17/2007	NS
	9/27/2008	NS
	12/10/2008	NS
	4/9/2013*	<0.000020 / <0.000015
	4/27/2016	NA
MW-11	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/2/2005	ND
	10/17/2007	NS
	9/25/2008	NS
	12/10/2008	NS
	5/6/2009	NS
	4/9/2013	<0.00015
	4/28/2016	NA
MW-12	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/2/2005	ND
	10/16/2007	NS
	9/25/2008	NS
	12/10/2008	NS
	5/5/2009	NS
	4/9/2013	<0.00015
	4/27/2016	NA

Table 8
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
Dinoseb Groundwater Results Summary

Well ID	Sample Collection Date	Dinoseb (mg/L)
MW-13	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/2/2005	ND
	10/16/2007	NS
	9/25/2008	NS
	12/10/2008	NS
	5/5/2009	NS
	4/9/2013	NS
	4/28/2016	NA
MW-14	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/2/2005	ND
	10/17/2007	NS
	9/27/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	<0.00015
	4/27/2016	NA
MW-15	11/2/2000	ND
	9/6/2002	ND
	9/27/2004	ND
	11/9/2004	ND
	3/3/2005	ND
	6/1/2005	ND
	10/17/2007	NS
	9/27/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	<0.00015
	4/27/2016	NA
MW-16	P&A - 8/11/2008	-
MW-17	P&A - 8/11/2008	-
MW-18	P&A - 8/11/2008	-
MW-19	9/27/2008	NS
	12/11/2008	NS
	5/6/2009	NS
	4/9/2013	<0.000015
	4/27/2016	NA
MW-20	9/27/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	<0.000018
	4/27/2016	NA

Table 8
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
Dinoseb Groundwater Results Summary

Well ID	Sample Collection Date	Dinoseb (mg/L)
MW-21	9/27/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	<0.000017
	4/27/2016	NA
MW-22	9/27/2008	NS
	12/10/2008	NS
	5/6/2009	NS
	4/9/2013	<0.000017
	4/28/2016	NA
MW-23	9/27/2008	NS
	12/10/2008	NS
	5/6/2009	NS
	4/9/2013	<0.000020
	4/28/2016	NA
MW-24	9/27/2008	NS
	12/10/2008	NS
	5/6/2009	NS
	4/9/2013	<0.000034
	4/28/2016	NA
MW-25	9/27/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	<0.000016
	4/27/2016	NA
MW-26	9/27/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	<0.000015
	4/27/2016	NA
MW-27	9/27/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	<0.000015
	4/27/2016	NA

Table 8
Duck Valley Indian Reservation
Investigation/Monitoring Petroleum Impacts
Dinoseb Groundwater Results Summary

Well ID	Sample Collection Date	Dinoseb (mg/L)
MW-28	9/27/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	<0.000018
	4/28/2016	NA
MW-29	9/27/2008	NS
	12/11/2008	NS
	5/6/2009	NS
	4/9/2013	<0.000015
	4/27/2016	NA
MW-30	9/27/2008	NS
	12/11/2008	NS
	5/5/2009	NS
	4/9/2013	<0.000015
	4/28/2016	NS
Region 9 EPA Tap Water Screening Levels (mg/L):		**15.0**
Region 9 EPA MCL (mg/L):		**7.0**

Notes:

J - Result is less than the reporting limit, but greater than or equal to the method detection limit. The "<" indicates that the compounds was not detected at the indicated laboratory Reporting Limit.

ND- not detected

NA- not analyzed

NE- not established

* = field duplicate

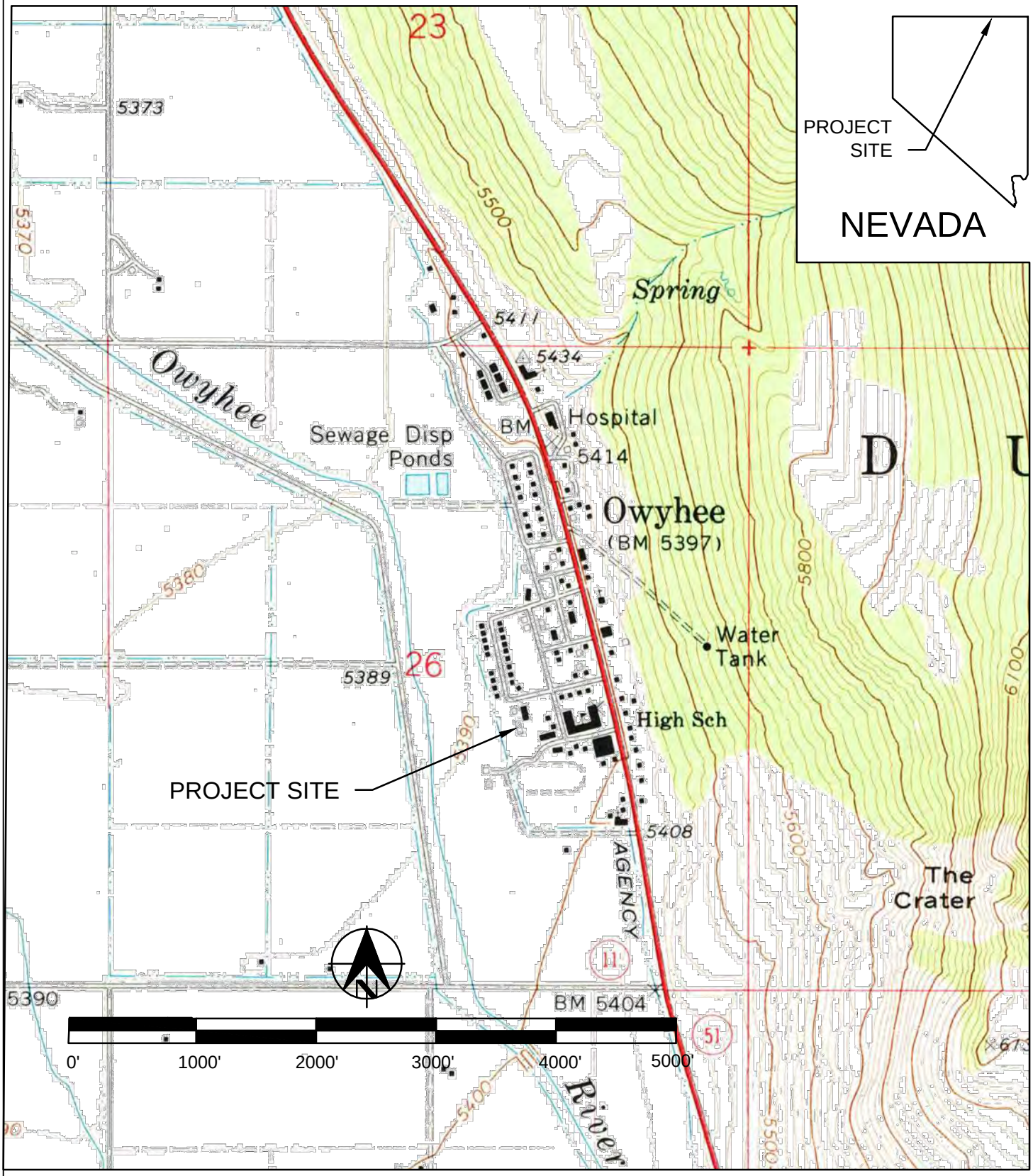
Bold face type indicates detections.

Shading indicates value exceeds one or more of the water quality standards listed.

U.S. Bureau of Indian Affairs - Duck Valley
Investigation/Monitoring Petroleum Impacts
Summary of Static Fluid Level Measurements
Table 9

WELL ID	LOCATION		TOP OF CASING*	DATE	TOP OF LNAPL		THICKNESS LNAPL	TOP OF GROUNDWATER	
	Latitude	Longitude	ft.-MSL		Depth to LNAPL (ft.-TOC)	Elevation LNAPL (ft.-MSL)	feet	Depth to Water (ft.-TOC)	Elevation of GW (ft.-MSL)
MW-1	41.942946	-116.098514	5392.45	4/9/2013				8.21	5384.24
				4/28/2016	Well not opened due to overburden surface water				0.00
									0.00
									0.00
MW-2	No Data - From DSE Survey			4/28/2016	--	--	--	4.30	--
MW-3			--	4/28/2016	Not Found	Not Found	Not Found	Not Found	Not Found
MW-4	P&A - 8/10/2008		--	--	--	--	--	--	--
MW-5	P&A - 8/10/2008		--	--	--	--	--	--	--
MW-5R	41.9436	-116.09938	5394.93	4/9/2013	--	--	--	7.59	5387.34
				4/26/2016	--	--	--	6.00	5388.93
									0.00
									0.00
MW-6	41.94356	-116.09912	5396.16	4/9/2013	--	--	--	8.81	5387.35
				4/26/2016	--	--	--	7.10	5389.06
									0.00
									0.00
MW-7	41.94379	-116.09961	5393.61	4/9/2013	--	--	--	6.65	5386.96
				4/26/2016	--	--	--	5.14	5388.47
									0.00
									0.00
MW-8	41.94392	-116.09901	5394.60	4/9/2013	--	--	--	7.88	5386.72
				4/26/2016	--	--	--	6.18	5388.42
									0.00
									0.00
MW-9	41.94436	-116.09795	5397.20	4/9/2013	--	--	--	10.62	5386.58
				4/28/2016	--	--	--	7.89	5389.31
									0.00
									0.00
MW-10	41.9446	-116.09694	5404.24	4/9/2013	--	--	--	18.83	5385.41
				4/26/2016	--	--	--	16.99	5387.25
									0.00
									0.00
MW-11	41.94447	-116.09902	5395.68	4/9/2013	--	--	--	9.30	5386.38
				4/26/2016	--	--	--	7.54	5388.14
									0.00
									0.00
MW-12	41.94421	-116.09967	5395.23	4/9/2013	--	--	--	5.54	5389.69
				4/26/2016	--	--	--	7.33	5387.90
									0.00
									0.00
MW-13	No Data - From DSE Survey			4/26/2016	--	--	--	6.12	--
MW-14	41.94515	-116.09926	5395.50	4/9/2013	--	--	--	10.40	5385.10
				4/26/2016	--	--	--	8.15	5387.35
									0.00
									0.00
MW-15	41.94542	-116.10011	5391.63	4/9/2013	--	--	--	6.36	5385.27
				4/27/2016	--	--	--	5.31	-5.31
									0.00
									0.00
MW-16	P&A - 8/11/2008		--	--	--	--	--	--	--
MW-17	P&A - 8/11/2008		--	--	--	--	--	--	--
MW-18	P&A - 8/11/2008		--	--	--	--	--	--	--
MW-19	41.94371	-116.09663	5403.48	4/9/2013	--	--	--	17.71	5385.77
				4/26/2016	--	--	--	15.51	5387.97
									0.00
									0.00
MW-20	41.9437	-116.097	5400.60	4/9/2013	--	--	--	14.89	5385.71
				4/26/2016	--	--	--	13.38	5387.22
									0.00
									0.00
MW-21	41.94397	-116.09721	5399.95	4/9/2013	--	--	--	14.31	5385.64
				4/26/2016	--	--	--	12.38	5387.57
									0.00
									0.00
MW-22	41.94457	-116.09663	5404.52	4/9/2013	--	--	--	19.02	5385.50
				4/26/2016	--	--	--	17.07	5387.45
									0.00
									0.00
MW-23	41.94465	-116.09743	5399.64	4/9/2013	--	--	--	14.32	5385.32
				4/26/2016	--	--	--	12.20	5387.44
									0.00
									0.00
MW-24	41.94487	-116.09752	5399.52	4/9/2013	--	--	--	14.21	5385.31
				4/26/2016	--	--	--	12.41	-12.41
									0.00
									0.00
MW-25	41.94455	-116.09836	5396.37	4/9/2013	--	--	--	10.85	5385.52
				4/26/2016	--	--	--	7.77	5388.60
									0.00
									0.00
MW-26	41.94422	-116.0987	5394.96	4/9/2013	--	--	--	9.30	5385.66
				4/26/2016	--	--	--	6.50	5388.46
									0.00
									0.00
MW-27	41.9438	-116.0985	5398.04	4/9/2013	--	--	--	12.23	5385.81
				4/26/2016	--	--	--	9.85	5388.19
									0.00
									0.00
MW-28	41.94427	-116.09921	5394.95	4/9/2013	--	--	--	8.31	5386.64
				4/26/2016	--	--	--	6.69	5388.26
									0.00
									0.00
MW-29	41.94475	-116.09961	5393.68	4/9/2013	--	--	--	7.58	5386.10
				4/26/2016	--	--	--	6.29	5387.39
									0.00
									0.00
MW-30	41.94478	-116.10009	5391.77	4/9/2013	--	--	--	5.81	5385.96
				4/28/2016	Not Found	Not Found	Not Found	Not Found	Not Found
									0.00
									0.00

Notes:
Top of Casing Elevation data from April 2013 survey by DSE
ft-TOC: measured in feet below TOP OF CASING
ft.-MSL: measured in feet calibrated to MEAN SEA LEVEL



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AKANA Plan + Design + Engineer + Manage	BUREAU OF INDIAN AFFAIRS HYDROCARBON ASSESSMENT AND INVESTIGATION 2600 N CENTRAL AVENUE, PHOENIX, AZ 85001	DUCK VALLEY INDIAN RESERVATION OWYHEE, NV OWYHEE LOCATION MAP	16-005 FIG.1

LEGEND

- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- FORMER MUNICIPAL SUPPLY WELLS

GRAPHIC SCALE

100 0 100 200

(IN FEET)

SITE LOCATION MAP

SCALE: 1"=100'

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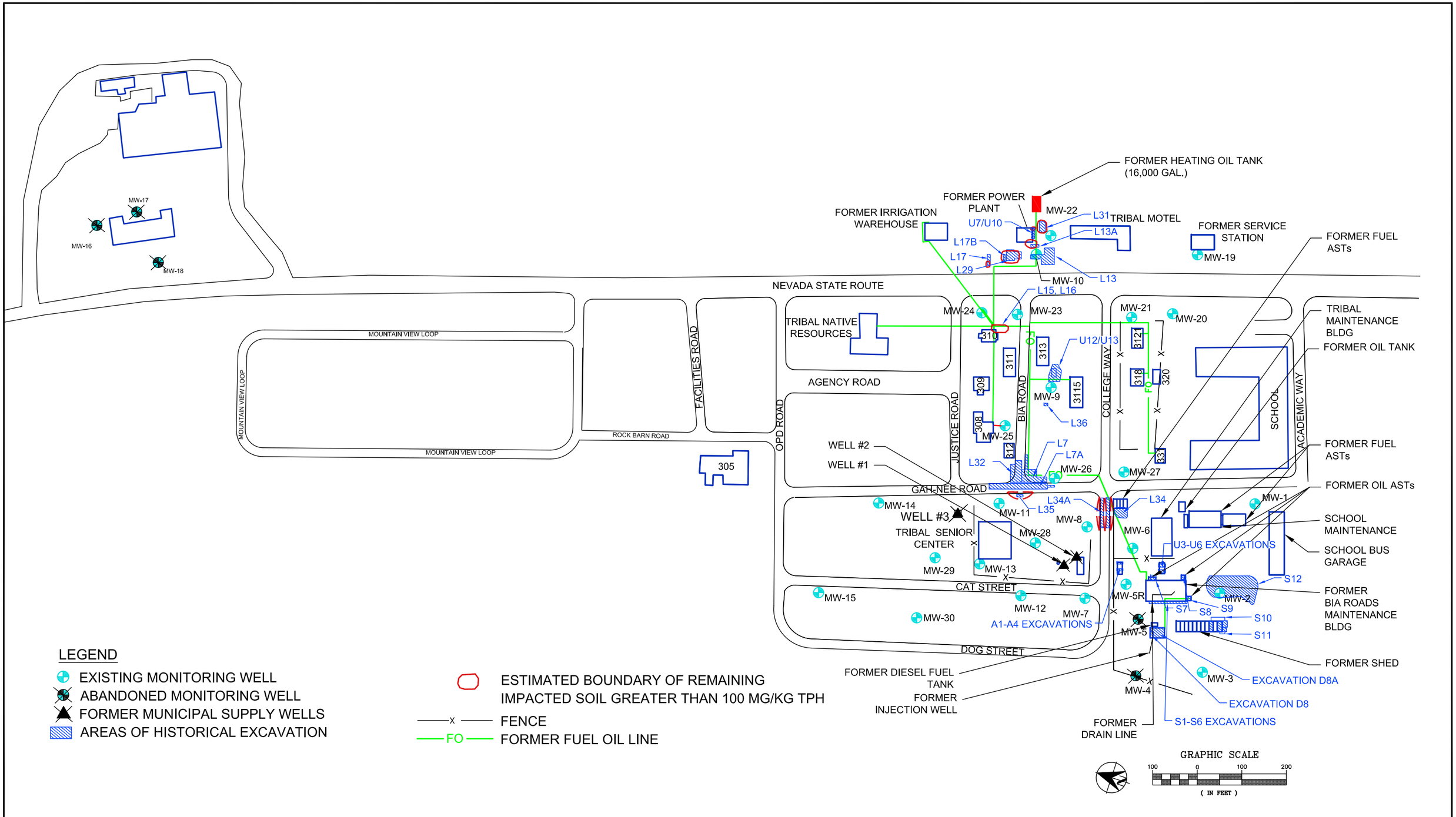
OWYHEE, NV

SITE VICINITY MAP AND AERIAL PHOTO

JOB NO. 16-005

SHEET NO. FIG. 2



P:\PDX PROJECTS\2016\16-005 BIA Duck Valley Env. Investigation\01 Item 0010 Project Planning\05 Task 5 Project Work Plan\Revised Hydrocarbon Workplan\Revised Figures\CAD\16-005-FIG3-CONTAMINANT SOURCE AND RELEASE AREA MAP.dwg 6/6/2017 9:15 AM

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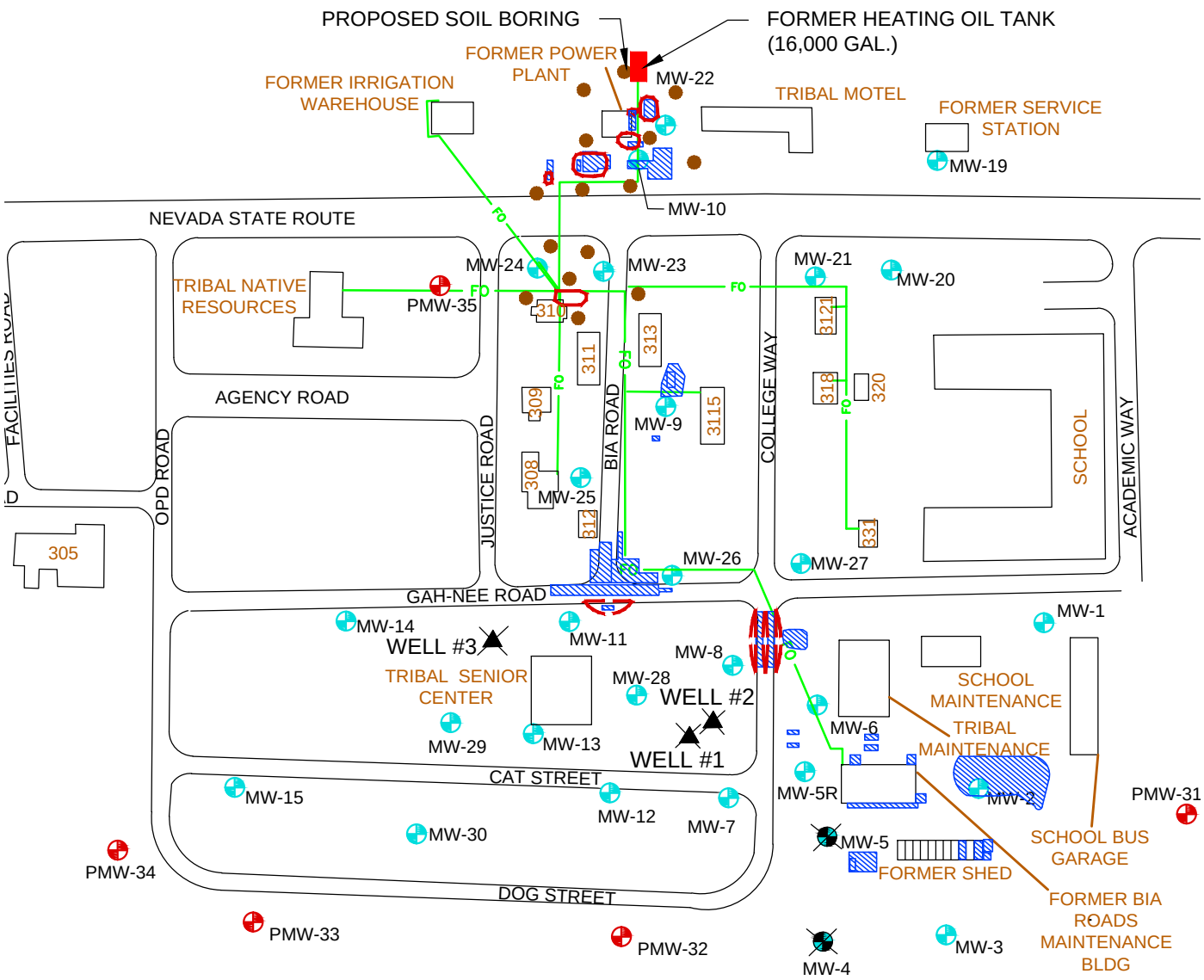
OWYHEE, NV

CONTAMINANT SOURCE AND RELEASE AREA MAP

16-005

FIG. 3



SITE LOCATION MAP
SCALE: 1"=100'

GRAPHIC SCALE
100 0 100 200
(IN FEET)

LEGEND

- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- FORMER MUNICIPAL SUPPLY WELLS
- PROPOSED SOIL BORING LOCATIONS
- PROPOSED NEW MONITORING WELL LOCATIONS
- AREAS OF EXCAVATION, SEE FIG.3 FOR NAMES OF EXCAVATIONS.
- ESTIMATED BOUNDARY OF REMAINING IMPACTED SOIL GREATER THAN 100 mg/kg
- FO — FORMER HEATING OIL LINE

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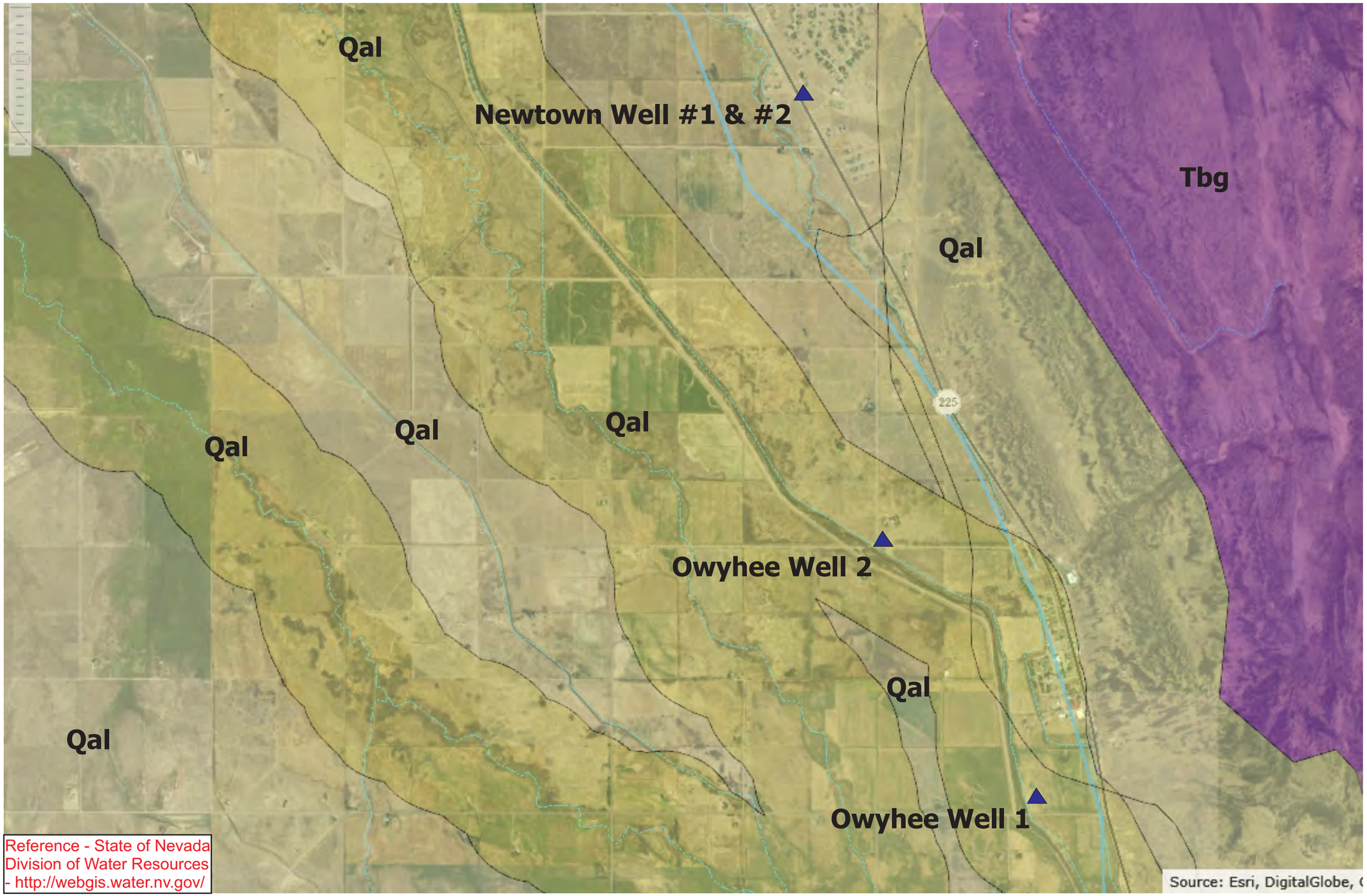
DUCK VALLEY INDIAN RESERVATION
OWYHEE, NV

PROPOSED INVESTIGATION LOCATIONS

16-005

FIG.4

P:\PDX PROJECTS\2016\16-005 BIA Duck Valley Env. Investigation\01 Item 0010 Project Planning\05 Task 5 Project Work Plan\Revised Hydrocarbon Workplan\Revised Figures\CAD\16-005-FIG 4 PROPOSED INVESTIGATION LOCATIONS.dwg 6/6/2017 10:43 AM



Reference - State of Nevada Division of Water Resources - http://webgis.water.nv.gov/

Legend

Municipal Well

Hydrogeology

Tbg - Banbury Formation

Bas

Qal - Quaternary Alluvium

Qas
Qf
Qflv
Qp
Ts
Water

Major Roads

Interstate
State Route
US Highway

Scale

2500ft
1km

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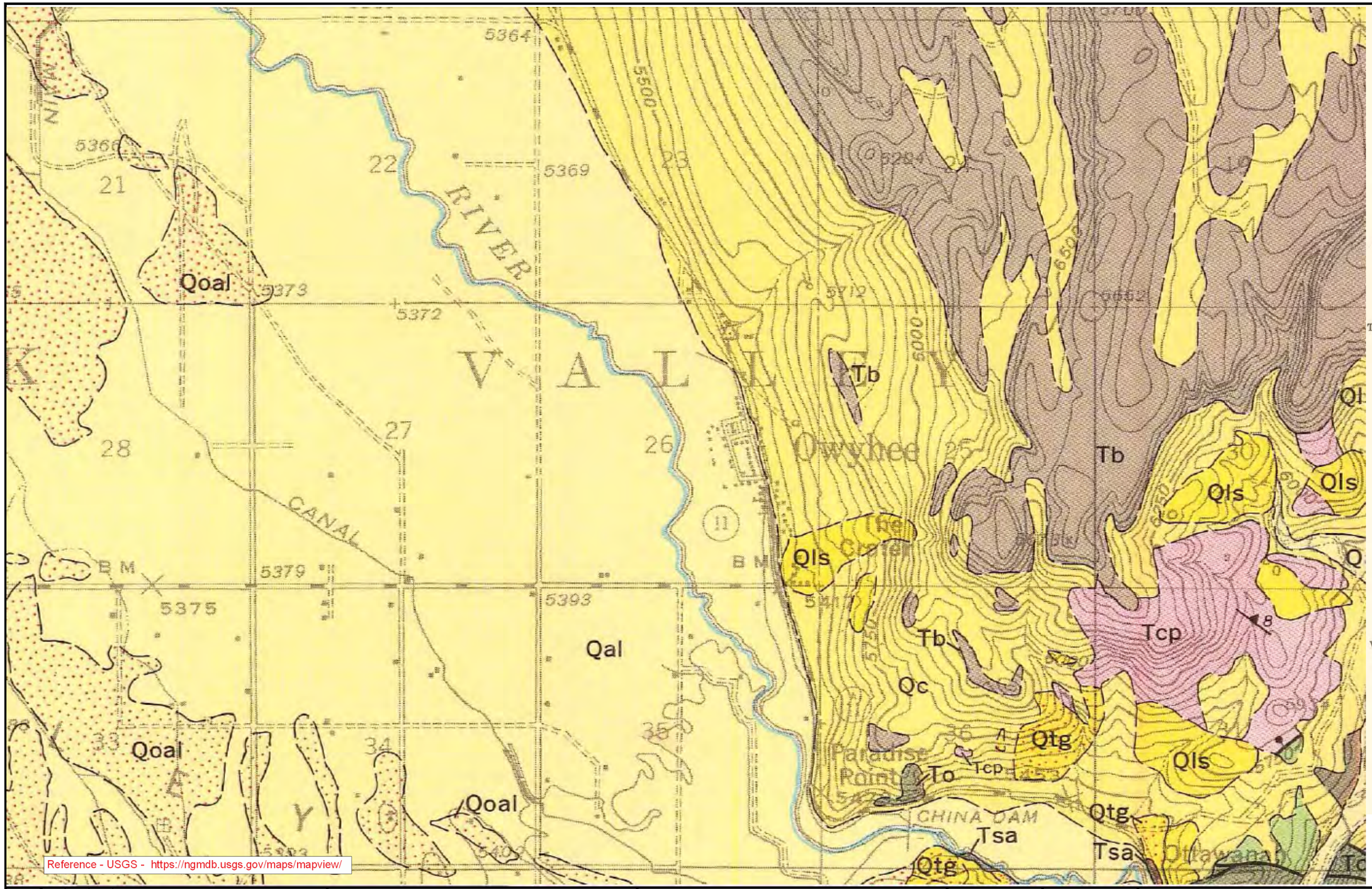
N W E S

DUCK ALLEY INDIAN RESERVATION
OWYHEE. NV

HYDROGEOLOGIC MAP

JOB NO. 16-005
SHEET NO. FIG. 5



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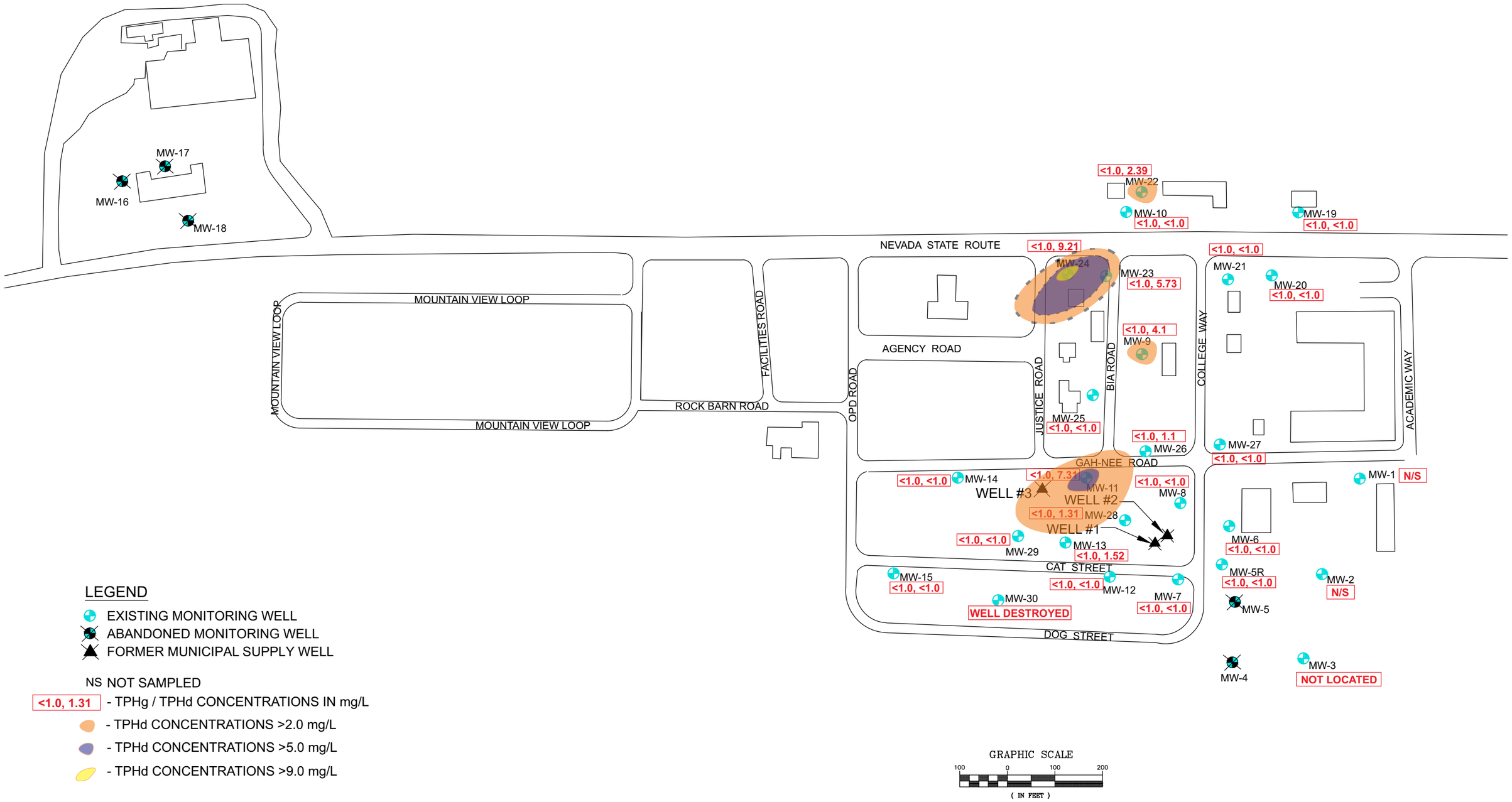
N W E S

DUCK ALLEY INDIAN RESERVATION
OWYHEE. NV

GEOLOGIC MAP

JOB NO. 16-005

SHEET NO. FIG. 6



LEGEND

- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- FORMER MUNICIPAL SUPPLY WELL

NS NOT SAMPLED

<1.0, 1.31 - TPHg / TPHd CONCENTRATIONS IN mg/L

- TPHd CONCENTRATIONS >2.0 mg/L
- TPHd CONCENTRATIONS >5.0 mg/L
- TPHd CONCENTRATIONS >9.0 mg/L

GRAPHIC SCALE

100 0 100 200

(IN FEET)

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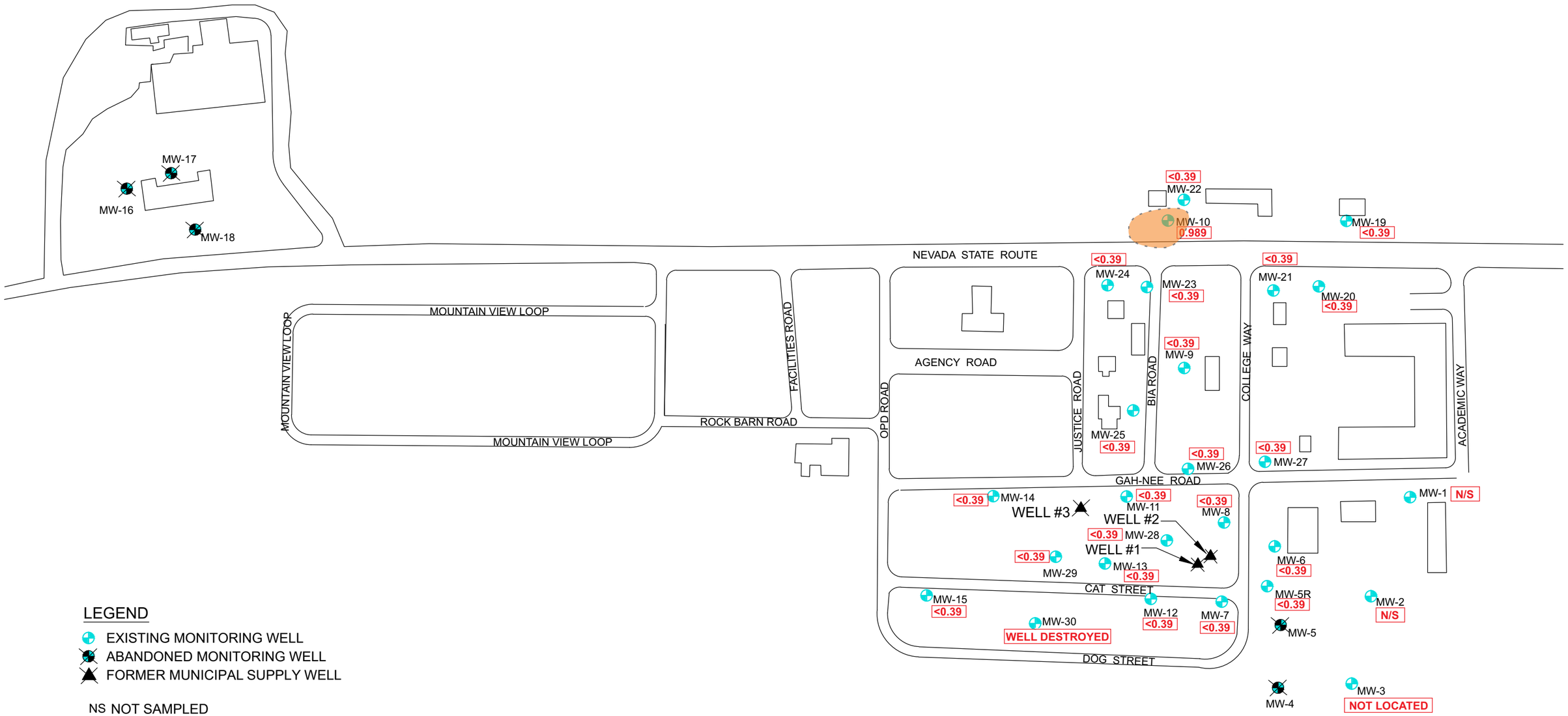
DUCK VALLEY INDIAN RESERVATION
OWYHEE, NV

TPHg & TPHd GROUNDWATER
ISOCONCENTRATIONS MAP (APRIL 2016)

JOB NO.
16-005

SHEET NO.
FIG. 7

OF



LEGEND

- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- FORMER MUNICIPAL SUPPLY WELL

NS NOT SAMPLED

0.989 - TCE CONCENTRATIONS IN ug/L

- TCE CONCENTRATIONS >.5 ug/L

TCE - MCL = 5 ug/L

EPA TAP WATER TCE RSL = 0.49 ug/L

GRAPHIC SCALE

100 0 100 200

(IN FEET)

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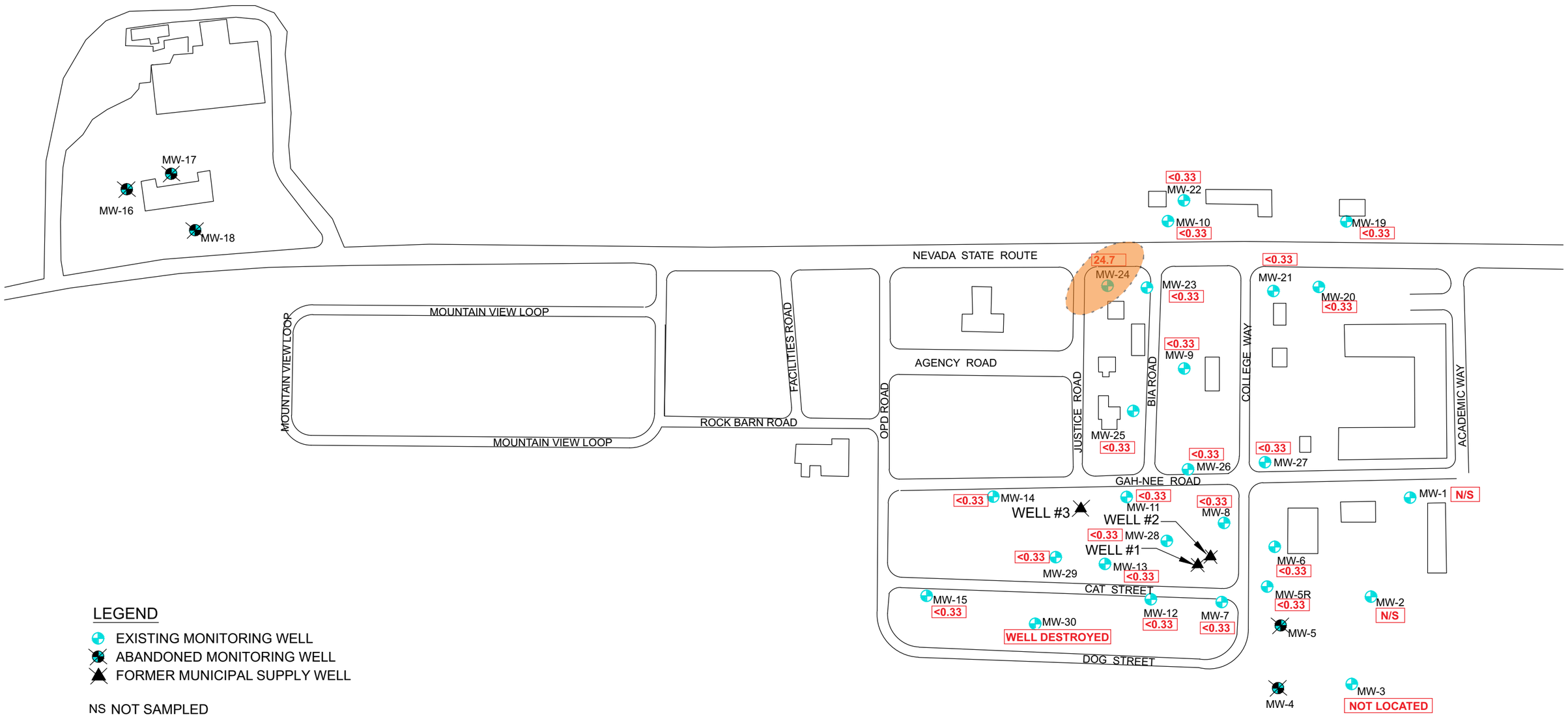
TCE GROUNDWATER
ISOCONCENTRATIONS MAP (APRIL 2016)

JOB NO. 16-005

SHEET NO. FIG. 8

OF



LEGEND

- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- FORMER MUNICIPAL SUPPLY WELL

NS NOT SAMPLED

24.7 - BENZENE CONCENTRATIONS IN ug/L

- BENZENE CONCENTRATIONS >20.0 ug/L

BENZENE - MCL = 5 ug/L

EPA TAP WATER BENZENE RSL = 0.46 ug/L

GRAPHIC SCALE

100 0 100 200

(IN FEET)

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DUCK VALLEY INDIAN RESERVATION
OWYHEE, NV

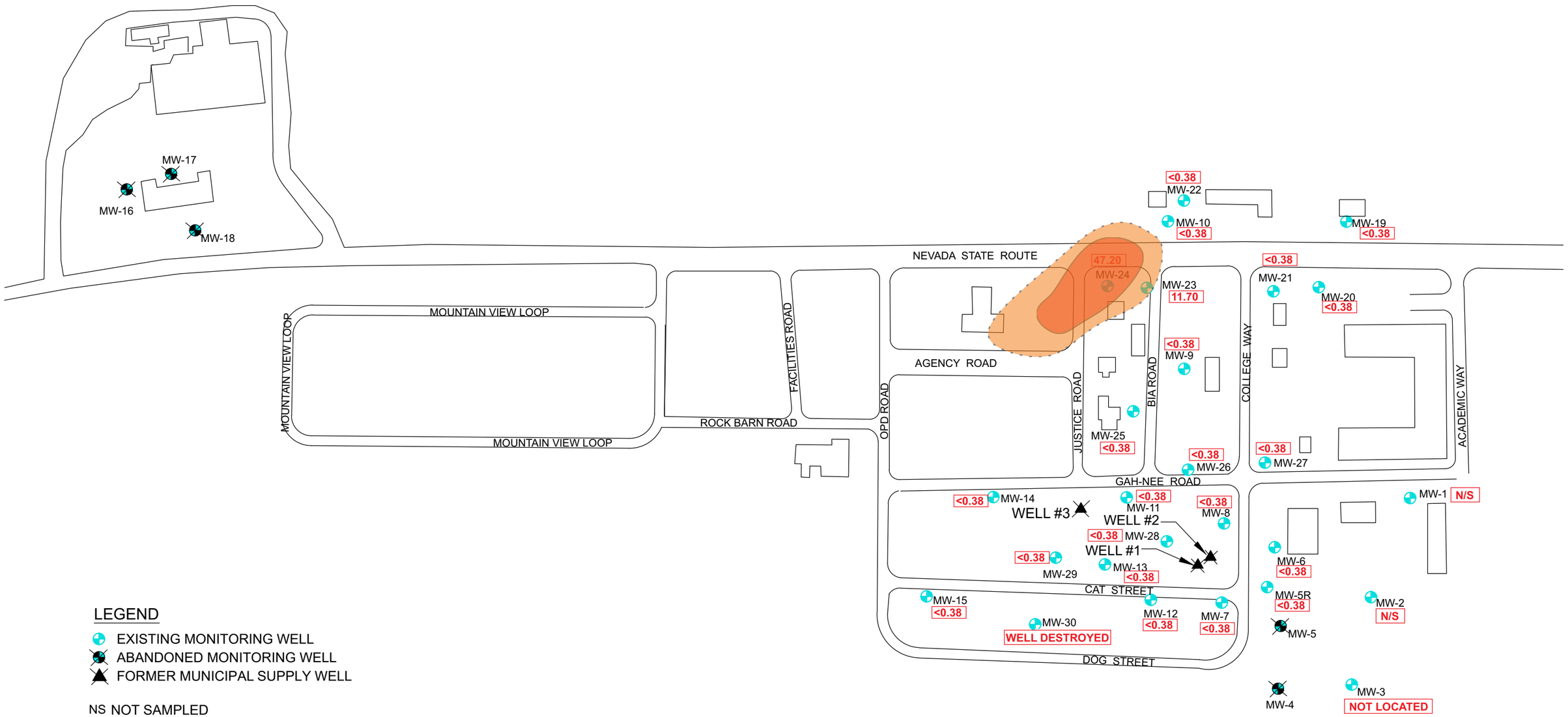
BENZENE GROUNDWATER
ISOCONCENTRATIONS MAP (APRIL 2016)

JOB NO. 16-005

SHEET NO.

FIG. 9

OF



LEGEND

- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- FORMER MUNICIPAL SUPPLY WELL

NS NOT SAMPLED

24.7 - ETHYL BENZENE CONCENTRATIONS IN ug/L

- ETHYL BENZENE CONCENTRATIONS >40.0 ug/L
- ETHYL BENZENE CONCENTRATIONS >10.0 ug/L

ETHYL BENZENE - MCL = 700 ug/L

EPA TAP WATER ETHYL BENZENE RSL = 1.5 ug/L

GRAPHIC SCALE

100 0 100 200

(IN FEET)

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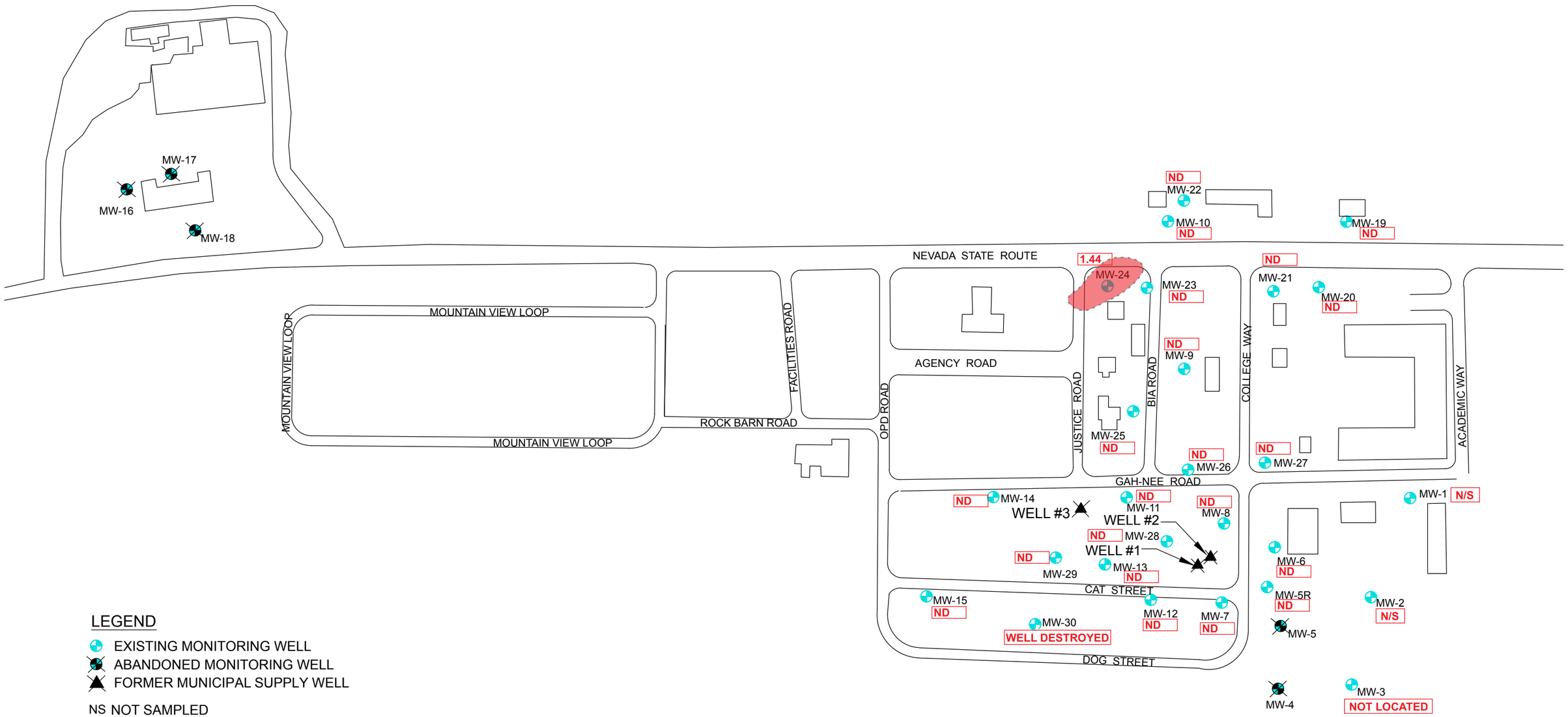
ETHYL BENZENE GROUNDWATER
ISOCONCENTRATIONS MAP (APRIL 2016)

JOB NO. 16-005

SHEET NO.

FIG. 10

OF



LEGEND

- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- FORMER MUNICIPAL SUPPLY WELL

NS NOT SAMPLED

ND NOT DETECTED ABOVE MDL

1.44 - TOLUENE CONCENTRATIONS IN ug/L

- TOLUENE CONCENTRATIONS >1.0 ug/L

TOLUENE - MCL = 1,000 ug/L

EPA TAP WATER TOLUENE RSL = 1,100 ug/L

GRAPHIC SCALE

100 0 100 200

(IN FEET)

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OWYHEE, NV

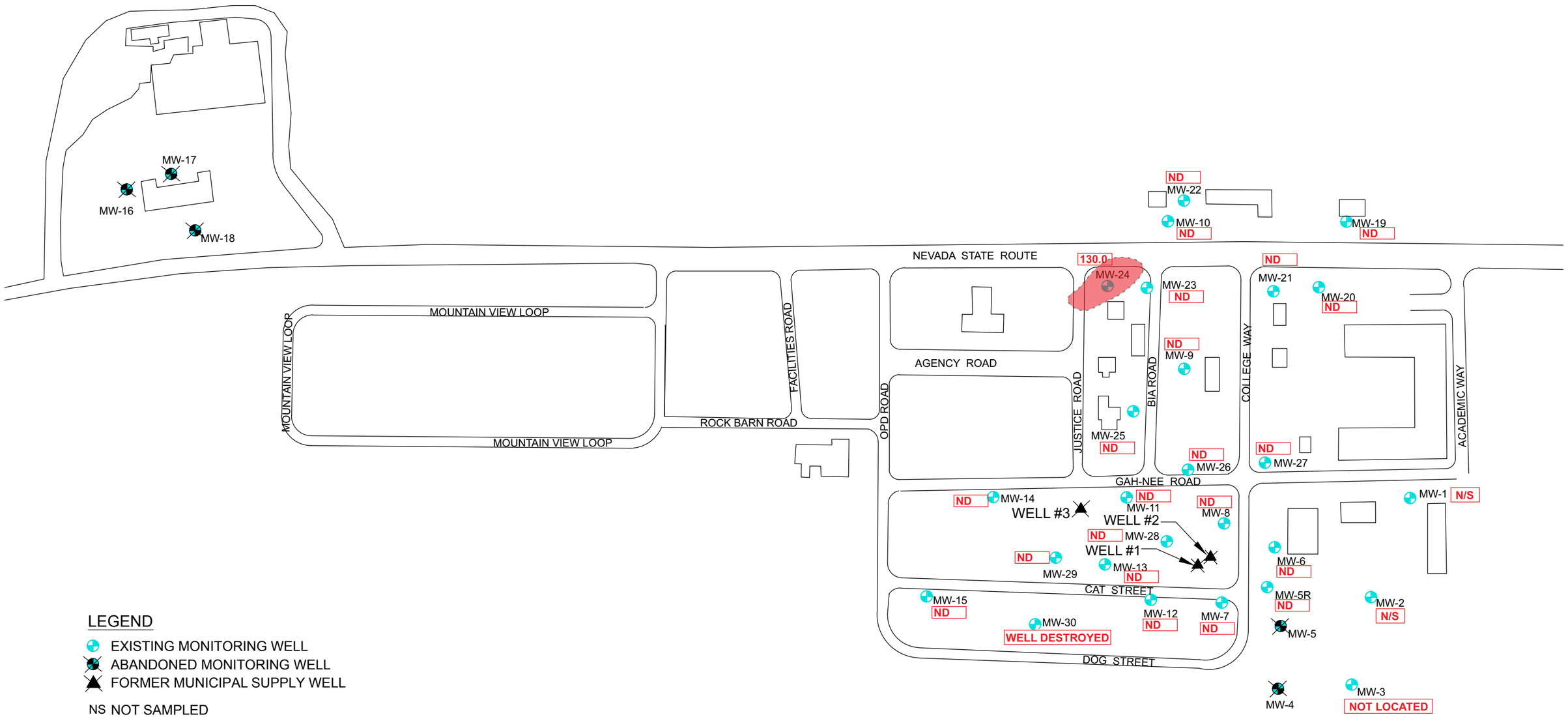
TOLUENE GROUNDWATER
ISOCONCENTRATIONS MAP (APRIL 2016)

JOB NO. 16-005

SHEET NO.

FIG. 11

OF



LEGEND

- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- FORMER MUNICIPAL SUPPLY WELL

NS NOT SAMPLED

ND NOT DETECTED ABOVE MDL

130 - TOTAL XYLENES CONCENTRATIONS IN ug/L

- TOTAL XYLENES CONCENTRATIONS >100.0 ug/L

TOTAL XYLENES - MCL = 10,000 ug/L

EPA TAP WATER TOTAL XYLENES RSL = 190 ug/L

GRAPHIC SCALE

100 0 100 200

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DUCK VALLEY INDIAN RESERVATION
OWYHEE, NV

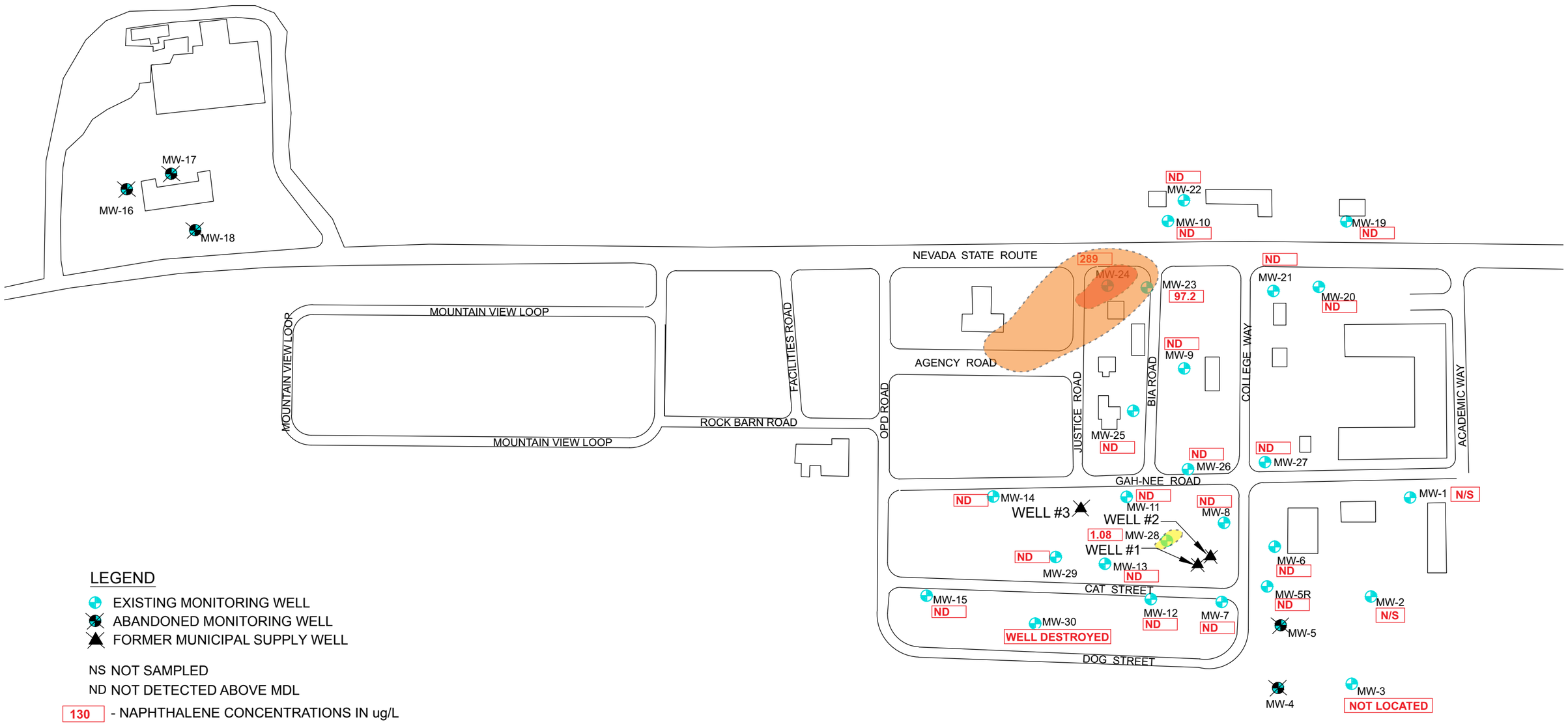
TOTAL XYLENES GROUNDWATER
ISOCONCENTRATIONS MAP (APRIL 2016)

JOB NO. 16-005

SHEET NO.

FIG. 12

OF



LEGEND

- EXISTING MONITORING WELL
- ABANDONED MONITORING WELL
- FORMER MUNICIPAL SUPPLY WELL

NS NOT SAMPLED

ND NOT DETECTED ABOVE MDL

130 - NAPHTHALENE CONCENTRATIONS IN ug/L

- NAPHTHALENE CONCENTRATIONS >280.0 ug/L
- NAPHTHALENE CONCENTRATIONS >90.0 ug/L
- NAPHTHALENE CONCENTRATIONS >1.0 ug/L

NAPHTHALENE - MCL = NOT LISTED

EPA TAP WATER NAPHTHALENE RSL = 0.17 ug/L

GRAPHIC SCALE

100 0 100 200

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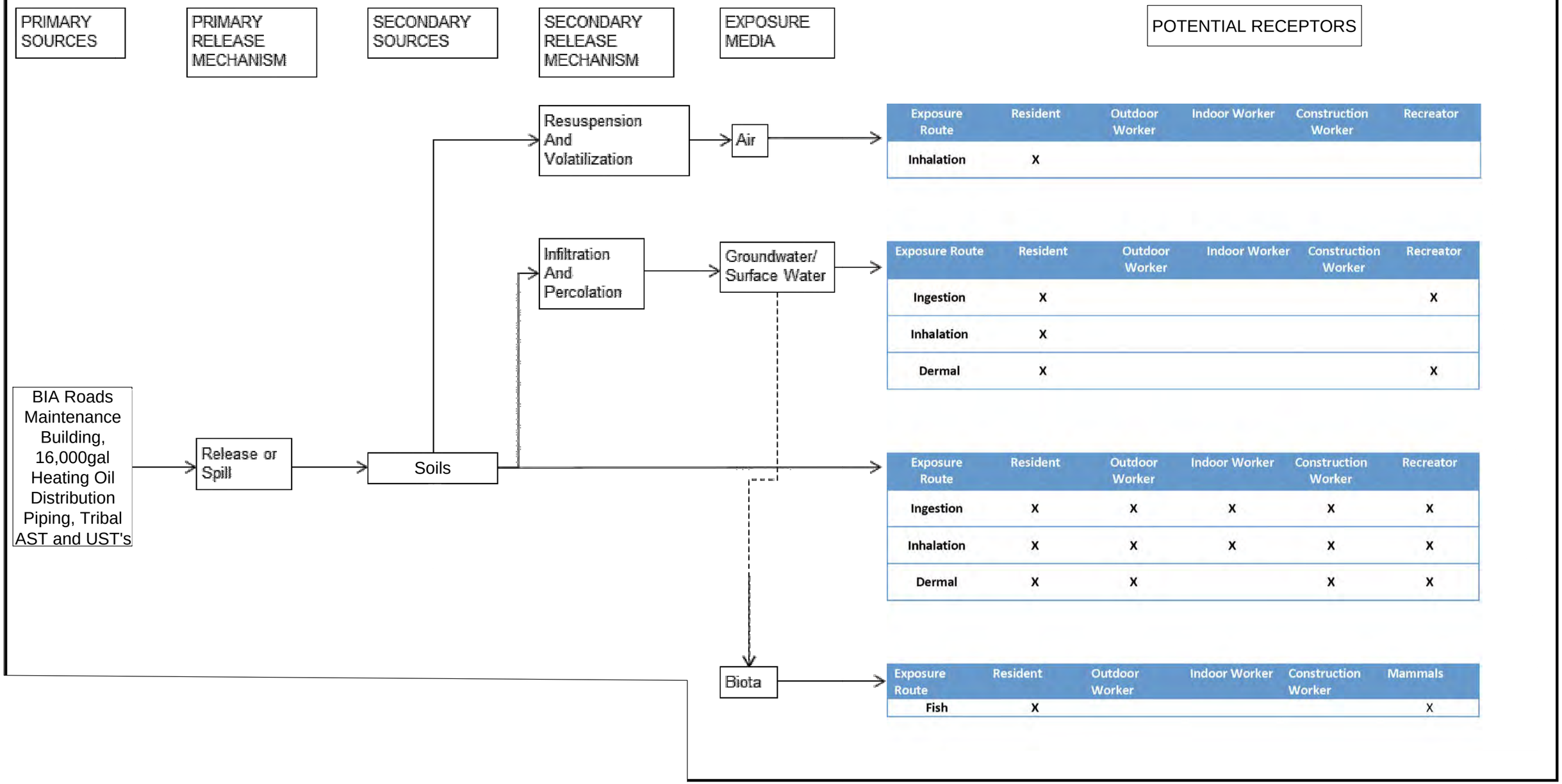
NAPHTHALENE GROUNDWATER
ISOCONCENTRATIONS MAP (APRIL 2016)

JOB NO. 16-005

SHEET NO.

FIG. 13

OF



Exposure Route	Resident	Outdoor Worker	Indoor Worker	Construction Worker	Recreator
Inhalation	X				

Exposure Route	Resident	Outdoor Worker	Indoor Worker	Construction Worker	Recreator
Ingestion	X				X
Inhalation	X				
Dermal	X				X

Exposure Route	Resident	Outdoor Worker	Indoor Worker	Construction Worker	Recreator
Ingestion	X	X	X	X	X
Inhalation	X	X	X	X	X
Dermal	X	X		X	X

Exposure Route	Resident	Outdoor Worker	Indoor Worker	Construction Worker	Mammals
Fish	X				X

P:\PDX PROJECTS\2016\16-005 BIA Duck Valley Env. Investigation\01 Item 0010 Project Planning\05 Task 5 Project Work Plan\Revised Hydrocarbon Workplan\Revised Figures\CAD\16-005-FIG. 14 JUNK.DWG 6/8/2017 2:02 PM

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DUCK VALLEY INDIAN RESERVATION
OWYHEE, NV

PRELIMANARY CONCEPTUAL SITE MODEL

JOB NO. 16-005

SHEET NO. FIG. 14

APPENDIX A

WELL DRILLER'S PLUGGING REPORTS FOR FORMER DRINKING WATER (DW) WELLS 1, 2, AND 3

(3 Pages)

STATE OF NEVADA
DIVISION OF WATER RESOURCES
WELL DRILLER'S PLUGGING REPORT

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Log No. 107108
Permit No.
Basin 037

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Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

NOTICE OF INTENT NO. 34018

1 OWNER Duck Valley Indian Reservation
MAILING ADDRESS Owhee NV

ADDRESS AT WELL LOCATION BIA Roads Shop yard
well #1 Duck valley Indian Reservation
Subdivision Name: County: Elko

2 LOCATION ~~SW~~ NW ¼ ~~NE~~ SE ¼ Sec 26 T 47N N/S R 52 E
PERMIT/WAIVER No. R-593 (Issued by Water Resources) none avalible (Parcel No.)

Latitude 41 56643
Longitude 116 05961
UTM E
N
☐ NAD 27
☒ NAD 83/WGS 84

3 TYPE OF WELL
☐ Domestic ☐ Irrigation ☐ Test
☒ Municipal/Industrial ☐ Monitor ☐ Stock

Is this well being plugged because a replacement well was drilled? no
If yes, what is replacement well NO!?

Is there an existing well log? no
If yes, what is NDWR well log #?

4 EXISTING WELL CONSTRUCTION
Depth Drilled 60 Feet Depth Cased 60 Feet

EXISTING CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
10.750	40.48	.365	+2	60

Existing Perforations:
Type of perforation not avalable
Size of perforation not avalable
From feet to feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

5 WATER LEVEL
Static water level 11 feet below land surface
Artesian flow n/a G.P.M. n/a P.S.I
Water temperature n/a °F Quality good

6 Additional Notes or Comments
.....1.5 Yards cement

N 41.944159
W 116.098415 NAD27

7 WELL PLUGGING PROCEDURE
Was well cleaned out to total depth? ☒ yes ☐ no
If well was not cleaned out to total depth, please explain why:

Was the well contaminated? ☒ yes ☐ no
Was the casing pulled? ☐ yes ☒ no
Was the casing over drilled? ☐ yes ☒ no
If casing was left in place, please show where additional perforations were made:

Additional Perforations:
Type of perforater used:
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot

8 WELL PLUGGING MATERIALS

From	feet to	Material Used		
0	60	neet cement	☒ Pumped	☐ Poured
			☐ Pumped	☐ Poured
			☐ Pumped	☐ Poured
			☐ Pumped	☐ Poured
			☐ Pumped	☐ Poured
			☐ Pumped	☐ Poured

Neat Cement Fluid Weight 94 lbs/gal 5.2
Bentonite Grout % bentonite
Date Started 9/26/2008
Date Completed 9/26/2008

9 DRILLER'S CERTIFICATION
This well was plugged and abandoned under my supervision and the report is true to the best of my knowledge.
Name WDC Exploration & Wells (Contractor)
Address 570 Corinthian Way (Contractor)
N.Las Vegas, NV 89030
Nevada contractor's license number issued by the *State Contractor's Board* 0012852
Nevada driller's license number issued by the Division of Water Resources, the *on-site driller* 2372
Signed Alex Segura (By driller performing actual drilling on site or contractor)
Date 9-29-08

(Rev 05-08)

USE ADDITIONAL SHEETS IF NECESSARY

STATE OF NEVADA
DIVISION OF WATER RESOURCES
WELL DRILLER'S PLUGGING REPORT

OFFICE USE ONLY
Log No. 107107
Permit No.
Basin 037

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

NOTICE OF INTENT NO. 34018

1 OWNER Duck Valley Indian Reservation
MAILING ADDRESS Owhee NV

ADDRESS AT WELL LOCATION BIA Roads Shop yard
Well #2 Duck valley Indian Reservation
Subdivision Name: County: Elko

2 LOCATION NW ¼ SE ¼ Sec 28 T 47N N/S R 52 E
PERMIT/WAIVER No. R-593 (Issued by Water Resources) none avalible (Parcel No.)

Latitude 41 56644
Longitude 116 05961
UTM E
N
☐ NAD 27
☒ NAD 83/WGS 84

3 TYPE OF WELL
☐ Domestic ☐ Irrigation ☐ Test
☒ Municipal/Industrial ☐ Monitor ☐ Stock

Is this well being plugged because a replacement well was drilled? no
If yes, what is replacement well NO#?

Is there an existing well log? no
If yes, what is NDWR well log #?

4 EXISTING WELL CONSTRUCTION
Depth Drilled 168 Feet Depth Cased 168 Feet

EXISTING CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
12.750	49.56	.375	+3	168

Existing Perforations:
Type of perforation not avalable
Size of perforation not avalable

From	25	feet to	83	feet
From	103	feet to	168	feet
From		feet to		feet
From		feet to		feet
From		feet to		feet

5 WATER LEVEL
Static water level 11 feet below land surface
Artesian flow n/a G.P.M. n/a P.S.I
Water temperature n/a °F Quality good

6 Additional Notes or Comments
.....4 Yards Cement

N 41.944176
W 116.098415 NAD27

7 WELL PLUGGING PROCEDURE
Was well cleaned out to total depth? ☒ yes ☐ no
If well was not cleaned out to total depth, please explain why:

Was the well contaminated? ☒ yes ☐ no
Was the casing pulled? ☐ yes ☒ no
Was the casing over drilled? ☐ yes ☒ no
If casing was left in place, please show where additional perforations were made:

Additional Perforations:
Type of perforater used: mills knife

From	83	feet to	103	feet	Number of perfs per linear foot 4
From		feet to		feet	Number of perfs per linear foot
From		feet to		feet	Number of perfs per linear foot
From		feet to		feet	Number of perfs per linear foot
From		feet to		feet	Number of perfs per linear foot
From		feet to		feet	Number of perfs per linear foot

8 WELL PLUGGING MATERIALS

					Material Used		
From	0	feet to	168	feet	neat cement	☒ Pumped	☐ Poured
From		feet to		feet		☐ Pumped	☐ Poured
From		feet to		feet		☐ Pumped	☐ Poured
From		feet to		feet		☐ Pumped	☐ Poured
From		feet to		feet		☐ Pumped	☐ Poured
From		feet to		feet		☐ Pumped	☐ Poured

Neat Cement Fluid Weight 94 lbs/gal 5.2
Bentonite Grout % bentonite
Date Started 9/26/2008
Date Completed 9/26/2008

9 DRILLER'S CERTIFICATION
This well was plugged and abandoned under my supervision and the report is true to the best of my knowledge.
Name WDC Exploration & Wells (Contractor)
Address 570 Corinthian Way (Contractor)
N.Las Vegas, NV 89030
Nevada contractor's license number issued by the *State Contractor's Board* 0012852
Nevada driller's license number issued by the Division of Water Resources, the *on-site driller* 2372
Signed (By driller performing actual drilling on site or contractor)
Date 9-29-08

(Rev. 05-08)

USE ADDITIONAL SHEETS IF NECESSARY

STATE OF NEVADA
DIVISION OF WATER RESOURCES
WELL DRILLER'S PLUGGING REPORT

OFFICE USE ONLY
Log No. 107106
Permit No.
Basin 037

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

NOTICE OF INTENT NO. 34018

1 OWNER Duck Valley Indian Reservation
MAILING ADDRESS Owhee NV

ADDRESS AT WELL LOCATION BIA Roads Shop yard
Well #3 Duck valley Indian Reservation
Subdivision Name: County: Elko

2 LOCATION SW ¼ NE ¼ Sec 26 T 47N N/S R 52 E
PERMIT/WAIVER No. R-593 (Issued by Water Resources) none avalible (Parcel No.)

Latitude 41 56682
Longitude 116 05950
UTM E
N
☐ NAD 27
☒ NAD 83/WGS 84

3 TYPE OF WELL
☐ Domestic ☐ Irrigation ☐ Test
☒ Municipal/Industrial ☐ Monitor ☐ Stock

Is this well being plugged because a replacement well was drilled? no
If yes, what is replacement well NOI?

Is there an existing well log? no
If yes, what is NDWR well log #?

4 EXISTING WELL CONSTRUCTION
Depth Drilled 83 Feet Depth Cased 83 Feet

EXISTING CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
10.750	40.48	.365	+2	83

Existing Perforations:
Type of perforation not avalable
Size of perforation not avalable
From feet to feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

5 WATER LEVEL
Static water level 11 feet below land surface
Artesian flow n/a G.P.M. n/a P.S.I
Water temperature n/a °F Quality good

6 Additional Notes or Comments
.....2 Yards Cement

N 41.944809
W 116.058231 NAD27

7 WELL PLUGGING PROCEDURE
Was well cleaned out to total depth? ☒ yes ☐ no
If well was not cleaned out to total depth, please explain why:

Was the well contaminated? ☒ yes ☐ no
Was the casing pulled? ☐ yes ☒ no
Was the casing over drilled? ☐ yes ☒ no
If casing was left in place, please show where additional perforations were made:

Additional Perforations:
Type of perforater used:
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot
From feet to feet Number of perfs per linear foot

8 WELL PLUGGING MATERIALS

From	feet to	Material Used		
0	83	neet cement	☒ Pumped	☐ Poured
			☐ Pumped	☐ Poured
			☐ Pumped	☐ Poured
			☐ Pumped	☐ Poured
			☐ Pumped	☐ Poured
			☐ Pumped	☐ Poured

Neat Cement Fluid Weight 94 lbs/gal 5.2
Bentonite Grout % bentonite
Date Started 9/26/2008
Date Completed 9/26/2008

9 DRILLER'S CERTIFICATION
This well was plugged and abandoned under my supervision and the report is true to the best of my knowledge.
Name WDC Exploration & Wells (Contractor)
Address 570 Corinthian Way (Contractor)
N.Las Vegas, NV 89030
Nevada contractor's license number issued by the *State Contractor's Board* 0012852
Nevada driller's license number issued by the Division of Water Resources, the *on-site driller* 2372
Signed (By driller performing actual drilling on site or contractor)
Date 9-29-08

(Rev 05-06)

USE ADDITIONAL SHEETS IF NECESSARY

APPENDIX B

EPA REGION 9 ADMINISTRATIVE ORDER ON CONSENT

(18 Pages)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

450

JUN 16 1995

JUN 1995
PHOENIX AREA OFFICE
ENVIRONMENTAL
SERVICES

Mr. Walt Mills
Area Director
Bureau of Indian Affairs
Post Office Box 10
Phoenix, AZ 85001

Dear Mr. Mills,

Enclosed is an Emergency Order issued to the Bureau of Indian Affairs ("BIA") by the United States Environmental Protection Agency, Region IX, Drinking Water Protection Branch (DWPB) regarding known and suspected groundwater and soil contamination at the BIA facility located on the federally recognized Duck Valley Indian Reservation in Owyhee, Nevada.

We are aware that correspondence, dated April 18, 1995, was sent to you from EPA, Region IX's Office of Underground Storage Tanks (USTs) requiring certain actions be taken by the Bureau of Indian Affairs to address possible groundwater and soil contamination related to USTs operated by the BIA at the Owyhee facility. To the extent possible, we will work with you and the Office of Underground Storage Tanks (OUST) to ensure that the BIA need only perform an activity once to satisfy the requirements of both the DWPB and the OUST in areas where the required activities duplicate each other.

We look forward to working with you to address the requirements set forth in the attached Emergency Order. If you have any questions, please Cynthia Sans at (415) 744-1837.

Sincerely,

Loretta Barsamian

Loretta K. Barsamian, Chief
Drinking Water Protection Branch

Enclosures

PHOENIX AREA DIRECTOR

JUN 19 11 08 AM '95

BUREAU OF INDIAN AFFAIRS

Printed on Recycled Paper

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

IN THE MATTER OF Walt Mills Area Director Bureau of Indian Affairs Post Office Box 10 Phoenix, AZ 85001 Respondent. Proceedings under §1431(a)(1) of the Safe Drinking Water Act, 42 U.S.C. § 300i(a)(1) and 40 C.F.R. § 144.27.	)	Docket No. UIC-EO-95-001 FINDING OF IMMINENT AND SUBSTANTIAL ENDANGERMENT TO THE HEALTH OF PERSONS AND ADMINISTRATIVE ORDER

STATUTORY AUTHORITY

The following Findings are made and Order issued under the authority vested in the Administrator of the U.S. Environmental Protection Agency by §1431(a) of the Safe Drinking Water Act ("the SDWA" or "the Act"), 42 United States Code ("U.S.C.") §300i(a) and 40 Code of Federal Regulations ("C.F.R.") § 144.27. The authority to take these actions has been duly redelegated to the undersigned Chief, Drinking Water Protection Branch, Water Management Division, EPA Region IX ("EPA").

DESCRIPTION OF RESPONDENT

1. The Respondent, the Bureau of Indian Affairs ("BIA") is a federal agency and thus a "person" within the meaning of §1401(12) and §1423(b) of the Act, 42 U.S.C. §300f(12), §300h-2(b).

2. BIA owns and operates a Maintenance Shop ("the Facility") on the federally recognized Duck Valley Reservation in

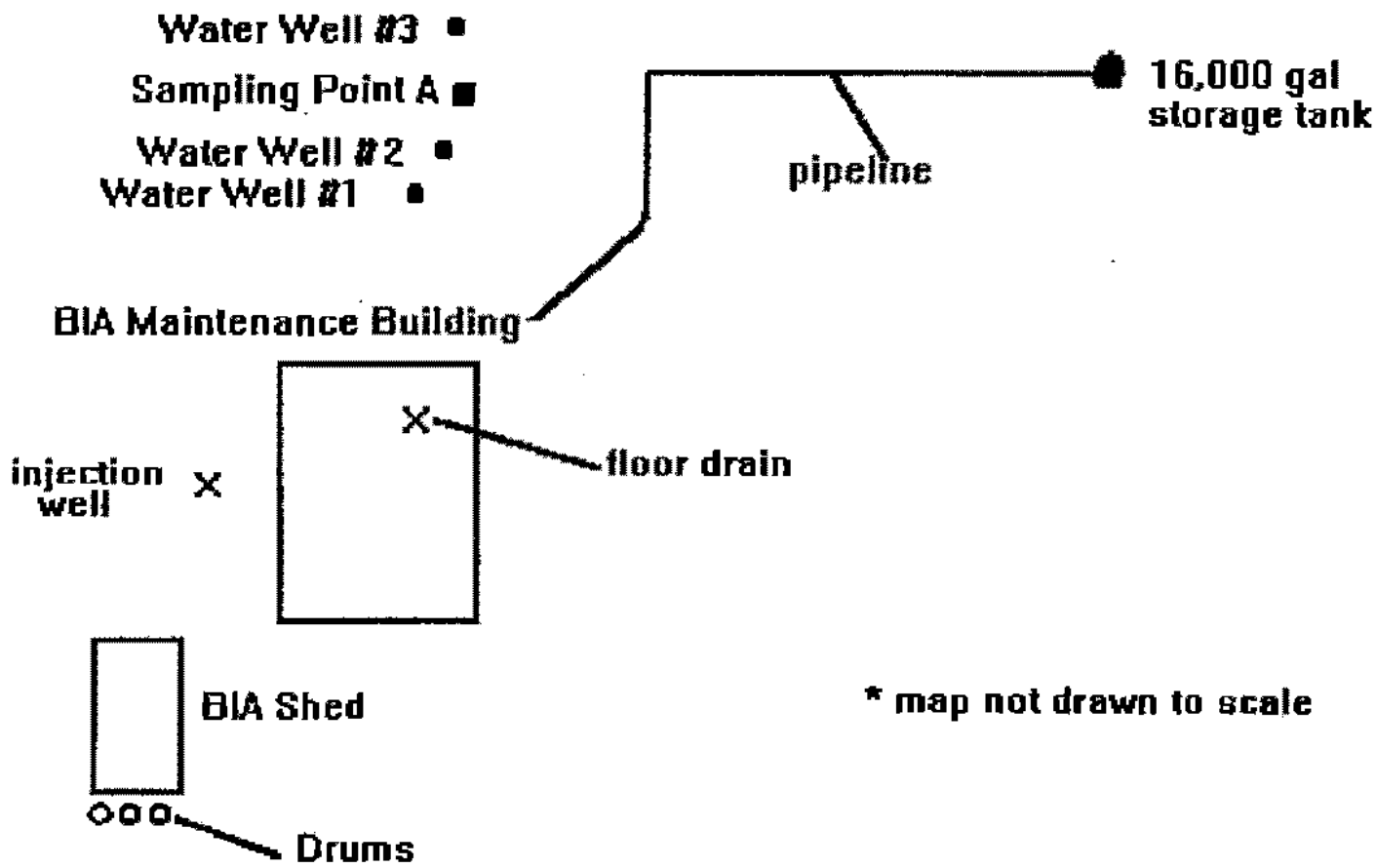
Owyhee, Nevada.

3. BIA has used an on-site shallow injection well ("the disposal well") to dispose of fluids produced while maintaining vehicles at the Facility. This well constitutes an injection well as defined by 40 C.F.R. §144.3. Thus, BIA is the owner and operator of an injection well within the meaning of 40 C.F.R. §144.3.

FINDINGS

4. The disposal well is connected to a floor drain inside the Facility's main maintenance building (see Map #1) and consists of a subsurface pipe leading to a disposal pit area. This well has been used for periodic disposal of wastes at various times since the late 1950's. During an inspection of the Facility conducted on October 19, 1994 ("EPA's October Inspection"), EPA observed a sludge-like substance in the floor drain and took samples of this substance. Results and analysis of these samples are enclosed as Appendix A. These samples indicate that BIA may have disposed of contaminants into the well in a manner that may have endangered the health of persons or risked causing exceedances of primary drinking water regulations under 40 C.F.R. Part 142.

5. BIA has disposed of various waste products, including wastewater from steam cleaning, onto the ground surrounding the maintenance building. This disposal practice has left visible soil staining in various locations indicative of petroleum hydrocarbon contamination.


Water Well #3
Sampling Point A
Water Well #2
Water Well #1
16,000 gal
storage tank
pipeline
BIA Maintenance Building
floor drain
injection
well
BIA Shed
Drums
* map not drawn to scale

MAP #1

6. BIA stores multiple chemical containers inside the maintenance building along with automotive parts and equipment (e.g., leaking batteries), some of which are in deteriorated or deteriorating condition such that additional leaking of chemicals to the floor drain is probable. In addition, BIA has not instituted any procedures for disposing of waste products containing petroleum hydrocarbons and\or metals that would be generated in the course of routine maintenance and cleaning (such as solvent bathing and steam cleaning) other than disposing of these materials into the disposal well or onto the ground surrounding the maintenance building.

7. BIA has performed vehicle maintenance, waste disposal, and chemical storage activities in a "shed area", located southwest of the Facility's main maintenance building (see Map #1). The shed has an unlined dirt floor and is divided into eleven sections. During EPA's October Inspection, it was observed that the soil in many of the sections of the shed was stained with what appeared to be petroleum hydrocarbon contamination. On the soil floor in the southernmost section, a standing pool of black, sludge-like substance is present that preliminary lab results show to contain benzene, toluene, xylene and various unknown compounds and semi-VOCs. In several sections, it was impossible for EPA to conduct a thorough inspection due to drums, containers, and machinery inhibiting access. However, the deteriorating condition of the drums and machinery indicated that other instances of contamination were

probable.

8. BIA has a storage area with approximately forty, 55-gallon drums against the outside southern wall of the shed. During EPA's October Inspection, inspectors observed that these drums were stacked on top of each other, many were unlabelled, and many appeared to be leaking or to have leaked in the past. No containment or berm is present to prevent product from leaking and seeping into the ground. EPA's inventory of labelled drums in this area revealed approximately 14 drums labelled Chevron Delo 400, Motor Oil SAE 15W-40, 2 drums labelled Conoco Fleet SAE 301 Mobile Delvac 1300 SUP 15W-40, 1 drum labelled DYCE Chemical Anti-Freeze and Summer Coolant, 5 drums labelled Golden Bear Division-Witco Crack Filler, and 4 drums labelled Low 30 Lub Oil Eng MIL-L-46152 DGS Stock. The remainder of the drums were unlabelled or unidentifiable.

9. Records also indicate that the Facility owns a subsurface fuel oil pipeline ("pipeline") which is connected to a 16,000 gallon storage tank ("16,000 gallon tank") located approximately 600 feet northeast of the Facility near the old power plant. During its October Inspection, EPA received contradictory statements as to whether the tank and the pipeline were still in use.

10. There is a public water supply pumphouse located approximately 120 feet northeast of the Facility. There is a 30 horsepower public water supply well ("Water Well #1") 20 feet north of the pumphouse and a second 7.5 horsepower well inside

the pumphouse ("Water Well #2"). In 1985, both wells were taken off-line due to petroleum hydrocarbon contamination. A 10 horsepower public water supply well ("Water Well #3"), located 250 feet northeast of the pumphouse, continues to provide drinking water to the community.

11. The aquifer underlying the Facility contains sufficient quantities of water to supply a public water system and contains less than 10,000 ppm total dissolved solids ("TDS"). It is therefore an underground source of drinking water ("USDW") as defined in 40 C.F.R. §144.3.

12. The community of Owyhee, Nevada currently draws water from this aquifer to supply the needs of the community. The depth from the ground surface to the water table fluctuates seasonally between 7.5 and 14 feet. The contamination of the aquifer has already forced closure of Water Wells #1 and #2. The contamination poses further risk to Water Well #3 and future drinking water wells that might be drilled into the formation to supply the community with drinking water.

13. Due to the condition of the Facility as documented in paragraphs 4-9 above, contaminants are present in or likely to enter the USDW and may present an imminent and substantial endangerment to the health of persons.

14. The Duck Valley Reservation has been federally recognized as an Indian Reservation and EPA, therefore, has jurisdiction to enforce all regulations under the SDWA and take all measures necessary to protect the health of persons on the

Reservation. State and local authorities are either unable under applicable law or have not taken all measures necessary to protect the health of persons in this matter.

15. The EPA therefore finds that the Order described below is authorized under §1431 of the SDWA, 42 U.S.C. §300i and 40 C.F.R. §144.27, and is necessary to protect the health of persons.

ORDER

16. Based upon the foregoing facts and findings, taking into account the imminent and substantial endangerment to the health of persons and under authority of §1431 of the SDWA, 42 U.S.C. §300i, and 40 C.F.R. §144.27, I hereby order compliance with the following provisions:

I. Cease Disposal

17. To prevent the continued endangerment of the USDW and to protect the health of persons, BIA shall:

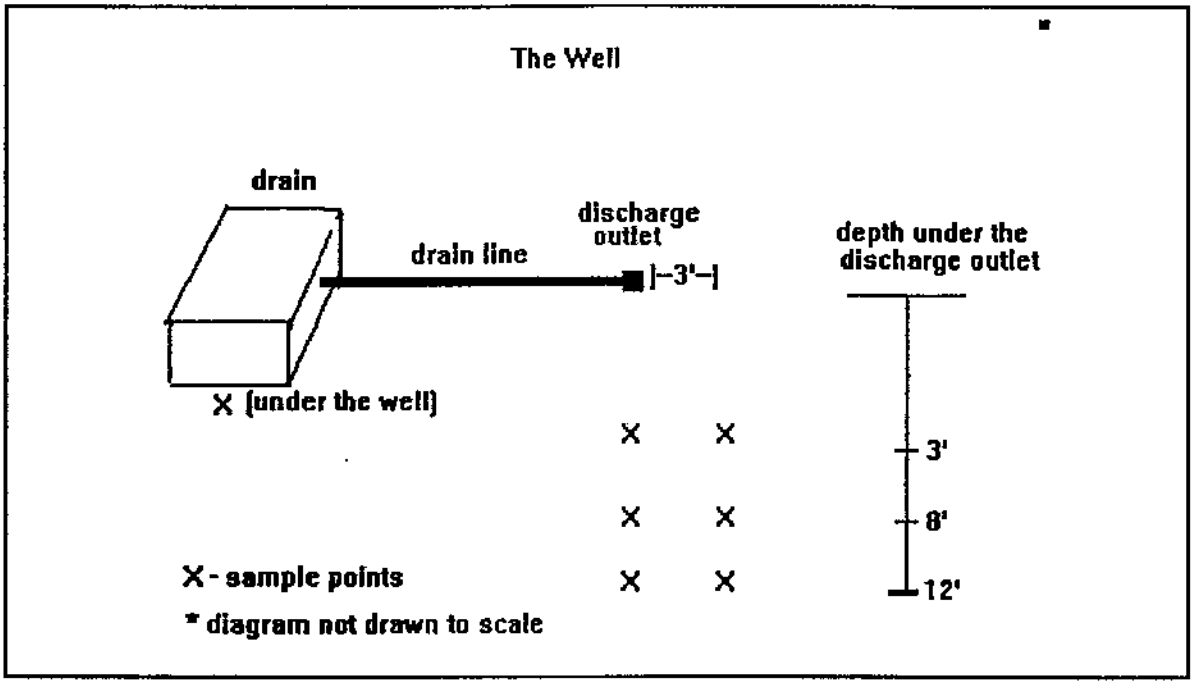
a. on the effective date of this Order, immediately cease injection of fluids into the disposal well,

b. cease disposal or draining of waste fluids containing petroleum hydrocarbons, such as steam cleaning wastewater or spent automotive fluids, onto unlined dirt areas of the Facility, and

c. provide EPA with a written certification within 48 hours of the effective date of this Order that any such injection, disposal or draining activities have ceased.

II. Work Plan

18. Within thirty (30) days of the effective date of this Order, BIA shall submit for EPA's approval a Work Plan covering each of the elements in Paragraphs 21 through 33 of the Order.



The BIA shall retain a professional, registered geologist or civil engineer with experience in performing hydrogeological investigations to prepare and implement the Work Plan.

19. If EPA does not approve the BIA's Work Plan required by the preceding paragraph, the BIA shall submit a new Work Plan incorporating EPA's comments within ten (10) days of receiving notice that the Work Plan is unacceptable.

20. Upon approval by EPA, the Work Plan shall be deemed incorporated into this Order as if fully set forth herein and BIA shall immediately begin implementation of the actions required by the Work Plan.

A. Closure of Disposal Well

21. Identify the location of each drain, drain line, discharge outlet, and\or sump associated with the disposal well.

Information must include the length of the drain line(s), the depth of the drain line(s) below the ground surface, and the distance between the discharge outlet to the top of the water table.

22. Describe the proposed method of removal of the contents of the disposal well and any surrounding contaminated soil, and associated floor drains and lines. BIA must first sample the waste in the disposal well to determine the presence of any constituents which would classify the waste as a Resource Conservation and Recovery Act ("RCRA") hazardous waste, as defined by 40 C.F.R. Part 261. If the waste is characterized as a RCRA hazardous waste, BIA must dispose of all the waste in the disposal well according to all federal, state and local regulations applicable to hazardous waste including, but not limited to, the federal requirements in 40 C.F.R. Parts 262, 266, and\or 279. BIA is ultimately responsible for the proper disposal of all wastes, and should carefully review all arrangements for disposal to ensure compliance with federal, state and local Laws.

23. If the waste is not hazardous under RCRA, BIA must include in the sampling Work Plan, procedures it will take to remove the waste from the disposal well. Information must include the method of removal, the date(s) of removal, the quantity of waste removed, and the final disposal destination. If BIA is not directly removing the waste, BIA must provide documentation from the responsible party testifying to the proper

removal and disposal of the waste from the Facility.

24. Outline a plan for taking representative soil samples in the areas around the disposal well in accordance with the procedures described in 40 C.F.R Part 261 Appendix I "Representative Sampling Methods." A minimum of four (4) samples must be taken in the following locations (see Diagram #1):

* **1 sample** 6" directly below the floor drain in the main maintenance building

* **3 samples** at the point of discharge from the drain line into the disposal well area at depths of 3', 8' and 12'.

25. All samples shall be analyzed by an EPA-approved laboratory for metals, volatile organics, semi-volatile organics, and total recoverable petroleum hydrocarbons ("TRPH"). Upon receipt, copies of all sampling results must be sent to EPA.

26. Describe how the disposal well and associated floor drains and lines will be permanently plugged and sealed. Appendix B contains guidelines for well closure.

27. Submit notification to EPA about the presence of any other injection wells on the Facility. Enclosed as Appendix C is documentation defining an injection well.

B. BIA 16,000 Gallon Storage Tank and Pipeline

28. Outline a plan to conduct testing to determine the integrity of the 16,000 gallon tank and the pipeline. Determine the existence of any fractures or breaks in the pipeline.

29. If the 16,000 gallon tank and pipeline are no longer in use, submit a statement to that effect and investigate the presence of any remaining product in the 16,000 gallon tank

and\or pipeline. If the tank and pipeline do not contain any product, provide certification to that effect to EPA.

30. Outline a plan for conducting a soil-gas survey (or some other method outlined by BIA and subject to EPA approval) to determine the existence of contamination in the area of the pipeline.

31. Describe a plan for follow-up sampling should contaminants be detected.

C. Sample Drinking Water Wells

32. Outline a plan for collecting water samples from drinking water wells #1, #2 and #3. The plan shall provide for quarterly sampling for drinking water wells #1 and #2 and monthly sampling for drinking water well #3.

33. Outline a plan for installing a monitoring well which will enable, among other things, the taking of a sample at the level of the water table. The sample location must be approximately halfway between Water Well #2 and Water Well #3.

34. All samples shall be analyzed by an EPA-approved laboratory for metals, volatile organics, semi-volatile organics, and TRPH. BIA must notify EPA at least fourteen (14) days prior to taking any samples. Upon receipt, copies of all sampling results shall be sent to EPA.

D. Site Characterization

35. Within sixty (60) days of receipt of this Order, submit to EPA the following information about the construction and operation of Water Wells #1, #2, and #3. Submittals for each

well should be summarized in separate documents and the information should correspond to the sequence requested in this Order. Information must include, but is not limited to:

a. construction information, including date of construction, date of completion, total depth of well from the ground surface, and length of the screened interval;

b. maximum and average pump rates;

c. standing water levels; and

d. length of time the well has been in use, indicating any periods when the well was off-line and the reason it was taken off-line.

36. Documentation may include, but is not limited to, well logs, well schematics, completion schematics, drilling logs, and\or construction data.

37. Within sixty (60) days of receipt of this Order submit to EPA the following information about the hydrogeology of the aquifer and the formation underlying the Facility and the Drinking Water Wells. Information must include, but is not limited to:

a. a description of the stratified layer of the formation extending down to the lowermost aquifer from which drinking water is drawn; if available indicate the material composition of each layer, its permeability, porosity, hydraulic conductivity and thickness;

b. a cross-sectional map of the formation, include the points where the Facility and the three wells are located;

c. the gradient and rate of groundwater flow in the aquifer(s) where wells are located, including any seasonal variations; and

d. any known fractures or disruptions in the formation which might increase the flow of

contaminants through the aquifer(s).

38. Documentation may include, but is not limited to, geological surveys, engineering reports, and\or regional maps.

39. The Work Plan shall outline a plan to delineate the boundaries of the groundwater contamination, the extent of soil contamination and the source(s) of the soil and groundwater contamination.

E. Site Remediation

40. Within sixty (60) days of receipt of this Order, BIA shall submit to EPA a Work Plan to clean-up and remediate the site. As described further below, BIA shall supplement this Work Plan as new information becomes available indicating the need for particular types of clean-up and other site remediation. Upon receipt of EPA approval, these supplements to the Work Plan shall be deemed incorporated into the Work Plan and the Order.

41. The Work Plan shall provide for proper storage and\or disposal of all the drums on the Facility. BIA must conduct a comprehensive inventory of the drums on the Facility identifying the number of drums, the type of product enclosed, and quantity in each drum. If the condition of the containers does not meet the standard in 40 C.F.R. 264 Subpart I, BIA must include procedures to properly transfer the product(s) and dispose of the drum.

42. The Work Plan must have separate provisions for 1) proper storage of drums that will remain on the Facility and 2) removal and\or disposal of drums containing hazardous or non-

hazardous materials. If any drum(s) contain or contained hazardous waste at any point, BIA must adhere to all regulations specified in 40 C.F.R. Parts 262 and 264. BIA must provide information to EPA as to how the drums are to be transported off the Facility for removal\disposal, the date(s) of transport, an inventory of the drums transported off the Facility, and the final destination of all drums and enclosed product. If BIA is not directly removing the drums, BIA must provide documentation from the responsible party testifying to the proper removal and disposal of the drums and all enclosed product.

43. The Work Plan shall provide for the prompt removal and proper disposal of all standing pools of sludge and\or other contaminants and surface soils that are visibly or otherwise detectably contaminated in all areas of the Facility.

44. The Work Plan shall provide for the appropriate remediation of all subsurface soil and/or groundwater contamination at the Facility that is discovered during the sampling and analysis tasks specified by this Order or otherwise undertaken by BIA or any third party. The Work Plan shall be periodically updated and supplemented with respect to appropriate site remediation as information from sampling and analysis tasks becomes available.

45. The Work Plan shall provide for the appropriate remediation of all subsurface soil and/or groundwater contamination, including contamination of Water Wells, off-site of the Facility that is shown probably to have been wholly or

partially caused by BIA. The Work Plan shall be updated during the first week of every month and supplemented with sampling information for site remediation as it becomes available.

III. SUBMITTALS

46. All submittals required by this Order shall be sent by mail to the following address:

Loretta Barsamian, Chief
Drinking Water Protection Branch
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105

ATTN: Cynthia Sans (W-6-3)
Alisa Wong (W-6-3)

47. All reports required to be submitted to EPA pursuant to this Order shall be accompanied by the following statement signed by a responsible BIA official:

> "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 gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, I certify that the information 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."

IV. GENERAL PROVISIONS

48. The provisions of this Order shall apply to and be binding upon BIA, its officers, directors, agents, successors and assigns. Notice of this Order shall be given to any successors in interest prior to transfer of the Facility or its operation. Action or inaction of any persons, firms, contractors, employees, agents, or corporations acting under, through, or for BIA shall

not excuse any failure of BIA to fully perform their obligations under this Order.

49. This Order does not constitute a waiver, suspension, or modification of the requirements of any federal statute, regulation, or condition of any permit issued thereunder, including the requirements of the SDWA and accompanying regulations. Issuance of this Order is not an election by EPA to forego any civil or any criminal action otherwise authorized under the SDWA.

50. This Order does not constitute a release of all claims regarding all conditions of operation or closure/post-closure of the well, nor does it necessarily establish all actions that may be necessary to respond to conditions revealed by the work required by this Order including further investigation or other response action.

51. Notwithstanding compliance with the terms of this Order, EPA is not precluded from taking any action authorized by law, including but not limited to, the issuance of additional administrative orders and/or the initiation of judicial actions against BIA. EPA expressly reserves the right to enforce this Order through appropriate proceedings.

52. Violation of any term of this Order, or failure or refusal to comply with this Order, may subject BIA to a civil penalty not to exceed $5,000 for each day in which such violation occurs or if failure to comply continues pursuant to section 1431(b) of the SDWA, 42 U.S.C. § 300i(b). In addition, actions

or omissions which violate this Order and any requirements of the EPA's Underground Injection Control ("UIC") program may subject BIA to additional civil penalty liability of up to $25,000 per day pursuant to §1423 of the SDWA, 42 U.S.C. § 300h-2.

V. SEVERABILITY

53. The provisions of this Order shall be severable. If any provision or the application of any provision to any Party or circumstance should be declared by a court competent to be unenforceable, the application of such provision to other Parties and circumstances, and the remaining provisions of this Order, shall remain in full force and effect.

VI. EFFECTIVE DATE

54. This Order shall be effective upon receipt.

Dated this 16th day of June, 1995.

Loretta Barsamian, Chief
Drinking Water Protection Branch
U.S. Environmental Protection Agency, Region IX

cc:
Lindsey Manning, Tribal Chairperson, Duck Valley Reservation
Bill Beck, Environmental Protection Specialist, Duck Valley Reservation
John Krause, Hazardous Waste Coordinator, BIA Area Office,
Charles Thomas, Acting Facility Manager, BIA Area Office
Steve Tibbetts, Superintendent, BIA Eastern Nevada Agency

APPENDIX C

STATUS OF CORRECTIVE ACTIONS ASSOCIATED WITH THE ADMINISTRATIVE ORDER ON CONSENT

(1 Page)

Status of Corrective Actions Associated with the 1995 SDWA AOC

Provision	AOC Paragraph	Enclosure	Narrative Response	Action Completed?
Cease Disposal	I.17a	1	BIA has fulfilled the requirements of AOC Paragraphs 17a, 17b and 17c, as documented by the BIA fax from WRO to ENA, dated June 20, 1995, and the BIA letter to EPA, dated June 21, 1998.	**Yes**
	I.17b			**Yes**
	I.17c			**Yes**
Investigation Work Plan	II.18	2	BIA has completed several work plans to investigate suspected and confirmed petroleum releases from the heating oil line, disposal well, hazardous materials storage areas, and aboveground and underground storage tanks systems. The "Roads Shop Facility Work Plan", Bureau of Reclamation, dated October 22. 1998 provided planning information responsive to the work plan requirements.	Yes
	II.19			Yes
	II.20			Yes
Close Disposal Well	II.A.21	4	Characterization of the drain line and disposal well are provided in two reports, "Subsurface Investigation Report", SECOR, dated May 1, 2000 and "Additional Roads Shop Soil Investigation", SECOR, dated November 2004. The investigation and removal of the disposal well and drain line, excavation of petroleum contaminated soils (PCS), and sealing of the drain line are provided in the SECOR Letter Report to EPA, dated July 21, 2005. Characterization of the materials in the Facility Sump is provided in the report, "Characterization, Packaging and Labeling of Materials in Owyhee, Nevada", MSE, Inc., dated July 18, 1995.	Yes
	II.A.22	3		Yes
	II.A.23	4		Yes
	II.A.24	3		Yes
	II.A.25	3		Yes
	II.A.26	4	EPA approved completion of disposal well closure responsibilities through their letter to BIA, dated January 17, 2007.	Yes
	II.A.27	NA	No other injection wells occur at the Facility.	Yes
16,000-Gallon Tank and Pipeline	II.B.28	4	Investigation of petroleum releases from the heating oil tank and pipeline and removal of PCS are documented in the reports: (1) "Sampling Results for the Bureau of Indian Affairs, Roads Shop Fuel Oil Pipeline on the Duck Valley Indian Reservation", MSE, Inc.; (2) "Subsurface Investigation Report", SECOR, dated May 1, 2000; (3) "Groundwater Impact Assessment of Former BIA Roads Shop on Owyhee Drinking Water Wells", SRK Consulting, dated May 2000; and (4) "Report of Findings from Soil Excavation and Groundwater Monitoring", SECOR, dated January 2, 2003. Removal of the heating oil line is found in the two SECOR reports, dated May 1, 2000 and January 2, 2003. Removal of the heating oil tank is documented in the SRK report, dated May 2000.	Yes
	II.B.29	3		Yes
	II.B.30	3		Yes
	II.B.31	3		Yes
Sample Drinking Water Wells	II.C.32	7	Drinking water wells have been sampled and analyzed by BIA and EPA extensively for a wide variety of compounds since 1988. Groundwater analyses have been focused on petroleum and pesticides. The "Roads Shop Facility Work Plan", dated October 22, 1998 presented the plan to sample these wells and install monitoring wells. Since 1998, several monitoring wells have been installed in and around the heating oil line, the drinking water wells, and the Facility.	Yes
	II.C.33	7		Yes
	II.C.34	7		Yes
Site Characterization	II.D.35	5	Well operation and construction for Wells #1, #2, and #3 has been conducted. Historical drinking water operation has been provided. Geophysical logging of the wells has been conducted. Well construction and abandonment information has been provided.	Yes
	II.D.36	5		Yes
	II.D.37	6	BIA has assembled the necessary information as required by the AOC to include: (1) geological cross sections; (2) well logs; (3) horizontal gradient and flow direction of the shallow aquifer; (4) site stratigraphy; and (5) soil data to include bulk density, porosity and hydraulic conductivity.	Yes
	II.D.38	NA		Yes
	II.D.39	2	Although work plans have substantially determined the extent of soil contamination, additional soil sampling is planned.	No
Site Remediation	II.E.40	2	The BIA has effectively cleaned up the soils. A plan and the associated characterization work needs to be developed for groundwater.	No
	II. E.41	4	Proper characterization and disposal of all hazardous materials stored in drums and containers stored at the Facility has occurred.	Yes
	II.E.42	4		Yes
	II.E.43	4	Removal and disposal of contaminants and surface soils above action levels has occurred.	Yes
	II.E.44	4	Although natural attenuation is planned, a work plan needs to be developed to further analyze remedial alternatives for the groundwater. This work plan will involve the abandonment of wells, well installation, soil borings, soil and groundwater analyses, and groundwater monitoring.	No
	II.E.45	4		No

APPENDIX D

SITE CHRONOLOGY

(7 Pages)

Appendix D

Site Chronology of Previous Investigations and Events (1985-2016)

- **1985 (February)** – Release of Fuel Oil discovered. The 16,000 gallon heating oil tank was removed from the distribution pipeline in 1985 after the reported loss of an estimated 8,000 gallons of heating oil.

- **1987 (October)** – An oil-like odor was discovered in two municipal wells. The wells were taken out of service by the Tribe.

- **1988 (March)** – The Indian Health Services (IHS) reported that the Owyhee public water supply contained a petroleum-like taste. The Tribe conducted nine test pit excavations to depths of 12 to 15 feet bgs. The pits were located east, west, and north of the Tribal maintenance building. Free-phase hydrocarbons (FPH) were observed in two pits located north of the Tribal maintenance building between municipal supply wells #1 and #3. Soils were excavated along the buried pipeline to groundwater, and FPH was encountered beneath the pipeline fittings. Soils samples were collected from underneath the pipeline and contained concentrations of total petroleum hydrocarbons in the diesel range (TPHd) from 11,000 to 12,000 milligrams per kilogram (mg/kg).

- **1988 (March)** - A 12,000-gallon underground storage tank (UST) located on the east side of the Road Shop building and a 12,000 gallon UST located south of the former power plant (east of the Highway) were removed. The USTs were used to store diesel. No hydrocarbon-impacted soils were reported from either excavation. No soil test data was available from this activity.

- **1988 (May)** - Soil samples were collected by IHS underneath the pipeline north of the Tribal Maintenance building. Petroleum hydrocarbons were detected in the samples.

- **1988 (July) -** A four-inch monitoring well was installed by the BIA Roads Crew to the north of the stone pump house near Wells #1 and #2. The well was installed to a completed depth of 16 feet bgs. Sometime after 1988, the operations of Wells #1 and #2 were discontinued.

- **1989 -** A former 1,000-gallon AST containing gasoline located at the northeast corner of the BIA Road Shop yard was vandalized. It was estimated that between 200 and 800 gallons of gasoline was released onto the ground surface.

- **1990 (March)** - EPA staff collected groundwater samples from Wells #1, #2, #3, and the four-inch monitoring well. The findings from the sampling event were

summarized in a report prepared by the EPA in August, 1990.

- **July, 1990** - A 2,000-gallon UST next to the BIA Law Enforcement building was removed.

- **April, 1991 -** EPA staff collected groundwater samples from six locations in Owyhee. The results from the sampling event were summarized in a report prepared by ICF Technology, Inc. in June, 1991.

- **November, 1991** - The BIA Environmental Services staff completed a review of test results from water analyses of groundwater from Well #1, and concluded that EPA Drinking Water Standards were not being violated.

- **1994** – Site investigations determined that further characterization of groundwater impacts be conducted and that pipelines near the municipal water wells #1, #2, and #3 be removed.

- **1994** – A round of water sampling indicated the municipal water wells #1, #2, and #3 were impacted with TPH. The Bureau of Reclamation developed a Work Plan to remove impacted soils, remove heating oil pipelines and drains, and analysis of soil and groundwater, add monitor wells to characterize the groundwater contaminant plume.

- **November 1994**: The BIA report titled "A Study of the Source of Contamination in Potable Water Wells in the Community of Owyhee, Nevada . . . " summarized available historical well operation information from their installation until their operation ceased in 1988 due to petroleum hydrocarbon impact"

- **1995** A discovery of an injection well located on the west edge of the former BIA Road Shop Yard was being used to dispose of petroleum hydrocarbon wastes. The USEPA later ordered the use of the injection well be discontinued and the injection well sampled and plugged to prevent additional migration of contaminants into the groundwater.

- **1995 (April)**: Work Plan and Health and Safety Plan for the Characterization, Packaging, and Labeling of Materials in Building 332 and the Roads Shop Area in Owyhee, Nevada, prepared by MSC, Inc.

- **1995 (June).** The USEPA Region 9 issued an Administrative Order (Order) to the BIA for Safe Drinking Water Act compliance violations. The order directed BIA to immediately cease use of the injection well, then to sample and formally abandon the well. These actions were included among six (6) total provisions and fifty-four (54) individual total requirements stipulated by the Order. (Appendix F). In response to the Order, the Bureau of Reclamation (BOR) assisted BIA with the development of a Work Plan to

facilitate removal of impacted soils, the removal of pipelines and drains, the sampling and analysis of soil and groundwater, characterization of contaminant impacts in soil and groundwater, and long term monitoring of groundwater contamination.

- **June 21, 1995**: A letter from Mr. Frank Jones (BIA Regional Director) was written to Mr. Loretta K Barsamian, Chief, Drinking Water Protection Branch, U.S EPA Region 9, indicating conformance with Paragraph 17 of the subject order, that BIA ENA staff have been directed to (1) cease any discharge to the facility floor drain; and (2) cease any discharge of fluids … onto unlined dirt areas of the facility. This letter continues to say that there in only one drain line that leads to the former well located west of the facility.

- **1995 (November)** Approximately 60 feet of pipeline was removed during the installation of a new water line. Soils in the vicinity of the line were reported to be impacted with heating oil.

- **1995 & 1996 –** BIA contracted the removal of approximately sixty feet of heating oil distribution pipeline northeast of the Tribal maintenance building, near the intersection of BIA Road and Gah-Nee Road. During the removal, soil within the excavation pit was observed contaminated along the entire length of the line. BIA also abandoned the injection well, and removed and disposed of several leaking drums containing used motor oil, road sealant, herbicides (2,4-D,2,4,5-T, and Dinoseb) from the Roads Yard; Approximately 40 cubic yards of Dinoseb contaminated soil were excavated to a depth of seven feet bgs.

- **1996 –** Associate Earth Sciences, Inc. sampled municipal water wells #1, #2, and #3 an found two of the wells had detectable concentration of hydrocarbons. AES conducted a geophysical survey of the three municipal water wells to obtain construction information which was not available before this time.

- **1998 (October) –** Bureau of Reclamation, Cherokee General Corporation and SECOR submit Road Shops Facility Work Plan

- **1999 –** Cherokee General Corporation and SECOR removed a majority of the remaining heating oil pipeline and significant quantities of hydrocarbon-impacted soils, where feasible. SECOR conducted a subsurface investigation to estimate the remaining impact to soil and groundwater, and to characterize the hydrogeology of the site. Four major releases (1-4) and two (2) moderate releases (5-6) were documented.

  1. Along the heating oil pipeline east of Highway 225;

  2. At a former heating oil UST, 200 feet west of Highway 225;

3. At a 90 degree turn in the pipeline, 475 feet west of Highway 225;

4. Along the pipeline near the ASTs in the northeast corner of the Tribal Maintenance Yard;

5. At the former UST location in the northern area of town near the jail; and

6. At the discharge pipe outlet in the BIA Road Shop Yard.

Of these releases, four of them (Locations 2 through 5) appeared to have impacted groundwater in the area of release and northwest of the release. Evidence of groundwater impact in these four areas consisted mainly of TPHd, although groundwater down-gradient of the Tribal maintenance yard release (Location 4) contained both TPHd and total petroleum hydrocarbons in the gasoline range (TPHg). Groundwater was not encountered during the excavation of Location 1, and the rocky subsurface prohibited water sample collection; it is therefore not known whether the groundwater in this area was impacted. Groundwater samples collected in the area surrounding the discharge pipe outlet (Location 6) indicate that groundwater was not impacted.

- **1999 - SECOR** investigated numerous other areas where petroleum releases occurred along the pipeline and the former storage tank locations and mitigated through soil removal. In total, approximately 2,850 cubic yards of impacted soil were removed from throughout the site. Of the nearly 30 areas excavated, TPH contaminated soil was left in 18 of the areas due to the location of the buildings or structures, roads or utilities preventing further excavation.

- **1999-2000** Investigation, removal and closure if the Injection Well and drain line. Secor preformed the first investigation, removal and closure of the Injection Well and drain line. Due to active asbestos abatement occurring in the Roads Shop building, investigation of the interior of building 323 Roads Shop was not addressed until a second investigation in 2004.

- **2000 –** Steffen, Robertson & Kirsten Consultants (SRK) installed 21 borings, 18 of which were converted the permanent groundwater monitoring wells (MW-1 through MW-18). The analytical data from the samples collected provided further evidence that soils and groundwater in the areas delineated in 1999 were impacted with TPH.

- **2000 (November)-** Groundwater sampling event was conducted by SRK and samples were analyzed for TPHg, volatile organic compounds (VOC), eight metals identified by the Resource Conservation and Recovery Act (RCRA) as hazardous (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). No metals concentrations

were detected in the groundwater samples and all VOCs were reported below the Federal primary drinking water standards. TPHd concentrations were not reported. Samples from MW-5 were also analyzed for pesticides and herbicides. No pesticides or herbicides were detected in the samples collected from MW-5.

- SRK also provided oversight for the removal of two USTs and one AST from the former HIS Hospital site during their investigation. All nonnative backfill materials were removed from the excavations and soil samples were collected from the native soils in the excavation. TPHd concentrations in the samples collected from the excavation ranged from 560 mg/kg to 6,100 mg/kg. Three (3) monitoring wells were installed in the vicinity of the hospital (MW-16, MW-17 and MW-18). Low detections of naphthalene, a degradation product of TPHd, were detected in the three wells.

- The 12,000 gallon heating oil tank was removed and disposed of by SRK Consulting.

- **2002 -** The BIA contracted Western Construction Inc. (Western) to begin grading and paving roads throughout Duck Valley. SECOR supervised Western during the excavation of TPH impacted soils from beneath the roads where impacted soils had been left during the 1999 investigation. A total of 1,932 cubic yards was excavated from beneath roads.

- **July 2004**: Report of Remedial Action Alternatives for Petroleum-Impacted Soil and Groundwater," prepared by SECOR for BIA.

- **2004 (September) – 2005 (June)** – SECOR conducted four quarterly groundwater monitoring events for the 17 monitoring wells.

  - The June 2005 analytical data indicated the groundwater in the area encompassing wells MW-6, MW-8, MW-11, and MW-13 continued to have TPHg concentrations ranging from 0.54 to 2.0 mg/L and TPHd concentrations from 1.3 to 67 mg/L. TCE was first detected in MW-10 during the September 2002 sampling event. The observed TCE concentration has remained relatively stable, ranging from 1.2 to 1.6 ug/L over the four quarterly monitoring events.

  - SECOR approximated the extent of the TPH contaminated soil that had not been excavated during the 1999 and 2002 excavations. TPH-impacted soil remains in the ground in the area between "L" and "N" Streets and wells MW-13 and MW-16 along utility corridors, beyond the street right-of-ways and throughout the soil/water interface (capillary fringe). Soil in the vicinity of MW-10 on the east and west sides of Highway 225 is impacted with TPHd.

- SECOR Recommended additional groundwater monitoring and additional soil borings and monitoring wells be installed to further delineate the extent of the TPH impacts to soil and groundwater.

- **July 2005**: Groundwater Monitoring Results, Final Report, prepared by Secor.
- **November 2005**: "Work Plan, Pilot Testing Presumptive Remediation Technologies," prepared by SECOR for BIA.
- **2007 (January)** The US Environmental Protection Agency (USEPA) confirmed in a letter dated January 17, 2007, that the shallow injection well located in the shop yard was permanently abandoned.
- **2008 (August – September)** The BIA contracted Stantec (Formerly SECOR) to abandon five monitoring wells (MW-4, MW-5, MW-16, MW-17 and MW-18), and three municipal wells (Well #1, Well #2, and Well #3), to install 13 monitoring wells (MW-5R and MW-19 through MW-30), and to monitor the new and existing well for a one year period. Samples were analyzed for TPHg, TPHd, benzene, toluene, ethylbenzene, and total xylenes (BTEX), and naphthalene. MW-10 was also analyzed for TCE.
- **2009 (December)**: The Stantec report to BIA titled "Summary Report, Well Installation, Abandonment and Monitoring Activities" presents information on abandonment of the supply wells 1-3 in place.
-
- **2009-** Stantec recommended that remedial objectives be established, including threshold remedial action goals for criteria contaminants, followed by the development and implementation of a remedial Work Plan and continued monitoring to evaluate the effectiveness of remedial activities.
- **2013 (April)-** BIA contracted Doughtery Sprague Environmental (DSE) to perform the latest groundwater monitoring event, sampling and analyzing groundwater from each of the existing monitoring wells. DSE collected samples from a total of twenty-three (23) monitoring wells, and reported that areas of groundwater contamination were relatively localized (TPH-DRO being the exception), and that only benzene was detected above the Regional Screening Level (RSL) in monitor well MW-24. TCE was not detected in any of the samples, but according to the laboratory analytical report, TCE was not analyzed during this sampling event. Each sample was analyzed for BTEX, TCE, Dinoseb, gasoline and diesel range organics.
- **January, 2016 –** BIA awarded a Contract to Akana to provide additional services for the investigation and monitoring of petroleum impacts to Trust Resources, provide support

on the status of compliance with the AOC, perform additional characterization of soil and groundwater, perform quarterly groundwater sampling, and develop a remedial design implementation work plan.

- **April 25 -April 29, 2016** - Akana conducted a preliminary groundwater sampling event to determine the current contaminant concentrations and the physical condition of the existing monitoring wells.

- **2016 (May-October) –** Akana completed a review of the contract SOW, submitted a revised SOW to the BIA and Contract Modification No. 1 was approved by the BIA.

- **2016 (November-December) –** Akana revised the Draft Work Plan based on the approved SOW revisions from Contract Modification No. 1 and submitted to the BIA COR for review.

A summary of the historical soil and groundwater data from the various investigations and monitoring events is provided on Tables 1 through 9.

APPENDIX E

TRIBAL 2016 PUBLIC WATER SYSTEM CONSUMER CONFIDENCE REPORT

(7 Pages)

Shoshone-Paiute Tribes of the Duck Valley Reservation

Public Water System Consumer Confidence Report

Prepared by:

Water and Sanitation Department
P.O. Box 219
Owyhee, NV 89832-0219

Contact Person:

Nathan Bacon
Water and Sanitation Department Director
(208) 759-3100, ext. 208

Date:

June 27, 2016

Duck Valley Public Water System
Consumer Confidence Report
Calendar Year 2015

INTRODUCTION

This report was developed by the Shoshone-Paiute Tribal Water & Sanitation Department. The report is about the community drinking water program for the calendar year shown above. The report is required by the Safe Drinking Water Act (SDWA: 1996) and follows the guidelines OF THE U.S. Environmental Protection Agency (USEPA) for report content and distribution.

The report contains information on your source water, the levels of any detected contaminants, and compliance with drinking water rules and regulations. The rationale for the report is that consumers have the right to know what is in their drinking water and where that water comes from. Every community water system that serves at least 15 service connections, serving year round residents, is required to develop and distribute the report.

Water System Information

The community water supply serving the towns of Owyhee, Newtown and Thomas Loop are under the supervision of the Shoshone-Paiute Tribes Water and Sanitation Department ("Department"). The Department is directed by Nathan Bacon and operator Murray Sope who can be reached at (208) 759-3100, ext. 208. Mr. Bacon is available to answer any questions regarding this report.

No public participation activities are incorporated into the Department. No non-English speaking person/s are known to live in the community. Native American members of the community are primarily bi-lingual with English as the second language amongst the older generation and Shoshone or Paiute as the second language amongst the majority of the younger population.

Sources of Water

The Duck Valley Community System is served by two separate water supplies: the Owyhee Well # 3 (feeding the town of Owyhee and along Hwy. 225 to the Rodeo Ground turn) with Owyhee Well #2 as a backup, and Newtown Well #1 and Well #3 (feeding the Newtown area, Thomas Loop and Hwy. 51) with Newtown Well #2 as backup. See Map for well locations.

Each system operates separately; however, a solenoid valve can be opened to provide water to the Newtown system from the Owyhee system.

In summary, the Owyhee system begins at the south end of town and ends at the rodeo grounds. The Newtown system begins at the rodeo grounds turn-off and ends at the Thomas Loop Sub-Division. Pumps bring the water out of the ground, which is then stored in water tanks for later distribution. Water is distributed under pressure through a distribution system network of buried pipes. Smaller pipes, called service lines, are attached to the main lines to bring water to your house. In our community system, water pressure is provided by pumping water into a storage tank at elevations that are higher than the homes. The force of gravity "pushes" the water into your home and is readily available at the tap. In the future, meters will be used to measure usage on your service line for more accurate billing.

Definitions

This report makes use of certain terms that are difficult to understand without an explanation. Therefore, the following definitions may assist you in understanding the report.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCL's are set closest to the MCLG as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there are no known or expected risk to health. MCLG's allow a margin of safety.

Maximum Detection Limit (MDL): The level at which the analytical laboratory will report a contaminant in drinking water.

Non-Detection or Non-Detects (ND): Laboratory analysis that indicates that a constituent is not present.

Parts per million (ppm) and milligrams per liter (mg/L): one part per million corresponds to a minute in two years or a single penny in $10,000.

Parts per billion or micrograms per liter (mg/L): One part per liter corresponds to one minute in 2,000 years, or a single penny in $10,000,000.

Parts per trillion or nanograms per liter (nanograms/L): One part per trillion corresponds to one minute in 2,000,000 years or a single penny in $10,000,000,000.

Picocuries per liter (pCi/L): Picocuries per liter is a measure of radioactivity in water.

Millorems per year (mrem/yr): Measures of radioactivity absorbed by the body.

Million fibers per liter (MLF): Measures the presence of asbestos fibers that are longer that 10 micrometers.

Nephelometric Turbidity Units (NTU): This is a measurement of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Regulatory Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

Treatment technique (TT): A required process to reduce the level of a contaminant in drinking water.

Action Level: The concentration of a contaminant which, if exceeded, triggers treatment of other requirements that a water supply must follow.

Variances or Exemptions: EPA permission not to meet an MCL, a treatment technique, or a reporting requirement under certain conditions.

DETECTED CONTAMINANTS

No harmful contaminants were detected in the water sampled from the Newtown drinking water wells. The test results from the three water wells shows that ***the Owyhee Community Water System is of clean, excellent water quality.***

Drinking water samples taken from the community supplies and analyzed by a certified laboratory indicate that contaminants were not detected in the water supply. The table that follows this report reveals the contaminants that were analyzed throughout year 2009.

What about contamination for Rio Tinto and BIA contaminated groundwater in the town of Owyhee?

No contamination associated with Rio Tinto or the former BIA groundwater contamination was found in the water quality tests. It is noted that hydrocarbons, including gasoline and heating oil, contaminated groundwater in the Town of Owyhee. The contamination forced the closure of one well in the town of Owyhee. This well is no longer used. The wells on the Map do not show any levels of contamination.

The Bureau of Indian Affairs has cleaned-up much of the contamination in the town of Owyhee. More clean-up work will be occurring in the following years. ***Monitoring performed by the program ensures that no harmful contaminants are in the water supply.***

In addition to contaminants that may have come from the abovementioned sources, the Water and Sanitation Department monitors for other contaminants. We are required to monitor for microbial contaminants like coliform, E. coli, and Cryptosporidium on a monthly basis. The table at the end of the report illustrates the sampling frequency for potential contaminants.

WATER QUALITY DATA TABLE

The table at the end of the report lists all of the drinking water contaminants that we sampled during the calendar year. ***The presence of contaminants in the drinking water was below the MCL Level and is reported as ND in the table***. The presence of contaminants in the water does not necessarily indicate that the water poses a health threat.

USEPA does not require us to monitor for certain contaminants less than once per year because the concentration of the contaminants do not change frequently.

Why Contaminants are in Drinking Water?

No harmful contaminants were detected in the water sampled from the drinking water wells.

Drinking water, including bottled water purchased at the store, may reasonably be expected to contain at least small amounts of contaminants. ***The presence of contaminants does not necessarily indicate that water poses a health risk***. More information about contaminants and potential health risks can be obtained by calling the USEPA Safe Drinking Water Hotlines (1-800-426-4791).

The sources of drinking water (both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the earth, or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activities.

Some people may be more sensitive to contaminants in drinking water than the general population. Immuno-comprimised persons, such as persons with cancer undergoing chemotherapy, persons who have had an organ transplant, persons with HIV/AIDS, or other immune system disorders, some elderly, and infants can be particularly at risk from infections. ***These people should seek the advice of health care provides about drinking the water.*** EPA/CDC guidelines on appropriate means to lessen the risk of infections by microbial contaminants, including *Cryptosporidium*, are available from the Safe Drinking Water Hotline (1-800-426-4791).

Contaminants that can be present in water sources include:

- Microbial contaminants, such as viruses and bacteria that may have come fro treatment plants, septic systems, agricultural livestock operations, and wildlife.

- Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

- Organic chemical constituents, including synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

- Radioactive contaminants can be naturally occurring or the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of certain contaminants provided through public water supplies. The Food and Drug Administration (FDA) also establishes regulations that limit contaminants in bottled water, which must provide the same protections for public health.

A detected contaminant is any contaminant detected at or above the MCL. The table at the end of this report is provided to reflect if, or if not, that contaminants have been detected in your drinking water. ***The table also indicates that contaminants have not been detected in any levels at or above the MDL***.

OTHER RELEVANT INFORMATION

The following information may be helpful to you to get in touch with the USEPA.

USEPA Hotline Telephone Number:

1-800-426-4791

USEPA Drinking Water Website:

www.epa.gov/safewater/

SHOSHONE-PAIUTE TRIBES OF THE DUCK VALLEY RESERVATION

WATER & SANITATION PROGRAM
CONSUMER CONFIDENCE REPORT
Calendar Year 2015

SUBSTANCE	MCLG	MCL	MDL	Sampling Frequency	Level Detected (ug/L) Owyhee Well #3	Newtown Well #2	Owyhee Well #2	Sampling Period	Comments
Microbiological Contaminants									
Total coliform (ppm)	0	5%	0	Monthly	ND	ND	ND	2015	See Attached
E Coli (ppm)	0	5%	0	Monthly	ND	ND	ND	2015	
Water Clarity									
Turbidity	n/a	TT	n/a	TT	ND	ND	ND	2015	
Radioactive Contaminants									
Betaphoton Emitters	0	4	0	As Required	NS	NS	NS	2015	
Alpha Emitters (pCi/L)		15	0	As Required	2.69+/-1.07	0.64+/-0.42	ND	2015	
Combined Radium (pCi/L)	0	5	0	As Required	1.10+/-0.59	ND	ND	2015	
Inorganic Contaminants									
Antimony (ppb)	6	6	5	As Required	NS	NS	NS	2015	
Arsenic (ppb)	-	50	3	As Required	NS	NS	NS	2015	
Barium (ppb)	2,000	2,000	50	As Required	NS	NS	NS	2015	
Beryllium (ppb)	4	4	0.5	As Required	NS	NS	NS	2015	
Cadmium (ppb)	5	5	0.5	As Required	NS	NS	NS	2015	
Chromium (ppb)	100	100	2	As Required	NS	NS	NS	2015	
Copper (ppm)	1,300	Al=1300	1,000	As Required	NS	NS	NS	2015	
Cyanide (ppb)	200	200	200	As Required	NS	NS	NS	2015	
Fluoride (ppb)	4,000	4,000	100	As Required	0.19	NS	NS	2015	
Mercury (ppb)	2	2	0.2	As Required	NS	NS	NS	2015	
Nickel (ppb)	UR	UR	20	As Required	NS	NS	NS	2015	
Nitrate (ppb)	10,000	10,000	200	As Required	0.2	0.8	0.3	2015	
Nitrite (ppb)	1,000	1,000	1	As Required	NS	NS	NS	2015	
Selenium (ppb)	50	50	5	As Required	NS	NS	NS	2015	
Sodium (ppb)	N/A	N/A	100	As Required	NS	NS	NS	2015	
Thallium (ppb)	0.5	2	2	As Required	NS	NS	NS	2015	
Synthetic Organic Compounds									
2,4-D (ppb)	70	70	0.14	As Required	NS	NS	NS	2015	
2,4,5-TP (silvex) (ppb)				As Required	NS	NS	NS	2015	
Dalapon (ppb)	200	200	0.11	As Required	NS	NS	NS	2015	
Dicamba	UR	UR	0.2	As Required	NS	NS	NS	2015	
Dinaseb (ppb)	7	7	0.2	As Required	NS	NS	NS	2015	
Pentachlrophenol (ppb)	0	1	0.05	As Required	NS	NS	NS	2015	
Picloram (ppb)	500	500	0.17	As Required	NS	NS	NS	2015	
Glyphospahte (ppb)	700	700	9.2	As Required	NS	NS	NS	2015	
Diquat (ppb)	20	20	0.6	As Required	NS	NS	NS	2015	
Aldrine	UR	UR	0.2	As Required	NS	NS	NS	2015	
Chlorodane (ppb)	0	2	0.1	As Required	NS	NS	NS	2015	
Dieldrin (ppb)	UR	UR	0.02	As Required	NS	NS	NS	2015	
Endrin (ppb)	2	2	0.1	As Required	NS	NS	NS	2015	
Heptochlor (ppt)	0	400	40	As Required	NS	NS	NS	2015	
Heptochlor epoxide (ppt)	0	200	20	As Required	NS	NS	NS	2015	
Lindane (ppt)	200	200		As Required	NS	NS	NS	2015	
Methoxychlor (ppb)	40	40	0.1	As Required	NS	NS	NS	2015	
Polychlorinated biphenyls (ppt)	0	500		As Required	NS	NS	NS	2015	
Volatile Organic Compounds									
Uranium	32,000	32,000	10,000	As Required	2	ND	2	2015	
Vinyl chloride (ppb)	0	2	0.03	As Required	NS	NS	NS	2015	
Benzene (ppb)	0	5	0.03	As Required	NS	NS	NS	2015	
Carbon tetrachloride (ppb)	0	5	0 01	As Required	NS	NS	NS	2015	
Trichlorethylene (ppb)	0	5	0.01	As Required	NS	NS	NS	2015	
para-Dichlorobenzene (ppb)	75	75	0 03	As Required	NS	NS	NS	2015	
1,1-Dichlorobenzene (ppb)				As Required	NS	NS	NS	2015	
1,1,1-Trichloroethane (ppb)	200	200	0.02	As Required	NS	NS	NS	2015	
cis-1,2-Dichloroethylene (ppb)	70	70	0.01	As Required	NS	NS	NS	2015	
o-Dichlorobenzene (ppb)	600	600	0.03	As Required	NS	NS	NS	2015	
Styrene (ppb)	100	100	0 02	As Required	NS	NS	NS	2015	
Tetrachloroethylene (ppb)	0	5	0.03	As Required	NS	NS	NS	2015	
Toluene (ppm)	1,000	1,000	0.05	As Required	NS	NS	NS	2015	
trans-1,2-Dichloroethelyne (ppb)	100	100		As Required	NS	NS	NS	2015	
Xyienes (Total) (ppb)	10,000	10,000	0.05	As Required	NS	NS	NS	2015	
Dichloromethane (ppb)	0	5	0.05	As Required	NS	NS	NS	2015	
1,2,4-Tnchlorobenzene (ppb)	70	70	0.02	As Required	NS	NS	NS	2015	
1 ,1,2-Trichloroethane (ppb)	200	200	0.04	As Required	NS	NS	NS	2015	

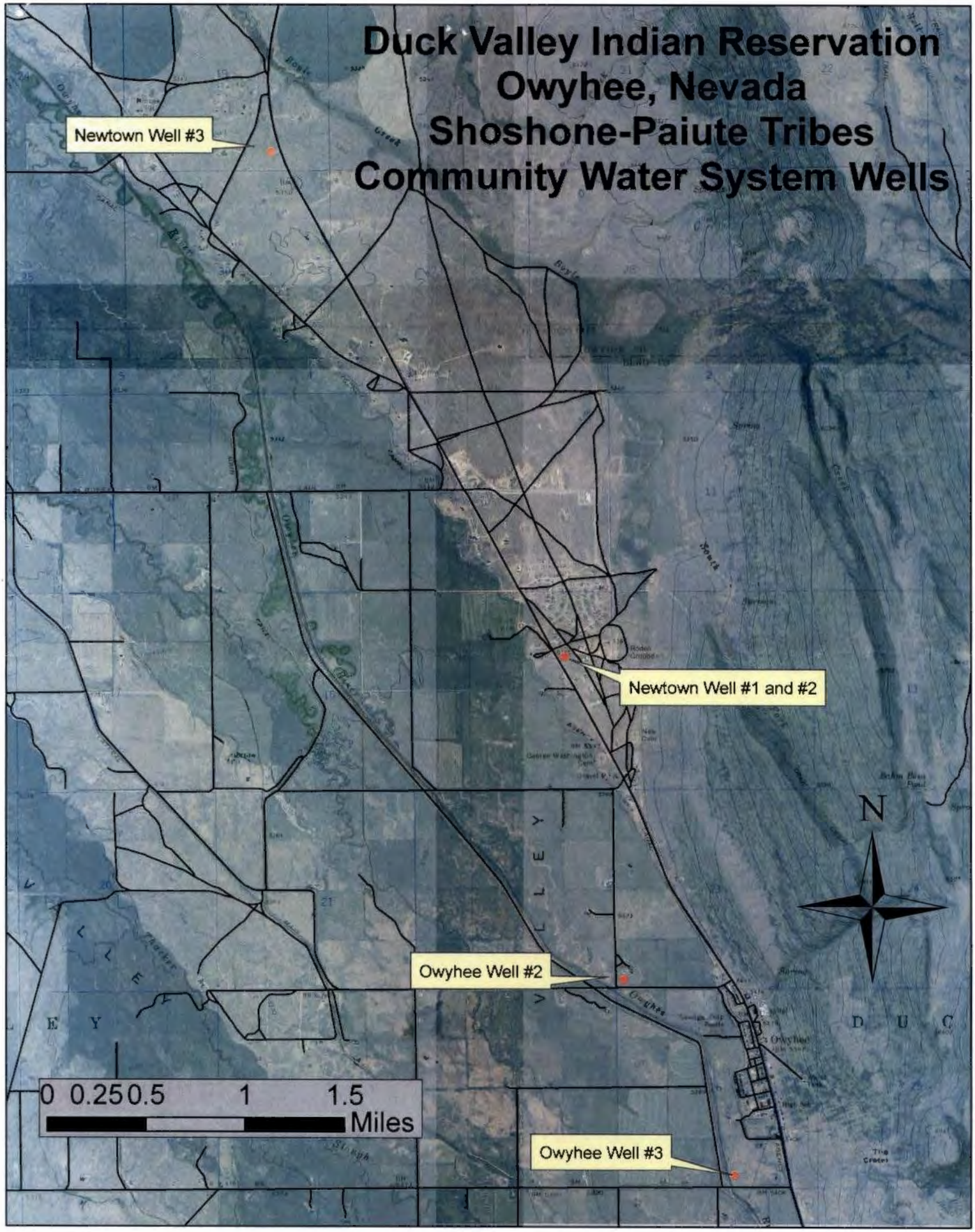
NOTES:

ND = Not Detected - reported concentration of contaminant below detection limit.

NS = Not Sampled - contaminant not sampled.

1. Waivers granted for Nitrite; Required sampling and analysis plan for radionuclides. inorganic chemicals, asbestos distribution system, Pesticides/SOC's/PCB's. Waiver based on EPA determination taking into account that contaminants have not appeared in prior year's sampling.

2. Table prepared following EPA Guidance for preparing Consumer Confidence Reports; and the review of sampled data provided by Tribal Water and Sanitation Department.


Duck Valley Indian Reservation
Owyhee, Nevada
Shoshone-Paiute Tribes
Community Water System Wells
Newtown Well #3
Newtown Well #1 and #2
Owyhee Well #2
Owyhee Well #3
N
0 0.25 0.5 1 1.5
Miles

NEWTOWN WATER
STORAGE TANK

OWYHEE WATER
STORAGE TANK

OWYHEE WATER SYSTEM NO. 2
PUMPHOUSE — RIVER ROAD

OWYHEE WATER SYSTEM NO. 3
PUMPHOUSE — CHINATOWN BRIDGE

NEWTOWN WATER SYSTEM NO. 1 AND 2
PUMPHOUSE — FIRE STATION ROAD

NEWTOWN WATER SYSTEM NO. 3
PUMPHOUSE — THOMAS LOOP

APPENDIX F

APRIL 2016 PRELIMINARY GROUNDWATER SAMPLING EVENT LABORATORY REPORT

(100 Pages)

ANALYTICAL REPORT

May 09, 2016

Akana - Richardson, TX

Sample Delivery Group:	L832663
Samples Received:	04/30/2016
Project Number:	Akana-16-005
Description:	Duck Valley Indian Reservation
Site:	OWYHEE, NV
Report To:	Brent Hamil 1850 N. Greenville Ave. Suite 170 Richardson, TX 75081

Entire Report Reviewed By:

Chris McCord
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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MW-5R L832663-01 GW

Collected by	Collected date/time	Received date/time
	04/27/16 09:05	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/04/16 22:00	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 04:45	05/03/16 04:45	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 01:42	05/06/16 01:42	DAH

MW-6 L832663-02 GW

Collected by	Collected date/time	Received date/time
	04/28/16 10:15	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/04/16 22:17	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 05:07	05/03/16 05:07	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 02:02	05/06/16 02:02	DAH

MW-7 L832663-03 GW

Collected by	Collected date/time	Received date/time
	04/27/16 12:40	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/04/16 22:33	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 05:29	05/03/16 05:29	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 02:22	05/06/16 02:22	DAH

MW-8 L832663-04 GW

Collected by	Collected date/time	Received date/time
	04/28/16 09:30	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/04/16 22:50	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 05:51	05/03/16 05:51	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 02:43	05/06/16 02:43	DAH

MW-9 L832663-05 GW

Collected by	Collected date/time	Received date/time
	04/28/16 08:40	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/04/16 23:07	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 06:13	05/03/16 06:13	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 03:03	05/06/16 03:03	DAH

MW-10 L832663-06 GW

Collected by	Collected date/time	Received date/time
	04/27/16 14:20	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/04/16 23:24	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 06:35	05/03/16 06:35	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 03:24	05/06/16 03:24	DAH

MW-11 L832663-07 GW

Collected by	Collected date/time	Received date/time
	04/28/16 10:50	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	2	05/03/16 22:13	05/04/16 23:40	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 06:58	05/03/16 06:58	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 03:44	05/06/16 03:44	DAH

MW-12 L832663-08 GW

Collected by	Collected date/time	Received date/time
	04/27/16 08:10	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/04/16 23:57	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 07:20	05/03/16 07:20	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 04:04	05/06/16 04:04	DAH

MW-14 L832663-09 GW

Collected by	Collected date/time	Received date/time
	04/27/16 15:40	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 00:13	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 07:42	05/03/16 07:42	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 04:25	05/06/16 04:25	DAH

MW-15 L832663-10 GW

Collected by	Collected date/time	Received date/time
	04/27/16 10:00	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 00:30	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 08:04	05/03/16 08:04	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 04:45	05/06/16 04:45	DAH

MW-19 L832663-11 GW

Collected by	Collected date/time	Received date/time
	04/27/16 13:35	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 01:53	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 08:26	05/03/16 08:26	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 05:05	05/06/16 05:05	DAH

MW-20 L832663-12 GW

Collected by	Collected date/time	Received date/time
	04/27/16 15:05	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 02:10	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 08:49	05/03/16 08:49	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 05:26	05/06/16 05:26	DAH

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

MW-21 L832663-13 GW

Collected by	Collected date/time	Received date/time
	04/27/16 10:50	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 02:27	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 09:11	05/03/16 09:11	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 05:46	05/06/16 05:46	DAH

MW-22 L832663-14 GW

Collected by	Collected date/time	Received date/time
	04/28/16 11:40	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 02:43	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 09:33	05/03/16 09:33	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 06:06	05/06/16 06:06	DAH

MW-23 L832663-15 GW

Collected by	Collected date/time	Received date/time
	04/28/16 13:05	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 03:00	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869050	1	05/03/16 09:55	05/03/16 09:55	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 06:27	05/06/16 06:27	DAH

MW-24 L832663-16 GW

Collected by	Collected date/time	Received date/time
	04/28/16 13:55	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	5	05/03/16 22:13	05/05/16 21:58	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869052	1	05/02/16 14:02	05/02/16 14:02	JHH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 06:47	05/06/16 06:47	DAH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG870646	5	05/07/16 04:11	05/07/16 04:11	BMB

MW-25 L832663-17 GW

Collected by	Collected date/time	Received date/time
	04/27/16 11:35	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 03:33	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869052	1	05/02/16 15:31	05/02/16 15:31	JHH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 07:08	05/06/16 07:08	DAH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG870646	1	05/07/16 04:32	05/07/16 04:32	BMB

MW-26 L832663-18 GW

Collected by	Collected date/time	Received date/time
	04/27/16 18:05	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 03:50	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869052	1	05/02/16 15:53	05/02/16 15:53	JHH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 07:28	05/06/16 07:28	DAH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG870646	1	05/07/16 04:52	05/07/16 04:52	BMB

MW-27 L832663-19 GW

Collected by	Collected date/time	Received date/time
	04/27/16 17:25	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 04:07	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869052	1	05/02/16 16:15	05/02/16 16:15	JHH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 07:49	05/06/16 07:49	DAH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG870646	1	05/07/16 05:13	05/07/16 05:13	BMB

MW-28 L832663-20 GW

Collected by	Collected date/time	Received date/time
	04/28/16 12:25	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869612	1	05/03/16 22:13	05/05/16 04:23	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869052	1	05/02/16 16:37	05/02/16 16:37	JHH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869006	1	05/06/16 08:09	05/06/16 08:09	DAH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG870646	1	05/07/16 05:33	05/07/16 05:33	BMB

MW-29 L832663-21 GW

Collected by	Collected date/time	Received date/time
	04/27/16 16:40	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869249	1	05/02/16 21:06	05/03/16 21:04	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869052	1	05/02/16 16:59	05/02/16 16:59	JHH
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869009	1	05/05/16 22:33	05/05/16 22:33	ACG

MW-13 L832663-22 GW

Collected by	Collected date/time	Received date/time
	04/28/16 15:00	04/30/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method 3511/8015	WG869249	1	05/02/16 21:06	05/03/16 21:20	JNS
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG869702	1	05/04/16 18:26	05/04/16 18:26	BMB
Volatile Organic Compounds (GC/MS) by Method 8260B	WG869431	1	05/06/16 06:55	05/06/16 06:55	JHH

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris McCord
Technical Service Representative

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 04:45	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*97.4*				*62.0-128*		*05/03/2016 04:45*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 01:42	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 01:42	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 01:42	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 01:42	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 01:42	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 01:42	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 01:42	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 01:42	WG869006
2-Chloroethyl vinyl ether	U	J6	0.00301	0.0500	0.0500	1	05/06/2016 01:42	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 01:42	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 01:42	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 01:42	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 01:42	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 01:42	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 01:42	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 01:42	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 01:42	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 01:42	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 01:42	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 01:42	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 01:42	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 01:42	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 01:42	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 01:42	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 01:42	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 01:42	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 01:42	WG869006
1,2,3-Trichlorobenzene	0.000360	J	0.000230	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 01:42	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 01:42	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 01:42	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 01:42	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 01:42	WG869006
(S) Toluene-d8	*100*				*90.0-115*		*05/06/2016 01:42*	WG869006
(S) Dibromofluoromethane	*99.6*				*79.0-121*		*05/06/2016 01:42*	WG869006
(S) 4-Bromofluorobenzene	*88.2*				*80.1-120*		*05/06/2016 01:42*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.0472	J	0.0247	0.100	0.100	1	05/04/2016 22:00	WG869612
(S) o-Terphenyl	*101*				*50.0-150*		*05/04/2016 22:00*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 05:07	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*97.7*				*62.0-128*		*05/03/2016 05:07*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 02:02	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 02:02	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 02:02	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 02:02	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 02:02	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 02:02	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 02:02	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 02:02	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 02:02	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 02:02	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 02:02	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 02:02	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 02:02	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 02:02	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 02:02	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 02:02	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 02:02	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 02:02	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 02:02	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 02:02	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 02:02	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 02:02	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 02:02	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 02:02	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 02:02	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 02:02	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 02:02	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 02:02	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 02:02	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 02:02	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 02:02	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 02:02	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/06/2016 02:02*	WG869006
(S) Dibromofluoromethane	*99.0*				*79.0-121*		*05/06/2016 02:02*	WG869006
(S) 4-Bromofluorobenzene	*86.9*				*80.1-120*		*05/06/2016 02:02*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.232		0.0247	0.100	0.100	1	05/04/2016 22:17	WG869612
(S) o-Terphenyl	*100*				*50.0-150*		*05/04/2016 22:17*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 05:29	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*97.8*				*62.0-128*		*05/03/2016 05:29*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 02:22	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 02:22	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 02:22	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 02:22	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 02:22	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 02:22	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 02:22	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 02:22	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 02:22	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 02:22	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 02:22	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 02:22	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 02:22	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 02:22	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 02:22	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 02:22	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 02:22	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 02:22	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 02:22	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 02:22	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 02:22	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 02:22	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 02:22	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 02:22	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 02:22	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 02:22	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 02:22	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 02:22	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 02:22	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 02:22	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 02:22	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 02:22	WG869006
(S) Toluene-d8	*100*				*90.0-115*		*05/06/2016 02:22*	WG869006
(S) Dibromofluoromethane	*99.3*				*79.0-121*		*05/06/2016 02:22*	WG869006
(S) 4-Bromofluorobenzene	*86.8*				*80.1-120*		*05/06/2016 02:22*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.120		0.0247	0.100	0.100	1	05/04/2016 22:33	WG869612
(S) o-Terphenyl	*99.4*				*50.0-150*		*05/04/2016 22:33*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 05:51	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*97.7*				*62.0-128*		*05/03/2016 05:51*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 02:43	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 02:43	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 02:43	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 02:43	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 02:43	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 02:43	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 02:43	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 02:43	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 02:43	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 02:43	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 02:43	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 02:43	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 02:43	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 02:43	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 02:43	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 02:43	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 02:43	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 02:43	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 02:43	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 02:43	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 02:43	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 02:43	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 02:43	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 02:43	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 02:43	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 02:43	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 02:43	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 02:43	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 02:43	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 02:43	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 02:43	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 02:43	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/06/2016 02:43*	WG869006
(S) Dibromofluoromethane	*101*				*79.0-121*		*05/06/2016 02:43*	WG869006
(S) 4-Bromofluorobenzene	*87.5*				*80.1-120*		*05/06/2016 02:43*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.123		0.0247	0.100	0.100	1	05/04/2016 22:50	WG869612
(S) o-Terphenyl	*98.8*				*50.0-150*		*05/04/2016 22:50*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 06:13	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*97.7*				*62.0-128*		*05/03/2016 06:13*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 03:03	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 03:03	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 03:03	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 03:03	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 03:03	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 03:03	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 03:03	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 03:03	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 03:03	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 03:03	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 03:03	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 03:03	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 03:03	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 03:03	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 03:03	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 03:03	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 03:03	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 03:03	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 03:03	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 03:03	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 03:03	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 03:03	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 03:03	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 03:03	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 03:03	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 03:03	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 03:03	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 03:03	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 03:03	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 03:03	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 03:03	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 03:03	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/06/2016 03:03*	WG869006
(S) Dibromofluoromethane	*98.9*				*79.0-121*		*05/06/2016 03:03*	WG869006
(S) 4-Bromofluorobenzene	*89.2*				*80.1-120*		*05/06/2016 03:03*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	4.10		0.0247	0.100	0.100	1	05/04/2016 23:07	WG869612
(S) o-Terphenyl	*104*				*50.0-150*		*05/04/2016 23:07*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 06:35	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*97.6*				*62.0-128*		*05/03/2016 06:35*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 03:24	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 03:24	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 03:24	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 03:24	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 03:24	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 03:24	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 03:24	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 03:24	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 03:24	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 03:24	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 03:24	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 03:24	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 03:24	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 03:24	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 03:24	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 03:24	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 03:24	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 03:24	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 03:24	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 03:24	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 03:24	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 03:24	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 03:24	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 03:24	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 03:24	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 03:24	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 03:24	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Trichloroethene	0.000989	J	0.000398	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 03:24	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 03:24	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 03:24	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 03:24	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 03:24	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/06/2016 03:24*	WG869006
(S) Dibromofluoromethane	*100*				*79.0-121*		*05/06/2016 03:24*	WG869006
(S) 4-Bromofluorobenzene	*87.8*				*80.1-120*		*05/06/2016 03:24*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.426		0.0247	0.100	0.100	1	05/04/2016 23:24	WG869612
(S) o-Terphenyl	*100*				*50.0-150*		*05/04/2016 23:24*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.0761	J	0.0314	0.100	0.100	1	05/03/2016 06:58	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*97.1*				*62.0-128*		*05/03/2016 06:58*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 03:44	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 03:44	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 03:44	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 03:44	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 03:44	WG869006
n-Butylbenzene	0.000421	J	0.000361	0.00100	0.00100	1	05/06/2016 03:44	WG869006
sec-Butylbenzene	0.00168		0.000365	0.00100	0.00100	1	05/06/2016 03:44	WG869006
tert-Butylbenzene	0.000532	J	0.000399	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 03:44	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 03:44	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 03:44	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 03:44	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 03:44	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 03:44	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 03:44	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 03:44	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 03:44	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 03:44	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 03:44	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 03:44	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 03:44	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 03:44	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 03:44	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 03:44	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 03:44	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 03:44	WG869006
n-Propylbenzene	0.000463	J	0.000349	0.00100	0.00100	1	05/06/2016 03:44	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 03:44	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 03:44	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 03:44	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 03:44	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 03:44	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 03:44	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/06/2016 03:44*	WG869006
(S) Dibromofluoromethane	*101*				*79.0-121*		*05/06/2016 03:44*	WG869006
(S) 4-Bromofluorobenzene	*89.7*				*80.1-120*		*05/06/2016 03:44*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	7.31		0.0494	0.100	0.200	2	05/04/2016 23:40	WG869612
(S) o-Terphenyl	*84.8*				*50.0-150*		*05/04/2016 23:40*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 07:20	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*98.1*				*62.0-128*		*05/03/2016 07:20*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 04:04	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 04:04	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 04:04	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 04:04	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 04:04	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 04:04	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 04:04	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 04:04	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 04:04	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 04:04	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 04:04	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 04:04	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 04:04	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 04:04	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 04:04	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 04:04	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 04:04	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 04:04	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 04:04	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 04:04	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 04:04	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 04:04	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 04:04	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 04:04	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 04:04	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 04:04	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 04:04	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 04:04	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 04:04	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 04:04	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 04:04	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 04:04	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/06/2016 04:04*	WG869006
(S) Dibromofluoromethane	*99.2*				*79.0-121*		*05/06/2016 04:04*	WG869006
(S) 4-Bromofluorobenzene	*87.1*				*80.1-120*		*05/06/2016 04:04*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.0928	J	0.0247	0.100	0.100	1	05/04/2016 23:57	WG869612
(S) o-Terphenyl	*95.9*				*50.0-150*		*05/04/2016 23:57*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 07:42	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*98.0*				*62.0-128*		*05/03/2016 07:42*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 04:25	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 04:25	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 04:25	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 04:25	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 04:25	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 04:25	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 04:25	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 04:25	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 04:25	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 04:25	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 04:25	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 04:25	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 04:25	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 04:25	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 04:25	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 04:25	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 04:25	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 04:25	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 04:25	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 04:25	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 04:25	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 04:25	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 04:25	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 04:25	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 04:25	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 04:25	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 04:25	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 04:25	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 04:25	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 04:25	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 04:25	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 04:25	WG869006
(S) Toluene-d8	*100*				*90.0-115*		*05/06/2016 04:25*	WG869006
(S) Dibromofluoromethane	*99.0*				*79.0-121*		*05/06/2016 04:25*	WG869006
(S) 4-Bromofluorobenzene	*85.7*				*80.1-120*		*05/06/2016 04:25*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.0405	J	0.0247	0.100	0.100	1	05/05/2016 00:13	WG869612
(S) o-Terphenyl	*95.3*				*50.0-150*		*05/05/2016 00:13*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 08:04	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*98.0*				*62.0-128*		*05/03/2016 08:04*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 04:45	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 04:45	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 04:45	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 04:45	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 04:45	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 04:45	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 04:45	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 04:45	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 04:45	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 04:45	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 04:45	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 04:45	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 04:45	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 04:45	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 04:45	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 04:45	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 04:45	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 04:45	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 04:45	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 04:45	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 04:45	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 04:45	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 04:45	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 04:45	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 04:45	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 04:45	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 04:45	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 04:45	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 04:45	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 04:45	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 04:45	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 04:45	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/06/2016 04:45*	WG869006
(S) Dibromofluoromethane	*98.5*				*79.0-121*		*05/06/2016 04:45*	WG869006
(S) 4-Bromofluorobenzene	*86.1*				*80.1-120*		*05/06/2016 04:45*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	U		0.0247	0.100	0.100	1	05/05/2016 00:30	WG869612
(S) o-Terphenyl	*97.3*				*50.0-150*		*05/05/2016 00:30*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.466		0.0314	0.100	0.100	1	05/03/2016 08:26	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*99.0*				*62.0-128*		*05/03/2016 08:26*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 05:05	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 05:05	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 05:05	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 05:05	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 05:05	WG869006
n-Butylbenzene	0.00116		0.000361	0.00100	0.00100	1	05/06/2016 05:05	WG869006
sec-Butylbenzene	0.000885	J	0.000365	0.00100	0.00100	1	05/06/2016 05:05	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 05:05	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 05:05	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 05:05	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 05:05	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 05:05	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 05:05	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 05:05	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 05:05	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 05:05	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 05:05	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 05:05	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 05:05	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 05:05	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 05:05	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 05:05	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 05:05	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 05:05	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 05:05	WG869006
n-Propylbenzene	0.000351	J	0.000349	0.00100	0.00100	1	05/06/2016 05:05	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 05:05	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 05:05	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 05:05	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 05:05	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 05:05	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 05:05	WG869006
(S) Toluene-d8	*99.7*				*90.0-115*		*05/06/2016 05:05*	WG869006
(S) Dibromofluoromethane	*101*				*79.0-121*		*05/06/2016 05:05*	WG869006
(S) 4-Bromofluorobenzene	*85.4*				*80.1-120*		*05/06/2016 05:05*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.184		0.0247	0.100	0.100	1	05/05/2016 01:53	WG869612
(S) o-Terphenyl	*96.4*				*50.0-150*		*05/05/2016 01:53*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 08:49	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*97.6*				*62.0-128*		*05/03/2016 08:49*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 05:26	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 05:26	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 05:26	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 05:26	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 05:26	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 05:26	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 05:26	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 05:26	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 05:26	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 05:26	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 05:26	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 05:26	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 05:26	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 05:26	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 05:26	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 05:26	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 05:26	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 05:26	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 05:26	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 05:26	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 05:26	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 05:26	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 05:26	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 05:26	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 05:26	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 05:26	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 05:26	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 05:26	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 05:26	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 05:26	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 05:26	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 05:26	WG869006
(S) Toluene-d8	*100*				*90.0-115*		*05/06/2016 05:26*	WG869006
(S) Dibromofluoromethane	*101*				*79.0-121*		*05/06/2016 05:26*	WG869006
(S) 4-Bromofluorobenzene	*86.6*				*80.1-120*		*05/06/2016 05:26*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.0590	J	0.0247	0.100	0.100	1	05/05/2016 02:10	WG869612
(S) o-Terphenyl	*95.2*				*50.0-150*		*05/05/2016 02:10*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 09:11	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*97.9*				*62.0-128*		*05/03/2016 09:11*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 05:46	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 05:46	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 05:46	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 05:46	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 05:46	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 05:46	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 05:46	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 05:46	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 05:46	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 05:46	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 05:46	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 05:46	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 05:46	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 05:46	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 05:46	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 05:46	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 05:46	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 05:46	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 05:46	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 05:46	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 05:46	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 05:46	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 05:46	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 05:46	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 05:46	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 05:46	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 05:46	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 05:46	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 05:46	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 05:46	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 05:46	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 05:46	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/06/2016 05:46*	WG869006
(S) Dibromofluoromethane	*100*				*79.0-121*		*05/06/2016 05:46*	WG869006
(S) 4-Bromofluorobenzene	*89.2*				*80.1-120*		*05/06/2016 05:46*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.0582	J	0.0247	0.100	0.100	1	05/05/2016 02:27	WG869612
(S) o-Terphenyl	*95.9*				*50.0-150*		*05/05/2016 02:27*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/03/2016 09:33	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*98.2*				*62.0-128*		*05/03/2016 09:33*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 06:06	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 06:06	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 06:06	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 06:06	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 06:06	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 06:06	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 06:06	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 06:06	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 06:06	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 06:06	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 06:06	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 06:06	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 06:06	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 06:06	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 06:06	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 06:06	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 06:06	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 06:06	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 06:06	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 06:06	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 06:06	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 06:06	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 06:06	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 06:06	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 06:06	WG869006
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 06:06	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 06:06	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 06:06	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 06:06	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 06:06	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 06:06	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 06:06	WG869006
(S) Toluene-d8	*100*				*90.0-115*		*05/06/2016 06:06*	WG869006
(S) Dibromofluoromethane	*97.8*				*79.0-121*		*05/06/2016 06:06*	WG869006
(S) 4-Bromofluorobenzene	*85.3*				*80.1-120*		*05/06/2016 06:06*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	2.39		0.0247	0.100	0.100	1	05/05/2016 02:43	WG869612
(S) o-Terphenyl	*98.9*				*50.0-150*		*05/05/2016 02:43*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.554		0.0314	0.100	0.100	1	05/03/2016 09:55	WG869050
(S) a,a,a-Trifluorotoluene(FID)	*96.5*				*62.0-128*		*05/03/2016 09:55*	WG869050

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 06:27	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 06:27	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 06:27	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 06:27	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 06:27	WG869006
n-Butylbenzene	0.00249		0.000361	0.00100	0.00100	1	05/06/2016 06:27	WG869006
sec-Butylbenzene	0.00503		0.000365	0.00100	0.00100	1	05/06/2016 06:27	WG869006
tert-Butylbenzene	0.00146		0.000399	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 06:27	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 06:27	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 06:27	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 06:27	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 06:27	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 06:27	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 06:27	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 06:27	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 06:27	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 06:27	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 06:27	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 06:27	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Ethylbenzene	0.0117		0.000384	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Isopropylbenzene	0.00732		0.000326	0.00100	0.00100	1	05/06/2016 06:27	WG869006
p-Isopropyltoluene	0.00153		0.000350	0.00100	0.00100	1	05/06/2016 06:27	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 06:27	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 06:27	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 06:27	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Naphthalene	0.0972		0.00100	0.00500	0.00500	1	05/06/2016 06:27	WG869006
n-Propylbenzene	0.0108		0.000349	0.00100	0.00100	1	05/06/2016 06:27	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 06:27	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 06:27	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 06:27	WG869006
1,2,4-Trimethylbenzene	0.105		0.000373	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,2,3-Trimethylbenzene	0.0371		0.000321	0.00100	0.00100	1	05/06/2016 06:27	WG869006
1,3,5-Trimethylbenzene	0.0190		0.000387	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 06:27	WG869006
Xylenes, Total	0.0414		0.00106	0.00300	0.00300	1	05/06/2016 06:27	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/06/2016 06:27*	WG869006
(S) Dibromofluoromethane	*101*				*79.0-121*		*05/06/2016 06:27*	WG869006
(S) 4-Bromofluorobenzene	*88.1*				*80.1-120*		*05/06/2016 06:27*	WG869006

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	5.73		0.0247	0.100	0.100	1	05/05/2016 03:00	WG869612
(S) o-Terphenyl	*104*				*50.0-150*		*05/05/2016 03:00*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.799	J3	0.0314	0.100	0.100	1	05/02/2016 14:02	WG869052
(S) a,a,a-Trifluorotoluene(FID)	*93.1*				*62.0-128*		*05/02/2016 14:02*	WG869052

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 06:47	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 06:47	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 06:47	WG869006
Benzene	0.0247		0.000331	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 06:47	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 06:47	WG869006
n-Butylbenzene	0.00471		0.000361	0.00100	0.00100	1	05/06/2016 06:47	WG869006
sec-Butylbenzene	0.00436		0.000365	0.00100	0.00100	1	05/06/2016 06:47	WG869006
tert-Butylbenzene	0.00130		0.000399	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 06:47	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 06:47	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 06:47	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 06:47	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 06:47	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 06:47	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 06:47	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 06:47	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 06:47	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 06:47	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 06:47	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 06:47	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Ethylbenzene	0.0472		0.000384	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Isopropylbenzene	0.00901		0.000326	0.00100	0.00100	1	05/06/2016 06:47	WG869006
p-Isopropyltoluene	0.00314		0.000350	0.00100	0.00100	1	05/06/2016 06:47	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 06:47	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 06:47	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 06:47	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Naphthalene	0.289		0.00500	0.00500	0.0250	5	05/07/2016 04:11	WG870646
n-Propylbenzene	0.0152		0.000349	0.00100	0.00100	1	05/06/2016 06:47	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Toluene	0.00144	J	0.000780	0.00500	0.00500	1	05/06/2016 06:47	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 06:47	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 06:47	WG869006
1,2,4-Trimethylbenzene	0.186		0.000373	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,2,3-Trimethylbenzene	0.0573		0.000321	0.00100	0.00100	1	05/06/2016 06:47	WG869006
1,3,5-Trimethylbenzene	0.000669	J	0.000387	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 06:47	WG869006
Xylenes, Total	0.130		0.00106	0.00300	0.00300	1	05/06/2016 06:47	WG869006
(S) Toluene-d8	*100*				*90.0-115*		*05/06/2016 06:47*	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/07/2016 04:11*	WG870646
(S) Dibromofluoromethane	*99.6*				*79.0-121*		*05/07/2016 04:11*	WG870646
(S) Dibromofluoromethane	*98.0*				*79.0-121*		*05/06/2016 06:47*	WG869006
(S) 4-Bromofluorobenzene	*87.8*				*80.1-120*		*05/06/2016 06:47*	WG869006
(S) 4-Bromofluorobenzene	*88.5*				*80.1-120*		*05/07/2016 04:11*	WG870646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	9.21		0.124	0.100	0.500	5	05/05/2016 21:58	WG869612
(S) o-Terphenyl	*90.7*				*50.0-150*		*05/05/2016 21:58*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/02/2016 15:31	WG869052
(S) a,a,a-Trifluorotoluene(FID)	*93.0*				*62.0-128*		*05/02/2016 15:31*	WG869052

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 07:08	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 07:08	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 07:08	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 07:08	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 07:08	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 07:08	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 07:08	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 07:08	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 07:08	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 07:08	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 07:08	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 07:08	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 07:08	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 07:08	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 07:08	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 07:08	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 07:08	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 07:08	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 07:08	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 07:08	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 07:08	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 07:08	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 07:08	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 07:08	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Naphthalene	0.00219	J	0.00100	0.00500	0.00500	1	05/07/2016 04:32	WG870646
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 07:08	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 07:08	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 07:08	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 07:08	WG869006
1,2,4-Trimethylbenzene	0.00192		0.000373	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 07:08	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 07:08	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 07:08	WG869006
(S) Toluene-d8	*99.9*				*90.0-115*		*05/06/2016 07:08*	WG869006
(S) Toluene-d8	*100*				*90.0-115*		*05/07/2016 04:32*	WG870646
(S) Dibromofluoromethane	*99.3*				*79.0-121*		*05/07/2016 04:32*	WG870646
(S) Dibromofluoromethane	*99.2*				*79.0-121*		*05/06/2016 07:08*	WG869006
(S) 4-Bromofluorobenzene	*87.1*				*80.1-120*		*05/06/2016 07:08*	WG869006
(S) 4-Bromofluorobenzene	*87.3*				*80.1-120*		*05/07/2016 04:32*	WG870646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.137		0.0247	0.100	0.100	1	05/05/2016 03:33	WG869612
(S) o-Terphenyl	*98.0*				*50.0-150*		*05/05/2016 03:33*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/02/2016 15:53	WG869052
(S) a,a,a-Trifluorotoluene(FID)	*93.3*				*62.0-128*		*05/02/2016 15:53*	WG869052

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 07:28	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 07:28	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 07:28	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 07:28	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 07:28	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 07:28	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 07:28	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 07:28	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 07:28	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 07:28	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 07:28	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 07:28	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 07:28	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 07:28	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 07:28	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 07:28	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 07:28	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 07:28	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 07:28	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 07:28	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 07:28	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 07:28	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 07:28	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 07:28	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/07/2016 04:52	WG870646
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 07:28	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 07:28	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 07:28	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 07:28	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 07:28	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 07:28	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 07:28	WG869006
(S) Toluene-d8	*100*				*90.0-115*		*05/06/2016 07:28*	WG869006
(S) Toluene-d8	*98.7*				*90.0-115*		*05/07/2016 04:52*	WG870646
(S) Dibromofluoromethane	*100*				*79.0-121*		*05/07/2016 04:52*	WG870646
(S) Dibromofluoromethane	*100*				*79.0-121*		*05/06/2016 07:28*	WG869006
(S) 4-Bromofluorobenzene	*88.5*				*80.1-120*		*05/06/2016 07:28*	WG869006
(S) 4-Bromofluorobenzene	*87.9*				*80.1-120*		*05/07/2016 04:52*	WG870646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	1.10		0.0247	0.100	0.100	1	05/05/2016 03:50	WG869612
(S) o-Terphenyl	*99.3*				*50.0-150*		*05/05/2016 03:50*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/02/2016 16:15	WG869052
(S) a,a,a-Trifluorotoluene(FID)	*93.2*				*62.0-128*		*05/02/2016 16:15*	WG869052

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 07:49	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 07:49	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 07:49	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 07:49	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 07:49	WG869006
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 07:49	WG869006
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 07:49	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 07:49	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 07:49	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 07:49	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 07:49	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 07:49	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 07:49	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 07:49	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 07:49	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 07:49	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 07:49	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 07:49	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 07:49	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 07:49	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 07:49	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 07:49	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 07:49	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 07:49	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Naphthalene	U		0.00100	0.00500	0.00500	1	05/07/2016 05:13	WG870646
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 07:49	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 07:49	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 07:49	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 07:49	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 07:49	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 07:49	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 07:49	WG869006
(S) Toluene-d8	*99.7*				*90.0-115*		*05/06/2016 07:49*	WG869006
(S) Toluene-d8	*101*				*90.0-115*		*05/07/2016 05:13*	WG870646
(S) Dibromofluoromethane	*99.1*				*79.0-121*		*05/07/2016 05:13*	WG870646
(S) Dibromofluoromethane	*99.3*				*79.0-121*		*05/06/2016 07:49*	WG869006
(S) 4-Bromofluorobenzene	*88.4*				*80.1-120*		*05/06/2016 07:49*	WG869006
(S) 4-Bromofluorobenzene	*88.7*				*80.1-120*		*05/07/2016 05:13*	WG870646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.0684	J	0.0247	0.100	0.100	1	05/05/2016 04:07	WG869612
(S) o-Terphenyl	*97.3*				*50.0-150*		*05/05/2016 04:07*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	0.0565	J	0.0314	0.100	0.100	1	05/02/2016 16:37	WG869052
(S) a,a,a-Trifluorotoluene(FID)	*93.2*				*62.0-128*		*05/02/2016 16:37*	WG869052

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 08:09	WG869006
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 08:09	WG869006
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 08:09	WG869006
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 08:09	WG869006
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 08:09	WG869006
n-Butylbenzene	0.000498	J	0.000361	0.00100	0.00100	1	05/06/2016 08:09	WG869006
sec-Butylbenzene	0.00114		0.000365	0.00100	0.00100	1	05/06/2016 08:09	WG869006
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 08:09	WG869006
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 08:09	WG869006
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 08:09	WG869006
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 08:09	WG869006
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 08:09	WG869006
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 08:09	WG869006
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/06/2016 08:09	WG869006
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 08:09	WG869006
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 08:09	WG869006
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 08:09	WG869006
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 08:09	WG869006
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 08:09	WG869006
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 08:09	WG869006
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 08:09	WG869006
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 08:09	WG869006
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 08:09	WG869006
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 08:09	WG869006
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Naphthalene	0.00108	J	0.00100	0.00500	0.00500	1	05/07/2016 05:33	WG870646
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 08:09	WG869006

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 08:09	WG869006
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 08:09	WG869006
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 08:09	WG869006
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 08:09	WG869006
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 08:09	WG869006
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 08:09	WG869006
(S) Toluene-d8	*99.7*				*90.0-115*		*05/06/2016 08:09*	WG869006
(S) Toluene-d8	*99.8*				*90.0-115*		*05/07/2016 05:33*	WG870646
(S) Dibromofluoromethane	*100*				*79.0-121*		*05/07/2016 05:33*	WG870646
(S) Dibromofluoromethane	*101*				*79.0-121*		*05/06/2016 08:09*	WG869006
(S) 4-Bromofluorobenzene	*88.0*				*80.1-120*		*05/06/2016 08:09*	WG869006
(S) 4-Bromofluorobenzene	*89.4*				*80.1-120*		*05/07/2016 05:33*	WG870646

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	1.31		0.0247	0.100	0.100	1	05/05/2016 04:23	WG869612
(S) o-Terphenyl	*102*				*50.0-150*		*05/05/2016 04:23*	WG869612

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/02/2016 16:59	WG869052
(S) a,a,a-Trifluorotoluene(FID)	*93.1*				*62.0-128*		*05/02/2016 16:59*	WG869052

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/05/2016 22:33	WG869009
Acrolein	U		0.00887	0.0500	0.0500	1	05/05/2016 22:33	WG869009
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/05/2016 22:33	WG869009
Benzene	U		0.000331	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/05/2016 22:33	WG869009
Bromoform	U		0.000469	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Bromomethane	U		0.000866	0.00500	0.00500	1	05/05/2016 22:33	WG869009
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/05/2016 22:33	WG869009
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/05/2016 22:33	WG869009
tert-Butylbenzene	U		0.000399	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Chloroethane	U		0.000453	0.00500	0.00500	1	05/05/2016 22:33	WG869009
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/05/2016 22:33	WG869009
Chloroform	U		0.000324	0.00500	0.00500	1	05/05/2016 22:33	WG869009
Chloromethane	U		0.000276	0.00250	0.00250	1	05/05/2016 22:33	WG869009
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/05/2016 22:33	WG869009
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/05/2016 22:33	WG869009
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Dichlorodifluoromethane	U		0.000551	0.00500	0.00500	1	05/05/2016 22:33	WG869009
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/05/2016 22:33	WG869009
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/05/2016 22:33	WG869009
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/05/2016 22:33	WG869009
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/05/2016 22:33	WG869009
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/05/2016 22:33	WG869009
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/05/2016 22:33	WG869009
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/05/2016 22:33	WG869009
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/05/2016 22:33	WG869009
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/05/2016 22:33	WG869009
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/05/2016 22:33	WG869009
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Naphthalene	U		0.00100	0.00500	0.00500	1	05/05/2016 22:33	WG869009
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/05/2016 22:33	WG869009

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,1,2,2-Tetrachloroethane	U	J4	0.000130	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Toluene	U		0.000780	0.00500	0.00500	1	05/05/2016 22:33	WG869009
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/05/2016 22:33	WG869009
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/05/2016 22:33	WG869009
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/05/2016 22:33	WG869009
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/05/2016 22:33	WG869009
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/05/2016 22:33	WG869009
(S) Toluene-d8	*103*				*90.0-115*		*05/05/2016 22:33*	WG869009
(S) Dibromofluoromethane	*104*				*79.0-121*		*05/05/2016 22:33*	WG869009
(S) 4-Bromofluorobenzene	*97.6*				*80.1-120*		*05/05/2016 22:33*	WG869009

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	0.129		0.0247	0.100	0.100	1	05/03/2016 21:04	WG869249
(S) o-Terphenyl	*107*				*50.0-150*		*05/03/2016 21:04*	WG869249

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	U		0.0314	0.100	0.100	1	05/04/2016 18:26	WG869702
(S) a,a,a-Trifluorotoluene(FID)	*99.0*				*62.0-128*		*05/04/2016 18:26*	WG869702

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Acetone	U		0.0100	1.00	1.00	1	05/06/2016 06:55	WG869431
Acrolein	U		0.00887	0.0500	0.0500	1	05/06/2016 06:55	WG869431
Acrylonitrile	U		0.00187	0.0100	0.0100	1	05/06/2016 06:55	WG869431
Benzene	U		0.000331	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Bromobenzene	U		0.000352	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Bromodichloromethane	U		0.000380	0.00125	0.00125	1	05/06/2016 06:55	WG869431
Bromoform	U		0.000469	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Bromomethane	U		0.000866	0.00500	0.00500	1	05/06/2016 06:55	WG869431
n-Butylbenzene	U		0.000361	0.00100	0.00100	1	05/06/2016 06:55	WG869431
sec-Butylbenzene	U		0.000365	0.00100	0.00100	1	05/06/2016 06:55	WG869431
tert-Butylbenzene	0.000461	J	0.000399	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Carbon tetrachloride	U		0.000379	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Chlorobenzene	U		0.000348	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Chlorodibromomethane	U		0.000327	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Chloroethane	U		0.000453	0.00500	0.00500	1	05/06/2016 06:55	WG869431
2-Chloroethyl vinyl ether	U		0.00301	0.0500	0.0500	1	05/06/2016 06:55	WG869431
Chloroform	U		0.000324	0.00500	0.00500	1	05/06/2016 06:55	WG869431
Chloromethane	U		0.000276	0.00250	0.00250	1	05/06/2016 06:55	WG869431
2-Chlorotoluene	U		0.000375	0.00100	0.00100	1	05/06/2016 06:55	WG869431
4-Chlorotoluene	U		0.000351	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	0.00500	1	05/06/2016 06:55	WG869431
1,2-Dibromoethane	U		0.000381	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Dibromomethane	U		0.000346	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,2-Dichlorobenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,3-Dichlorobenzene	U		0.000220	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,4-Dichlorobenzene	U		0.000274	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Dichlorodifluoromethane	U	J4	0.000551	0.00500	0.00500	1	05/06/2016 06:55	WG869431
1,1-Dichloroethane	U		0.000259	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,2-Dichloroethane	U		0.000361	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,1-Dichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 06:55	WG869431
cis-1,2-Dichloroethene	U		0.000260	0.00100	0.00100	1	05/06/2016 06:55	WG869431
trans-1,2-Dichloroethene	U		0.000396	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,2-Dichloropropane	U		0.000306	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,1-Dichloropropene	U		0.000352	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,3-Dichloropropane	U		0.000366	0.00100	0.00100	1	05/06/2016 06:55	WG869431
cis-1,3-Dichloropropene	U		0.000418	0.00100	0.00100	1	05/06/2016 06:55	WG869431
trans-1,3-Dichloropropene	U		0.000419	0.00100	0.00100	1	05/06/2016 06:55	WG869431
2,2-Dichloropropane	U		0.000321	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Di-isopropyl ether	U		0.000320	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Ethylbenzene	U		0.000384	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Hexachloro-1,3-butadiene	U		0.000256	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Isopropylbenzene	U		0.000326	0.00100	0.00100	1	05/06/2016 06:55	WG869431
p-Isopropyltoluene	U		0.000350	0.00100	0.00100	1	05/06/2016 06:55	WG869431
2-Butanone (MEK)	U		0.00393	0.0100	0.0100	1	05/06/2016 06:55	WG869431
Methylene Chloride	U		0.00100	0.00500	0.00500	1	05/06/2016 06:55	WG869431
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	0.0100	1	05/06/2016 06:55	WG869431
Methyl tert-butyl ether	U		0.000367	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Naphthalene	U		0.00100	0.00500	0.00500	1	05/06/2016 06:55	WG869431
n-Propylbenzene	U		0.000349	0.00100	0.00100	1	05/06/2016 06:55	WG869431

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
Styrene	U		0.000307	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Tetrachloroethene	U		0.000372	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Toluene	U		0.000780	0.00500	0.00500	1	05/06/2016 06:55	WG869431
1,2,3-Trichlorobenzene	U		0.000230	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,2,4-Trichlorobenzene	U		0.000355	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,1,1-Trichloroethane	U		0.000319	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,1,2-Trichloroethane	U		0.000383	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Trichloroethene	U		0.000398	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Trichlorofluoromethane	U		0.00120	0.00500	0.00500	1	05/06/2016 06:55	WG869431
1,2,3-Trichloropropane	U		0.000807	0.00250	0.00250	1	05/06/2016 06:55	WG869431
1,2,4-Trimethylbenzene	U		0.000373	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,2,3-Trimethylbenzene	U		0.000321	0.00100	0.00100	1	05/06/2016 06:55	WG869431
1,3,5-Trimethylbenzene	U		0.000387	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Vinyl chloride	U		0.000259	0.00100	0.00100	1	05/06/2016 06:55	WG869431
Xylenes, Total	U		0.00106	0.00300	0.00300	1	05/06/2016 06:55	WG869431
(S) Toluene-d8	*107*				*90.0-115*		*05/06/2016 06:55*	WG869431
(S) Dibromofluoromethane	*115*				*79.0-121*		*05/06/2016 06:55*	WG869431
(S) 4-Bromofluorobenzene	*103*				*80.1-120*		*05/06/2016 06:55*	WG869431

Semi-Volatile Organic Compounds (GC) by Method 3511/8015

Analyte	Result mg/l	Qualifier	SDL mg/l	Unadj. MQL mg/l	MQL mg/l	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	1.52		0.0247	0.100	0.100	1	05/03/2016 21:20	WG869249
(S) o-Terphenyl	*115*				*50.0-150*		*05/03/2016 21:20*	WG869249

Method Blank (MB)

(MB) R3133332-3 05/03/16 01:25

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) Low Fraction	U		0.0314	0.100
(S) a,a,a-Trifluorotoluene(FID)	*97.6*			*62.0-128*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3133332-1 05/03/16 00:18 • (LCSD) R3133332-2 05/03/16 00:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	5.67	5.70	103	104	67.0-132			0.400	20
(S) a,a,a-Trifluorotoluene(FID)				*103*	*103*	*62.0-128*				

L832635-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832635-06 05/03/16 02:53 • (MS) R3133332-4 05/03/16 01:47 • (MSD) R3133332-5 05/03/16 02:09

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	ND	4.29	4.33	78.1	78.8	1	50.0-143			0.900	20
(S) a,a,a-Trifluorotoluene(FID)					*101*	*101*		*62.0-128*				

Method Blank (MB)

(MB) R3133644-3 05/02/16 13:10

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) Low Fraction	U		0.0314	0.100
(S) a,a,a-Trifluorotoluene(FID)	*93.0*			*62.0-128*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3133644-1 05/02/16 12:03 • (LCSD) R3133644-2 05/02/16 12:26

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	4.93	5.38	89.7	97.9	67.0-132			8.73	20
(S) a,a,a-Trifluorotoluene(FID)				*102*	*102*	*62.0-128*				

L832663-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832663-16 05/02/16 14:02 • (MS) R3133644-4 05/02/16 14:25 • (MSD) R3133644-5 05/02/16 14:47

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	0.799	5.44	6.82	84.4	109	1	50.0-143		J3	22.4	20
(S) a,a,a-Trifluorotoluene(FID)					*103*	*105*		*62.0-128*				

Method Blank (MB)

(MB) R3133815-4 05/04/16 09:11

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) Low Fraction	U		0.0314	0.100
(S) a,a,a-Trifluorotoluene(FID)	*99.2*			*62.0-128*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3133815-2 05/04/16 08:09 • (LCSD) R3133815-3 05/04/16 08:30

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	5.64	5.83	103	106	67.0-132			3.35	20
(S) a,a,a-Trifluorotoluene(FID)				*98.0*	*99.7*	*62.0-128*				

L832099-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832099-05 05/04/16 11:29 • (MS) R3133815-8 05/04/16 15:18 • (MSD) R3133815-9 05/04/16 15:39

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) Low Fraction	5.50	ND	5.87	7.99	107	145	1	50.0-143		J3 J5	30.6	20
(S) a,a,a-Trifluorotoluene(FID)					*100*	*101*		*62.0-128*				

Method Blank (MB)

(MB) R3134400-3 05/05/16 18:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0100	1.00
Acrolein	U		0.00887	0.0500
Acrylonitrile	U		0.00187	0.0100
Benzene	U		0.000331	0.00100
Bromobenzene	U		0.000352	0.00100
Bromodichloromethane	U		0.000380	0.00125
Bromoform	U		0.000469	0.00100
Bromomethane	U		0.000866	0.00500
n-Butylbenzene	U		0.000361	0.00100
sec-Butylbenzene	U		0.000365	0.00100
tert-Butylbenzene	U		0.000399	0.00100
Carbon tetrachloride	U		0.000379	0.00100
Chlorobenzene	U		0.000348	0.00100
Chlorodibromomethane	U		0.000327	0.00100
Chloroethane	U		0.000453	0.00500
2-Chloroethyl vinyl ether	U		0.00301	0.0500
Chloroform	U		0.000324	0.00500
Chloromethane	U		0.000276	0.00250
2-Chlorotoluene	U		0.000375	0.00100
4-Chlorotoluene	U		0.000351	0.00100
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500
1,2-Dibromoethane	U		0.000381	0.00100
Dibromomethane	U		0.000346	0.00100
1,2-Dichlorobenzene	U		0.000349	0.00100
1,3-Dichlorobenzene	U		0.000220	0.00100
1,4-Dichlorobenzene	U		0.000274	0.00100
Dichlorodifluoromethane	U		0.000551	0.00500
1,1-Dichloroethane	U		0.000259	0.00100
1,2-Dichloroethane	U		0.000361	0.00100
1,1-Dichloroethene	U		0.000398	0.00100
cis-1,2-Dichloroethene	U		0.000260	0.00100
trans-1,2-Dichloroethene	U		0.000396	0.00100
1,2-Dichloropropane	U		0.000306	0.00100
1,1-Dichloropropene	U		0.000352	0.00100
1,3-Dichloropropane	U		0.000366	0.00100
cis-1,3-Dichloropropene	U		0.000418	0.00100

Method Blank (MB)

(MB) R3134400-3 05/05/16 18:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
trans-1,3-Dichloropropene	U		0.000419	0.00100
2,2-Dichloropropane	U		0.000321	0.00100
Di-isopropyl ether	U		0.000320	0.00100
Ethylbenzene	U		0.000384	0.00100
Hexachloro-1,3-butadiene	U		0.000256	0.00100
Isopropylbenzene	U		0.000326	0.00100
p-Isopropyltoluene	U		0.000350	0.00100
2-Butanone (MEK)	U		0.00393	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100
Methyl tert-butyl ether	U		0.000367	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.000349	0.00100
Styrene	U		0.000307	0.00100
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100
Tetrachloroethene	U		0.000372	0.00100
Toluene	U		0.000780	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100
1,2,3-Trichlorobenzene	U		0.000230	0.00100
1,2,4-Trichlorobenzene	U		0.000355	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
1,1,2-Trichloroethane	U		0.000383	0.00100
Trichloroethene	U		0.000398	0.00100
Trichlorofluoromethane	U		0.00120	0.00500
1,2,3-Trichloropropane	U		0.000807	0.00250
1,2,3-Trimethylbenzene	U		0.000321	0.00100
1,2,4-Trimethylbenzene	U		0.000373	0.00100
1,3,5-Trimethylbenzene	U		0.000387	0.00100
Vinyl chloride	U		0.000259	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*102*			*90.0-115*
(S) Dibromofluoromethane	*104*			*79.0-121*
(S) 4-Bromofluorobenzene	*98.8*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134400-1 05/05/16 17:12 • (LCSD) R3134400-2 05/05/16 17:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.0942	0.0987	75.4	79.0	28.7-175			4.68	20.9
Acrolein	0.125	0.108	0.113	86.2	90.6	40.4-172			5.02	20
Acrylonitrile	0.125	0.0985	0.102	78.8	81.9	58.2-145			3.92	20
Benzene	0.0250	0.0213	0.0220	85.0	87.9	73.0-122			3.29	20
Bromobenzene	0.0250	0.0229	0.0235	91.6	93.9	81.5-115			2.52	20
Bromodichloromethane	0.0250	0.0221	0.0217	88.3	86.9	75.5-121			1.56	20
Bromoform	0.0250	0.0208	0.0210	83.2	84.2	71.5-131			1.13	20
Bromomethane	0.0250	0.0294	0.0292	117	117	22.4-187			0.410	20
n-Butylbenzene	0.0250	0.0232	0.0243	92.9	97.3	75.9-134			4.72	20
sec-Butylbenzene	0.0250	0.0213	0.0221	85.1	88.4	80.6-126			3.78	20
tert-Butylbenzene	0.0250	0.0220	0.0225	88.0	89.9	79.3-127			2.16	20
Carbon tetrachloride	0.0250	0.0216	0.0212	86.2	85.0	70.9-129			1.49	20
Chlorobenzene	0.0250	0.0229	0.0231	91.6	92.3	79.7-122			0.690	20
Chlorodibromomethane	0.0250	0.0217	0.0218	86.6	87.2	78.2-124			0.620	20
Chloroethane	0.0250	0.0232	0.0233	92.8	93.2	41.2-153			0.420	20
2-Chloroethyl vinyl ether	0.125	0.0420	0.0460	33.6	36.8	23.4-162			9.02	23.5
Chloroform	0.0250	0.0224	0.0231	89.7	92.6	73.2-125			3.17	20
Chloromethane	0.0250	0.0203	0.0209	81.1	83.7	55.8-134			3.07	20
2-Chlorotoluene	0.0250	0.0226	0.0223	90.6	89.3	76.4-125			1.40	20
4-Chlorotoluene	0.0250	0.0226	0.0229	90.2	91.6	81.5-121			1.54	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0197	0.0204	78.7	81.6	64.8-131			3.66	20
1,2-Dibromoethane	0.0250	0.0225	0.0228	90.0	91.2	79.8-122			1.33	20
Dibromomethane	0.0250	0.0218	0.0214	87.2	85.5	79.5-118			1.90	20
1,2-Dichlorobenzene	0.0250	0.0231	0.0238	92.4	95.0	84.7-118			2.80	20
1,3-Dichlorobenzene	0.0250	0.0216	0.0222	86.5	88.9	77.6-127			2.75	20
1,4-Dichlorobenzene	0.0250	0.0219	0.0226	87.7	90.5	82.2-114			3.10	20
Dichlorodifluoromethane	0.0250	0.0243	0.0251	97.3	100	56.0-134			3.06	20
1,1-Dichloroethane	0.0250	0.0227	0.0232	90.6	92.7	71.7-127			2.30	20
1,2-Dichloroethane	0.0250	0.0240	0.0251	95.9	100	65.3-126			4.54	20
1,1-Dichloroethene	0.0250	0.0237	0.0238	94.6	95.3	59.9-137			0.680	20
cis-1,2-Dichloroethene	0.0250	0.0224	0.0227	89.5	90.9	77.3-122			1.57	20
trans-1,2-Dichloroethene	0.0250	0.0214	0.0222	85.5	88.9	72.6-125			3.90	20
1,2-Dichloropropane	0.0250	0.0209	0.0219	83.8	87.5	77.4-125			4.31	20
1,1-Dichloropropene	0.0250	0.0229	0.0236	91.6	94.4	72.5-127			2.94	20
1,3-Dichloropropane	0.0250	0.0229	0.0233	91.7	93.0	80.6-115			1.40	20
cis-1,3-Dichloropropene	0.0250	0.0221	0.0219	88.3	87.8	77.7-124			0.630	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134400-1 05/05/16 17:12 • (LCSD) R3134400-2 05/05/16 17:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	0.0217	0.0223	86.7	89.2	73.5-127			2.81	20
2,2-Dichloropropane	0.0250	0.0222	0.0228	88.7	91.3	61.3-134			2.91	20
Di-isopropyl ether	0.0250	0.0203	0.0209	81.3	83.7	65.1-135			2.87	20
Ethylbenzene	0.0250	0.0223	0.0229	89.3	91.6	80.9-121			2.61	20
Hexachloro-1,3-butadiene	0.0250	0.0205	0.0222	81.9	88.7	73.7-133			7.92	20
Isopropylbenzene	0.0250	0.0217	0.0224	86.8	89.7	81.6-124			3.21	20
p-Isopropyltoluene	0.0250	0.0218	0.0228	87.2	91.2	77.6-129			4.43	20
2-Butanone (MEK)	0.125	0.0926	0.0956	74.1	76.5	46.4-155			3.16	20
Methylene Chloride	0.0250	0.0208	0.0212	83.3	85.0	69.5-120			1.95	20
4-Methyl-2-pentanone (MIBK)	0.125	0.0977	0.101	78.1	81.0	63.3-138			3.60	20
Methyl tert-butyl ether	0.0250	0.0218	0.0222	87.3	88.7	70.1-125			1.67	20
Naphthalene	0.0250	0.0194	0.0212	77.6	84.7	69.7-134			8.83	20
n-Propylbenzene	0.0250	0.0230	0.0235	92.2	93.8	81.9-122			1.79	20
Styrene	0.0250	0.0227	0.0228	91.0	91.4	79.9-124			0.430	20
1,1,1,2-Tetrachloroethane	0.0250	0.0215	0.0217	85.8	86.8	78.5-125			1.09	20
1,1,2,2-Tetrachloroethane	0.0250	0.0192	0.0200	76.8	80.2	79.3-123	J4		4.22	20
Tetrachloroethene	0.0250	0.0230	0.0230	91.9	91.9	73.5-130			0.0300	20
Toluene	0.0250	0.0214	0.0216	85.5	86.3	77.9-116			0.930	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0227	0.0230	90.8	91.9	62.0-141			1.13	20
1,2,3-Trichlorobenzene	0.0250	0.0199	0.0212	79.6	85.0	75.7-134			6.52	20
1,2,4-Trichlorobenzene	0.0250	0.0217	0.0231	86.9	92.6	76.1-136			6.37	20
1,1,1-Trichloroethane	0.0250	0.0214	0.0225	85.5	90.0	71.1-129			5.06	20
1,1,2-Trichloroethane	0.0250	0.0222	0.0220	88.6	87.9	81.6-120			0.770	20
Trichloroethene	0.0250	0.0224	0.0218	89.7	87.3	79.5-121			2.62	20
Trichlorofluoromethane	0.0250	0.0211	0.0215	84.4	86.1	49.1-157			1.99	20
1,2,3-Trichloropropane	0.0250	0.0210	0.0218	83.9	87.3	74.9-124			3.87	20
1,2,3-Trimethylbenzene	0.0250	0.0226	0.0232	90.2	92.9	79.9-118			2.96	20
1,2,4-Trimethylbenzene	0.0250	0.0220	0.0223	87.8	89.2	79.0-122			1.59	20
1,3,5-Trimethylbenzene	0.0250	0.0215	0.0220	85.8	87.9	81.0-123			2.42	20
Vinyl chloride	0.0250	0.0227	0.0231	90.7	92.4	61.5-134			1.91	20
Xylenes, Total	0.0750	0.0666	0.0681	88.8	90.8	79.2-122			2.18	20
(S) Toluene-d8				*105*	*104*	*90.0-115*				
(S) Dibromofluoromethane				*105*	*105*	*79.0-121*				
(S) 4-Bromofluorobenzene				*101*	*101*	*80.1-120*				

L832468-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832468-06 05/05/16 20:56 • (MS) R3134400-4 05/05/16 19:01 • (MSD) R3134400-5 05/05/16 19:20

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	U	0.0511	0.0488	40.9	39.1	1	25.0-156			4.49	21.5
Acrolein	0.125	U	0.102	0.0997	81.8	79.7	1	34.0-194			2.54	21.5
Acrylonitrile	0.125	U	0.102	0.101	81.4	80.8	1	55.9-161			0.800	20
Benzene	0.0250	U	0.0194	0.0188	77.6	75.4	1	58.6-133			2.85	20
Bromobenzene	0.0250	U	0.0217	0.0206	87.0	82.5	1	70.6-125			5.22	20
Bromodichloromethane	0.0250	U	0.0218	0.0211	87.1	84.3	1	69.2-127			3.27	20
Bromoform	0.0250	U	0.0202	0.0191	80.9	76.5	1	66.3-140			5.57	20
Bromomethane	0.0250	U	0.0229	0.0203	91.7	81.2	1	16.6-183			12.2	20.5
n-Butylbenzene	0.0250	U	0.0228	0.0223	91.3	89.0	1	64.8-145			2.53	20
sec-Butylbenzene	0.0250	U	0.0209	0.0199	83.6	79.5	1	66.8-139			4.96	20
tert-Butylbenzene	0.0250	U	0.0210	0.0203	83.9	81.0	1	67.1-138			3.52	20
Carbon tetrachloride	0.0250	U	0.0189	0.0186	75.8	74.4	1	60.6-139			1.89	20
Chlorobenzene	0.0250	U	0.0210	0.0203	84.0	81.3	1	70.1-130			3.30	20
Chlorodibromomethane	0.0250	U	0.0205	0.0196	81.9	78.5	1	71.6-132			4.31	20
Chloroethane	0.0250	U	0.0197	0.0188	78.7	75.0	1	33.3-155			4.81	20
2-Chloroethyl vinyl ether	0.125	U	ND	ND	0.000	0.000	1	5.00-149	J6	J6	0.000	40
Chloroform	0.0250	U	0.0305	0.0296	122	119	1	66.1-133			2.99	20
Chloromethane	0.0250	U	0.0167	0.0156	66.8	62.6	1	40.7-139			6.50	20
2-Chlorotoluene	0.0250	U	0.0209	0.0203	83.4	81.1	1	66.9-134			2.88	20
4-Chlorotoluene	0.0250	U	0.0215	0.0211	86.2	84.4	1	66.8-134			2.07	20
1,2-Dibromo-3-Chloropropane	0.0250	U	0.0192	0.0214	76.9	85.5	1	63.9-142			10.7	20.2
1,2-Dibromoethane	0.0250	U	0.0209	0.0198	83.8	79.2	1	73.8-131			5.59	20
Dibromomethane	0.0250	U	0.0192	0.0187	76.8	74.6	1	72.8-127			2.81	20
1,2-Dichlorobenzene	0.0250	U	0.0220	0.0213	88.2	85.1	1	77.4-127			3.61	20
1,3-Dichlorobenzene	0.0250	U	0.0208	0.0198	83.1	79.3	1	67.9-136			4.67	20
1,4-Dichlorobenzene	0.0250	U	0.0210	0.0203	84.1	81.4	1	74.4-123			3.36	20
Dichlorodifluoromethane	0.0250	U	0.0173	0.0159	69.2	63.6	1	42.2-146			8.37	20
1,1-Dichloroethane	0.0250	U	0.0210	0.0202	83.9	80.7	1	64.0-134			3.90	20
1,2-Dichloroethane	0.0250	U	0.0221	0.0210	88.3	84.2	1	60.7-132			4.83	20
1,1-Dichloroethene	0.0250	U	0.0202	0.0190	80.9	76.0	1	48.8-144			6.34	20
cis-1,2-Dichloroethene	0.0250	U	0.0201	0.0200	80.3	80.2	1	60.6-136			0.150	20
trans-1,2-Dichloroethene	0.0250	U	0.0187	0.0180	74.8	72.2	1	61.0-132			3.53	20
1,2-Dichloropropane	0.0250	U	0.0195	0.0193	77.9	77.2	1	69.7-130			0.950	20
1,1-Dichloropropene	0.0250	U	0.0206	0.0198	82.2	79.2	1	61.5-136			3.81	20
1,3-Dichloropropane	0.0250	U	0.0213	0.0201	85.1	80.5	1	74.3-123			5.55	20
cis-1,3-Dichloropropene	0.0250	U	0.0197	0.0191	78.9	76.3	1	71.1-129			3.32	20

L832468-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832468-06 05/05/16 20:56 • (MS) R3134400-4 05/05/16 19:01 • (MSD) R3134400-5 05/05/16 19:20

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	U	0.0199	0.0191	79.8	76.3	1	66.3-136			4.43	20
2,2-Dichloropropane	0.0250	U	0.0209	0.0197	83.6	78.9	1	54.9-142			5.79	20
Di-isopropyl ether	0.0250	U	0.0189	0.0180	75.8	72.0	1	59.9-140			5.15	20
Ethylbenzene	0.0250	U	0.0225	0.0212	90.1	84.8	1	62.7-136			6.04	20
Hexachloro-1,3-butadiene	0.0250	U	0.0188	0.0182	75.1	72.6	1	61.1-144			3.34	20.1
Isopropylbenzene	0.0250	U	0.0210	0.0202	84.1	80.9	1	67.4-136			3.87	20
p-Isopropyltoluene	0.0250	U	0.0217	0.0210	86.8	83.8	1	62.8-143			3.51	20
2-Butanone (MEK)	0.125	U	0.0680	0.0683	54.4	54.6	1	45.0-156			0.390	20.8
Methylene Chloride	0.0250	U	0.0180	0.0175	72.0	69.9	1	61.5-125			2.96	20
4-Methyl-2-pentanone (MIBK)	0.125	U	0.0972	0.0980	77.7	78.4	1	60.7-150			0.810	20
Methyl tert-butyl ether	0.0250	U	0.0202	0.0196	80.7	78.3	1	61.4-136			3.02	20
Naphthalene	0.0250	U	0.0214	0.0220	85.7	88.1	1	61.8-143			2.76	20
n-Propylbenzene	0.0250	U	0.0223	0.0218	89.2	87.0	1	63.2-139			2.43	20
Styrene	0.0250	U	0.0212	0.0202	84.7	81.0	1	68.2-133			4.46	20
1,1,1,2-Tetrachloroethane	0.0250	U	0.0206	0.0195	82.3	77.9	1	70.5-132			5.58	20
1,1,2,2-Tetrachloroethane	0.0250	U	0.0190	0.0185	75.9	74.2	1	64.9-145			2.27	20
Tetrachloroethene	0.0250	U	0.0202	0.0193	80.9	77.2	1	57.4-141			4.62	20
Toluene	0.0250	U	0.0223	0.0214	89.2	85.7	1	67.8-124			4.02	20
1,1,2-Trichlorotrifluoroethane	0.0250	U	0.0217	0.0199	86.8	79.7	1	53.7-150			8.44	20
1,2,3-Trichlorobenzene	0.0250	U	0.0187	0.0190	74.9	75.9	1	65.7-143			1.31	20
1,2,4-Trichlorobenzene	0.0250	U	0.0204	0.0203	81.5	81.0	1	67.0-146			0.620	20
1,1,1-Trichloroethane	0.0250	U	0.0202	0.0199	80.8	79.6	1	58.7-134			1.44	20
1,1,2-Trichloroethane	0.0250	U	0.0206	0.0200	82.5	79.8	1	74.1-130			3.29	20
Trichloroethene	0.0250	U	0.0196	0.0188	78.3	75.3	1	48.9-148			3.91	20
Trichlorofluoromethane	0.0250	U	0.0209	0.0194	83.7	77.8	1	39.9-165			7.31	20
1,2,3-Trichloropropane	0.0250	U	0.0213	0.0217	85.3	87.0	1	71.5-134			1.91	20
1,2,3-Trimethylbenzene	0.0250	U	0.0239	0.0235	95.6	94.1	1	62.7-133			1.57	20
1,2,4-Trimethylbenzene	0.0250	U	0.0246	0.0236	98.3	94.4	1	60.5-137			4.06	20
1,3,5-Trimethylbenzene	0.0250	U	0.0218	0.0209	87.3	83.7	1	67.9-134			4.25	20
Vinyl chloride	0.0250	U	0.0177	0.0169	70.9	67.5	1	44.3-143			4.96	20
Xylenes, Total	0.0750	U	0.0691	0.0661	92.1	88.2	1	65.6-133			4.33	20
(S) Toluene-d8					*103*	*103*		*90.0-115*				
(S) Dibromofluoromethane					*104*	*102*		*79.0-121*				
(S) 4-Bromofluorobenzene					*102*	*100*		*80.1-120*				

Method Blank (MB)

(MB) R3134345-3 05/06/16 03:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0100	1.00
Acrolein	U		0.00887	0.0500
Acrylonitrile	U		0.00187	0.0100
Benzene	U		0.000331	0.00100
Bromobenzene	U		0.000352	0.00100
Bromodichloromethane	U		0.000380	0.00125
Bromoform	U		0.000469	0.00100
Bromomethane	U		0.000866	0.00500
n-Butylbenzene	U		0.000361	0.00100
sec-Butylbenzene	U		0.000365	0.00100
tert-Butylbenzene	U		0.000399	0.00100
Carbon tetrachloride	U		0.000379	0.00100
Chlorobenzene	U		0.000348	0.00100
Chlorodibromomethane	U		0.000327	0.00100
Chloroethane	U		0.000453	0.00500
2-Chloroethyl vinyl ether	U		0.00301	0.0500
Chloroform	U		0.000324	0.00500
Chloromethane	U		0.000276	0.00250
2-Chlorotoluene	U		0.000375	0.00100
4-Chlorotoluene	U		0.000351	0.00100
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500
1,2-Dibromoethane	U		0.000381	0.00100
Dibromomethane	U		0.000346	0.00100
1,2-Dichlorobenzene	U		0.000349	0.00100
1,3-Dichlorobenzene	U		0.000220	0.00100
1,4-Dichlorobenzene	U		0.000274	0.00100
Dichlorodifluoromethane	U		0.000551	0.00500
1,1-Dichloroethane	U		0.000259	0.00100
1,2-Dichloroethane	U		0.000361	0.00100
1,1-Dichloroethene	U		0.000398	0.00100
cis-1,2-Dichloroethene	U		0.000260	0.00100
trans-1,2-Dichloroethene	U		0.000396	0.00100
1,2-Dichloropropane	U		0.000306	0.00100
1,1-Dichloropropene	U		0.000352	0.00100
1,3-Dichloropropane	U		0.000366	0.00100
cis-1,3-Dichloropropene	U		0.000418	0.00100

Method Blank (MB)

(MB) R3134345-3 05/06/16 03:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
trans-1,3-Dichloropropene	U		0.000419	0.00100
2,2-Dichloropropane	U		0.000321	0.00100
Di-isopropyl ether	U		0.000320	0.00100
Ethylbenzene	U		0.000384	0.00100
Hexachloro-1,3-butadiene	U		0.000256	0.00100
Isopropylbenzene	U		0.000326	0.00100
p-Isopropyltoluene	U		0.000350	0.00100
2-Butanone (MEK)	U		0.00393	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100
Methyl tert-butyl ether	U		0.000367	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.000349	0.00100
Tetrachloroethene	U		0.000372	0.00100
Styrene	U		0.000307	0.00100
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100
Toluene	U		0.000780	0.00500
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100
1,2,3-Trichlorobenzene	U		0.000230	0.00100
Trichloroethene	U		0.000398	0.00100
1,2,4-Trichlorobenzene	U		0.000355	0.00100
1,1,2-Trichloroethane	U		0.000383	0.00100
Trichlorofluoromethane	U		0.00120	0.00500
1,2,3-Trichloropropane	U		0.000807	0.00250
1,2,3-Trimethylbenzene	U		0.000321	0.00100
1,2,4-Trimethylbenzene	U		0.000373	0.00100
1,3,5-Trimethylbenzene	U		0.000387	0.00100
Vinyl chloride	U		0.000259	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*106*			*90.0-115*
(S) Dibromofluoromethane	*113*			*79.0-121*
(S) 4-Bromofluorobenzene	*102*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134345-1 05/06/16 01:16 • (LCSD) R3134345-2 05/06/16 01:38

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.127	0.131	102	105	28.7-175			2.47	20.9
Acrolein	0.125	0.124	0.129	99.5	103	40.4-172			3.34	20
Acrylonitrile	0.125	0.129	0.130	103	104	58.2-145			1.39	20
Benzene	0.0250	0.0258	0.0261	103	104	73.0-122			1.22	20
Bromobenzene	0.0250	0.0247	0.0253	98.8	101	81.5-115			2.38	20
Bromodichloromethane	0.0250	0.0254	0.0256	101	102	75.5-121			0.800	20
Bromoform	0.0250	0.0225	0.0230	90.1	92.1	71.5-131			2.11	20
Bromomethane	0.0250	0.0257	0.0279	103	112	22.4-187			8.26	20
n-Butylbenzene	0.0250	0.0255	0.0260	102	104	75.9-134			2.14	20
sec-Butylbenzene	0.0250	0.0240	0.0248	96.0	99.1	80.6-126			3.14	20
tert-Butylbenzene	0.0250	0.0242	0.0250	96.9	99.9	79.3-127			2.99	20
Carbon tetrachloride	0.0250	0.0249	0.0249	99.7	99.7	70.9-129			0.0300	20
Chlorobenzene	0.0250	0.0241	0.0246	96.6	98.2	79.7-122			1.71	20
Chlorodibromomethane	0.0250	0.0239	0.0248	95.7	99.0	78.2-124			3.42	20
Chloroethane	0.0250	0.0232	0.0229	92.6	91.6	41.2-153			1.13	20
2-Chloroethyl vinyl ether	0.125	0.188	0.192	151	154	23.4-162			2.06	23.5
Chloroform	0.0250	0.0268	0.0271	107	108	73.2-125			1.01	20
Chloromethane	0.0250	0.0274	0.0277	109	111	55.8-134			1.20	20
2-Chlorotoluene	0.0250	0.0239	0.0243	95.6	97.3	76.4-125			1.77	20
4-Chlorotoluene	0.0250	0.0247	0.0255	99.0	102	81.5-121			3.02	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0206	0.0219	82.4	87.7	64.8-131			6.15	20
1,2-Dibromoethane	0.0250	0.0242	0.0249	96.9	99.5	79.8-122			2.70	20
Dibromomethane	0.0250	0.0258	0.0261	103	104	79.5-118			1.21	20
1,2-Dichlorobenzene	0.0250	0.0248	0.0252	99.3	101	84.7-118			1.65	20
1,3-Dichlorobenzene	0.0250	0.0230	0.0240	91.8	96.1	77.6-127			4.52	20
1,4-Dichlorobenzene	0.0250	0.0233	0.0237	93.3	94.7	82.2-114			1.49	20
Dichlorodifluoromethane	0.0250	0.0346	0.0357	138	143	56.0-134	J4	J4	3.14	20
1,1-Dichloroethane	0.0250	0.0269	0.0273	107	109	71.7-127			1.43	20
1,2-Dichloroethane	0.0250	0.0286	0.0287	114	115	65.3-126			0.600	20
1,1-Dichloroethene	0.0250	0.0273	0.0279	109	112	59.9-137			2.42	20
cis-1,2-Dichloroethene	0.0250	0.0263	0.0268	105	107	77.3-122			1.73	20
trans-1,2-Dichloroethene	0.0250	0.0265	0.0269	106	108	72.6-125			1.58	20
1,2-Dichloropropane	0.0250	0.0256	0.0257	103	103	77.4-125			0.170	20
1,1-Dichloropropene	0.0250	0.0280	0.0281	112	113	72.5-127			0.470	20
1,3-Dichloropropane	0.0250	0.0246	0.0260	98.6	104	80.6-115			5.25	20
cis-1,3-Dichloropropene	0.0250	0.0268	0.0271	107	109	77.7-124			1.16	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134345-1 05/06/16 01:16 • (LCSD) R3134345-2 05/06/16 01:38

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	0.0263	0.0266	105	106	73.5-127			0.940	20
2,2-Dichloropropane	0.0250	0.0260	0.0263	104	105	61.3-134			1.01	20
Di-isopropyl ether	0.0250	0.0261	0.0265	104	106	65.1-135			1.47	20
Ethylbenzene	0.0250	0.0236	0.0245	94.3	98.0	80.9-121			3.91	20
Hexachloro-1,3-butadiene	0.0250	0.0235	0.0237	93.9	94.9	73.7-133			1.04	20
Isopropylbenzene	0.0250	0.0232	0.0241	92.7	96.3	81.6-124			3.79	20
p-Isopropyltoluene	0.0250	0.0249	0.0258	99.8	103	77.6-129			3.29	20
2-Butanone (MEK)	0.125	0.125	0.129	99.9	103	46.4-155			3.22	20
Methylene Chloride	0.0250	0.0253	0.0254	101	102	69.5-120			0.390	20
4-Methyl-2-pentanone (MIBK)	0.125	0.128	0.131	102	105	63.3-138			2.64	20
Methyl tert-butyl ether	0.0250	0.0260	0.0263	104	105	70.1-125			1.25	20
Naphthalene	0.0250	0.0236	0.0249	94.2	99.6	69.7-134			5.58	20
n-Propylbenzene	0.0250	0.0248	0.0257	99.4	103	81.9-122			3.51	20
Styrene	0.0250	0.0246	0.0255	98.3	102	79.9-124			3.87	20
1,1,1,2-Tetrachloroethane	0.0250	0.0229	0.0238	91.6	95.4	78.5-125			4.00	20
1,1,2,2-Tetrachloroethane	0.0250	0.0228	0.0236	91.2	94.3	79.3-123			3.36	20
Tetrachloroethene	0.0250	0.0227	0.0228	91.0	91.2	73.5-130			0.210	20
Toluene	0.0250	0.0240	0.0240	95.9	95.8	77.9-116			0.0900	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0270	0.0271	108	108	62.0-141			0.380	20
1,2,3-Trichlorobenzene	0.0250	0.0229	0.0249	91.7	99.7	75.7-134			8.39	20
1,1,1-Trichloroethane	0.0250	0.0273	0.0278	109	111	71.1-129			1.75	20
1,2,4-Trichlorobenzene	0.0250	0.0237	0.0252	94.6	101	76.1-136			6.49	20
1,1,2-Trichloroethane	0.0250	0.0242	0.0246	96.7	98.3	81.6-120			1.68	20
Trichloroethene	0.0250	0.0241	0.0246	96.5	98.3	79.5-121			1.90	20
Trichlorofluoromethane	0.0250	0.0264	0.0264	105	106	49.1-157			0.0600	20
1,2,3-Trichloropropane	0.0250	0.0240	0.0244	96.1	97.4	74.9-124			1.39	20
1,2,3-Trimethylbenzene	0.0250	0.0243	0.0250	97.3	99.9	79.9-118			2.58	20
1,2,4-Trimethylbenzene	0.0250	0.0246	0.0252	98.5	101	79.0-122			2.38	20
1,3,5-Trimethylbenzene	0.0250	0.0245	0.0251	98.1	101	81.0-123			2.51	20
Vinyl chloride	0.0250	0.0267	0.0269	107	108	61.5-134			0.640	20
Xylenes, Total	0.0750	0.0709	0.0724	94.6	96.5	79.2-122			2.01	20
(S) Toluene-d8				*110*	*108*	*90.0-115*				
(S) Dibromofluoromethane				*113*	*113*	*79.0-121*				
(S) 4-Bromofluorobenzene				*106*	*108*	*80.1-120*				

L832642-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832642-21 05/06/16 05:25 • (MS) R3134345-4 05/06/16 03:54 • (MSD) R3134345-5 05/06/16 04:17

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	ND	0.0839	0.0828	49.7	48.8	1	25.0-156			1.33	21.5
Acrolein	0.125	ND	0.130	0.128	104	102	1	34.0-194			1.50	21.5
Acrylonitrile	0.125	ND	0.142	0.138	114	110	1	55.9-161			3.15	20
Benzene	0.0250	ND	0.0253	0.0249	101	99.8	1	58.6-133			1.55	20
Bromobenzene	0.0250	ND	0.0250	0.0250	99.8	100	1	70.6-125			0.320	20
Bromodichloromethane	0.0250	ND	0.0258	0.0256	103	103	1	69.2-127			0.520	20
Bromoform	0.0250	ND	0.0226	0.0234	90.5	93.6	1	66.3-140			3.41	20
Bromomethane	0.0250	ND	0.0257	0.0223	103	89.2	1	16.6-183			14.2	20.5
n-Butylbenzene	0.0250	ND	0.0257	0.0264	103	106	1	64.8-145			2.76	20
sec-Butylbenzene	0.0250	ND	0.0242	0.0248	96.9	99.2	1	66.8-139			2.34	20
tert-Butylbenzene	0.0250	ND	0.0244	0.0251	97.4	100	1	67.1-138			2.89	20
Carbon tetrachloride	0.0250	ND	0.0246	0.0244	98.6	97.5	1	60.6-139			1.11	20
Chlorobenzene	0.0250	ND	0.0240	0.0244	96.1	97.5	1	70.1-130			1.37	20
Chlorodibromomethane	0.0250	ND	0.0238	0.0248	95.2	99.3	1	71.6-132			4.21	20
Chloroethane	0.0250	ND	0.0220	0.0214	88.1	85.5	1	33.3-155			3.03	20
2-Chloroethyl vinyl ether	0.125	ND	ND	ND	0.000	0.000	1	5.00-149	J6	J6	0.000	40
Chloroform	0.0250	ND	0.0292	0.0288	108	106	1	66.1-133			1.14	20
Chloromethane	0.0250	ND	0.0247	0.0247	97.8	97.6	1	40.7-139			0.190	20
2-Chlorotoluene	0.0250	ND	0.0239	0.0241	95.6	96.5	1	66.9-134			0.960	20
4-Chlorotoluene	0.0250	ND	0.0251	0.0255	100	102	1	66.8-134			1.51	20
1,2-Dibromo-3-Chloropropane	0.0250	ND	0.0218	0.0233	87.1	93.1	1	63.9-142			6.63	20.2
1,2-Dibromoethane	0.0250	ND	0.0243	0.0249	97.1	99.7	1	73.8-131			2.56	20
Dibromomethane	0.0250	ND	0.0262	0.0253	105	101	1	72.8-127			3.62	20
1,2-Dichlorobenzene	0.0250	ND	0.0252	0.0255	101	102	1	77.4-127			1.04	20
1,3-Dichlorobenzene	0.0250	ND	0.0236	0.0242	94.6	96.6	1	67.9-136			2.11	20
1,4-Dichlorobenzene	0.0250	ND	0.0238	0.0237	95.3	94.7	1	74.4-123			0.620	20
Dichlorodifluoromethane	0.0250	ND	0.0315	0.0315	126	126	1	42.2-146			0.160	20
1,1-Dichloroethane	0.0250	ND	0.0268	0.0264	107	106	1	64.0-134			1.36	20
1,2-Dichloroethane	0.0250	ND	0.0292	0.0280	117	112	1	60.7-132			4.15	20
1,1-Dichloroethene	0.0250	ND	0.0263	0.0265	105	106	1	48.8-144			0.710	20
cis-1,2-Dichloroethene	0.0250	0.00200	0.0286	0.0277	106	103	1	60.6-136			3.05	20
trans-1,2-Dichloroethene	0.0250	ND	0.0253	0.0250	101	100	1	61.0-132			1.00	20
1,2-Dichloropropane	0.0250	ND	0.0251	0.0250	100	99.8	1	69.7-130			0.580	20
1,1-Dichloropropene	0.0250	ND	0.0269	0.0271	108	108	1	61.5-136			0.560	20
1,3-Dichloropropane	0.0250	ND	0.0253	0.0257	101	103	1	74.3-123			1.85	20
cis-1,3-Dichloropropene	0.0250	ND	0.0265	0.0263	106	105	1	71.1-129			1.01	20

L832642-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832642-21 05/06/16 05:25 • (MS) R3134345-4 05/06/16 03:54 • (MSD) R3134345-5 05/06/16 04:17

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	ND	0.0256	0.0254	102	101	1	66.3-136			0.900	20
2,2-Dichloropropane	0.0250	ND	0.0266	0.0258	106	103	1	54.9-142			3.09	20
Di-isopropyl ether	0.0250	ND	0.0258	0.0253	103	101	1	59.9-140			2.01	20
Ethylbenzene	0.0250	ND	0.0234	0.0244	93.6	97.7	1	62.7-136			4.29	20
Hexachloro-1,3-butadiene	0.0250	ND	0.0230	0.0241	92.1	96.3	1	61.1-144			4.47	20.1
Isopropylbenzene	0.0250	ND	0.0233	0.0237	93.2	94.9	1	67.4-136			1.84	20
p-Isopropyltoluene	0.0250	ND	0.0254	0.0259	101	103	1	62.8-143			1.96	20
2-Butanone (MEK)	0.125	ND	0.0986	0.0974	78.9	77.9	1	45.0-156			1.24	20.8
Methylene Chloride	0.0250	ND	0.0245	0.0242	98.2	96.6	1	61.5-125			1.60	20
4-Methyl-2-pentanone (MIBK)	0.125	ND	0.135	0.134	108	107	1	60.7-150			0.650	20
Methyl tert-butyl ether	0.0250	ND	0.0271	0.0262	108	105	1	61.4-136			3.09	20
Naphthalene	0.0250	ND	0.0242	0.0253	96.7	101	1	61.8-143			4.55	20
n-Propylbenzene	0.0250	ND	0.0251	0.0256	100	102	1	63.2-139			1.88	20
Styrene	0.0250	ND	0.0247	0.0251	98.7	100	1	68.2-133			1.66	20
1,1,1,2-Tetrachloroethane	0.0250	ND	0.0234	0.0237	93.6	94.7	1	70.5-132			1.19	20
1,1,2,2-Tetrachloroethane	0.0250	ND	0.0245	0.0246	98.0	98.6	1	64.9-145			0.580	20
Tetrachloroethene	0.0250	0.0536	0.0713	0.0731	71.0	78.0	1	57.4-141			2.43	20
Toluene	0.0250	ND	0.0241	0.0241	96.3	96.3	1	67.8-124			0.0100	20
1,1,2-Trichlorotrifluoroethane	0.0250	ND	0.0266	0.0261	106	104	1	53.7-150			1.84	20
1,2,3-Trichlorobenzene	0.0250	ND	0.0239	0.0246	95.7	98.4	1	65.7-143			2.73	20
1,1,1-Trichloroethane	0.0250	ND	0.0276	0.0269	110	108	1	58.7-134			2.57	20
1,2,4-Trichlorobenzene	0.0250	ND	0.0247	0.0257	98.7	103	1	67.0-146			3.91	20
1,1,2-Trichloroethane	0.0250	ND	0.0243	0.0250	97.2	100	1	74.1-130			2.96	20
Trichloroethene	0.0250	0.00592	0.0299	0.0300	96.0	96.1	1	48.9-148			0.100	20
Trichlorofluoromethane	0.0250	ND	0.0261	0.0255	105	102	1	39.9-165			2.52	20
1,2,3-Trichloropropane	0.0250	ND	0.0250	0.0256	99.9	102	1	71.5-134			2.40	20
1,2,3-Trimethylbenzene	0.0250	ND	0.0245	0.0249	98.0	99.4	1	62.7-133			1.44	20
1,2,4-Trimethylbenzene	0.0250	ND	0.0246	0.0252	98.3	101	1	60.5-137			2.46	20
1,3,5-Trimethylbenzene	0.0250	ND	0.0244	0.0249	97.8	99.5	1	67.9-134			1.80	20
Vinyl chloride	0.0250	ND	0.0249	0.0248	99.8	99.3	1	44.3-143			0.440	20
Xylenes, Total	0.0750	ND	0.0702	0.0720	93.5	95.9	1	65.6-133			2.53	20
(S) Toluene-d8					*110*	*109*		*90.0-115*				
(S) Dibromofluoromethane					*115*	*113*		*79.0-121*				
(S) 4-Bromofluorobenzene					*105*	*107*		*80.1-120*				

Method Blank (MB)

(MB) R3134421-3 05/05/16 23:42

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0100	1.00
Acrolein	U		0.00887	0.0500
Acrylonitrile	U		0.00187	0.0100
Benzene	U		0.000331	0.00100
Bromobenzene	U		0.000352	0.00100
Bromodichloromethane	U		0.000380	0.00125
Bromoform	U		0.000469	0.00100
Bromomethane	U		0.000866	0.00500
n-Butylbenzene	U		0.000361	0.00100
sec-Butylbenzene	U		0.000365	0.00100
tert-Butylbenzene	U		0.000399	0.00100
Carbon tetrachloride	U		0.000379	0.00100
Chlorobenzene	U		0.000348	0.00100
Chlorodibromomethane	U		0.000327	0.00100
Chloroethane	U		0.000453	0.00500
2-Chloroethyl vinyl ether	U		0.00301	0.0500
Chloroform	U		0.000324	0.00500
Chloromethane	U		0.000276	0.00250
2-Chlorotoluene	U		0.000375	0.00100
4-Chlorotoluene	U		0.000351	0.00100
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500
1,2-Dibromoethane	U		0.000381	0.00100
Dibromomethane	U		0.000346	0.00100
1,2-Dichlorobenzene	U		0.000349	0.00100
1,3-Dichlorobenzene	U		0.000220	0.00100
1,4-Dichlorobenzene	U		0.000274	0.00100
Dichlorodifluoromethane	U		0.000551	0.00500
1,1-Dichloroethane	U		0.000259	0.00100
1,2-Dichloroethane	U		0.000361	0.00100
1,1-Dichloroethene	U		0.000398	0.00100
cis-1,2-Dichloroethene	U		0.000260	0.00100
trans-1,2-Dichloroethene	U		0.000396	0.00100
1,2-Dichloropropane	U		0.000306	0.00100
1,1-Dichloropropene	U		0.000352	0.00100
1,3-Dichloropropane	U		0.000366	0.00100
cis-1,3-Dichloropropene	U		0.000418	0.00100

Method Blank (MB)

(MB) R3134421-3 05/05/16 23:42

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
trans-1,3-Dichloropropene	U		0.000419	0.00100
2,2-Dichloropropane	U		0.000321	0.00100
Di-isopropyl ether	U		0.000320	0.00100
Ethylbenzene	U		0.000384	0.00100
Hexachloro-1,3-butadiene	U		0.000256	0.00100
Isopropylbenzene	U		0.000326	0.00100
p-Isopropyltoluene	U		0.000350	0.00100
2-Butanone (MEK)	U		0.00393	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100
Methyl tert-butyl ether	U		0.000367	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.000349	0.00100
Styrene	U		0.000307	0.00100
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100
Tetrachloroethene	U		0.000372	0.00100
Toluene	U		0.000780	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100
1,2,3-Trichlorobenzene	0.000238		0.000230	0.00100
1,2,4-Trichlorobenzene	U		0.000355	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
1,1,2-Trichloroethane	U		0.000383	0.00100
Trichloroethene	U		0.000398	0.00100
Trichlorofluoromethane	U		0.00120	0.00500
1,2,3-Trichloropropane	U		0.000807	0.00250
1,2,3-Trimethylbenzene	U		0.000321	0.00100
1,2,4-Trimethylbenzene	U		0.000373	0.00100
1,3,5-Trimethylbenzene	U		0.000387	0.00100
Vinyl chloride	U		0.000259	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*100*			*90.0-115*
(S) Dibromofluoromethane	*99.9*			*79.0-121*
(S) 4-Bromofluorobenzene	*88.2*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134421-1 05/05/16 22:19 • (LCSD) R3134421-2 05/05/16 22:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.0986	0.107	78.9	85.4	28.7-175			7.93	20.9
Acrolein	0.125	0.105	0.103	84.1	82.5	40.4-172			1.90	20
Acrylonitrile	0.125	0.160	0.149	128	119	58.2-145			7.25	20
Benzene	0.0250	0.0243	0.0249	97.1	99.5	73.0-122			2.52	20
Bromobenzene	0.0250	0.0212	0.0220	85.0	88.0	81.5-115			3.51	20
Bromodichloromethane	0.0250	0.0229	0.0231	91.4	92.5	75.5-121			1.11	20
Bromoform	0.0250	0.0255	0.0255	102	102	71.5-131			0.150	20
Bromomethane	0.0250	0.0304	0.0306	122	123	22.4-187			0.600	20
n-Butylbenzene	0.0250	0.0229	0.0236	91.8	94.2	75.9-134			2.62	20
sec-Butylbenzene	0.0250	0.0209	0.0217	83.5	87.0	80.6-126			4.01	20
tert-Butylbenzene	0.0250	0.0208	0.0215	83.3	86.2	79.3-127			3.37	20
Carbon tetrachloride	0.0250	0.0203	0.0209	81.4	83.6	70.9-129			2.68	20
Chlorobenzene	0.0250	0.0227	0.0237	90.6	94.8	79.7-122			4.53	20
Chlorodibromomethane	0.0250	0.0233	0.0239	93.2	95.5	78.2-124			2.42	20
Chloroethane	0.0250	0.0308	0.0310	123	124	41.2-153			0.750	20
2-Chloroethyl vinyl ether	0.125	0.192	0.192	154	153	23.4-162			0.0400	23.5
Chloroform	0.0250	0.0227	0.0233	90.9	93.3	73.2-125			2.53	20
Chloromethane	0.0250	0.0282	0.0293	113	117	55.8-134			3.62	20
2-Chlorotoluene	0.0250	0.0226	0.0232	90.5	92.8	76.4-125			2.54	20
4-Chlorotoluene	0.0250	0.0215	0.0221	86.1	88.2	81.5-121			2.43	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0256	0.0246	102	98.4	64.8-131			3.84	20
1,2-Dibromoethane	0.0250	0.0240	0.0244	96.1	97.5	79.8-122			1.40	20
Dibromomethane	0.0250	0.0248	0.0248	99.3	99.4	79.5-118			0.0900	20
1,2-Dichlorobenzene	0.0250	0.0228	0.0236	91.1	94.4	84.7-118			3.58	20
1,3-Dichlorobenzene	0.0250	0.0211	0.0218	84.4	87.3	77.6-127			3.33	20
1,4-Dichlorobenzene	0.0250	0.0230	0.0238	91.9	95.0	82.2-114			3.37	20
Dichlorodifluoromethane	0.0250	0.0269	0.0274	107	110	56.0-134			2.03	20
1,1-Dichloroethane	0.0250	0.0252	0.0256	101	103	71.7-127			1.89	20
1,2-Dichloroethane	0.0250	0.0233	0.0233	93.2	93.2	65.3-126			0.0300	20
1,1-Dichloroethene	0.0250	0.0259	0.0263	104	105	59.9-137			1.59	20
cis-1,2-Dichloroethene	0.0250	0.0242	0.0249	96.7	99.6	77.3-122			2.95	20
trans-1,2-Dichloroethene	0.0250	0.0238	0.0241	95.2	96.5	72.6-125			1.35	20
1,2-Dichloropropane	0.0250	0.0266	0.0267	106	107	77.4-125			0.630	20
1,1-Dichloropropene	0.0250	0.0248	0.0256	99.2	103	72.5-127			3.32	20
1,3-Dichloropropane	0.0250	0.0254	0.0254	102	102	80.6-115			0.0800	20
cis-1,3-Dichloropropene	0.0250	0.0259	0.0263	104	105	77.7-124			1.58	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134421-1 05/05/16 22:19 • (LCSD) R3134421-2 05/05/16 22:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	0.0262	0.0263	105	105	73.5-127			0.500	20
2,2-Dichloropropane	0.0250	0.0233	0.0240	93.2	95.8	61.3-134			2.78	20
Di-isopropyl ether	0.0250	0.0268	0.0270	107	108	65.1-135			0.880	20
Ethylbenzene	0.0250	0.0225	0.0233	90.0	93.2	80.9-121			3.45	20
Hexachloro-1,3-butadiene	0.0250	0.0225	0.0231	90.1	92.2	73.7-133			2.33	20
Isopropylbenzene	0.0250	0.0215	0.0221	86.0	88.2	81.6-124			2.52	20
p-Isopropyltoluene	0.0250	0.0216	0.0224	86.6	89.5	77.6-129			3.31	20
2-Butanone (MEK)	0.125	0.151	0.147	121	117	46.4-155			3.09	20
Methylene Chloride	0.0250	0.0241	0.0245	96.5	98.1	69.5-120			1.62	20
4-Methyl-2-pentanone (MIBK)	0.125	0.162	0.155	130	124	63.3-138			4.33	20
Methyl tert-butyl ether	0.0250	0.0243	0.0239	97.1	95.8	70.1-125			1.32	20
Naphthalene	0.0250	0.0226	0.0229	90.3	91.7	69.7-134			1.47	20
n-Propylbenzene	0.0250	0.0224	0.0232	89.5	93.0	81.9-122			3.84	20
Styrene	0.0250	0.0230	0.0238	92.0	95.4	79.9-124			3.65	20
1,1,1,2-Tetrachloroethane	0.0250	0.0222	0.0229	88.8	91.5	78.5-125			2.95	20
1,1,2,2-Tetrachloroethane	0.0250	0.0242	0.0236	96.6	94.3	79.3-123			2.41	20
Tetrachloroethene	0.0250	0.0221	0.0228	88.6	91.1	73.5-130			2.78	20
Toluene	0.0250	0.0233	0.0239	93.4	95.5	77.9-116			2.18	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0263	0.0271	105	108	62.0-141			2.83	20
1,2,3-Trichlorobenzene	0.0250	0.0224	0.0233	89.7	93.1	75.7-134			3.70	20
1,2,4-Trichlorobenzene	0.0250	0.0226	0.0236	90.3	94.3	76.1-136			4.29	20
1,1,1-Trichloroethane	0.0250	0.0217	0.0222	87.0	88.8	71.1-129			2.08	20
1,1,2-Trichloroethane	0.0250	0.0236	0.0234	94.5	93.7	81.6-120			0.890	20
Trichloroethene	0.0250	0.0237	0.0239	94.8	95.5	79.5-121			0.720	20
Trichlorofluoromethane	0.0250	0.0251	0.0254	101	102	49.1-157			1.18	20
1,2,3-Trichloropropane	0.0250	0.0241	0.0242	96.2	96.8	74.9-124			0.580	20
1,2,3-Trimethylbenzene	0.0250	0.0225	0.0233	89.9	93.2	79.9-118			3.65	20
1,2,4-Trimethylbenzene	0.0250	0.0210	0.0218	84.1	87.1	79.0-122			3.49	20
1,3,5-Trimethylbenzene	0.0250	0.0208	0.0215	83.2	85.9	81.0-123			3.15	20
Vinyl chloride	0.0250	0.0284	0.0287	114	115	61.5-134			0.980	20
Xylenes, Total	0.0750	0.0666	0.0689	88.8	91.8	79.2-122			3.38	20
(S) Toluene-d8				*100*	*100*	*90.0-115*				
(S) Dibromofluoromethane				*101*	*101*	*79.0-121*				
(S) 4-Bromofluorobenzene				*86.1*	*85.4*	*80.1-120*				

L832663-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832663-01 05/06/16 01:42 • (MS) R3134421-4 05/06/16 00:03 • (MSD) R3134421-5 05/06/16 01:01

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	U	0.0502	0.0473	40.2	37.9	1	25.0-156			5.88	21.5
Acrolein	0.125	U	0.115	0.107	92.4	85.6	1	34.0-194			7.57	21.5
Acrylonitrile	0.125	U	0.131	0.120	105	96.1	1	55.9-161			8.42	20
Benzene	0.0250	U	0.0209	0.0199	83.8	79.8	1	58.6-133			4.91	20
Bromobenzene	0.0250	U	0.0196	0.0190	78.4	76.0	1	70.6-125			3.12	20
Bromodichloromethane	0.0250	U	0.0207	0.0200	82.8	80.2	1	69.2-127			3.24	20
Bromoform	0.0250	U	0.0226	0.0217	90.6	87.0	1	66.3-140			4.07	20
Bromomethane	0.0250	U	0.0228	0.0216	91.1	86.2	1	16.6-183			5.50	20.5
n-Butylbenzene	0.0250	U	0.0219	0.0206	87.5	82.2	1	64.8-145			6.26	20
sec-Butylbenzene	0.0250	U	0.0199	0.0190	79.5	75.8	1	66.8-139			4.81	20
tert-Butylbenzene	0.0250	U	0.0199	0.0188	79.8	75.2	1	67.1-138			5.91	20
Carbon tetrachloride	0.0250	U	0.0179	0.0167	71.6	66.9	1	60.6-139			6.72	20
Chlorobenzene	0.0250	U	0.0209	0.0198	83.7	79.4	1	70.1-130			5.30	20
Chlorodibromomethane	0.0250	U	0.0214	0.0209	85.6	83.6	1	71.6-132			2.32	20
Chloroethane	0.0250	U	0.0244	0.0233	97.5	93.2	1	33.3-155			4.57	20
2-Chloroethyl vinyl ether	0.125	U	ND	ND	0.000	0.000	1	5.00-149	J6	J6	0.000	40
Chloroform	0.0250	U	0.0209	0.0201	83.6	80.5	1	66.1-133			3.73	20
Chloromethane	0.0250	U	0.0193	0.0184	77.3	73.5	1	40.7-139			5.07	20
2-Chlorotoluene	0.0250	U	0.0211	0.0200	84.3	80.0	1	66.9-134			5.32	20
4-Chlorotoluene	0.0250	U	0.0200	0.0192	79.8	76.7	1	66.8-134			3.96	20
1,2-Dibromo-3-Chloropropane	0.0250	U	0.0220	0.0202	88.1	80.8	1	63.9-142			8.57	20.2
1,2-Dibromoethane	0.0250	U	0.0210	0.0202	83.9	80.8	1	73.8-131			3.82	20
Dibromomethane	0.0250	U	0.0213	0.0201	85.1	80.5	1	72.8-127			5.56	20
1,2-Dichlorobenzene	0.0250	U	0.0215	0.0202	86.1	80.8	1	77.4-127			6.38	20
1,3-Dichlorobenzene	0.0250	U	0.0197	0.0189	78.9	75.7	1	67.9-136			4.12	20
1,4-Dichlorobenzene	0.0250	U	0.0218	0.0206	87.2	82.2	1	74.4-123			5.86	20
Dichlorodifluoromethane	0.0250	U	0.0172	0.0167	68.9	66.7	1	42.2-146			3.22	20
1,1-Dichloroethane	0.0250	U	0.0225	0.0215	89.9	86.1	1	64.0-134			4.32	20
1,2-Dichloroethane	0.0250	U	0.0200	0.0190	80.2	76.1	1	60.7-132			5.21	20
1,1-Dichloroethene	0.0250	U	0.0211	0.0203	84.4	81.1	1	48.8-144			3.91	20
cis-1,2-Dichloroethene	0.0250	U	0.0216	0.0204	86.4	81.6	1	60.6-136			5.70	20
trans-1,2-Dichloroethene	0.0250	U	0.0194	0.0185	77.4	74.1	1	61.0-132			4.41	20
1,2-Dichloropropane	0.0250	U	0.0238	0.0228	95.2	91.4	1	69.7-130			4.09	20
1,1-Dichloropropene	0.0250	U	0.0207	0.0199	82.8	79.5	1	61.5-136			4.09	20
1,3-Dichloropropane	0.0250	U	0.0228	0.0219	91.3	87.4	1	74.3-123			4.27	20
cis-1,3-Dichloropropene	0.0250	U	0.0225	0.0217	90.0	86.7	1	71.1-129			3.73	20

L832663-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832663-01 05/06/16 01:42 • (MS) R3134421-4 05/06/16 00:03 • (MSD) R3134421-5 05/06/16 01:01

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	U	0.0230	0.0221	92.0	88.3	1	66.3-136			4.01	20
2,2-Dichloropropane	0.0250	U	0.0230	0.0199	92.1	79.6	1	54.9-142			14.5	20
Di-isopropyl ether	0.0250	U	0.0239	0.0227	95.7	90.7	1	59.9-140			5.35	20
Ethylbenzene	0.0250	U	0.0206	0.0198	82.4	79.1	1	62.7-136			4.13	20
Hexachloro-1,3-butadiene	0.0250	U	0.0214	0.0207	85.8	82.8	1	61.1-144			3.46	20.1
Isopropylbenzene	0.0250	U	0.0201	0.0191	80.3	76.2	1	67.4-136			5.13	20
p-Isopropyltoluene	0.0250	U	0.0203	0.0194	81.3	77.7	1	62.8-143			4.50	20
2-Butanone (MEK)	0.125	U	0.0920	0.0827	73.6	66.2	1	45.0-156			10.6	20.8
Methylene Chloride	0.0250	U	0.0206	0.0199	82.3	79.4	1	61.5-125			3.57	20
4-Methyl-2-pentanone (MIBK)	0.125	U	0.135	0.124	108	99.0	1	60.7-150			8.35	20
Methyl tert-butyl ether	0.0250	U	0.0209	0.0194	83.8	77.7	1	61.4-136			7.47	20
Naphthalene	0.0250	U	0.0199	0.0190	79.4	76.0	1	61.8-143			4.39	20
n-Propylbenzene	0.0250	U	0.0209	0.0199	83.5	79.7	1	63.2-139			4.59	20
Styrene	0.0250	U	0.0213	0.0205	85.4	82.0	1	68.2-133			4.07	20
1,1,1,2-Tetrachloroethane	0.0250	U	0.0212	0.0200	84.9	80.0	1	70.5-132			5.94	20
1,1,2,2-Tetrachloroethane	0.0250	U	0.0223	0.0209	89.2	83.8	1	64.9-145			6.21	20
Tetrachloroethene	0.0250	U	0.0195	0.0184	77.9	73.4	1	57.4-141			6.00	20
Toluene	0.0250	U	0.0208	0.0198	83.1	79.2	1	67.8-124			4.79	20
1,1,2-Trichlorotrifluoroethane	0.0250	U	0.0227	0.0214	90.8	85.8	1	53.7-150			5.72	20
1,2,3-Trichlorobenzene	0.0250	0.000360	0.0206	0.0197	80.8	77.5	1	65.7-143			4.10	20
1,2,4-Trichlorobenzene	0.0250	U	0.0215	0.0203	85.8	81.0	1	67.0-146			5.74	20
1,1,1-Trichloroethane	0.0250	U	0.0196	0.0181	78.3	72.3	1	58.7-134			7.93	20
1,1,2-Trichloroethane	0.0250	U	0.0214	0.0204	85.4	81.8	1	74.1-130			4.41	20
Trichloroethene	0.0250	U	0.0201	0.0191	80.6	76.2	1	48.9-148			5.56	20
Trichlorofluoromethane	0.0250	U	0.0228	0.0217	91.3	86.7	1	39.9-165			5.16	20
1,2,3-Trichloropropane	0.0250	U	0.0213	0.0201	85.0	80.5	1	71.5-134			5.51	20
1,2,3-Trimethylbenzene	0.0250	U	0.0212	0.0199	84.7	79.5	1	62.7-133			6.34	20
1,2,4-Trimethylbenzene	0.0250	U	0.0196	0.0186	78.4	74.5	1	60.5-137			5.10	20
1,3,5-Trimethylbenzene	0.0250	U	0.0196	0.0183	78.3	73.1	1	67.9-134			6.84	20
Vinyl chloride	0.0250	U	0.0208	0.0197	83.3	78.9	1	44.3-143			5.47	20
Xylenes, Total	0.0750	U	0.0606	0.0582	80.8	77.6	1	65.6-133			4.01	20
(S) Toluene-d8					*99.3*	*99.2*		*90.0-115*				
(S) Dibromofluoromethane					*100*	*99.3*		*79.0-121*				
(S) 4-Bromofluorobenzene					*85.7*	*85.8*		*80.1-120*				

Method Blank (MB)

(MB) R3134703-3 05/07/16 01:08

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Naphthalene	U		0.00100	0.00500
(S) Toluene-d8	*100*			*90.0-115*
(S) Dibromofluoromethane	*98.1*			*79.0-121*
(S) 4-Bromofluorobenzene	*89.0*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134703-1 05/06/16 23:26 • (LCSD) R3134703-2 05/06/16 23:46

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.0250	0.0215	0.0220	85.8	88.2	69.7-134			2.69	20
(S) Toluene-d8				*98.1*	*99.2*	*90.0-115*				
(S) Dibromofluoromethane				*99.3*	*98.6*	*79.0-121*				
(S) 4-Bromofluorobenzene				*85.7*	*88.0*	*80.1-120*				

L832643-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832643-09 05/07/16 02:50 • (MS) R3134703-4 05/07/16 01:29 • (MSD) R3134703-5 05/07/16 01:49

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.0250	U	0.0206	0.0216	82.3	86.4	1	61.8-143			4.78	20
(S) Toluene-d8					*99.6*	*98.7*		*90.0-115*				
(S) Dibromofluoromethane					*101*	*99.8*		*79.0-121*				
(S) 4-Bromofluorobenzene					*86.4*	*86.4*		*80.1-120*				

Method Blank (MB)

(MB) R3134400-3 05/05/16 18:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0100	1.00
Acrolein	U		0.00887	0.0500
Acrylonitrile	U		0.00187	0.0100
Benzene	U		0.000331	0.00100
Bromobenzene	U		0.000352	0.00100
Bromodichloromethane	U		0.000380	0.00125
Bromoform	U		0.000469	0.00100
Bromomethane	U		0.000866	0.00500
n-Butylbenzene	U		0.000361	0.00100
sec-Butylbenzene	U		0.000365	0.00100
tert-Butylbenzene	U		0.000399	0.00100
Carbon tetrachloride	U		0.000379	0.00100
Chlorobenzene	U		0.000348	0.00100
Chlorodibromomethane	U		0.000327	0.00100
Chloroethane	U		0.000453	0.00500
2-Chloroethyl vinyl ether	U		0.00301	0.0500
Chloroform	U		0.000324	0.00500
Chloromethane	U		0.000276	0.00250
2-Chlorotoluene	U		0.000375	0.00100
4-Chlorotoluene	U		0.000351	0.00100
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500
1,2-Dibromoethane	U		0.000381	0.00100
Dibromomethane	U		0.000346	0.00100
1,2-Dichlorobenzene	U		0.000349	0.00100
1,3-Dichlorobenzene	U		0.000220	0.00100
1,4-Dichlorobenzene	U		0.000274	0.00100
Dichlorodifluoromethane	U		0.000551	0.00500
1,1-Dichloroethane	U		0.000259	0.00100
1,2-Dichloroethane	U		0.000361	0.00100
1,1-Dichloroethene	U		0.000398	0.00100
cis-1,2-Dichloroethene	U		0.000260	0.00100
trans-1,2-Dichloroethene	U		0.000396	0.00100
1,2-Dichloropropane	U		0.000306	0.00100
1,1-Dichloropropene	U		0.000352	0.00100
1,3-Dichloropropane	U		0.000366	0.00100
cis-1,3-Dichloropropene	U		0.000418	0.00100

Method Blank (MB)

(MB) R3134400-3 05/05/16 18:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
trans-1,3-Dichloropropene	U		0.000419	0.00100
2,2-Dichloropropane	U		0.000321	0.00100
Di-isopropyl ether	U		0.000320	0.00100
Ethylbenzene	U		0.000384	0.00100
Hexachloro-1,3-butadiene	U		0.000256	0.00100
Isopropylbenzene	U		0.000326	0.00100
p-Isopropyltoluene	U		0.000350	0.00100
2-Butanone (MEK)	U		0.00393	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100
Methyl tert-butyl ether	U		0.000367	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.000349	0.00100
Styrene	U		0.000307	0.00100
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100
Tetrachloroethene	U		0.000372	0.00100
Toluene	U		0.000780	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100
1,2,3-Trichlorobenzene	U		0.000230	0.00100
1,2,4-Trichlorobenzene	U		0.000355	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
1,1,2-Trichloroethane	U		0.000383	0.00100
Trichloroethene	U		0.000398	0.00100
Trichlorofluoromethane	U		0.00120	0.00500
1,2,3-Trichloropropane	U		0.000807	0.00250
1,2,3-Trimethylbenzene	U		0.000321	0.00100
1,2,4-Trimethylbenzene	U		0.000373	0.00100
1,3,5-Trimethylbenzene	U		0.000387	0.00100
Vinyl chloride	U		0.000259	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*102*			*90.0-115*
(S) Dibromofluoromethane	*104*			*79.0-121*
(S) 4-Bromofluorobenzene	*98.8*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134400-1 05/05/16 17:12 • (LCSD) R3134400-2 05/05/16 17:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.0942	0.0987	75.4	79.0	28.7-175			4.68	20.9
Acrolein	0.125	0.108	0.113	86.2	90.6	40.4-172			5.02	20
Acrylonitrile	0.125	0.0985	0.102	78.8	81.9	58.2-145			3.92	20
Benzene	0.0250	0.0213	0.0220	85.0	87.9	73.0-122			3.29	20
Bromobenzene	0.0250	0.0229	0.0235	91.6	93.9	81.5-115			2.52	20
Bromodichloromethane	0.0250	0.0221	0.0217	88.3	86.9	75.5-121			1.56	20
Bromoform	0.0250	0.0208	0.0210	83.2	84.2	71.5-131			1.13	20
Bromomethane	0.0250	0.0294	0.0292	117	117	22.4-187			0.410	20
n-Butylbenzene	0.0250	0.0232	0.0243	92.9	97.3	75.9-134			4.72	20
sec-Butylbenzene	0.0250	0.0213	0.0221	85.1	88.4	80.6-126			3.78	20
tert-Butylbenzene	0.0250	0.0220	0.0225	88.0	89.9	79.3-127			2.16	20
Carbon tetrachloride	0.0250	0.0216	0.0212	86.2	85.0	70.9-129			1.49	20
Chlorobenzene	0.0250	0.0229	0.0231	91.6	92.3	79.7-122			0.690	20
Chlorodibromomethane	0.0250	0.0217	0.0218	86.6	87.2	78.2-124			0.620	20
Chloroethane	0.0250	0.0232	0.0233	92.8	93.2	41.2-153			0.420	20
2-Chloroethyl vinyl ether	0.125	0.0420	0.0460	33.6	36.8	23.4-162			9.02	23.5
Chloroform	0.0250	0.0224	0.0231	89.7	92.6	73.2-125			3.17	20
Chloromethane	0.0250	0.0203	0.0209	81.1	83.7	55.8-134			3.07	20
2-Chlorotoluene	0.0250	0.0226	0.0223	90.6	89.3	76.4-125			1.40	20
4-Chlorotoluene	0.0250	0.0226	0.0229	90.2	91.6	81.5-121			1.54	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0197	0.0204	78.7	81.6	64.8-131			3.66	20
1,2-Dibromoethane	0.0250	0.0225	0.0228	90.0	91.2	79.8-122			1.33	20
Dibromomethane	0.0250	0.0218	0.0214	87.2	85.5	79.5-118			1.90	20
1,2-Dichlorobenzene	0.0250	0.0231	0.0238	92.4	95.0	84.7-118			2.80	20
1,3-Dichlorobenzene	0.0250	0.0216	0.0222	86.5	88.9	77.6-127			2.75	20
1,4-Dichlorobenzene	0.0250	0.0219	0.0226	87.7	90.5	82.2-114			3.10	20
Dichlorodifluoromethane	0.0250	0.0243	0.0251	97.3	100	56.0-134			3.06	20
1,1-Dichloroethane	0.0250	0.0227	0.0232	90.6	92.7	71.7-127			2.30	20
1,2-Dichloroethane	0.0250	0.0240	0.0251	95.9	100	65.3-126			4.54	20
1,1-Dichloroethene	0.0250	0.0237	0.0238	94.6	95.3	59.9-137			0.680	20
cis-1,2-Dichloroethene	0.0250	0.0224	0.0227	89.5	90.9	77.3-122			1.57	20
trans-1,2-Dichloroethene	0.0250	0.0214	0.0222	85.5	88.9	72.6-125			3.90	20
1,2-Dichloropropane	0.0250	0.0209	0.0219	83.8	87.5	77.4-125			4.31	20
1,1-Dichloropropene	0.0250	0.0229	0.0236	91.6	94.4	72.5-127			2.94	20
1,3-Dichloropropane	0.0250	0.0229	0.0233	91.7	93.0	80.6-115			1.40	20
cis-1,3-Dichloropropene	0.0250	0.0221	0.0219	88.3	87.8	77.7-124			0.630	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134400-1 05/05/16 17:12 • (LCSD) R3134400-2 05/05/16 17:32

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	0.0217	0.0223	86.7	89.2	73.5-127			2.81	20
2,2-Dichloropropane	0.0250	0.0222	0.0228	88.7	91.3	61.3-134			2.91	20
Di-isopropyl ether	0.0250	0.0203	0.0209	81.3	83.7	65.1-135			2.87	20
Ethylbenzene	0.0250	0.0223	0.0229	89.3	91.6	80.9-121			2.61	20
Hexachloro-1,3-butadiene	0.0250	0.0205	0.0222	81.9	88.7	73.7-133			7.92	20
Isopropylbenzene	0.0250	0.0217	0.0224	86.8	89.7	81.6-124			3.21	20
p-Isopropyltoluene	0.0250	0.0218	0.0228	87.2	91.2	77.6-129			4.43	20
2-Butanone (MEK)	0.125	0.0926	0.0956	74.1	76.5	46.4-155			3.16	20
Methylene Chloride	0.0250	0.0208	0.0212	83.3	85.0	69.5-120			1.95	20
4-Methyl-2-pentanone (MIBK)	0.125	0.0977	0.101	78.1	81.0	63.3-138			3.60	20
Methyl tert-butyl ether	0.0250	0.0218	0.0222	87.3	88.7	70.1-125			1.67	20
Naphthalene	0.0250	0.0194	0.0212	77.6	84.7	69.7-134			8.83	20
n-Propylbenzene	0.0250	0.0230	0.0235	92.2	93.8	81.9-122			1.79	20
Styrene	0.0250	0.0227	0.0228	91.0	91.4	79.9-124			0.430	20
1,1,1,2-Tetrachloroethane	0.0250	0.0215	0.0217	85.8	86.8	78.5-125			1.09	20
1,1,2,2-Tetrachloroethane	0.0250	0.0192	0.0200	76.8	80.2	79.3-123	J4		4.22	20
Tetrachloroethene	0.0250	0.0230	0.0230	91.9	91.9	73.5-130			0.0300	20
Toluene	0.0250	0.0214	0.0216	85.5	86.3	77.9-116			0.930	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0227	0.0230	90.8	91.9	62.0-141			1.13	20
1,2,3-Trichlorobenzene	0.0250	0.0199	0.0212	79.6	85.0	75.7-134			6.52	20
1,2,4-Trichlorobenzene	0.0250	0.0217	0.0231	86.9	92.6	76.1-136			6.37	20
1,1,1-Trichloroethane	0.0250	0.0214	0.0225	85.5	90.0	71.1-129			5.06	20
1,1,2-Trichloroethane	0.0250	0.0222	0.0220	88.6	87.9	81.6-120			0.770	20
Trichloroethene	0.0250	0.0224	0.0218	89.7	87.3	79.5-121			2.62	20
Trichlorofluoromethane	0.0250	0.0211	0.0215	84.4	86.1	49.1-157			1.99	20
1,2,3-Trichloropropane	0.0250	0.0210	0.0218	83.9	87.3	74.9-124			3.87	20
1,2,3-Trimethylbenzene	0.0250	0.0226	0.0232	90.2	92.9	79.9-118			2.96	20
1,2,4-Trimethylbenzene	0.0250	0.0220	0.0223	87.8	89.2	79.0-122			1.59	20
1,3,5-Trimethylbenzene	0.0250	0.0215	0.0220	85.8	87.9	81.0-123			2.42	20
Vinyl chloride	0.0250	0.0227	0.0231	90.7	92.4	61.5-134			1.91	20
Xylenes, Total	0.0750	0.0666	0.0681	88.8	90.8	79.2-122			2.18	20
(S) Toluene-d8				*105*	*104*	*90.0-115*				
(S) Dibromofluoromethane				*105*	*105*	*79.0-121*				
(S) 4-Bromofluorobenzene				*101*	*101*	*80.1-120*				

L832468-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832468-06 05/05/16 20:56 • (MS) R3134400-4 05/05/16 19:01 • (MSD) R3134400-5 05/05/16 19:20

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	U	0.0511	0.0488	40.9	39.1	1	25.0-156			4.49	21.5
Acrolein	0.125	U	0.102	0.0997	81.8	79.7	1	34.0-194			2.54	21.5
Acrylonitrile	0.125	U	0.102	0.101	81.4	80.8	1	55.9-161			0.800	20
Benzene	0.0250	U	0.0194	0.0188	77.6	75.4	1	58.6-133			2.85	20
Bromobenzene	0.0250	U	0.0217	0.0206	87.0	82.5	1	70.6-125			5.22	20
Bromodichloromethane	0.0250	U	0.0218	0.0211	87.1	84.3	1	69.2-127			3.27	20
Bromoform	0.0250	U	0.0202	0.0191	80.9	76.5	1	66.3-140			5.57	20
Bromomethane	0.0250	U	0.0229	0.0203	91.7	81.2	1	16.6-183			12.2	20.5
n-Butylbenzene	0.0250	U	0.0228	0.0223	91.3	89.0	1	64.8-145			2.53	20
sec-Butylbenzene	0.0250	U	0.0209	0.0199	83.6	79.5	1	66.8-139			4.96	20
tert-Butylbenzene	0.0250	U	0.0210	0.0203	83.9	81.0	1	67.1-138			3.52	20
Carbon tetrachloride	0.0250	U	0.0189	0.0186	75.8	74.4	1	60.6-139			1.89	20
Chlorobenzene	0.0250	U	0.0210	0.0203	84.0	81.3	1	70.1-130			3.30	20
Chlorodibromomethane	0.0250	U	0.0205	0.0196	81.9	78.5	1	71.6-132			4.31	20
Chloroethane	0.0250	U	0.0197	0.0188	78.7	75.0	1	33.3-155			4.81	20
2-Chloroethyl vinyl ether	0.125	U	ND	ND	0.000	0.000	1	5.00-149	J6	J6	0.000	40
Chloroform	0.0250	U	0.0305	0.0296	122	119	1	66.1-133			2.99	20
Chloromethane	0.0250	U	0.0167	0.0156	66.8	62.6	1	40.7-139			6.50	20
2-Chlorotoluene	0.0250	U	0.0209	0.0203	83.4	81.1	1	66.9-134			2.88	20
4-Chlorotoluene	0.0250	U	0.0215	0.0211	86.2	84.4	1	66.8-134			2.07	20
1,2-Dibromo-3-Chloropropane	0.0250	U	0.0192	0.0214	76.9	85.5	1	63.9-142			10.7	20.2
1,2-Dibromoethane	0.0250	U	0.0209	0.0198	83.8	79.2	1	73.8-131			5.59	20
Dibromomethane	0.0250	U	0.0192	0.0187	76.8	74.6	1	72.8-127			2.81	20
1,2-Dichlorobenzene	0.0250	U	0.0220	0.0213	88.2	85.1	1	77.4-127			3.61	20
1,3-Dichlorobenzene	0.0250	U	0.0208	0.0198	83.1	79.3	1	67.9-136			4.67	20
1,4-Dichlorobenzene	0.0250	U	0.0210	0.0203	84.1	81.4	1	74.4-123			3.36	20
Dichlorodifluoromethane	0.0250	U	0.0173	0.0159	69.2	63.6	1	42.2-146			8.37	20
1,1-Dichloroethane	0.0250	U	0.0210	0.0202	83.9	80.7	1	64.0-134			3.90	20
1,2-Dichloroethane	0.0250	U	0.0221	0.0210	88.3	84.2	1	60.7-132			4.83	20
1,1-Dichloroethene	0.0250	U	0.0202	0.0190	80.9	76.0	1	48.8-144			6.34	20
cis-1,2-Dichloroethene	0.0250	U	0.0201	0.0200	80.3	80.2	1	60.6-136			0.150	20
trans-1,2-Dichloroethene	0.0250	U	0.0187	0.0180	74.8	72.2	1	61.0-132			3.53	20
1,2-Dichloropropane	0.0250	U	0.0195	0.0193	77.9	77.2	1	69.7-130			0.950	20
1,1-Dichloropropene	0.0250	U	0.0206	0.0198	82.2	79.2	1	61.5-136			3.81	20
1,3-Dichloropropane	0.0250	U	0.0213	0.0201	85.1	80.5	1	74.3-123			5.55	20
cis-1,3-Dichloropropene	0.0250	U	0.0197	0.0191	78.9	76.3	1	71.1-129			3.32	20

L832468-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832468-06 05/05/16 20:56 • (MS) R3134400-4 05/05/16 19:01 • (MSD) R3134400-5 05/05/16 19:20

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	U	0.0199	0.0191	79.8	76.3	1	66.3-136			4.43	20
2,2-Dichloropropane	0.0250	U	0.0209	0.0197	83.6	78.9	1	54.9-142			5.79	20
Di-isopropyl ether	0.0250	U	0.0189	0.0180	75.8	72.0	1	59.9-140			5.15	20
Ethylbenzene	0.0250	U	0.0225	0.0212	90.1	84.8	1	62.7-136			6.04	20
Hexachloro-1,3-butadiene	0.0250	U	0.0188	0.0182	75.1	72.6	1	61.1-144			3.34	20.1
Isopropylbenzene	0.0250	U	0.0210	0.0202	84.1	80.9	1	67.4-136			3.87	20
p-Isopropyltoluene	0.0250	U	0.0217	0.0210	86.8	83.8	1	62.8-143			3.51	20
2-Butanone (MEK)	0.125	U	0.0680	0.0683	54.4	54.6	1	45.0-156			0.390	20.8
Methylene Chloride	0.0250	U	0.0180	0.0175	72.0	69.9	1	61.5-125			2.96	20
4-Methyl-2-pentanone (MIBK)	0.125	U	0.0972	0.0980	77.7	78.4	1	60.7-150			0.810	20
Methyl tert-butyl ether	0.0250	U	0.0202	0.0196	80.7	78.3	1	61.4-136			3.02	20
Naphthalene	0.0250	U	0.0214	0.0220	85.7	88.1	1	61.8-143			2.76	20
n-Propylbenzene	0.0250	U	0.0223	0.0218	89.2	87.0	1	63.2-139			2.43	20
Styrene	0.0250	U	0.0212	0.0202	84.7	81.0	1	68.2-133			4.46	20
1,1,1,2-Tetrachloroethane	0.0250	U	0.0206	0.0195	82.3	77.9	1	70.5-132			5.58	20
1,1,2,2-Tetrachloroethane	0.0250	U	0.0190	0.0185	75.9	74.2	1	64.9-145			2.27	20
Tetrachloroethene	0.0250	U	0.0202	0.0193	80.9	77.2	1	57.4-141			4.62	20
Toluene	0.0250	U	0.0223	0.0214	89.2	85.7	1	67.8-124			4.02	20
1,1,2-Trichlorotrifluoroethane	0.0250	U	0.0217	0.0199	86.8	79.7	1	53.7-150			8.44	20
1,2,3-Trichlorobenzene	0.0250	U	0.0187	0.0190	74.9	75.9	1	65.7-143			1.31	20
1,2,4-Trichlorobenzene	0.0250	U	0.0204	0.0203	81.5	81.0	1	67.0-146			0.620	20
1,1,1-Trichloroethane	0.0250	U	0.0202	0.0199	80.8	79.6	1	58.7-134			1.44	20
1,1,2-Trichloroethane	0.0250	U	0.0206	0.0200	82.5	79.8	1	74.1-130			3.29	20
Trichloroethene	0.0250	U	0.0196	0.0188	78.3	75.3	1	48.9-148			3.91	20
Trichlorofluoromethane	0.0250	U	0.0209	0.0194	83.7	77.8	1	39.9-165			7.31	20
1,2,3-Trichloropropane	0.0250	U	0.0213	0.0217	85.3	87.0	1	71.5-134			1.91	20
1,2,3-Trimethylbenzene	0.0250	U	0.0239	0.0235	95.6	94.1	1	62.7-133			1.57	20
1,2,4-Trimethylbenzene	0.0250	U	0.0246	0.0236	98.3	94.4	1	60.5-137			4.06	20
1,3,5-Trimethylbenzene	0.0250	U	0.0218	0.0209	87.3	83.7	1	67.9-134			4.25	20
Vinyl chloride	0.0250	U	0.0177	0.0169	70.9	67.5	1	44.3-143			4.96	20
Xylenes, Total	0.0750	U	0.0691	0.0661	92.1	88.2	1	65.6-133			4.33	20
(S) Toluene-d8					*103*	*103*		*90.0-115*				
(S) Dibromofluoromethane					*104*	*102*		*79.0-121*				
(S) 4-Bromofluorobenzene					*102*	*100*		*80.1-120*				

Method Blank (MB)

(MB) R3134345-3 05/06/16 03:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0100	1.00
Acrolein	U		0.00887	0.0500
Acrylonitrile	U		0.00187	0.0100
Benzene	U		0.000331	0.00100
Bromobenzene	U		0.000352	0.00100
Bromodichloromethane	U		0.000380	0.00125
Bromoform	U		0.000469	0.00100
Bromomethane	U		0.000866	0.00500
n-Butylbenzene	U		0.000361	0.00100
sec-Butylbenzene	U		0.000365	0.00100
tert-Butylbenzene	U		0.000399	0.00100
Carbon tetrachloride	U		0.000379	0.00100
Chlorobenzene	U		0.000348	0.00100
Chlorodibromomethane	U		0.000327	0.00100
Chloroethane	U		0.000453	0.00500
2-Chloroethyl vinyl ether	U		0.00301	0.0500
Chloroform	U		0.000324	0.00500
Chloromethane	U		0.000276	0.00250
2-Chlorotoluene	U		0.000375	0.00100
4-Chlorotoluene	U		0.000351	0.00100
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500
1,2-Dibromoethane	U		0.000381	0.00100
Dibromomethane	U		0.000346	0.00100
1,2-Dichlorobenzene	U		0.000349	0.00100
1,3-Dichlorobenzene	U		0.000220	0.00100
1,4-Dichlorobenzene	U		0.000274	0.00100
Dichlorodifluoromethane	U		0.000551	0.00500
1,1-Dichloroethane	U		0.000259	0.00100
1,2-Dichloroethane	U		0.000361	0.00100
1,1-Dichloroethene	U		0.000398	0.00100
cis-1,2-Dichloroethene	U		0.000260	0.00100
trans-1,2-Dichloroethene	U		0.000396	0.00100
1,2-Dichloropropane	U		0.000306	0.00100
1,1-Dichloropropene	U		0.000352	0.00100
1,3-Dichloropropane	U		0.000366	0.00100
cis-1,3-Dichloropropene	U		0.000418	0.00100

Method Blank (MB)

(MB) R3134345-3 05/06/16 03:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
trans-1,3-Dichloropropene	U		0.000419	0.00100
2,2-Dichloropropane	U		0.000321	0.00100
Di-isopropyl ether	U		0.000320	0.00100
Ethylbenzene	U		0.000384	0.00100
Hexachloro-1,3-butadiene	U		0.000256	0.00100
Isopropylbenzene	U		0.000326	0.00100
p-Isopropyltoluene	U		0.000350	0.00100
2-Butanone (MEK)	U		0.00393	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100
Methyl tert-butyl ether	U		0.000367	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.000349	0.00100
Tetrachloroethene	U		0.000372	0.00100
Styrene	U		0.000307	0.00100
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100
Toluene	U		0.000780	0.00500
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100
1,2,3-Trichlorobenzene	U		0.000230	0.00100
Trichloroethene	U		0.000398	0.00100
1,2,4-Trichlorobenzene	U		0.000355	0.00100
1,1,2-Trichloroethane	U		0.000383	0.00100
Trichlorofluoromethane	U		0.00120	0.00500
1,2,3-Trichloropropane	U		0.000807	0.00250
1,2,3-Trimethylbenzene	U		0.000321	0.00100
1,2,4-Trimethylbenzene	U		0.000373	0.00100
1,3,5-Trimethylbenzene	U		0.000387	0.00100
Vinyl chloride	U		0.000259	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*106*			*90.0-115*
(S) Dibromofluoromethane	*113*			*79.0-121*
(S) 4-Bromofluorobenzene	*102*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134345-1 05/06/16 01:16 • (LCSD) R3134345-2 05/06/16 01:38

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.127	0.131	102	105	28.7-175			2.47	20.9
Acrolein	0.125	0.124	0.129	99.5	103	40.4-172			3.34	20
Acrylonitrile	0.125	0.129	0.130	103	104	58.2-145			1.39	20
Benzene	0.0250	0.0258	0.0261	103	104	73.0-122			1.22	20
Bromobenzene	0.0250	0.0247	0.0253	98.8	101	81.5-115			2.38	20
Bromodichloromethane	0.0250	0.0254	0.0256	101	102	75.5-121			0.800	20
Bromoform	0.0250	0.0225	0.0230	90.1	92.1	71.5-131			2.11	20
Bromomethane	0.0250	0.0257	0.0279	103	112	22.4-187			8.26	20
n-Butylbenzene	0.0250	0.0255	0.0260	102	104	75.9-134			2.14	20
sec-Butylbenzene	0.0250	0.0240	0.0248	96.0	99.1	80.6-126			3.14	20
tert-Butylbenzene	0.0250	0.0242	0.0250	96.9	99.9	79.3-127			2.99	20
Carbon tetrachloride	0.0250	0.0249	0.0249	99.7	99.7	70.9-129			0.0300	20
Chlorobenzene	0.0250	0.0241	0.0246	96.6	98.2	79.7-122			1.71	20
Chlorodibromomethane	0.0250	0.0239	0.0248	95.7	99.0	78.2-124			3.42	20
Chloroethane	0.0250	0.0232	0.0229	92.6	91.6	41.2-153			1.13	20
2-Chloroethyl vinyl ether	0.125	0.188	0.192	151	154	23.4-162			2.06	23.5
Chloroform	0.0250	0.0268	0.0271	107	108	73.2-125			1.01	20
Chloromethane	0.0250	0.0274	0.0277	109	111	55.8-134			1.20	20
2-Chlorotoluene	0.0250	0.0239	0.0243	95.6	97.3	76.4-125			1.77	20
4-Chlorotoluene	0.0250	0.0247	0.0255	99.0	102	81.5-121			3.02	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0206	0.0219	82.4	87.7	64.8-131			6.15	20
1,2-Dibromoethane	0.0250	0.0242	0.0249	96.9	99.5	79.8-122			2.70	20
Dibromomethane	0.0250	0.0258	0.0261	103	104	79.5-118			1.21	20
1,2-Dichlorobenzene	0.0250	0.0248	0.0252	99.3	101	84.7-118			1.65	20
1,3-Dichlorobenzene	0.0250	0.0230	0.0240	91.8	96.1	77.6-127			4.52	20
1,4-Dichlorobenzene	0.0250	0.0233	0.0237	93.3	94.7	82.2-114			1.49	20
Dichlorodifluoromethane	0.0250	0.0346	0.0357	138	143	56.0-134	J4	J4	3.14	20
1,1-Dichloroethane	0.0250	0.0269	0.0273	107	109	71.7-127			1.43	20
1,2-Dichloroethane	0.0250	0.0286	0.0287	114	115	65.3-126			0.600	20
1,1-Dichloroethene	0.0250	0.0273	0.0279	109	112	59.9-137			2.42	20
cis-1,2-Dichloroethene	0.0250	0.0263	0.0268	105	107	77.3-122			1.73	20
trans-1,2-Dichloroethene	0.0250	0.0265	0.0269	106	108	72.6-125			1.58	20
1,2-Dichloropropane	0.0250	0.0256	0.0257	103	103	77.4-125			0.170	20
1,1-Dichloropropene	0.0250	0.0280	0.0281	112	113	72.5-127			0.470	20
1,3-Dichloropropane	0.0250	0.0246	0.0260	98.6	104	80.6-115			5.25	20
cis-1,3-Dichloropropene	0.0250	0.0268	0.0271	107	109	77.7-124			1.16	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134345-1 05/06/16 01:16 • (LCSD) R3134345-2 05/06/16 01:38

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	0.0263	0.0266	105	106	73.5-127			0.940	20
2,2-Dichloropropane	0.0250	0.0260	0.0263	104	105	61.3-134			1.01	20
Di-isopropyl ether	0.0250	0.0261	0.0265	104	106	65.1-135			1.47	20
Ethylbenzene	0.0250	0.0236	0.0245	94.3	98.0	80.9-121			3.91	20
Hexachloro-1,3-butadiene	0.0250	0.0235	0.0237	93.9	94.9	73.7-133			1.04	20
Isopropylbenzene	0.0250	0.0232	0.0241	92.7	96.3	81.6-124			3.79	20
p-Isopropyltoluene	0.0250	0.0249	0.0258	99.8	103	77.6-129			3.29	20
2-Butanone (MEK)	0.125	0.125	0.129	99.9	103	46.4-155			3.22	20
Methylene Chloride	0.0250	0.0253	0.0254	101	102	69.5-120			0.390	20
4-Methyl-2-pentanone (MIBK)	0.125	0.128	0.131	102	105	63.3-138			2.64	20
Methyl tert-butyl ether	0.0250	0.0260	0.0263	104	105	70.1-125			1.25	20
Naphthalene	0.0250	0.0236	0.0249	94.2	99.6	69.7-134			5.58	20
n-Propylbenzene	0.0250	0.0248	0.0257	99.4	103	81.9-122			3.51	20
Styrene	0.0250	0.0246	0.0255	98.3	102	79.9-124			3.87	20
1,1,1,2-Tetrachloroethane	0.0250	0.0229	0.0238	91.6	95.4	78.5-125			4.00	20
1,1,2,2-Tetrachloroethane	0.0250	0.0228	0.0236	91.2	94.3	79.3-123			3.36	20
Tetrachloroethene	0.0250	0.0227	0.0228	91.0	91.2	73.5-130			0.210	20
Toluene	0.0250	0.0240	0.0240	95.9	95.8	77.9-116			0.0900	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0270	0.0271	108	108	62.0-141			0.380	20
1,2,3-Trichlorobenzene	0.0250	0.0229	0.0249	91.7	99.7	75.7-134			8.39	20
1,1,1-Trichloroethane	0.0250	0.0273	0.0278	109	111	71.1-129			1.75	20
1,2,4-Trichlorobenzene	0.0250	0.0237	0.0252	94.6	101	76.1-136			6.49	20
1,1,2-Trichloroethane	0.0250	0.0242	0.0246	96.7	98.3	81.6-120			1.68	20
Trichloroethene	0.0250	0.0241	0.0246	96.5	98.3	79.5-121			1.90	20
Trichlorofluoromethane	0.0250	0.0264	0.0264	105	106	49.1-157			0.0600	20
1,2,3-Trichloropropane	0.0250	0.0240	0.0244	96.1	97.4	74.9-124			1.39	20
1,2,3-Trimethylbenzene	0.0250	0.0243	0.0250	97.3	99.9	79.9-118			2.58	20
1,2,4-Trimethylbenzene	0.0250	0.0246	0.0252	98.5	101	79.0-122			2.38	20
1,3,5-Trimethylbenzene	0.0250	0.0245	0.0251	98.1	101	81.0-123			2.51	20
Vinyl chloride	0.0250	0.0267	0.0269	107	108	61.5-134			0.640	20
Xylenes, Total	0.0750	0.0709	0.0724	94.6	96.5	79.2-122			2.01	20
(S) Toluene-d8				*110*	*108*	*90.0-115*				
(S) Dibromofluoromethane				*113*	*113*	*79.0-121*				
(S) 4-Bromofluorobenzene				*106*	*108*	*80.1-120*				

L832642-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832642-21 05/06/16 05:25 • (MS) R3134345-4 05/06/16 03:54 • (MSD) R3134345-5 05/06/16 04:17

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	ND	0.0839	0.0828	49.7	48.8	1	25.0-156			1.33	21.5
Acrolein	0.125	ND	0.130	0.128	104	102	1	34.0-194			1.50	21.5
Acrylonitrile	0.125	ND	0.142	0.138	114	110	1	55.9-161			3.15	20
Benzene	0.0250	ND	0.0253	0.0249	101	99.8	1	58.6-133			1.55	20
Bromobenzene	0.0250	ND	0.0250	0.0250	99.8	100	1	70.6-125			0.320	20
Bromodichloromethane	0.0250	ND	0.0258	0.0256	103	103	1	69.2-127			0.520	20
Bromoform	0.0250	ND	0.0226	0.0234	90.5	93.6	1	66.3-140			3.41	20
Bromomethane	0.0250	ND	0.0257	0.0223	103	89.2	1	16.6-183			14.2	20.5
n-Butylbenzene	0.0250	ND	0.0257	0.0264	103	106	1	64.8-145			2.76	20
sec-Butylbenzene	0.0250	ND	0.0242	0.0248	96.9	99.2	1	66.8-139			2.34	20
tert-Butylbenzene	0.0250	ND	0.0244	0.0251	97.4	100	1	67.1-138			2.89	20
Carbon tetrachloride	0.0250	ND	0.0246	0.0244	98.6	97.5	1	60.6-139			1.11	20
Chlorobenzene	0.0250	ND	0.0240	0.0244	96.1	97.5	1	70.1-130			1.37	20
Chlorodibromomethane	0.0250	ND	0.0238	0.0248	95.2	99.3	1	71.6-132			4.21	20
Chloroethane	0.0250	ND	0.0220	0.0214	88.1	85.5	1	33.3-155			3.03	20
2-Chloroethyl vinyl ether	0.125	ND	ND	ND	0.000	0.000	1	5.00-149	J6	J6	0.000	40
Chloroform	0.0250	ND	0.0292	0.0288	108	106	1	66.1-133			1.14	20
Chloromethane	0.0250	ND	0.0247	0.0247	97.8	97.6	1	40.7-139			0.190	20
2-Chlorotoluene	0.0250	ND	0.0239	0.0241	95.6	96.5	1	66.9-134			0.960	20
4-Chlorotoluene	0.0250	ND	0.0251	0.0255	100	102	1	66.8-134			1.51	20
1,2-Dibromo-3-Chloropropane	0.0250	ND	0.0218	0.0233	87.1	93.1	1	63.9-142			6.63	20.2
1,2-Dibromoethane	0.0250	ND	0.0243	0.0249	97.1	99.7	1	73.8-131			2.56	20
Dibromomethane	0.0250	ND	0.0262	0.0253	105	101	1	72.8-127			3.62	20
1,2-Dichlorobenzene	0.0250	ND	0.0252	0.0255	101	102	1	77.4-127			1.04	20
1,3-Dichlorobenzene	0.0250	ND	0.0236	0.0242	94.6	96.6	1	67.9-136			2.11	20
1,4-Dichlorobenzene	0.0250	ND	0.0238	0.0237	95.3	94.7	1	74.4-123			0.620	20
Dichlorodifluoromethane	0.0250	ND	0.0315	0.0315	126	126	1	42.2-146			0.160	20
1,1-Dichloroethane	0.0250	ND	0.0268	0.0264	107	106	1	64.0-134			1.36	20
1,2-Dichloroethane	0.0250	ND	0.0292	0.0280	117	112	1	60.7-132			4.15	20
1,1-Dichloroethene	0.0250	ND	0.0263	0.0265	105	106	1	48.8-144			0.710	20
cis-1,2-Dichloroethene	0.0250	0.00200	0.0286	0.0277	106	103	1	60.6-136			3.05	20
trans-1,2-Dichloroethene	0.0250	ND	0.0253	0.0250	101	100	1	61.0-132			1.00	20
1,2-Dichloropropane	0.0250	ND	0.0251	0.0250	100	99.8	1	69.7-130			0.580	20
1,1-Dichloropropene	0.0250	ND	0.0269	0.0271	108	108	1	61.5-136			0.560	20
1,3-Dichloropropane	0.0250	ND	0.0253	0.0257	101	103	1	74.3-123			1.85	20
cis-1,3-Dichloropropene	0.0250	ND	0.0265	0.0263	106	105	1	71.1-129			1.01	20

L832642-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832642-21 05/06/16 05:25 • (MS) R3134345-4 05/06/16 03:54 • (MSD) R3134345-5 05/06/16 04:17

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	ND	0.0256	0.0254	102	101	1	66.3-136			0.900	20
2,2-Dichloropropane	0.0250	ND	0.0266	0.0258	106	103	1	54.9-142			3.09	20
Di-isopropyl ether	0.0250	ND	0.0258	0.0253	103	101	1	59.9-140			2.01	20
Ethylbenzene	0.0250	ND	0.0234	0.0244	93.6	97.7	1	62.7-136			4.29	20
Hexachloro-1,3-butadiene	0.0250	ND	0.0230	0.0241	92.1	96.3	1	61.1-144			4.47	20.1
Isopropylbenzene	0.0250	ND	0.0233	0.0237	93.2	94.9	1	67.4-136			1.84	20
p-Isopropyltoluene	0.0250	ND	0.0254	0.0259	101	103	1	62.8-143			1.96	20
2-Butanone (MEK)	0.125	ND	0.0986	0.0974	78.9	77.9	1	45.0-156			1.24	20.8
Methylene Chloride	0.0250	ND	0.0245	0.0242	98.2	96.6	1	61.5-125			1.60	20
4-Methyl-2-pentanone (MIBK)	0.125	ND	0.135	0.134	108	107	1	60.7-150			0.650	20
Methyl tert-butyl ether	0.0250	ND	0.0271	0.0262	108	105	1	61.4-136			3.09	20
Naphthalene	0.0250	ND	0.0242	0.0253	96.7	101	1	61.8-143			4.55	20
n-Propylbenzene	0.0250	ND	0.0251	0.0256	100	102	1	63.2-139			1.88	20
Styrene	0.0250	ND	0.0247	0.0251	98.7	100	1	68.2-133			1.66	20
1,1,1,2-Tetrachloroethane	0.0250	ND	0.0234	0.0237	93.6	94.7	1	70.5-132			1.19	20
1,1,2,2-Tetrachloroethane	0.0250	ND	0.0245	0.0246	98.0	98.6	1	64.9-145			0.580	20
Tetrachloroethene	0.0250	0.0536	0.0713	0.0731	71.0	78.0	1	57.4-141			2.43	20
Toluene	0.0250	ND	0.0241	0.0241	96.3	96.3	1	67.8-124			0.0100	20
1,1,2-Trichlorotrifluoroethane	0.0250	ND	0.0266	0.0261	106	104	1	53.7-150			1.84	20
1,2,3-Trichlorobenzene	0.0250	ND	0.0239	0.0246	95.7	98.4	1	65.7-143			2.73	20
1,1,1-Trichloroethane	0.0250	ND	0.0276	0.0269	110	108	1	58.7-134			2.57	20
1,2,4-Trichlorobenzene	0.0250	ND	0.0247	0.0257	98.7	103	1	67.0-146			3.91	20
1,1,2-Trichloroethane	0.0250	ND	0.0243	0.0250	97.2	100	1	74.1-130			2.96	20
Trichloroethene	0.0250	0.00592	0.0299	0.0300	96.0	96.1	1	48.9-148			0.100	20
Trichlorofluoromethane	0.0250	ND	0.0261	0.0255	105	102	1	39.9-165			2.52	20
1,2,3-Trichloropropane	0.0250	ND	0.0250	0.0256	99.9	102	1	71.5-134			2.40	20
1,2,3-Trimethylbenzene	0.0250	ND	0.0245	0.0249	98.0	99.4	1	62.7-133			1.44	20
1,2,4-Trimethylbenzene	0.0250	ND	0.0246	0.0252	98.3	101	1	60.5-137			2.46	20
1,3,5-Trimethylbenzene	0.0250	ND	0.0244	0.0249	97.8	99.5	1	67.9-134			1.80	20
Vinyl chloride	0.0250	ND	0.0249	0.0248	99.8	99.3	1	44.3-143			0.440	20
Xylenes, Total	0.0750	ND	0.0702	0.0720	93.5	95.9	1	65.6-133			2.53	20
(S) Toluene-d8					*110*	*109*		*90.0-115*				
(S) Dibromofluoromethane					*115*	*113*		*79.0-121*				
(S) 4-Bromofluorobenzene					*105*	*107*		*80.1-120*				

Method Blank (MB)

(MB) R3134421-3 05/05/16 23:42

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0100	1.00
Acrolein	U		0.00887	0.0500
Acrylonitrile	U		0.00187	0.0100
Benzene	U		0.000331	0.00100
Bromobenzene	U		0.000352	0.00100
Bromodichloromethane	U		0.000380	0.00125
Bromoform	U		0.000469	0.00100
Bromomethane	U		0.000866	0.00500
n-Butylbenzene	U		0.000361	0.00100
sec-Butylbenzene	U		0.000365	0.00100
tert-Butylbenzene	U		0.000399	0.00100
Carbon tetrachloride	U		0.000379	0.00100
Chlorobenzene	U		0.000348	0.00100
Chlorodibromomethane	U		0.000327	0.00100
Chloroethane	U		0.000453	0.00500
2-Chloroethyl vinyl ether	U		0.00301	0.0500
Chloroform	U		0.000324	0.00500
Chloromethane	U		0.000276	0.00250
2-Chlorotoluene	U		0.000375	0.00100
4-Chlorotoluene	U		0.000351	0.00100
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500
1,2-Dibromoethane	U		0.000381	0.00100
Dibromomethane	U		0.000346	0.00100
1,2-Dichlorobenzene	U		0.000349	0.00100
1,3-Dichlorobenzene	U		0.000220	0.00100
1,4-Dichlorobenzene	U		0.000274	0.00100
Dichlorodifluoromethane	U		0.000551	0.00500
1,1-Dichloroethane	U		0.000259	0.00100
1,2-Dichloroethane	U		0.000361	0.00100
1,1-Dichloroethene	U		0.000398	0.00100
cis-1,2-Dichloroethene	U		0.000260	0.00100
trans-1,2-Dichloroethene	U		0.000396	0.00100
1,2-Dichloropropane	U		0.000306	0.00100
1,1-Dichloropropene	U		0.000352	0.00100
1,3-Dichloropropane	U		0.000366	0.00100
cis-1,3-Dichloropropene	U		0.000418	0.00100

Method Blank (MB)

(MB) R3134421-3 05/05/16 23:42

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
trans-1,3-Dichloropropene	U		0.000419	0.00100
2,2-Dichloropropane	U		0.000321	0.00100
Di-isopropyl ether	U		0.000320	0.00100
Ethylbenzene	U		0.000384	0.00100
Hexachloro-1,3-butadiene	U		0.000256	0.00100
Isopropylbenzene	U		0.000326	0.00100
p-Isopropyltoluene	U		0.000350	0.00100
2-Butanone (MEK)	U		0.00393	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100
Methyl tert-butyl ether	U		0.000367	0.00100
Naphthalene	U		0.00100	0.00500
n-Propylbenzene	U		0.000349	0.00100
Styrene	U		0.000307	0.00100
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100
Tetrachloroethene	U		0.000372	0.00100
Toluene	U		0.000780	0.00500
1,1,2-Trichlorotrifluoroethane	U		0.000303	0.00100
1,2,3-Trichlorobenzene	0.000238		0.000230	0.00100
1,2,4-Trichlorobenzene	U		0.000355	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100
1,1,2-Trichloroethane	U		0.000383	0.00100
Trichloroethene	U		0.000398	0.00100
Trichlorofluoromethane	U		0.00120	0.00500
1,2,3-Trichloropropane	U		0.000807	0.00250
1,2,3-Trimethylbenzene	U		0.000321	0.00100
1,2,4-Trimethylbenzene	U		0.000373	0.00100
1,3,5-Trimethylbenzene	U		0.000387	0.00100
Vinyl chloride	U		0.000259	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*100*			*90.0-115*
(S) Dibromofluoromethane	*99.9*			*79.0-121*
(S) 4-Bromofluorobenzene	*88.2*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134421-1 05/05/16 22:19 • (LCSD) R3134421-2 05/05/16 22:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	0.0986	0.107	78.9	85.4	28.7-175			7.93	20.9
Acrolein	0.125	0.105	0.103	84.1	82.5	40.4-172			1.90	20
Acrylonitrile	0.125	0.160	0.149	128	119	58.2-145			7.25	20
Benzene	0.0250	0.0243	0.0249	97.1	99.5	73.0-122			2.52	20
Bromobenzene	0.0250	0.0212	0.0220	85.0	88.0	81.5-115			3.51	20
Bromodichloromethane	0.0250	0.0229	0.0231	91.4	92.5	75.5-121			1.11	20
Bromoform	0.0250	0.0255	0.0255	102	102	71.5-131			0.150	20
Bromomethane	0.0250	0.0304	0.0306	122	123	22.4-187			0.600	20
n-Butylbenzene	0.0250	0.0229	0.0236	91.8	94.2	75.9-134			2.62	20
sec-Butylbenzene	0.0250	0.0209	0.0217	83.5	87.0	80.6-126			4.01	20
tert-Butylbenzene	0.0250	0.0208	0.0215	83.3	86.2	79.3-127			3.37	20
Carbon tetrachloride	0.0250	0.0203	0.0209	81.4	83.6	70.9-129			2.68	20
Chlorobenzene	0.0250	0.0227	0.0237	90.6	94.8	79.7-122			4.53	20
Chlorodibromomethane	0.0250	0.0233	0.0239	93.2	95.5	78.2-124			2.42	20
Chloroethane	0.0250	0.0308	0.0310	123	124	41.2-153			0.750	20
2-Chloroethyl vinyl ether	0.125	0.192	0.192	154	153	23.4-162			0.0400	23.5
Chloroform	0.0250	0.0227	0.0233	90.9	93.3	73.2-125			2.53	20
Chloromethane	0.0250	0.0282	0.0293	113	117	55.8-134			3.62	20
2-Chlorotoluene	0.0250	0.0226	0.0232	90.5	92.8	76.4-125			2.54	20
4-Chlorotoluene	0.0250	0.0215	0.0221	86.1	88.2	81.5-121			2.43	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0256	0.0246	102	98.4	64.8-131			3.84	20
1,2-Dibromoethane	0.0250	0.0240	0.0244	96.1	97.5	79.8-122			1.40	20
Dibromomethane	0.0250	0.0248	0.0248	99.3	99.4	79.5-118			0.0900	20
1,2-Dichlorobenzene	0.0250	0.0228	0.0236	91.1	94.4	84.7-118			3.58	20
1,3-Dichlorobenzene	0.0250	0.0211	0.0218	84.4	87.3	77.6-127			3.33	20
1,4-Dichlorobenzene	0.0250	0.0230	0.0238	91.9	95.0	82.2-114			3.37	20
Dichlorodifluoromethane	0.0250	0.0269	0.0274	107	110	56.0-134			2.03	20
1,1-Dichloroethane	0.0250	0.0252	0.0256	101	103	71.7-127			1.89	20
1,2-Dichloroethane	0.0250	0.0233	0.0233	93.2	93.2	65.3-126			0.0300	20
1,1-Dichloroethene	0.0250	0.0259	0.0263	104	105	59.9-137			1.59	20
cis-1,2-Dichloroethene	0.0250	0.0242	0.0249	96.7	99.6	77.3-122			2.95	20
trans-1,2-Dichloroethene	0.0250	0.0238	0.0241	95.2	96.5	72.6-125			1.35	20
1,2-Dichloropropane	0.0250	0.0266	0.0267	106	107	77.4-125			0.630	20
1,1-Dichloropropene	0.0250	0.0248	0.0256	99.2	103	72.5-127			3.32	20
1,3-Dichloropropane	0.0250	0.0254	0.0254	102	102	80.6-115			0.0800	20
cis-1,3-Dichloropropene	0.0250	0.0259	0.0263	104	105	77.7-124			1.58	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134421-1 05/05/16 22:19 • (LCSD) R3134421-2 05/05/16 22:40

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	0.0262	0.0263	105	105	73.5-127			0.500	20
2,2-Dichloropropane	0.0250	0.0233	0.0240	93.2	95.8	61.3-134			2.78	20
Di-isopropyl ether	0.0250	0.0268	0.0270	107	108	65.1-135			0.880	20
Ethylbenzene	0.0250	0.0225	0.0233	90.0	93.2	80.9-121			3.45	20
Hexachloro-1,3-butadiene	0.0250	0.0225	0.0231	90.1	92.2	73.7-133			2.33	20
Isopropylbenzene	0.0250	0.0215	0.0221	86.0	88.2	81.6-124			2.52	20
p-Isopropyltoluene	0.0250	0.0216	0.0224	86.6	89.5	77.6-129			3.31	20
2-Butanone (MEK)	0.125	0.151	0.147	121	117	46.4-155			3.09	20
Methylene Chloride	0.0250	0.0241	0.0245	96.5	98.1	69.5-120			1.62	20
4-Methyl-2-pentanone (MIBK)	0.125	0.162	0.155	130	124	63.3-138			4.33	20
Methyl tert-butyl ether	0.0250	0.0243	0.0239	97.1	95.8	70.1-125			1.32	20
Naphthalene	0.0250	0.0226	0.0229	90.3	91.7	69.7-134			1.47	20
n-Propylbenzene	0.0250	0.0224	0.0232	89.5	93.0	81.9-122			3.84	20
Styrene	0.0250	0.0230	0.0238	92.0	95.4	79.9-124			3.65	20
1,1,1,2-Tetrachloroethane	0.0250	0.0222	0.0229	88.8	91.5	78.5-125			2.95	20
1,1,2,2-Tetrachloroethane	0.0250	0.0242	0.0236	96.6	94.3	79.3-123			2.41	20
Tetrachloroethene	0.0250	0.0221	0.0228	88.6	91.1	73.5-130			2.78	20
Toluene	0.0250	0.0233	0.0239	93.4	95.5	77.9-116			2.18	20
1,1,2-Trichlorotrifluoroethane	0.0250	0.0263	0.0271	105	108	62.0-141			2.83	20
1,2,3-Trichlorobenzene	0.0250	0.0224	0.0233	89.7	93.1	75.7-134			3.70	20
1,2,4-Trichlorobenzene	0.0250	0.0226	0.0236	90.3	94.3	76.1-136			4.29	20
1,1,1-Trichloroethane	0.0250	0.0217	0.0222	87.0	88.8	71.1-129			2.08	20
1,1,2-Trichloroethane	0.0250	0.0236	0.0234	94.5	93.7	81.6-120			0.890	20
Trichloroethene	0.0250	0.0237	0.0239	94.8	95.5	79.5-121			0.720	20
Trichlorofluoromethane	0.0250	0.0251	0.0254	101	102	49.1-157			1.18	20
1,2,3-Trichloropropane	0.0250	0.0241	0.0242	96.2	96.8	74.9-124			0.580	20
1,2,3-Trimethylbenzene	0.0250	0.0225	0.0233	89.9	93.2	79.9-118			3.65	20
1,2,4-Trimethylbenzene	0.0250	0.0210	0.0218	84.1	87.1	79.0-122			3.49	20
1,3,5-Trimethylbenzene	0.0250	0.0208	0.0215	83.2	85.9	81.0-123			3.15	20
Vinyl chloride	0.0250	0.0284	0.0287	114	115	61.5-134			0.980	20
Xylenes, Total	0.0750	0.0666	0.0689	88.8	91.8	79.2-122			3.38	20
(S) Toluene-d8				*100*	*100*	*90.0-115*				
(S) Dibromofluoromethane				*101*	*101*	*79.0-121*				
(S) 4-Bromofluorobenzene				*86.1*	*85.4*	*80.1-120*				

L832663-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832663-01 05/06/16 01:42 • (MS) R3134421-4 05/06/16 00:03 • (MSD) R3134421-5 05/06/16 01:01

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Acetone	0.125	U	0.0502	0.0473	40.2	37.9	1	25.0-156			5.88	21.5
Acrolein	0.125	U	0.115	0.107	92.4	85.6	1	34.0-194			7.57	21.5
Acrylonitrile	0.125	U	0.131	0.120	105	96.1	1	55.9-161			8.42	20
Benzene	0.0250	U	0.0209	0.0199	83.8	79.8	1	58.6-133			4.91	20
Bromobenzene	0.0250	U	0.0196	0.0190	78.4	76.0	1	70.6-125			3.12	20
Bromodichloromethane	0.0250	U	0.0207	0.0200	82.8	80.2	1	69.2-127			3.24	20
Bromoform	0.0250	U	0.0226	0.0217	90.6	87.0	1	66.3-140			4.07	20
Bromomethane	0.0250	U	0.0228	0.0216	91.1	86.2	1	16.6-183			5.50	20.5
n-Butylbenzene	0.0250	U	0.0219	0.0206	87.5	82.2	1	64.8-145			6.26	20
sec-Butylbenzene	0.0250	U	0.0199	0.0190	79.5	75.8	1	66.8-139			4.81	20
tert-Butylbenzene	0.0250	U	0.0199	0.0188	79.8	75.2	1	67.1-138			5.91	20
Carbon tetrachloride	0.0250	U	0.0179	0.0167	71.6	66.9	1	60.6-139			6.72	20
Chlorobenzene	0.0250	U	0.0209	0.0198	83.7	79.4	1	70.1-130			5.30	20
Chlorodibromomethane	0.0250	U	0.0214	0.0209	85.6	83.6	1	71.6-132			2.32	20
Chloroethane	0.0250	U	0.0244	0.0233	97.5	93.2	1	33.3-155			4.57	20
2-Chloroethyl vinyl ether	0.125	U	ND	ND	0.000	0.000	1	5.00-149	J6	J6	0.000	40
Chloroform	0.0250	U	0.0209	0.0201	83.6	80.5	1	66.1-133			3.73	20
Chloromethane	0.0250	U	0.0193	0.0184	77.3	73.5	1	40.7-139			5.07	20
2-Chlorotoluene	0.0250	U	0.0211	0.0200	84.3	80.0	1	66.9-134			5.32	20
4-Chlorotoluene	0.0250	U	0.0200	0.0192	79.8	76.7	1	66.8-134			3.96	20
1,2-Dibromo-3-Chloropropane	0.0250	U	0.0220	0.0202	88.1	80.8	1	63.9-142			8.57	20.2
1,2-Dibromoethane	0.0250	U	0.0210	0.0202	83.9	80.8	1	73.8-131			3.82	20
Dibromomethane	0.0250	U	0.0213	0.0201	85.1	80.5	1	72.8-127			5.56	20
1,2-Dichlorobenzene	0.0250	U	0.0215	0.0202	86.1	80.8	1	77.4-127			6.38	20
1,3-Dichlorobenzene	0.0250	U	0.0197	0.0189	78.9	75.7	1	67.9-136			4.12	20
1,4-Dichlorobenzene	0.0250	U	0.0218	0.0206	87.2	82.2	1	74.4-123			5.86	20
Dichlorodifluoromethane	0.0250	U	0.0172	0.0167	68.9	66.7	1	42.2-146			3.22	20
1,1-Dichloroethane	0.0250	U	0.0225	0.0215	89.9	86.1	1	64.0-134			4.32	20
1,2-Dichloroethane	0.0250	U	0.0200	0.0190	80.2	76.1	1	60.7-132			5.21	20
1,1-Dichloroethene	0.0250	U	0.0211	0.0203	84.4	81.1	1	48.8-144			3.91	20
cis-1,2-Dichloroethene	0.0250	U	0.0216	0.0204	86.4	81.6	1	60.6-136			5.70	20
trans-1,2-Dichloroethene	0.0250	U	0.0194	0.0185	77.4	74.1	1	61.0-132			4.41	20
1,2-Dichloropropane	0.0250	U	0.0238	0.0228	95.2	91.4	1	69.7-130			4.09	20
1,1-Dichloropropene	0.0250	U	0.0207	0.0199	82.8	79.5	1	61.5-136			4.09	20
1,3-Dichloropropane	0.0250	U	0.0228	0.0219	91.3	87.4	1	74.3-123			4.27	20
cis-1,3-Dichloropropene	0.0250	U	0.0225	0.0217	90.0	86.7	1	71.1-129			3.73	20

L832663-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832663-01 05/06/16 01:42 • (MS) R3134421-4 05/06/16 00:03 • (MSD) R3134421-5 05/06/16 01:01

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
trans-1,3-Dichloropropene	0.0250	U	0.0230	0.0221	92.0	88.3	1	66.3-136			4.01	20
2,2-Dichloropropane	0.0250	U	0.0230	0.0199	92.1	79.6	1	54.9-142			14.5	20
Di-isopropyl ether	0.0250	U	0.0239	0.0227	95.7	90.7	1	59.9-140			5.35	20
Ethylbenzene	0.0250	U	0.0206	0.0198	82.4	79.1	1	62.7-136			4.13	20
Hexachloro-1,3-butadiene	0.0250	U	0.0214	0.0207	85.8	82.8	1	61.1-144			3.46	20.1
Isopropylbenzene	0.0250	U	0.0201	0.0191	80.3	76.2	1	67.4-136			5.13	20
p-Isopropyltoluene	0.0250	U	0.0203	0.0194	81.3	77.7	1	62.8-143			4.50	20
2-Butanone (MEK)	0.125	U	0.0920	0.0827	73.6	66.2	1	45.0-156			10.6	20.8
Methylene Chloride	0.0250	U	0.0206	0.0199	82.3	79.4	1	61.5-125			3.57	20
4-Methyl-2-pentanone (MIBK)	0.125	U	0.135	0.124	108	99.0	1	60.7-150			8.35	20
Methyl tert-butyl ether	0.0250	U	0.0209	0.0194	83.8	77.7	1	61.4-136			7.47	20
Naphthalene	0.0250	U	0.0199	0.0190	79.4	76.0	1	61.8-143			4.39	20
n-Propylbenzene	0.0250	U	0.0209	0.0199	83.5	79.7	1	63.2-139			4.59	20
Styrene	0.0250	U	0.0213	0.0205	85.4	82.0	1	68.2-133			4.07	20
1,1,1,2-Tetrachloroethane	0.0250	U	0.0212	0.0200	84.9	80.0	1	70.5-132			5.94	20
1,1,2,2-Tetrachloroethane	0.0250	U	0.0223	0.0209	89.2	83.8	1	64.9-145			6.21	20
Tetrachloroethene	0.0250	U	0.0195	0.0184	77.9	73.4	1	57.4-141			6.00	20
Toluene	0.0250	U	0.0208	0.0198	83.1	79.2	1	67.8-124			4.79	20
1,1,2-Trichlorotrifluoroethane	0.0250	U	0.0227	0.0214	90.8	85.8	1	53.7-150			5.72	20
1,2,3-Trichlorobenzene	0.0250	0.000360	0.0206	0.0197	80.8	77.5	1	65.7-143			4.10	20
1,2,4-Trichlorobenzene	0.0250	U	0.0215	0.0203	85.8	81.0	1	67.0-146			5.74	20
1,1,1-Trichloroethane	0.0250	U	0.0196	0.0181	78.3	72.3	1	58.7-134			7.93	20
1,1,2-Trichloroethane	0.0250	U	0.0214	0.0204	85.4	81.8	1	74.1-130			4.41	20
Trichloroethene	0.0250	U	0.0201	0.0191	80.6	76.2	1	48.9-148			5.56	20
Trichlorofluoromethane	0.0250	U	0.0228	0.0217	91.3	86.7	1	39.9-165			5.16	20
1,2,3-Trichloropropane	0.0250	U	0.0213	0.0201	85.0	80.5	1	71.5-134			5.51	20
1,2,3-Trimethylbenzene	0.0250	U	0.0212	0.0199	84.7	79.5	1	62.7-133			6.34	20
1,2,4-Trimethylbenzene	0.0250	U	0.0196	0.0186	78.4	74.5	1	60.5-137			5.10	20
1,3,5-Trimethylbenzene	0.0250	U	0.0196	0.0183	78.3	73.1	1	67.9-134			6.84	20
Vinyl chloride	0.0250	U	0.0208	0.0197	83.3	78.9	1	44.3-143			5.47	20
Xylenes, Total	0.0750	U	0.0606	0.0582	80.8	77.6	1	65.6-133			4.01	20
(S) Toluene-d8					*99.3*	*99.2*		*90.0-115*				
(S) Dibromofluoromethane					*100*	*99.3*		*79.0-121*				
(S) 4-Bromofluorobenzene					*85.7*	*85.8*		*80.1-120*				

Method Blank (MB)

(MB) R3134703-3 05/07/16 01:08

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Naphthalene	U		0.00100	0.00500
(S) Toluene-d8	*100*			*90.0-115*
(S) Dibromofluoromethane	*98.1*			*79.0-121*
(S) 4-Bromofluorobenzene	*89.0*			*80.1-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3134703-1 05/06/16 23:26 • (LCSD) R3134703-2 05/06/16 23:46

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.0250	0.0215	0.0220	85.8	88.2	69.7-134			2.69	20
(S) Toluene-d8				*98.1*	*99.2*	*90.0-115*				
(S) Dibromofluoromethane				*99.3*	*98.6*	*79.0-121*				
(S) 4-Bromofluorobenzene				*85.7*	*88.0*	*80.1-120*				

L832643-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L832643-09 05/07/16 02:50 • (MS) R3134703-4 05/07/16 01:29 • (MSD) R3134703-5 05/07/16 01:49

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Naphthalene	0.0250	U	0.0206	0.0216	82.3	86.4	1	61.8-143			4.78	20
(S) Toluene-d8					*99.6*	*98.7*		*90.0-115*				
(S) Dibromofluoromethane					*101*	*99.8*		*79.0-121*				
(S) 4-Bromofluorobenzene					*86.4*	*86.4*		*80.1-120*				

Method Blank (MB)

(MB) R3133524-1 05/03/16 11:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) High Fraction	U		0.0247	0.100
(S) o-Terphenyl	*102*			*50.0-150*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3133524-2 05/03/16 11:46 • (LCSD) R3133524-3 05/03/16 12:02

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	1.50	1.89	1.61	126	107	50.0-150			15.8	20
(S) o-Terphenyl				*103*	*106*	*50.0-150*				

Method Blank (MB)

(MB) R3133911-1 05/04/16 12:37

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
TPH (GC/FID) High Fraction	U		0.0247	0.100
(S) o-Terphenyl	*104*			*50.0-150*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3133911-2 05/04/16 12:54 • (LCSD) R3133911-3 05/04/16 13:10

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
TPH (GC/FID) High Fraction	1.50	1.53	1.60	102	107	50.0-150			4.89	20
(S) o-Terphenyl				*101*	*105*	*50.0-150*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND,U	Not detected at the Sample Detection Limit.
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.
SDL	Sample Detection Limit.
MQL	Method Quantitation Limit.
Unadj. MQL	Unadjusted Method Quantitation Limit.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**

***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660
Alaska	UST-080
Arizona	AZ0612
Arkansas	88-0469
California	01157CA
Colorado	TN00003
Conneticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia [1]	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky [1]	90010
Kentucky [2]	16
Louisiana	AI30792
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086
Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico	TN00003
New York	11742
North Carolina	Env375
North Carolina [1]	DW21704
North Carolina [2]	41
North Dakota	R-140
Ohio–VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	221
South Carolina	84004
South Dakota	n/a
Tennessee [1 4]	2006
Texas	T 104704245-07-TX
Texas [5]	LAB0152
Utah	6157585858
Vermont	VT2006
Virginia	109
Washington	C1915
West Virginia	233
Wisconsin	9980939910
Wyoming	A2LA

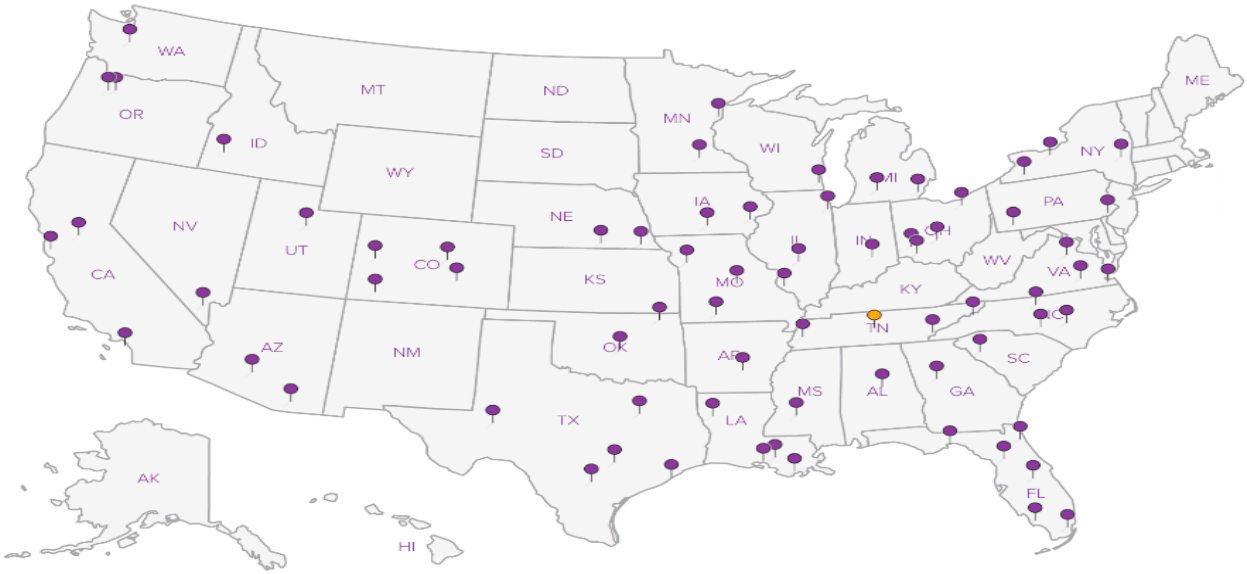
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01
A2LA – ISO 17025 [5]	1461.02
Canada	1461.01
EPA–Crypto	TN00003
AIHA	100789
DOD	1461.01
USDA	S-67674

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Akana - Richardson, TX

1850 N. Greenville Ave.
Suite 170
Richardson, TX 75081

Billing Information:
Accounts Payable
6400 SE Lake Rd., Ste. 270
Portland, OR 97222

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Chain of Custody Page ___ of ___

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12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L832663

I177

Acctnum: AKANARTX
Template: T111578
Prelogin: P550211
TSR: 526 - Chris McCord
PB: 4/18/16 90
Shipped Via: FedEX Ground

Report to: Brent Hamil

Email To: brent.hamil@akana.us

Project Description: Duck Valley Indian Reservation

City/State Collected:

Phone: 214-676-2274
Fax:

Client Project #: Akana-16-005

Lab Project #: AKANARTX-16-005

Collected by (print):

Site/Facility ID #: OWYHEE, NV

P.O. #: PO # (16-005 Task 4)

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DROLVI 40mlAmb-HCl-BT	GRO 40mlAmb HCl	V8260 40mlAmb-HCl							Rem./Contaminant	Sample # (lab only)
~~MW-1~~		~~GW~~				~~7~~	~~X~~	~~X~~	~~X~~								
MW-5R	G	GW	NA	4-27-16	905	7	X	X	X								-01
MW-6	↑	GW	↑	4-28-16	1015	7	X	X	X								02
MW-7		GW		4-27-16	1240	7	X	X	X								03
MW-8		GW		4-28-16	930	7	X	X	X								04
MW-9		GW		4-28-16	840	7	X	X	X								05
MW-10		GW		4-27-16	1420	7	X	X	X								06
MW-11		GW		4-28-16	1050	7	X	X	X								07
MW-12	↓	GW	↓	4-27-16	810	7	X	X	X								08
MW-14	G	GW	NA	4-27-16	1540	7	X	X	X								09

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

6711 0336 5533

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ ___	Condition: (lab use only)
[signature]	4-30-16	1000			JW7
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.1 °C Bottles Received: 147+3+B	COC Seal Intact: ___Y ___N ___NA
Relinquished by : (Signature)	Date:	Time:	Received for lab by (Signature) [signature]	Date: 4-30-16 Time: 9:00	pH Checked: NCF: 1

Akana - Richardson, TX

1850 N. Greenville Ave.
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Richardson, TX 75081

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ESC LAB SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Report to: Brent Hamil

Email To: brent.hamil@akana.us

Project Description: Duck Valley Indian Reservation

City/State Collected:

Phone: 214-676-2274
Fax:

Client Project #: Akana-16-005

Lab Project #: AKANARTX-16-005

Collected by (print):

Site/Facility ID #: OWYHEE, NV

P.O. #: PO # (16-005 Task 4)

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X___Yes
FAX? ___No ___Yes

L# L832643

Table #

Acctnum: AKANARTX
Template: T111578
Prelogin: P550211
TSR: 526 - Chris McCord
PB: [illegible]
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DROLVI 40mlAmb-HCl-BT	GRO 40mlAmb HCl	V8260 40mlAmb-HCl								Rem./Contaminant	Sample # (lab only)
MW-15	G	GW	NA	4-27-16	1000	7	X	X	X									10
MW-19	↑	GW	↑	4-27-16	1335	7	X	X	X									11
MW-20		GW		4-27-16	1505	7	X	X	X									12
MW-21		GW		4-27-16	1050	7	X	X	X									13
MW-22		GW		4-28-16	1140	7	X	X	X									14
MW-23		GW		4-28-16	1305	7	X	X	X									15
MW-24		GW		4-28-16	1355	7	X	X	X									16
MW-25		GW		4-27-16	1135	7	X	X	X									17
MW-26	↓	GW	↓	4-27-16	1805	7	X	X	X									18
MW-27	G	GW	NA	4-27-16	1725	7	X	X	X									19

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ ___	Condition: (lab use only)
[signature]	4-30-16	1000	[signature]		[illegible]
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.1 °C Bottles Received: 1971318	COC Seal Intact: ___Y ___N ___NA
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) [signature]	Date: 4-30-16 Time: 9:00	pH Checked: NCF: ✓

Akana - Richardson, TX

1850 N. Greenville Ave.
Suite 170
Richardson, TX 75081

Billing Information:
Accounts Payable
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Portland, OR 97222

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
YOUR LAB OF CHOICE
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Report to: Brent Hamil

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Project Description: Duck Valley Indian Reservation

City/State Collected:

Phone: 214-676-2274
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Client Project #: Akana-16-005

Lab Project #: AKANARTX-16-005

Collected by (print): Brent Hamil

Site/Facility ID #: OWYHEE, NV

P.O. #: PO # (16-005 Task 4)

Collected by (signature): [signature]

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

L# L832663

Table #

Acctnum: AKANARTX
Template: T111578
Prelogin: P550211
TSR: 526 - Chris McCord
PB: 4/28/16 [illegible]
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	DROLVI 40mlAmb-HCl-BT	GRO 40mlAmb HCl	V8260 40mlAmb-HCl							Rem./Contaminant	Sample # (lab only)
MW-28	G	GW	NA	4-28-16	1225	7	X	X	X								20
MW-29	G	GW	NA	4-27-16	1640	7	X	X	X								21
~~MW-30~~		~~GW~~				~~7~~	~~X~~	~~X~~	~~X~~								
		GW				7	X	X	X								
		GW				7	X	X	X								
		GW				7	X	X	X								
		GW				7	X	X	X								
		GW				7	X	X	X								

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ ____	Condition: (lab use only)
[signature]	4-30-16	1000	[illegible]		SWT
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.7 °C Bottles Received: 1+17+3TB	COC Seal Intact: ___Y ___N ___NA
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) [signature]	Date: 4/30/16 Time: 9:00	pH Checked: NCF: ✓

Andy Vann

ESC Lab Sciences
Non-Conformance Form

Login #: L832663	Client: AKANARTX	Date: 4/30/16	Evaluated by: Rosie

Non-Conformance (check applicable items)

	Sample Integrity		Chain of Custody Clarification		
	Parameter(s) past holding time	x	Login Clarification Needed		**If Broken Container:**
	Improper temperature		Chain of custody is incomplete		Insufficient packing material around container
	Improper container type		Please specify Metals requested.		Insufficient packing material inside cooler
	Improper preservation		Please specify TCLP requested.		Improper handling by carrier (FedEx / UPS / Cour
	Insufficient sample volume.	x	Received additional samples not listed on coc.		Sample was frozen
	Sample is biphasic.		Sample ids on containers do not match ids on coc		Container lid not intact
	Vials received with headspace.		Trip Blank not received.		**If no Chain of Custody:**
	Broken container		Client did not "X" analysis.		Received by:
	Broken container:		Chain of Custody is missing		Date/Time:
	Sufficient sample remains				Temp./Cont. Rec./pH:
					Carrier:
					Tracking#

Login Comments: Received MW-13 4/28/16 1500 not listed on Chain

Client informed by:		Call	x	Email		Voice Mail		Date:5/2/16	Time:10:45
TSR Initials:CM	Client Contact: Carol Townsend								

Login Instructions:

Log MW-13 for DROLVI, GRO and V8260.

This E-mail and any attached files are confidential, and may be copyright protected. If you are not the addressee, any dissemination of this communication is strictly prohibited. If you have received this message in error, please contact the sender immediately and delete/destroy all information received.

APPENDIX G

SAMPLING AND ANALYSIS PLAN

(133 Pages)

SAMPLING AND ANALYSIS PLAN (SAP)

Investigation/Monitoring Petroleum Impacts
Shoshone Paiutes of Duck Valley

U.S. Bureau of Indian Affairs
Solicitation No: A16PS00132
Order No: A16PX00431
Akana Project No. 16-005

March 3, 2017

Prepared by

AKANA
Plan + Design + Engineer + Manage

6400 SE Lake Road, Suite 270
Portland, OR 97222

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1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) presents procedures to be used during the installation of soil borings; the installation and development of groundwater monitoring wells; and soil and groundwater sampling activities for the BIA – Duck Valley Project. The primary objective of these procedures is to provide a sampling methodology consistent with accepted good practice and which will maximize accuracy, reproducibility, and comparability of data between sampling events. These procedures are based on accepted practice as provided in various guidance documents (e.g. U.S. EPA 1986, U.S. EPA 2007).

1.1 SUBCONTRACTOR SUPPORT

Akana will be self-performing all of the professional services for this project. Akana will be working with two major subcontractors to provide drilling and analytical laboratory services:

- Cascade Drilling, Inc. (Cascade Drilling)– Akana has selected Cascade Drilling to provide direct push drilling and well abandonment services. Cascade Drilling will be mobilizing from their Boise, ID office.
- ESC Lab Sciences (ESC Labs) – Akana has selected ESC Labs to provide analytical services for this project. ESC operates the largest single location laboratory in the nation.
- Wallace Mooring Surveying, Inc. (WMS) – Akana has selected WMS to perform the top of casing survey for all existing monitor wells and any newly installed monitoring wells. WMS is a Registered Professional Land Surveyor (RPLS) in the State of Nevada and is located nearby in Elko, NV.
- EnviroCare Inc. – EnviroCare, which is located in Elko, Nevada, will provide waste profiling, waste disposal and waste transportation services as well as provide Akana with totes and drums to store investigation derived waste.

1.2 SAMPLING LOCATIONS AND SCHEDULES

Groundwater samples will be collected from twenty three (23) existing monitoring wells (MW 1, 5R, 6-12, 14, 15, 19-30) during a preliminary groundwater sampling event. The locations of the existing wells are shown on Figure 1 in Attachment A. Akana will perform Phase II field work including the installation of five (5) new groundwater monitoring wells and the collection of soil samples from 20 borings. The proposed monitor well locations and soil borings are provided on Figure 2 in Attachment A. Following the installation the additional monitoring wells, four quarterly groundwater sampling events will be conducted for all existing wells.

2.0 FIELD PROCEDURES

Well installation and environmental sample collection activities will be conducted at the site during the Phase II field investigation. This document presents the soil and groundwater sample collection methods and procedures to be performed at the site and includes those methods that are to be expected given the facility setting and end-goals. Field sampling and laboratory procedures, when applicable, will be performed in general accordance with the U.S. Environmental Protection Agency (EPA) and other pertinent documents listed in Section 12.

Environmental samples will be collected in sufficient volume to perform field measurements and laboratory analyses, and to provide for quality control (QC) samples.

Field personnel will wear chemical resistant gloves when collecting samples. Sampling equipment may consist of split spoons, Shelby-tubes, steel hand augers, bailers, or other types of sampling equipment appropriate for the environmental media being addressed. A clean stainless steel trowel or other appropriate tool, or gloved hand will be used to transfer the sample from the sampling equipment to the laboratory container. At the time of collection, samples will be placed in properly preserved containers according to the sample matrix and requested analyses. Samples will be accompanied to the analytical laboratory by a chain-of-custody record. During storage and subsequent shipment to the laboratory, samples will be placed on ice and protected from ultraviolet light. Sample preservation requirements and holding times for each constituent group will be in accordance with the appropriate EPA Method. Sample containers used will be supplied by the laboratory and will contain the appropriate preservative.

2.1 DRILLING AND BOREHOLE PROCEDURES

Soil borings will be installed in accordance with the procedures described below in order to collect samples for physical and chemical laboratory analyses, to assist in characterizing the site geology/hydrogeology, and to install monitoring wells. All abandoned boreholes will be filled, sealed and plugged with a cement/bentonite slurry.

The selected drilling methods described below apply to drilling in subsurface materials, including but not limited to: sand; gravel; clay; silt; and man-made fill (unconsolidated). Drilling methods are selected based on the site geology and terrain; purpose of drilling; type of sampling/testing; and the overall subsurface exploration program proposed for the site (i.e., depth, temporary-vs-permanent, etc). Several drilling methods applicable to the proposed program are discussed below with indications of the preferred method to be utilized. The other methods discussed are for the purpose of "Plan B" planning should they prove to be necessary. The method(s) were selected based on the available information from past investigations and how well each method meets the sampling and testing requirements of the Phase II drilling program.

2.1.1 Direct Push

This type of soil sampling utilizes a hydraulic ram that pushes the core-barrel into the soil. The core barrel then cuts an "undisturbed" soil sample and the barrel is advanced. The barrels are usually lined with a sleeve that contains the soil sample. The advantage of this method is the minimization of soil cuttings and potential cross-contamination. The disadvantage is that the depth that can be achieved is determined by the nature and density of the soil. Any course-grained soil layers will limit the advancement of the barrel.

2.1.2 Hollow-Stem Auger

This type of auger consists of a hollow, steel stem or shaft with a continuous, spiraled steel flight, welded onto the exterior. A hollow auger bit, generally with carbide plates or teeth, disturbs soil material when rotated, whereupon the spiral flights transport the cuttings to the surface. This method is best suited in soils that have a tendency to collapse when disturbed.

2.2 SOIL BORINGS

Twenty (20) soil borings will be advanced at selected site locations utilizing a truck mounted, direct-push probe. Information obtained from the soil borings will be used to further characterize and delineate total petroleum hydrocarbon (TPH)-impacted soil in the area between "L" and "N" Streets, in the vicinity of monitoring wells MW-13 and MW-16, TPH-diesel (TPHd)-impacted soil in the vicinity of well MW-10 on the east and west sides of Highway 225, and in areas where soil contamination was not fully delineated during past investigations. Soil sampling will be performed by a direct-push probe while utilizing a continuous core sampler. Soil samples will be collected using a 1.5-inch inner diameter (ID) to 2-inch outer diameter (OD) core barrel depending on the model drilling rig utilized. In this method, the probe and core barrel are "drilled-through" the target sample zone. As an alternative, undisturbed samples may be collected for qualitative analytical and/or quantitative physical laboratory tests by collecting relatively undisturbed samples may be obtained by pushing a section of 3-inch OD, 16 gauge, steel tubing (Shelby tube) into the soil at the selected sampling depths. In this method, the augers are advanced to the top of the target sample zone, the hollow-stem plug removed, and the Shelby Tube or Split-Spoon sampler is pushed into the soil column through the auger annulus. This procedure is described in the EPA document *Operating Procedure for Soil Sampling* (EPA, 2007). Each tube, together with the encased soil, will be carefully removed from the ground, the sample extracted from the tube and immediately placed in the soil sample container supplied by the third-party laboratory, labeled, preserved, and transported to the laboratory.

From every five-foot (5-ft) interval of core, representative field analysis will be performed (from a depth interval NOT retained for laboratory analysis). From each 5-ft of core, a representative sample will be placed in a new, clean, quart-sized, Ziploc bag. The bag will be sealed allowing the field sample to volatilize for a minimum of 15-minutes and a maximum of 30-minutes. The presence of volatile organic compounds (VOCs) in the extracted soil sample will be measured using a calibrated photo-ionization detector (PID). The numerical responses will be recorded on the Soil Boring Log (see Attachment B), and the soil sample with the highest VOC measurement will be submitted to the laboratory for chemical analysis.

Locations and depths of samples will be shown on the Soil Boring Log (see Attachment B). The sample containers will be labeled to indicate the following:

- Project name,
- Project number,
- Sample identifier,
- Date of sample collection,
- Sample depth interval (top and bottom).

Soil Boring and Sample Nomenclature – At the time of the field implementation, sample nomenclature will be determined for borings and sample identification to be included on all forms and reports. As an example AB-1 (0.5-3′) (Akana Boring-1 (Depth)).

Soil samples will be stored and preserved in ice chests as per the sample handling procedures discussed below. Pertinent information will be recorded in the field notebook.

The field geologist/environmental scientist/technician will complete a lithologic log for each boring based on a visual review of the soil samples and soil cuttings. The lithology will be recorded on a Soil Boring Log (see Attachment B). Soil samples will be classified according to the Unified Soil Classification System (USCS), and physical soil characteristics (I.e., moisture content, consistency, odor, color, etc.), drilling difficulty, sample recovery, and soil type will be noted. Drilling and soil sampling equipment will be decontaminated in accordance with the procedures herein before introduction into the borehole.

2.3 MONITORING WELL INSTALLATION

In order to assist in the evaluation of groundwater flow direction and potential petroleum impacts, five (5) additional groundwater monitoring wells will be installed at the site. Well installation procedures are discussed below.

2.3.1 Monitor Well Installation Procedures

Monitor wells will be installed to characterize groundwater flow and quality at the site with regards to potential petroleum hydrocarbon impacts. Each monitor well will be constructed in accordance with ASTM *Standard Guide for Design and Installation of Groundwater Monitoring Wells* (D5092-04, 2004).

Monitoring wells will be constructed of 2-inch diameter schedule 40 polyvinylchloride (PVC) well screen and casing. Factory slotted 0.010-inch PVC well screen will be utilized in the lower 10 feet of each well. The annular space around the well screen will be filled with an appropriate filter pack (clean sand) to a height of 2 to 3 feet above the well screen. Four to five feet of bentonite pellets will be placed over the sand pack, followed by cement for the surface completion. Each well will be completed with a surface casing for protection with a flush mount surface completion.

2.3.2 Well Development

Newly completed monitor wells will be developed using bailing methods to remove fine-grained sediment and to improve communication with the water-bearing strata. Bailing techniques involve removing sediment and water from the well using a PVC, Teflon™, or disposable bailer attached to a nylon or polyethylene rope. Development will be terminated when the ground water appears to be free of suspended sediment and the pH, temperature and specific conductivity and turbidity measurements of the groundwater have stabilized as follows:

- +/- 0.2 units for pH
- +/- 3% for temperature
- +/- 10% for specific conductance
- +/- 10% for turbidity

Well development water will be containerized and managed in accordance with these procedures. Wells will be allowed to rest for at least 24 hours prior to groundwater sampling.

2.3.3 Documentation

Field personnel will record pertinent well installation information in the field notebook and on a Well Installation Record Form (see Attachment C), and well development information on the Well Development Data Form (see Attachment D).

2.4 SURVEY OF MONITOR WELLS

Groundwater flow direction and seasonal flow variations will be determined through performance of quarterly elevation surveys at four month intervals during the one year groundwater monitoring period. The grade elevation at the top of casing for each of the twenty three (23) existing and five (5) new monitoring wells will be surveyed by a registered land surveyor using standard surveying procedures. Akana field personnel will use a handheld global positioning system (GPS) device to collect latitude and longitude information for the new monitoring wells subsequent to well installation. Top-of-casing (TOC) elevations will be determined by a Registered Professional Land Surveyor. Monitor well head caps will be removed to allow the well casing pressure to equilibrate to atmospheric pressure prior to measuring the static water level. The depth to groundwater will be measured using TOC elevation as a reference point. Potentiometric surface maps illustrating aquifer characteristics will be prepared by Akana following each elevation survey.

3.0 ENVIRONMENTAL SAMPLING

This Section discusses the key aspects of sample planning, collection, handling and shipping.

3.1 EQUIPMENT AND SUPPLIES

Field personnel responsible for environmental sampling will verify that necessary equipment and supplies for obtaining soil and groundwater samples at the site are available. A routine equipment check will be performed that includes the following:

- Meters, probes, standards and other field measurement equipment;
- Filtration equipment, if applicable;
- Appropriate sample containers with labels;
- Applicable field and trip blanks;
- Sample shippers or coolers;
- Bagged ice;
- Electronic water level indicator;
- Bound Field book and indelible ink marker;
- Appropriate field sampling record forms;
- Chain of Custody forms;
- Well evacuation equipment;
- Disposable or dedicated bailer(s), or pump(s) and dedicated tubing;
- Cleaning and decontamination solutions, distilled water, and decontamination equipment, including buckets and scrub brushes and plastic sheeting, etc.;
- Other necessary equipment, such as monitoring well keys, tools, camera, and calculator, Personal Protection Safety Equipment, Health and Safety Plan, copy of Sampling and Analysis Procedures, and copy of the Work Plan.

3.2 SAMPLE COLLECTION SEQUENCE

When the selected analytical sample suite for a soil or groundwater sample includes more than one set of parameters, the samples will be collected in the following order owing to each constituent group's stability:

Sequence	Parameter
1.	pH, Specific Conductance, Temperature and Turbidity
2.	Volatile Organic Compounds
3.	Polycyclic Aromatic Hydrocarbons
4.	Total Petroleum Hydrocarbons

3.3 SOIL SAMPLING PROCEDURES

Procedures for soil sampling will be performed in accordance with EPA *Operating Procedure for Soil Sampling* (EPA, 2007), and the EPA *Soil Screening Guidance User's Guide* (EPA, 1996)

Soil samples will be obtained using borings advanced by a drill rig. Soil samples will be removed from the sampler and placed in appropriate containers until the containers are full or the sample volume has been exhausted. Threads on the container and lid should be cleaned to ensure a tight seal when closed. If samples are to be analyzed for VOCs, they should be collected in a manner that minimizes disturbance of the sample.

The soil sampling equipment will be decontaminated between each sample collection activity. The laboratory and field cleaning procedures will follow decontamination methods described in these procedures.

3.3.1 Container Type, Sample Preservation, and Holding Times

The soil sample container types, preservation, and holding times are summarized below.

Test Description	Method(s)	Recommended Quantity	Preservation	Holding Time
Volatile Organics (VOCs) - 10 Day TAT				
VOCs	8260B	2 - 4 oz. Jars	Cool $\leq 6^{o}C$	14 days
Total Petroleum Hydrocarbons (TPH) - 10 Day TAT				
TPH-DRO - GRO	8015D	2 - 4 oz. Jars	Cool $\leq 6^{o}C$	14 days
Polycyclic Aromatic Hydrocarbons (PAH) 10 Day TAT				
PAHs	8310/ 8270 SIM	1 - 4oz glass jar	Cool $<6^{o}C$	14 days

3.4 GROUNDWATER SAMPLING PROCEDURES

Groundwater quality samples will be collected from the monitor wells for laboratory analysis in accordance with the EPA *Operating Procedure for Groundwater Sampling* (EPA, 2007).

3.4.1 Water Level Measurements

Prior to well purging and ground-water sampling, the (1) depth to ground water and (2) total well depth from the top of well casing will be measured to the nearest 0.01 ft. using an interface device that distinguishes between water and hydrocarbon. Note that if light, non-aqueous, phase-separated hydrocarbon is identified floating on the top of the water column, the thickness will be measured but the groundwater will not be sampled or field tested. Water levels will be measured from an established, surveyed measuring point marked on top of the well casing.

When using the interface electronic fluid level indicator, the probe will be inserted into the well and lowered to the fluid surface. The depth to fluid, relative to the measuring point, will be determined from the electronic indicator. This distance, top of well casing to top of fluid, will be recorded to determine the groundwater elevation to the nearest 0.01 foot. If light non-aqueous phase liquid (LNAPL) is encountered, the depth to LNAPL and depth to groundwater will both be recorded. All measurements will be recorded in a bound, water-resistant field notebook and on the Groundwater Sampling Field Data Sheet (see Attachment E) and on the Fluid Level Measurement Record (see Attachment F).

The electronic tape will be decontaminated after each use by the following method in accordance with EPA *Operating Procedures for Field Equipment Cleaning and Decontamination* (EPA, 2007):

- Wash with soap and tap water
- Rinse with tap water
- Rinse with de-ionized water

3.4.2 Well Purging

Prior to collecting groundwater samples, monitoring wells will be purged. With respect to the groundwater chemistry, an adequate purge is achieved when the pH, specific conductance, and temperature of the ground water have stabilized and the turbidity has

either stabilized or is below 10 Nephelometric turbidity units (NTUs). Stabilization occurs when, for at least three consecutive measurements:

- ± 0.1 for pH
- ± 3% for conductivity
- ± 10 mv for redox potential
- ± 10% for dissolved oxygen (DO)
- ± 10% for turbidity
- the temperature is constant

3.4.3 Low-Flow (Minimal Drawdown) Groundwater Sampling

Wells should be sampled immediately following, but no later than 2 hours after purging. Akana personnel will wear disposable, powder free nitrile gloves when collecting samples to prevent possible cross contamination. The gloves will be changed between sample locations. Groundwater samples will be obtained using a peristaltic pump or a submersible pump, dedicated tubing, and an in-line flow-through cell.

The pump or tubing will be slowly and carefully lowered to the middle of the screened interval or slightly above the middle. This is to minimize excessive mixing of the stagnant water in the casing above the screen with the screened interval zone water, and to minimize resuspension of solids which will have collected at the bottom of the well. The sampling flow rate may remain at the established purge rate or may be adjusted slightly to minimize aeration, bubble formation, turbulent filling of sample bottles or loss of volatiles due to extended residence time in tubing. Typically, flow rates less than 0.15 gallons per minute are appropriate. Sampling will occur in a progression from least to most contaminated well.

Upon parameter stabilization, sampling can be initiated as follows:

- The in-line device will be disconnected or bypassed and the sample containers will be filled.
- Groundwater samples will be placed in appropriate containers containing the proper preservative, where appropriate. The containers will then be placed on ice in a shipping container for storage prior to delivery to the laboratory.

- Temperature, pH, specific conductivity and turbidity of the sample will be measured in the field at the time of sample collection. The field measurement data will be recorded on the Groundwater Sampling Field Data Sheet (see Attachment E).

- Information pertinent to the groundwater sampling activities will be recorded in the field notebook and on the Groundwater Sampling Field Data Sheet (see Attachment E).

3.4.4 Container Type, Sample Preservation, and Holding Times

The groundwater sample container types, preservation, and holding times are summarized below.

Test Description	Method(s)	Recommended Quantity	Preservation	Holding Time
Volatile Organics (VOCs) - 10 Day TAT				
VOCs	8260B	3 x 40 ml Glass	Cool ≤6°C, HCl	7 days/14 days preserved
Total Petroleum Hydrocarbons (TPH) - 10 Day TAT				
TPH-DRO - GRO	8015D	3 x 40 ml Glass	Cool ≤6°C, HCl	14 days
Polycyclic Aromatic Hydrocarbons (PAH) 10 Day TAT				
PAH SIM	8270C SIM	3 x 40ml Amber vials	Cool <6°C	7 days
Naturally-Occurring Electron Acceptors 10 Day TAT (5 samples)				
Nitrate	300.0	125 mL plastic	Cool <6C, None	48 hrs.
Sulfate	300.0	1 Liter plastic	Cool <6C, None	28 days
Total Alkalinity	2320 B		Cool <6C, None	14 days
TDS	2540C		Cool <6C, None	7 days
Dissolved Iron	200.7	500 mL plastic	Cool <6C, None	7 days
Dissolved Manganese	200.7		Cool <6C, None	7 days

3.5 SAMPLE IDENTIFICATION AND SHIPMENT

All samples will be labeled in a clear and consistent fashion. Each sample container will be identified by affixing a pressure-sensitive adhesive label. The label will be either waterproof or sealed with a clear, waterproof adhesive tape after proper completion of the label. The label information will include the sample identification number, date and time of sample collection, source of sample, preservative(s) used, if any, and the collector's initials.

The label will be completed with waterproof ink. This information will also be recorded in a bound, water-resistant field book.

Chain of Custody Records included with the sample shippers/coolers will also be completed to establish a tracking record for the samples and to provide historical documentation. After the samples are collected and stored in a cooler with ice, the field sampling personnel will sign the Chain of Custody Record in preparation for shipment of the samples to the laboratory.

The samples will be shipped via commercial overnight shipping or laboratory courier service to the laboratory the same day as sample collection or as soon as possible, thereafter. The shipping container will be designed to prevent breakage, spillage and contamination of the samples and will be securely sealed and clearly labeled.

3.6 RECORD KEEPING

Pertinent details of the field activities will be documented in a bound, water-resistant field notebook. The information will include procedures used, observations made, results obtained and pertinent logistic information. Deviations from the procedures specified in these procedures will also be documented in the field notebook. Additional forms and records that will document field activities may include the following:

1. Soil Boring Log;
2. Soil Sampling Field Data Record;
3. Monitoring Well Installation Record;
4. Well Development Field Record;
5. Groundwater Sampling Field Data Record;
6. Water Levels on Groundwater Sampling Field Data Record; and
7. Chain of Custody Record.

These documents (forms, records and notebooks) will contain sufficient information to allow reconstruction of field activities and sample handling procedures, if needed at a later date. The documents will be legible, identifiable and retrievable.

A centralized project file will be maintained. The file will contain the data, records, forms and other documents pertaining to project activities.

3.7 DECONTAMINATION PROCEDURES

Decontamination procedures for drilling and field sampling equipment and sample containers are provided in the following sections.

3.7.1 Sampling Equipment Cleaning Procedures

Prior to conducting drilling activities at each sampling location, the following field equipment will be steam-cleaned:

- Drill rods and augers;
- Sampling devices and drill bits;
- Pipe wrenches and tools that come in contact with downhole materials; and
- Working end of drill rig.

Appropriate materials, equipment and transport vehicles will be steam cleaned before arriving and before leaving the site. Non-dedicated sampling equipment will be washed between sample collection activities using phosphate-free detergent and thoroughly rinsed with potable water followed by a distilled water rinse. The use of rig lubricants, fuels, and hydraulic fluids will be closely monitored to avoid their introduction into the borehole.

Field cleaning procedures for non-dedicated stainless steel, Teflon and PVC sampling equipment will be performed between each sampling episode, as follows, to reduce possible cross-contamination between boreholes and sample locations.

1. Clean with tap water and laboratory grade detergent, using a brush if necessary, to remove particulate matter and surface films. Steam cleaning may be necessary to remove matter that is difficult to remove with a brush.
2. Rinse thoroughly with tap water,
3. Rinse thoroughly with deionized water and allow to air dry as long as practical.

PVC and stainless steel well construction materials (i.e. casings, screens, riser pipes) will be cleaned and sealed by the manufacturer prior to arrival on-site.

3.7.2 Sample Container Cleaning Procedures

Clean sample containers will be provided by the contract laboratory to perform the specified analyses. The containers will be cleaned or purchased meeting the procedures specified in EPA SW-846 (EPA, 1986). After cleaning, the sample containers will be sealed and placed in storage or shipping cases. These cases will be sealed and labeled to indicate the type of container and date of cleaning. Sample containers will be unopened prior to shipment to the site.

3.8 WASTE MATERIAL DISPOSAL PROCEDURES

3.8.1 Groundwater Disposal

Groundwater collected during well development and purging activities will be managed in accordance with EPA Guidance Number TSC-92-02 "Management of Contaminated Media" and characterized for appropriate disposal.

3.8.2 Soil Cutting Disposal

Cuttings from soil borings will be managed in accordance with EPA Guidance No. TSC-92-02 "Management of Contaminated Media," and characterized for appropriate disposal.

3.8.3 Decontamination Fluid

Wastewater from decontamination procedures will be managed in accordance with EPA Guidance Number TSC-92-02 "Management of Contaminated Media" and characterized for appropriate disposal.

4.0 QUALITY ASSURANCE OBJECTIVES FOR MEASURING DATA

The management objectives for the SAP are as follows:

- To monitor the quality of data generated by studies so that the analytical goals of the remedial investigations are met;
- To maintain the value of any data produced in studies for use as evidence in legal action or suit;
- To review the validity and integrity of the site data; and
- To control the quality of work performed by subcontractors and support services so that they maintain the same performance quality standards as those defined by this SAP.

The policies outlined in this SAP are designed to provide assurance that the investigations will yield comprehensive and valid investigative results which comply with applicable federal and state regulations and legal requirements.

Specific procedures for sampling, chain of custody, laboratory instruments calibration, laboratory analysis, reporting of data, internal quality control (QC) audits, preventive maintenance of field equipment, and corrective action are described in other sections of this SAP. The purpose of this section is to address the specific objectives for accuracy, precision, completeness, representativeness, and comparability.

4.1 LEVEL OF QUALITY CONTROL EFFORT

Environmental samples will be collected using the procedures outlined in Section 3.0 of this SAP. Blanks will be collected to assess potential contamination due to sampling, shipping, or ambient conditions to which the samples are exposed. Field duplicates, field blanks and matrix spike samples will be analyzed to assess the quality of the data resulting from the field sampling program. Field duplicate samples are analyzed to check for sampling and analytical reproducibility. One field duplicate will be collected or generated at a minimum of one in ten investigative samples. Matrix spikes provide information about the effect of the sample matrix on the preparation and measurement methodology. Matrix spike duplicate samples will be generated during the preparation procedure prior to analysis.

All matrix spikes are performed in duplicate and are hereinafter referred to as MS/MSD samples. One MS/MSD pair will be generated at a minimum of one in twenty investigative samples per sample matrix, or one per batch.

The level of QC effort provided by the laboratory will be equivalent to the level of QC effort specified under the appropriate approved test methods.

4.2 QUALITY ASSURANCE OBJECTIVES FOR ANALYTICAL MEASUREMENTS

Professional personnel will oversee the field activities to meet the overall project objectives. The quality assurance (QA) objectives will establish the guidelines which define the quality of the environmental measurements required to meet the objectives specified and the acceptance criteria of the analytical protocols. This section addresses objectives for precision, accuracy, completeness, representativeness, and comparability.

QA objectives for precision, accuracy, and completeness for each major measurement parameter will be established for site activities. These objectives cover both laboratory and field activities. All measurements are to be representative of the media tested. All data will be calculated and reported in units consistent with similar data measurements from the site to allow easy comparison of site data. Definitions for precision, accuracy, completeness, representativeness and comparability are as follows:

Precision: A measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision is best expressed in terms of the standard deviation or alternatively, by relative percent difference IX_1-X_2 100/mean of X. Various measures of precision exist, depending upon the "prescribed similar conditions."

Accuracy: The degree of agreement of a measurement (or an average of measurements of the same thing), X, with an accepted reference or true value, T., expressed as the percentage difference between the two values, (100%)T-X/T. Accuracy is a measure of the bias in a system.

Completeness: A measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions.

Representativeness: Expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Representativeness is a qualitative parameter which is dependent upon the proper design of the sampling program and proper laboratory protocol. The sampling network is designed to provide data representative of site conditions. The rationale of the sampling network is discussed in the Work Plan.

Representativeness will be satisfied by following the SAP, using proper sampling techniques, and following proper analytical procedures.

Comparability: Expresses the confidence with which one data set can be compared with another. The extent to which existing and future analytical data will be comparable depends on the similarity of sampling and analytical methods.

The levels of laboratory QC effort for SW-846 procedures are also specified in this SAP. For typical activities outlined in this SAP, 85 percent completeness is expected for laboratory data and 85 percent completeness is expected for field data and sample collection.

4.3 FIELD MEASUREMENTS

The accuracy of field measurements of pH, conductivity and turbidity will be assessed through pre-measurement calibrations and post-measurement verifications in the field as required by the manufacturer.

The pH meter will be field calibrated and verified by performing two measurements on standard buffer solutions as described in Section 4.1. Each measurement must be within ± 0.1 standard unit of buffer solution values. Precision will be assessed through duplicate measurements on one water sample per day or every 20th sample whichever is more frequent. A 2% relative percent difference is the criterion for acceptable field pH data.

The conductivity meter will be calibrated as described above. Measurements for accuracy should be within ±10% of the conductivity of the calibration solution being measured. Precision and accuracy for the conductivity is performed in the field similar to that for the pH measurements.

The turbidity meter will be calibrated as described above. Measurements for accuracy should be within 10% of the two calibration standards used during calibration.

A Field Instrument Calibration Log (see Attachment G) will be completed for each field instrument calibration.

5.0 SAMPLE CUSTODY

5.1 FIELD OPERATIONS

Sample custody will be initiated at the time of sample collection. Detailed documentation of sampling procedures and sample identification will be recorded during sampling in a bound, water resistant field notebook. Pre-cleaned sampling containers, with appropriate preservatives, will be supplied directly by the contract laboratory. All sample containers will have sample labels completed with indelible ink and sealed with custody seals.

In order to document sample possession from time of collection to time of sample receipt by the laboratory, a Chain-of-Custody Form will be maintained for each sample set. The Chain-of-Custody Record Form (see Attachment H) will be placed in a plastic bag, secured inside the sample shipping container and accompany the sample shipment to the laboratory. Individuals relinquishing and receiving the sample will sign, date and note the time on the Chain-of-Custody Form. Custody seals will be signed and dated by the field representative and packing tape will be used to seal the shipping container. Chain-of-Custody procedures will follow those specified in SW-846 (EPA, 1986). Shipping records and air bills also provide means of tracking the sample shipment and will be retained as part of the chain-of-custody documentation. Air bill numbers for each shipping container will be recorded in the field notebook.

5.2 LABORATORY OPERATIONS

The laboratory doors will remain locked at all times. All non-laboratory personnel will be required to sign a sign-in log before entering the laboratory. Chain-of-Custody (COC) procedures employed by the laboratory will be conducted in accordance with the following procedure:

5.2.1 Requirements for Receiving Samples

- Each sample or group of samples must be accompanied by a COC.
- The COC must be signed and dated (with a time) by the person who is relinquishing the sample(s) under "RELINQUISHED BY:"
- The laboratory personnel must sign the COC as "RECEIVED BY:" with a date and time.
- The sampler's signature must be on the COC.

- The project number and name are required before laboratory acceptance. The project number may be on the COC or can be taken from the Request for Analysis (RFA).

- The client's sample name and the date and time of collection are required on the COC.

- The following items will be noted on the COC:

  a. The laboratory personnel who opens the sample cooler must sign and date (with time) the COC as "COOLER OPENED BY".

  b. The pH will be checked by the laboratory and recorded for all water samples except volatile analyses. Any preservative added will be listed on the COC by the sampler.

  c. The matrix and number of containers will be on the COC and any discrepancies will be noted on the COC by the laboratory. Note any broken samples or improper containers as well.

  d. The temperature of the samples and condition of the seal on the cooler will be noted on the COC by the laboratory. The condition of the seal must be noted as "sealed" or "not sealed."

  e. The temperature will be noted as "Cooled at 6 degrees C" by the laboratory if samples were properly received on ice.

  f. The analyses requested will be listed for each sample.

- If any of the above requirements are not met, the samples will be stored in the lab refrigerator and the client must be notified of the problem. The samples cannot be logged in or signed as "RECEIVED FOR LABORATORY BY:" until all problems are corrected.

5.2.2 Logging in Samples

- Insure that requirements for sample receiving have been met (see previous section).

- The following information is typically entered into a Laboratory Sample Log Book:

  a. Laboratory # =Enter the next number in sequence from the last one logged in.

b. Client ID = Client's sample name

c. Matrix = Matrix of sample

d. Container = Type of sample container and capacity

e. D.Rec. = Date the sample was received by the lab

f. D.Col. = Date the sample was collected

g. Chain = Was there a COC? (should always be yes)

h. Location = Refrigerator number and shelf number of the sample location

i. Note or analysis = Any notes about samples or analysis requested should be listed here.

- Make labels with laboratory number and transfer them to the appropriate sample container.
- Samples would then be processed according to the order given by Laboratory Management.

6.0 CALIBRATION PROCEDURES AND FREQUENCY

6.1 FIELD EQUIPMENT

Field monitoring equipment, including the pH meter, conductivity meter and turbidity meter will be calibrated by Geotech and as needed in the field. Instrument calibration will be rechecked at a minimum of once per day following use. A record of each calibration or check event will be recorded in the field notebook and on the Field Calibration Log (see Attachment G). The record will include the date and time of the calibration, the person conducting the calibration, the instrument serial number, the lot number of the calibration standard and the calibration result.

Calibration of the pH meter will follow procedures in the equipment manual supplied by the manufacturer. The pH meter will normally be calibrated using two or three standard buffer solutions of pH 7.0 and pH 4.0 and/or pH 10.0. The two pH standards chosen will bracket the anticipated sample pH. The calibration will be verified by immediately measuring the pH of the buffers used for calibration. The pH will be verified every daily by measuring the pH of one or both of the standard buffer solutions. Instrument readings will be recorded to the nearest 0.1 pH units on the Field Calibration Log (see Attachment G).

Calibration of the specific conductivity meter will follow the procedures provided in the equipment manual supplied by the manufacturer. The specific conductivity meter will normally be calibrated using a standard conductivity solution of potassium chloride. Instrument readings will be recorded to the nearest 10 units for readings under 1,000 micromhos per centimeter (umhos/cm) and to the nearest 100 units for readings over 1,000 micromhos per centimeter. The calibration curve will be verified once daily by measuring the specific conductance of the standard solution.

Calibration of the turbidity meter will be in accordance with the manufacturer's instructions. The turbidity meter will normally be calibrated using 2 standard solutions, for example, a 0 NTU standard and a 10 NTU standard. If the instrument readings do not agree within 10% of the calibration standards, then the unit must be recalibrated.

Standards used to calibrate the pH, conductivity and turbidity meters, will be traceable to the National Bureau of Standards (NBS) or National Institute for Standards and Technology (NIST). If the standard requires preparation, it will be prepared according to published procedures using reagent-grade chemicals and standards of specified priority traceable to the NBS or NIST.

6.2 LABORATORY PROCEDURES

Calibration procedures employed by the laboratory will be those specified in SW-846 (EPA, 1986); other approved methods are in the individual instrument manual.

Calibration standards will be traceable to NIST whenever such standards are available. All standards will have the labeled concentration verified by comparison with another standard prior to use.

The working lifetime of standard preparations are dependent upon the compound types comprising the standards. Most standards have shelf lives specified in the applicable method. Otherwise, a standard is considered to be acceptable until comparison with a reference material indicates a problem.

Instruments will be calibrated before being put into service and will be recalibrated at intervals consistent with the manufacturer's and/or method recommendations. Instrument response and calibration will be verified between the regular recalibrations as specified in the appropriate method. Detection limit studies will be performed on each instrument for each analyte determined on the instrument whenever an instrument undergoes a major modification or annually.

7.0 ANALYTICAL PROCEDURES

7.1 FIELD PROCEDURES

The field parameters and measuring equipment are listed below:

PARAMETER	EQUIPMENT
pH	A multi-parameter water quality meter that will measure pH
Temperature	A multi-parameter water quality meter that will measure temperature
Specific Conductivity	A multi-parameter water quality meter that will measure conductivity
Turbidity	A multi-parameter water quality meter that will turbidity

Field measurement readings will be recorded in a bound, water-resistant field notebook and on appropriate field sampling forms.

The procedures used to obtain pH, temperature, specific conductivity and turbidity measurements will follow guidelines provided in the equipment manuals and as specified in SW-846. Demonstration of the stability of these measurements during the purging of three to five well casing volumes will be used to indicate that representative ground-water samples are collected.

The procedures for measurement of water levels using an electronic tape are described in Section 3.4.1. Water level elevations will be determined by subtracting the depth to groundwater from the measuring point elevation. Field measurements will be recorded in a field notebook and on the Fluid Level Measurement Record Form (see Attachment F).

Probes used in measuring pH, temperature and specific conductivity will be cleaned by wiping the probe dry, rinsing with distilled water, and wiping dry. These instruments will not come in contact with soil, surface water or ground-water samples collected for laboratory analysis.

The glass cuvette used to measure turbidity will be cleaned by rinsing with distilled water.

7.2 LABORATORY PROCEDURES

The proposed analytical suite for each ground water monitoring well sample and any collected soil samples will be specified prior to sampling activities. The primary constituent groups of concern at the Site are PAHs, VOCs, and diesel range petroleum hydrocarbon.

Specific parameters and corresponding analytical methods, extractions, and clean up analyses employed by the laboratory will be performed in accordance with SW-846 (EPA, 1986), or other EPA-approved methods.

8.0 DATA REDUCTION, VALIDATION, AND REPORTING

8.1 REDUCTION AND VALIDATION OF FIELD MEASUREMENT DATA

Temperature, specific conductivity, pH, turbidity, and water levels in wells will be measured in the field and checked by the Field Site Manager or his designated representative. Field data will be reviewed at the time of collection for accuracy, reproducibility (precision), representativeness and comparability to expected or typical results. If field data are determined to be inconsistent with historical data, the field instruments will be checked to verify operational functions are correct. Groundwater monitoring protocols will also be reviewed. Anomalous data will be checked by performing additional measurements.

Additional corrective action procedures are discussed in Section 11. A decision regarding the validity of field data will be made prior to leaving the sampling site.

8.2 REDUCTION AND VALIDATION OF LABORATORY DATA

The laboratory's procedures for analytical data validation will be based on results of internal quality control procedures discussed in Section 8.2.

8.2.1 Data Review

A data package composed of analytical results and supporting documentation will be prepared and checked by the chemist performing the analysis. This review will include the following items: data interpretation, quantitation, quality control data inspection for completeness and compliance, QC results and raw data. This data package will reviewed by a second analyst proficient in the appropriate methodologies.

Upon completion of the peer review, the data package will be provided to the Laboratory QA Officer. Data reduction, evaluation, and reporting will be conducted by the laboratory.

8.2.2 Data Validation

Chemical data will be validated by professional project personnel, qualified and experienced in data validation, using the *Laboratory Data Validation Functional Guidelines for Organic and Inorganic Analytes* (U.S. EPA, 1988). The data validation will be performed by or under the supervision of the Project QA Officer.

Compounds detected in samples will be checked against possible blank contamination. If an analyte is found in a blank, any detection of the same analyte in a sample will be considered a laboratory artifact if the detected analyte is less than ten times the blank contamination for "common laboratory contaminants" or less than five times the blank contamination for any other analyte.

8.3 DATA REPORTING

Data summaries and reports will be reviewed for transcriptional and typographical errors. Data typically included in investigative reports are water level, field parameters, soil and ground-water quality data. Laboratory analytical reports for soil and ground water will include the following information:

- Sample identification numbers
- Dates sampled and analyzed
- Parameters measured
- Reporting units
- % Recovery
- Analytical methods
- Practical Quantitation Limits
- Original Chain-of-Custody Records

Water level data reports will include the following:

- Measuring point elevation
- Depth to ground water
- Groundwater elevation

8.4 PROJECT FILE

Laboratory data generated will be stored by the laboratory in project files. The files will include bench-sheets or copies of notebook pages with sample weights, dilutions, concentrations, data reduction, instrument logs, and raw data.

Documentation of laboratory data, assessment, and validation, and field notes and measurements will be maintained in the Project File of the firm conducting assessment activities.

9.0 INTERNAL QUALITY CONTROL

The internal QC measures that will be employed in the field include:

- Training of personnel for general adherence to EPA sampling procedures
- Proper calibration and verification of field analytical equipment
- Proper cleaning and decontamination of sampling equipment and analytical field instruments
- Maintenance of sample Chain-of-Custody Records
- Use of sample containers prepared with appropriate preservatives
- Maintenance of field sampling, calibration, and preventative maintenance records, testing of field instruments for precision and accuracy
- Collection of QC samples including field duplicates, matrix spike/matrix spike duplicates, and field, trip, and equipment blanks.

9.1 FIELD CHECKS

Field sampling procedures potentially will include submittal of two types of QC samples from the field:

- Equipment Rinse Blank - One equipment rinse blank will be collected per sampling event for documentation of decontamination of sampling tools when appropriate. The equipment blanks will be analyzed for all site specific parameters.
- Field Duplicates -Two sets of samples from a single source will be prepared, labeled with unique sample numbers, and submitted to the laboratory without identification as duplicates on the chain of custody/parameter request sheet. One field duplicate will be collected for every fifty samples collected for each matrix type.

The results of these analyses will be included in the deliverable package from the laboratory.

9.2 LABORATORY OPERATIONS

Internal quality control procedures will include the use of method blanks, matrix spike and matrix spike duplicates, calibration standards, internal standards, surrogate standards, blank spike and laboratory duplicate/replicate analysis. SW-846 (EPA, 1986) procedures relative to

internal and external audits, specific calibration check standards, and quality control acceptance criteria will be followed.

To obtain data on the analytical precision and accuracy, the laboratory will batch project samples together and analyze the following laboratory control samples at a rate of one per batch per matrix of project samples or one per twenty project samples per matrix, whichever is more frequent. The control limits and corrective actions specified in SW-846 (EPA, 1986) and other approved methods will be followed. The following methods will be used:

- Laboratory duplicate - to check laboratory precision for those parameters when matrix spike duplicates are not analyzed; the relative percent difference will be calculated for the laboratory duplicate or the matrix spike duplicate
- Laboratory or method blank - to check for laboratory contamination
- Blank Spike - to check accuracy
- Matrix spike/Matrix spike duplicate - to check analytical precision and accuracy
- Field duplicates -to check analytical precision and accuracy
- Field blanks -to check sample integrity for potential contamination from ambient conditions.

The results from each of these quality control samples will be available from the laboratory as necessary. Percent recoveries and relative percent differences will be calculated by the laboratory for the matrix spike/matrix spike duplicate analyses.

10.0 PREVENTATIVE MAINTENANCE

10.1 FIELD OPERATIONS

Field equipment will be maintained in accordance with the manufacturers' recommended schedules and procedures, as indicated below:

INSTRUMENT	MAINTENANCE SCHEDULE	MAINTENANCE DESCRIPTION
Multi-Parameter Water Quality Meter	Daily and periodically	Verify that batteries are adequate and replace, if necessary. Field calibrate according to the owner's manual provided by the manufacturer. Rinse electrodes with deionized or distilled water; periodically replace electrode plug to prevent drying. Clean with mild acid, base, or alcohol solution.

10.2 LABORATORY OPERATIONS

The analytical laboratory will conform with established Standard Operating Procedures for preventative maintenance for each measurement system and required support activity. All maintenance activities will be documented in logbooks to provide a history of maintenance records. Each analyst is responsible for conducting a daily inspection of critical systems on instruments under his/her charge. The performance of all instruments will be checked against known standards at the beginning of each working day or shift. Failure to achieve proper performance will be interpreted as an indication of a system problem. If system problems are detected, they will be dealt with by laboratory personnel or by the manufacturer's service representative.

All working systems will be serviced according to a fixed schedule by laboratory personnel or the manufacturer's service representative. A record of service or repairs, whether accomplished by laboratory personnel or by the manufacturer's service representative, will be maintained in a logbook kept with each instrument.

11.0 PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

Laboratory results will be assessed for compliance with required precision, accuracy, completeness and sensitivity as follows:

11.1 PRECISION

Precision of laboratory analysis will be assessed by comparing the analytical results between matrix spike/matrix spike duplicates for organic analyses and laboratory duplicate analyses for inorganic analysis. The relative percent difference (% RPD) will be calculated for each pair of duplicate analysis using the following equation:

$$\%RPD = \frac{S - D \times IOO}{(S+D)/2}$$

Where: S = First sample value (original or MS value)
D = Second sample value (duplicate or MSD value)

Additionally, the RPD for field blind duplicates will be calculated to assess sampling and analytical precision.

11.2 ACCURACY

Accuracy of laboratory results will be assessed for compliance with the established QC criteria using the analytical results from method blanks, matrix spike/matrix spike duplicate samples, field blanks, blank spikes (laboratory control samples), and bottle blanks. The percent recovery (%R) of surrogates, matrix spike samples, and laboratory control samples will be calculated using the following equation:

$$\%R = \frac{A - B \times 100}{C}$$

Where: A = The analyte concentration determined experimentally from the spiked sample

B = The background level determined by a separate analysis of the unspiked sample and

C = The amount of spike added

11.3 COMPLETENESS

The data completeness of field and laboratory analytical results will be assessed for compliance with the amount of data required for decision making. The completeness will be calculated by comparing the actual number of data points or samples collected and analyzed to the planned number of data points or samples.

$$\% \text{ Completeness} = \frac{\text{Valid Data Points Collected X 100}}{\text{Total Data Points Planned}}$$

12.0 CORRECTIVE ACTION PROCEDURES

Corrective action measures may be necessary for the following reasons: field and analytical data do not meet data quality and management objectives; unacceptable performance or system audit results; and unacceptable results of internal and external QC audits. The following corrective action measures will be initiated for each of the following situations:

- Corrective action measures may include review of equipment integrity and field measurement techniques. Equipment will be checked for adequacy of the power source and mechanical/electrical integrity. If the field equipment is determined to be malfunctioning, it will be repaired or replaced, and follow up data will be collected. Field personnel will be audited for proper field measurement procedures. If necessary, field measurement techniques will be corrected and field measurements repeated.

- If review of laboratory analytical data indicates that the data are anomalous, appropriate corrective action measures will be initiated. These corrective action measures may include modifications of laboratory analytical procedures and/or field sampling techniques. Resampling and/or reanalysis may be performed, if necessary. Appropriate corrective measures employed by the laboratories will follow procedures specified in SW-846 (EPA, 1986).

- If external audits indicate corrective action is necessary, corrective action measures will be initiated to address concerns.

13.0 PERMITS AND NOTIFICATION REQUIREMENTS

A Licensed Well Driller will install all monitor wells and soil boring activities described in the SOW. Drilling logs and plugging reports will be submitted within 30 days after the completion or plugging and abandonment of the wells. The appropriate permits will be obtained and provided with the investigation assessment reports.

Logistics, sequencing, and coordination for all field work, reporting, and communication will be communicated with the BIA, Tribal Representatives, and TERO. Logistics and coordination between Akana and our subcontractors will be coordinated by Carol Townsend based on discussions with the BIA and the Tribal Council. Akana has submitted and has received approval by Ms. Shelley Collins, Compliance Safety Officer, Tribal Employments Rights Office, (TERO) of our TERO Compliance Plan. A copy of the TERO Plan is provided as Attachment K.

14.0 REFERENCES

ASTM D5092-04, *Standard Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers*, ASTM International, West Conshohocken, PA, 2004

EPA Region 4 Science and Ecosystem Support Division, *Operating Procedure for Soil Sampling*, Publication No. SESDPROC-300-R1, November 2007, 22 pgs.

EPA Office of Emergency and Remedial Response, *Soil Screening Guidance: User's Guide*, Publication No. DPA/540/R-96/018, July 1996, 39 pgs.

EPA Office of Research and Development, *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures.* EPA/540/S-95/504. Puls, Robert W., Michael J. Barcelona, , U.S. EPA, Ada, Oklahoma, 1996

EPA Region 4 Science and Ecosystem Support Division, *Operating Procedure for Groundwater Sampling*, Publication No. SESDPROC-301-R1, November 2007, 30 pgs.

EPA Region 4 Science and Ecosystem Support Division, *Operating Procedure for Field Equipment Cleaning and Decontamination*, Publication No. SESDPROC-205-R1, November 2007, 30 pgs.

EPA Solid Waste Guidance Document, *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, SW-846, Third Edition, 1986

ATTACHMENT A

Figures

Figure 1 - Existing Monitor Well Location Map

Figure 2 -Proposed New Monitor Well and Soil Boring Location Map

LEGEND

- EXISTING MONITOR WELL
- ABANDONED MONITOR WELL
- FORMER MUNICPAL SUPPLY WELLS
- H HOUSE
- PROPOSED SOIL BORING LOCATIONS
- PROPOSED NEW MONITOR WELL LOCATIONS

GRAPHIC SCALE

100 0 100 200

(IN FEET)

BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET ADJUST SCALES ACCORDINGLY

NO.	DATE	BY	REVISIONS

AKANA
Plan + Design + Engineer + Manage

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CT — DESIGNED BY
NLO — DRAWN BY
CT — CHECKED BY
— DRAWING DATE

SUBMITTAL

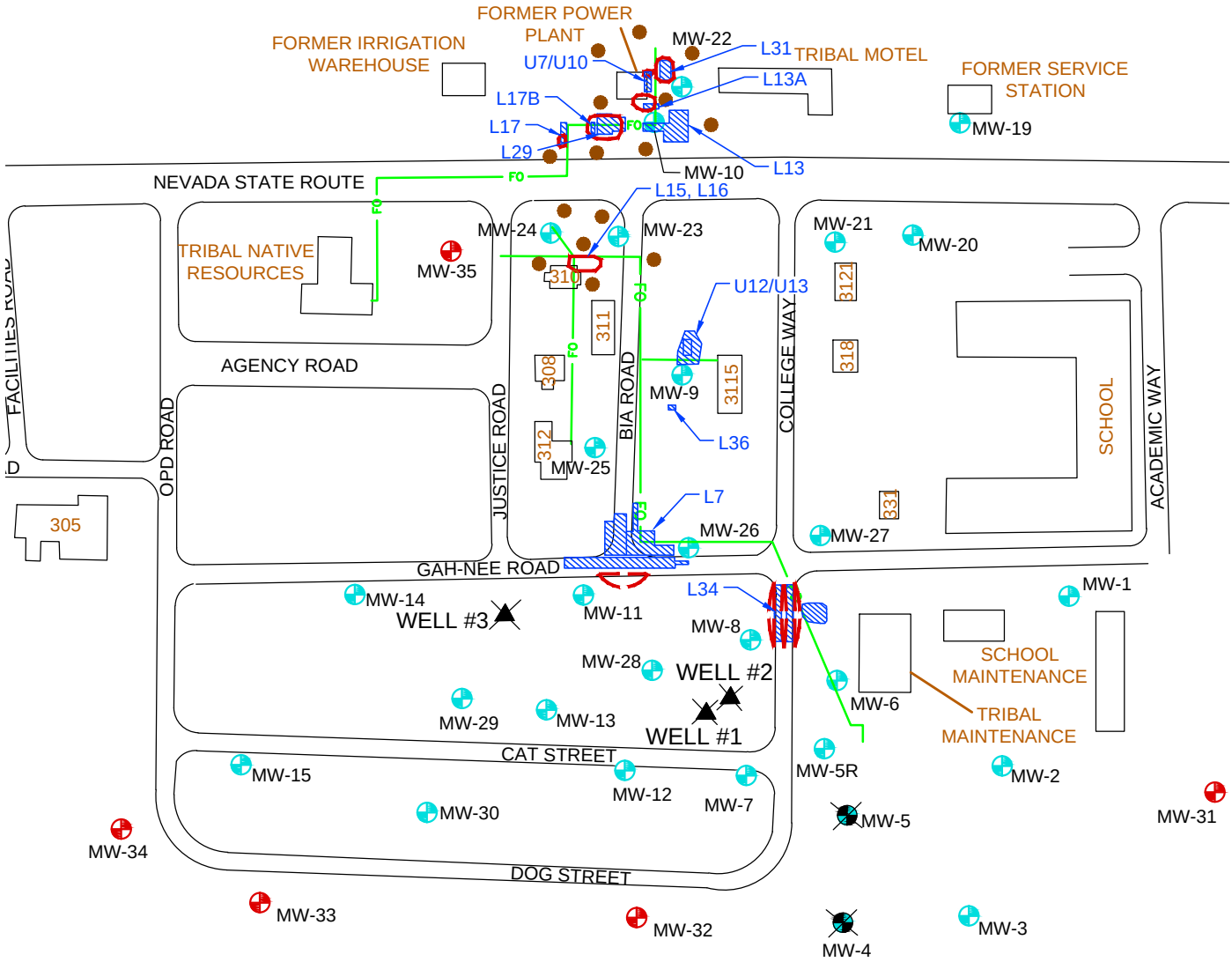
DUCK VALLEY INDIAN RESERVATION
OWYHEE, NV

OWYHEE, NV COMMUNITY LAYOUT MAP

JOB NO. 16-005

SHEET NO. FIG. 1

OF



LEGEND

- EXISTING MONITOR WELL
- ABANDONED MONITOR WELL
- FORMER MUNICPAL SUPPLY WELLS
- H HOUSE
- PROPOSED SOIL BORING LOCATIONS
- PROPOSED NEW MONITOR WELL LOCATIONS
- AREAS OF EXCAVATION
- ESTIMATED BOUNDARY OF REMAINING IMPACTED SOIL GREATER THAN 100 mg/kg
- L36 EXCAVATION NAME
- FO FORMER HEATING OIL LINE

GRAPHIC SCALE

100 0 100 200

(IN FEET)

AKANA Plan + Design + Engineer + Manage	BUREAU OF INDIAN AFFAIRS HYDROCARBON ASSESSMENT AND INVESTIGATION 2600 W CENTRAL AVENUE, SUITE 400 12th FLOOR PHOENIX, AZ 85001 602-379-3723	DUCK VALLEY INDIAN RESERVATION OWYHEE, NV PROPOSED INVESTIGATION LOCATIONS	16-005 2

ATTACHMENT B

Soil Boring Log

SOIL BORING LOG

Client	BIA	Top Grade		Site Coordinate		Boring No.
Job No.	16-005 Hydrocarbon Assessment Duck Valley Reservation Owynee, NV	Drill Rig Model		Total Depth		Time Start
Logged By:		Sampling Method	Direct Push	Top Saturation		Time Finish
Driller & Lic. No.		Water Sampled?	[ ]YES [ ]NO	Static Water Level	Ft-TOC Date/Time	Date(s) Drilled

Footage	Sample No.	Sample Depth (ft.)	Lab ID No.	OVM/PID Reading	USCS Symbol	LITHOLOGIC DESCRIPTION
0						
5						
10						
15						
20						
25						
30						
35						Total Depth - Borehole = 20-ft Boring Plugged with Bentonite
40						
45						
50						

ATTACHMENT C

Monitor Well Log

MONITOR WELL CONSTRUCTION LOG

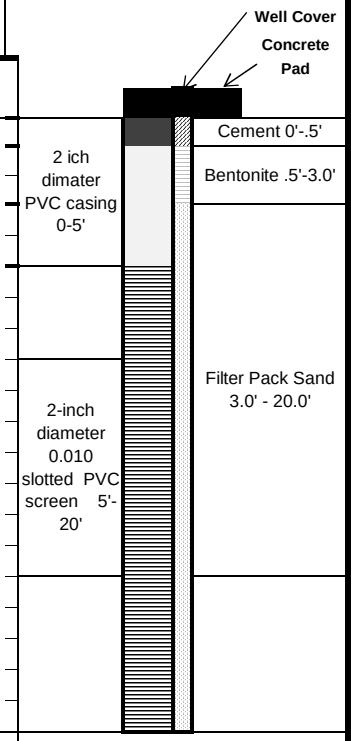
Client: BIA	Driller & Lic. No.	TOC	Well No.: MW - 31
Job No.: 16-005 Duck Valley	Drilling Rig Model	Drilling/ Sampling Method	Date(s) Drilled
Logged By:	Location: Owyhee, NV	Total Depth Drilled	Time Start / Time Finish

Footage	Sample No.	Sample Depth	Analy by Lab	OVM/PID Reading	USCS Symbol	LITHOLOGIC DESCRIPTION
0						
5						
10						
15						
20						
25						
30						
35						
40						
45						
50						

AKANA

COMPLETION DATA

Material Settings



ATTACHMENT D

Well Installation Record Form

WELL INSTALLATION FIELD DATA RECORD

LOCATION - GPS FIELD COORDINATES

N _____ **W** _____

Client	Job No.
Original Boring No.	Location
Field	Date Installed
Tech/ Geologist	Type Rig
Top Saturation	Type of Drilling [ ] Hollow Stem [ ] Push [ ] Solid Stem [ ] Sonic [ ] Rotary ⇨ [ ] Air [ ] Water [ ] Mud
Drilling Method	Total Depth Drilled
Drilling Company	Driller
Drilling Co. Location	Drill License #

INSTALLATION DEVELOPMENT

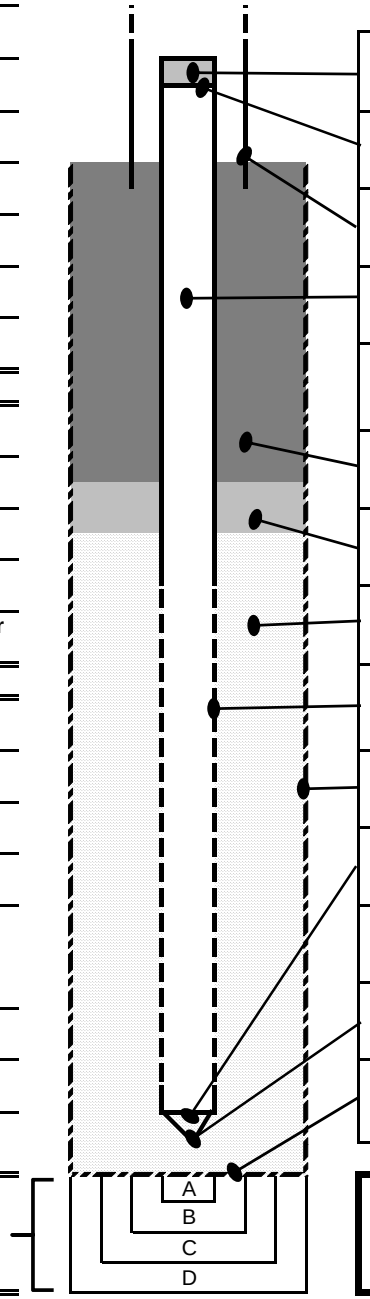
Method Used				
Began	Date & Time		Finish	Date & Time
Pre-Developme	pH	Turbidity	Specific Conduc.	Temp.
Post-Developme	pH	Turbidity	Specific Conduc.	Temp.
Volume Removed		Rate of Removal	**Use Well Development Form For Detailed Record**	

MATERIALS USED

Filter Pack Sand	# Sacks	Sieve Size Range	Manufacturer	
Bentonite Pellets	# Pails	Pellet Size (inch)	Manufacturer	
Cement	# Sacks	Grade Type	Manufacturer	
Bentonite Powder	# Sacks	Grade Type	Manufacturer	
Blank Casing	# Feet	Diameter (inch)	Schedule	Manufacturer
Slotted Screen	# Feet	Diameter (inch)	Slot Size (inch)	
Surface Casing	# Feet	Diameter (inch)	Type [ ] PVC [ ] Stainless Steel [ ] Black Steel [ ] Fiberglass [ ] Other _____	
Surface Protection	[ ] Flush [ ] Stand	Dia. Of Pipe (inch)	Material	Locking [ ] YES [ ] NO
Surface Pad	cu yds cement	Type [ ] Sand base [ ] Gravel base	Pad Size (feet) LxW	Pad Thick. (inches)

A - Well/Screen Diameter (inch)	B - Protective Pipe Diameter (inche)	C - Surface Casing Diameter (inch)	D - Borehole Diameter (inch)

WELL COMPLETION



Type of Well Cape
Top of Well from Grade Level
Protective Casing to
Well Casing to
Cement Grout to
Bentonite Pellets to
Filter Pack Sand to
Slotted Screen to
Borehole to
Bottom Cap to
Cap Type
Total Well Depth
Total Borehole Depth

WELL NAME

ATTACHMENT E

Well Development Data Form

WELL DEVELOPMENT FIELD RECORD

Client: _____

Location: _____

WELL NO. _____ Job #: _____

Date: _____

(A) Static Water Level: _____ feet below Top of Casing (BTOC)

(B) Original Borehole Depth: _____ feet BTOC

(C) Water Column (h) : _____ feet……(B) - (A)

(D) Borehole Diameter (d) : _____ inches

_____ feet……(D) / 12

(E) Borehole Radius (r) : _____ inches

_____ feet…..(E) / 12

(F) Purge Volume (V)[1] : _____ gallons……..(C) x (3.264)

(G) Production Rate (Q) : _____ gallons per minute

(H) Final Water Level : _____ feet BTOC

(1): Formula for calculating Purge Volume (12-inch borehole with 8-inch well) =

$V_{gallons} = ((B)_{feet} - (A)_{feet}) \times 3.264$ gallons per linear foot

Gallons Purged	Time	Water Level (ft-BTOC)	Temperature (°F)	pH (stn units)	Specific Conductance	Water Quality

Temperature Units: _____ **Specific Conductance Units:** _____

Time Started: _____ **Name of Driller:** _____

Time Completed: _____ **Name of Geologist:** _____

Drilling Method Used:

- ☐ **Air Rotary**
- ☐ **Mud Additives**
- ☐ **Potable Water Only**
- ☐ **Auger Only**
- ☐ **Other:** _____

ATTACHMENT F

Groundwater Sampling Field Data Sheet

Akana Low Flow Sampling Field Log

Client: BIA

Sample Point ID: _____

Location: Owyhee, NV - Duck Valley

Field Representative: _____

Samp. Matrix: Water

Lab Sample # _____

PURGE INFORMATION

Method of Well Purge and Pump type: Low Flow

Dedicated: Tubing not pump

Start Date/Time: _____

Casing Vol: _____

Initial Water Level: _____

Vol Purged: _____

Groundwater Elevation _____

Resulting Water Level: _____

Well Depth: _____

Completed Date/Time: _____

Casing Diameter (in.): _____

Appearance, color or odor of Sample: _____

Screen Interval (feet.): _____

PURGE DATA

Project No. 15-208

Time	Purge Rate (gpm/htz)	Cumulative Volume	pH (std units)	EC Conduct. (microMHos/cm))	Turb. (NTU)	Dissolved Oxygen (mg/L)	Temp °C	ORP or Eh (mV)

Well and Pad Inspection Notes:

Sampler Signature

ATTACHMENT G

Fluid Level Measurement Record

AKANA

FLUID LEVEL MEASUREMENTS

Duck Valley Investigation

Well Number	Top of LNAPL Ft-TOC	Top of Water Ft-TOC	Date	Time	By (initials)
MW-1					
MW-5R					
MW-6					
MW-7					
MW-8					
MW-9					
MW-10					
MW-11					
MW-12					
MW-14					
MW-15					
MW-19					
MW-20					
MW-21					
MW-22					
MW-23					
MW-24					
MW-25					
MW-26					
MW-27					
MW-28					

FLUID LEVEL MEASUREMENTS

Duck Valley Investigation

Well Number	Top of LNAPL Ft-TOC	Top of Water Ft-TOC	Date	Time	By (initials)
MW-29					
MW-30					
Monitor Wells Installed 2017					
MW-31					
MW-32					
MW-33					
MW-34					
MW-35					
MW-36					
MW-37					

ATTACHMENT H

Instrument Calibration Log

Water Quality Meter - Calibration Log

Client:	BIA	Sampling Event:	
Facility	Owyhee, NV - Duck Valley	Year:	
Proj. No.	16-005	Sampler:	

Horiba U-50

Serial No.		Auto Calibrate:	Y / N
Calibration		Manual Calibrate:	Y / N
Solution			

Parameter Zeros	
pH	4.01
EC - mS/cm	4.49
Turbidity - NTU	0
DO - mg/L	8.92
% DO	0
m	0

Calibration Measurements

Date:				
pH:				
mS/cm				
NTU				
mg/L DO				
% DO				
m				

Attachment I

Daily Activities Logs for Soil and Groundwater

DAILY ACTIVITIES LOG

AKANA
Plan + Design + Engineer + Manage

Activities Performed This Date Only:

DATE OF REPORT	NAME OF SAMPLER	BIA WRO CLIENT	Duck Valley Indain Reservation Owynee, NV LOCATION

WELL NUMBER										
PURGED										
SAMPLED										
SHIPPED										
NOTES										

WELL NUMBER										
PURGED										
SAMPLED										
SHIPPED										
NOTES										

GENERAL NOTES: _____

For this day only, This Form is PAGE _____ OF _____ PAGES

DAILY ACTIVITIES LOG

AKANA
Plan • Design • Engineer • Manage

Activities Performed This Date Only:

DATE OF REPORT	NAME OF SAMPLER	CLIENT	Soils -

Plot # or Area #	Boring #	Latitude	Longitude	Geologic Description	Notes:
	B1				
	B2				
	B3				
	B4				
	B5				
	B6				
	B7				
	B8				
	B9				
	B10				Sample Time :
	B1				
	B2				
	B3				
	B4				
	B5				
	B6				
	B7				
	B8				
	B9				
	B10				Sample Time :
	B1				
	B2				
	B3				
	B4				
	B5				
	B6				
	B7				
	B8				
	B9				
	B10				Sample Time

Sampler Signature	Daily Notes :

Attachment J

Chain-Of-Custody

Company Name/Address:

Billing Information:

Report to:

Email To:

Project Description:

City/State Collected:

Phone:
Fax:

Client Project #

Lab Project #

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ____

Rush? (Lab MUST Be Notified)

____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No ___Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum:

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs										Rem./Contaminant	Sample # (lab only)

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

pH _____ Temp _____

Remarks:

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: o UPS o FedEx o Courier o _____	Condition: (lab use only)
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	COC Seal Intact: ____ Y ____N ____NA
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	pH Checked: NCF:

ATTACHMENT K

TERO Compliance Plan

Shoshone-Paiute Tribes

Tribal Employments Office

TERO Compliance Plan

Investigation/Monitoring Petroleum Impacts
Duck Valley Reservation
Owyhee, Nevada
U.S. Bureau of Indian Affairs
Solicitation No: A16PS00132
Akana Project No: 16-005

AKANA
Plan + Design + Engineer + Manage

6400 SE Lake Road, Suite 270
Portland, OR 97222
(503) 652-9090
(503) 253-5412 fax

TERO Compliance Plan and Attachment

SHOSHONE-PAIUTE TRIBES
TRIBAL EMPLOYMENT RIGHTS OFFICE
<u>TERO COMPLIANCE PLAN</u>

1. General Information

Employer/Contractor:	Akana		
Address:	6400 SE Lake Road, Suite 270, Portland, OR 97222-2129		
Telephone:	503-652-9090	Fax:	503-253-5412

2. Authorized Contract Representative

Name:	Carol Townsend	Title:	Environmental Serivces Manager

3. Description of overall construction activity contract to be conducted on the Reservation:

Provide services to BIA WRO for the investigation and monitoring of petroleum impacts to Trust Resources on the Shoshone Paiutes of Duck Valley Indian Reservation, for remedial design, and implementing plan development. Work includes compelting environmental investigation of soil and groundwater associated with historical release of heating oil. The specific activities include: 1) Monitoring of well water levels and collecting samples of contaminated groundwater using specialized equipment. 2) Collecting samples of contaminated soil. 3) Installing monitor wells and abandoning others based on regulatory and technical criteria. 4) Technical characterization of groundwater system characteristics. 5) Conduting meetings to present technical information.

4. Key Personnel, please list permanent staff, their positions and wages, that will work throughout the duration of this contract (***Section 3.11 of Shoshone-Paiute Tribes' TERO Ordinance, No. 96-SPO-05***):

Name	Position Title	Wages
Said Amali, PE, PhD and Carol Townsend	Project Manager and Investigation Team Leader	154.43/hr
Brent Hamil	Field Services Task Leader	124.25/hr
Peter Van Zandt	Environmental Scientist	84.87/hr
Tim Norman	Field Technician	69.27/hr

5. Describe each phase of work to be performed. Specify the number of employees to be used, including occupation positions and wage scale. Identify "Key Personnel" (Pg. 1, #4), and list positions to be filled with local TERO referrals. Please specify minimum requirements for position (s), as attachments, to plan. ***All unskilled labor must be 100% local hire***.

Phase 1 Description
Phase: Project Planning - Most work to be done in office on desktop or at Phoenix BIA Office Includes File and Historical Data Reivew Develop Project Work Plan Collect Groundwater Samples

Position Needed	Wage/Scale	Name (***To be completed by TERO***)
Environemtal Scientist or Technician	$30/hr	

Phase 2 Description
Field Investigation including Monitor Well Installation and/or decommission, Soil boring installation, Groundwater Monitoring, Aquifer Characterization Tests, Writing Project Reports

Position Needed	Wage/Scale	Name (***To be completed by TERO***)
Environemtal Scientist or Technician	$30/hr.	
Geologist Intern	$20/hr.	
CAD	$30/hr	

Phase 3 Description
Remediation Design Engineering, Implementation Planing, Developing Technical Reports

Position Needed	Wage/Scale	Name (***To be completed by TERO***)
Environmental Scientist or Technician	$30/hr	

6. **PURSUANT TO THE SHOSHONE-PAIUTE TRIBES' TERO ORDINANCE, NO. 96-SPO-05**, the employer/contractor agrees to notify the TERO Office for referrals for any employment positions which may occur on this job/project, whether or not such positions are presently included in the Compliance Plan.

7. **Each employer/contractor (including sub-contractors) must submit a monthly report to the TERO Compliance Officer, indicating the following:**

    a. **Number of Indians in their workforce**
    b. **How close they are to meeting their goals**
    c. **All persons hired or fired during the month (specifying the job positions involved)**
    d. **Other information that may be required by TERO**

8. Section 17 (Employment Administrative Fee) of the Shoshone-Paiute Tribes' TERO Ordinance, No. 96-SPO-05 states:

17.1, Contractors: Every contractor conducting business on the Reservation and with a contract of $50,000.00 or more shall pay a one-time Employment Administrative Fee of 1.5 percent (1.5%) of the total amount of the contract, per each contract. Said fee shall be paid prior to commencing work on the Reservation. However, where good cause is shown, the fee may be paid in installments over the length of the contract, if approved by the Commission.

Total Contract Amount:	$346,510.93
Total, 1.5% Employment Administrative Fee:	$5,197.66
Method of Payment:	☐ Total Sum Payment ☒ Installments
Reason and schedule for installments:The project cost will be invoiced to BIA on a recurring basis with payments received on a monthly basis. Additioally, we are a small Indian-owned business. In order to cover overhead costs and the fact this is a long term contract, we would like to make monthly installments	

9. **EFFECTIVE DATE**: This TERO Compliance Plan is in full force and effect, beginning on 16 March 2016, and for the duration of the job/project, or until both parties mutually agree to renegotiate a negotiable item.

Employer/Contractor Signature: _____ Date: _____

TERO Compliance Officer Signature: _____ Date: _____

Attachment to the Shoshone-Paiute Tribes TERO Compliance Plan

Compliance Plan Item #5 – Minimum requirements for positions(s)

Environmental Scientist or Technician

Environmental Scientist:

- Bachelor's degree in Environmental Sciences, Environmental Engineering, Geology, Soil Sciences, or related disciplines.
- Minimum three years of experience in environmental investigation and/or remediation/cleanup.
- 40 – hour HAZWOPER training.
- Knowledge of Microsoft Office Suite.
- Ability to communicate clearly and concisely both orally and in writing.
- Works with minimal direct supervision.

Environmental Technician:

- Associates or Bachelor's degree in Environmental Sciences, Environmental Engineering, Geology, Soil Sciences, or related disciplines.
- Minimum two years of experience in environmental investigation, field work (including multi-media sampling), and/or remediation/cleanup.
- 40 – hour HAZWOPER training.
- Knowledge of Microsoft Office Suite.
- Ability to communicate clearly and concisely both orally and in writing.
- Works with direct supervision of Environmental Scientist.

Geologist Intern

- Bachelor degree in geology, hydrogeology, or a closely related field, or enrolled in such a degree program at an accredited college or university.
- Within 1 year of degree completion.
- Knowledge of Microsoft Office Suite.
- Ability to communicate clearly and concisely both orally and in writing.
- Works with direct supervision of Environmental Scientist.

BIA Contract
Statement of Work

SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS
OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24, & 30

1. REQUISITION NUMBER: 0040249855
PAGE 1 OF 52

2. CONTRACT NO.:
3. AWARD/EFFECTIVE DATE:
4. ORDER NUMBER: A16PX00431
5. SOLICITATION NUMBER:
6. SOLICITATION ISSUE DATE:

7. FOR SOLICITATION INFORMATION CALL:
a. NAME: Gerald Knox
b. TELEPHONE NUMBER (No collect calls): 602-379-4029
8. OFFER DUE DATE/LOCAL TIME:

9. ISSUED BY CODE A11

BIA WRO 00011
2600 N CENTRAL AVENUE
Contracting Office
SUITE 400 MAILROOM
Phoenix AZ 85001

10. THIS ACQUISITION IS ☐ UNRESTRICTED OR ☒ SET ASIDE. % FOR
☐ SMALL BUSINESS
☐ HUBZONE SMALL BUSINESS
☐ SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS
☐ WOMEN-OWNED SMALL BUSINESS (WOSB) ELIGIBLE UNDER THE WOMEN-OWNED SMALL BUSINESS PROGRAM
☐ EDWOSB
☐ 8(A)
NAICS: 541620
SIZE STANDARD: $15.0

11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED ☐ SEE SCHEDULE
12. DISCOUNT TERMS: PP30
☐ 13a. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)
13b. RATING:
14. METHOD OF SOLICITATION ☐ RFQ ☐ IFB ☐ RFP

15. DELIVER TO CODE 0009062035

BIA WRO ENVIRONMENTAL MGT
2600 N CENTRAL AVENUE
4TH FLOOR
PHOENIX AZ 85004

16. ADMINISTERED BY CODE A11

BIA WRO 00011
2600 N CENTRAL AVENUE
Contracting Office
SUITE 400 MAILROOM
Phoenix AZ 85001

17a. CONTRACTOR/OFFEROR CODE 0070034618 FACILITY CODE

COOPER ZIETZ ENGINEERS, INC.
Attn: ATTN GOVERNMENT POC
6400 SE LAKE RD STE 270
PORTLAND OR 97222-2129

TELEPHONE NO. 000-000-0000

☐ 17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER

18a. PAYMENT WILL BE MADE BY CODE IPP INV

Invoice Processing Platform System
US Department of Treasury
http://www.ipp.gov

18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK BELOW IS CHECKED ☐ SEE ADDENDUM

19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	Provide services for the investigation and monitoring of petroleum impacts to Trust Resources on the Shoshone Paiutes of Duck Valley Indian Reservation, remedial design and implementing plan development, Owyhee, Nevada, in accordance with the Statement of Work herein. The total awarded amount is $346,510.93 with partial funding of $251,530.00 at award date. The difference will be incorporated within a reasonable period, but not later then contract *(Use Reverse and/or Attach Additional Sheets as Necessary)*				

25. ACCOUNTING AND APPROPRIATION DATA: 01
26. TOTAL AWARD AMOUNT (For Govt. Use Only): $251,530.00

☐ 27a. SOLICITATION INCORPORATES BY REFERENCE FAR 52.212-1, 52.212-4. FAR 52.212-3 AND 52.212-5 ARE ATTACHED. ADDENDA ☐ ARE ☐ ARE NOT ATTACHED.
☒ 27b. CONTRACT/PURCHASE ORDER INCORPORATES BY REFERENCE FAR 52.212-4. FAR 52.212-5 IS ATTACHED. ADDENDA ☒ ARE ☐ ARE NOT ATTACHED.

☐ 28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN _____ COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED.

☒ 29. AWARD OF CONTRACT. A16PS00132 OFFER DATED 01/15/2016 YOUR OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS. Tasks 1 to 12

30a. SIGNATURE OF OFFEROR/CONTRACTOR

31a. UNITED STATES OF AMERICA (SIGNATURE OF CONTRACTING OFFICER) Gerald Knox

30b. NAME AND TITLE OF SIGNER (Type or print): Timothy J. Oliver Vice President
30c. DATE SIGNED: 29 JAN 16
31b. NAME OF CONTRACTING OFFICER (Type or print): Gerald Knox
31c. DATE SIGNED: 01/28/2016

19. ITEM NO.	20. SCHEDULE OF SUPPLIES/SERVICES	21. QUANTITY	22. UNIT	23. UNIT PRICE	24. AMOUNT
	expiration date. . Legacy Doc #: IA Delivery: 01/31/2017 Account Assignment: K G/L Account: 6100.252R0 Business Area: A000 Commitment Item: 252R00 Cost Center: AAHH006200 Functional Area: A0R3B3030.999900 Fund: 156A2100DD Fund Center: AAHH006200 PR Acct Assign Line: 01 Period of Performance: 02/01/2016 to 01/31/2017				
00010	Phase I Project Planning				35,080.00
00020	Phase II Field Investigation				176,150.00
00030	Phase III Remedial Planning				32,000.00
00040	Technical Meetings & Support				8,300.00
	Continued ...				

32a. QUANTITY IN COLUMN 21 HAS BEEN

☐ RECEIVED ☐ INSPECTED ☐ ACCEPTED, AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED: _____

32b. SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE	32c. DATE	32d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE

32e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE	32f. TELEPHONE NUMBER OF AUTHORIZED GOVERNMENT REPRESENTATIVE 32g. E-MAIL OF AUTHORIZED GOVERNMENT REPRESENTATIVE

33. SHIP NUMBER	34. VOUCHER NUMBER	35. AMOUNT VERIFIED CORRECT FOR	36. PAYMENT	37. CHECK NUMBER
☐ PARTIAL ☐ FINAL			☐ COMPLETE ☐ PARTIAL ☐ FINAL	

38. S/R ACCOUNT NUMBER	39. S/R VOUCHER NUMBER	40. PAID BY

41a. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT		42a. RECEIVED BY *(Print)*	
41b. SIGNATURE AND TITLE OF CERTIFYING OFFICER	41c. DATE	42b. RECEIVED AT *(Location)*	
		42c. DATE REC'D *(YY/MM/DD)*	42d. TOTAL CONTAINERS

NAME OF OFFEROR OR CONTRACTOR
COOPER ZIETZ ENGINEERS, INC.

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	POINT OF CONTACT: JOHN GRAVES 602-379-3723 The total amount of award: $251,530.00. The obligation for this award is shown in box 26.				

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1.	SECTION B	SUPPLIES OR SERVICES AND PRICES	
		Quote Schedule	
2.	SECTION C	DESCRIPTIONS / SPECIFICATIONS	
		Statement of Work (SOW)	
3.	SECTION G	CONTRACT ADMINISTRATION DATA	
		DOI ELECTRONIC INVOICING Electronic Invoicing and Payment Requirements -Invoice Processing Platform (IPP) April 2013	
4.	SECTION H	SPECIAL CONTRACT REQUIREMENTS	
		Required Background Investigation	
	1450-0016-001	Homeland Security Presidential Directive -12 (HSPD-12)	August 2004
		Prohibition of Texting While Driving	
		Drug Free Work Site	
5.	SECTION I	CONTRACT CLAUSES	
	1452.226-70	Indian Preference	April 1984
	1452.226-71	Indian Preference Program	April 1984
	1452.280-2	Notice of Indian Economic Enterprise Set-Aside	July 2013
	1452.280-3	Subcontracting Limitations	July 2013
	52.212-4	Contract Terms and Conditions - Commercial Items	May 2015
	52.212-5	Contract Terms and Conditions Required to Implement Statutes or Executive Orders - Commercial Items	December 2015
	52.223-6	Drug-Free Workplace	May 2001
	52.223-18	Encouraging Contractor Policies to Ban Text Messaging While Driving	August 2011
	52.232-40	Providing Accelerated Payments to Small Business Subcontractors	December 2013
6.	SECTION J	LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS	
		DOI Policy - Prohibition on Texting While Driving	
		J.2 BY Referance – AKANA Proposal, 18spages, Appendix A – Project Work Plan, 11 pages and Appendix B -- Cost Proposal, a6 gages, dated January 14, 2015 is incorporated.	

SECTION B SUPPLIES OR SERVICES AND PRICES

1452.280-1 NOTICE OF INDIAN BUSINESS ECONOMIC ENTERPRISE SET-ASIDE JULY 2013

Under the Buy Indian Act, 25 U.S.C. 47, offers are solicited only from Indian economic enterprises (Subpart 1480.8). Any acquisition resulting from this solicitation will be from such a concern. Offers received from enterprises that are not Indian economic enterprises will not be considered and will be rejected.

This procurement is issued under NAICS Code 541620.

Contractor Akana

E-Mail Address agent@akana.us

DUNS# 802745448

Phone# 503-652-9090

QUOTE SCHEDULE

REQUIREMENT: Investigation and Monitoring of Petroleum Impacts to Trust Resources of the Shoshone Paiutes of Duck Valley, Remedial Design and Implementing Plan Development, Owyhee, Nevada.

Quoters shall provide the following itemized quote breakout:

Investigation and Monitoring of Petroleum Impacts to Trust Resources of the Shoshone Paiutes of Duck Valley, Remedial Design and Implementing Plan Development, Owyhee, Nevada.

Tasks 1 to 12 Total $ 346,510.93

The quote price is to be inclusive of all costs including but not limited to, all applicable taxes (Federal, State & Tribal), FOB Destination shipping/delivery costs, labor, supervision, permits & fees, material and supplies, travel, disposal costs, etc.

Quoters are responsible to contact their State Dept. of Revenue to obtain the appropriate taxes to be applied to their quote - NO EXCEPTIONS.

SECTION C DESCRIPTIONS / SPECIFICATIONS

STATEMENT OF WORK
FOR
INVESTIGATON AND MONITORING OF PETROLEUM IMPACTS TO TRUST RESOURCES OF THE SHOSHONE PAIUTES OF DUCK VALLEY, REMEDIAL DESIGN AND IMPLEMENTING PLAN DEVELOPMENT

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VIII. PLACE OF PERFORMANCE 16

I. INTRODUCTION

This requirement is for the continued assessment, evaluation, and remedial planning necessary to address petroleum hydrocarbon contamination to subsurface soil and shallow groundwater present within the community of Owyhee, Nevada, on the Shoshone-Paiutes of Duck Valley (Sho-Pai) Indian Reservation (see Figure 1, attached). Work entails review of associated documents, records and reports, project planning, soil and groundwater sample collection and analysis, data analysis and interpretation, semi-annual groundwater monitoring, quarterly well elevation surveying, slug and aquifer pump testing, monitoring well installation and abandonment, reporting of assessment activities and results, remedial design and implementation planning, and other technical assistance, coordination and support for the Bureau of Indian Affairs (BIA), Western Regional Office (WRO) Division of Environmental and Cultural Resources Management (DECRM), located in Phoenix, Arizona.

Offerors are advised that all field work and deliverables shall be reviewed, monitored, and/or approved by participating federal and tribal stakeholders, including, but not limited to: (1) BIA Eastern Nevada Agency (ENA); (2) the Sho-Pai Council and Tribal offices; the Indian Health Service (IHS), and; (3) the Enforcement Division of the United States Environmental Protection Agency (EPA), Region 9. Frequent travel to Owyhee, Nevada is required for performance of field investigations at regular intervals during the one (1) year assessment period, and attendance during project planning and technical meetings with stakeholders.

II. BACKGROUND

A. Site Description

The Sho-Pai Indian Reservation is located north of Elko, Nevada, and just south of the Idaho-Nevada border on Nevada State Highway 225, which turns into Idaho State Highway 51 at the Idaho-Nevada state line. The town of Owyhee is situated at an approximate elevation of 5,400 feet above mean sea level (amsl) (see Figure 2, attached). The land to the east rises sharply to an elevation of approximately 6,700 feet amsl. Duck Valley is on the Snake River Drainage, just north of the Great Basin. Irrigation water is controlled by the Wild Horse Dam located approximately 30 miles upstream (to the southwest) on the Owyhee River.

Groundwater occurs in a shallow alluvial aquifer. The depth to groundwater recorded in monitoring wells between 2005 and 2009 ranged from approximately 3 feet to 14 feet below ground surface (bgs). The direction of groundwater flow in the central area of Owyhee, south of OPD Road, historically has been to the northwest at a gradient of approximately 0.006 feet per foot (ft/ft). A trough-like feature in the potentiometric surface with a northwest-southeast trend has also been observed in this area. The direction of groundwater flow in the vicinity of the former IHS facility has historically been to the west; however, the hydraulic gradient is steeper in this area (0.05 ft/ft).

B. Contaminant Release History

In February 1985, 8,000 gallons of heating oil were delivered to a 16,000-gallon above-ground storage tank (AST), located approximately 75 feet east of Highway 225 near an old power plant (see Figure 3, attached). Five days later and before the 8,000 gallons should have been consumed, the tank was empty, suggesting that the pipelines that carried fuel to consumers had substantial leaks. Use of the heating oil pipeline was discontinued in 1985, and the 16,000-gallon AST continued to be used to store fuel, which was transferred by truck to individual ASTs.

In October 1987, an oil-like odor was discovered in two municipal wells that were subsequently taken out of service. In March 1998, the Indian Health Services (IHS) reported that the Owyhee public water contained a petroleum-like taste. The Shoshone-Paiute Tribe (Tribe) conducted nine test pit excavations to depths 12 to 15 feet below the ground surface (bgs) at locations to the east, west and north of the Tribal maintenance building. Free-phase hydrocarbons (FPH) were observed on the groundwater surface in two test pits located north of the Tribal Maintenance Building between the municipal supply Wells #1 and #3. Soil was excavated along the buried pipeline north of the Tribal Maintenance building to groundwater, and FPH were encountered beneath pipeline fittings. Soil samples obtained from underneath the pipeline contained concentrations of total petroleum hydrocarbons in the diesel range (TPHd) from 11,000 to 12,000 milligrams per kilogram (mg/kg).

In March 1988, a 12,000-gallon underground storage tank (UST) located on the east side of the Road Shop building and a 12,000-gallon UST located south of the former power plant (east of the highway) were removed (Figure 3). Both USTs were used for storing diesel, and neither UST was connected to the town site distribution pipeline. No hydrocarbon-impacted soil was reported from either excavation, and no soil test data was available from this activity. Sometime during 1989, a former 1,000-gallon AST containing gasoline located at the northeast corner of the Road Shop yard was vandalized. It was estimated that between 200 to 800 gallons of gasoline were released to the ground surface.

During the installation of a water line in November 1995, approximately sixty feet of pipeline was removed northeast of the Tribal Maintenance Building near the intersection of "L" and "C" Streets. Soils in the vicinity of the line were reported to be impacted with heating oil.

C. Administrative Order / Finding of Imminent and Substantial Endangerment to the Health of Persons

In June, 1995, the USEPA Region 9 issued an Administrative Order (Order) to BIA for violation of the Safe Drinking Water Act. In the Order, EPA directed BIA to immediately cease use of the injection well, then to sample, plug and formally abandon the well. These actions were included among the six (6) total provisions and fifty-four individual (54) total requirements stipulated by the Order. Compliance requirements for environmental assessment, corrective action, and remediation, (Order Provisions I – II, requirements 1 – 45) are summarized below (*see also* Section E of this Part):

- Locating all piping and drains associated with injection well
- Sampling fluids within the disposal well and piping
- Permanently plugging the disposal well and associated drains
- Proper storage or disposal of contents of drums
- Removal and disposal of all standing pools of contaminants and stained soil
- Develop work plan for remediation of impacted soil and groundwater if necessary
- Proper storage or disposal of contents of drums
- Removal and disposal of all standing pools of contaminants and stained soil
- Develop work plan for remediation of impacted soil and groundwater if necessary

In response to the Order, the Bureau of Reclamation (BOR) assisted BIA with the development of a Work Plan to facilitate removal of impacted soils, the removal of pipelines and drains, the sampling and analysis of soil and groundwater, characterization of contaminant impacts in soil and groundwater, and long term monitoring of groundwater contamination.

D. Previous Investigations, Corrective Actions, and Environmental Remediation

During 1995 and 1996, BIA contracted the removal of approximately sixty feet of heating oil distribution pipeline northeast of the Tribal Maintenance Building, near the intersection of BIA Road and Gah-Nee Road; during the removal, soil within the excavation pit was observed contaminated along the entire length of the line. BIA also plugged and abandoned the injection well, and removed and disposed of several leaking drums containing used motor oil, roads sealant, herbicides (2,4-D, 2,4,5-T, and Dinoseb) from the Roads Yard; approximately 40 cubic yards of Dinoseb contaminated soil were excavated to a depth of seven feet below grade (bgs).

In 1999, Cherokee General Corporation and SECOR removed the majority of the remaining heating oil pipeline and significant quantities of hydrocarbon-impacted soils, where feasible (see Figure 4, attached). SECOR also conducted a subsurface investigation to estimate the remaining impact to soil and groundwater, and characterized the hydrogeology of the site. The results from the investigation suggest that four major releases (Locations 1 through 4, below) and two moderate releases (Locations 5 and 6, below) of petroleum products had occurred. Their locations were:

(1) Along the heating oil pipeline east of Highway 225;

(2) At a former heating oil UST, 200 feet west of Highway 225;

(3) At a 90 degree turn in the pipeline, 475 feet west of Highway 225 at the intersection of "L" Street and "C" Street;

(4) Along the pipeline near the ASTs in the northeast corner of the Tribal Maintenance Yard;

(5) At a former UST location in the northern area of town near the jail; and

(6) At the discharge pipe outlet in the Bureau of Indian Affairs (BIA) Road Shop Yard.

Of these releases, four of them (Locations 2 through 5) appeared to have impacted groundwater in the area of the release and northwest of the release. Evidence of groundwater impact in these four areas consisted mainly of TPHd, although groundwater down-gradient from the Tribal Maintenance Yard release (Location 4) contained both TPHd and total petroleum hydrocarbons in the gasoline range (TPHg). Groundwater was not encountered during excavation in the area of Location 1, and the rocky subsurface prohibited water sample collection; it is therefore not known whether groundwater in this area was impacted. Groundwater samples collected in the area surrounding the discharge pipe outlet (Location 6) indicate that groundwater was not impacted.

Numerous other areas where petroleum releases occurred along the pipeline and at former storage tank locations were investigated by SECOR in 1999 and mitigated through soil removal. Relatively shallow subsurface soils that were impacted with petroleum products by past activities (e.g., equipment storage) at the Road Shop area were also excavated and removed. In total, approximately 2,850 cubic yards (yd^3) of impacted soil were removed from throughout the site. Of the nearly 30 areas excavated during this investigation, TPH contaminated soil was left in 18 of the areas due to the location of buildings or structures, roads or utilities prevented further excavation, or where the amount of clean soils overlying impacted areas made the removal of the soils cost prohibitive.

In the fall of 2000, Steffen, Robertson & Kirsten Consultants (SRK) advanced and sampled 21 soil borings, 18 of which were converted to groundwater monitoring wells (see Figure 5, attached). The analytical data from samples collected during the installation of the wells provided further evidence that soils and groundwater in the areas delineated in 1999 were impacted with TPH. During the November 2000 sampling event, groundwater samples from the wells were analyzed for TPH-g, volatile organic compound (VOCs), semi-volatile organic compounds (SVOCs) and the eight metals identified by the Resource Conservation and Recovery Act (RCRA) as hazardous (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). The VOC and SVOC analyses provided an indication of the concentration of degraded TPHd components and solvent constituents in the groundwater, but did not provide TPHd concentrations. No metal concentrations were detected in the groundwater samples and all VOC concentrations reported were below the Federal primary drinking water standards. Samples from well MW-5 were also analyzed for pesticides and herbicides because of reported historic improper disposal of these compounds in the vicinity of the well. No pesticides or herbicides were detected in the samples.

SRK also provided oversight for the removal of two USTs and one AST from the former IHS Hospital site during their investigation (Figure 3). Only non-native backfill soils were removed from the UST basin, and soil samples collected from native soils in the excavation had TPHd concentrations ranging from 560 mg/kg to 6,100 mg/kg. Three monitoring wells were installed in the vicinity of the hospital (MW-16, -17 and -18). Low concentrations of naphthalene, a degradation product of TPHd, were detected in each of the three wells.

In 2002, the BIA contracted Western Construction Incorporated (Western) to begin grading and paving roads throughout Duck Valley. While the roads were under construction, SECOR supervised Western during the excavation of TPH-impacted soils from beneath the roads where impacted soils had been left during the 1999 investigation. During this investigation, approximately 1,932 yd^3 of TPH-impacted soil were excavated from beneath roads. The total volume of soils excavated was comprised of 1,348 yds^3 from the area near the intersection of "L" Street and "C" Street; 560 yd^3 from the area along the pipeline near the ASTs in the northeast corner of the Tribal Maintenance Yard; and 24 yds^3 from approximately 50 feet west of Highway 51 along the northern edge of "D" Street. Approximate locations of the 1999 and 2002 excavations are indicated in Figure 4.

SECOR personnel monitored and sampled 17 monitoring wells for four quarters between September 2004 and June 2005. The June 2005 analytical data indicated that groundwater in the area encompassing wells MW-6, MW-8, MW-11 and MW-13 continued to have TPHg concentrations ranging from 0.54 to 2.0 milligrams per liter (mg/L) and TPHd concentrations from 1.3 to 67 mg/L. TCE was first detected in monitoring well MW-10 during the September 2002 sampling event. The observed TCE concentration has remained relatively stable, ranging from 1.2 to1.6 µg/L over the entire period of groundwater monitoring.
SECOR also approximated the extent of TPH contaminated soil that had not been excavated during the 1999 and 2002 excavations. TPH-impacted soil remains in the ground in the area between "L" and "N" Streets and wells MW-13 and MW-16 along utility corridors, beyond the street right-of-ways and throughout the soil/water interface (capillary fringe). Soil in the vicinity of well MW-10 on the east and west sides of Highway 225 is impacted with TPHd (see Figure 6, attached).

Based on final groundwater sampling event SECOR recommended that groundwater sampling be continued, and additional soil borings and monitoring wells be installed to further delineate the extent of the TPH impacts to soil and groundwater. In addition, SECOR reported that due to a lack of remedial action levels at the site, it was not possible to make recommendations regarding the extent of Dinoseb contamination in groundwater.

During August and September 2008, BIA subsequently contracted with Stantec (formerly SECOR) to abandon five monitoring wells (MW-4, MW-5, MW-16, MW-17, and MW-18), and three municipal wells (Well #1, Well #2, and Well #3), to install 13 monitoring wells (MW-5R, and MW-19 through MW-30), and to monitor new and existing wells were for a period of one year (Figure 5). Samples were analyzed for TPH-g, TPH-d, benzene, toluene, ethylbenzene and total xylenes (BTEX), and naphthalene. Additionally, the sample collected from well MW-10 was analyzed for TCE.

In Stantec's 2009 Summary Report, Stantec recommended that remedial objectives for the site be established, including threshold remedial action goals for criteria contaminants, followed by the development and implementation of a Remedial Work Plan and continued monitoring to evaluate the effectiveness of remedial activities.

In April, 2013 BIA contracted Doughtery Sprague Environmental (DSE) to perform the latest groundwater monitoring event, sampling and analyzing groundwater from each of the existing monitoring wells. DSE collected samples from a total of twenty (23) monitoring wells, and reported that areas of groundwater contamination were relatively localized (TPH-DRO being the exception), and that only benzene, was detected above the Regional Screening Level (RSL) in monitor well MW-24. TCE was not detected in any of the samples. Each sample was analyzed for BTEX, TCE, Dinoseb, gasoline and diesel range organics.

The current nature and extent of groundwater detectible contaminant concentrations contaminants documented during the 2013 groundwater monitoring event is illustrated for each contaminant in Figures -7 through -12 (attached). Analytical results and contaminant trends are also provided chronologically for each monitoring well sampled during the 2013 monitoring event (see Table 1, attached).

E. Administrative Order Compliance Status

In a 2007 letter to BIA, EPA acknowledged the assessment, corrective and remedial actions performed/completed by BIA since the issuance of the Order. The letter also briefly summarized requirements of the Order BIA has yet to fulfill, as excerpted below:

"Outstanding obligations remaining from the Administrative Order include locating an alternative vehicle maintenance fluid storage area, and remedying any ground water contamination found to be caused by Roads Shop contamination from the injection well, the leaking Underground Storage Tank, associated pipelines, or other contaminating practices. ... EPA requests that BIA prepare a list linking each of the Order's requirements to BIA actions, taken or planned, by April 19, 2007. The summary will provide a basis for discussion between BIA, EPA, the Indian Health Service, and the Tribe to determine what is needed to conclude this matter."

Through BIA's internal review of the Order and evaluation of work performed to date, BIA has determined that it has achieved and/or demonstrated compliance with approximately two thirds of the corrective actions, environmental and remediation requirements of Administrative Order. BIA's compliance achievements are indicated in Table 2 (attached), as denoted by a green check in the status field next to the Order's compliance requirement. BIA has identified several outstanding compliance requirements that have an indeterminate and/or incomplete fulfillment status, as denoted by a red x in the status column next to the requirement.

III. STATEMENT OF WORK

A. Work Objectives

The overall objective of this requirement and fundamental governmental need is the performance/conduct of contracted services, support, and products necessary to completely address, fulfill, or otherwise satisfy compliance Provisions I and II and all related requirements of the 1995 EPA Administrative Order.

B. Work Requirements

The successful Offeror (contractor) shall supply BIA WRO the professional services and technical support, subcontracted as necessary, to implement and fully execute Tasks -1 through -11 of this requirement. Services and support are to include, but are not limited to: contract administration, project management and coordination; furnishing of personnel, labor, equipment, materials and supplies necessary for the development, submittal, and acceptance of deliverables; performance of work, services, and products rendered with observance of, and adherence to the conditions and prescriptive specifications provided in this Part.
While working on the Sho-Pai Indian Reservation, the contractor shall adhere to all federal and state law, and tribal ordinances and requirements. Application and procurement of permits and licenses and payment of fees are the responsibility of the contractor. Tribal permits and licenses may include (but are not limited to) 1) Business License; 2) Tribal Employment Rights Office (TERO) Permit; and 3) Natural Resources Permits and Approvals. The contractor shall schedule, coordinate, and communicate all field work with Tribal personnel, as directed, and DECRM.

This requirement includes a total of twelve work Tasks as prescribed below. Task 12 includes: contractor presentations, coordination and participation conducted during one (1) technical meeting in Owyhee, NV; contractor presentations, coordination, and participation during seven (7) teleconferences, and; technical support and assistance requested by DECRM. A conceptual project completion schedule for rendering of contracted work, services, and products during the execution of this requirement is presented in Table 3 (attached).

PHASE I: Project Planning

- **Task 1:** Records Review and Stakeholder Outreach
- **Task 2:** Administrative Order Review, Compliance Status and Gap Analysis
- **Task 3:** Initial Site Visit and Project Kick-Off Meeting

- **Task 4:** Preliminary Groundwater Sampling
- **Task 5:** Phase II and III Project Work Plan

PHASE II: Field Investigations and Assessment Reporting

Task 6: Monitoring Well Installation (7 wells), Abandonment (3 wells), Soil Sampling and Analysis (48 Borings)

Task 7: Quarterly Elevation Surveys (30 Wells)

Task 8: Semi-Annual Groundwater Monitoring (30 Wells). Slug and Aquifer Pump Testing

Task 9: Bi-Annual Groundwater Comparative Assessment Reporting (Groundwater Assessment Reports)

Phase III: Remedial Planning

- **Task 10:** Remedial Design Plan
- **Task 11:** Remedial Implementation Work Plan

Other Technical Assistance, Coordination and Support Services

- **Task 12:** Teleconferences, Meetings and Support

C. Work Specifications

Task 1: Records Review and Stakeholder Outreach

The contract shall thoroughly review all technical reports, correspondence and other documents related to the environmental assessment and remediation of soil and groundwater contamination caused by BIA facilities in the community of Owyhee, NV. This information shall include, but not be limited to the reports and documents provided as attachments of this requirement. This review shall be performed in-house at BIA WRO in Phoenix, AZ, or alternatively, at the contractor's home office location; however, original documents may not be shipped to off-site locations. The contractor shall be responsible for all costs associated with reproduction and shipment of copied materials for home office location reviews.

As directed, the contractor shall contact Sho-Pai's Tribal Employment Rights Office, Business Office, and Natural Resources Offices and others as directed to arrange for and obtain all required permits, licenses and fees.

The contractor shall coordinate with stakeholders (BIA, Sho-Pai, EPA) and participate during one (1) 1½ hour teleconference call for stakeholder introductions, discussion of contracted activities and services, project logistics and schedule. The contractor shall prepare and present the project overview of this requirement via WebEx, note and summarize discussions and electronically distribute teleconference minutes to stakeholders within one (1) business day following the teleconference.

The contractor shall complete this Task within sixty (60) calendar days from the NTP date.

Task 2: Administrative Order Review, Compliance Status and Data Gap Analysis

The contractor shall thoroughly review EPA's Administrative Order to BIA, and based on the document review and information assembled during Task 1, verify the completion status of provisions I and II of the Order, for each of the thirty-one (31) compliance requirements (paragraph #17 through -45). For each requirement that have not been completed,

and/or for which the completion status cannot be verified or is otherwise indeterminate, the contractor shall identify and incorporate as practicable, the performance and/or conduct of Phase II Field Investigations and Phase III Remediation Plans that are necessary to complete/fulfill the requirement into the approved Phase I Project Planning deliverable (see Task 4, below). The results of this review shall be reported as an appendix to the Task 4 Project Work Plan, and referenced as needed to support rational for the contractor's approach, activities, and methods proposed and memorialized in the Project Work Plan. Results of this review shall also be included and incorporated into the evaluation of remedial alternatives considered during development of the Task 9 Remedial Design Plan deliverable of this requirement.

The contractor shall complete this Task within sixty (60) calendar days from the NTP date.

Task 3: Initial Site Visit and Project Kick-Off Meeting

Within ninety (90) calendar days from the NTP the contractor shall travel to Owyhee, Nevada to attend, facilitate and conduct a project 'kick-off' meeting with federal and tribal officials and personnel to discuss the work activities and deliverables of this requirement, project logistics, and schedule. During this meeting the contractor will present to the audience a Microsoft PowerPoint 'chronological overview' of past environmental assessment and remedial activities contracted by BIA, summary of informational and data needs to be gathered by the contractor during the next one (1) year assessment period of this requirement, and potential future short and long term requirements for environmental monitoring and remediation. The contractor shall present a conceptual site model during the presentation/discussion, and based on available information, identifying potential risks from contaminant releases to human health and/or natural resources.

During the meeting, the contractor shall provide participants with hard copies of the Task #4 (draft) Project Work Plan deliverable. The contractor shall make an estimated twelve (12) copies available to the participants attending the kick-off meeting. The contractor's chronological overview presentation shall complement the introduction and scope and deliverables of this requirement, as outlined in the draft Project Work Plan. The duration of the meeting shall be an estimated minimum of three (3) hours.

The contractor shall conduct a minimum four (4) hour site visit during the afternoon following the kick-off meeting (a single eight (8) hour work day is anticipated for this Task). Observations, notes, photographs and other information collected during this Task and documented during periodic teleconferences shall be utilized by the contractor for revision and finalization of the Project Work Plan.

Task 4: Preliminary Groundwater Sampling

Following the initial site visit, but prior to development of the Project Work Plan, the contractor shall collect groundwater samples from each of twenty-three (23) monitoring wells to establish baseline contaminant concentrations in groundwater. Samples shall be analyzed using EPA Method 8260B and EPA Method 8015D for TPH-GRO and TPH-DRO. The contractor shall collect samples from existing monitoring well #s: MW -1,-5R, 6 -12, 14-15, 19-30).

Task 5: Project Work Plan

The contractor shall prepare and submit draft and final copies of a Project Work Plan to communicate and to formalize project objectives, approach, methods, notification procedures, schedule (Gantt chart, with schedule of significant milestones), regulatory requirements, organizational structure (including list of subcontractors), and contractor and personnel licenses and certifications.

The Project Work Plan shall include, but not be limited to, the following components:

- Site Description, Nature and Extent of Contamination
- Project Overview and Objectives
- Project Logistics and Schedule

- Site Conceptual Model and Receptor Risk Evaluation
- Soil and Groundwater Sampling and Analysis Plan (SAP)
- Health and Safety Plan (HASP)
- Quality Assurance Project Plan (QAPP)

Stakeholders shall have a minimum sixty (60) calendar day review and comment period following the distribution of the draft Project Work Plan at the project kick-off meeting. The contractor shall incorporate to the greatest extent practical, and as appropriate, any comments, concerns and/or recommendations provided by the stakeholders during this period. The contractor shall submit by mail one (1) hard and one (1) electronic copy of the final Project Work Plan to DECRM, and three (3) hard and three (3) electronic copies of the final Work Plan to Sho-Pai, and to EPA Region 9.

The final Work Plan deliverable shall be submitted within one hundred eighty (180) calendar days from the NTP.

Task 6: Monitoring Well Installation (7 wells), Abandonment (3 wells), Soil Sampling and Analysis (48 Borings)

Monitoring Well Installation

Following completion of Phase I Project Planning Activities, within two hundred ten (210) calendar days from the NTP date the contractor shall commence Phase II field work, beginning with the installation and development of seven (7) new monitoring wells and subsurface soil investigation. Services include acquiring wells installation permits from the Nevada Division of Water Resources and submitting Affidavits of Abandonment, and proper disposal of all investigation derived waste.

New monitoring wells shall be constructed in accordance with ASTM Standard Guide for Design and Installation of Groundwater Monitoring Wells (D5092 – 04), utilizing a truck-mounted, direct-push probe bored to a maximum depth of twenty (20) feet bgs. Wells shall be placed in accordance with locations identified in the approved, final Project Work Plan.

Six (6) 2-inch diameter and one (1) 4-inch diameter wells shall be constructed using flush-threaded, Schedule 40 polyvinyl chloride (PVC) casing and 0.020-inch machine slotted PVC well screen. A sand filter pack shall be placed in the annular space surrounding the screen, extending approximately 2 feet above the top of the screen. A bentonite annular seal shall be placed above the filter pack, and then cemented to ground surface. The wellheads shall be completed at the ground surface with lockable compression-type well caps and flush-mounted, traffic-rated locking well vaults with bolt-down lids. Each well shall be developed by surging and bailing water from the well casing to remove sediment from the filter pack. The northing, easting, and top-of-casing (TOC) elevations for each of the new wells shall be surveyed following completion, and a completion report shall be prepared for each well. Completion reports shall be included in the first Groundwater Assessment Report.

Soil Sampling and Analysis

Following completion of Phase I Project Planning Activities, within two hundred ten (210) calendar days from the NTP date, the contractor shall use direct push methods to advance a maximum of forty eight (48) borings to a maximum depth of twenty five (20) feet bgs to further characterize and delineate TPH-impacted soil in the area between "L" and "N" Streets, and in the vicinity of monitoring wells MW-13 and MW-16, and TPHd-impacted soil in the vicinity of well MW-10 on the east and west sides of Highway 225. Borings shall be located in accordance with locations identified in the approved, final Project Work Plan.

One (1) soil sample shall be collected at each five-foot interval during the advancement of each boring (four (4) samples total per boring). Soil samples shall be classified according to the Unified Soil Classification System (USCS), and physical soil characteristics (i.e., moisture content, consistency, odor, color, etc.), drilling difficulty, sample recovery, and soil type shall be noted. In addition, the presence of VOCs in the extracted soil sample shall be measured using calibrated

photo-ionization detector (PID) or flame ionization detector (FID). The soil sample with the highest VOC measurement shall be submitted to an analytical laboratory for chemical analyses.

The contractor shall submit a maximum total of forty eight (48) soil samples to a certified laboratory for analysis. Each sample shall be analyzed for TPH, VOCs, and polynuclear aromatic hydrocarbons (PAHs) by EPA Methods SW8015B, SW8260B, and SW8310, respectively. Results of the soil investigation shall be included and incorporated into the Remedial Design Plan, developed pursuant to Task 9 of this requirement.

Monitoring Well Abandonment

Near the end of the one-year assessment period but within five-hundred forty (540) days from the NTP, the contractor shall abandon a minimum of three (3) monitoring wells (MW -2, -3, and -13) in accordance with tribal requirements and the specifications identified in the approved Project Work Plan. Abandonment shall include removal of the end cap of each well, bailing, and pumping grout into the well from the bottom of the casing to the ground surface. Once filled with grout, the contractor shall remove casings from the ground, and grade the surface to match the surrounding area.

All Task 5 field work shall be completed within five-hundred forty (540) days from the NTP

Task 7: Quarterly Elevation Surveys (30 Wells)

Following completion of Phase I Project Planning Activities, the contractor shall determine groundwater flow direction and seasonal flow variations through performance of quarterly elevation surveys at four (4) month intervals during the one (1) year groundwater monitoring period. Measurements shall be obtained from each of the seven (7) new monitoring wells, and twenty three (23) of the existing wells (MW -1,-5R, 6 -12, 14-15, 19-30).

The contractor shall use a handheld GPS device to collect latitude and longitude information for the new monitoring wells. For the top-of-casing (TOC) elevations, a Trimble LL400 laser level was used in conjunction with a Trimble HL700 Laserometer and surveying rod, or equivalent methodology. The contractor shall remove well head caps and allow the well casing pressure to equilibrate to atmospheric pressure prior to measuring the static water level. The depth to groundwater shall be measured using TOC elevation as a reference point. Following each elevation survey, the contractor shall prepare potentiometric surface maps illustrating aquifer characteristics.

Results of the first and second elevation surveys shall be presented in the first Bi-Annual Assessment Report. Results of the third and fourth elevation surveys shall be presented in the second Bi-Annual Assessment Report.

All Task 5 field work shall be completed within five-hundred forty (540) days from the NTP.

Task 8: Quarterly Groundwater Monitoring (30 Wells), Slug and Aquifer Pump Testing

Quarterly Groundwater Monitoring

Following completion of Phase I Project Planning Activities, the contractor shall collect and analyze groundwater samples for each of four (4) monitoring events, performed at four (4) month intervals during the one (1) year groundwater monitoring period. A total of thirty monitoring wells shall be sampled during each event. Prior to sample collection, the contractor shall remove well head caps and allow the well casing pressure to equilibrate to atmospheric pressure prior to measuring the static water level. The depth to groundwater and the total depth of the well shall be measured using the top of the well casing as a reference point. Based on the measurements obtained during well gauging, the contractor shall calculate the purge volume for each well and then purge the well using disposable bailers designed to minimize turbulence within the well casing.

Each well shall be monitored for the stabilization parameters pH, temperature, and specific conductance, during the well purging process. Once stabilization is achieved and approximately three casing volumes of water is evacuated from the well, three 40 milliliter vials containing hydrochloric acid preservative shall be filled, sealed with Teflon septa lids, and checked for zero head space. Sample vials shall be labeled, placed in an ice chest to maintain sample temperature at 4°C (±2°C), and transported to the laboratory under chain of custody record for analysis.

Each of the thirty (30) groundwater samples collected shall be analyzed for one or more of the following constituents: TPH-g and TPH-d by EPA Method SW8015B, VOCs by EPA Method SW8260B, and PAHs by SW8310, in general accordance with the following schedule:

	TPH-G	TPH-D	Naphthalene	BTEX	TCE	PAHs
Total # Analysis	27	30	27	14	5	30

Results of the first groundwater monitoring event shall be included in the first and second Groundwater Assessment Reports. Results of the second and third groundwater monitoring events shall be presented in the second Groundwater Assessment Report.

Slug Testing

At any time during the Phase II field investigations, the contractor shall conduct slug tests for calculation of the approximate hydraulic conductivity of the saturated materials in the immediate vicinity of the monitoring wells with detectable contaminant concentrations. Slug testing shall be conducted by lowering a slug (an enclosed PVC cylinder) below the water level of the wells and monitoring the hydraulic response caused by introduction of the slug. Before and during slug testing, water level fluctuations in the monitoring wells will be monitored with a water level indicator and a pressure transducer. Based on the data analysis, the hydraulic conductivity and transmissivity of the saturated formation materials shall be estimated. Slug testing parameters and analysis of the slug test data will be performed using approved methods specified in the Project Work Plan. Results of the Slug Testing shall be included and incorporated into the Remedial Design Plan, developed pursuant to Task 9 of this requirement.

Aquifer Pump Testing

At anytime during the Phase II field investigations, the contractor shall conduct an aquifer pump test. The purpose of the pump test is to evaluate hydraulic properties of the shallow aquifer required for the design of a pump and treat system for remediation of contaminated groundwater pursuant to development of the Task 9 Remedial Design Plan. The contractor shall perform a 24-72-hour constant-discharge pumping test utilizing a new or redeveloped existing monitoring well as an extraction well, measuring hydraulic responses (drawdown) from the pumping test utilizing two of the new or two of the existing monitoring wells located near the extraction well as observation wells. Aquifer testing parameters and analysis of the aquifer test data will be performed using approved methods specified in the Project Work Plan. Results of the Aquifer testing shall be included and incorporated into the Remedial Design Plan, developed pursuant to Task 9 of this requirement. Offerors shall assume the generation of approximately 5,000 gallons of wastewater for this activity.

All Task 5 field work shall be completed within five-hundred forty (540) days from the NTP.

Task 9: Bi-Annual Groundwater Comparative Assessment Reports

The contractor shall prepare and submit draft and final Groundwater Assessment Reports upon completion of each six (6) month assessment period. The Reports shall include and incorporate the results the quarterly elevation surveys and semi-annual groundwater monitoring events conducted during performance of this requirement.

Groundwater Assessment Reports shall describe, summarize, and detail all assessment-related activities, methods, and results for all field work conducted/performed by the contractor for the previous assessment period, incorporating where practical, prior contaminant concentration results and elevation data and other information required for reconstruction, interpretation, and explanation of the nature and extent of groundwater contamination and attenuation of contaminants since 2002. Each report shall detail the nature and extent of groundwater contaminants, contaminant concentration, and

movement of contaminated groundwater. Reports shall include figures, tabulated analytical data, summary tables, evaluation and interpretation of analytical results.

Draft Groundwater Assessment Reports shall be distributed to stakeholders electronically for editing and markup. Upon receipt of draft documents, stakeholders shall have a minimum sixty (60) calendar day review and comment period following submittal of each draft Report. Final Groundwater Assessment Reports shall be submitted within thirty (30) days following the stakeholder review. The contractor shall incorporate to the greatest extent practical, and as appropriate, any comments, concerns and/or recommendations provided by the stakeholders during this period into the final Reports.

The contractor shall submit by mail one (1) hard and one (1) electronic copy of each final Groundwater Assessment Report to DECRM, and three (3) hard and three (3) electronic copies of each final Report to Sho-Pai, and to EPA Region 9.

The first, final Groundwater Assessment Report deliverable shall be submitted within four hundred eighty (480) calendar days from the NTP date. The second, final Groundwater Assessment Report deliverable shall be submitted within six hundred sixty (660) calendar days from the NTP date.

Task 10: Remedial Design Plan

The contractor shall prepare and submit draft and final Remedial Design Plan documents upon completion Phase II field work. The Reports shall present, include and incorporate the results elevation surveys, semi-annual groundwater monitoring events, soil investigation, slug testing and aquifer pump testing conducted during performance of this requirement, and all available historical groundwater monitoring and environmental assessment information. All corrective and remedial actions performed to date shall be detailed. The Remedial Design Plan shall include, but not be limited to, the following components:

- Consideration and Integration of Administrative Order Requirements
- Contaminant Delineation and Distribution in Groundwater (2002-2016)
- Contaminant Delineation and Distribution in Subsurface Soil
- Slug and Aquifer Pump Test Methods and Results
- Human Health / Environmental Receptor Risk Assessment
- Identification of Criteria Contaminants in Soil and Groundwater
- Regional Screening Levels for Criteria Contaminants
- Remedial Treatment Goals for Criteria Contaminants (if different than RSLs)
- Technical Analysis and Overview of Remedial Alternatives and Limitations
- Capitol and Operational Life Cycle Cost Estimation
- Evaluation and Selection of Preferred Remedy(s)
- Short and Long term Groundwater Sampling and Analysis Requirements
- Installation / Abandonment of Groundwater Monitoring Wells
- Draft and Final Remedial Design Plan, Specifications, and Schedule

The draft Remedial Design Plan shall be distributed to stakeholders electronically for editing and markup. Upon receipt of draft documents, stakeholders shall have a minimum sixty (60) calendar day review and comment period following submittal of each Bi-Annual Assessment Report. The final Remedial Design Plan shall be submitted within thirty (30) days following the stakeholder review. The contractor shall incorporate to the greatest extent practical, and as appropriate, any comments, concerns and/or recommendations provided by the stakeholders during this period into the final Plan.

The contractor shall submit by mail one (1) hard and one (1) electronic copy of the final Remedial Design Plan to DECRM, and three (3) hard and three (3) electronic copies of the final Plan to Sho-Pai, and to EPA Region 9.

The draft Remedial Design Plan deliverable shall be submitted within four hundred eighty (480) calendar days from the NTP date. The final Remedial Design Plan deliverable shall be submitted within six hundred sixty (660) calendar days from the NTP date.

Task 11: Remedial Implementation Work Plan

Upon finalization of the Remedial Design Plan, the contractor shall submit draft and hardcopies of a Remedial Implementation Work Plan, developed to execute the approved remedial approach for addressing hydrocarbon contaminated soil and groundwater within the community of Owhyee, NV. The Remedial Implementation Work Plan shall include specifications and work requirements necessary to fully implement all aspects of the approved Remedial Design, including specifications and work requirements for the procurement, construction, installation, maintenance, monitoring of remedial equipment, supplies and materials, soil excavation, removal and disposal, and short and long term groundwater monitoring of natural attenuation and/or effectiveness of remedial techniques(s) and treatment system(s). The Remedial Implementation Work Plan shall include, but not be limited to, the following components:

- Bid Ready Statement of Work and Technical Specifications for one (1) Base and four (4) Optional Performance Periods in Request for Bid format
- Racer ® or Equivalent Engineering Cost Estimate
- HASP / QAPP
- Tables, Figures and Attachments

The draft Remedial Implementation Work Plan shall be distributed to stakeholders electronically for editing and markup. Upon receipt of draft document, stakeholders shall have a minimum thirty (30) calendar day review and comment period following submittal the draft Plan. The final Remedial Implementation Work Plan shall be submitted within thirty (30) days following the stakeholder review. The contractor shall incorporate to the greatest extent practical, and as appropriate, any comments, concerns and/or recommendations provided by the stakeholders during this period into the final Plan.

The contractor shall submit by mail one (1) hard and one (1) electronic copy of the final Remedial Implementation Work Plan to DECRM, and three (3) hard and three (3) electronic copies of the final Plan to Sho-Pai, and to EPA Region 9.

The draft Remedial Implementation Work Plan deliverable shall be submitted within seven hundred twenty (720) calendar days from the NTP date. The final Plan shall be submitted within seven hundred eighty (780) calendar days from the NTP date.

Task 12: Teleconferences, Meetings and Support

The contractor shall attend and conduct a one (1) eight (8) hour technical meeting in Owybee, NV. The contractor shall prepare and present the results of field investigations, draft remedial alternatives, and proposed treatment plans during the technical meeting.

In addition, the contractor shall attend and conduct a minimum total of seven (7) WebEx teleconferences during the performance period of this requirement, and prepare and present materials for each teleconference as requested by BIA and/or other participating stakeholders.

IV. NOTICE TO OFFERORS

Offerors are required to include in their proposals a preliminary project work plan, which describes in detail the approach of executing this requirement, identification of project personnel and qualifications, contractor/subcontractor organization, descriptions of past work involving a minimum of three (3) similar job sites, and anticipated schedule.

Proposals must include unit prices for labor, equipment, materials, travel, analytical services, transportation, and disposal expenses, as well as subtotal and total costs for Tasks 1-11 detailed above. Proposals are to be limited twenty (20) pages in length, excluding bid schedule information. Offerors shall identify unit prices and fees, including all subcontracted services and fees, detailed in a bid schedule submitted in response for each Task.

As with all government commercial contracts for goods or services, the warranted BIA Contracting Officer (CO) responsible for administration of contracted services identified herein is the only BIA official that may authorize post-award modification to the scope, budget, or quantity of contracted services and deliverables. The contactor shall notify the CO of any anticipated or requested modifications, and provide a technical and cost proposal as directed.

V. DELIVERABLES

- Draft and Final Project Work Plan
- Draft and Final Bi-Annual Summary Reports
- Draft and Final Remedial Design Plan
- Draft and Final Remedial Implementation Work Plan

VI. LIST OF ATTACHMENTS

- ✓ Figure 1. Owhyee Nevada Location Map
- ✓ Figure 2. Owyhee Community Layout
- ✓ Figure 3. Contaminant Sources and Release Areas
- ✓ Figure 4. 1999-2002 Soil Excavation Areas

- ✓ Figure 5. Existing Monitoring Well, Abandoned Monitoring and Municipal Well Locations
- ✓ Figure 6. Approximated Areas of Petroleum Contaminated Soil
- ✓ Figure 7. 2013 GRO Contaminant Concentrations in Groundwater
- ✓ Figure 8. 2013 DRO Contaminant Concentrations in Groundwater
- ✓ Figure 9. 2013 Benzene Contaminant Concentrations in Groundwater
- ✓ Figure 10. 2013 Toluene Contaminant Concentrations in Groundwater
- ✓ Figure 11. 2013 Ethyl-benzene Contaminant Concentrations in Groundwater
- ✓ Figure 12. 2013 Xylene Contaminant Concentrations in Groundwater
- ✓ Figure 13. 2013 Naphthalene Contaminant Concentrations in Groundwater

- ✓ Table 1. 2002-2013 GW Analytical Results, Detections, and Exceedances
- ✓ Table 2. Administrative Order Fulfillment Status
- ✓ Table 3. Project Organization and Completion Schedule

VII. PERIOD OF PERFORMANCE

The performance period of this requirement is seven hundred eighty (780) days from the NTP date.

VIII. PLACE OF PERFORMANCE

Field work and technical meetings shall be performed in the community of Owyhee, Nevada, Elko County.

ATTACHMENTS

FIGURE 1. OWHYEE NEVADA LOCATION MAP

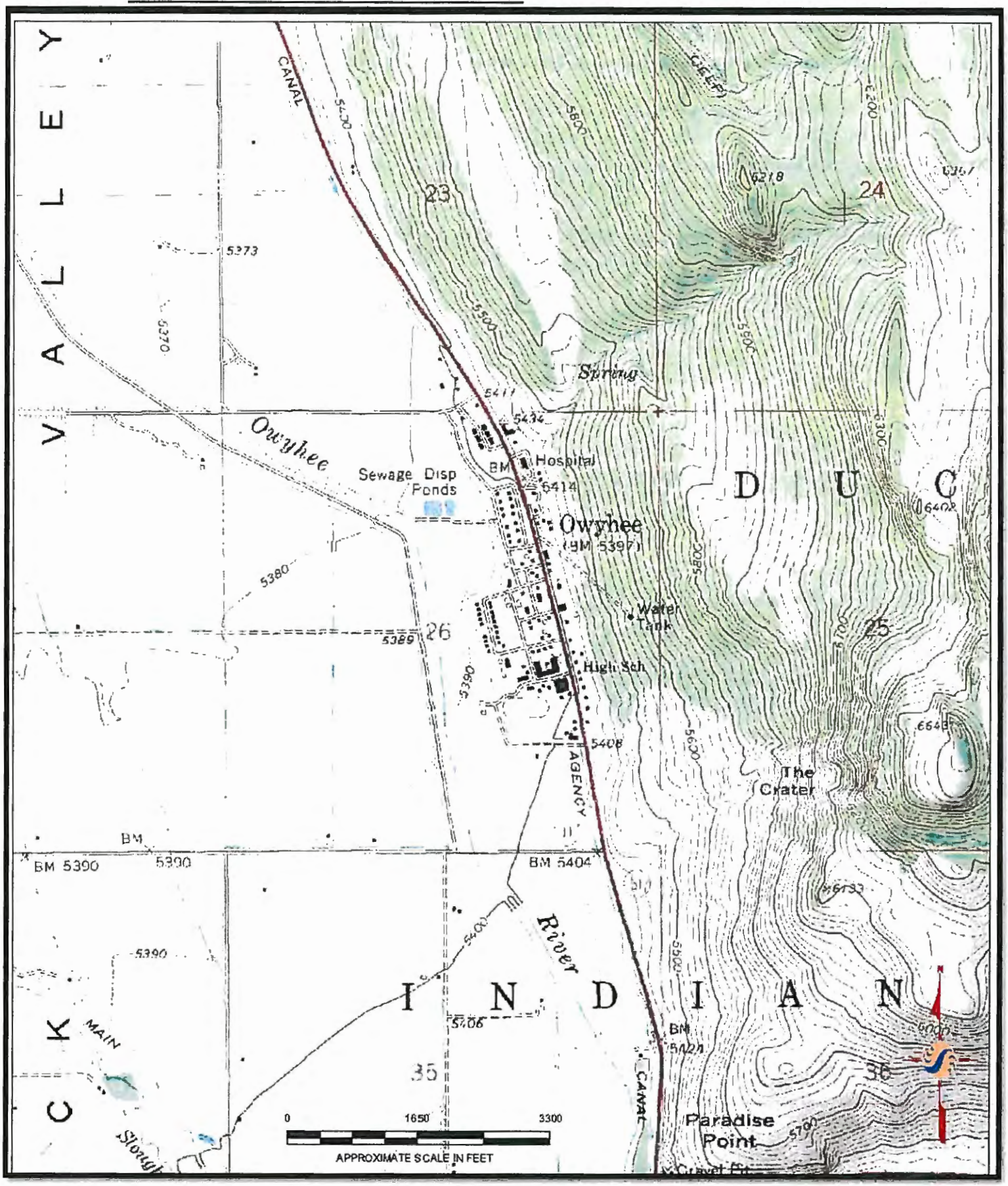


FIGURE 2. OWYHEE COMMUNITY LAYOUT

FIGURE 3. CONTAMINANT SOURCES AND RELEASE AREAS

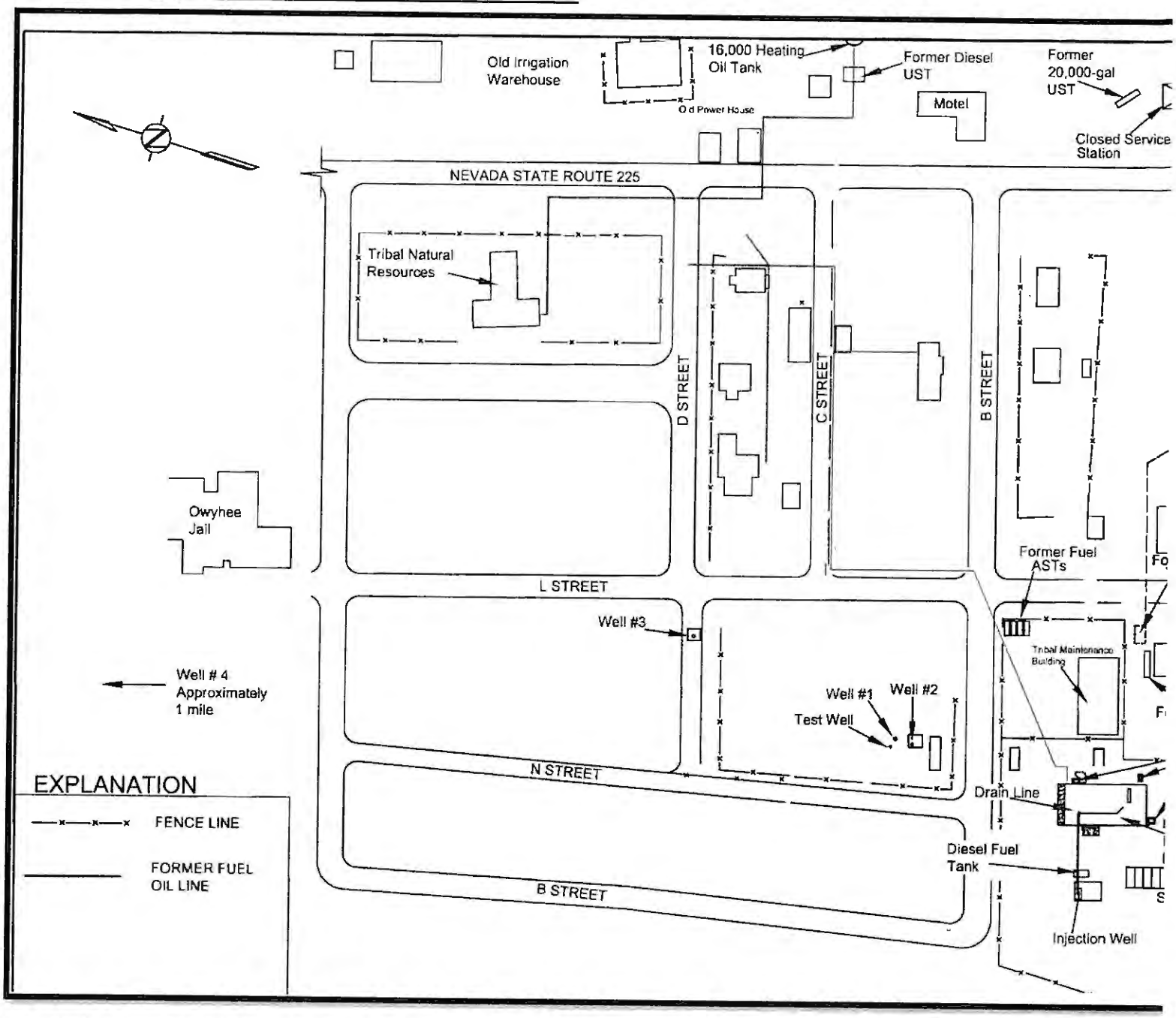


FIGURE 4. 1999-2002 SOIL EXCAVATION AREAS

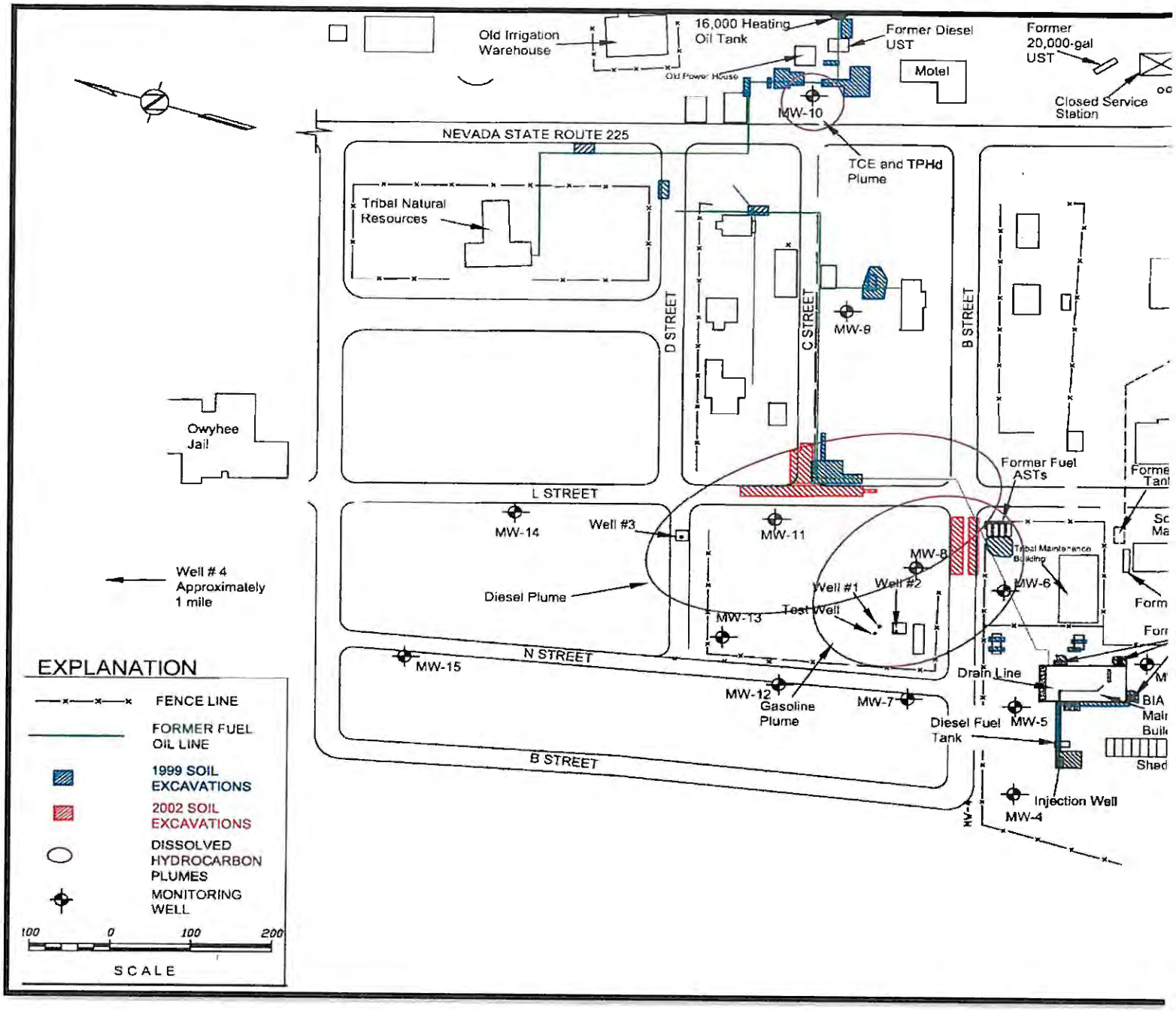

Old Irrigation Warehouse
16,000 Heating Oil Tank
Former Diesel UST
Former 20,000-gal UST
Old Power House
Motel
Closed Service Station
MW-10
NEVADA STATE ROUTE 225
TCE and TPHd Plume
Tribal Natural Resources
D STREET
C STREET
B STREET
MW-9
Owyhee Jail
Former Fuel ASTs
L STREET
MW-14
Well #3
MW-11
MW-8
Tribal Maintenance Building
MW-6
Well #1
Well #2
Test Well
Diesel Plume
MW-13
Well # 4 Approximately 1 mile
N STREET
MW-15
Drain Line
MW-12
Gasoline Plume
MW-7
Diesel Fuel Tank
MW-5
B STREET
Injection Well
MW-4
EXPLANATION
FENCE LINE
FORMER FUEL OIL LINE
1999 SOIL EXCAVATIONS
2002 SOIL EXCAVATIONS
DISSOLVED HYDROCARBON PLUMES
MONITORING WELL
100 0 100 200
SCALE

FIGURE 5. EXISTING MONITORING WELLS, ABANDONED MONITORING AND MUNICIPAL WELL LOCATIONS (AS OF 2009)

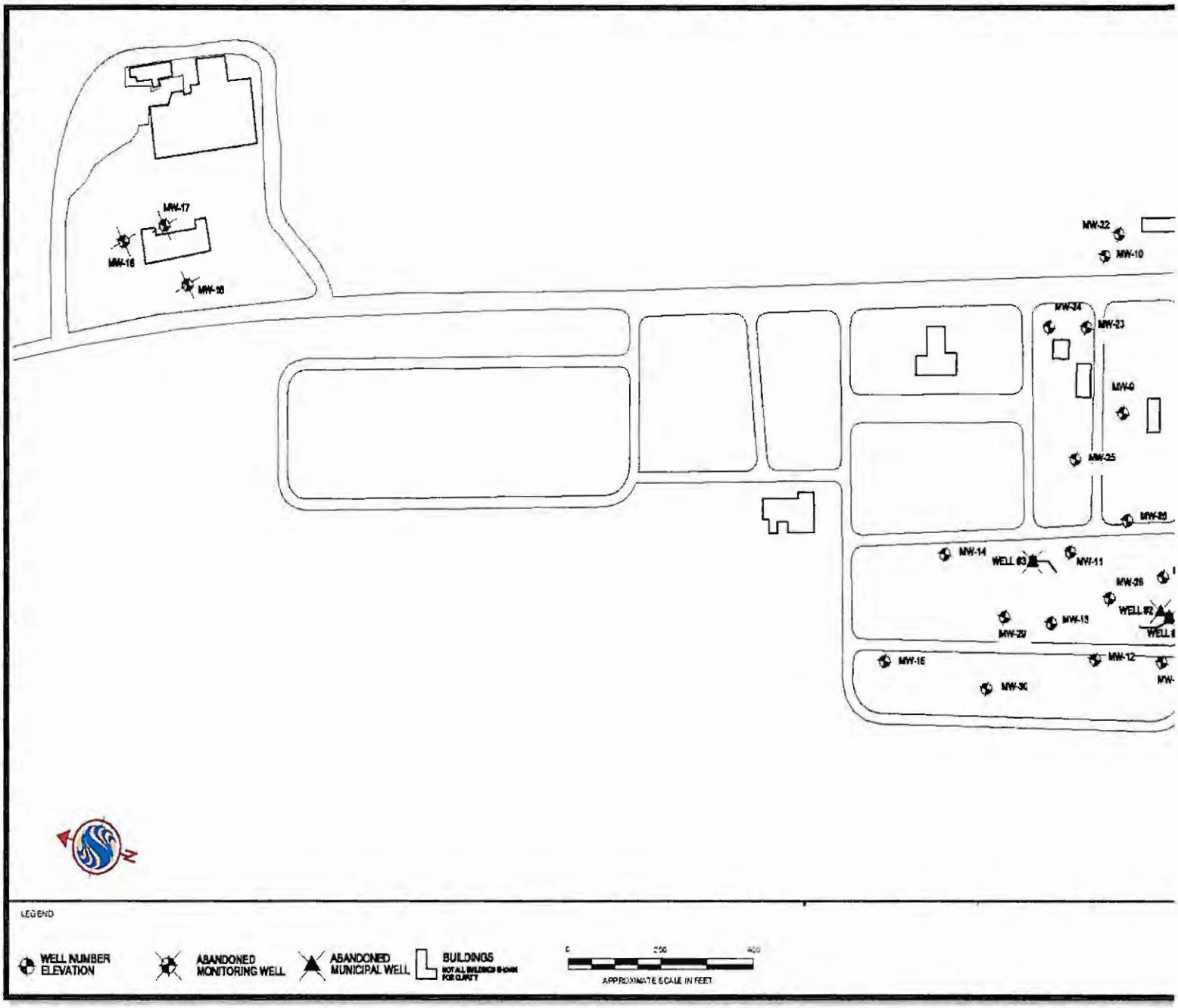


FIGURE 6. APPROXIMATED AREAS OF PETROLEUM CONTAMINATED SOIL

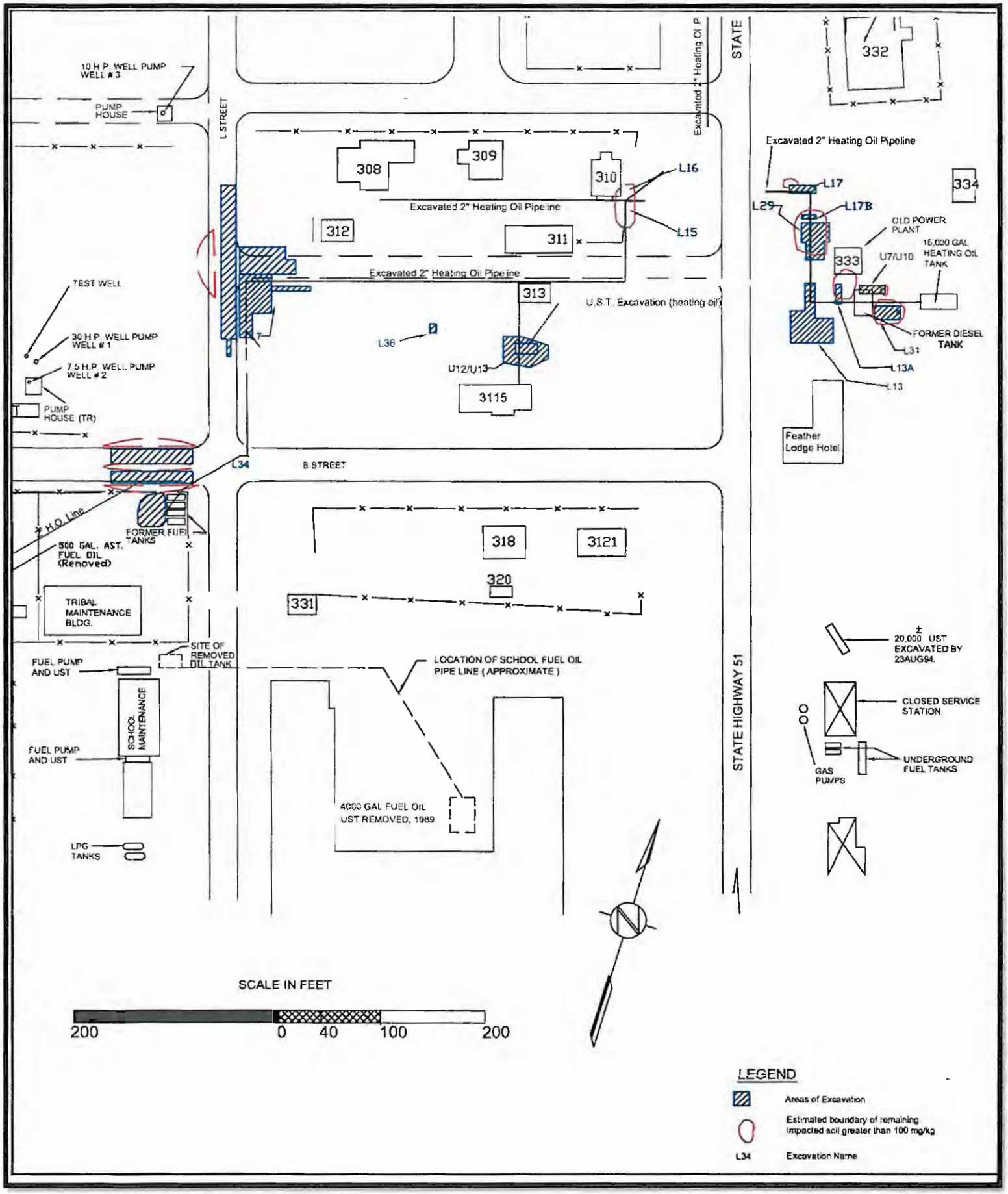


FIGURE 7. 2013 GRO CONTAMINANT CONCENTRATIONS IN GROUNDWATER

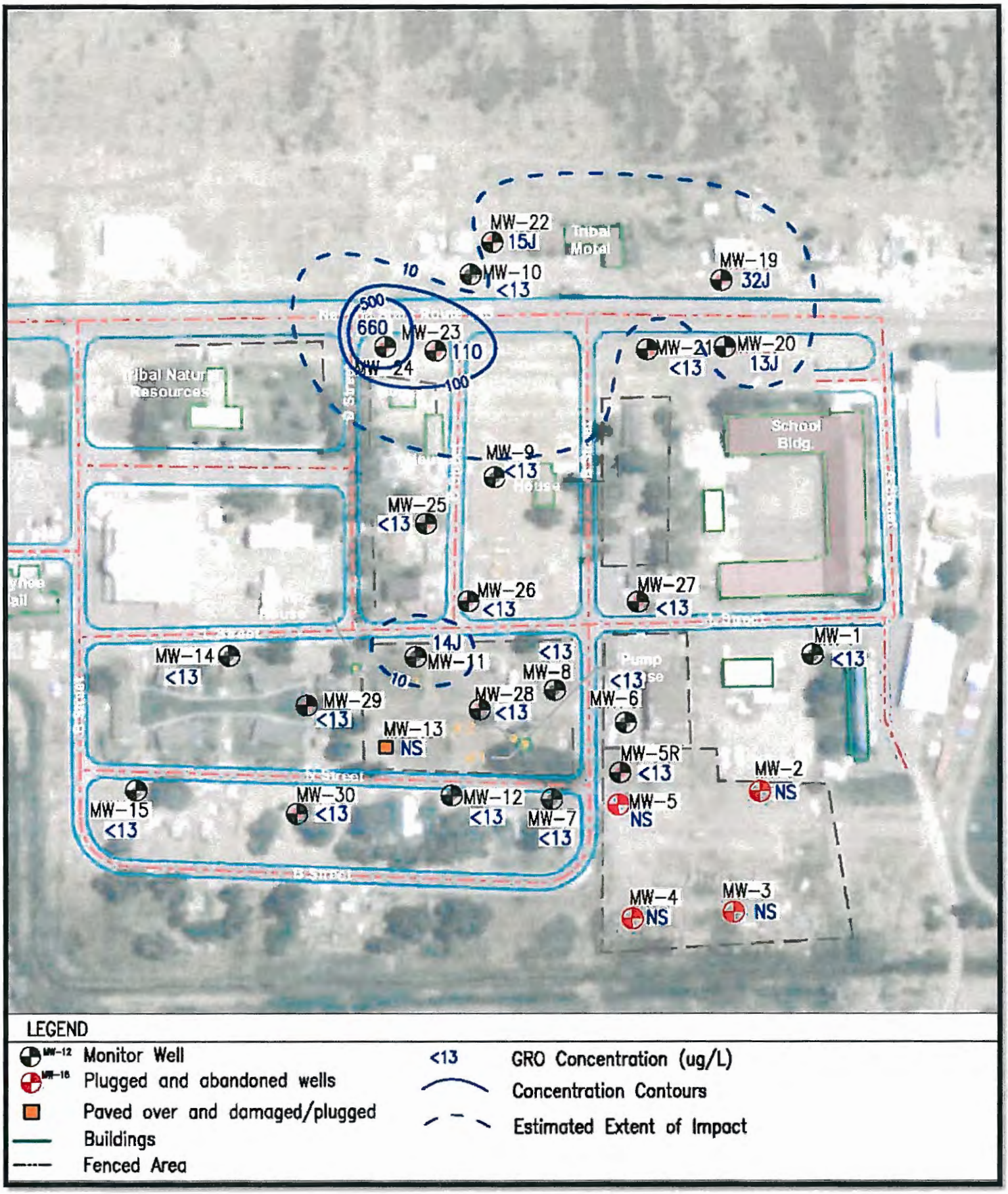


FIGURE 8. 2013 DRO CONTAMINANT CONCENTRATIONS IN GROUNDWATER

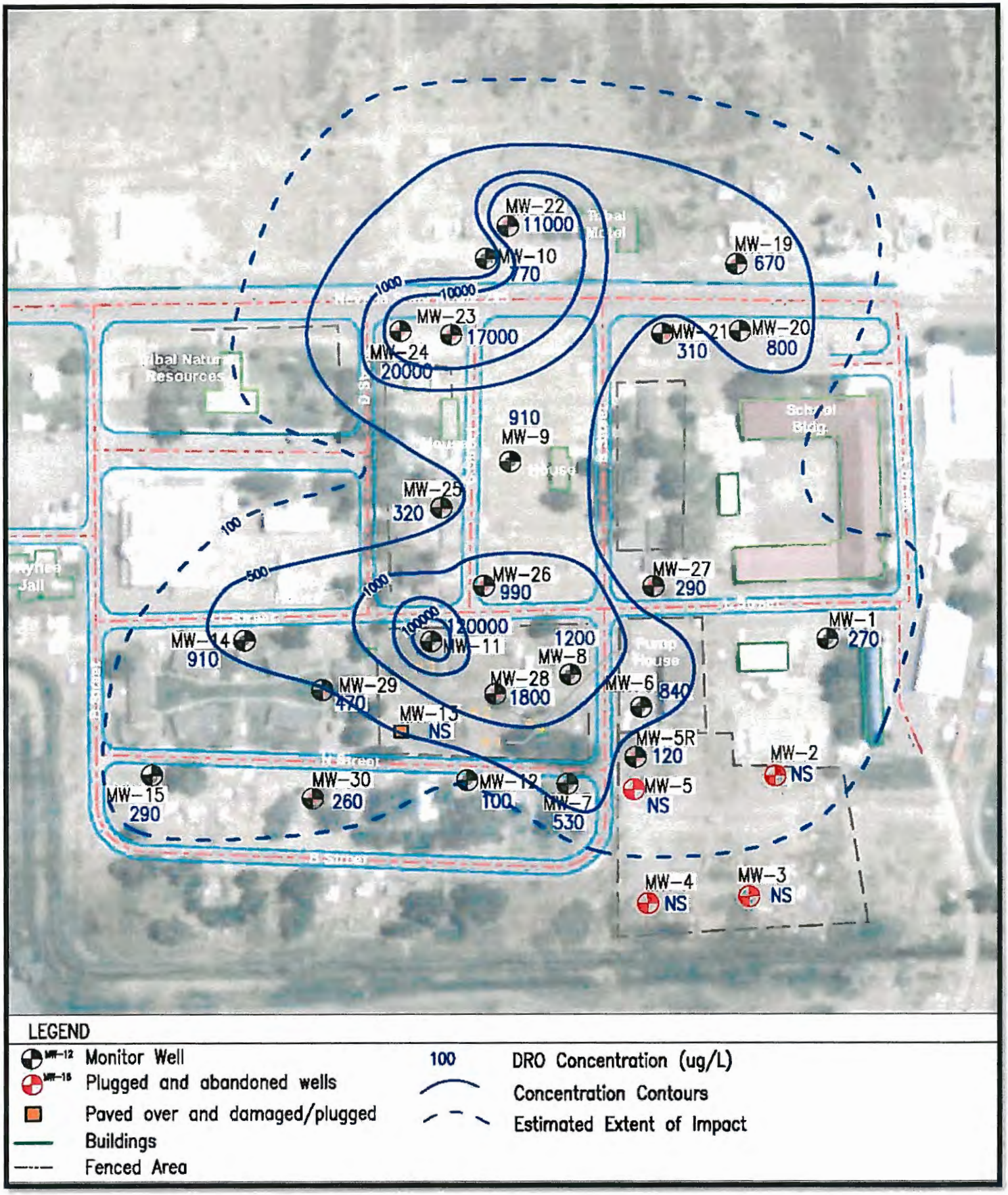


FIGURE 9. 2013 BENZENE CONTAMINANT CONCENTRATIONS IN GROUNDWATER

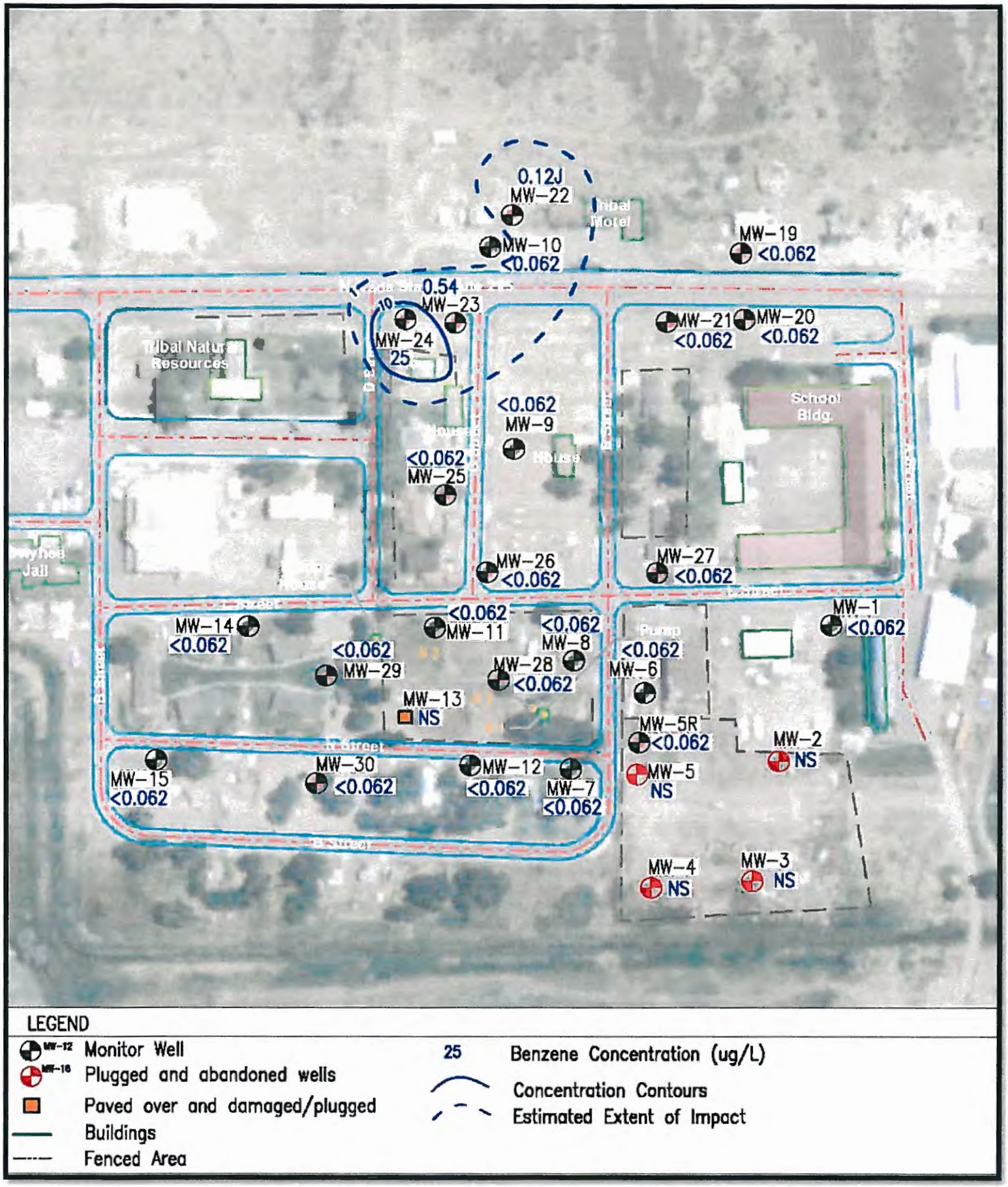


FIGURE 10. 2013 TOLUENE CONTAMINANT CONCENTRATIONS IN GROUNDWATER

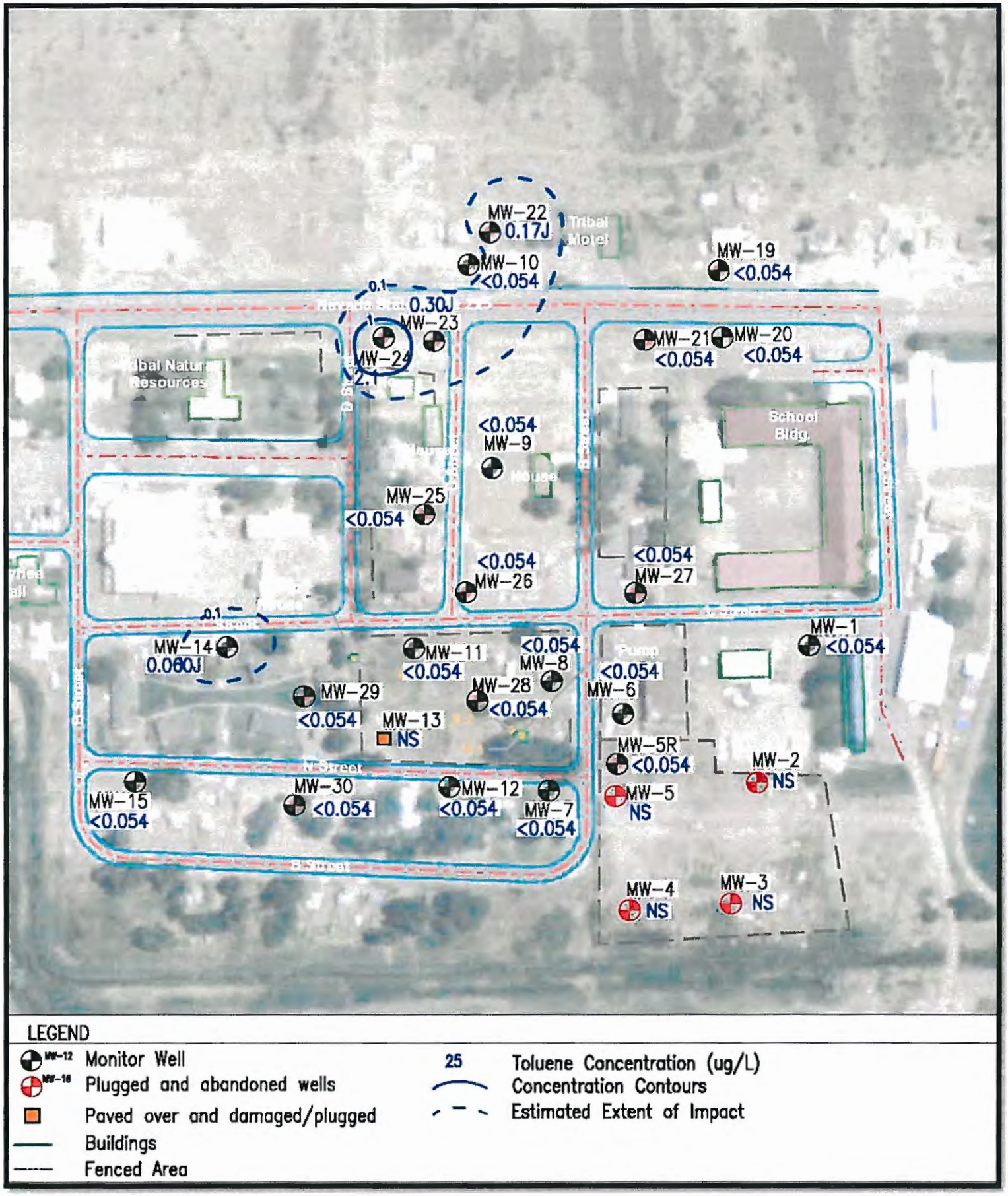


FIGURE 11. 2013 ETHYL BENZENE CONTAMINANT CONCENTRATIONS IN GROUNDWATER

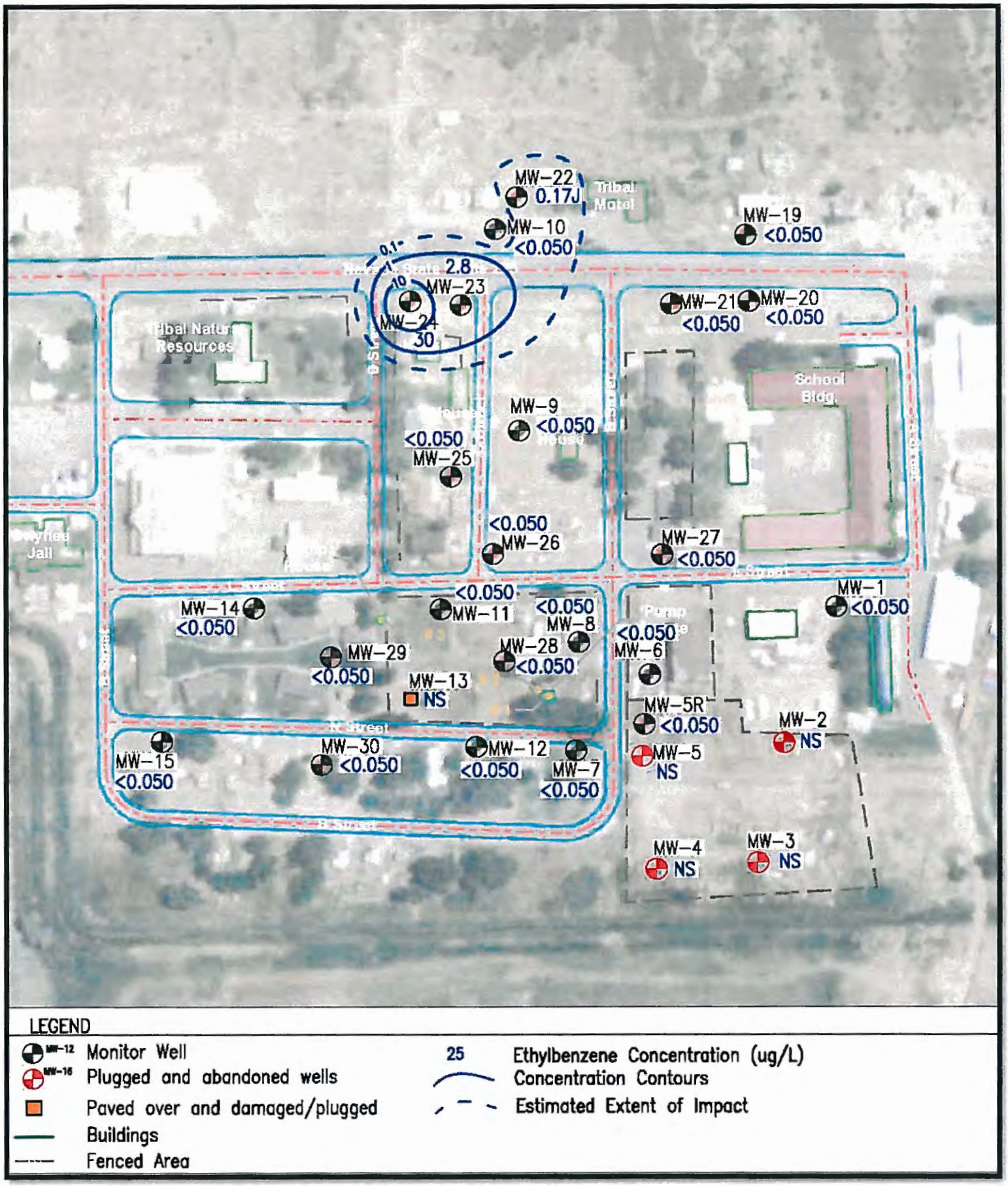


FIGURE 12. 2013 XYLENE CONTAMINANT CONCENTRATIONS IN GROUNDWATER

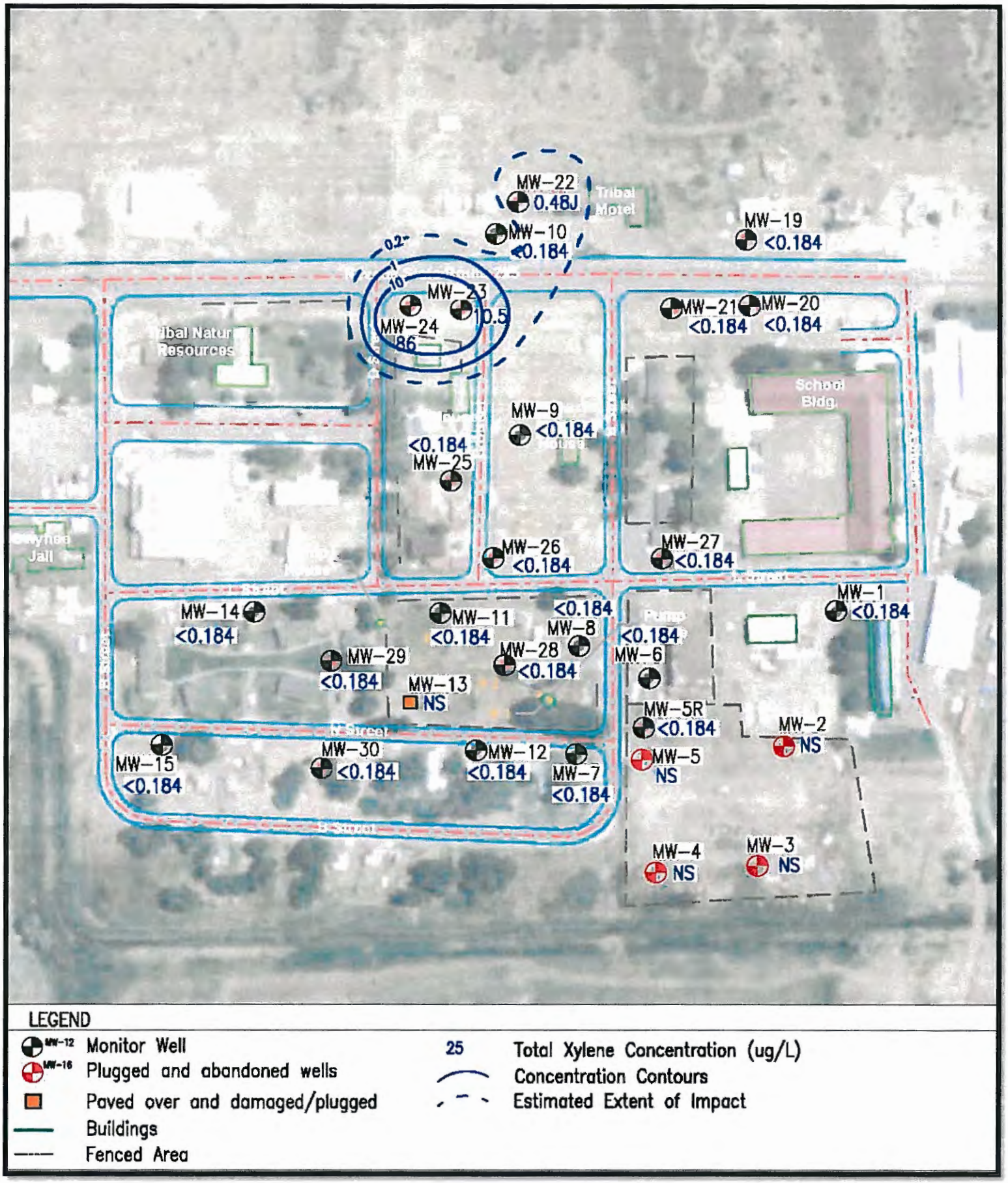


FIGURE 13. 2013 NAPHTHALENE CONTAMINANT CONCENTRATIONS IN GROUNDWATER

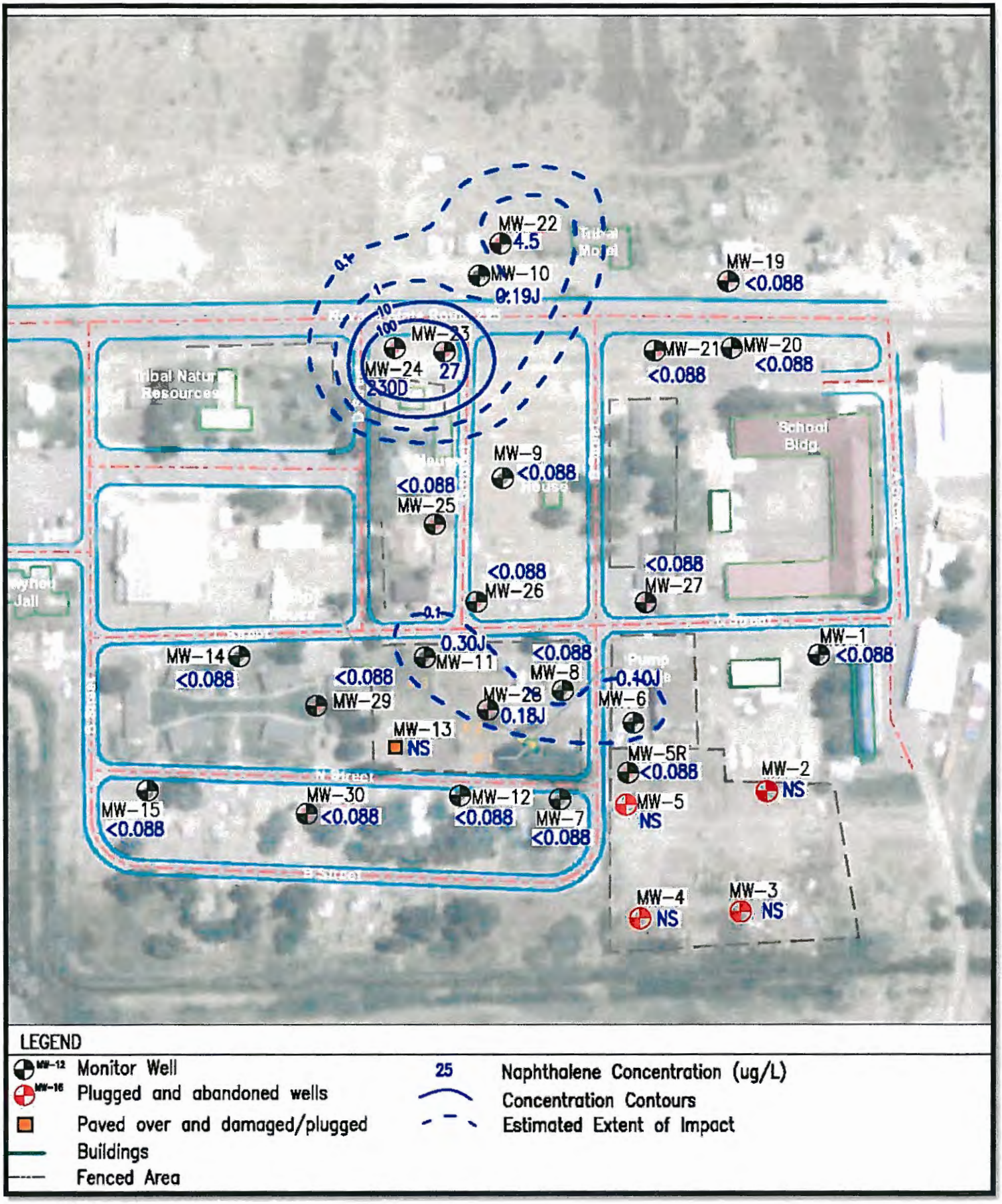


TABLE 1. 2002-2013 GROUNDWATER ANALYTICAL RESULTS, DETECTIONS, AND EXCEEDANCES

Well ID (TOC Elev.)	Sample Collection Date	Depth to Water	Groundwater Elevation	TPHg (mg/L)	TPHd (mg/L)	Naphthalene (ug/L)	Diethylphthalate (ug/L)	TCE (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Dinoseb (ug/L)	MTBE (ug/L)
MW-1	11/2/2000	9.55	5386.58	<0.02	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
(5399.03)	9/6/2002	8.80	5387.33	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	10.11	5386.02	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	10.88	5385.25	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	11.33	8384.80	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/1/2005	5.61	5390.52	<0.50	<0.50	<10.0	<10.0	NA	NA	NA	NA	NA	ND	ND
	10/16/2007	8.52	5387.61	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/25/2008	7.63	5388.50	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/11/2008	10.31	5385.82	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	8.57	5387.56	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	8.21	5384.24	<0.013	**0.270**	<0.088	NS	NS	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-2	11/2/2000	8.45	5385.84	<0.04	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
(5397.21)	9/6/2002	7.80	5386.49	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	10.11	5384.18	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	9.60	5384.69	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	9.99	5384.30	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/1/2005	4.68	5389.61	<0.50	<0.50	NA	NA	NA	NA	NA	NA	NA	ND	ND
	10/16/2007	7.37	5386.92	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/25/2008	6.67	5387.62	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/10/2008	8.95	5385.34	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/6/2009	7.13	5387.16	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]
MW-3	11/2/2000	6.87	5385.05	<0.04	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
(5394.83)	9/6/2002	6.15	5385.77	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	7.13	5384.79	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	7.86	5384.06	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	8.18	5383.74	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/1/2005	2.97	5388.95	<0.50	<0.50	NA	NA	NA	NA	NA	NA	NA	ND	ND
	10/16/2007	5.48	5386.44	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/25/2008	4.86	5387.06	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/10/2008	7.05	5384.87	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/6/2009	4.98	5386.94	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]
MW-4	11/2/2000	7.22	5387.23	<0.04	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
(5394.45)	9/6/2002	6.41	5388.04	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	7.27	5387.18	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	7.95	5386.50	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	8.21	5386.24	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/1/2005	3.08	5391.37	<0.50	<0.50	NA	NA	NA	NA	NA	NA	NA	ND	ND
	10/16/2007	5.45	5389.00	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]
MW-5	11/2/2000	9.26	not surveyed in 2004	<0.02	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/6/2002	**	well obstructed @ 6'	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
	9/27/2004	**	well obstructed @ 6'	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
	11/9/2004	**	well obstructed @ 6'	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
	3/3/2005	**	well obstructed @ 6'	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
	6/1/2005	**	well obstructed @ 6'	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
	10/16/2007	**	well obstructed @ 6'	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND
	4/9/2013	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]	NS[1]
MW-5R	9/27/2008	7.91	5386.82	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/10/2008	10.08	5384.65	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/6/2009	8.05	5386.68	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	7.59	5387.34	<0.013	**0.120**	<0.088	NS	NS	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-6	11/2/2000	10.81	5385.22	**0.17**	NA	NA	NA	<1.0	<1.0	<1.0	**1.82**	**5.0**	ND	ND
(5398.93)	9/6/2002	10.20	5385.83	**1.5**	**0.85**	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	11.01	5384.39	**0.74**	**2.5**	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	11.64	5384.06	**1.1**	**0.71**	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	11.97	5384.06	**1.3**	**1.2**	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/2/2005	6.95	5389.08	**0.66**	**1.3**	<10.0	<10.0	NA	NA	NA	NA	NA	ND	ND
	10/16/2007	9.62	5386.41	<0.50	**0.7**	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/25/2008	8.97	5387.06	<0.50	**1.5**	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/10/2008	11.50	5384.53	**0.65**	**0.74**	**5.1**	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/6/2009	9.21	5386.82	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	8.81	5387.35	<0.013	**0.840**	**0.103**	NS	NS	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-7	11/2/2000	9.70	5383.86	<0.04	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
(5396.33)	9/6/2002	8.57	5384.93	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	9.50	5384.00	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	10.23	5383.27	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	10.45	5383.05	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/2/2005	5.48	5388.02	<0.50	<0.50	NA	NA	NA	NA	NA	NA	NA	ND	ND
	10/16/2007	7.72	5385.78	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/25/2008	7.28	5386.22	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/10/2008	9.35	5384.15	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	7.28	5386.22	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	6.65	5386.96	<0.013	**0.530**	<0.088	NS	NS	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-8	11/2/2000	10.30	5384.18	**0.06**	NA	NA	NA	<25.0	<25.0	<25.0	<25.0	<25.0	ND	ND
(5397.36)	9/6/2002	9.69	5384.78	**0.73**	**2.5**	NA	NA	<1.0	<1.0	<1.0	**6.0**	**5.1**	ND	ND
	9/27/2004	10.19	5384.29	**0.86**	**12**	<10.0	<10.0	<1.0	<1.0	<1.0	**2.0**	**2.3**	ND	ND
	11/9/2004	10.78	5383.70	**2.4**	**33**	NA	NA	NA	<1.0	<1.0	**6.7**	**18.3**	ND	ND
	3/3/2005	11.08	5383.40	**2.8**	**36**	NA	NA	NA	<1.0	<1.0	**3.2**	**4.2**	ND	ND
	6/2/2005	6.10	5388.38	<0.50	**1.2**	**28**	<10.0	NA	NA	NA	NA	NA	ND	ND
	10/17/2007	8.73	5385.75	<0.50	<0.50	**5.4**	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/26/2008	8.11	5386.37	<0.50	**0.75**	**5.6**	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/10/2008	10.13	5384.35	**2.6**	**7.6**	**68**	NA	NA	<1.0	<1.0	**2.3**	**6.8**	NS	NS
	5/5/2009	8.22	5386.26	<0.50	**0.8**	**4.3**	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	7.88	5386.72	<0.013	**1.200**	<0.088	NS	NS	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-9	11/2/2000	12.72	5384.35	**0.10**	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
(5400.02)	9/6/2002	11.15	5385.92	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	11.95	5385.12	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	13.17	5383.90	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	13.56	5383.51	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/2/2005	6.46	5390.61	<0.50	<0.50	NA	NA	NA	NA	NA	NA	NA	ND	ND
	10/17/2007	11.19	5385.88	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/26/2008	10.00	5387.07	<0.50	<0.50	<4.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS

TABLE 1 (CONTINUED): 2002-2013 GROUNDWATER ANALYTICAL RESULTS, DETECTIONS, AND EXCEEDANCES

Well ID (TOC Elev.)	Sample Collection Date	Depth to Water	Groundwater Elevation	TPHg (mg/L)	TPHd (mg/L)	Naphthalene (ug/L)	Diethylphthalate (ug/L)	TCE (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Dibromo (ug/L)	MTBE (ug/L)
	12/10/2008	12.94	5384.13	<0.50	<0.50	2.6	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	10.56	5386.51	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	10.62	5386.58	<0.013	0.910	<0.088	NS	NS	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-10/FD-1 (5407.06)	11/2/2000	19.50	5384.64	0.06	NA	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	ND	ND
	9/6/2002	18.47	5385.67	<0.50	0.55	NA	NA	1.3	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	19.12	5385.02	<0.50	1.8	<10.0	<10.0	1.2	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	20.24	5383.90	0.74	6.4	NA	NA	1.4	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	20.67	5383.47	<0.50	1.8	NA	NA	1.6	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/3/2005	13.94	5390.20	<0.50	1.1	<10.0	<10.0	NA	NA	NA	NA	NA	ND	ND
	10/17/2007	18.82	5385.32	<0.50	<0.50	<2.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/27/2008	17.33	5386.81	<0.50	<0.50	<2.0	NA	1.3	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/10/2008	20.02	5384.12	<0.50	<0.50	<2.0	NA	1.7	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	18.34	5385.80	<0.50	<0.50	<2.0	NA	1.5	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013*	18.83	5385.41	<0.013/ <0.013	0.770/ 0.650	0.19J/ <0.088	NA	NA	<0.062/ <0.062	<0.054/ <0.054	<0.050/ <0.050	<0.184/ <0.184	<0.020/ <0.015	<0.11/ <0.11
MW-11 (5397.16)	11/2/2000	11.17	5383.13	0.05	NA	NA	NA	<25.0	<25.0	<25.0	<25.0	<25.0	ND	ND
	9/6/2002	10.36	5383.94	4.9	50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	10.57	5383.73	2.0	67	<100.0	<100.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	11.50	5382.61	1.3	14	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	11.69	5388.12	1.6	88	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/2/2005	6.18	5385.28	0.73	21	<20.0	<20.0	NA	NA	NA	NA	NA	ND	ND
	10/17/2007	9.02	5385.28	<0.50	140	2.1	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/25/2008	Well Not Located												
	12/10/2008	10.73	5383.57	1.3	32	9	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/6/2009	8.42	5385.88	0.7	29	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	9.30	5386.38	0.014J	120.00	0.30J	NS	NS	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-12 (5397.98)	11/2/2000	11.80	5383.28	<0.04	NA	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/6/2002	10.88	5384.20	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	11.45	5383.63	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	12.19	5382.89	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	12.42	5382.66	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/2/2005	7.48	5387.60	<0.50	<0.50	NA	NA	NA	NA	NA	NA	NA	ND	ND
	10/16/2007	9.68	5385.40	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/25/2008	9.28	5385.80	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/10/2008	11.30	5383.78	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	9.09	5385.99	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	5.54	5389.69	<0.013	0.100	<0.088	NS	NS	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-13 (5398.13)	11/2/2000	12.26	5382.99	0.03	NA	NA	NA	<5.0	<5.0	<5.0	<5.0	<5.0	ND	ND
	9/6/2002	11.39	5383.86	1.1	0.94	NA	NA	<1.0	<1.0	<1.0	1.1	<1.0	ND	ND
	9/27/2004	11.82	5383.43	0.54	1.3	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	12.60	5382.65	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	12.83	5382.42	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/2/2005	7.91	5387.34	0.69	1.3	<10.0	<10.0	NA	NA	NA	NA	NA	ND	ND
	10/17/2007	10.14	5385.11	<0.50	0.66	6.6	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/27/2008	9.71	5385.54	0.56	0.55	3.6	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/10/2008	11.73	5383.52	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/6/2009	9.55	5385.70	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	NS*	NS*	NS*	NS*	NS*	NS*	NS*	NS*	NS*	NS*	NS*	NS*	NS*
MW-14 (5398.35)	11/2/2000	11.18	5384.21	<0.02	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/6/2002	10.28	5385.11	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	10.81	5384.58	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	11.88	5383.51	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	12.15	5383.24	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/2/2005	6.94	5388.45	<0.50	<0.50	<10.0	<10.0	NA	NA	NA	NA	NA	ND	ND
	10/17/2007	10.58	5384.81	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/27/2008	9.27	5386.12	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/11/2008	11.76	5383.63	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	10.01	5385.38	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	10.40	5385.14	<0.013	0.910	<0.088	NS	NS	<0.062	0.060J	<0.050	<0.184	<0.015	<0.11
MW-15 (5394.44)	11/2/2000	10.08	5381.40	<0.02	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/6/2002	9.03	5382.45	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	9.16	5382.32	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	10.03	5381.45	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/3/2005	10.28	5381.20	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/1/2005	6.30	5385.18	<0.50	<0.50	NA	NA	NA	NA	NA	NA	NA	ND	ND
	10/17/2007	7.76	5383.72	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	9/27/2008	7.45	5384.03	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/11/2008	9.31	5382.17	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	7.14	5384.34	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	6.36	5385.27	<0.013	0.290	<0.088	NS	NS	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-16 (5441.19)	11/2/2000	25.38	5415.81	0.03	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/6/2002	13.92	5427.27	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	14.87	5426.32	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	15.24	5425.95	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/4/2005	15.23	5425.96	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/3/2005	12.91	5428.28	<0.50	<0.50	<10.0	<10.0	NA	NA	NA	NA	NA	ND	ND
	10/17/2007	16.63	5424.56	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'
MW-17 (5440.85)	11/2/2000	18.37	5422.48	0.05	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/6/2002	11.23	5429.62	<0.50	0.56	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	11.76	5429.09	<0.50	1.2	<20.0	140	<2.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	12.29	5428.56	<0.50	0.81	<10.0	<10.0	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/4/2005	9.76	5431.09	<0.50	0.65	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/3/2005	9.91	5430.94	<0.50	<0.50	<10.0	<10.0	NA	NA	NA	NA	NA	ND	ND
	10/17/2007	13.74	5427.11	<0.50	0.72	<8.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'
MW-18 (5427.48)	11/2/2000	15.56	5411.92	0.05	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/6/2002	7.35	5420.13	<0.50	<0.50	NA	NA	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	9/27/2004	7.03	5420.45	<0.50	<0.50	<10.0	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	ND	ND
	11/9/2004	6.03	5421.45	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	3/4/2005	5.45	5422.03	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	ND	ND
	6/3/2005	4.42	5423.06	<0.50	<0.50	<10.0	<10.0	NA	NA	NA	NA	NA	ND	ND
	10/17/2007	8.80	5418.68	<0.50	<0.50	NA	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'	NS'
MW-19	9/27/2008	15.95	5387.46	5.2	<0.50	30	NA	NA	<2.0	<2.0	<2.0	<2.0	NS	NS
	12/11/2008	18.80	5384.61	6	<0.50	<16.0	NA	NA	<2.0	<2.0	<2.0	<2.0	NS	NS
	5/6/2009	17.08	5386.33	3.5	<0.50	<16.0	NA	NA	<2.0	<2.0	<2.0	<2.0	NS	NS
	4/9/2013	17.71	5385.77	0.032J	0.670	<0.088	NA	NA	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-20	9/27/2008	13.08	5387.39	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/11/2008	15.96	5384.51	<0.50	<0.50	<8.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	14.31	5386.16	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	14.89	5385.71	0.013J	0.800	<0.088	NA	NA	<0.062	<0.054	<0.050	<0.184	<0.018	<0.11
MW-21	9/27/2008	12.67	5387.14	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS

TABLE 1 (CONTINUED): 2002-2013 GROUNDWATER ANALYTICAL RESULTS, DETECTIONS, AND EXCEEDANCES

Well ID (TOC Elev.)	Sample Collection Date	Depth to Water	Groundwater Elevation	TPHg (mg/L)	TPHd (mg/L)	Naphthalene (ug/L)	Diethylphthalate (ug/L)	TCE (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Total Xylenes (ug/L)	Dinoseb (ug/L)	MTBE (ug/L)
	12/11/2008	15.43	5384.38	<0.50	<0.50	<4.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	14.73	5385.08	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	14.31	5385.64	<0.013	0.310	<0.088	NA	NA	<0.062	<0.054	<0.050	<0.184	<0.017	<0.11
MW-22	9/27/2008	17.42	5386.98	0.71	11	42	NA	<2.0	<1.0	<1.0	1.1	7.5	NS	NS
	12/10/2008	20.22	5384.18	1.5	25	12	NA	<1.0	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/6/2009	18.44	5385.96	0.86	4	43	NA	<1.0	<1.0	<1.0	1.7	9.5	NS	NS
	4/9/2013	19.02	5385.50	0.015J	110.00	4.5	NA	NA	0.12J	0.17J	0.17J	0.48J	<0.17	<0.11
MW-23	9/27/2008	12.60	5386.90	2.1	1	110	NA	<2.0	<1.0	<1.0	17	60	NS	NS
	12/10/2008	15.35	5384.15	14	120	320	NA	<20	<10	<10	20	83	NS	NS
	5/6/2009	13.72	5385.78	4.3	16	150	NA	<2.0	<1.0	<1.0	19	73	NS	NS
	4/9/2013	14.32	5385.32	0.110	170.00	27	NA	NA	0.54	0.30J	2.8	10.5	<0.20	<0.11
MW-24	9/27/2008	12.68	5386.69	2.7	2.2	82	NA	<4.0	32	3.4	40	220	NS	NS
	12/10/2008	15.38	5383.99	7.7	19	600	NA	<20	34	<10	71	280	NS	NS
	5/6/2009	13.72	5385.65	6.8	33	570	NA	<10	43	5.1	94	370	NS	NS
	4/9/2013	14.21	5385.31	0.660	200.00	230D	NA	NA	25	2.1	30	86	<0.034	<0.11
MW-25	9/27/2008	9.47	5386.82	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/11/2008	12.22	5384.07	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	10.37	5385.92	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	10.85	5385.52	<0.013	0.320	<0.088	NA	NA	<0.062	<0.054	<0.050	<0.184	<0.016	<0.11
MW-26	9/27/2008	8.17	5386.68	<0.50	<0.50	2.9	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/11/2008	10.76	5384.09	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	8.96	5385.89	<0.50	0.92	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	9.30	5385.66	<0.013	0.990	<0.088	NA	NA	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-27/FD-2	9/27/2008	10.86	5387.02	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/11/2008	13.50	5384.40	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	11.88	5386.02	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013*	12.23	5385.81	<0.013/ <0.013	0.094/ 0.290	<0.088/ <0.088	NA	NA	<0.062/ <0.062	<0.054/ <0.054	<0.050/ <0.050	<0.184/ <0.184	NA[1]/ <0.015	<0.11/ <0.11
MW-28	9/27/2008	7.77	5386.11	<0.50	0.72	5.3	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/11/2008	10.04	5383.84	<0.50	0.71	4.4	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	7.83	5386.05	<0.50	0.65	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	8.31	5386.64	<0.013	180.0	0.18J	NA	NA	<0.062	<0.054	<0.050	<0.184	<0.016	<0.11
MW-29	9/27/2008	8.48	5385.08	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/11/2008	10.44	5383.12	<0.50	0.99	2.2	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/6/2009	8.25	5385.31	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	7.58	5386.10	<0.013	0.470	<0.088	NA	NA	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
MW-30	9/27/2008	6.89	5384.74	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	12/11/2008	8.73	5382.90	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	5/5/2009	6.51	5385.12	<0.50	<0.50	<2.0	NA	NA	<1.0	<1.0	<1.0	<1.0	NS	NS
	4/9/2013	5.81	5385.96	<0.013	0.260	<0.088	NA	NA	<0.062	<0.054	<0.050	<0.184	<0.015	<0.11
Trip Blank	-	-	-	NA	NA	<0.088	NA	NA	<0.062	<0.054	<0.050	<0.184	NA	<0.11
MCL				**NE**	**NE**	**NE**	**NE**	**5**	**5**	**1000**	**700**	**10000**	**7**	**NE**

*Field Duplicate collected on this date
NA=Not Analyzed
NA[1]=Lab lost the Dinoseb sample, it was also a Field Duplicate, FD2, so an analytical result is shown for Dinoseb
ND=No historical data was provided
NS=Not Sampled
NS[1]=Not Sampled; well was Plugged and Abandoned
NS[2]=Not Sampled; well was damaged and inaccessible
NE=Not Established
=concentration is above its Method Detection Limit
=concentration is above its Maximum Concentration Limit

TABLE 2. ADMINISTRATIVE ORDER FULFILLMENT STATUS

#	Part	Provision	Paragraph	Status	Description
I.		Cease Disposal	17a.	✓	cease injection
			17b.	✓	cease disposal on ground
			17c.	✓	notify EPA that those actions have ceased
II.		Work Plan	18	✓	30 days: workplan to sample
			19	✓	if workplan not approved
			20	✓	upon approval, workplan incorporated into order
	A.	Close Disposal Well	21	✓	plot well
			22	✗	describe proposed method to remove contents, characterize per RCRA
			23	✗	destination for non-haz
			24	✓	soil sampling plans
			25	✓	EPA approved sampling methods
			26	✓	describe permanent plug/seal
			27	✓	notify EPA any other injection wells at facility
	B.	Underground Storage Tank Closure	28	✗	UST and pipeline integrity
			29	✗	if UST no longer in use, document it
			30	✗	characterize impact
			31	✗	if samples show contamination, what will BIA do to remedy
	C.	Sample DW Wells	32	✓	Monitor Drinking Water Supply Wells 1, 2, 3
			33	✓	Plan a monitoring well for water table well between DW wells 2 and 3
			34	✓	All samples must be analyzed for metals, VOCs, SVOCs, and TRPH; with 14 day adva
	D.	Site Characterization	35	✓	Construction and operation of DW wells 1, 2, 3
			36	✓	well logs, drill logs, etc
			37	✓	hydrogeology of affected USDW
			38	✓	geologic surveys, engineering reports, regional maps
			39	✓	workplan shall include plan to delineate boundaries of gw contamination
	E.	Site Remediation	40	✗	soil cleanup plan
			41	✗	proper storage and/or disposal of all drums at facility, including inventory and content id
			42	✗	storage plan for drums that will remain, manifest plans for drums to go
			43	✓	prompt disposal of standing pools of sludge or areas where soil visibly contaminated
			44	✓	remediation of all soil/gw contamination discovered during sampling/analysis, periodic u
			45	✗	remediation of drinking water wells wholly or partially caused by BIA

TABLE 3. PROJECT ORGANIZATION AND COMPLETION SCHEDULE

Phase	Project Task	Period / Duration	Days from Notice to Proceed (NTP) Date																										
			30 Days	60 Days	90 Days	120 Days	150 Days	180 Days	210 Days	240 Days	270 Days	300 Days	330 Days	360 Days	390 Days	420 Days	450 Days	480 Days	510 Days	540 Days	570 Days	600 Days	630 Days	660 Days	690 Days	720 Days	750 Days	780 Days
Phase 1: Project Planning		6 months																											
Task 1	Records Review	60 Days																											
Task 2	AO Review / GAP Analysis	90 Days																											
Task 3	Site Visit/Meeting	8 hrs																											
Task 4	Project Work Plan	120 Days			Draft			Final																					
Phase II: Field Investigations and Reports		16 Months																											
Task 5	Well Installation, Abandonment, Soil Sampling	12 Days																											
Task 6	Elevation Surveying (4 x 2 days)	8 Days																											
Task 7	GW Sampling Event (3 x 2 days)	6 Days																											
Task 8	Assessment Report #1	300 Days														Draft		Final											
	Assessment Report #2	300 Days																				Draft		Final					
Phase III: Remedial Planning		13 Months																											
Task 9	Remedial Design Plan	300 Days																				Draft		Final					
Task 10	Remedial Implementation Work Plan	150 Days																								Draft		Final	
Teleconferences, Meetings and Support		26 Months																											
Task 11	Teleconferences (7 x 1.5 hrs)	10.5 hrs																											
	Technical Meeting (Owyhee, NV)	8 hrs																											

Deliverable Documents
Phase Duration
Task Activity Period(s)

SITE OBSERVATION VISIT / INSPECTION

Contractor are encouraged to conduct an on-site assessment to determine existing conditions and building layout. Contractor shall verify all items of work and notify the COR of any discrepancies or concerns prior to performing any work.

Contractor shall contract Mr. John Graves, Environmental Risk Manager, Environmental and Safety Management at **phone number 602/ 379-3723 e-mail address: john.graves@bia.gov** to arrange for inspection visit of areas identified for service under this project.

SECTION G CONTRACT ADMINISTRATION DATA

DOI ELECTRONIC INVOICING Electronic Invoicing and Payment Requirements – Invoice Processing Platform (IPP) April 2013

Payment requests must be submitted electronically through the U. S. Department of the Treasury's Invoice Processing Platform System (IPP).

"Payment request" means any request for contract financing payment or invoice payment by the Contractor. To constitute a proper invoice, the payment request must comply with the requirements identified in the applicable Prompt Payment clause included in the contract, or the clause 52.212-4 Contract Terms and Conditions - Commercial Items included in commercial item contracts.

The IPP website address is: https://www.ipp.gov.

Under this contract, the following documents are required to be submitted as an attachment to the IPP invoice [CO to edit and include the documentation required under this contract]: **Contractors shall attach a hard copy of their invoice in IPP when submitting invoices via IPP. Invoices will be rejected if no invoice is attached.**

The Contractor must use the IPP website to register, access and use IPP for submitting requests for payment. The Contractor Government Business Point of Contact (as listed in SAM will receive enrollment instructions via email from the Federal Reserve Bank of Boston (FRBB) within 3 - 5 business days of the contract award date. Contractor assistance with enrollment can be obtained by contacting the IPP Production Helpdesk via email ippgroup@bos.frb.org or phone (866) 973-3131.

If the Contractor is unable to comply with the requirement to use IPP for submitting invoices for payment, the Contractor must submit a waiver request in writing to the Contracting Officer with its proposal or quotation.

SECTION H SPECIAL CONTRACT REQUIREMENTS

1. REQUIRED BACKGROUND INVESTIGATION

Contractor Background Investigation (On-Site Superintendent)

a. Upon issuance of an approved contract, **the selected contractor will work with the COR** to obtain the CNACI background clearance, or provide existing CNACI clearance information.

b. The Contractor must have a minimum of one person in supervisory capacity overseeing field work/employees, and must have a favorable CNACI background clearance during the duration of this project. Individual may be a superintendent, project manager, lead foreman, and/or supervisor, (or other similar field supervisory classification

c. **The Background Investigation for the On-Site Superintendent may take up to 90 calendar days or longer to obtain a positive result.**

d. **Site work or service shall not proceed until a positive result is obtained.**

2. 1450-0016-001 HOMELAND SECURITY PRESIDENTIAL DIRECTIVE -12 (HSPD-12) AUGUST 2004

Contractor Personnel Security and Suitability Requirements

Performance of this contract requires contractor personnel to have a Federal government-issued Personal Identity Verification (PIV) credential before being allowed unsupervised access to a DOI [facility and/or information system]. The Contracting Officer's Representative (COR) or Contracting Officer's Technical Representative (COTR) will be the requesting official, and will make arrangements through a DOI Access Card Sponsor for personal identity verification and DOI Access Card issuance.

At least two weeks before start of contract performance, the Contractor must identify all contractor and subcontractor personnel who will require [physical and/or logical] access for performance of work under this contract. Physical Access means routine, unescorted or unmonitored access to non-public areas of a Federally-controlled facility. Logical Access means routine unsupervised access to a Level 3 or 4 Federally controlled information system. The Contractor must make their personnel available at the place and time specified by the COR/COTR or DOI Access Card Sponsor in order to initiate screening and background investigations. The following forms and inquiries, or their equivalent, will be used to initiate the credentialing process:

o OPM Standard Form 85 or 85P
o OF 306
o National Criminal History Check (NCHC) (local procedures may require the fingerprinting to done at a police station; in this case, any charges are to be borne by the contractor)
o Release to Obtain Credit Information
o PIV card application (web-based)

Before starting work under this contract, a National Criminal History Check (NCHC) will be initiated to verify the identity of the individual applying for clearance and to determine the individual's suitability for the position. If the NCHC adjudication is favorable, a DOI Access Card will be issued for that individual. If the adjudication is unfavorable, the credentials will not be issued and the contractor must make other arrangements for performance of the work. In the event of a disagreement between the Contractor and the Government concerning the suitability of an individual to perform work under this contract, DOI shall have the right of final determination.

Contractor employees must give, and authorize others to give, full, frank, and truthful answers to relevant and material questions needed to reach a suitability determination. Refusal or failure to furnish or authorize provision of information may constitute grounds for denial or revocation of credentials. Government personnel may contact the contractor personnel being screened or investigated in person, by telephone or in writing, and the Contractor must ensure they are available for such contract.

Alternatively, if an individual has already been credentialed by another agency through OPM, and that credential has not yet expired, further investigation may not be necessary. In that case, the contractor must provide the COR/COTR with documentation that supports the individual's credentialed status.

Contractor employees who have been successfully adjudicated will be issued DOI Access Cards, which must be activated at a USAccess Credentialing Center. Those Contractor employees not located within a reasonable travel time of a USAccess Credentialing Center will be screened and issued alternate credentials, such as temporary access badges.

During performance of the contract, the Contractor must keep the COR/COTR apprised of changes in personnel to ensure that performance is not delayed by compliance with credentialing processes. Cards that have been lost, damaged, or stolen must be reported to the COR/COTR and Issuing Office within 24 hours. If reissuance of expired credentials is needed, it must be coordinated through the COR/COTR.

At the end of contract performance, or when a contractor employee is no longer working under this contract, the Contractor must ensure that all identification cards are returned to the COR/COTR.

3. PROHIBITION OF TEXTING WHILE DRIVING

Special attention is directed to FAR Clause 52.223-18 "Encouraging Contractor Policies to Ban Text Messaging While Driving", and to the DOI Policy - "Prohibition on Texting While Driving". The Executive Order requires Federal agencies to take steps to encourage Federal contractors, subcontractors, recipients, and sub recipients of financial assistance to adopt and enforce their own policies that ban employees from texting while driving GOVs or company-owned, company-leased, or company-rented vehicles or while driving POVs on official Government business or when performing work for, or on behalf of, the Government. Those entities are further encouraged to educate their employees and to urge voluntary compliance with a texting ban for off-duty employees.

4. DRUG FREE WORKSITE

Rerference is made to FAR Clause 52.223-6 "Drug-Free Workplace". Eastern Nevada Agency is a DRUG FREE LOCATION, no drugs of any type are allowed on the compound, including any and all tobacco products.

SECTION I CONTRACT CLAUSES

1. 1452.226-70 Indian Preference April 1984

(a) The Contractor agrees to give preferences to Indians who can perform the work required regardless of age (subject to existing laws and regulations), sex, religion, or tribal affiliation for training and employment opportunities under this contract and, to the extent feasible consistent with the efficient performance of this contract, training and employment preferences and opportunities shall be provided to Indians regardless of age (subject to existing laws and regulations), sex, religion, or tribal affiliation who are not fully qualified to perform under this contract. The Contractor also agrees to give preference to Indian organizations and Indian-owned economic enterprises in the awarding of any subcontracts consistent with the efficient performance of this contract. The Contractor shall maintain such records as are necessary to indicate compliance with this paragraph.

(b) In connection with the Indian employment preference requirements of this clause, the Contractor shall also provide opportunities for training incident to such employment. Such training shall include on-the-job, classroom, or apprenticeship training which is designed to increase the vocational effectiveness of an Indian employee.

(c) If the Contractor is unable to fill its training and employment needs after giving full consideration to Indians as required by this clause, those needs may be satisfied by selection of persons other than Indians in accordance with the clause of this contract entitled "Equal Opportunity."

(d) If no Indian organizations or Indian-owned economic enterprises are available for awarding of subcontracts in connection with the work performed under this contract, the Contractor agrees to comply with the provisions of this contract involving utilization of small business concerns, small business concerns owned and controlled by socially and economically disadvantaged individuals, or labor surplus area concerns.

(e) As used in this clause:

(1) "Indian" means a person who is a member of an Indian Tribe. If the Contractor has reason to doubt that a person seeking employment preference is an Indian, the contractor shall grant the preference but shall require the individual within thirty (30) days to provide evidence from the Tribe concerned that the person is a member of that Tribe.

(2) "Indian organization" means the governing body of any Indian Tribe or entity established or recognized by such governing body in accordance with the Indian Financing Act of 1974 (88 Stat. 77; 25 U.S.C. 1451); and

(3) "Indian-owned economic enterprise" means any Indian-owned commercial, industrial, or business activity established or organized for the purpose of profit provided that such Indian ownership shall constitute not less than 51 percent of the enterprise.

(4) "Indian Tribe" means an Indian Tribe, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act (85 Stat. 668; 43 U.S.C. 1601) which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

(f) The Contractor agrees to include the provisions of the clause including this paragraph (f) in each subcontract awarded under this contract.

(g) In the event of noncompliance with this clause, the Contractor's right to proceed may be terminated in whole or in part by the Contracting Officer and the work completed in a manner determined by the Contracting Officer to be in the best interests of the Government.

2. 1452.226-71 Indian Preference Program April 1984

(a) In addition to the requirements of the clause of this contract entitled "Indian Preference -- Department of the Interior," the Contractor agrees to establish and conduct an Indian preference program which will expand the opportunities for Indian organizations and Indian-owned economic enterprises to receive a preference in the awarding of subcontracts and which will expand opportunities for Indians to receive preference for training and employment in connection with the work to be performed under this contract. In this connection, the Contractor shall --

(1) Designate a liaison officer who will: i. maintain liaison with the Government and Tribe(s) on Indian preference matters; ii. supervise compliance with the provisions of this clause; and iii. administer the Contractor's Indian preference program.

(2) Advise its recruitment sources in writing and include a statement in all advertisements for employment that Indian applicants will be given preference in employment and training incident to such employment.

(3) Not less than twenty (20) calendar days prior to commencement of work under this contract, post a written notice in the Tribal office of any reservations on which or near where the work under this contract is to be performed, which sets forth the Contractor's employment needs and related training opportunities. The notice shall include the approximate number and types of employees needed, the approximate dates of employment; the experience or special skills required for employment, if any; training opportunities available; and all other pertinent information necessary to advise prospective employees of any other employment requirements. The Contractor shall also request the Tribe(s) on or near whose reservation(s) the work is to be performed to provide assistance to the Contractor in filling its employment needs and training opportunities. The Contracting Officer will advise the Contractor of the name, location, and phone number of the Tribal officials to contact in regard to the posting of notices and requests for Tribal assistance.

(4) Establish and conduct a subcontracting program which gives preference to Indian organizations and Indian-owned economic enterprises as subcontractors and suppliers under this contract. Consistent with the efficient performance of this contract, the Contractor shall give public notice of existing subcontracting opportunities by soliciting bids or proposals only from Indian organizations or Indian-owned economic enterprises. The Contractor shall request assistance and information on Indian firms qualified as suppliers or subcontractors from the Tribe(s) on or near whose reservation(s) the work under the contract is to be performed. The Contracting Officer will advise the Contractor of the name, location, and phone number of the Tribal officials to be contacted in regard to the request for assistance and information. Public notices and solicitations for existing subcontracting opportunities shall provide an equitable opportunity for Indian firms to submit bids or proposals by including -- i.a clear description of the supplies or services required including quantities, specifications, and delivery schedules which facilitate the participation of Indian firms; ii.a statement indicating the preference will be given to Indian organizations and Indian-owned economic enterprises in accordance with Section 7(b) of Public Law 93-638; (88 Stat. 2205; 25 U.S.C. 450e(b)); iii.definitions for the terms "Indian organization" and "Indian-owned economic enterprise" as prescribed under the "Indian Preference -- Department of the Interior" clause of this contract; iv.a representation to be completed by the bidder or offeror that it is an Indian organization or Indian-owned economic enterprise; and (v) a closing date for receipt of bids or proposals which provides

sufficient time for preparation and submission of a bid or proposal. If after soliciting bids from Indian organizations and Indian-owned economic enterprises, no responsible bid is received, the Contractor shall comply with the requirements of paragraph (d) of the "Indian Preference -- Department of the Interior" clause of this contract. If one or more responsible bids are received, award shall be made to the low responsible bidder if the bid price is determined to be reasonable. If the low responsive bid is determined to be unreasonable as to price, the Contractor shall attempt to negotiate a reasonable price and award a subcontract. If a reasonable price cannot be agreed upon, the Contractor shall comply with the requirements of paragraph (d) of the "Indian Preference -- Department of the Interior" clause of the contract.

(5) Maintain written records under this contract which indicate: i.the names and addresses of all Indians seeking employment for each employment position available under this contract; ii.the number and types of positions filled by (A) Indians and (B) non-Indians, and the name, address and position of each Indian employed under this contract; iii.for those positions where there are both Indian and non-Indian applicants, and a non-Indian is selected for employment, the reason(s) why the Indian applicant was not selected; iv.actions taken to give preference to Indian organizations and Indian-owned economic enterprises for subcontracting opportunities which exist under this contract; v.reasons why preference was not given to Indian firms as subcontractors or suppliers for each requirement where it was determined by the Contractor that such preference would not be consistent with the efficient performance of the contract, and vi.the names and addresses of all Indian organizations and Indian-owned economic enterprises (A) contacted, and (B) receiving subcontract awards under this contract.

(6) The Contractor shall submit to the Contracting Officer for approval a semiannual report which summarizes the Contractor's Indian preference program and indicates (i) the number and types of available positions filled and dollar amounts of all subcontracts awarded to (a) Indian organizations and Indian-owned economic enterprises and (b) all other firms.

(7) Records maintained pursuant to this clause will be kept available for review by the Government until expiration of one (1) year after final payment under this contract, or for such longer period as may be required by any other clause of this contract or by applicable law or regulation.

(b) For purpose of this clause, the following definitions of terms shall apply:

(1) The terms "Indian," "Indian Tribe," "Indian Organization, and "Indian-owned economic enterprise" are defined in the clause of this contract entitled "Indian Preference."

(2) "Indian reservation" includes Indian reservations, public domain Indian allotments, former Indian reservations on Oklahoma, and land held by incorporated Native groups, regional corporations, and village corporations under the provisions of the Alaska Native Claims Settlement Act, (85 Stat. 688; 43 U.S.C. 1601 et seq.).

(3) "On or near an Indian Reservation" means on a reservation or reservations or within that area surrounding an Indian reservation(s) where a person seeking employment could reasonably be expected to commute to and from in the course of a work day.

(c) Nothing in the requirements of this clause shall be interpreted to preclude Indian Tribes from independently developing and enforcing their own Indian preference requirements. Such requirements must not hinder the Government's right to award contracts and to administer their provisions.

(d) The Contractor agrees to include the provisions of this clause including this paragraph (d) in each subcontract awarded under this contract and to notify the Contracting Officer of such subcontracts.

(e) In the event of noncompliance with this clause, the Contractor's right to proceed may be terminated in whole or in part by the Contracting Officer and the work completed in a manner determined by the Contracting Officer to be in the best interest of the Government.

3. 1452.280-2 Notice of Indian Economic Enterprise Set-Aside July 2013

(a) Definitions as used in this clause.

Indian means a person who is a member of an Indian Tribe or ``Native" as defined in the Alaska Native Claims Settlement Act (PL 92-203; 85 Stat. 688; 43 U.S.C. 1601).

Indian Economic Enterprise means any business activity owned by one or more Indians or Indian Tribes that is established for the purpose of profit, provided that: (i) The combined Indian or Indian Tribe ownership shall constitute not less than 51 percent of the enterprise; (ii) the Indians or Indian Tribes sball, together, receive at least a majority of the earnings from the contract; and (iii) the management and daily business operations of an Indian economic enterprise must be controlled by one or more individuals who are members of an Indian Tribe. To ensure actual control over the enterprise, the individuals must possess requisite management or technical capabilities directly related to the primary industry in which the enterprise conducts business. The enterprise must meet these requirements throughout the following time periods: (1) At the time an offer is made in response to a written solicitation; (2) At the time of contract award; and, (3) During the full term of the contract.

Indian Tribe means an Indian Tribe, band, nation, or other recognized group or community which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians, including any Alaska Native village, regional or village corporation established under the Alaska Native Claims Settlement Act (PL 92-203, 85 Stat. 688; 43 U.S.C. 1601).

Representation means the positive statement by an enterprise of its eligibility for preferential consideration and participation for acquisitions conducted under the Buy Indian Act, 25 U.S.C. 47, in accordance with the procedures in Subpart 1480.8.

(b) General.

(1) Under the Buy Indian Act, offers are solicited only from Indian economic enterprises.

(2) BIA will reject all offers received from ineligible enterprises.

(3) Any award resulting from this solicitation will be made to an Indian economic enterprise, as defined in paragraph (a) of this clause.

(c) Required Submissions. In response to this solicitation, an offeror must also provide the following:

(1) A description of the required percentage of the work/costs to be provided by the offeror over the contract term as required by section 1452.280-3, Subcontracting Limitations clause;

(2) A description of the source of human resources for the work to be performed by the offeror;

(3) A description of the method(s) of recruiting and training Indian employees, indicating the extent of soliciting employment of Indian persons, as required by DIAR 1452.226-70, Indian Preference, or DIAR 1452.226-71, Indian Preference Program, clause(s);

(4) A description of how subcontractors (if any) will be selected in compliance with the "Indian Preference" or "Indian Preference Program" clause(s);
(5) The names, addresses, and descriptions of work to be performed by Indian persons or economic enterprises being considered for subcontracts (if any) and the percentage of the total direct project work/costs they would be performing;
(6) Qualifications of the key personnel (if any) that will be assigned to the contract; and
(7) A description of method(s) for compliance with any supplemental Tribal employment preference requirements, if contained in this solicitation.

(d) Required Assurance. The offeror must provide written assurance to the Indian Affairs that it will comply, or has, complied fully with the requirements of this clause. It must do this before Indian Affairs awards the Buy Indian contract, and upon successful and timely completion of the contract, but before the Indian Affairs Contracting Officer (CO) accepts the work or product.

(e) Non-responsiveness. Failure to provide the information required by paragraphs (c) and (d) of this clause may cause Indian Affairs to find an offer non-responsive and to reject it.

(f) Eligibility.
(1) Participation in the Mentor-Protégé Program established under section 831 of the National Defense Authorization Act for Fiscal Year 1991 (25 U.S.C. 47 note) does not render an Indian economic enterprise ineligible for contracts awarded under the Buy Indian Act.
(2) If a contractor no longer meets the definition of an Indian economic enterprise after award, the contractor must notify the CO in writing. The notification must include full disclosure of circumstances causing the contractor to lose eligibility status and a description of any actions that the contractor will take to regain eligibility. Failure to give the CO immediate written notification means that: (i) The economic enterprise may be declared ineligible for future contract awards under this part; and (ii) Indian Affairs may consider termination for default if it is in the best interest of the government.

4. 1452.280-3 Subcontracting Limitations July 2013
(a) Definitions as used in this clause.
(1) *Concern* means any business entity organized for profit (even if its ownership is in the hands of a nonprofit entity) with a place of business located in the United States or its outlying areas and that makes a significant contribution to the U.S. economy through payment of taxes and/or use of American products, material and/or labor, etc. It includes but is not limited to an individual, partnership, corporation, joint venture, association, or cooperative. For the purpose of making affiliation findings (see 19.101) any business entity, whether organized for profit or not, and any foreign business entity, i.e., any entity located outside the United States and its outlying areas.
(2) *Subcontract* means any agreement (other than one involving an employer-employee relationship) entered into by a Government prime contractor or subcontractor calling for supplies and/or services required for performance of the contract, contract modification, or subcontract.
(3) *Subcontractor* means a concern to which a contractor subcontracts any work under the contract. It includes subcontractors at any tier who perform work on the contract.

(b) Required Percentages of work by the concern. The contractor must comply with FAR 52.219-14 Limitations on Subcontracting clause in allocating what percentage of work to subcontract. Of the work subcontracted, no more than 50 percent may be subcontracted to a concern other than a responsible Indian economic enterprise.

(c) Indian Preference. Regardless of the contract type for services, supplies, or covered construction, the contractor agrees to give preference to Indian organizations and Indian owned economic enterprises in awarding subcontracts under this contract in accordance with DIAR 1452.226-71, Indian Preference.

(d) Cooperation. The contractor must: (1) Carry out the requirements of this clause to the fullest extent; and (2) Cooperate in any study or survey that the CO, Indian Affairs, or its agents may conduct to verify the contractor's compliance with this clause.

(e) Incorporation in Subcontracts. The contractor must incorporate the substance of this clause, including this paragraph (e), in all subcontracts for supplies, services, and construction awarded under this contract.

5. 52.212-4 Contract Terms and Conditions—Commercial Items May 2015

(a) Inspection/Acceptance. The Contractor shall only tender for acceptance those items that conform to the requirements of this contract. The Government reserves the right to inspect or test any supplies or services that have been tendered for acceptance. The Government may require repair or replacement of nonconforming supplies or reperformance of nonconforming services at no increase in contract price. If repair/replacement or reperformance will not correct the defects or is not possible, the Government may seek an equitable price reduction or adequate consideration for acceptance of nonconforming supplies or services. The Government must exercise its post-acceptance rights- (1) Within a reasonable time after the defect was discovered or should have been discovered; and (2) Before any substantial change occurs in the condition of the item, unless the change is due to the defect in the item.

(b) Assignment. The Contractor or its assignee may assign its rights to receive payment due as a result of performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency in accordance with the Assignment of Claims Act (31 U.S.C. 3727). However, when a third party makes payment (e.g., use of the Governmentwide commercial purchase card), the Contractor may not assign its rights to receive payment under this contract.

(c) Changes. Changes in the terms and conditions of this contract may be made only by written agreement of the parties.

(d) Disputes. This contract is subject to 41 U.S.C. chapter 71, Contract Disputes. Failure of the parties to this contract to reach agreement on any request for equitable adjustment, claim, appeal or action arising under or relating to this contract shall be a dispute to be resolved in accordance with the clause at FAR 52.233-1, Disputes, which is incorporated herein by reference. The Contractor shall proceed diligently with performance of this contract, pending final resolution of any dispute arising under the contract.

(e) Definitions. The clause at FAR 52.202-1, Definitions, is incorporated herein by reference.

(f) Excusable delays. The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence such as, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement of any excusable delay, setting forth the full particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch, and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence.

(g) Invoice. (1) The Contractor shall submit an original invoice and three copies (or electronic invoice, if authorized) to the address designated in the contract to receive invoices. An invoice must include- (i) Name and address of the Contractor; (ii) Invoice date and number; (iii) Contract number, contract line item number and, if applicable, the order number; (iv) Description, quantity, unit of measure, unit price and extended price of the items delivered; (v) Shipping number and date of shipment, including the bill of lading number and weight of shipment if shipped on Government bill of lading; (vi) Terms of any discount for prompt payment offered; (vii) Name and address of official to whom payment is to be sent; (viii) Name, title, and phone number of person to notify in event of defective invoice; and (ix) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract. (x) Electronic funds transfer (EFT) banking information. (A) The Contractor shall include EFT banking information on the invoice only if required elsewhere in this contract. (B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision, contract clause (e.g., 52.232-33, Payment by Electronic Funds Transfer-System for Award Management, or 52.232-34, Payment by Electronic Funds Transfer-Other Than System for Award Management), or applicable agency procedures. (C) EFT banking information is not required if the Government waived the requirement to pay by EFT.
(2) Invoices will be handled in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) prompt payment regulations at 5 CFR Part 1315.

(h) Patent indemnity. The Contractor shall indemnify the Government and its officers, employees and agents against liability, including costs, for actual or alleged direct or contributory infringement of, or inducement to infringe, any United States or foreign patent, trademark or copyright, arising out of the performance of this contract, provided the Contractor is reasonably notified of such claims and proceedings.

(i) Payment.-
(1) Items accepted. Payment shall be made for items accepted by the Government that have been delivered to the delivery destinations set forth in this contract.
(2) Prompt payment. The Government will make payment in accordance with the Prompt Payment Act (31 U.S.C. 3903) and prompt payment regulations at 5 CFR Part 1315.
(3) Electronic Funds Transfer (EFT). If the Government makes payment by EFT, see 52.212-5(b) for the appropriate EFT clause.
(4) Discount. In connection with any discount offered for early payment, time shall be computed from the date of the invoice. For the purpose of computing the discount earned, payment shall be considered to have been made on the date which appears on the payment check or the specified payment date if an electronic funds transfer payment is made.
(5) Overpayments. If the Contractor becomes aware of a duplicate contract financing or invoice payment or that the Government has otherwise overpaid on a contract financing or invoice payment, the Contractor shall- (i) Remit the overpayment amount to the payment office cited in the contract along with a description of the overpayment including the- (A) Circumstances of the overpayment (e.g., duplicate payment, erroneous payment, liquidation errors, date(s) of overpayment); (B) Affected contract number and delivery order number, if applicable; (C) Affected contract line item or subline item, if applicable; and (D) Contractor point of contact. (ii) Provide a copy of the remittance and supporting documentation to the Contracting Officer.
(6) Interest. (i) All amounts that become payable by the Contractor to the Government under this contract shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in 41 U.S.C. 7109 , which is applicable to the period in which the amount becomes due, as provided in (i)(6)(v) of this clause, and then at the rate applicable for each six-month period as fixed by the Secretary until the amount is paid. (ii) The Government may issue a demand for payment to the Contractor upon finding a debt is due under the contract. (iii) Final decisions. The Contracting Officer will issue a final decision as required by 33.211 if- (A) The Contracting Officer and the Contractor are unable to reach agreement on the existence or amount of a debt within 30 days; (B) The Contractor fails to liquidate a debt previously demanded by the Contracting Officer within the timeline specified in the demand for payment unless the amounts were not repaid because the Contractor has requested an installment payment agreement; or (C) The Contractor requests a deferment of collection on a debt previously demanded by the Contracting Officer (see 32.607-2). (iv) If a demand for payment was previously issued for the debt, the demand for payment included in the final decision shall identify the same due date as the original demand for payment. (v) Amounts shall be due at the earliest of the following dates: (A) The date fixed under this contract. (B) The date of the first written demand for payment, including any demand for payment resulting from a default termination. (vi) The interest charge shall be computed for the actual number of calendar days involved beginning on the due date and ending on- (A) The date on which the designated office receives payment from the Contractor; (B) The date of issuance of a Government check to the Contractor from

which an amount otherwise payable has been withheld as a credit against the contract debt; or (C) The date on which an amount withheld and applied to the contract debt would otherwise have become payable to the Contractor. (vii) The interest charge made under this clause may be reduced under the procedures prescribed in 32.608-2 of the Federal Acquisition Regulation in effect on the date of this contract.

(j) Risk of loss. Unless the contract specifically provides otherwise, risk of loss or damage to the supplies provided under this contract shall remain with the Contractor until, and shall pass to the Government upon: (1) Delivery of the supplies to a carrier, if transportation is f.o.b. origin; or (2) Delivery of the supplies to the Government at the destination specified in the contract, if transportation is f.o.b. destination.

(k) Taxes. The contract price includes all applicable Federal, State, and local taxes and duties.

(l) Termination for the Government's convenience. The Government reserves the right to terminate this contract, or any part hereof, for its sole convenience. In the event of such termination, the Contractor shall immediately stop all work hereunder and shall immediately cause any and all of its suppliers and subcontractors to cease work. Subject to the terms of this contract, the Contractor shall be paid a percentage of the contract price reflecting the percentage of the work performed prior to the notice of termination, plus reasonable charges the Contractor can demonstrate to the satisfaction of the Government using its standard record keeping system, have resulted from the termination. The Contractor shall not be required to comply with the cost accounting standards or contract cost principles for this purpose. This paragraph does not give the Government any right to audit the Contractor's records. The Contractor shall not be paid for any work performed or costs incurred which reasonably could have been avoided.

(m) Termination for cause. The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, and the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.

(n) Title. Unless specified elsewhere in this contract, title to items furnished under this contract shall pass to the Government upon acceptance, regardless of when or where the Government takes physical possession.

(o) Warranty. The Contractor warrants and implies that the items delivered hereunder are merchantable and fit for use for the particular purpose described in this contract.

(p) Limitation of liability. Except as otherwise provided by an express warranty, the Contractor will not be liable to the Government for consequential damages resulting from any defect or deficiencies in accepted items.

(q) Other compliances. The Contractor shall comply with all applicable Federal, State and local laws, executive orders, rules and regulations applicable to its performance under this contract.

(r) Compliance with laws unique to Government contracts. The Contractor agrees to comply with 31 U.S.C. 1352 relating to limitations on the use of appropriated funds to influence certain Federal contracts; 18 U.S.C. 431 relating to officials not to benefit; 40 U.S.C. chapter 37, Contract Work Hours and Safety Standards; 41 U.S.C. chapter 87, Kickbacks; 41 U.S.C. 4712 and 10 U.S.C. 2409 relating to whistleblower protections; 49 U.S.C. 40118, Fly American; and 41 U.S.C. chapter 21 relating to procurement integrity.

(s) Order of precedence. Any inconsistencies in this solicitation or contract shall be resolved by giving precedence in the following order: (1) The schedule of supplies/services. (2) The Assignments, Disputes, Payments, Invoice, Other Compliances, Compliance with Laws Unique to Government Contracts, and Unauthorized Obligations paragraphs of this clause; (3) The clause at 52.212-5. (4) Addenda to this solicitation or contract, including any license agreements for computer software. (5) Solicitation provisions if this is a solicitation. (6) Other paragraphs of this clause. (7) The Standard Form 1449. (8) Other documents, exhibits, and attachments. (9) The specification.

(t) System for Award Management (SAM). (1) Unless exempted by an addendum to this contract, the Contractor is responsible during performance and through final payment of any contract for the accuracy and completeness of the data within the SAM database, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the SAM database after the initial registration, the Contractor is required to review and update on an annual basis from the date of initial registration or subsequent updates its information in the SAM database to ensure it is current, accurate and complete. Updating information in the SAM does not alter the terms and conditions of this contract and is not a substitute for a properly executed contractual document. (2)(i) If a Contractor has legally changed its business name, "doing business as" name, or division name (whichever is shown on the contract), or has transferred the assets used in performing the contract, but has not completed the necessary requirements regarding novation and change-of-name agreements in FAR Subpart 42.12, the Contractor shall provide the responsible Contracting Officer a minimum of one business day's written notification of its intention to (A) change the name in the SAM database; (B) comply with the requirements of Subpart 42.12; and (C) agree in writing to the timeline and procedures specified by the responsible Contracting Officer. The Contractor must provide with the notification sufficient documentation to support the legally changed name. (ii) If the Contractor fails to comply with the requirements of paragraph (t)(2)(i) of this clause, or fails to perform the agreement at paragraph (t)(2)(i)(C) of this clause, and, in the absence of a properly executed novation or change-of-name agreement, the SAM information that shows the Contractor to be other than the Contractor indicated in the contract will be considered to be incorrect information within the meaning of the "Suspension of Payment" paragraph of the electronic funds transfer (EFT) clause of this contract. (3) The Contractor shall not change the name or address for EFT payments or manual payments, as appropriate, in the SAM record to reflect an assignee for the

purpose of assignment of claims (see Subpart 32.8, Assignment of Claims). Assignees shall be separately registered in the SAM database. Information provided to the Contractor's SAM record that indicates payments, including those made by EFT, to an ultimate recipient other than that Contractor will be considered to be incorrect information within the meaning of the "Suspension of payment" paragraph of the EFT clause of this contract. (4) Offerors and Contractors may obtain information on registration and annual confirmation requirements via SAM accessed through https://www.acquisition.gov.

(u) Unauthorized Obligations (1) Except as stated in paragraph (u)(2) of this clause, when any supply or service acquired under this contract is subject to any End User License Agreement (EULA), Terms of Service (TOS), or similar legal instrument or agreement, that includes any clause requiring the Government to indemnify the Contractor or any person or entity for damages, costs, fees, or any other loss or liability that would create an Anti-Deficiency Act violation (31 U.S.C. 1341), the following shall govern: (i) Any such clause is unenforceable against the Government. (ii) Neither the Government nor any Government authorized end user shall be deemed to have agreed to such clause by virtue of it appearing in the EULA, TOS, or similar legal instrument or agreement. If the EULA, TOS, or similar legal instrument or agreement is invoked through an "I agree" click box or other comparable mechanism (e.g., "click-wrap" or "browse-wrap" agreements), execution does not bind the Government or any Government authorized end user to such clause. (iii) Any such clause is deemed to be stricken from the EULA, TOS, or similar legal instrument or agreement. (2) Paragraph (u)(1) of this clause does not apply to indemnification by the Government that is expressly authorized by statute and specifically authorized under applicable agency regulations and procedures.

(v) Incorporation by reference. The Contractor's representations and certifications, including those completed electronically via the System for Award Management (SAM), are incorporated by reference into the contract.

6. 52.212-5 Contract Terms and Conditions Required to Implement Statutes or Executive Orders—Commercial Items January 2016

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses, which are incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

(1) 52.209-10, Prohibition on Contracting with Inverted Domestic Corporations (Nov 2015)

(2) 52.233-3, Protest After Award (AUG 1996) (31 U.S.C. 3553).

(3) 52.233-4, Applicable Law for Breach of Contract Claim (OCT 2004)(Public Laws 108-77 and 108-78 (19 U.S.C. 3805 note)).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

__ (1) 52.203-6, Restrictions on Subcontractor Sales to the Government (Sept 2006), with Alternate I (Oct 1995) (41 U.S.C. 4704 and 10 U.S.C. 2402).

__ (2) 52.203-13, Contractor Code of Business Ethics and Conduct (Oct 2015) (41 U.S.C. 3509)).

__ (3) 52.203-15, Whistleblower Protections under the American Recovery and Reinvestment Act of 2009 (June 2010) (Section 1553 of Pub. L. 111-5). (Applies to contracts funded by the American Recovery and Reinvestment Act of 2009.)

__ (4) 52.204-10, Reporting Executive Compensation and First-Tier Subcontract Awards (Oct 2015) (Pub. L. 109-282) (31 U.S.C. 6101 note).

__ (5) [Reserved].

__ (6) 52.204-14, Service Contract Reporting Requirements (Jan 2014) (Pub. L. 111-117, section 743 of Div. C).

__ (7) 52.204-15, Service Contract Reporting Requirements for Indefinite-Delivery Contracts (Jan 2014) (Pub. L. 111-117, section 743 of Div. C).

__ (8) 52.209-6, Protecting the Government's Interest When Subcontracting with Contractors Debarred, Suspended, or Proposed for Debarment. (Oct 2015) (31 U.S.C. 6101 note).

__ (9) 52.209-9, Updates of Publicly Available Information Regarding Responsibility Matters (Jul 2013) (41 U.S.C. 2313).

__ (10) [Reserved].

__ (11)(i) 52.219-3, Notice of HUBZone Set-Aside or Sole-Source Award (Nov 2011) (15 U.S.C. 657a).

__ (ii) Alternate I (Nov 2011) of 52.219-3.

__ (12)(i) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (OCT 2014) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a).

__ (ii) Alternate I (JAN 2011) of 52.219-4.

__ (13) [Reserved]

__ (14)(i) 52.219-6, Notice of Total Small Business Set-Aside (Nov 2011) (15 U.S.C. 644).

__ (ii) Alternate I (Nov 2011).

__ (iii) Alternate II (Nov 2011).

__ (15)(i) 52.219-7, Notice of Partial Small Business Set-Aside (June 2003) (15 U.S.C. 644).

__ (ii) Alternate I (Oct 1995) of 52.219-7.

__ (iii) Alternate II (Mar 2004) of 52.219-7.

__ (16) 52.219-8, Utilization of Small Business Concerns (Oct 2014) (15 U.S.C. 637(d)(2) and (3)).

__ (17)(i) 52.219-9, Small Business Subcontracting Plan (Oct 2015) (15 U.S.C. 637(d)(4)).
__ (ii) Alternate I (Oct 2001) of 52.219-9.
__ (iii) Alternate II (Oct 2001) of 52.219-9.
__ (iv) Alternate III (Oct 2015) of 52.219-9.
__ (18) 52.219-13, Notice of Set-Aside of Orders (Nov 2011) (15 U.S.C. 644(r)).
__ (19) 52.219-14, Limitations on Subcontracting (Nov 2011) (15 U.S.C. 637(a)(14)).
__ (20) 52.219-16, Liquidated Damages—Subcon-tracting Plan (Jan 1999) (15 U.S.C. 637(d)(4)(F)(i)).
__ (21) 52.219-27, Notice of Service-Disabled Veteran-Owned Small Business Set-Aside (Nov 2011) (15 U.S.C. 657 f).
__ (22) 52.219-28, Post Award Small Business Program Rerepresentation (Jul 2013) (15 U.S.C. 632(a)(2)).
__ (23) 52.219-29, Notice of Set-Aside for Economically Disadvantaged Women-Owned Small Business (EDWOSB) Concerns (Jul 2013) (15 U.S.C. 637(m)).
__ (24) 52.219-30, Notice of Set-Aside for Women-Owned Small Business (WOSB) Concerns Eligible Under the WOSB Program (Jul 2013) (15 U.S.C. 637(m)).
__ (25) 52.222-3, Convict Labor (June 2003) (E.O. 11755).
_X (26) 52.222-19, Child Labor—Cooperation with Authorities and Remedies (Jan 2014) (E.O. 13126).
_X_ (27) 52.222-21, Prohibition of Segregated Facilities (Apr 2015).
_X_ (28) 52.222-26, Equal Opportunity (Apr 2015) (E.O. 11246).
__ (29) 52.222-35, Equal Opportunity for Veterans (Oct 2015)(38 U.S.C. 4212).
__ (30) 52.222-36, Equal Opportunity for Workers with Disabilities (Jul 2014) (29 U.S.C. 793).
__ (31) 52.222-37, Employment Reports on Veterans (OCT 2015) (38 U.S.C. 4212).
__ (32) 52.222-40, Notification of Employee Rights Under the National Labor Relations Act (Dec 2010) (E.O. 13496).
_X_ (33)(i) 52.222-50, Combating Trafficking in Persons (Mar 2015) (22 U.S.C. chapter 78 and E.O. 13627).
__ (ii) Alternate I (Mar 2015) of 52.222-50 (22 U.S.C. chapter 78 and E.O. 13627).
__ (34) 52.222-54, Employment Eligibility Verification (OCT 2015). (Executive Order 12989). (Not applicable to the acquisition of commercially available off-the-shelf items or certain other types of commercial items as prescribed in 22.1803.)
__ (35)(i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA–Designated Items (May 2008) (42 U.S.C. 6962(c)(3)(A)(ii)). (Not applicable to the acquisition of commercially available off-the-shelf items.)
__ (ii) Alternate I (May 2008) of 52.223-9 (42 U.S.C. 6962(i)(2)(C)). (Not applicable to the acquisition of commercially available off-the-shelf items.)
__ (36)(i) 52.223-13, Acquisition of EPEAT®-Registered Imaging Equipment (JUN 2014) (E.O.s 13423 and 13514).
__ (ii) Alternate I (Oct 2015) of 52.223-13.
__ (37)(i) 52.223-14, Acquisition of EPEAT®-Registered Televisions (JUN 2014) (E.O.s 13423 and 13514).
__ (ii) Alternate I (Jun 2014) of 52.223-14.
__ (38) 52.223-15, Energy Efficiency in Energy-Consuming Products (DEC 2007) (42 U.S.C. 8259b).
__ (39)(i) 52.223-16, Acquisition of EPEAT®-Registered Personal Computer Products (OCT 2015) (E.O.s 13423 and 13514).
__ (ii) Alternate I (Jun 2014) of 52.223-16.
_X_ (40) 52.223-18, Encouraging Contractor Policies to Ban Text Messaging While Driving (AUG 2011) (E.O. 13513).
__ (41) 52.225-1, Buy American—Supplies (May 2014) (41 U.S.C. chapter 83).
__ (42)(i) 52.225-3, Buy American—Free Trade Agreements—Israeli Trade Act (May 2014) (41 U.S.C. chapter 83, 19 U.S.C. 3301 note, 19 U.S.C. 2112 note, 19 U.S.C. 3805 note, 19 U.S.C. 4001 note, Pub. L. 103-182, 108-77, 108-78, 108-286, 108-302, 109-53, 109-169, 109-283, 110-138, 112-41, 112-42, and 112-43.
__ (ii) Alternate I (May 2014) of 52.225-3.
__ (iii) Alternate II (May 2014) of 52.225-3.
__ (iv) Alternate III (May 2014) of 52.225-3.
__ (43) 52.225-5, Trade Agreements (NOV 2013) (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note).
__ (44) 52.225-13, Restrictions on Certain Foreign Purchases (June 2008) (E.O.'s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).
__ (45) 52.225-26, Contractors Performing Private Security Functions Outside the United States (Jul 2013) (Section 862, as amended, of the National Defense Authorization Act for Fiscal Year 2008; 10 U.S.C. 2302 Note).
__ (46) 52.226-4, Notice of Disaster or Emergency Area Set-Aside (Nov 2007) (42 U.S.C. 5150).
__ (47) 52.226-5, Restrictions on Subcontracting Outside Disaster or Emergency Area (Nov 2007) (42 U.S.C. 5150).
__ (48) 52.232-29, Terms for Financing of Purchases of Commercial Items (Feb 2002) (41 U.S.C. 4505, 10 U.S.C. 2307(f)).
__ (49) 52.232-30, Installment Payments for Commercial Items (Oct 1995) (41 U.S.C. 4505, 10 U.S.C. 2307(f)).
_X_ (50) 52.232-33, Payment by Electronic Funds Transfer—System for Award Management (Jul 2013) (31 U.S.C. 3332).
__ (51) 52.232-34, Payment by Electronic Funds Transfer—Other than System for Award Management (Jul 2013) (31 U.S.C. 3332).

__ (52) 52.232-36, Payment by Third Party (May 2014) (31 U.S.C. 3332).
__ (53) 52.239-1, Privacy or Security Safeguards (Aug 1996) (5 U.S.C. 552a).
__ (54)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (Feb 2006) (46 U.S.C. Appx. 1241(b) and 10 U.S.C. 2631).
__ (ii) Alternate I (Apr 2003) of 52.247-64.
(c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

__ (1) 52.222-17, Nondisplacement of Qualified Workers (May 2014)(E.O. 13495).
__ (2) 52.222-41, Service Contract Labor Standards (May 2014) (41 U.S.C. chapter 67).
__ (3) 52.222-42, Statement of Equivalent Rates for Federal Hires (May 2014) (29 U.S.C. 206 and 41 U.S.C. chapter 67).
__ (4) 52.222-43, Fair Labor Standards Act and Service Contract Labor Standards-Price Adjustment (Multiple Year and Option Contracts) (May 2014) (29 U.S.C. 206 and 41 U.S.C. chapter 67).
__ (5) 52.222-44, Fair Labor Standards Act and Service Contract Labor Standards—Price Adjustment (May 2014) (29 U.S.C. 206 and 41 U.S.C. chapter 67).
__ (6) 52.222-51, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment—Requirements (May 2014) (41 U.S.C. chapter 67).
__ (7) 52.222-53, Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services—Requirements (May 2014) (41 U.S.C. chapter 67).
_X_ (8) 52.222-55, Minimum Wages Under Executive Order 13658 (Dec 2015) (E.O. 13658).
__ (9) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations (May 2014) (42 U.S.C. 1792).
__ (10) 52.237-11, Accepting and Dispensing of $1 Coin (Sept 2008) (31 U.S.C. 5112(p)(1)).
(d) Comptroller General Examination of Record. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records—Negotiation.
(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.
(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.
(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.
(e)(1) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c), and (d) of this clause, the Contractor is not required to flow down any FAR clause, other than those in this paragraph (e)(1) in a subcontract for commercial items. Unless otherwise indicated below, the extent of the flow down shall be as required by the clause—
(i) 52.203-13, Contractor Code of Business Ethics and Conduct (Oct 2015) (41 U.S.C. 3509).
(ii) 52.219-8, Utilization of Small Business Concerns (Oct 2014) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds $700,000 ($1.5 million for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.
(iii) 52.222-17, Nondisplacement of Qualified Workers (May 2014) (E.O. 13495). Flow down required in accordance with paragraph (l) of FAR clause 52.222-17.
(iv) 52.222-21, Prohibition of Segregated Facilities (Apr 2015)
(v) 52.222-26, Equal Opportunity (Apr 2015) (E.O. 11246).
(vi) 52.222-35, Equal Opportunity for Veterans (Oct 2015) (38 U.S.C. 4212).
(vii) 52.222-36, Equal Opportunity for Workers with Disabilities (Jul 2014) (29 U.S.C. 793).
(viii) 52.222-37, Employment Reports on Veterans (Oct 2015) (38 U.S.C. 4212)
(ix) 52.222-40, Notification of Employee Rights Under the National Labor Relations Act (Dec 2010) (E.O. 13496). Flow down required in accordance with paragraph (f) of FAR clause 52.222-40.
(x) 52.222-41, Service Contract Labor Standards (May 2014) (41 U.S.C. chapter 67).
(xi)
__(A) 52.222-50, Combating Trafficking in Persons (Mar 2015) (22 U.S.C. chapter 78 and E.O 13627).

__(B) Alternate I (Mar 2015) of 52.222-50 (22 U.S.C. chapter 78 and E.O 13627).
(xii) 52.222-51, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment-Requirements (May 2014) (41 U.S.C. chapter 67).
(xiii) 52.222-53, Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services-Requirements (May 2014) (41 U.S.C. chapter 67).
(xiv) 52.222-54, Employment Eligibility Verification (OCT 2015) (E.O. 12989).
(xv) 52.222-55, Minimum Wages Under Executive Order 13658 (Dec 2015) (E.O. 13658).
(xvi) 52.225-26, Contractors Performing Private Security Functions Outside the United States (Jul 2013) (Section 862, as amended, of the National Defense Authorization Act for Fiscal Year 2008; 10 U.S.C. 2302 Note).
(xvii) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations (May 2014) (42 U.S.C. 1792). Flow down required in accordance with paragraph (e) of FAR clause 52.226-6.
(xviii) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (Feb 2006) (46 U.S.C. Appx. 1241(b) and 10 U.S.C. 2631). Flow down required in accordance with paragraph (d) of FAR clause 52.247-64.
(2) While not required, the contractor may include in its subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

6. 52.223-6 Drug-Free Workplace May 2001

(a) *Definitions*. As used in this clause—
"Controlled substance" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11 - 1308.15.
"Conviction" means a finding of guilt (including a plea of *nolo contendere*) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.
"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession, or use of any controlled substance.
"Drug-free workplace" means the site(s) for the performance of work done by the Contractor in connection with a specific contract where employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.
"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than a minimal impact or involvement in contract performance.
"Individual" means an offeror/contractor that has no more than one employee including the offeror/contractor.
(b) The Contractor, if other than an individual, shall—within 30 days after award (unless a longer period is agreed to in writing for contracts of 30 days or more performance duration), or as soon as possible for contracts of less than 30 days performance duration— (1) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (2) Establish an ongoing drug-free awareness program to inform such employees about— (i) The dangers of drug abuse in the workplace; (ii) The Contractor's policy of maintaining a drug-free workplace; (iii) Any available drug counseling, rehabilitation, and employee assistance programs; and (iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace; (3) Provide all employees engaged in performance of the contract with a copy of the statement required by paragraph (b)(1) of this clause; (4) Notify such employees in writing in the statement required by paragraph (b)(1) of this clause that, as a condition of continued employment on this contract, the employee will— (i) Abide by the terms of the statement; and (ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 days after such conviction; (5) Notify the Contracting Officer in writing within 10 days after receiving notice under subdivision (b)(4)(ii) of this clause, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee; (6) Within 30 days after receiving notice under subdivision (b)(4)(ii) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace: (i) Taking appropriate personnel action against such employee, up to and including termination; or (ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency; and (7) Make a good faith effort to maintain a drug-free workplace through implementation of paragraphs (b)(1) through (b)(6) of this clause.
(c) The Contractor, if an individual, agrees by award of the contract or acceptance of a purchase order, not to engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance while performing this contract.
(d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraph (b) or (c) of this clause may, pursuant to FAR 23.506, render the Contractor subject to suspension of contract payments, termination of the contract or default, and suspension or debarment.

7. 52.232-40 Providing Accelerated Payments to Small Business Subcontractors December 2013

(a) Upon receipt of accelerated payments from the Government, the Contractor shall make accelerated payments to its small business subcontractors under this contract, to the maximum extent practicable and prior to when such payment is otherwise required under the applicable contract or subcontract, after receipt of a proper invoice and all other required documentation from the small business subcontractor.
(b) The acceleration of payments under this clause does not provide any new rights under the Prompt Payment Act.
(c) Include the substance of this clause, including this paragraph (c), in all subcontracts with small business concerns, including subcontracts with small business concerns for the acquisition of commercial items.

SECTION J LIST OF DOCUMENTS, EXHIBITS, AND OTHER ATTACHMENTS

1. DOI POLICY - Prohibition on Texting While Driving

Memorandum

To: All DOI Employees

From: Deputy Secretary

Subject: Prohibition on Texting While Driving

Recent deadly crashes involving drivers distracted by text messaging while driving highlight a growing danger. Text messaging causes drivers to take their eyes off the road and at least one hand off the steering wheel, endangering both themselves and others. President Obama recently issued Executive Order 13513, "Federal Leadership on Reducing Text Messaging While Driving." This important order prohibits Federal employees from text messaging while doing any of the following:

- Driving Government-owned, Government-leased, or Government-rented vehicles (GOVs);
- Driving privately-owned vehicles (POV) while on official Government business; and
- Using electronic equipment supplied by the Government (including, but not limited to, cell phones, Blackberries, or other electronic devices) while driving.

A Federal Government-wide prohibition on the use of text messaging while driving on official business or while using Government-supplied equipment will help save lives, reduce injuries, and set an example for state and local governments, private employers, and individual drivers.

Texting or text messaging means reading from or entering data into any handheld or other electronic device, including SMS texting, e-mailing, instant messaging, obtaining navigational information, or engaging in any other form of electronic data retrieval or electronic data communication.

In addition, **the Executive Order requires Federal agencies to take steps to encourage Federal contractors, subcontractors, recipients, and sub recipients of financial assistance to adopt and enforce their own policies that ban employees from texting while driving GOVs or company-owned, company-leased, or company-rented vehicles or while driving POVs on official Government business or when performing work for, or on behalf of, the Government. Those entities are further encouraged to educate their employees and to urge voluntary compliance with a texting ban for off-duty employees.**

All DOI employees are directed to comply with E.O. 13513 immediately, and human capital, procurement, and other applicable teams are directed to update all relevant policies and procedures to include the express prohibitions of the Order as soon as possible. In addition, employees and contractors are strongly encouraged to refrain from off-duty text messaging on personal devices while operating POVs.

J.2 BY Referance – AKANA Proposal, 18spages, Appendix A – Project Work Plan, 11 pages and Appendix B – Cost Proposal, a6 gages, dated January 14, 2015 is incorporated.

PO	Type	Vendor	Name				PGp	Order Date
Item	Material		Short Text					Mat. Group
D I A	Plnt	SLoc		Order Qty	Un	Net Price	Curr.	per Un
A16PX00431	ZC	70034618	COOPER ZIETZ ENGINEERS, INC.				A11	01/28/2016
00010			**Phase I Project Planning**				**F115**	
D K A000				**1**	**AU**	**35,080.00**	**USD**	**1 AU**
Still to be delivered						**35,080.00**	**USD**	**100.00 %**
Still to be invoiced						**0.00**	**USD**	**0.00 %**
00020			Phase II Field Investigation				F115	
D K A000				1	AU	176,150.00	USD	1 AU
Still to be delivered						176,150.00	USD	100.00 %
Still to be invoiced						0.00	USD	0.00 %
00030			**Phase III Remedial Planning**				**F115**	
D K A000				**1**	**AU**	**32,000.00**	**USD**	**1 AU**
Still to be delivered						**32,000.00**	**USD**	**100.00 %**
Still to be invoiced						**0.00**	**USD**	**0.00 %**
00040			Technical Meetings & Support				F115	
D K A000				1	AU	8,300.00	USD	1 AU
Still to be delivered						8,300.00	USD	100.00 %
Still to be invoiced						0.00	USD	0.00 %

Akana Subcontractors and Service Provider List

Akana Project 16-005
Subcontractors/Vendors
BIA - Env Investigation Duck Valley Reservation, Owyhee, NV

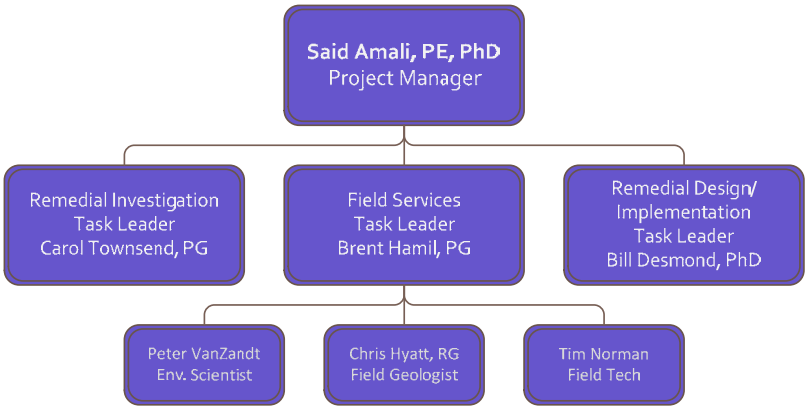
Subcontractor Name	Job Duties and estimated length of their work
Cascade Drilling LP Jeff Townsend PO Box 1184 17270 Woodinville-Redmond, Road NE, Bldg A, STE. 777 Woodinville, main 425-485-8908 Jeff- 208-345-0878 jtownsend@cascadedrilling.com	Environmental Drilling Company: estimated to be on the reservation for one week
ESC Labs Chris McCord (Technical Service Rep) 12065 Lebanon Road, Mt Juliet, TN 37122 615-773-3281 cmccord@esclabsciences.com	contract laboratory, will never be on the reservation working
Wallace Morris Orban Surveying, LLC Kurt Orban - Cell 702-358-1619 1096 Lamoille Highway Elko, NV 89801 775-753-3610 korban@wmsurveying.com	Will be onsite for one day to survey the location of the monitor wells
EnviroCare Randy Betker (Account Executive) randyb@ecihazmat.com 775-401-6449 505 North Main Street North Salt Lake, UT 84054 Chet Littledyke (Elko, NV chet@ecihazmat.com 620 Union Pacificway Elko, NV 89801 775-401-6449 775-401-6757 fax Tiffiny Farnsworth - Billing and Payroll tiffiny@ecihazmat.com Cindy Jelsma - AP Accounting/Collections cindy@ecihazmat.com	Waste Disposal Services: one person and a truck will be onsite at various times throughout the contract period to pick up investigation derived waste (soil cutting and water)
Geotech Environmental Equipment, Inc. 2650 East 40th Avenue Denver, CO 80205 303-320-4767	Environmental Equipment Rental: no personnel on the reservation

Key & Permanent Employees and Job Descriptions

Key Personnel

Akana has assembled a team of Environmental Professionals with extensive experience completing environmental investigations, conducting groundwater sampling and preparing remediation plan documents similar in scope to the Duck Valley Project. Our team will be led by Said Amali, PE, PhD. Dr. Amali will be our single point of contact with the BIA Contracting Officer (CO) and Contracting Officer's Technical Representative (COTR). Dr. Amali will manage the project scope, schedule and budget. As shown in our org chart below, Dr. Amali will be supported by a team of environmental professionals. A summary of our key personnel qualifications is presented below.

Our Project Team will be led by Said Amali, PhD, PE. Dr. Amali is a Principal Environmental Scientist with over 25 years of Site Investigation and Remediation Experience. Dr. Amali is a regional expert in groundwater characterization and remediation. Dr. Amali will be supported by three Task Managers: Carol Townsend, PG; Brent Hamil, PG; and Bill Desmond, PhD. Carol Townsend will lead the Remedial Investigation Task which includes Tasks 1-9 in our Work Breakdown Structure (WBS). Brent Hamil is our field services Task Manager and will coordinate field work associated with Tasks 5, 6, 7,8, and 9. Brent will be assisted by technical staff, Chris Hyatt, Peter Van Zandt, and Tim Norman. Bill Desmond will lead the Remedial Design and Implementation Work Plan tasks (Tasks 10 and 11).



Projected Man Hours

Akana Project 16-005
Projected Man-hours
BIA WRO - Env Investigation Duck Valley Reservation, Owyhee, NV

Item 0010 - Phase I Project Planning (Subtasks 1-5) (2/1/2016-7/1/2016)

Subtask	Resources Employee	Labor Category	Man-hours (Hrs)
SubTask 1 - Records Review and Stakeholder Outreach (all desktop and offsite work)			
records review	Brent Hamil	Proj. Geologist	24
project overview and	Said Amali	Project Manager	6.5
teleconference	Carol Townsend	Sr Env Scientist	8
Total Hours for Sub Task			**38.5**
SubTask 2 - Administrative Order Review, Compliance Status and Data Gap Analysis (all desktop and offsite work)			
	Brent Hamil	Proj. Geologist	8
	Said Amali	Project Manager	4
Total Hours for Sub Task			**12**
SubTask 3 - Initial Site Visit and Project Kick Off Meeting (work on reservation)			
	Said Amali	Project Manager	20
	Carol Townsend	Env Scientist	20
	Brent Hamil	Proj. Geologist	1.5
Total Hours for Sub Task			**41.5**
SubTask 4 - Preliminary GW Sampling Event (work on reservation)			
	Brent Hamil	Proj. Geologist	70
	Peter Van Zandt	Env Scientist	2
	Bill Renfroe	Health and Safety Plan	1
subcontractor	Laboratory (ESC Lab)	no one onsite	0
Total Hours for Sub Task			**73**
SubTask 5 - Project Workplan (all desktop and offsite work)			
	Said Amali	Project Manager	8
	Carol Townsend	Sr Env Scientist	40
	Brent Hamil	Proj. Geologist	40
	Nick Oatman	CAD	8
Total Hours for Sub Task			**96**

Subtask	Resources Employee	Labor Category	Man-hours (Hrs)
Item 0020 - Phase II Field Investigation (Subtasks 6-9) (7/1/2016-10/1/2017)			
Subtask	**Resources Employee**	**Labor Category**	**Man-hours (Hrs)**
Sub Task 6 - Monitoring Well Installation, Abandonment, Soil Borings, and Sampling (work on reservation)			
	Carol Townsend	Sr Env Scientist	10
	Brent Hamil	Proj. Geologist	90
	Bill Renfroe	Health and Safety Plan	1
	Peter Van Zandt	Env Scientist	90
	Tim Norman	Field Tech	30
	Kathy Odell	Admin Assistance	2
Subcontractor	Cascade Drilling	3 people	120
	Laboratory Services	no one onsite	0
Subcontractor	Enviro Care (Waste Disposal) (all task 4,6, 8)		24
Total Hours for Sub Task			**367**
Sub Task 7 - Quarterly Elevation Survey (work on reservation)			
	Tim Norman	Field Tech	8
	Brent Hamil	Proj. Geologist	6
Subcontractor	Survey(or Wallace Morris Orban)		8
Total Hours for Sub Task			**22**
Sub Task 8A - Quarterly GW Monitoring (1st Quarter event August 2016) (work on reservation)			
	Carol Townsend	Sr Env Scientist	2
	Brent Hamil	Proj. Geologist	2
	Tim Norman	Field Tech	72
	Bill Renfroe	Health and Safety Plan	2
	Laboratory Services	no one onsite	0
Total Hours for Sub Task			**74**
Sub Task 8B - Slug and Aquifer Pump Tests (August 2016) (work on reservation)			
	Said Amali	Project Manager	6
	Carol Townsend	Sr Env Scientist	10
	Brent Hamil	Proj. Geologist	82
	Peter Van Zandt	Env Scientist	82
	Tim Norman	Field Tech	82
Total Hours for Sub Task			**262**
Sub Task 8C - Quarterly GW Monitoring (2nd Quarter event October/Nov 2016) (work on reservation)			
	Carol Townsend	Sr Env Scientist	2
	Brent Hamil	Proj. Geologist	2
	Peter Van Zandt	Env Scientist	45
	Tim Norman	Field Tech	45
	Laboratory Services	no one onsite	0
Total Hours for Sub Task			**94**
Sub Task 9 Bi-Annual GW Assessment Reports (per report x 2 reporting event) (all office desktop work)			
	Carol Townsend	Sr Env Scientist	8
	Brent Hamil	Proj. Geologist	24
	Peter Van Zandt	Env Scientist	40
	Nick Oatman	CAD	8
Total Hours for Sub Task			**80**

Subtask	Resources Employee	Labor Category	Man-hours (Hrs)
Item 0030 Phase III - Remedial Planning (Subtasks 10 and 11) (1/1/2017-10/31/2017) (don't need these tasks set up yet)			
Subtask	**Resources Employee**	**Labor Category**	**Man-hours (Hrs)**
Sub Task 10 - Remedial Design Plan			
		(all desk top work from office)	
Total Future Hours for Sub Task			**352**
Sub Task 11 Remedial Implementation Work Plan		**(all desk top work from office)**	
	Said Amali	Project Manager	32
	Carol Townsend	Sr Env Scientist	40
	Brent Hamil	Proj. Geologist	50
	Peter Van Zandt	Env Scientist	50
Total Hours for Sub Task			**172**
Item 0040 Phase IV - Teleconferences, Meetings, and Support (SubTask 12) (3/1/2016-10/1/2017)			
Subtask	**Resources Employee**	**Labor Category**	**Man-hours (Hrs)**
Sub Task 12 - Teleconference, Meetings, and Support (Desktop work and telephone)			
	Said Amali	Project Manager	40
	Carol Townsend	Sr Env Scientist	8
	Brent Hamil	Proj. Geologist	24
Total Hours for Sub Task			**72**

Workers Compensation Insurance

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 9/15/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
Shipley & Pease Insurance
PO Box 928
Woodinville, WA 98072

CONTACT NAME: Stan Pease
PHONE (A/C, No, Ext): 503-282-3444 FAX (A/C, No): 503 282 3345
E-MAIL ADDRESS: stan@shipleyins.com

INSURER(S) AFFORDING COVERAGE	NAIC #
INSURER A: RLI Insurance Company	
INSURER B: Travelers Casualty & Surety	
INSURER C:	
INSURER D:	
INSURER E:	
INSURER F:	

INSURED
AKANA
6400 SE Lake Rd, Ste. 270
Portland, OR 97222
(206)768-8500
(206)234-5367

COVERAGES CERTIFICATE NUMBER: REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT LOC X OTHER: Pollution			PSB0003789	9/10/15	9/10/16	EACH OCCURRENCE	$ 2,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 500,000
							MED EXP (Any one person)	$ 10,000
							PERSONAL & ADV INJURY	$ 2,000,000
							GENERAL AGGREGATE	$ 4,000,000
							PRODUCTS - COMP/OP AGG	$ 4,000,000
							Per Occur	$ 2,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS			PSA0001884	9/10/15	9/10/16	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
							BODILY INJURY (Per person)	$
							BODILY INJURY (Per accident)	$
							PROPERTY DAMAGE (Per accident)	$
								$
A	X UMBRELLA LIAB X OCCUR X EXCESS LIAB CLAIMS-MADE DED RETENTION $ 10,000			PSE0002148	9/10/15	9/10/16	EACH OCCURRENCE	$ 5,000,000
							AGGREGATE	$ 5,000,000
								$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N Y	N/A	PSW0003067 Incl. Stop Gap	4/8/15	4/8/16	X PER STATUTE OTH-ER	
							E.L. EACH ACCIDENT	$ 1,000,000
							E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	$ 1,000,000
B B	Professional Liability			106254290	3/6/15	3/6/16	2,000,000 per Claim 4,000,000 Aggregate 75,000 Per Occ. Deduct.	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
This certificate refers to but the policies themselves are not limited to a specific project: New No. A12PC00422

CERTIFICATE HOLDER

Bureau of Indian Affairs
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APPENDIX H

STANDARD OPERATING PROCEDURES FOR UNIFIED SOILS CLASSIFICATION SYSTEM LOGGING

(37 Pages)

ENVIRONMENTAL SOIL FIELD LOGGING
Standard Operating Procedures For The Field Geologist

March 2017

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SECTION 1
INTRODUCTION

1.1 Purpose

The purpose of this document is to establish uniform procedures, descriptors, and format for the identification and description of soils and rocks as it pertains to environmental drilling and sampling.

In 1982, primarily due to its broad-based use and descriptive completeness, the US Environmental Protection Agency (USEPA) recognized the Unified Soil Classification System (USCS as the industry standard for all subsurface work performed under USEPA contract. Following acceptance by the USEPA, nearly all State regulatory agencies also adopted the USCS.

The identification and description of soils are based on the USCS using procedures and terms taken from the ASTM Standards with some modifications accepted through the years so that the system is more conducive to environmental project information. The resulting descriptions contain qualitative values of certain soil properties which can be precisely quanitated only by laboratory testing; nevertheless, estimates of these values can be made by visual-manual procedures under field conditions with sufficient precision for most purposes. Also, some elements of a complete soil description, such as the presence of cobbles, changes in strata, type of strata transition, and the relative proportions of soil types in the layer system, can be supplied only by the geologist/logging technician on the scene.

It should be noted that when laboratory geotechnical testing is available, the field descriptions should be adjusted so that all descriptive elements determined both in the field and in the laboratory match.

This document will attempt to offer a greater degree of “hands-on” explanation concerning the field determination of the descriptors that make up the USCS identification of various soil and rock types than is found by reading the ASTM standards.

1.2 Terms and Definitions

Attachment A contains terms and definitions that are used to classify soils, rocks and groundwater. The definitions are provided for the purposes of clarification as they pertain to their use in environmental hydrogeology.

SECTION 2
SOIL CLASSIFICATION

2.1 Introduction

Rarely are natural soils comprised of particles falling into only a single group of size and mineralogy composition such as sand, silt, or clay. Instead, a variety of sizes and mineral types will be found in a typical soil. The proportions of these components produce overall characteristics empirically defined by a single name such as sand or clay. These overall or average characteristics of soils are defined in terms of gradation and plasticity and are represented by the fifteen groups shown in Figure 1.

Due to the complexity in defining a soil type and the need to create a "universally" understood description, a specific format of listing descriptors is a key part to the USCS. Adhering to the format described later in this section will both simplify the process of learning the USCS and allow rapid logging without "missing" an important descriptive component. Descriptions must be as comprehensive and precise as possible under field conditions, yet be terse and sensible. The environmental field geologist/logging technician can never predict when something, that at the time seems to be a minor detail, may become crucial to the understanding of the site contaminant transport or in designing a future remediation program. Attention must be given to conveying a correct overall impression of a soil without distorting this impression by excessive emphasis on one or two of what may be many details. For example, it would be misleading to describe a uniform fine sand containing one or two percent medium and coarse sand particles as being a "coarse to fine sand". No firm rules or guidelines can be established to ensure descriptions free of misleading or ambiguous words; rather, good judgment and common sense are required of the field geologist/logging technician. In addition, focusing and slanting your descriptions with the end goal of the current project may cause a description that leaves out a vital detail needed for Phase II, III, or IV of the project five years hence. These vital qualities of logging will be gained through increased knowledge of the three-way relationship between the physical behavior of a soil, the formation hydrologic characteristics, and the soil classification indices.

2.2 Classification Procedures

2.2.1 Preliminary Classification – As the first step in classification, a soil is considered to be either predominantly coarse-grained (gravel or sand) or predominantly fine-grained (silt or clay) depending on whether more or less than 50 percent by volume of the material would be greater than 0.075 mm (retained on a No.200 sieve). A particle that can be discerned by the unaided eye is approximately 0.050 mm in size. For all gradation estimates of soils, no particles larger than 3 inches in size are included.

2.2.2 Coarse-Grained Soils – If the soil is predominantly coarse-grained, it is classified as either gravel or sand depending on whether more or less than 50 percent of the coarse-grained component is larger than 4.76 mm (retained on a No. 4 sieve). If a soil classified as either gravel or sand contains less than 5 percent fines (silts and/or clays), it is considered to be well graded or poorly graded depending on the distribution of the coarse-grained fraction sizes. Well-graded, coarse-grained soil has to have a more or less equal distribution of fine and coarse sand and/or gravel.

EXAMPLE
Gravel with 40% fine gravel, 57% coarse gravel, and 3% silt would be a WELL GRADED GRAVEL.

Gravel with approximately 85% fine gravel, 10% coarse gravel, and 5% silt would be a POORLY GRADED GRAVEL.

Gravel with approximately 95% fine gravel and 5% silt would be a UNIFORM GRAVEL.

Laboratory Confirmation – Grain Size Analysis (ASTM D422): The distinction between well graded and poorly graded sands and gravel are made by calculating the grain size ratio, the components of which can be read directly from the grain size analysis curve. Table 1 is an example of a simple grain size analysis curve evaluation. The ratio is calculated by dividing the grain size (in mm) at the 60% point (D60) on the curve by the grain size at the 10% point (D10) on the curve or:

$$Cu = D60/D10$$

If the sample is predominantly gravel and the Cu is:

>4 soils is a Well Graded GRAVEL
<4 soils is a Poorly Graded GRAVEL

If the sample is predominantly sand and the Cu is:

>6 soils is a Well Graded SAND
<6 soils is a Poorly Graded SAND

HOWEVER, if a sand or gravel contains greater than 5% fines, the classification depends on the type of fine-grained material present. If the fine-grained fraction is clay, then the sample is classified as a Clayey GRAVEL or Clayey SAND. If the fine-grained fraction is silt, then the sample is classified as a Silty GRAVEL or Silty SAND. If the fine-grained fraction of the sample is both silt and clay then the sample will be classified as a Silty Clayey GRAVEL or Silty Clayey SAND (if greater than 50% of the fine-grained fraction of the sample is clay). When admixtures of soil types occur, the predominant descriptor soil type is stated next to the matrix material.

Laboratory Confirmation – Atterberg Limits (ASTM D4318): If the fine-grained fraction of a predominately coarse-grained sample has a plastic index (PI) less than 4, then the sample is a Silty GRAVEL or a Silty SAND. If the PI is greater than 7, then the sample is a Clayey GRAVEL or a Clayey SAND.

2.2.3 Fine-Grained Soils - If the soil is predominantly fine-grained, then further classification is based on the type of soil making up the fine-grained fraction of the sample. As a rule of thumb, if the sample has grains that can be discerned using a hand-lens and/or feels gritty when wetted and smeared between thumb and finger, then the soil can be considered as a silt. If no grains are discernable and/or the sample feels smooth when smeared, it can be considered as a clay. In addition, if the sample contains greater than 20% organic material, then the sample is classified as an Organic Clay or an Organic Silt..

Laboratory Confirmation – Atterberg Limits (ASTM D4318):
The overall characteristic of the soil is that of a silt if the Atterberg Limits geotechnical test results in a point below the A-line on the plasticity chart (Figure 2), or if the PI is less than 4. The soil is a clay if the point lies above the A-line and the PI is greater than 7 (the range of PI from 4 to 7 constituting a borderline region). Further subdivision of a silt or a clay can depend on whether the liquid limit (LL) is less than 50% (low plasticity) or greater than 50% (highly plastic). Classifications of Organic SILT and Organic CLAY are also confirmed with respect to their locations on the plasticity chart as indicated for silt and clay.

2.2.4 Residual Soils - A residual soil is decomposed rock, which has not been eroded and, therefore, has never been subjected to the separating, sorting, rounding, and blending given a transported soil. Residual soils can be difficult to classify where they retain the relict structure of the parent rock or

where the decomposition of the parent rock is incomplete. The material cannot be considered rock, yet it retains the structure of the original material, and, to a certain extent, it defies description in the terms ordinarily applied to soils.

The field geologist/logging technician must be aware that the contrary nature of most residual soils will tend to produce uncertain classifications and descriptions, leading to misunderstandings and the possibility of making mistakes. Descriptions of samples should be preceded in most cases by an introductory name, such as WEATHERED SANDSTONE, DECOMPOSED GRANITE, etc., to emphasize the uncertainty of the words to follow. Then, the soil should be named and described as well as possible in accordance with the USCS, with particular attention given to the soundness (or structural cohesiveness) of the coarse-grained particles.

2.3 FORMAT

As discussed earlier, part of the USCS descriptive use includes the presentation of the descriptive information in a specific order, and in a specific way. Table 2 summarizes the format that must always be followed when logging soil samples in the field. In general, the format order of the USCS soil description is as follows:

1. NAME
   - A. Introductory Name
   - B. Modifier
   - C. Predominant (or Matrix) Constituent
2. GRADATION-coarse grain
   - A. Overall Gradation
   - B. Characteristics of individual soil sizes (from coarsest to finest)
     - i. percent by volume
     - ii. grain shape
     - iii. grain angularity
     - iv. mineral composition
     - v. plasticity of fines
3. PLASTICITY-fine grain
   - A. Plasticity of fines
   - B. Percent and range of particle sizes of coarse-grained fraction
4. DENSITY-noncohesive
   - A. Relative Density
5. CONSISTENCY-cohesive
   - A. Relative Consistency
6. NATURALY MOISTURE CONDITION
7. COLOR
8. STRUCTURE
9. GEOLOGIC ORIGIN and/or LOCAL NAME
10. USCS SYMBOL (unless a specific column is provided on the logging form for the symbol

EXAMPLES

SAND, uniform, fine, well-rounded, 2-5 % fines, loose, damp, light brown, (SP)

CLAY, highly plastic, stiff, moist, dark brown (CH)

SILT, nonplastic, 5-10% very fine sand, very loose, saturated, light gray, some mica, lacustrine, (ML)

Gravelly SAND, well-graded, 15-20% subangular gravel to 0.6 inches maximum, sub angular medium sand, < 5 % fines, dense, moist, reddish brown, alluvial (SW)

Silty CLAY, moderately plastic, 5-10% fine sand, hard (undisturbed) – stiff (when remolded), saturated, tan, calcareous throughout (CL)

SAND, poorly graded medium to fine (mostly fine), 5-10% nonplastic fines, compact, damp, brown, (SP)

LAYERED SILT AND CLAY: SILT, nonplastic, 2-4% fine sand, stiff, saturated, medium greenish gray, layers in partings and seams, 75 % of overall sample; CLAY, highly plastic, firm, moist, tan, layers in seams, (ML and CH)

Silty SAND, gap graded, 75-85% subrounded coarse sand, 15-25% highly plastic silt, medium dense, damp, gray silt - brown sand, laminated in partings, alluvium, (SM)

Sandy SILT, highly plastic, 25-30% fine subangular sand, stiff, saturated, very light gray to white, weak calcareous cementation, marl (MH)

2.4 VISUAL-MANUAL DETERMINATIONS

2.4.1 Soil Names - The basic name of a soil is that of the predominant constituent (*GRAVEL*, *SAND*, *SILT*, or *CLA Y*) as defined by the USCS. A single-word modifier indicating the major subordinate constituent(s) (*Gravelly*, *Sandy*, *Silty*, *Clayey*, or *Organic*) is placed before the basic name when required by the USCS, or whenever it is considered helpful in conveying a significant characteristic of a soil with the very first words of the description. For example, a soil given a classification of SP might be a clean fine sand properly named *SAND*, or it might contain a complete range of all sand sizes plus significant gravel-size particles and be better characterized with the name *Gravelly SAND*. A modifier should be added only if the subordinate constituent is at least 5 percent of the overall sample.

For unusual or inter-layered soils, such as fill or varved clay, an introductory name should precede the basic name or names to clarify the subsequent description. Possible introductory names would include *Topsoil*, *Layered Sand and Clay*, *Fly Ash*, *Clay Shale*, *Decomposed Limestone*, *Varved Clay*, etc. Such names should be used whenever the name or names derived from the USCS would tend to be misleading without reading the entire soil description. When two or more distinct soil types are present (and one is not considered merely an inclusion in the other), each should be described separately, starting with the predominant type, after the introductory name. The presence of oversize material (boulders and cobbles), which is excluded from the USCS, can be so overwhelmingly important that an introductory name is required in most cases. A name like *Sand with Boulders* could precede a basic name of *Silty SAND* for a gap graded, colluvial or talus soil.

2.4.2 Gradation - For a predominantly coarse-grained soil, the name is followed by, first, an evaluation of the overall gradation of the fraction smaller that 3 inches in size. If the sand or gravel is considered to be clean (less than 5 % fines), the soil should be described as either *well graded* or *poorly graded*. When a soil is not well graded because it is uniform or gap-graded, it can be described as being *uniform* or *gap-graded* rather than just poorly graded. However, if a sand or gravel has a significant percentage of fines, the designations of *well graded* and *poorly graded* should not be used because of

their specific restriction to clean materials in the USCS. Instead, the overall gradation of a soil with fines can be described as *uniform, widely graded*, or *gap-graded*.

GRADATION DESCRIPTION SUMMARY

Well Graded	Having full range of coarse grain sizes (i.e., fine to coarse), <5% fine grain material.
Poorly Graded	Having predominantly one coarse grain size, < 5 % fine grain material.
Gap Graded	Having two predominant grain sizes (i.e., clay and sand), > 5 % fine grain material.
Uniform	The coarse grain fraction being one size (i.e., coarse sand), > 5 % fine grain material.

2.4.3 Percentages - The percentage of each of the subordinate constituent of a predominantly coarse-grained soil are noted beginning with the coarsest fraction and proceeding to the finest fraction. Table 3 indicates a visual representation of various percentages in an overall matrix. At this point in the soil description, the percentage and maximum size of any boulders (larger than 12 inches) or cobbles (3 to 12 inches) should be indicated. The percentage of oversize material refers to the total volume of the soil, while the percentages of other constituents only refers to the fraction smaller than 3 inches. In effect, the percentages and limitations in sizes of the several fractions provide sufficient bases for sketching an approximate gradation curve. As each fraction is indicated, characteristics such as angularity and shape of individual particles in that fraction can be included. Finally, the percentages and plasticity of fines are added.

When percentages of subordinate constituents are estimated from visual examination in the field, a range should be given for each percentage to ensure that the values are not misinterpreted to be the result of laboratory sieve analyses. The width of the range also serves to express the confidence level of the field geologist/logging technician in the overall accuracy of the estimate. For example, in the case of a clean sand, a geologist/logging technician might estimate with confidence "5-10% gravel to 0.8 inch maximum" or "2-4% fines" but might not do better than "30-45% nonplastic fines" in a very uniform silty sand.

If the characteristics of individual particles within every fraction of a predominantly coarse-grained soil were mentioned, the description would be intolerably lengthy. Due to this, field geologist/logging technicians must use their judgment and common sense. The geologist/logging technician can assume that unmentioned characteristics are, as they commonly would be expected to be. For example, the word" sand" conveys an idea of bulky, subangular to sub rounded hard quartz particles, but would be inadequate, by itself, for a sample of freshly broken sand-size flaky fragments of limestone. Any important differences from commonly expected characteristics must be identified and included in the description. Experience and good judgment by the field geologist/logging technician are needed to eliminate unnecessary information while retaining everything necessary.

2.4.4 Grain Shape - The shape of a particle refers to the ratios of overall dimensions. Particles might be elongate or flat. Unless explicitly indicated to have an unusual shape, coarse-grained particles are assumed to be essentially equidemensional.

SHAPE DESCRIPTION SUMMARY

Flat	Grains with a width/length ratio >3

Elongated	Grains with a length/width ratio >3
Flat and Elongated	Grains meeting both of the above criteria

2.4.5 Angularity - The angularity of a particle refers to the degree of rounding of the corners. Particles might be angular, subangular, subrounded, rounded, or well-rounded.

ANGULARITY DESCRIPTION SUMMARY

Angular	Grains have sharp edges and relatively planar sides with unpolished surfaces.
Subangular	Grains are similar to angular but have rounded edges.
Subrounded	Grains have nearly planar sides but with well-rounded edges and corners.
Rounded	Particles have smoothly curved sides and no edges.
Well-Rounded	Particles are nearly spherical.

2.4.6 Plasticity - For a predominantly fine-grained soil, the name is followed by, first, an evaluation of the plasticity of the fraction smaller than 0.075 mm and, second, the percentage and limitations in sizes of any particles larger than 0.075 mm.

With laboratory Atterberg Test (ASTM D4318) results, the plasticity and type of fine-grained soil is identified by placement on the Plasticity Chart (see Figure 2). Test results on fine-grained soils or fine-grained soil fractions, which fall between the U-line and the A-line and have a liquid limit greater than 50%, are highly plastic clays (CH). Those that plot below the A-line and have a liquid limit of less than 50% are low to moderately plastic silts (ML), and so on.

Field estimation of plasticity is accomplished by the repeated act of deforming and remolding a small lump of the soil. The two methods of performing this field evaluation are the worm-test and the cube-test. When wearing protective gloves, the cube-test is the recommended method since it requires less precise control of the soil sample.

In the worm-test, a small lump of the soil (approximately 0.5 inches by 0.5 inches) is removed from the core. The lump of soil is first saturated (add water if not naturally saturated), and then rolled back and forth between the palms of the hand until a "worm" of approximately 1/8 inch in diameter is formed. The sample is at its plastic limit when the worm breaks upon being rolled. The sample is then remolded into a lump, and the process (without adding additional water) is repeated. The plasticity description is based upon the number of times the process can be repeated as follows:

PLASTICITY DETERMINATION (WORM-TEST)

Nonplastic	1/8" worm cannot be rolled at any water content.
Low Plasticity	1/8" worm can barely be rolled and lump cannot be formed after reaching plastic limit one time.
Moderate Plasticity	1/8" worm is easy to roll and form but lump cannot be formed after reaching plastic limit one to three times.

High Plasticity	1/8" worm can be easily rolled and reformed 4+ times.

A modification to the worm-test method is the cube-test. This method works on the same principle of deformation and remolding as the worm-test. With the cube-test, a small lump of the soil (approximately 1 inch by 1 inch) is removed from the soil sample. The lump is then saturated (water is added if the sample is not naturally saturated) and formed into a cube. The cube is then flattened, broken into four roughly equal pieces and then reformed into a cube. The plasticity description is based on the number of times this process can be repeated and the sample can be reformed into a cube without crumbling.

PLASTICITY DESCRIPTION (CUBE- TEST)

Nonplastic	The cube cannot be formed without crumbling or cracking. Sample falls apart when flattened.
Low Plasticity	The cube can be formed and, flattened once but cannot be reformed into a cube without crumbling or cracking.
Moderate Plasticity	The cube can be easily formed and flattened twice but then cannot be reformed into a cube without crumbling or cracking.
High Plasticity	The cube can be formed and flattened at least through three cycles.

2.4.7 Relative Density and Consistency - In situ strength and compressibility characteristics are indexed by relative density for a noncohesive or slightly cohesive soil, and by consistency for a cohesive soil. Both are difficult to measure with a high level of accuracy since both are highly sensitive to sample collection disturbance. However, two in-field physical testing techniques have been developed which allow a quantification of each.

The relative density of a noncohesive or slightly cohesive soil is determined by recording an "N value" from the hammer blows used to advance a split-spoon sampler. The split-spoon sample is collected by advancing an IS-inch long by I-inch ID sampler with repeated 30-inch free-fall drops of a 140-pounds hammer. The sampler is gently placed on the bottom of the borehole, and 6-inch increments are marked off on the drill stem from a fixed reference (usually the top of the augers or lip of the mud-pit). The hammer is then used to advance the sampler (as indicated above), and the number of blows required to drive each 6-inch interval are recorded. The first 6-inch interval is considered as "seating" and is discarded unless the sampler cannot be advanced at least 6-inches. For the protection of the sampler tool, no more than 50 blows are used during any single 6-inch advance. The N-value is the total number of blows needed to advance the second and third 6-inch intervals. If 50 blows are reached, then the N-value is reported as a fraction of 50 over the total inches advanced during both the second and third 6inch intervals. If the 6-inch "seating" interval is not achieved with 50 blows, then the N-value is reported as a matter of reference as REF over the inches actually penetrated. All 6-inch interval blow counts are to be reported (in addition to the N-value) as fractions.

EXAMPLES

COUNT	*N-VALUE*	*DESCRIPTION*
3/6, 10/6, 25/6	*35*	*Full 18-inches of penetration with second and third 6-inch intervals comprising the N-Value*
45/6, 40/6, 50/2	*50/8*	*Full penetration on first and second 6-inch intervals, 2-inches of penetration after 50*

		blows on third 6-inch interval
25/6, 50/5	*50/5*	*Full penetration on first 6-inch interval, 5-inch penetration after 50 blows on second 6-inch interval*
50/4	*REF/4*	*4-inches penetration after 50 blows on first (or reference) 6-inch interval*

After recording the blow counts and determining the N-value, the density can be determined as follows:

RELATIVE DENSITY DETERMINATION

Loose	N-Value = 0 - 10
Medium Dense	N-Value = 10 - 30
Dense	N-Value = 30 - 50
Very Dense	N-Value > 50

The relative consistency of a cohesive soil sample can be determined by both a quantitative and a qualitative method. The quantitative method utilizes a pocket-penetrometer that yields a value in tons per square foot directly from the pocket-penetrometer scale from a 3-inch minimum diameter sample (standard Shelby-Tube). To use the pocket-penetrometer, a fresh, flat face is cut on the end of soil sample, the indicator ring on the pocket-penetrometer is zeroed, and the penetration probe is advanced into the center of the circular sample in the same downward direction that the sampler was pushed. The probe is advance until ¼- inch penetration is achieved (ring etched on probe). The calibrated spring within the pocket penetrometer will move the indicator ring, and the penetration value (in tons per square foot) is read off the scale that corresponds with the lower edge of the ring. The penetration value is recorded, and the relative consistency is then determined as follows:

RELATIVE CONSISTENCY PHYSICAL DETERMINATION
(POCKET - PENETROMETER)

Stiff Very Stiff	PP Value < 0.125 tons/ft^2
Soft	PP Value = 0.125 to 0.25 tons/ft^2
Firm	PP Value = 0.25 to 0.50 tons/ft^2
Stiff	PP Value = 0.50 to 1.00 tons/ft^2
Very Stiff	PP Value = 1.00 to 2.00 tons/ft^2
Hard	PP Value >2.00 tons/ft^2

The second, or qualitative, method that can be used (in the absence of a pocket-penetrometer or 3-inch minimum diameter sample) is a manual procedure, which we will refer to as "the rule of thumb". Using this method, the sample is prepared as discussed above. The relative density is determined by the ease of penetration that can be accomplished with your thumb into the end of the sample. This method is not as accurate as a pocket penetrometer and becomes less accurate when the

geologist/logging technician is wearing protective gloves, but will yield an indication of the samples consistency. When recording the plasticity on the logging form, a lack of a recorded pocket penetrometer value will lead to the assumption that the determination was made manually. The relative consistency is determined as follows:

RELA TIVE CONSISTENCY MANUAL DETERMINATION
(RULE OF THUMB METHOD)

Very Soft	Thumb penetrates 1”+
Soft	Thumb penetrates about 1”
Firm	Thumb penetrates about ½”
Stiff	Thumb penetrates about ¼”
Very Stiff	Thumbnail only makes indention
Hard	Thumb or thumbnail will not indent

2.4.8 Moisture Condition - The water content of a soil is one of the descriptors that can potentially be tremendously important in understanding an aquifers characteristics and it's reactions to stresses such as a recovery system. Because of the value of this characteristic, great care should be taken when determining the point at which saturation occurs (saturated soil) and the thickness of any capillary fringe that may or may not exist (moist soil).

Non-saturated soils are described as being dry, damp, or moist with increasing degrees of saturation. When a sample can be seen to be completely saturated, such as a sand sample yielding free-water from the grain pore space, careful note should be made of the depth where it becomes saturated and of the depth at which the soil ceases being saturated (commonly at a lithologic change). The degree of saturation is determined in the field using the following visual methods:

MOISTURE CONDITION DETERMINATION

Dry	Absence of moisture, dusty, dry to the touch.
Damp -	Sufficient moisture to hold particles together but not sufficient to smear fines when rubbed.
Moist -	Sufficient moisture to hold particles together and to smear fines when rubbed.
Saturated	Sample has free water. Visible water forms at sample surface when struck repeatedly with the flat edge of a sampling knife.

2.4.9 Color - The color imparted to a soil by its fine-grained fraction can be useful in distinguishing between different strata, interpreting the geologic history of the site, and possibly identifying over consolidated, cohesive soils that have recently undergone differential movement or loading. While this USCS descriptor method is inherently obvious, certain guidelines should be used.

The color descriptor should be as terse as possible but should not be limited to only gray and brown.

Also, the wording of the color description must not be permitted to obscure the overall visual impression of the soil by emphasizing unimportant details.

Dull or drab colors, possibly affected by colloidal organic matter, should be distinguished from bright colors typical of completely organic or mineral stained soils. Mottling or marbling of colors can be indicative of in-situ desiccation and should be noted adequately. Staining or discoloration associated with discontinuities are not as crucial as staining caused by possible contaminants.

Once color descriptions have been established for the different strata of a site, these should be used consistently from one boring to another across the site. For example, if a stratum is described as greenish-gray in one boring, it should not be described as olive gray or grayish green in the next boring (unless the color changes). Color changes from boring to boring will lead to conclusions of transitional environments during overall site evaluation.

EXAMPLES

Bright medium gray

Chalky white

Light gray finely veined with dark reddish brown

Dull yellowish brown mottled with brownish red and dark brown Olive gray banded with light brownish gray

2.4.10 Structure - Discontinuities and inclusions can be extremely important and must be detected and fully described. These features include, but are not limited to joints, lamination, slickensides, veins, pockets, lenses, layers, partings, root mottles, roots, wood, shells, rock fragments, gravel, cementation, odor, etc. Such irregularities can markedly increase or decrease the other descriptors so far discussed.

In general, discontinuities are described with regard to their spacing, orientation, surface texture, luster/discoloration, and, where present, infilling material. Inclusions are described by giving their number, size, type, and contents. Key,. words in descriptions of significant structural features should be underscored to ensure emphasis.

EXAMPLES

Moderately slickensided, spaced 1" to 1.5" with striated and highly polished surfaces

Minor, isolated, almost vertical joints with dull surfaces discolored light yellowish brown

Thinly (0.1 to 0.2 inches) laminated

5-10 % small pockets or lenses of dark brown fine silty sand

3-5 per foot 0.8 inch particles angular gravel

Weakly cemented with calcium carbonate

Slight chemical odor

Strong natural organic odor

2.4.11 Geological And Local Names - When possible, the geologic and/or local names should be given. Geologic names relate to geologic environments such as alluvial, flood plain, levee, colluvial slope, colluvial plain, etc. Local names refer to formation or unit names such as Beaumont formation, Jackson member of Queen City formation, etc.

2.4.12 Group Symbol - Each soil description is concluded (if specific space for the USCS symbol is not provided on the logging form) with the symbol or symbols indicating it's grouping in the USCS. A dual symbol is required for any of the several defined borderline classifications, and also may be used to indicate that a soil is close to any of the gradation or plasticity boundaries separating groups.

SECTION 3
ROCK CLASSIFICATION

3.1 INTRODUCTION

The USCS method of identification and description of rocks are based on procedures suggested by Russell Travis of the Colorado School *of* Mines which lump all rocks into the broadest possible categories, sedimentary rocks, igneous rocks, and metamorphic rocks. Thus, mineralogy and texture is the primary base for the identification of rocks. The descriptive terminology for particles and the boundaries of particle-size ranges used for rocks are not the same as outlined earlier for soils. In order to lend simplicity to the identification process, these particle-size ranges and terminology for rock identification are kept unchanged. Also, a procedure is described for documenting rock core recovery in terms of "Rock Quality Designator", or RQD, due to its significance as an indicator of the property as it relates to fluid flow and migration.

Since the majority of university geology departments spend vast amounts of time and effort to train its students in identifying the characteristics of rocks, this document will not dwell on the precise meaning of terms such as jointed, faulted, etc., nor will it detail the procedures for mineral identification. Instead, the purpose of this section of this document is to inform the field geologist/logging technician as to the terminology used with the USCS methodology.

3.2 FORMAT

The following sequence of physical properties and characteristics are used to identify and describe rocks:

1. Color
2. General rock type
3. Jointing, Bedding, Foliation, and Faulting
4. Weathering
5. Hardness
6. Texture
7. Mineralogic composition

3.3 CLASSIFICATION PROCEDURES

3.3.1 Color - The first element in the description of a rock is the color since this is more than just the first characteristic noticed, but is an integral part of the rock type identification. The color name should have a modifier to indicate whether it is light, dark, very dark, dull, glossy, etc.

3.3.2 General Rock Type - The initial distinguishing of the rock as sedimentary, igneous, or metamorphic is based on the flow chart indicated in Table 4. Once the broad category of the rock is established, further identification of sedimentary rock types follow the bases given in Table 5.

3.3.3 Jointing. Bedding. Foliation. and Faulting - The following terms are used to describe the structural aspects of the formation:

STRUCTURAL MODIFIERS:

Joint Spacing	Bedding, Cleavage, & Foliation	Interval
Very Close	Very Thin	< 2 inches
Close	Thin	2 inches - 1 foot
Moderately Close	Medium	1 foot - 3 feet
Wide	Thick	3 feet - 10 feet
Very Wide	Very Thick	> 10 feet
Very Close	Very Thin	< 2 inches
Close	Thin	2 inches - 1 foot
Moderately Close	Medium	1 foot - 3 feet
Wide	Thick	3 feet - 10 feet

1. Strike and Dip - for core logging, the dip angle recorded shall be the acute angle between the joint and the perpendicular to the axis of the core; if it is possible to determine the quadrant direction of the dip, include this information.

2. Width of Joints

3. Offset space fill, if any

4. Degree of staining, alteration, and weathering

5. Slickensides, if any

Faults, wherever encountered within a site area, may vary widely in type and extent and, in addition to the preceding descriptive data from rock cores, it is necessary to provide the following data:

1. The extent and direction of movement, if possible.

2. Detailed descriptions of the type and condition of the material in the actual fault plane (gouge, breccia, etc.). In the case of an extensive gouge, soil description terms should be used.

3. Descriptions of secondary mineralization or solution, if any.

3.3.4 Weathering - Both the overall (or mass) weathering of the rock and any solution or alterations effects are included in the description at this point. While some of these characteristics can be determined from rock cores, weathering and solution or alteration, from a groundwater hydrologic standpoint, generally refer to the "rock mass" characteristics.

The following terms are used for identifying degrees of relative overall weathering:

WEA THERING DETERMINATION

Unweathered	Rock fresh; crystals or grains bright; a few joints may show slight staining; crystalline rocks ring if struck with a hammer.
Slightly Weathered	Rock generally fresh; joints stained and may show clay filling if open; staining may extend into rock fabric adjacent to weathered planes; if present, sedimentary rocks show etching between grains.
Moderately Weathered	Except for quartz, most of the rock mass shows discoloration and some decomposition; most feldspar is discolored and altering to clay, rock easily broken and or easily gouged with a rock hammer.
Severely Weathered	All minerals except quartz discolored or stained; rock fabric still discernible; intergranular or intercrystalline disassociation virtually complete; internal structure essentially that of a soil; fragments of stronger rock may remain.
Completely Weathered	Rock is decomposed to a soil; fabric not discernible or only rarely discernible; quartz may remain as stringers.

In the case of carbonate rocks, weathering due to solution or hydrothermal alteration may be encountered. The following terms are used to describe any voids that result from such action:

CARBONATE ROCK SECONDARY DECOMPOSITION DESCRIPTIONS

Solid	Contains no voids.
Pitted	Small voids generally restricted to joint surfaces, bedding planes, or other surfaces that provide access for attacking fluids.
Vuggy	Voids may be found throughout rock core or in isolated pockets, voids up to 4 inches average diameter.
Cavernous	Voids and channels greater than 4 inches in average diameter.

3.3.5 Hardness - The following scale (not to be confused with Moh's scale for hardness of minerals) is used to describe the average hardness of a rock core:

HARDNESS DETERMINATION

Very Hard	Cannot be scratched with knife, breaking of the core requires several hard blows with a rock hammer.
Hard	Can be scratched with a knife but only with difficulty; hard blow with a rock hammer required to break core.
Moderately Hard	Can be scratched with a knife easily, core broken with a moderate blow of a rock hammer.
Medium Hard	Can be easily grooved 1/16 inch with firm pressure on a knife
Soft	Can be readily grooved with a knife or the pick of a rock hammer, small sections can be broken off core with finger pressure.
Very Soft	Can be carved with a knife, can be scratched with a finger nail.

3.3.6 Texture - Texture refers to the size and angularity of the constituent particles. The description of angularity should include those for soils (see Section 2.4.5). The following terms are used to describe rock grain size ranges:

ROCK GRAIN SIZE DETERMINATION

Igneous and Metamorphic Rocks

Fine	< 1mm
Medium	1mm to 5mm
Coarse	> 5mm

Clastic Sedimentary Rocks

Clay-size	< 0.005mm
Silt-size	0.005mm to 0.065mm
Very Fine	0.065mm to 0.125mm
Fine	0.125mm to 0.25mm
Medium Coarse	0.25 mm to 0.50 mm
Very Coarse	1.00mm to 2.00mm
Granular	2.00mm to 4.00mm
Pebble-size	4.00mm to 64.0mm
Cobble-size	64.0mm TO 256.0mm
Boulder	> 256mm

3.3.7 Mineralogic Composition - Mineralogic descriptions must employ geologically accepted mineral names; colloquial terminology such as "fools gold" should never be used. General series or group names, such as feldspar, pyroxene, or mica, should be used along with the specific name, for example "microcline (feldspar)" or "diopside (pyroxene)".

In describing the mineral assemblage of a rock core, the least abundant mineral should be mentioned first, followed in order by successively more abundant minerals. In using the descriptive rock

terminology of this manual, it should, at most, be necessary to mention only the accessory minerals since the rock name itself will define the range of percentages of characterizing minerals.

3.3.8 Hydrologically Important Comments - Hydrological comments should include any observations pertaining to the field geologist/logging technician's evaluation of the rock encountered as a flow medium for both groundwater and contaminant
Infiltration. These comments are meant to include field observations to aid hydrogeologic evaluations at any subsequent review stage. Categorization of these comments is considered important to provide a "quick summary" though not always complete, of the field data. The following descriptive examples are not meant to be all-inclusive but to give the geologist/logging technician a guideline as to what sort of information is required:

HYDROLOGIC COMMENTS

Sedimentary Rocks		
	Shale	Qualitative evaluations of the degree of compaction and/or cementation; resistance to slaking; presence of bentonite or other clay interbeds.
	Sandstone	Type and degree of cementation; weak interbeds, intergranular porosity.
	Limestone	Presence of solution effects and degree of susceptibility to solution and weathering; clay or shale interbeds; chert inclusions.
Igneous Rocks		
	Extrusive Rocks	Extreme and' extensive open jointing; scoriaceous zones; ash and tuffaceous interbeds; clay zones.
	Intrusive Rocks	Weathering effects controlled by mineralogical and/or structural features.
Metamorphic Rocks		
	General	Weathering effects controlled by textural and/or structural features.

3.3.9 Rock Quality Designator - The Rock Quality Designator (RQD) represents a modified form of recording rock core recovery. The RQD is determined as follows:

ROCK QUALITY DESIGNATOR DETERMINATION

% RQD = 100 x (Total Length of core 4" +)/ (Hole length drilled)

An RQD determined by simply totaling the lengths of core 4 inches and longer represents the minimum possible RQD rating for the rock. In actual practice, the field geologist/logging technician should attempt to differentiate between natural breaks such as jointing, etc. and breaks caused by the coring process. Natural breaks in the core can usually be distinguished by the presence of weathering products, secondary deposits, dullness or rounding produced by solution. The RQD is used as a diagnostic description to determine the competency of the rock mass. The following descriptions can be correlated to RQD percentages:

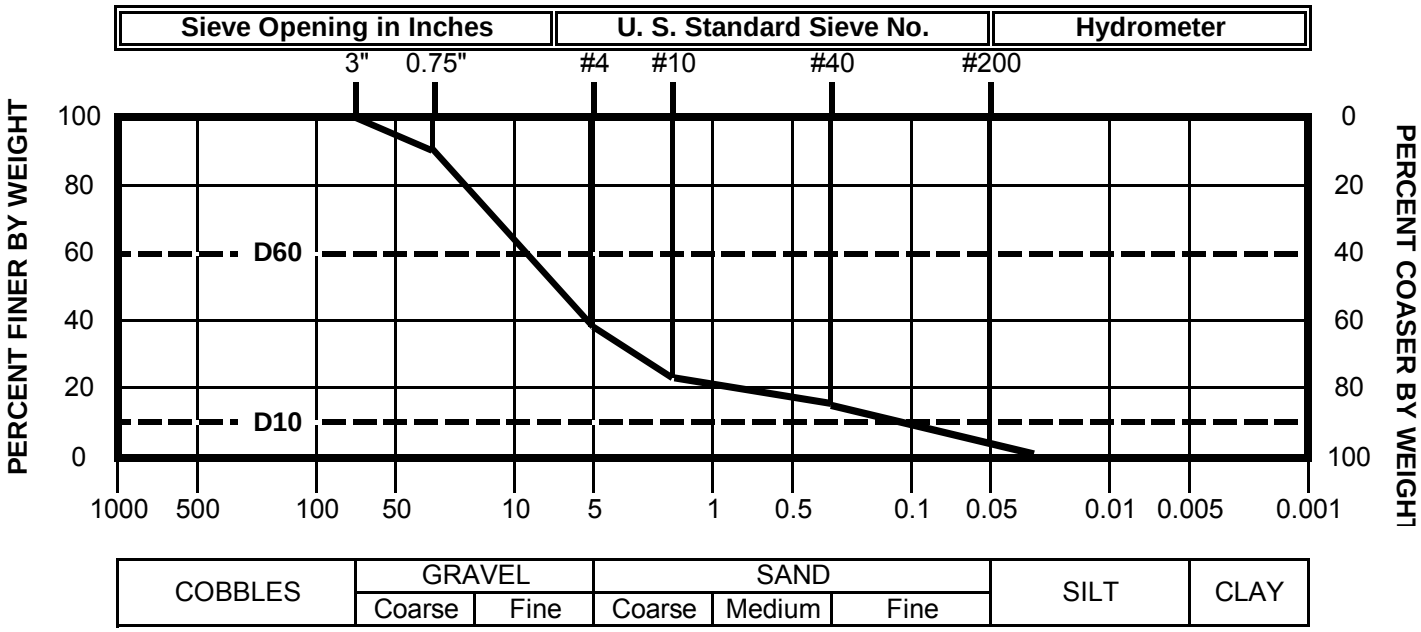
ROCK QUALITY DESIGNATOR INTERPRETATION

Diagnostic Description	RQD Value
Excellent	> 90%
Good	75% - 90%
Fair	50% - 75%
Poor	25% - 50%
Very Poor	< 25%

TABLES

TABLE 1

EXAMPLE GRAIN-SIZE ANALYSIS EVALUATION



GRAIN-SIZE CURVE EVALUATION		
GRAIN SIZE	**% FINER**	**% OF SAMPLE**
Cobbles	100%	0%
Coarse Gravel	93%	7%
Fine Gravel	38%	55%
Coarse Sand	23%	15%
Medium Sand	12%	11%
Fine Sand	3%	9%
Silt	0%	3%
Clay	0%	0%

Cu = (7.5mm) / (0.3mm) = 22.7
Therefore:
Sandy GRAVEL, well graded

TABLE 2

FORMAT FOR DESCRIPTION OF SOILS

INTRODUCTORY NAME
(fill, topsoil, layered, weathered, etc.)

NAME MODIFIER
(Gravelly, Sandy, Silty, Clayey, Organic)

MATRIX CONSTITUENT NAME
(Gravel, Sand, Silt, Clay, Peat)

COARSE-GRAIN SOILS

RELATIVE GRADATION
Well Graded, Poorly Graded,
Uniform, Gap-Graded

CHARACTERISTICS
(Coarsest to Finest)

1 % of Each Size Fraction
2 Shape (flat, elongated, rounded)
3 Angularity (angular, subangular, subrounded, rounded)
4 Mineral Composition (calcareous, micases, opaline)
5 % and overall plasticity of fines

FINE-GRAIN SOILS

PLASTICITY
(Nonplastic, poorly plastic,
moderately plastic, highly plastic)

% AND NAME OF COARSE GRAINED FRACTION
(10% fine sand, 5% medium gravel, etc.)

COHESIVINESS
(cohesive or non-cohesive)

NON-COHESIVE SOILS RELATIVE DENSITY
(Loose, medium dense, dense,
very dense)

COHESIVE SOILS RELATIVE CONSISTENCY
(very soft, soft, firm, stiff,
very stiff, hard)

NATURAL MOISTURE CONTENT
(dry, damp, moist, saturated)

COLOR

STRUCTURE(S)

GEOLOGIC ORIGIN AND/OR LOCAL NAME

USCS GROUP SYMBOL
(Pt, CH, CL, OH, OL, ML, MH,
SC, SM, SP, SW, GC, GM, GP, GW)

TABLE 3

GENERIC FLOW CHART FOR CRYSTALLINE ROCKS

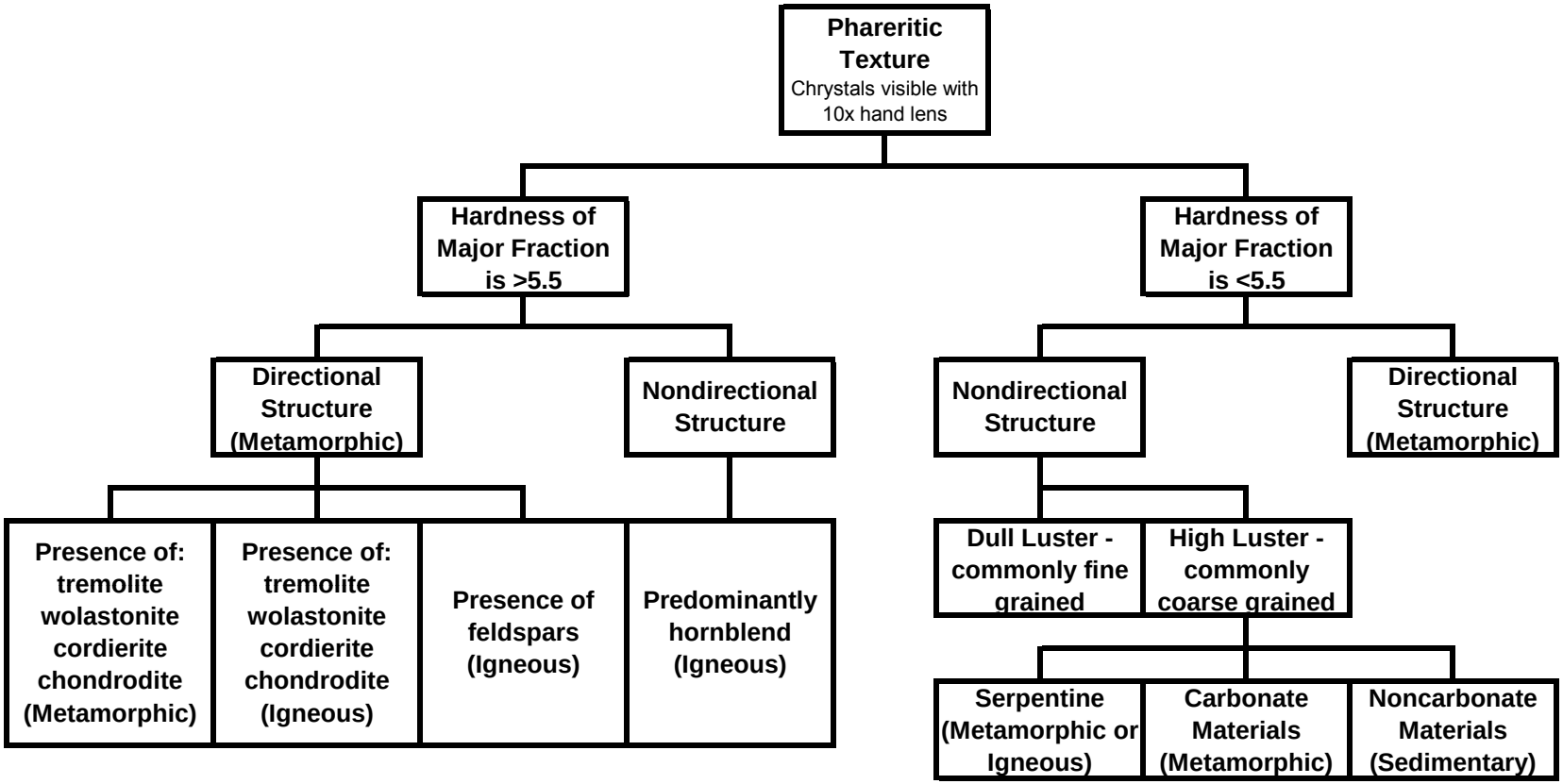


TABLE 4

CLASSIFICATION OF SEDIMENTARY ROCKS

modified from Russell B. Travis, Colorado School of Mines

TEXTURE	GRAIN SIZE <0.04MM		GRAIN SIZE 0.04mm to 2.00mm							GRAIN SIZE >2.00mm	
	CRYSTALLINE, CLASTIC, or AMORPHOUS		CRYSTALLINE, CLASTIC, BIOCLASTIC, OOLITIC, etc.		CLASTIC UNCONSOLIDATE silt and/or sand			CLASTIC CONSOLIDATE siltstone and/or sandstone		CLASTIC UNCONSOLIDATE - gravel, cobbles CONSOLIDATED - conglomerate, breccia	
COMPOSITION OF MAJOR FRACTION	Composition as indicated in left column	Clay Minerals or Clay-Size Material	Composition as indicated in left column	Shaly Calcite or Dolomite	>90% Quartz	Chiefly Quartz &10%-20% Feldspar	Chiefly Quartz & >10% Rock chips	Quartz & >25% Feldspar	Quartz, Feldspar, Rock Chips, Pelltic (angular grains)	Chiefly One Constituents	Several Constituents
COMPOSITION OF MINOR FRACTION											
<10% Minor Fraction				LIMESTONE, DOLOMITE	QUARTZ SANDSTONE	FELDSPATHIC SANDSTONE	LITHIC SANDSTONE	ARKOSE	GRAYWACKEY, SUB-GRAYWACKEY	QUARTZ PEBBLE CONGLOM., CHERT PEBBLE CONGLOM., LIMESTONE PEBBLE CONGLOM.	MIXED PEBBLE CONGLOM., MIXED COBBLE CONGLOM.
Clay Minerals or Clay-Based Minerals	CLAYSTONE, MUDSTONE, SHALE, ARGILLITE, BENTONITE			ARGILLACEOUS LIMESTONE, etc.	ARGILLACEOUS QUARTZ SANDSTONE	ARGILLACEOUS FELDSPATHIC SANDSTONE, LOESS	ARGILLACEOUS LITHIC SANDSTONE	ARGILLACEOUS ARKOSE	ARGILLACEOUS GRAYWACKEY, ARGILLACEOUS SUB-GRAYWACKEY	ARGILLACEOUS CONGLOM.	ARGILLACEOUS MIXED CONGLOM.
Silica, Quartz, Opal, or Chalondony	CHERT, DIATOMITE, RADIOLARITE	SILICEOUS SHALE, SILICEOUS CLAYSTONE, SILICEOUS MUDSTONE	SILICEOUS OOLITE, RADIOLARITE, OOLITIC CHERT, DIATOMITE	CHERTY LIMESTONE, SILICEOUS LIMESTONE	ORTHOQUART- ZITE	FELDSPATHIC ORTHOQUART- ZITE	LITHIC ORTHOQUART- ZITE	SILICEOUS ARKOSE	SILICEOUS SUB-GRAYWACKEY	SILICEOUS CONGLOM.	SILICEOUS MIXED CONGLOM.
Calcite or Dolomite	LIMESTONE, DOLOMITE, CHALK, CALICHE	CALCAREOUS SHALE, MARLSTONE	LIMESTONE, DOLOMITE, CLASTIC LIMESTONE, CALCAREOUS OOLITE, OOLITIC LIMESTONE, BIOSTONE		CALCAREOUS QUARTZ SANDSTONE	FELDSPATHIC QUARTZ SANDSTONE	LITHIC QUARTZ SANDSTONE	CALCAREOUS ARKOSE	CALCAREOUS SUB-GRAYWACKEY	CALCAREOUS CONGLOM.	CALCAREOUS MIXED CONGLOM.
Iron Minerals	HEMATITE, LIMONITE, IRONSTONE, SIDERITE	LIMONITIC SHALE, HEMATITIC SHALE	SIDERITE, HEMATITIC OOLITE, LIMONITITIC OOLITE, OOLITIC IRONSTONE	LIMONITIC LIMESTONE, HEMATITIC LIMESTONE	LIMONITIC QUARTZ SANDSTONE, HEMATITIC QUARTZ SANDSTONE	LIMONITIC FELDSPATHIC QUARTZ SANDSTONE, HEMATITIC FELDSPATHIC QUARTZ SANDSTONE	LIMONITIC LITHIC SANDSTONE, HEMATITIC LITHIC SANDSTONE	LIMONITIC ARKOSE, HEMATITIC ARKOSE	LIMONITIC GREYWACKEY, LIMONITIC SUB-GRAYWACKEY, HEMATITIC GREYWACKEY, HEMATITIC SUB-GREYWACKEY	LIMONITIC CONGLOM., HEMATITIC CONGLOM.	LIMONITIC MIXED CONGLOM., HEMATITIC MIXED CONGLOM.
Carbon (Humus)	COAL	CARBONACEOUS SHALE, BITUMINOUS SHALE	PEAT, LIGNITE	CARBONACEOUS LIMESTONE, BITUMINOUS LIMESTONE	CARBONACEOUS QUARTZ SANDSTONE, BITUMINOUS QUARTZ SANDSTONE	CARBONACEOUS FELDSPATHIC QUARTZ SANDSTONE, BITUMINOUS FELDSPATHIC QUARTZ SANDSTONE	CARBONACEOUS LITHIC SANDSTONE, BITUMINOUS LITHIC SANDSTONE	CARBONACEOUS ARKOSE, BITUMINOUS ARKOSE	CARBONACEOUS GREYWACKEY, CARBONACEOUS SUB-GRAYWACKEY, BITUMINOUS GREYWACKEY, BITUMINOUS SUB-GREYWACKEY	CARBONACEOUS CONGLOM., BITUMINOUS CONGLOM.	CARBONACEOUS MIXED CONGLOM., HEMATITIC MIXED CONGLOM.
Evaporites	PHOSPHORITE, HALITE, ANHYDRITE, GYPSUM	PHOSPHITIC SHALE, HALITIC SHALE, ANHYDRITIC SHALE, GYPSITIC SHALE	PHOSPHATIC OOLITE, HALITIC OOLITE, ANHYDRITIC OOLITE, GYPSUM SAND	PHOSPHITIC LIMESTONE, OOLITIC LIMESTONE	PHOSPHITIC QUARTZ SANDSTONE, HALITIC QUARTZ SANDSTONE	PHOSPHITIC FELDSPATHIC SANDSTONE, HALITIC FELDSPATHIC SANDSTONE	PHOSPHITIC LITHIC SANDSTONE, HALITIC LITHIC SANDSTONE	PHOSPHITIC ARKOSE, HALITIC ARKOSE	PHOSPHITIC SUB-GREYWACKEY, HALITIC SUB-GREYWACKEY	PHOSPHITIC CONGLOM, HALITIC CONGLOM.	PHOSPHITIC MIXED CONGLOM, HALITIC MIXED CONGLOM.

FIGURES

FIGURE 1

UNIFIED SOIL CLASSIFICATION SYSTEM

GRADATION AND PLASTICIY CHARACTERISTICS (excluding particles larger than 3 inches)				LABORATORY CONFIRMATION	GROUP SYMBOL	SOIL NAMES
PREDOMINANTLY COARSE-GRAINED > 50% of grains larger than 0.075 mm	GRAVEL > 50% or coarse-grained material is larger than 4.76 mm		CLEAN < 5% fines	D_{60} / D_{10} > 4	GW	Well-graded GRAVEL or SANDY GRAVEL
				Not Meeting Gradation Requirements for GW	GP	Poorly graded, uniform, or gap-graded GRAVEL or SANDY GRAVEL
			WITH FINES > 5% fines	Atterberg Limit below A-Line OR PI < 4	GM	SILTY GRAVEL
				Atterberg Limit above A-Line AND PI < 4	GC	CLAYEY GRAVEL
	SAND > 50% or coarse-grained material is smaller than 4.76 mm		CLEAN < 5% fines	D_{60} / D_{10} > 6	SW	Well-graded SAND or GRAVELLY SAND
				Not Meeting Gradation Requirements for SW	SP	Poorly graded, uniform, or gap-graded SAND or GRAVELLY SAND
			WITH FINES > 5% fines	Atterberg Limit below A-Line OR PI < 4	SM	SILTY SAND
				Atterberg Limit above A-Line AND PI < 4	SC	CLAYEY SAND
PREDOMINANTLY FINE-GRAINED > 50% of grains smaller than 0.075 mm	Plasticity Characteristics of fraction larger than 0.425 mm	SILT Atterberg Limits below A-Line OR PI<4	INORGANIC	Liquid Limit < 50	ML	Non-plastic, slightly plastic, or moderately plastic SILT, CLAYEY SILT, SANDY SILT, or GRAVELLY SILT
				Liquid Limit > 50	MH	Highly plastic or very highly plastic SILT, CLAYEY SILT, SANDY SILT, or GRAVELLY SILT
			ORGANIC	Liquid Limit < 50	OL	Slightly plastic or moderately plastic ORGANIC SILT (ORGANIC CLAY if Atterberg Limit above A-Line)
				Liquid Limit > 50	OH	Highly plastic or very highly plastic ORGANIC SILT (ORGANIC CLAY if Atterberg Limit above A-Line)
		CLAY Atterberg Limits above A-Line AND PI > 7		Liquid Limit < 50	CL	Slightly plastic or moderately plastic CLAY, SILTY CLAY, SANDY CLAY or GRAVELLY CLAY
				Liquid Limit > 50	CH	Highly plastic or very highly plastic CLAY, SILTY CLAY, SANDY CLAY or GRAVELLY CLAY
HIGHLY ORGANIC (identified by spongy feel)					Pt	PEAT

FIGURE 2

PLASTICITY CHART

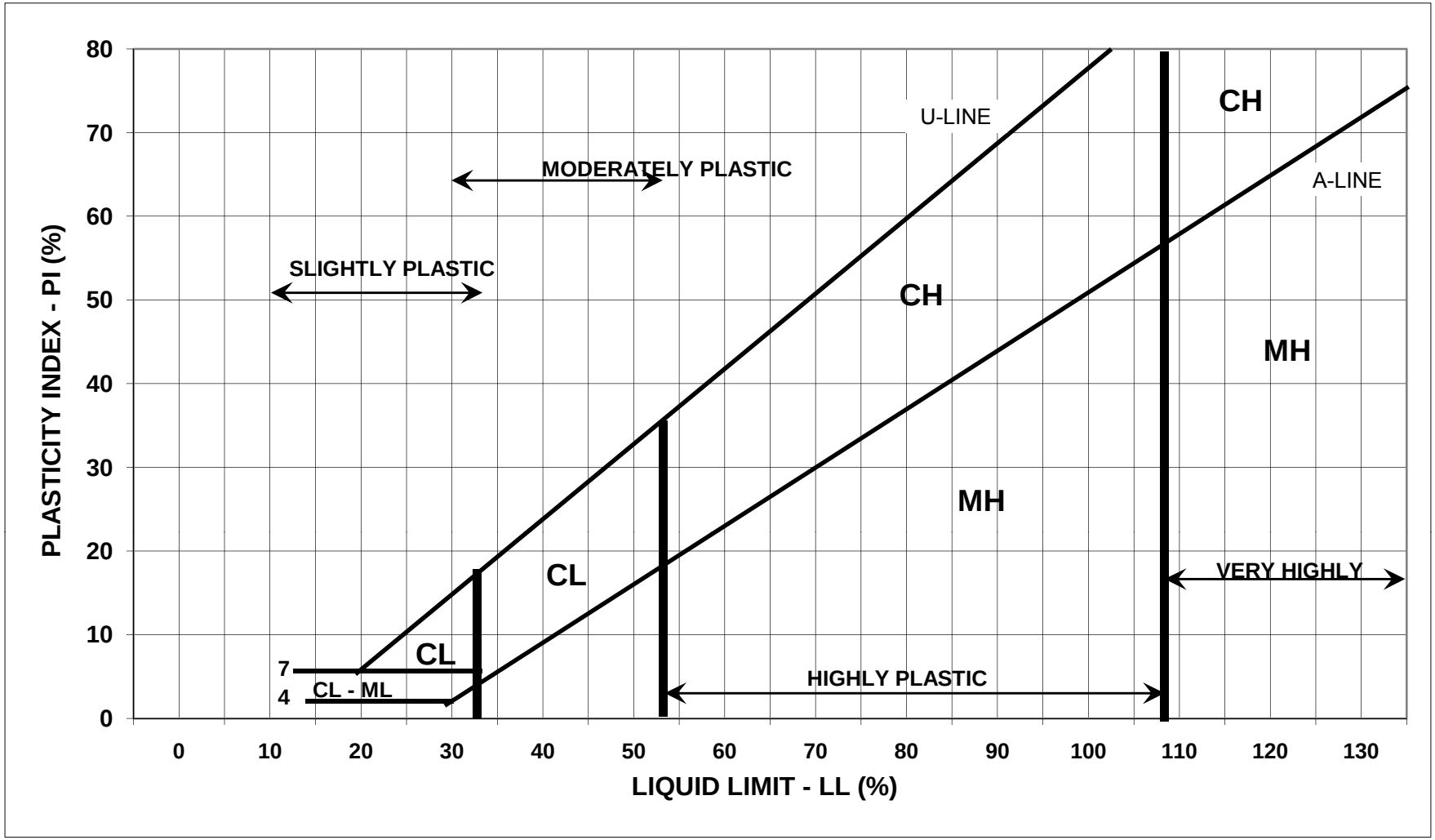
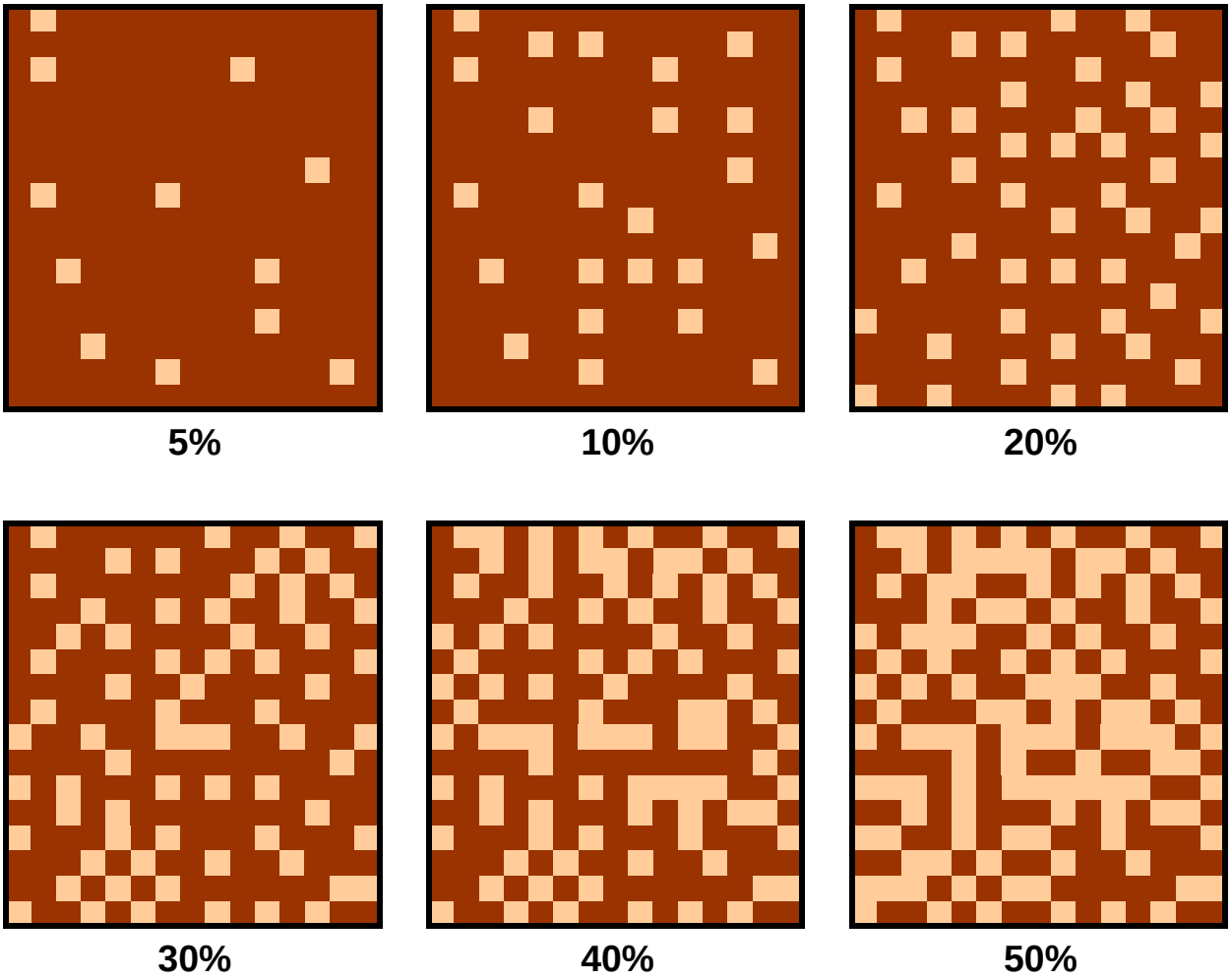


FIGURE 3

PERCENTAGE DETERMINATIONS



PERCENTAGE REFERS TO THE LIGHT AREAS WITHIN THE DARK BACKGROUND

ATTACHMENT A
DEFINITIONS

ABSORBED WATER	Water held mechanically in a soil or rock mass and having physical properties not substantially different from formation surface water at the same temperature and pressure
ADSORPTION	The assimilation of fluids into the matrix interstices
ADMIXTURE	A material other than water, aggregates, or cementation equally distributed in the soil/rock matrix material
ADSORBED WATER	Fluid in a soil or rock mass attracted to the particle surfaces by physiochemical forces, having properties that may differ from those of pore water at the same temperature and pressure
ADSORPTION	The attachment of fluid molecules or ions to the surfaces of soil particles
ALLUVIUM	Soil, the constituents of which have been transported in suspension by flowing water and subsequently deposited by sedimentation
ANGULAR	Soil and rock grains which possess well-defined edges formed at the intersection of roughly planar faces
AQUICLUDE	A relatively impervious formation capable of absorbing water slowly but will not transmit it fast enough to furnish an appreciable free-water flow under on-atmosphere of pressure.
AQIIFER	A saturated, transmissive, natural geologic formation
AQUITARD	A confining bed that retards but does not prevent the flow of water to or frm an adjacent aquifer; a leaky confining bed
AREA RATIO OF A SAMPLING TOOL	The area ratio is an indication of the volume of sil displaced by the sampling tool, calculated as follows: $Ar = [(De^2) – (Di^2/Di^2)] \times 100$; where De = maximum external diameter of the sampling tool along the length of the sample advance Di = minimum internal diameter of the sampling tool at the cutting edge
BEDDING	Consolidation of sediments which exhibit surfaces of separation (bedding planes) between layers of the same or different materials
BOULDERS	A rock fragment, usually rounded by weathering or abrasion, with an average dimension of 12 inches (305 mm) or more

CAPILLARY ACTION	The rise or movement of water in the interstices of soil or rock due to capillary forces
CAPILLARY FRINGE ZONE	The zone above the free water elevation in which water is held by capillary action
CAPILLARY HEAD	The potential, expressed in head of water, that causes the water to flow by capillary action
CAPILLARY RISE	The height above a free water elevation to which water will rise by capillary action
CAPILLARY WATER	Water subject to the influence of capillary action
CLAY	Soil passing a #200 (75 μm) sieve that can be made to exhibit plasticity (putty-like properties) within a range of water contents and exhibits considerable strength when air-dried. For classification, a clay is a fine-grained soil or the fine-grained portion of a soil whose individual grains cannot be visually distinguished but does exhibit plastic properties
CLEAVAGE	The splitting, or tendency to split, along planes determined by the crystalline structure
CLEAVAGE PLANES	The parallel surfaces along which a rock or mineral cleaves or separates, the planes of least cohesion
COBBLE	A rock fragment, usually rounded or semirounded, with an average dimension between 3 inches and 12 inches (75 mm and 305 mm)
COEFFICIENT OF UNIFORMITY [D]	The ratio D60/D10, where D60 is the particle diameter corresponding to 60% finer on the cumulative particle-size distribution curve, and D10 is the particle diameter corresponding to 10% finer on the cumulative particle-size distribution curve
COHESIONLESS SOIL	A soil that when unconfined has little or no strength
COHESIVE SOIL	A soil that when unconfined has considerable strength
COMPACTION CURVE	(*aka*, Proctor Curve or Moisture-Density Curve) the curve showing the relationship between the dry unit weight (density) and the water content of a soil for a given compaction effort
CONSISTENCY	The relative ease with which a soil can be deformed
CORE RECOVERY	Ratio of the length of core recovered to the length of the hole drilled to recover the core, expressed as a percentage
CUTTINGS	Small-sized soil and rock fragments resulting from the drilling

	process
DEGREE OF SATURATION	The extent or degree to which the voids in soil and rock contain fluid. Expressed as a percentage.
EFFECTIVE POROSITY (ne)	The ratio of the volume of the voids of a soil or rock mass that can be drained by gravity, to the total volume of the maxx
EOLIAN DEPOSITS	Wind-deposited material such as dune sands and loess deposits
FAULT	A fracture or fracture zone along which there has been displacement of the two sides relative to one another parallel to the fracture
FAULT BRECCIA	The assemblage of broken rock fragments frequently found along faults
FAULT GOUGE	A clay material occurring between the walls of a fault as a result of displacement abrasion
FIBRIC PEAT	A peat in which the original plant fibers are recognizable and slightly decomposed (>70% fibers)
FILL	A man-made deposit of natural soils or rock products and waste materials
FINES	Portion of a soil finer than a #200 (75 μm) sieve
FREE WATER	Water that is free to move through a soil or rock mass under the influence of gravity
GRADATION	The proportions by mass of a soil or fragmented rock distributed as specified particle-size ranges
GRAVEL	Particles of rock that will pass a 3-inch (75 mm) sieve and be retained on a #4 (4.75 mm) sieve with the following subdivisions: Coarse – passes a 3-inch (75 mm) sieve and is retained on a ¾ inch (19 mm) sieve; Fine – passes a ¾ inche sieve and is retained on a #4 (4.75 mm) sieve
GROUND-WATER ELEVATION	Elevations at which the pressure in the water is zero with respect to the atmospheric pressure
GROUND-WATER SATURATION	The level below which all soil or rock available porosity is filled with fluid (*i.e.*, top of saturation)
GROUND-WATER RECHARGE	The process of water addition to the saturated zone
HARDNESS	Resistance of a material to indentation or scratching

HARDPAN	A hard impervious layer, composed chiefly of clay-size material which is cemented by relatively insoluble materials, that does not become plastic when mixed with water and definitely limits the downward movement of both water and plant roots.
HEAVE	Upward movement of soil caused by expansion from wate absorption or displacement resulting from hydrostatic pressure.
HEMIC PEAT	Peat in which the original plant fibers are moderately decomposed (35% to 70% fibers)
HETEROGENEITY	Having different properties at different points
HOMOGENEITY	Having the same properties at all points
HORIZON (SOIL HORIZON)	The layers of the soil profile distinguished principally by its texture, color, structure, and chemical content. Further subdivided by: "A" Horizon – the uppermost layer of a soil profile from which inorganic colloids and other soluble materials have bee leached, usually contains remnants of organic life "B" Horizon – the layer of a soil profile in which material leached from the overlying "A" horizon is accumulated "C" Horizon – undisturved parent material from which the overlying soil profile has been developed
HUMES	A brown or black material fromed by the partial decomposition of vegetable or animal matter, the organic portion of a soil
HYDRAULIC GRADIENT (i)	The loss of hydraulic head per unit distance of flow, dh/dl, commonly expressed in feet per foot
HYDRAULIC HEAD (h)	The fluid pressure of a formation water produced by the hight of water above the uppermost level of saturation
HYDROSTATIC PRESSURE (u)	A state of stress in which all the principle stresses are equal, the pressure expressed in pounds per square inch needed to raise a formation water a vertical distance equal to the hydraulic head
IN SITU	Applied to a rock or soil when occurring in the situation in which it was originally formed or deposited
INTERSTITIAL	Occurring between the grains or in the pores in rock or soil
JOINT	A break of geological origin in the continuity of a body of rock occurring either singly or, more frequently, in a set or system, but not attended by a visible movement parallel to the surface of the discontinuity
LINEATION	The parallel orientation of structural features that are lines rather than planes

LIQUID LIMIT (LL)	The wate content corresponding to the arbitrary limit between the liquid and plastic states of consistency of a soil, the percent of water content needed for a given soil to acquire the characteristics of a liquid
LITHOLOGY	The description of rocks (sedimentary) and soils on the basis of such characteristics as color, structures, mineralogy, and particle size
LOAM	A mixture of sand, silt, or clay or a combination of any of these, with organic matter
LOESS	A uniform eolian deposit of silty material having an open structure and relatively high cohesion due to cementation of clay or calcareous material at grain contacts
MARL	A calcareous clay, usually containing from 35% to 65% calcium carbonate
MATRISX	A material in which particles are embedded, the majority soil type in an admixture
OPTIMUM MOISTURE CONTENT (OMC)	The water content at which a soil can be compacted to a maximum dry unit weight by a given compaction effort
ORGAINC CLAY/SILT	A clay and/or silt with sufficient organic content (natural) to influence the soil properties. Formal classification can only be determined by laboratory testing when it's liquid limit value after oven drying is less than 75% of it's liquid limit value before oven drying
PEAT	A soil composed primarily of vegetable tissue in various stages of decomposition usually with an organic odor, a dark brown to black color, a spongy consistency, and a texture ranging from fiberous to amorphous
PERCOLATION	Movement under hydrostatic pressure of water through the smaller interstices of rock or soil, excluding movement through large openings such as faults, caverns, or solution channels
PERMEABILITY (K)	The capacity of a soil to conduct liquid or gas
PLASTICITY	The property of a soil which allows it to be deformed beyond the point of recovery without cracking or appreciable volume change
PLASTIC INDEX (PI)	Numberical difference between the liquid limit and the plastic limit, (LL-PL)
PLASTIC LIMIT (PL)	The water content corresponding to an arbitrary limit between the plastic and semisolid states of consistency of a soil, the percent of water content needed for a given soil to acquire the characteristics

	of a plastic solid or semisolid
PORE WATER	Water contained in the voids of a soil or rock
POROSITY (n)	The ratio, expressed as a percentage, of the volume of the voids in a soil or rock to the total volume of the soil or rock
PRIMARY PERMEABILITY (Kp)	Internal permeability of intact section of rock or soil excluding secondary fracturing
RESIDUAL SOIL	Soil derived in place by weathering of the underlying material
SAND	Particles of rock that will pass a #4 (4.75 mm) sieve and be retained on a #200 (75 μm) sieve with the following subdivisions: Coarse – passes #4 (4.75 mm) sieve and is retained on a #10 (2.0 mm) sieve Medium – passes a #10 (2.0 mm) sieve and is retained on a #40 (425 μm) sieve Fine – passes a #40 (425 μm) sieve and is retained on a #200 (75 μm) sieve
SCHISTOSITY	The variety of foliation that occurs in the coarser-grained metamorphic rocks and is generally the result of the parallel arrangement of platy and ellipsoidal mineral grains within the rock substance
SILT	Soil passing a #200 (75 μm) sieve that can be made to exhibit plasticity within a range of water contents and that exhibits little or no strength when air-dried. For classification, a silt is a fine-grained soil or the fine-grained portion of a soil whose individual grains can be visually distinguished but does exhibit plastic properties
SUBSOIL	The soil below a subgrade of fill
TALUS	Rock fragments mixed with soil at the foot of a natural slope dfrom which they have been separated
TEXTURE	Geometrical aspects consisting of size, shape, arrangement, and crystallinity of the component particles and of the related characteristics of voids
TOPSOIL	Surface soil usually containing organic matter
VARVED CLAY	Alternating thin layers of silt (or fine sand) and clay formed by variations in sedimentation during the various seasons of the year, often exhibiting contrasting colors when partially dried
VOID	Space in a soil or rock mass not occupied by solid mineral matter

VOID RATIO	The ratio of the volume of void space to the volume of solid particles in a given soil mass
WATER CONTENT (w)	The ratio of the mass of water contained in the pore spaces of soil or rock material, to the solid mass of particles in that material, expressed as a percentage
WEATHERING	The process of disintegration and decomposition as a consequence of exposure to the atmosphere, to chemical action, and to the action of frost, water and heat

APPENDIX I

QUALITY ASSURANCE PROJECT PLAN

(35 Pages)

QUALITY ASSURANCE PROJECT PLAN (QAPP)

Investigation/Monitoring Petroleum Impacts
Shoshone Paiutes of Duck Valley

U.S. Bureau of Indian Affairs
Solicitation No: A16PS00132
Order No: A16PX00431
Akana Project No. 16-005

March 2017

Prepared by

AKANA
Plan + Design + Engineer + Manage

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LIST OF ACRONYMS

AST	Above Ground Storage Tank
BIA	Bureau of Indian Affairs
CO	Contracting Officer
COC	Contaminant of Concern
COR	Contracting Officer Representative
DQO	Data Quality Objective
DUSR	Data Usability Summary Report
ENA	Eastern Nevada Agency
GC	Gas Chromatograph
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operator
LCS	Laboratory Control Sample
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PAHs	Polynuclear Aromatic Hydrocarbons
PID	Photoionization Detector
ppm	Parts per Million
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RBSL	Risk-Based Screening Level
RDL	Reporting Detection Limit
RPD	Relative Percent Difference
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SOW	Statement of Work
TERO	Tribal Employment Rights Office

TPH	Total Petroleum Hydrocarbons
µg/kg	Micrograms per Kilogram
VOCs	Volatile Organic Compounds
VOA	Volatile Organic Analysis

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) presents the quality assurance (QA) and quality control (QC) activities for site remediation activities planned for the US Bureau of Indian Affairs (BIA) Duck Valley Environmental Investigation located in Owyhee, Nevada. In February1985, 8,000 gallons of heating oil were delivered to a 16,000 gallon aboveground storage tank (AST), located approximately 75 feet east of Highway 225 near an old power plant. Five days later and before the 8,000 gallons should have been consumed, the tank was empty, suggesting that the pipeline that carried the fuel to consumers had substantial leaks. Use of the heating oil pipeline was discontinued in 1985, and the 16,000 AST continued to be used to store fuels, which was transferred by truck to individual AST's.

The goal of these activities is to complete the investigation of historic petroleum releases to characterize the nature and extent of existing contamination and move forward with any required remedial design activity. The project includes sampling groundwater monitoring wells, the installation of five (5) new monitor wells, the installation and soil sampling of up to twenty soil borings. This QAPP specifies project objectives; procedures for office, field, and laboratory documentation; and other QA requirements that will be used to obtain valid, representative field samples and measurements. This QAPP was prepared in accordance with the U.S. Environmental Protection Agency's (EPA's) *Quality Assurance Guidance for Conducting Brownfields Site Assessments* (EPA 1998).

2.0 PROJECT MANAGEMENT

The BIA has hired Akana to conduct an environmental investigation of soil and groundwater contamination associated with historical releases of heating oil in the town of Owyhee, Nevada. The project scope covered by this QAPP includes the installation of new groundwater monitoring wells, additional soil and groundwater sampling/monitoring, preparation of groundwater assessment reports and development of a Remedial Design Plan and a Remedial Implementation Work Plan.

2.1 PROJECT/TASK ORGANIZATION

This section outlines the individuals directly involved with this project and their specific responsibilities.

EPA Region 9 Project Officer: Hillary Hecht is the EPA Enforcement Officer responsible for ensuring that all federal regulatory requirements are met and for providing assistance in problem resolution and technical matters. Hillary Hecht will also provide EPA review, either directly or through assignment, of work plans and deliverables. Hillary will work directly with the BIA.

EPA Region 9 Quality Assurance Officer: Hillary Hecht. The QA Officer reviews and approves the site-specific QAPP. The QA Officer may assess field activities. The project QA Officer will be assigned when EPA receives this QAPP.

BIA Contracting Officer Representative (COR): **John Graves** is the BIA Project Manager for this project and will be the primary point of contact for the Project Officer. He will review and approve invoices and provide technical oversight along with John Krause

BIA COR: **John Krause** is the BIA Co-Project Manager for this project and will also be a primary point of contact for the Project Officer. Due to his historical knowledge of the project, he will oversee the preparation of the project work plan; review and comment on site-specific sample and quality assurance plans, health and safety plans, and reports; and will report directly to the Contracting Officer and the EPA as needed.

BIA Eastern Nevada Agency (ENA) Representatives: **Marty Leyva and Joseph McDade** are local representatives for the BIA ENA.

Duck Valley Environmental Manager: It is unknown who is currently the lead environmental staff person for the Shoshone-Paiutes of Duck Valley Reservation (Duck Valley).

Duck Valley Tribal Employment Rights Office (TERO): Shelly Collins is the Compliance and Safety Officer for the Shoshone-Paiutes of Duck Valley TERO office.

Duck Valley Tribal Business Council: Lindsey Manning is the Chairman for the Shoshone-Paiutes of Duck Valley Tribal Business Council.

Akana Project Manager: Mr. Said Amali, P.E., PhD is the Project Manager for Akana and will be the primary contact for the BIA Project Managers. He will maintain primary responsibility for project quality, schedule, and budget; QA review of data; providing final review of all project deliverables; and serving as a technical resource throughout the project. Mr. Bill Desmond will also monitor project QA procedures to ensure compliance with this QAPP and, if any problems or deficiencies are observed, will facilitate appropriate corrective action.

Akana Task Manager: Ms. Carol Townsend, P.G. is the Task Manager for this project and will report to the Akana Project Manager. Ms. Townsend will oversee daily operations, prepare project deliverables, and manage and coordinate all Akana field personnel. She will also act as the Akana Health and Safety Officer for the project and will be responsible for adherence to the site-specific Health and Safety Plan (HASP).

Akana Field Technicians: Brent Hamil P.G., Peter Van Zandt, Tim Norman, and Chris Hyatt will be responsible for implementing the Sampling and Analysis Plan (SAP), including preparation for the field events, implementation of all field activities, and maintaining chain-of-custody procedures with the analytical laboratory.

2.2 COORDINATION

The BIA has retained Akana as their environmental consultant. As the BIA's consultant, Akana will coordinate field activities with the BIA Project Managers and keep them apprised of project and field activities, issues that may affect project schedule or outcome, and any problems that are encountered. Before initiation of field activities, the BIA will provide notification to local residents and city, county, and tribal representatives, as appropriate.

2.3 TRAINING

All field personnel present during sampling activities are required to be 40-hour Hazardous Waste Operations (HAZWOPER)-certified with subsequent 8-hour annual refreshers. Health and safety procedures for Akana personnel will be addressed in a site-specific HASP which will be prepared prior to initiation of field work at the site. Included in the HASP will be descriptions of anticipated chemical, physical, and biological hazards, required levels of protection, health and safety monitoring requirements and action levels, personal decontamination procedures, and emergency procedures.

2.4 DOCUMENT RETENTION

Documents generated during this project will include work plans, reports, laboratory data sheets, correspondence, chain-of-custody documentation, logbooks, corrective action forms, reference materials, and photographs. Hard and electronic copies (if originally prepared in electronic form) will be kept in a secure filing area for a minimum of 5 years after closure of the project. Copies of all deliverables will be provided to BIA. Copies of other documents will be made available on request.

3.0 QUALITY ASSURANCE OBJECTIVES FOR DATA MANAGEMENT

3.1 DATA QUALITY OBJECTIVES

The data quality objectives (DQO) for this project are to develop and implement procedures for obtaining and evaluating data of a specified quality that can be used to confirm or deny the presence of contaminants of concern (COC) that may pose a risk to human health or the environment. To collect such information, analytical data must have an appropriate degree of accuracy and reproducibility, samples collected must be representative of actual field conditions, and samples must be collected and analyzed using unbroken chain-of-custody procedures. The DQO process for this project followed that described in the EPA document, *Guidance on Systematic Planning Using the Data Quality Objectives Process* (EPA 2006).

3.2 CRITERIA FOR DATA MEASUREMENT

To meet DQOs, the overall QA objective for analytical data is to ensure that data of known and acceptable quality are provided. To achieve this goal, data must be reviewed for sensitivity, representativeness, comparability, accuracy, precision and completeness. These criteria, which are described below, are necessary attributes to ensure that analytical data are reliable, scientifically sound, and defensible. Each analytical result or set of results generated should be fully defensible in any legal action, whether administrative, civil, or criminal.

3.2.1 Sensitivity

Table 1 below provides a summary of sample containers for each analysis, preservatives, hold times, analytical methods and quantitation or method detection limits (MDL). MDLs are the lowest practical limits at which concentrations can be quantified with the technology that is available at commercial laboratories. Because analytical results will be compared to EPA Regional Screening Levels (RSL; EPA 2015), laboratory procurement will include evaluation of MDLs with respect to RSLs to ensure that the data generated will be sufficient for making decisions about the significance of concentrations of COCs in soil and groundwater. In the case where a RSBL is lower than the MDL, the laboratory will be required to report detections below the MDL as an estimated quantity.

Table 1 - Summary of Sample Containers and Preservatives and Holding Times

Test Description	Method(s)	Recommended Quantity	Preservation	Holding Time
Volatile Organics (VOCs) - 10 Day TAT				
VOCs (water)	8260B	3 x 40 ml Glass	Cool ≤6°C, HCL	7 days/14 days preserved
VOCs (soil)	8260B	2 - 4 oz. Jars	Cool ≤6°C	14 days
Total Petroleum Hydrocarbons (TPH) - 10 Day TAT				
TPH-DRO - GRO (water)	8015D	3 x 40 ml Glass	Cool ≤6°C, HCL	14 days
TPH-DRO - GRO (soil)	8015D	2 - 4 oz. Jars	Cool ≤6°C	14 days
Polycyclic Aromatic Hydrocarbons (PAH) 10 Day TAT				
PAHs (soil)	8310/ 8270 SIM	1 - 4oz glass jar	Cool <6C, None	14 days
PAH SIM (water)	8270C SIM	3 x 40 ml Amber vials	Cool <6C, None	7 days
Naturally-Occurring Electron Acceptors 10 Day TAT (5 samples)				
Nitrate	300.0	125mL plastic	Cool <6C, None	48hrs
Sulfate	300.0	1 Liter plastic	Cool <6C, None	28 days
Total Alkalinity	2320 B		Cool <6C, None	14 days
TDS	2540C		Cool <6C, None	7 days
Dissolved Iron	200.7	500mL plastic	Cool <6C, None	7 days
Dissolved Manganese	200.7		Cool <6C, None	7 days

Table 2 - Analytical Method and Quantitation Limit Goals for Volatile Organic Compounds (VOCs)

VOCs 8260B			Water (mg/L)		Soil (mg/kg)	
CAS#	**Parameter**	**Method**	**RDL**	**MDL**	**RDL**	**MDL**
67-64-1	Acetone	8260B	1	0.01	1	0.01
107-02-8	Acrolein	8260B	0.05	0.008870	NA	NA
107-13-1	Acrylonitrile	8260B	0.01	0.001870	0.01	0.001790
71-43-2	**Benzene**	8260B	0.0010	0.000331	0.0010	0.000270
108-86-1	Bromobenzene	8260B	0.0010	0.000352	0.0010	0.000284
75-27-4	Bromodichloromethane	8260B	0.001250	0.000380	0.001250	0.000254
75-25-2	Bromoform	8260B	0.0010	0.000469	0.0010	0.000424
74-83-9	Bromomethane	8260B	0.0050	0.000866	0.0050	0.001340
104-51-8	n-Butylbenzene	8260B	0.0010	0.000361	0.0010	0.000258
135-98-8	sec-Butylbenzene	8260B	0.0010	0.000365	0.0010	0.000201
98-06-6	tert-Butylbenzene	8260B	0.0010	0.000399	0.0010	0.000206
56-23-5	Carbon tetrachloride	8260B	0.0010	0.000379	0.0010	0.000328
VOCs 8260B			**Water (mg/l)**		**Soil (mg/kg)**	

CAS#	Parameter	Method	RDL	MDL	RDL	MDL
108-90-7	Chlorobenzene	8260B	0.0010	0.000348	0.0010	0.000212
124-48-1	Chlorodibromomethane	8260B	0.0010	0.000327	0.0010	0.000373
75-00-3	Chloroethane	8260B	0.0050	0.000453	0.0050	0.000946
110-75-8	2-Chloroethyl vinyl ether	8260B	0.05	0.003010	0.05	0.002340
67-66-3	Chloroform	8260B	0.0050	0.000324	0.0050	0.000229
74-87-3	Chloromethane	8260B	0.0025	0.000276	0.0025	0.000375
95-49-8	2-Chlorotoluene	8260B	0.0010	0.000375	0.0010	0.000301
106-43-4	4-Chlorotoluene	8260B	0.0010	0.000351	0.0010	0.000240
96-12-8	1,2-Dibromo-3-Chloropropane	8260B	0.0050	0.001330	0.0050	0.001050
106-93-4	1,2-Dibromoethane	8260B	0.0010	0.000381	0.0010	0.000343
74-95-3	Dibromomethane	8260B	0.0010	0.000346	0.0010	0.000382
95-50-1	1,2-Dichlorobenzene	8260B	0.0010	0.000349	0.0010	0.000305
541-73-1	1,3-Dichlorobenzene	8260B	0.0010	0.000220	0.0010	0.000239
106-46-7	1,4-Dichlorobenzene	8260B	0.0010	0.000274	0.0010	0.000226
75-71-8	Dichlorodifluoromethane	8260B	0.0050	0.000551	0.0050	0.000713
75-34-3	1,1-Dichloroethane	8260B	0.0010	0.000259	0.0010	0.000199
107-06-2	1,2-Dichloroethane	8260B	0.0010	0.000361	0.0010	0.000265
75-35-4	1,1-Dichloroethene	8260B	0.0010	0.000398	0.0010	0.000303
156-59-2	cis-1,2-Dichloroethene	8260B	0.0010	0.000260	0.0010	0.000235
156-60-5	trans-1,2-Dichloroethene	8260B	0.0010	0.000396	0.0010	0.000264
78-87-5	1,2-Dichloropropane	8260B	0.0010	0.000306	0.0010	0.000358
563-58-6	1,1-Dichloropropene	8260B	0.0010	0.000352	0.0010	0.000317
142-28-9	1,3-Dichloropropane	8260B	0.0010	0.000366	0.0010	0.000207
10061-01-5	cis-1,3-Dichloropropene	8260B	0.0010	0.000418	0.0010	0.000262
10061-02-6	trans-1,3-Dichloropropene	8260B	0.0010	0.000419	0.0010	0.000267
594-20-7	2,2-Dichloropropane	8260B	0.0010	0.000321	0.0010	0.000279
108-20-3	Di-isopropyl ether	8260B	0.0010	0.000320	0.0010	0.000248
100-41-4	**Ethylbenzene**	8260B	0.0010	0.000384	0.0010	0.000297
87-68-3	Hexachloro-1,3-butadiene	8260B	0.0010	0.000256	0.0010	0.000342
98-82-8	Isopropylbenzene	8260B	0.0010	0.000326	0.0010	0.000243
99-87-6	p-Isopropyltoluene	8260B	0.0010	0.000350	0.0010	0.000204
78-93-3	2-Butanone (MEK)	8260B	0.01	0.003930	0.01	0.004680
75-09-2	Methylene Chloride	8260B	0.0050	0.0010	0.0050	0.0010
108-10-1	4-Methyl-2-pentanone (MIBK)	8260B	0.01	0.002140	0.01	0.001880
1634-04-4	Methyl tert-butyl ether	8260B	0.0010	0.000367	0.0010	0.000212
91-20-3	**Naphthalene**	8260B	0.0050	0.0010	0.0050	0.0010
103-65-1	n-Propylbenzene	8260B	0.0010	0.000349	0.0010	0.000206
VOCs 8260B			**Water (mg/L)**		**Soil (mg/kg)**	
CAS#	**Parameter**	**Method**	**RDL**	**MDL**	**RDL**	**MDL**

100-42-5	Styrene	8260B	0.0010	0.000307	0.0010	0.000234
630-20-6	1,1,1,2-Tetrachloroethane	8260B	0.0010	0.000385	0.0010	0.000264
79-34-5	1,1,2,2-Tetrachloroethane	8260B	0.0010	0.000130	0.0010	0.000365
76-13-1	1,1,2-Trichlorotrifluoroethane	8260B	0.0010	0.000303	0.0010	0.000365
127-18-4	Tetrachloroethene	8260B	0.0010	0.000372	0.0010	0.000276
108-88-3	**Toluene**	8260B	0.0050	0.000780	0.0050	0.000434
87-61-6	1,2,3-Trichlorobenzene	8260B	0.0010	0.000230	0.0010	0.000306
120-82-1	1,2,4-Trichlorobenzene	8260B	0.0010	0.000355	0.0010	0.000388
71-55-6	1,1,1-Trichloroethane	8260B	0.0010	0.000319	0.0010	0.000286
79-00-5	1,1,2-Trichloroethane	8260B	0.0010	0.000383	0.0010	0.000277
79-01-6	**Trichloroethene**	8260B	0.0010	0.000398	0.0010	0.000279
75-69-4	Trichlorofluoromethane	8260B	0.0050	0.0012	0.0050	0.000382
96-18-4	1,2,3-Trichloropropane	8260B	0.0025	0.000807	0.0025	0.000741
95-63-6	1,2,4-Trimethylbenzene	8260B	0.0010	0.000373	0.0010	0.000211
526-73-8	1,2,3-Trimethylbenzene	8260B	0.0010	0.000321	0.0010	0.000287
108-67-8	1,3,5-Trimethylbenzene	8260B	0.0010	0.000387	0.0010	0.000266
75-01-4	Vinyl chloride	8260B	0.0010	0.000259	0.0010	0.000291
1330-20-7	**Xylenes, Total**	8260B	0.0030	0.001060	0.0030	0.000698

Bold Values indicate Contaminants of Concern
mg/L – milligrams per Liter
mg/kg – milligrams per kilogram

Table 3 Analytical Method and Quantitation Limit Goals for Total Petroleum Hydrocarbons (TPH)

Total Petroleum Hydrocarbons by 8015D - Water			
Parameter	**Method**	**RDL**	**MDL**
TPH DRO – Diesel Range Organics	8015D	0.1 mg/L	0.0247 mg/L
TPH GRO – Gasoline Range Organics	8015D	0.1 mg/L	0.0314 mg/L
Total Petroleum Hydrocarbons by Method 8015 Soil			
TPH DRO	8015D	4.0 mg/kg	0.769 mg/kg
TPH GRO	8015D	0.1 mg/kg	0.0217 mg/kg

Bold Values indicate Contaminants of Concern

Table 4 - Analytical Method and Quantitation Limit Goals for Polynuclear Aromatic Hydrocarbons (PAHs)

PAHs by 8270C SIM SS (Soil)				
CAS#	**Parameter**	**Method**	**RDL**	**MDL**
120-12-7	Anthracene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
83-32-9	Acenaphthene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
208-96-8	Acenaphthylene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
56-55-3	Benzo(a)anthracene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
50-32-8	Benzo(a)pyrene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
205-99-2	Benzo(b)fluoranthene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
191-24-2	Benzo(g,h,i)perylene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
207-08-9	Benzo(k)fluoranthene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
218-01-9	Chrysene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
53-70-3	Dibenz(a,h)anthracene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
132-64-9	Dibenzofuran	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
206-44-0	Fluoranthene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
86-73-7	Fluorene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
193-39-5	Indeno(1,2,3-cd)pyrene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
91-20-3	**Naphthalene**	8270C-SIM	0.02 mg/kg	0.0020 mg/kg
85-01-8	Phenanthrene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
129-00-0	Pyrene	8270C-SIM	0.0060 mg/kg	0.0006 mg/kg
120-12-7	Anthracene	8310	0.02 mg/kg	0.004710 mg/kg
83-32-9	Acenaphthene	8310	0.02 mg/kg	0.003130 mg/kg
208-96-8	Acenaphthylene	8310	0.02 mg/kg	0.003960 mg/kg
56-55-3	Benzo(a)anthracene	8310	0.02 mg/kg	0.00000293 mg/kg
50-32-8	Benzo(a)pyrene	8310	0.02 mg/kg	0.002440 mg/kg
205-99-2	Benzo(b)fluoranthene	8310	0.02 mg/kg	0.00000212 mg/kg
191-24-2	Benzo(g,h,i)perylene	8310	0.02 mg/kg	0.00000227 mg/kg
207-08-9	Benzo(k)fluoranthene	8310	0.02 mg/kg	0.002440 mg/kg
218-01-9	Chrysene	8310	0.02 mg/kg	0.003960 mg/kg
53-70-3	Dibenz(a,h)anthracene	8310	0.02 mg/kg	0.005090 mg/kg
206-44-0	Fluoranthene	8310	0.02 mg/kg	0.003970 mg/kg
86-73-7	Fluorene	8310	0.02 mg/kg	0.003260 mg/kg
193-39-5	Indeno(1,2,3-cd)pyrene	8310	0.02 mg/kg	0.004270 mg/kg
90-12-0	1-Methylnaphthalene	8310	0.02 mg/kg	0.003280 mg/kg
91-57-6	2-Methylnaphthalene	8310	0.02 mg/kg	0.003090 mg/kg
91-20-3	**Naphthalene**	8310	0.02 mg/kg	0.003140 mg/kg

PAHs by 8270C SIM SS (Soil)				
CAS#	**Parameter**	**Method**	**RDL**	**MDL**
85-01-8	Phenanthrene	8310	0.02 mg/kg	0.004140 mg/kg
129-00-0	Pyrene	8310	0.02 mg/kg	0.003690 mg/kg

Bold Values indicate Contaminants of Concern

Table 5 Analytical Methods and Quantitation Limit Goals for Electron Acceptors

Naturally-Occurring Electron Acceptors				
CAS#	**Parameter**	**Method**	**RDL**	**MDL**
DSOLIDS	Total Dissolved Solids	2540 C-DW 1997	10 mg/L	2.82 mg/L
14797-55-8	Nitrate as (N)	300.0	0.10 mg/L	0.0227 mg/L
14797-65-0	Nitrite as (N)	300.0	0.10 mg/L	0.0277 mg/L
14808-79-8	Sulfate	300.0	5 mg/L	0.0774 mg/L
N/A	Total Alkalinity	2320-B-1997	20 mg/L	2.71 mg/L
7439-89-6	Iron, Dissolved	200.7	0.10 mg/L	0.0282 mg/L
7439-96-5	Manganese, Dissolved	200.7	0.01 mg/L	0.0020 mg/L

3.2.2 Precision

Precision is a measure of the reproducibility of data under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared to their average value. For duplicate measurements, precision can be expressed as the relative percent difference (RPD). Typically analysis of field duplicate samples will serve to measure the precision of sampling. Field and laboratory duplicate measurements are be carried out with approximately a 10 percent frequency for each sample matrix and for laboratory samples.

3.2.3 Accuracy

Accuracy is the agreement between the measured value and the true value. Accuracy depends on the magnitude of systematic (bias) and random (precision) errors in the measurement. Bias due to sample matrix effects will be assessed by spiking the samples with known standards and calculating the recovery for the standards. Matrix spikes will be used at a minimum frequency of one in 20 or one per sample set. Perfect accuracy is 100 percent recovery.

3.2.4 Representativeness

Representativeness is a measure of how closely the results reflect the actual concentration of the chemical parameters in the medium sampled. Sampling procedures as well as sample-handling protocols for storage, preservation, and transportation are designed to preserve the representativeness of the samples collected.

Field procedures for collecting representative samples will be implemented to reduce the potential for contamination of samples, such as using decontaminated or disposable sampling equipment, laboratory-supplied jars, and jars with lids equipped with Teflon liners. Proper documentation will also confirm that protocols are followed. This helps to assure sample identification and integrity. Representativeness can be assessed qualitatively by the use of QC samples, such as rinsate, field blanks, trip blanks and duplicate field samples. These QC samples are discussed in Section 4.4.

3.2.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. A DQO for this program is to produce data with the greatest possible degree of comparability. Comparability of the data will be assured by using EPA-defined procedures that specify sample collection, handling, and analytical methods.

3.2.6 Completeness

Completeness is defined as a measure of the amount of valid data obtainable from a measurement system compared to the amount that was expected to be obtained under normal conditions. It is important that appropriate QA procedures be maintained to ensure that valid data are obtained in

order to meet project needs. For the data generated, the goal required for completeness for this project is 95 percent.

4.0 SAMPLING REQUIREMENTS

4.1 SAMPLE DESIGN AND METHODS

The basis and scope of the proposed investigation activities are described in the main text of the project Work Plan. In general, samples will be collected for site characterization purposes. Descriptions of the types of materials which will be tested are also described in the Work Plan. Field sampling methods are described in detail in the SAP provided in Section 14.0 of the work plan.

4.2 FIELD DATA MANAGEMENT

4.2.1 Field Measurements and Observations

A field logbook will be used to document field measurements, daily activities, and observations. Documentation will be sufficient to enable participants to reconstruct events that occurred during the project accurately and objectively at a later time. The logbook will be bound, and all pages will be consecutively numbered. All entries will be made in waterproof ink, dated, and signed by the person conducting the work. Because the logbook is a complete documentation of field procedures, it will contain only facts and observations. Language is to be objective, clear, concise, and free of personal interpretation or terminology that might be misconstrued. At a minimum, the following data will be recorded in the logbook:

- Date and time of any activity
- Purpose and location of activity
- Weather conditions
- Description of sample reference point(s)
- Sample location, depth, volume, and identification number
- Field measurements made
- Calibration records for field instruments
- Relevant comments regarding field activities
- The signature of responsible personnel.

Field logbooks will be identified by the project name and a project-specific number, and stored in the field project files when not in use. Field logbooks will be photocopied after the investigation, and photocopies will be stored in the permanent project files. After field activities are completed, logbooks will be stored in the permanent project file.

4.2.2 Photographs

Photographs will be taken as directed by the Task Manager and at the discretion of the Field Technician. The following information will be noted in the logbook concerning photographs: date,

location, and direction where photographs were taken; description of photographs taken; and reasons why photographs were taken. Upon downloading of photographs, each folder of photographs will be labeled as to their date and location/activity. After field activities are completed, electronic files will remain with the electronic project file and any hard copies of photographs will be stored in the permanent project file.

4.2.3 Corrections

All original data are recorded in field notes using indelible ink. Documents will be retained even if they are illegible or contain inaccuracies that require correction. No pages will be removed for any reason. If an error is made on a document, the individual making the entry will correct the document by crossing a line through the error, entering the correct information, and initialing and dating the correction. Any subsequent errors discovered on a document will be corrected, initialed, and dated by the person who made the entry.

4.3 SAMPLE HANDLING AND CUSTODY

4.3.1 Containers

Sample containers will be obtained directly from the analytical laboratory performing the analysis. Container type, number, volume, preservatives, and maximum sample holding times to extraction and/or analysis will be completed as specified by the respective EPA analytical methods. Table 1 in Section 3.2.1 includes a summary of the sample containers sizes, preservatives, and holding times for the project.

4.3.2 Sample Identification

A sample label will be affixed to the sample container which will be used to identify each sample collected in the field and to avoid the possibility of misidentification. The Field Technician will fill out each sample label using waterproof ink and specify on the label a unique field sample number, project number, the sample date and time, sampler initials, analysis required, and preservation (when applicable). To minimize handling of sample containers, labels will be completed before sample collection to the extent possible. After each sample is collected, an entry will be made in the logbook describing the sample and its identifying number.

4.3.3 Storage and Shipment

Sample storage in the field will typically consist of placement of labeled filled sample containers into individual Ziploc bags and into insulated coolers with ice. The cooler will be kept closed except when opening the lid to add additional samples. Styrofoam peanuts or bubble wrap will be placed around the sample containers within the cooler to ensure safe storage and container integrity during transport. When not under direct observation of the Field Technician, the cooler will be

sealed with a custody seal (preprinted gel-type seals, designed to break into small pieces if the seals are disturbed). Seals will be signed and dated before use.

When a sample shipment is transported to the laboratory, a chain-of-custody form will be placed in the cooler (chain-of-custody forms are discussed in detail below). A temperature blank, consisting of a water-filled vial, will also be placed in the cooler along with ice. The samples will be maintained at 4 degrees Celsius. The cooler will be sealed with signed and dated custody seals in as many places as necessary to ensure security. Packaging, marking, labeling, and shipping of samples will comply with all regulations promulgated by the U.S. Department of Transportation in the Code of Federal Regulations, 49 CFR 171-177, and International Air Transport Association regulations. If sent by overnight carrier, a bill of lading will also be used. Freight bills and bills of lading will be retained as part of the permanent documentation.

4.3.4 Chain of Custody

Sample chain-of-custody refers to the process of tracking the possession of a sample from the time it is collected in the field through the laboratory analysis. A sample is considered to be under a person's custody if it is in a person's physical possession; in view of the person after possession has been taken; or secured by that person so no one can tamper with the sample, or secured by that person in an area restricted to authorized personnel.

A chain-of-custody form is used to record possession of a sample and to document analyses requested. Each time the sample bottles or samples are transferred between individuals, both the sender and receiver sign and date the chain-of-custody form. This record will document sample custody transfer. Specifically, the following information is recorded on a chain-of-custody form:

- Sample identification number
- Sample collector's signature
- Date and time of collection
- Description of sample
- Analyses requested
- Shipper's name and address
- Receiver's name and address
- Signatures of persons involved in chain of custody.

All original data are recorded on chain-of-custody forms using indelible ink. If an error is made, the individual making the entry will correct the document by crossing a line through the error, entering the correct information, and initialing and dating the correction. Any subsequent errors discovered on a document will be corrected, initialed, and dated by the person who made the entry.

When transporting samples to the laboratory, the original chain-of-custody form will be placed in a sealed plastic bag in the sample cooler (each cooler will have a separate chain-of-custody form). A copy of the form will be retained in the project files. The cooler will be sealed with signed and dated custody seals in as many places as necessary to ensure security. Upon receipt at the laboratory, the custodian will check that seals on the cooler are intact, will open the cooler, and check that all samples are present. The laboratory will then assume sample custody by signing the chain-of-custody form and retain the samples in a secure area until such time as the samples are ordered destroyed.

4.4 QUALITY CONTROL SAMPLES

QC checks for sample collection will be accomplished by a combination of chain-of-custody protocols, laboratory quality assurance as prescribed by the analytical methods, and collection of field QC samples. QC samples are discussed below.

4.4.1 Field Duplicates

The field duplicate is two representative aliquots of the same sample that are prepared and analyzed identically. Collection of duplicate samples provides for the evaluation of precision both in the field and at the laboratory by comparing the analytical results of two samples taken from the same location (i.e., the primary and duplicate samples). Obtaining duplicate samples from a solid matrix requires homogenization (except for volatile compounds) of the sample aliquot prior to filling sample containers, in order to best achieve representative samples. Every effort will be made to obtain replicate samples; however, due to interference, lack of homogeneity, and the nature of the solid samples, the analytical results are not always reproducible.

At the five soil borings that will be converted to new monitor wells (MW-31 through MW-35), one duplicate soil sample will be analyzed for VOCs. For soil borings installed in the vicinity of MW-23 and MW-24, two duplicate soil samples will be analyzed for VOCs. For the soil borings to be installed near the former power house and MW-10, duplicate samples will be analyzed for VOCs.

One duplicate water sample will be collected from one monitor well each quarter and will be analyzed for VOCs.

No duplicates were requested in the statement of work (SOW).

4.4.2 Rinsate Blanks

A rinsate blank is a sample of laboratory-demonstrated analyte-free water passed over decontaminated sampling equipment. A rinsate blank is used to indicate potential contamination from sample instruments used to collect and transfer samples. This water must originate from one

common source within the laboratory and should be the same water used by the laboratory performing the analysis.

No rinsate blanks will be collected

4.4.3 Field Blank

Field blanks are used to determine if any onsite atmospheric contaminants are present that may result in contamination of samples during collection. Field blanks are collected by pouring laboratory-supplied analyte-free water into a volatile organic analyte (VOA) vial. No field blanks will be collected.

4.4.4 Trip Blanks

Trip blanks are used to determine if any onsite atmospheric contaminants are seeping into the sample vials or if any cross-contamination of samples is occurring during shipment or storage of sample containers. They consist of a VOA vial filled with laboratory-demonstrated analyte-free water. The trip blanks accompany the empty sample bottles from the laboratory into the field and with the filled bottles back to the laboratory. The trip blanks are never opened in the field.

At the five soil borings that will be converted to new monitor wells (MW-31 through MW-35), one trip blank will be analyzed for VOCs. For soil borings installed in the vicinity of MW23 and MW-24, two trips blanks will be analyzed for VOCs. For the soil borings to be installed near the former power house and MW-10, two trip blanks will be analyzed for VOCs.

One trip blank per quarterly groundwater monitoring event will be analyzed for VOCs for QA/QC.

4.5 EQUIPMENT MAINTENANCE

To ensure that field measurement is accomplished accurately, field equipment undergoes routine maintenance and calibration as described below.

4.5.1 Preventive Maintenance

Akana performs routine inspections and preventive maintenance (parts replacement and cleaning) for all pieces of field equipment in our supply and equipment room. Maintenance activities are conducted by our field technicians, who are specifically trained in the use, operation, and maintenance of the equipment. All field equipment used during this project, including water level indicators, photoionization detectors (PID), and water parameter meters (e.g., pH), is cleaned and decontaminated prior to use. Each piece of equipment is inspected and tested to ensure proper working function and facilitate replacement or repair of broken or non-operational components. Extra batteries are included in the equipment cases or in field vehicles for replacing dead batteries during field work.

4.5.2 Calibration

All field equipment is calibrated according to the manufacturer's guidelines and recommendations. If a PID is used during this project, it will be calibrated on a daily basis according to the manufacturer's specifications. The PID preferred by Akana field personnel is an Ion Science PhoCheck Tiger or MiniRAE 3000. These instruments have the widest measurement range on the market and can detect VOCs from 0.1 parts per million (ppm) to 20,000 ppm. It also has the advantage of various lamps and is calibrated using a manufacturer-supplied standard gas isobutylene.

5.0 ANALYTICAL REQUIREMENTS

5.1 METHODS

Previous sample data were assessed to identify COCs in site media. An analytical testing program will be performed to verify cleanup levels have been attained and document the residual contaminant concentrations in soil. Additionally, samples may be analyzed for waste designation and potential re-use purposes.

All samples will be submitted for offsite fixed laboratory analyses using essentially SW-846 analytical protocols (EPA website 2009). The laboratory used will have the appropriate accreditations to perform the requested analyses. Samples will be analyzed for:

- TPH (EPA Method 8015D)
- VOCs (EPA Method 8260B)
- PAHs (EPA Method 8270 SIM & Method 8310)

Tables 2, 3, 44, and 5 located in Section 3.2.1 lists the MDLs for the proposed analyses. Table 1 lists the specific container and storage requirements for the proposed analytical methods. Sample analyses will be performed on a standard turnaround time (i.e., typically 10 business days). Hard copy and electronic results will be delivered to Akana upon completion of each sample delivery group (not to exceed 21 days from sample receipt).

5.2 LABORATORY OPERATIONS

Quality assurance of laboratory operations is guided by the laboratory's Quality Assurance Manual and standard operating procedures (SOP). To ensure that samples are accurately tracked and instrumentation produces valid results, the laboratory follows sample custody procedures and performs preventive maintenance, calibration, and corrective action on instrumentation. These laboratory operations are discussed below.

5.2.1 Laboratory Custody Procedures

A designated sample custodian at the laboratory will accept custody of the shipped samples from the carrier and enter preliminary information about the package into a package or sample receipt log, including the person delivering the package and the status of the custody seals on the coolers (i.e., broken versus unbroken). The custodian responsible for sample log-in will follow the laboratory's SOP for opening the package, checking the contents, and verifying that the information on the chain-of-custody form agrees with samples received. The laboratory will also check the

temperature blank inside the cooler and document it in the sample log-in form. Each sample in the cooler will be assigned a unique laboratory identification number used by the laboratory for analysis assignment, sample tracking, and data reporting.

5.2.2 Preventive Maintenance

Laboratories perform routine testing, inspection, and preventive maintenance (parts replacement and cleaning) of all instruments and equipment, and provide a clean, climate-controlled environment for instrument/equipment operation. Major instruments such as gas chromatographs (GC), atomic absorption spectrophotometers, analytical balances, and GC/mass spectrometer systems are maintained under commercial services contracts or by qualified in-house service technicians. All instrument maintenance is recorded in the associated instrument logbook for future reference and validation of scheduled maintenance. Logbook entries include the date, analyst's name, detailed description of the problem, detailed explanation of the solution, and a verification that the instrument is functioning properly.

5.2.3 Calibration

Calibration of analytical instrumentation is required to verify that the analytical system is operating properly and at the sensitivity necessary to meet established quantitation limits. Each instrument will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations, as well as criteria set forth in the applicable analytical methodology references. Once the operating parameters for an instrument have been established according to the analytical method, the analyst prepares standard solutions containing all of the analytes of interest, any internal standards, and any surrogate standards appropriate to the method. To establish the calibration curve for the particular analytes, these standard solutions are prepared at graduated dilution. One of the concentrations must be above the detection limit while the others are used to define the working range of the instrument.

5.2.4 Corrective Action

The laboratory Quality Assurance Manual also contains the systems established to assure that conditions adverse to quality are promptly identified and corrected. This corrective action system functions at both the bench level, through recognition and response to isolated events, and at the management level, through trend analysis. Recalibrations are performed when fundamental changes to the instrument characteristics occur (i.e., change of analytical column, etc.) or when results of QC check standards or samples indicate an out-of-control condition.

5.3 QUALITY CONTROL SAMPLES

The laboratory conducts internal QC checks by analyzing QC samples to determine if analytical operations are in control, as well as determining the effect that the sample matrix may have on data

being generated. The type and frequency of specific QC samples analyzed will conform to the specified analytical method and project-specific requirements. QC results that vary from acceptable ranges shall result in the implementation of appropriate corrective measures, potential application of qualifiers, and/or an assessment of the impact these corrective measures have on the established data quality objectives. Quality control samples that will be analyzed are discussed below.

5.3.1 Method Blanks

Method blanks, consisting of aliquots of water or purified solid, are carried through the analytical scheme and serve to measure potential contamination associated with laboratory storage, preparation, or instrumentation (i.e., the level of laboratory background contamination). For most analyses, method blanks are analyzed on a daily basis and at a frequency of 1 per 20 samples if more than 20 samples are analyzed in a given batch.

5.3.2 Laboratory Control Samples

Laboratory control samples (LCS) are aliquots of spiked water or purified solid to which known amounts of analytes have been added. They are subjected to the sample preparation or extraction procedure and are analyzed as samples. Stock solutions used for LCSs are purchased or prepared independently of the calibration standards. The LCS analysis evaluates the functioning analytical method process and equipment function. Results of the LCS analysis are expressed as percent recovery. LCSs are prepared and analyzed on at least a daily basis, with a greater frequency if a greater number of samples are analyzed on a given day.

5.3.3 Calibration Blanks

Calibration blanks are prepared with standards to create an instrument calibration curve. They differ from other standards only by the absence of an analyte and provide the zero-point for the curve.

5.3.4 Surrogates

Surrogates are measured amounts of certain compounds added before sample preparation or extraction. Analysts measure the surrogate recovery to determine systematic extraction problems and to assess the accuracy of a chemical measurement by comparing the measured value to the actual spiked value. Surrogates are added to all samples analyzed for organics. Surrogate recoveries are expressed as percent recovery.

5.3.5 Matrix Spikes

Matrix spike (MS) analyses are performed on samples submitted to the laboratory that are of the same matrix as the actual sample. The MS sample is spiked with known levels of the constituents of interest using a stock solution purchased or prepared independently of calibration standards. The

MS sample is then subjected to the entire analytical procedure as the actual sample. MS analyses are used to assess the potential for matrix interference with recovery or detection of the constituents of interest and the accuracy of the determination. The MS results are compared to the expected result (i.e., sample concentration plus spike amount) and are reported as percent recovery. Spikes are prepared and analyzed on a daily basis and at a frequency of at least 1 per 20 samples or one per batch, whichever is more frequent.

5.3.6 Matrix Spike Duplicates

A second matrix spike sample (a.k.a., the matrix spike duplicate [MSD]) is prepared as above and analyzed. This sample is compared to the initial matrix spike to assess the precision of the analytical method by calculating the RPD. For this method, both a percent recovery and an RPD are reported. As such, both accuracy and precision for the matrix are measured. The samples are used to assess matrix interference effects on the method, as well as to evaluate instrument performance. MSDs are prepared and analyzed on a daily basis.

5.3.7 Laboratory Duplicates

A duplicate is a second laboratory sample taken from a submitted sample. The duplicate is then prepared along with the original. It is analyzed and compared to the original sample to assess the precision of the analytical method and the potential variability of the sample matrix. This comparison is reported as the RPD.

5.3.8 Laboratory Control Sample Duplicates

In cases where the analyte concentration is consistently below the method detection limit, LCS duplicates are substituted for laboratory duplicate samples. An LCS duplicate is a second analysis of an LCS. The duplicate is prepared along with the original sample. It is analyzed and compared to the original sample to assess the precision of the analytical method and the potential variability of the sample matrix. For this method, both a percent recovery and an RPD are reported. As such, both accuracy and precision for the matrix are measured. LCS duplicates are prepared as needed.

5.4 DOCUMENTATION

Laboratory data report packages will be provided in both hard copy and electronic formats. These packages will be kept in both the project file and the electronic database system, respectively, in Akana's office. Laboratory data reports will include all internal laboratory quality control checks and sample results. At a minimum, laboratory reporting shall include the following.

- Both field and laboratory sample identification number
- The sample date, the date it was received at the laboratory, and the date that it was extracted and/or analyzed

- The quantified concentration
- The method reporting limit
- Units for reporting
- Laboratory QC sample results (including date and time of analysis, method, and acceptability criteria)
- Data qualifiers assigned by the laboratory, with definitions presented in each report.

Upon receipt of laboratory data, the Akana Project Manager will review the data for completeness and format. If any error is noted in the laboratory report, the laboratory will be informed and appropriate corrective action will be performed, including review of raw data, assigning a data qualifier to the sample result, and/or re-analysis of the sample. For minor corrections (such as misspelled sample names), the individual making the correction shall cross a line through the error, enter the correct information, and initial and date the correction. Data validation and reporting are discussed in Section 7.0.

6.0 ASSESSMENT AND OVERSIGHT

6.1 RESPONSE ACTIONS

Assessments used during implementation of the project will include daily communication and updates during field work and data quality review by the Akana Project and Task Managers. Response actions to identified issues will be coordinated between these managers, the Field Technician, the BIA, and involved subcontractors, as appropriate.

Although not planned, the BIA COR Officer or designee may conduct an audit of the field activities for this project. The auditor will have the authority to stop work upon finding a significant condition that would adversely affect the quality and usability of the data. The Akana Project Manager will then have the responsibility for initiating and implementing response actions to address these deficiencies identified by the site audit. Once the response action(s) have been implemented, the BIA COTR Officer or designee may perform a follow-up audit.

6.2 CORRECTIVE ACTIONS

If a QA/QC audit detects unacceptable conditions or data, the Akana Project Manager will be responsible for developing and initiating corrective action. The BIA Project Manager will be notified if the nonconformance is significant or requires special expertise. Corrective action may include the following:

- Reanalyzing the samples, if holding times can be met
- Resampling and analyzing
- Evaluating and amending sampling and analytical procedures
- Accepting data and acknowledging the level of uncertainty or inaccuracy by flagging the data.

All corrective actions will be documented in writing and will be signed by the Project Manager and implementing Manager.

6.3 REPORTING

During assessment activities, the Akana Project Manager will prepare monthly progress reports that consist of a summary of activities completed during the month, and problems encountered and recommended solutions (including any related to QA). The progress reports will be transmitted electronically to the BIA representatives.

After the conclusion of field activities and upon receipt of analytical results, Akana will prepare the Remedial Investigation Report. This report will describe activities performed during the project and present an evaluation of the data (along with any statements about data quality, as specified in Section 7.3).

7.0 DATA VALIDATION AND USABILITY

Data generated during this project will be validated to ensure that DQOs have been met and the data are suitable for their intended use. The data validation review will include an evaluation of: the information provided on the analytical data sheets and required supporting documentation for all sample analyses; the sample collection documentation, including field notes, chain-of-custody forms, and field instrument calibration; and adherence to the procedures described in the SAP and the requested analytical methods.

7.1 DATA REDUCTION AND REVIEW

Data reduction includes all processes that change the numerical value of the raw data. Laboratory analytical data are first generated in raw form at the instrument. These data may be in either graphic form or printed in tabular form. Specific data reduction, generation procedures, and calculations are found in each of the methods, as well as within the laboratory's QAPP. Analytical results must be reported consistently. Data will be reported in concentrations of milligrams per kilogram (mg/kg) or micrograms per kilogram (µg/kg). Aqueous sample data will be reported in milligrams per Liter (mg/L) or micrograms per Liter (µg/L). Data reduction will be performed by the laboratory technician/analyst experienced with the particular analysis and knowledgeable of the method's QC requirements.

The technician/analyst who generates the analytical data is responsible for the correctness and completeness of those data. This review process involves evaluation of both the results of the QC data and the professional judgment of the person(s) conducting the review. This application of technical knowledge and experience to the evaluation of data is essential in ensuring that high-quality data are generated. The laboratory has documented procedures, which are to be followed and must be accessible to all laboratory personnel. The data review is generally conducted in a three-step process at the laboratory level prior to release of the final data package.

- *Level 1 Technical Data Review.* The analysts review the quality of their work based on an established set of guidelines. The review will ensure at a minimum that appropriate preparation, analysis, and SOPs have been followed; analytical results are correct and complete; QC samples are within established control limits; and that documentation is complete (e.g., any anomalies have been documented).

- *Level 2 Technical Review.* This level of review will be performed by a supervisor, data review specialist, or QA/QC officer whose function is to provide an independent review of the data package. This review shall also be conducted according to an established set of guidelines (i.e., method requirements and laboratory SOPs). The Level 2 review includes a review of qualitative and quantitative data and review of documented anomalies.

- *Level 3 Administrative Data Review.* The final review of the data, prior to final report release, is performed by the project manager at the laboratory. This level of review provides a total overview of the data package to ensure its consistency and compliance with project requirements.

7.2 DATA VALIDATION

Data validation is a systematic procedure of reviewing a body of data against a set of established criteria to provide a specified level of assurance of validity prior to its intended use. The Akana Project Manager will assure validation of the analytical data by reviewing the field sampling procedures used and the laboratory analyses performed.

7.2.1 Sampling Procedure Review

Documentation from the field sampling activities will be reviewed to ensure that the samples were collected consistent with the procedures specified in the SAP, that they are representative of the conditions being measured (e.g., residual concentrations in soil, and that they fulfill their intended purpose (e.g., confirmation, waste designation). Field notes will be checked to verify samples have supporting information to verify when, how and where sampling occurred; who performed the sampling; and that appropriate sample identifiers were used. Field instrument calibration logs will be reviewed if relied upon for selection of samples for analysis or if they are critical for interpretation of analytical results. Chain-of-custody and sample receipt documentation will be reviewed to ensure that chain of custody was unbroken and samples arrived in good condition.

7.2.2 Analytical Data Validation

The analytical data will be evaluated in accordance with the QA/QC requirements specified in this QAPP and the technical specifications of the analytical methods in the EPA's National Functional Guidelines (EPA 2004, 2008). The laboratory generating analytical data for this project will be required to submit results that are supported by sufficient backup and QA/QC data to enable the reviewer to determine the quality of the data. The data evaluation process will include reviewing:

- The overall deliverable package for completeness
- Holding times
- That all samples were analyzed using the specified analytical methods
- Laboratory QC results (e.g., blanks, surrogates, spikes, duplicates) to assess if the data are within the method required limits and specifications
- Field quality QC results (e.g., field duplicates, blanks)
- Laboratory qualifiers.

A review of raw data will not be performed. When possible, discrepancies will be resolved through direct correspondence with the laboratory project manager. If the data review reveals significant

deviations and problems with the analytical data, Akana may recommend corrective action (Section 6.2) or a complete validation of the data, including raw data.

7.3 QUALITY ASSURANCE REPORTING

After the conclusion of field activities and upon receipt of analytical results, Akana will prepare a Remedial Investigation Report. The results of the data validation will be included in a Data Usability Summary Report (DUSR) as an appendix to the Site Assessment Report. The DUSR will describe the samples and the analytical parameters performed data deficiencies, analytical protocol deviations, and QC problems. All data qualifiers will be discussed. The DUSR will also render an opinion as to the validity and usability of the data and whether DQOs have been achieved. In addition, the Remedial Investigation Report and/or DUSR will address the following:

- Any adverse conditions or deviations from the SAP
- Significant QA problems and recommended solutions
- Corrective actions taken for any problems previously identified.

8.0 AUDITS

Audits are systematic examinations to determine whether activities comply with planned arrangements, whether the arrangements are implemented effectively, and whether the results are suitable to achieve project objectives. No field or laboratory audits are anticipated for this project. Laboratories routinely undergo performance evaluation audits by various federal and state agencies to ensure that they meet accreditation or certification requirements. Additionally, laboratories regularly perform internal QA analyses for the applicable analytical methods to be used for a project.

REFERENCES

U.S. Environmental Protection Agency's (EPA's) *Quality Assurance Guidance for Conducting Brownfields Site Assessments* (EPA 1998).

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EPA. 2004. *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganics Data Review*. EPA 540-R-04-004. U.S. Environmental Protection Agency. October.

EPA. 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process.* EPA/240/B-06/001. U.S. Environmental Protection Agency. February.

EPA. 2008. *U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organics Data Review*. EPA/540/R-08/01. U.S. Environmental Protection Agency. June.

EPA. 2009. *Regional Screening Levels for Chemical Contaminants at Superfund Sites.* U.S. Environmental Protection Agency. December 2009.

EPA website. 2009. *SW-846 On-Line Test Methods*. http://www.epa.gov/epaoswer/hazwaste/test/main.htm.

APPENDIX J

HEALTH AND SAFETY PLAN

(29 Pages)

AKANA	**Approved by**: Bill Renfroe *Corporate Safety Director* **Date: March 1, 2017**

SITE HEALTH & SAFETY PLAN

BIA
Eastern Nevada Agency

Investigation and Monitoring of Petroleum Impacts

Owyhee, Nevada
Sho-Pai Indian Reservation – Duck Valley

March 2017

AKANA SITE HEALTH AND SAFETY PLAN

BIA – INVESTIGATION OF PETROLEUM IMPACTS TO SUBSURFACE SOIL AND SHALLOW GROUNDWATER

PHASE II ENVIRONMENTAL ACTIVITIES

Akana has adopted the following Health & Safety Plan (HASP) for Soil/Groundwater Sampling and Phase II Environmental activities on the Sho-Pai Indian Reservation, located in Owyhee, NV. All work will be done in general accordance with current OSHA regulations and with the BIA Contractor Safety Policies.

This document outlines Akana's site specific health and safety plan and is to be read and signed by all Akana project workers.

1. Job Execution Goal

Implement a Project in a safe efficient manner without incident to personnel, property, or the community.

- ✓ No Injury
- ✓ No Illness
- ✓ No Environmental Excursion
- ✓ No Work Permit Violation
- ✓ Incident Free Job Execution
- ✓ Drug Free Workplace

The following Site Health & Safety Plan may be used, when deemed necessary, to address specific policies and procedures to be instituted for work projects contracted to Akana. All Akana employees will review and familiarize themselves with this Site Health & Safety Plan, as applicable, prior to commencement of any work.

Akana shall perform all work in strict accordance with standards, drawings and other data as released by the BIA. Akana will meet or exceed all BIA policies and procedures as identified in this HASP.

2. Site Location

The community of Owyhee is located on the Sho-Pai Indian Reservation to the north of Elko, Nevada, and just south of the Idaho-Nevada border. From Boise, Idaho, take I-84

east for approximately 36 miles to exit 90 toward State Hwy 51. Merge onto I-84 business and head east for 4 miles to State Hwy 51. Continue on State Hwy 51 heading south for 91 miles to the Idaho-Nevada state line where State Hwy 51 becomes State Hwy 225. Follow State Hwy 225 south for 4 miles to Owyhee, Nevada.

3. Scope of Work

This plan pertains to all service work provided by Akana for BIA – Investigation of Petroleum Impacts to Subsurface Soil and Shallow Groundwater.

The purpose of the Health & Safety Plan is to provide communication to all personnel involved with the subsurface investigation that is being performed in order to further delineate and/or define potential and existing subsurface soil and groundwater impacts to the subsurface media.

Initial work performed for this project will include a preliminary groundwater sampling event to collect samples from each of 23 monitoring wells to establish baseline contaminant concentrations in groundwater. Following completion of the preliminary groundwater sampling, Akana will begin with the installation and development of seven (5) new monitoring wells along with the advancement of 20 soil borings to a max depth of 20 feet bsg through the use of a DPT track mounted drilling rig. New monitoring wells will be constructed in accordance with ASTM D5092-04.

Akana will determine groundwater flow direction and seasonal flow variations through performance of quarterly surveys from 30 monitoring wells at four month intervals during the one year groundwater monitoring period.

Akana will collect and analyze groundwater samples from 30 monitoring wells for each of four monitoring events, performed at three month intervals during the one year groundwater monitoring period.

Any work performed outside of the scope outlined in this HASP must be communicated with the Akana Safety Department prior to commencement of work.

4. Subsurface Clearance

Prior to any subsurface penetration activities, the drilling locations are required by Nevada State law to have a utility clearance performed by the USA North 811 line locate system. Each drilling location was marked with a flagged survey stake in the field. Then, no more than 14-days and no fewer than 48-hours before drilling, a one-call (i.e., USA North 811) request for utility clearance will be made for each of the drilling sites. All site markings made by underground utilities and other companies will be honored. If necessary, the drilling location will be moved if an underground line is marked within 20-feet of the proposed borehole location. In addition, specific drilling locations will also be cleared in the field by use of one, or a combination, of the following techniques:

A. Hand-augering;

B. Slow, flat-bit auguring with the rig or geoprobe;

In addition, a visual check for overhead power lines and underground lines will be completed prior to any subsurface clearance activities.

5. Project Safety Officer Responsibilities

The Project Safety Officer shall monitor all activities of equipment and personnel at the project work site. The Project Safety Officer's responsibilities will include the following:

A. Ensuring that all Akana workers are properly trained, have read the Site Health & Safety Plan, and have signed the HASP acknowledgement form.

B. Keep a written log of on-site activities and events.

C. Timely reporting and documenting of all injuries and safety incidents.

D. Conduct daily Toolbox Safety Meetings.

E. Conduct Weekly Safety Meeting utilizing safety topic provided by Akana HSE Department.

F. Ensure a Job Safety Analysis (JSA) is completed by each work crew and perform JSA audits as needed.

G. Serve as site liaison with Akana Corporate HSE Department.

6. Incident Reporting

All incidents must be reported immediately to the BIA, the Akana site supervisor/leader, and Akana Safety Director. In accordance with Akana HSE Policy, all incidents will be reported immediately to Akana Safety Director at a minimum verbally. Written incident report shall be submitted within 24-hours.

Akana will notify the BIA Western Regional Office (WRO) representative of all job site incidents involving the following:

A. OSHA recordable accidents

B. Vehicle accidents

C. Incidents involving equipment damage

D. Spills of hazardous materials

E. Fires

F. Near misses that had the potential to cause injuries or property damage.

Notification, either in person or by telephone or radio, will be made as soon as possible and, without exception, prior to the end of the workday to the BIA WRO.

7. Enforcement

The BIA WRO project superintendent or his/her designated representative has full authority to enforce the job site safety policies. Observed safety violations will be referred to the Akana Site Supervisor for immediate correction. Repeated safety violations may lead to the removal of the Akana employee or the entire crew from the job site. Certain violations, such as fighting or use of illegal substances, are considered intolerable, and will result in immediate dismissal.

8. General Job Safety

A. Anyone under the influence of drugs or intoxicating substances shall be immediately removed from the job site.

B. No one shall be permitted or required to work while the person's ability or alertness is impaired by fatigue, illness, or other conditions that expose the employee or others to injury.

C. Horseplay, scuffling, fighting, or possession of illegal drugs, alcohol, firearms, or explosives is prohibited.

D. Report any hazardous conditions immediately to the Akana Project Safety Officer and the BIA WRO representative.

E. Do not block or obstruct aisles, doors, stairways, fire extinguishers, or emergency exits.

F. Personal protective equipment must be inspected regularly.

G. Do not handle or tamper with electrical equipment, machinery, air/water lines, or chemicals if it is not within the scope of your duties.

H. Machinery shall not be serviced, repaired or adjusted while in operation. Where appropriate, request the Client implement lockout procedures and de-energize equipment.

I. Do not throw or drop anything from heights.

9. Drugs/Alcohol/Smoking

Medicine and alcohol can increase or exaggerate the effects from exposure to toxic chemicals. Personnel who must take prescribed drugs will inform a qualified physician of the type of work to be performed, the potential for exposure to specific hazardous materials, and follow the physician's guidance.

Alcoholic beverage intake is prohibited on-site and should be minimized offsite. The use of alcohol, illegal drugs or abuse of controlled or intoxicating substances is prohibited on-site. Person(s) found using alcoholic beverages, illegal drugs, or abusing controlled or other intoxicating substances, or is found to be intoxicated while on-site will be subject to disciplinary action, up to and including permanent expulsion from the job site.

Smoking is prohibited within decontamination areas at all times. Site personnel may only smoke in designated areas during break and lunch periods.

10. Site Evacuation

In the event of an emergency that necessitates the evacuation of the site, such as a chemical release or fire or explosion, site personnel will implement the following procedures:

A. Site personnel will be alerted by direct verbal communication or hand movements.

B. Personnel in the exclusion zone may or may not perform field decontamination prior to leaving the exclusion zone, depending on the nature of the incident requiring the evacuation. In the event of a fire or explosion, these individuals will evacuate to either the primary or secondary meeting point (location will be upwind based on prevailing wind direction).

C. Once personnel have evacuated to the designated meeting point, the Project Safety Officer will perform a head count.

11. Back Safety

Back injuries are common and debilitating. To avoid injuring your back, observe the following lifting precautions:

A. Know the approximate weight of the load to be lifted.

B. Lift with the leg muscles not the back.

C. The maximum permissible load for one person is 40 lbs.

D. Always seek assistance when lifting heavy, bulky objects – don't try to do it on your own.

12. Barriers and Warning Signs

A. Barriers must be placed around safety hazards such as open excavations or areas where heavy equipment is in use. Barriers must be sturdy and obvious to site workers and the general public.

B. Warning signs must be placed on or near safety hazards. "Danger" signs must be used wherever an imminent hazard is present. "Caution" signs must be used wherever potentially unsafe conditions exist.

C. Safety instruction signs must be used wherever additional safety instructions regarding hazards are appropriate.

13. Chemical Hazards

The contaminants of concern associated with contaminated soils and debris include: Total Petroleum Hydrocarbons, Volatile Organic Compounds such as Benzene, Ethylbenzene, Toluene, Xylenes, Trichloroethene, Napthalene, PAH compounds such as 2-Methylnapthalene, Acenapthene, Fluorene, Fluoranthene, Coal Tar Pitch Volatiles (Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Chrysene, Phenanthrene, Pyrene), Benzo(k)fluoranthene, Benzo(g,h,i)perlyene, Benzo(b)fluoranthene, Indeno(1,2,3-cd)pyrene. Of these, seven compounds are recognized as human carcinogens. Those compounds include Benzene, Ethylbenzene, Napthalene, Coal Tar Pitch Volatiles (Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Chrysene, Phenanthrene, Pyrene), Benzo(k)fluoranthene, Benzo(b)fluoranthene and Indeno(1,2,3-cd)pyrene.

Table 2-1 lists the chemicals, associated hazards, threshold limit values (TLVs), and/or permissible exposure limits (PELs), routes of exposure, and signs and symptoms of exposure. This information covers potential toxic effects that could occur if relatively significant acute and/or chronic exposure were to happen.

TABLE 1-1
CHEMICAL HAZARDS ASSESSMENT

Chemical Hazard	Exposure Limits	Routes of Exposure	Signs and Symptoms
Benzene	OSHA PEL-TWA = 1 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation to eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; potential occupational carcinogen
Ethylbenzene	OSHA PEL-TWA = 100 ppm	inhalation, ingestion, skin and/or eye contact	Irritation to eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma
Toluene	OSHA PEL-TWA = 100 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation to eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage
Xylenes	OSHA PEL-TWA = 100 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation to eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis
Trichloroethene	OSHA PEL-TWA = 100 ppm	inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation to eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; potential occupational carcinogen
Naphthalene	OSHA PEL-TWA = 10 ppm	inhalation, ingestion, skin and/or eye contact	Hemolytic anemia, nausea, vomiting, diarrhea, irritation to nose and respiratory system, potential human carcinogen
2-Methylnapthalene	OSHA PEL = not established	Inhalation, skin and/or eye contact	Irritation to eyes, skin and respiratory system.

Chemical Hazard	Exposure Limits	Routes of Exposure	Signs and Symptoms
Acenaphthene	OSHA PEL = not established	Inhalation, skin absorption and ingestion	Irritation to skin, eyes, nose and throat;
Dibenzofuran	OSHA PEL = not established	Inhalation, skin absorption	Irritation to skin, eyes, nose and throat
Fluorene	OSHA PEL = not established	Inhalation, skin and/or eye contact	Irritation to skin, eyes, nose and throat
Fluoranthene	OSHA PEL = not established	Inhalation, skin and/or eye contact, ingestion	Irritation to skin, eyes and respiratory system
Coal Tar Pitch Volatiles (Anthracene, Benz(a)anthracene Benzo(a)pyrene, Chrysene, Phenanthrene, Pyrene)	OSHA PEL-TWA = 0.2 mg/m^3	Inhalation, skin and/or eye contact	Dermatitis, bronchitis; potential occupational carcinogen Note: benzene extractable method
Benzo(k)fluoranthene	OSHA PEL = not established	Inhalation, ingestion	Probable human carcinogen
Benzo(g,h,i)perylene	OSHA PEL = not established	Inhalation, ingestion	Information not available.
Benzo(b)fluoranthene	OSHA PEL = not established	Inhalation	Probable human carcinogen.
Indeno(1,2,3-cd) pyrene	OSHA PEL = not established	Inhalation, ingestion	Probable human carcinogen.

Notes:
CNS central nervous system
IDLH concentration at which chemical hazard is immediately dangerous to life and health
OSHA Occupational Safety and Health Administration
ppm parts per million
PEL permissible exposure limit
TWA time-weighted average (8 hours)

14. Physical Safety Hazards and Control Measures

TABLE 1-2
PHYSICAL HAZARDS ASSESSMENT

Physical Hazard	Control Measure
Rotating Mechanisms on the drilling rig	Employee will keep clear of drill rig unless accompanied by licensed driller. Wear bright safety vest for visibility.
Water knife	Due to high pressure only personnel with proper PPE should be within 10 feet of equipment. Stop work to let project manager confirm utility clearance.
Noise	Hearing protection must be worn in wherever noise levels exceed 85 dBA.
Spark/flare	Wear flame-resistant clothing. Fire extinguisher must be available around all hot work.
Dermal contact with COCs	Employees will wear protective clothing, boots and gloves, if necessary.
Inhalation of vapors	Employees will wear half face respirators, if necessary based on air monitoring. Considered level C PPE.
Ingestion of COCs	Employees will wash hands and face thoroughly before eating or drinking.
Mechanical – Slip-Trip-Fall	Walk cautiously; keep waste and equipment clear of work area when not in use. Keep aware of physical surroundings, keep work area clean.

Physical Hazard	Control Measure
Snakes, tics and mosquitoes	Wear insect repellant. While on foot or stepping out of vehicles, keep alert to surroundings and watch for snakes especially in tall vegetation. Make noise upon approach to location.
Heat Stress	• Establish a work/rest schedule • Know signs/symptoms of heat illnesses; monitor self/coworkers. • Block out direct sun or other heat sources. • Use cooling fans/air-conditioning; rest regularly. • Drink lots of water; about 1 cup every 15 minutes. • Wear lightweight, light colored, loose-fitting clothes. • Avoid alcohol, caffeinated drinks, or heavy meals.

15. Environmental Spill

If a chemical spill occurs:

A. Report the spill immediately to the BIA WRO supervisor, who will alert a cleanup crew.

B. If the spill creates immediate danger to life or health (e.g., cloud, fire, etc.) alert all site personnel by direct verbal communication or hand movements.

C. Do not touch or walk on spilled materials.

D. Keep combustibles (wood, paper, oil) away from spilled materials.

E. Turn off all electrical equipment in the spill area.

16. Equipment Inspections

The following equipment must be inspected daily (written inspection records not required):

A. Tools

B. PPE

17. Eye & Face Protection

A. Safety Glasses with side shields must be worn at all times.

B. If working around chemicals, chemical splash goggles as well as a face shield shall be worn at all times.

18. Fire extinguishers

A. Only ABC rated fire extinguishers shall be used on this project. The rating types are as follows:

i. Class A – Ordinary combustible material fires
ii. Class B – Flammable liquid, gas or grease fires
iii. Class C – Energized-electrical equipment fires

B. Fire extinguishers must be visually checked monthly to ensure that they are fully charged and operable.

C. Documented maintenance inspections shall be completed monthly.

D. Whenever an extinguisher is removed from service to be checked or repaired, a replacement fire extinguisher must be provided.

19. Fire Fighting

A. Akana personnel are to attempt to fight a fire ONLY in the incipient stages and ONLY if properly trained. Do not attempt to fight a fully developed fire with a fire extinguisher.

B. NEVER USE WATER TO EXTINGUISH FIRES ON ELECTRICAL EQUIPMENT, GASOLINE, OIL, OR GREASE.

C. Use a suitable extinguisher if the fire is small and an exit is readily available.

D. Remember **PASS**:

P ull the pin to unlock the operating lever.
A im low, pointing the nozzle or hose at the base of the fire.
S queeze the handle to release the extinguishing agent.
S weep from side to side until the flames are out.

E. After extinguishing, a fire watch should be maintained for approx. **30** minutes in case of re-ignition.

F. If the fire cannot be put out with an extinguisher, notify the BIA WRO representative and others within the immediate area and evacuate the area immediately. Notify the Client of any fire and report the incident.

20. Fire Prevention

A. Combustible scrap, debris, and waste materials (paper, wood shavings etc.) must be cleaned up daily, before the end of the work shift. Oily rags must be placed in a metal container with a metal lid.

B. Keep all work areas, particularly around electrical machinery, clear of litter.

C. Immediately clean up spilled oil or solvents using appropriate spill kit supplies.

D. Never use compressed air around open flames, fuels, oil, or grease.

E. Open flames, sparks, incandescent surfaces, or other sources of ignition must not be used near flammable liquids, gases, or dusts.

F. All electrical circuits must be protected by the correct capacity fuse or a ground fault circuit interrupter (GFCI).

G. Unplug electrical equipment not in use at the end of the workday.

H. Stored materials must be compatible.

   a. Compatible means they don't react violently on contact, such as oxygen and grease.
   b. They should also be readily accessible and secured so they aren't accidentally knocked over.

I. Always take precautions to prevent fires particularly from oily waste, rags, gasoline, flammable liquids, acetylene torches and trash.

J. Never use gasoline or flammable solvents for cleaning purposes.

K. Smoking is prohibited within **25** feet of flammable substances.

21. Flammable and Combustible Materials/Liquids

A. Keep flammable and combustible materials or liquids to a minimum. Bring on site only enough to complete the day's work.

B. Combustible scrap, debris and waste materials must be removed from the worksite daily. Oily rags stored in covered metal receptacles.

C. Flammable liquids must be stored in approved, self-closing, non-combustible, metal containers. Such containers must be labeled with the word "FLAMMABLE" in large letters.

D. Flammable liquids may be used only in areas where there are no flames or other sources of ignition.

E. Do not drag containers labeled "Flammable."

22. Housekeeping

A. Akana personnel will practice good housekeeping procedures while at the project site. This includes in office areas as well as in the field.

B. Housekeeping should be an ongoing process and not relegated to the end of the day.

C. In particular all Akana employees are required to observe the following practices:

   a. Ensure that all trash is disposed of in designated trash bins or cans properly and promptly.

   b. Keep work areas free of debris, waste, and combustible materials. Scrap is to be removed and deposited in proper waste containers at least daily.

   c. Crating materials, banding straps, etc., must be disposed of to prevent tripping hazards, cuts, etc.

   d. Keep all material piled and stored neatly. Nails, bolts, nuts, etc. should be kept in their containers.

e. Work areas are to be kept clean and orderly. Tools, wires, supplies, materials and loose objects are not to be left in disorder during the work day, at the conclusion of the work day, or at the end of the project.

f. Keep materials and equipment out of aisles, passageways, and off stairways.

g. Keep floors dry; avoid spilling liquids; wipe up all spills immediately.

h. Spilled liquids or other materials must be cleaned up immediately.

i. Sharp protruding nails and wire must be removed or bent.

23. Job Safety Analysis (JSA)

A. The Project Safety Officer is responsible for assuring a JSA is completed prior to the beginning of work activities. Work may not begin without a completed job safety analysis on hand. A JSA is required to be reviewed by each work crew prior to the work being performed. A tailgate safety meeting will be held at the start of each day with all personnel including drilling contractor participating in the daily meeting prior to any work starting.

B. No work will be started until hazards have been identified and controlled by the work crew. If hazards still exist, stop work, control hazards, communicate, and then proceed.

24. Ladders

A. Akana personnel may use ladders if properly inspected and secured.

25. Material Handling/Storage

A. Stored materials must be accessible from at least two sides.

B. Do not store materials near flammable substances or other sources of ignition

C. Do not lift heavy loads over areas where employees are working or equipment is parked.

D. When working near others, let them know before you drop a load.

E. All tools used for sampling shall be decontaminated after each use with Liquinox (Alconox) followed by a rinse. See attached SDS.

26. Pedestrians/ Walking Safety

A. Use walkways and sidewalks where provided.

B. If ice or slippery conditions are encountered, walk around the area and notify operations of the hazardous condition.

C. If ice must be crossed, ice cleats shall be used at all times and proceed with extreme caution.

D. Do not walk in front or behind any vehicle that is maneuvering to pick up or lower a load.

E. Do not walk behind a vehicle attempting to back up. The driver may not see you.

F. Do not stop while you are in a vehicle roadway. Step to the side to prevent vehicles from having to maneuver around you.

G. Walk around areas where overhead work is in progress or areas, which have been barricaded.

H. Be alert to traffic conditions around you.

27. Personal Protective Equipment

For all team members working on site the minimum required personal protective equipment includes the following:

A. Hard-hat that meets the requirements of ANSI Z89.1 Class B or E.

B. Safety glasses shall be worn at all times.

   i. Safety glasses must be worn with side shields that meet the ANSI Z87.1 standard.

C. Monogoggles for chemical splash protection must be mounted on hardhats so that they are readily available.

D. Workers must wear ANSI/ASTM approved steel toed boots or composite material toed safety boots with puncture resistant soles -- boots must be constructed of leather and cover the wearer's ankles.

   i. No soft shoes (jogging, tennis, loafers) are permitted on site.

E. Field personnel shall wear appropriate field clothing including:

   i. Shirts with long sleeves.
   ii. Full-length trousers.
   iii. Additional clothing requirements may be necessary depending on the work area.

F. Hearing protection is required to be worn in high noise level areas.

G. Chemical resistant gloves such as nitrile rubber or Viton must be worn when handling potentially contaminated materials.

H. Long hairstyles shall be permitted on the job site if properly secured to prevent entanglement in machinery and equipment.

I. Respiratory protection will not be required; however, if vapors or mists exceed acceptable levels, NIOSH approved respirators will be used.

28. Radiation Hazards (Not Applicable)

29. Respiratory Protection

A. Respiratory protection will not be required. However, if vapors or mists exceed acceptable levels, Akana employees will leave the area and notify the Akana HSE Department for further direction.

B. If the scope of work changes, the Akana HSE Department shall be notified for coordination of appropriate training and equipment.

30. Safe Vehicle Operation

A. Akana personnel must comply with all BIA WRO vehicle operations requirements.

B. Akana personnel must comply with the DOI policy prohibiting texting while driving. Texting or text messaging means reading from or entering data into any handheld or other electronic device, including SMS texting, e-mailing, instant messaging, obtaining navigational information, or engaging in any other form of electronic data retrieval or electronic data communication.

C. Only properly maintained and operating vehicles and equipment are allowed on site. Brakes, lights, horn, tires, steering, windshield wipers, alarms etc. must function properly.

D. All vehicle occupants must properly use seat belts and any other required safety equipment at all times during vehicle operations.

E. Travel the most direct and safest route; observe all traffic laws.

F. Pedestrians always have the right-of-way. Always assume that pedestrians cannot see you.

G. Observe posted speed limits and do not travel faster than is safe for conditions.

H. Report all motor vehicle accidents to the Akana site supervisor and the BIA WRO representative.

I. Do not leave the scene of an accident in which you are involved, unless injured, without reporting to your supervisor.

J. Make sure loads on trucks are securely tied down and properly marked.

K. Vehicles should be carefully loaded to prevent loss, damage, or injury from falling objects. Any object that may fall off must be packed, tied, or otherwise secured.

31. Training

A. All personnel assigned to work on site will be provided a copy of this HASP prior to entering the site for field work and they will be required to understand and comply with the requirements in the HASP. Any contractors that will be working on-site will also be required to comply with their company's site specific HASP while on-site.

B. Work shall not be performed unsupervised unless worker has been properly trained and that training has been verified.

32. <u>EMERGENCY PHONE NUMBERS:</u>

Akana Company Representatives

Project Manager Said Amali Portland, OR 503-720-2116 said.amali@akana.us	Senior Environmental Scientist Carol Townsend Richardson, TX 214-676-2274 carol.townsend@akana.us
Project Geologist Brent Hamil Richardson, TX 469-506-9473 brent.hamil@akana.us	Technician Peter Van Zandt Austin, TX 512-987-1535 peter.vanzandt@akana.com
Technician Tim Norman Portland, OR 971-270-7937 tim.norman@akana.com	Corporate Health and Safety Manager Bill Renfroe Portland, OR Phone 503-939-2096 bill.renfroe@akana.us

BIA WRO Representatives:

911	**Emergency #**
(208-695-1484)	**Non-Emergency #**
(208-695-1484)	**Safety Dept. Rep. – Marty Leyva, BIA Facility Manager**
(602-379-3723)	**Client Rep. – John Krause, BIA Tech. Project Manager**

Clinics/Hospitals –

- FOR EMERGENCIES AND IMMEDIATE MEDICAL TREATMENT
  Use the following hospital/emergency room:

Nearest Emergency Room:

St. Luke's Elmore Medical Center
895 N. 6th E. Street
Mountain Home, ID 83647

Turn left toward NV-225 N
118 ft
Follow ID-51 N to N 4th E in Mountain Home
2 h 11 min (96.4 mi)
Turn left onto NV-225 N
Entering Idaho
3.9 mi
Continue onto ID-51 N
90.8 mi
Turn right onto ID-51 N/W 6th S St/Airbase Rd
Continue to follow ID-51 N
1.6 mi
Turn right onto ID-51 N/American Legion Blvd (signs for Fairfield)
0.1 mi
Drive to N 6th E St
1 min (0.4 mi)
Turn left at the 2nd cross street onto N 4th E
79 ft
Slight right onto N 6th E St
Destination will be on the left
0.3 mi

- FOR NON-LIFE THREATENING PHYSICIAN OCCUPATION INJURY REVIEW AND TREATMENT

Use the following clinic:

US Indian Health
1623 Hospital Loop (State Hwy 225)
Owyhee, NV 89832

SITE SAFETY SIGNATURE SHEET

The following site personnel have read the Site Specific Health and Safety Procedures and are familiar with its provisions.

NAME (print)	**SIGNATURE**	**DATE**

Plan reviewed by: Bill Renfroe, Corporate Safety Director

Project # 16-005

ATTACHMENT A

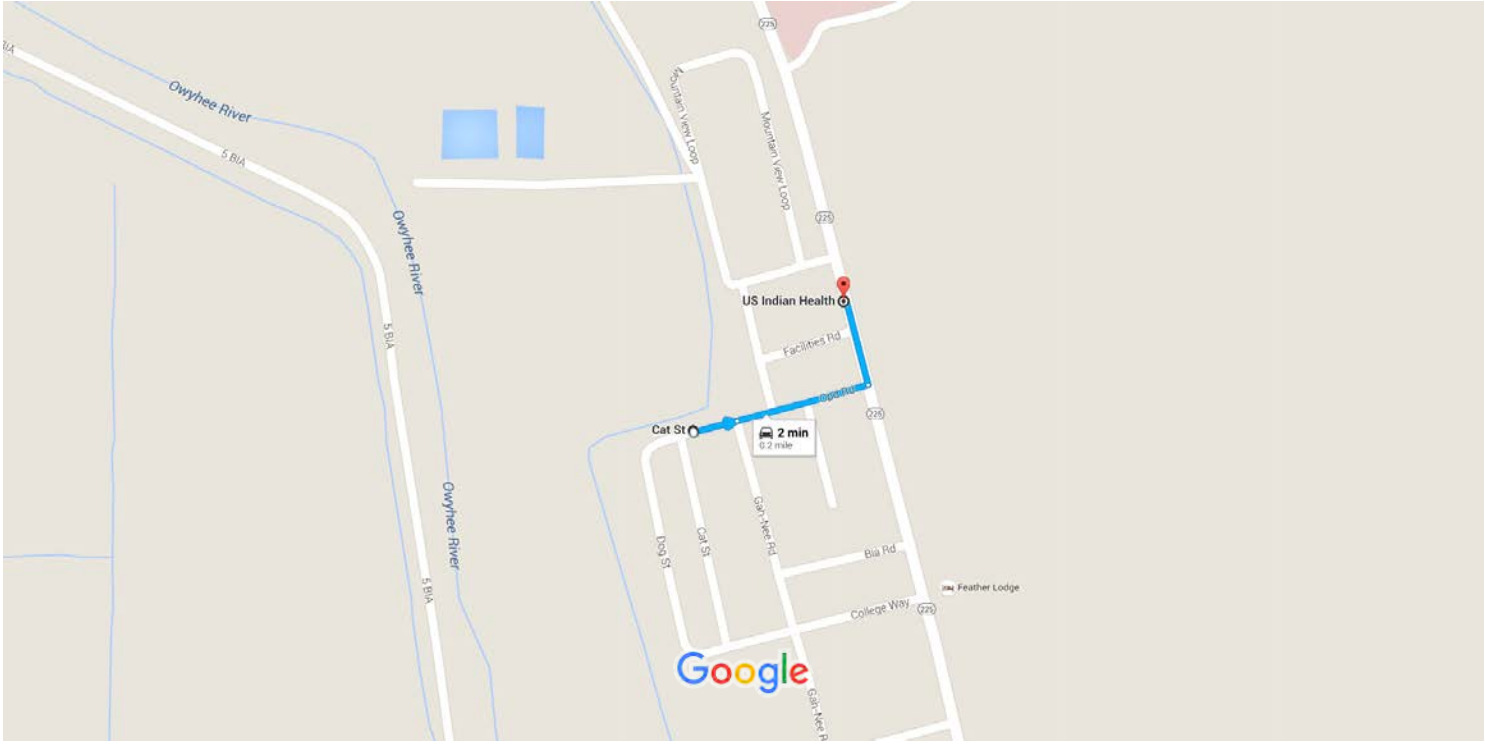
Maps & Routes To Nearest Hospital

Google Maps

Cat St, Owyhee, NV 89832 to US Indian Health

Drive 0.2 mile, 2 min

NEAREST NON-EMERGENCY CLINIC



Map data ©2016 Google 200 ft

Cat St

Owyhee, NV 89832

1. Head east toward Gah-Nee Rd

151 ft

2. Continue onto Opd Rd

463 ft

3. Turn left onto NV-225 N

Destination will be on the left

299 ft

US Indian Health

1623 Hospital Loop, Owyhee, NV 89832

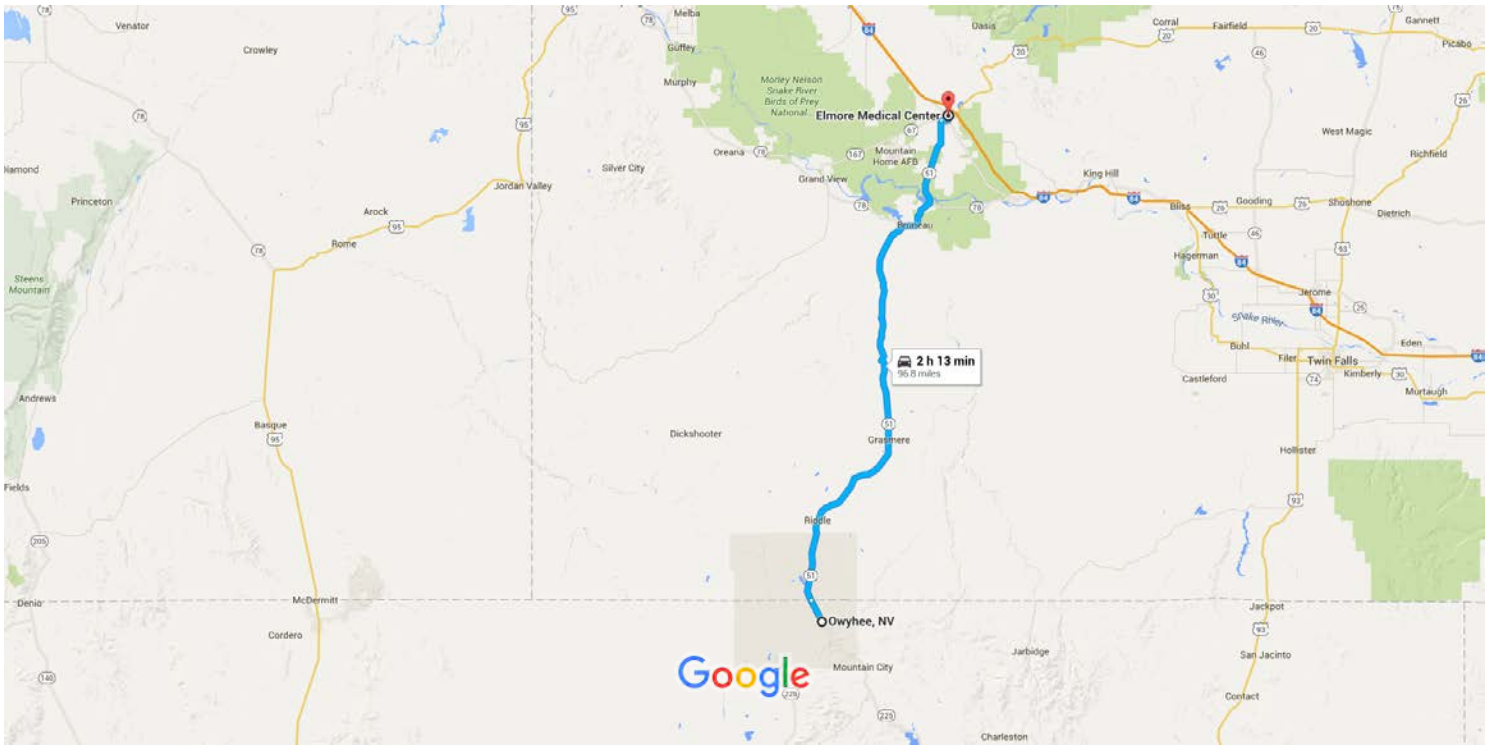
These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Google Maps

Owyhee, NV to Elmore Medical Center

Drive 96.8 miles, 2 h 13 min

NEAREST EMERGENCY ROOM



Map data ©2016 Google 10 mi

via ID-51 N

2 h 13 min

2 h 8 min without traffic

96.8 miles

Owyhee, NV

Take Mountain View Loop to NV-225 N
19 s (292 ft)
Head south on Mountain View Loop
174 ft
Turn left toward NV-225 N
118 ft
Follow ID-51 N to N 4th E in Mountain Home
2 h 11 min (96.4 mi)
Turn left onto NV-225 N
Entering Idaho
3.9 mi
Continue onto ID-51 N
90.8 mi
Turn right onto ID-51 N/W 6th S St/Airbase Rd
Continue to follow ID-51 N
1.6 mi
Turn right onto ID-51 N/American Legion Blvd (signs for Fairfield)
0.1 mi
Drive to N 6th E St
1 min (0.4 mi)
Turn left at the 2nd cross street onto N 4th E
79 ft
Slight right onto N 6th E St
Destination will be on the left
0.3 mi
Elmore Medical Center
895 North 6th East Street, Mountain Home, ID 83647

ATTACHMENT B

Tailgate Safety Forms

Daily Tailgate Safety Meeting Record

AKANA
Plan + Design + Engineer + Manage

Time _____

Facility _____

Location _____

Client Name _____

Meeting Led By: _____

General Activities To Be Performed This Day:

- ☐ Soil Sampling - Drill Rig/GeoProbe
- ☐ Soil Sampling - by hand
- ☐ Well Installation
- ☐ Excavations (pits, trenches, etc)
- ☐ Groundwater Sampling - bailing
- ☐ Groundwater Sampling - pumps
- ☐ Groundwater Sampling - passive (no-purge)
- ☐ Mapping/Surveying
- ☐ Inspections
- ☐ Other _____

Discussion Topics for Todays Safety Meeting:

- ☐ Tasks to be performed today and task assignments
- ☐ Weather Conditions anticipated for today
- ☐ PPE and other requirements for today's activities
- ☐ Actual and/or Potential safety issues from previous day
- ☐ Any possible and/or anticipated safety issues for today
- ☐ Anticipated Work Hours
- ☐ If in several locations, means of communication and contact information

Other and/or Project-Specific Topics Discussed:

_____

_____

_____

Notes

_____

_____

_____

_____

Today's Participants

Print Name	*Signature*	*Company*

ATTACHMENT C

Job Safety Analysis Forms

Akana Inc. **Job Safety Analysis (JSA) Form** **Form HSE - 005**	Duck Valley Investigation & Monitoring of Petroleum Impacts	Client/ Site Name: BIA – Duck Valley Job/Permit/Work Order #:

Section A – General Site Information

Date:		Unit:	Sho-Pai Indian Reservation	Contact Name:	John Krause
Time:		Area:	Owyhee, Nevada	Contact Phone:	602-379-3723

Section B – Labor Crew Information

Crew Leader:		Brief Job Description:	Groundwater Sampling & Phase II Environmental activities: Perform Quarterly Groundwater Sampling Events and Phase II Environmental activities which include subsurface soil and groundwater investigations utilizing drilling rigs and Geoprobe units			
Crew Members: ***(Print and Sign)*** *(By signing, the employees acknowledge they have reviewed all hazards and controls identified)*	1. _____ 2. _____ 3. _____ 4. _____ 5. _____	❒ **Groundwater Sampling** ❒ **Phase II Environmental activities** ❒	❒ ❒ ❒ ❒	❒ ❒ ❒ ❒	❒ ❒ ❒ ❒ Other	

Section C – Emergency Action Plan

Emergency Phone Number(s): 911, **Carol Townsend – 214-676-2274** **Brent Hamil – 469-506-9473** **Peter Van Zandt – 512-987-1535** **Tim Norman – 971-270-7937** **Bill Renfroe - 503-939-2096**	Wind direction. (Use steam plumes or wind socks.)	Location of muster point nearest your location: **Assemble at vehicle – preferably upwind.**
Location / Type of Extinguishing Equipment: **NA**	First Aid Station**: NA**	Emergency Exits / Evacuation Route:
Equipment Shut Down Procedures: **NA**	Safety Shower/Eye Wash: **NA**	Identify weather conditions that could create a hazard & precaution steps:
Identify locations of the unit that are barricaded:	Location of SDS: **NA**	Has a pre-job review been performed with Operations? ❒ Yes ❒No (If no, do not proceed until the review has been conducted)

This form **must** be completed and reviewed by all parties involved prior to the start of each task. The JSA **must** be revised whenever there is a change in personnel or whenever conditions necessitate additional review of hazards. By completing this document, it implies the proper "Hazard Assessment" has been performed and that all parties understand their responsibility in complying with the control methods outlined. Employees who refuse to review and/or comply with the JSA shall not be allowed to proceed with the task.

Section D – General Hazard Assessment

Potential Hazard(s)		Methods To Control / Eliminate Hazards Identified	Review
Hand Injury	X Yes ❒ No	Wear correct gloves, make sure guards are in place, use proper tool. Identify pinch points. Avoid hot pipes/ steam lines.	❒
Fall Hazard	❒ Yes X No	Inspect fall protection prior to use. Full body harness w/twin leg shock absorbing lanyard. Ensure adequate anchor point. Request installation of railing. Ensure proper climbing angle (4:1). Maintain 3 points of contact when climbing or descending.	❒
Eye Injury	X Yes ❒ No	Safety Glasses. Upgrade to Face Shield / Chemical Goggles or combination, when needed.	❒
Lifting Hazards	❒ Yes X No	Know your limits. Use lifting / carrying devices. Ensure rigging has been inspected.	❒
Falling Objects	❒ Yes X No	Identify overhead work and avoid these areas. Rope off areas/ attach proper signs. Install netting as needed. Wear Hard Hat.	❒
Head Injury	X Yes ❒ No	Identify low hanging objects with tape/tags. Wear proper head protection. Scan above and around before walking or standing up.	❒
Chemical Exposure	X Yes ❒ No	Know what chemicals are in unit. Utilize proper PPE (wear chemical resistant clothing, gloves, face shield, respirators as necessary). Be observant for audio, visual, or olfactory leaks. Report all spills/leaks.	❒
Excessive Noise	X Yes ❒ No	Wear appropriate hearing protection. (Ear plugs, muffs or combination)	❒
Heat /Cold Stress	X Yes ❒ No	Drink plenty of fluids. Utilize Work-Rest Cycles. Ensure adequate clothing. Construct wind barriers. Limit exposure times. Avoid wet conditions.	❒
Slippery Surface / Tripping Hazards	X Yes ❒ No	Use absorbent. Dry area. Warn others. Barricade area if not corrected. Hang cords and hoses overhead or use traffic ramp. Be observant for trip hazards and do not walk while looking at the LeakTracker (datalogger) screen.	❒
Foot Injury	X Yes ❒ No	Wear Steel Toe Boots. Identify uneven surfaces. Be aware of foot placement. Take measures to eliminate hazards.	❒
Hot Processes / Objects / Surfaces	❒ Yes X No	Wear protective gloves, face shield and/or heat suits, as needed. Apply proper barriers for protection against heat sources. Avoid line of fire.	❒
Respiratory Hazard	X Yes ❒ No	Move up wind. Determine if IDLH atmosphere. Monitor air quality, as needed. Ventilate area to eliminate hazards. Determine respirator required for hazard(s). If respiratory protection needed, leave area.	❒
Electrical Hazard	❒ Yes X No	Use GFCI, Low Voltage Lighting. Have Electrician connect or disconnect equipment to eliminate hazards. Ensure proper grounding of equipment.	❒
Confined Spaces	❒ Yes X No	Identify ALL hazards of space. Obtain Permits. Monitor atmosphere for hazards. Ventilate as needed. Verify proper egress.	❒
Stored Energy (LO/TO Required)	❒ Yes X No	Verify isolation of energy source before beginning work. Ensure bleed valves opened and lines cleared. Ensure affected personnel are notified.	❒
Rotating Equipment	❒ Yes X No	Remove / secure loose clothing, long hair or jewelry. Establish clearance for body position. Ensure Barricades/ Guards are in place.	❒
Animals / Insects	X Yes ❒ No	Be cautious of confined areas and observe for nests.	❒

Are any permits required and have they been issued?	❒ Yes X No
Have employees received the proper training/certifications necessary to perform this task? (If no, Stop and Take Action)	X Yes ❒ No
Have employees received instructions on equipment and tools to be used? (If no, Stop and Take Action)	X Yes ❒ No
Have all tools/equipment been inspected prior to starting work? (If no, Stop and Take Action)	X Yes ❒ No
Will Ladders Be Used? (If yes, verify they have been inspected by a competent person and secured prior to use)	❒ Yes X No
Will Scaffolds Be Used? (If yes, verify inspection via competent person, tagged/completed, & emergency egress determined prior to use)	❒ Yes X No
If using equipment such as Forklift, JLG or Scissor Lift, has operator been properly trained? (If no, Stop and Take Action)	❒ Yes ❒ No X N/A
Have inspections been performed on equipment such as Forklifts, JLGs or Scissor Lifts prior to operating? (If no, Stop and Take Action)	❒ Yes ❒ No X N/A
Have procedures been reviewed for performing a Critical Lift of equipment or materials? (If no, Stop and Take Action)	❒ Yes ❒ No X N/A
Have lifting and rigging devices been inspected for wear and defects prior to lift? (If no, Stop and Take Action)	❒ Yes ❒ No X N/A
Are compressed gas cylinders properly secured and stored. Are connections leak free? (If no, Stop and Take Action)	❒ Yes ❒ No X N/A
Has LO/TO isolation been verified for control of energy sources? (If no, Stop and Take Action)	❒ Yes ❒ No X N/A
Have areas been properly barricaded and signs posted, when required? (If no, Stop and Take Action)	❒ Yes ❒ No X N/A
Have non-essential personnel been removed from controlled areas? (If no, Stop and Take Action)	❒ Yes ❒ No X N/A
Have all identified hazards been discussed by the task performers? (If no, Stop and Take Action)	X Yes ❒ No

Section E – PPE Requirements *(All PPE must be inspected prior to use)*

Minimum At All Sites	Additional Requirements	Respirator / Cartridge Type	
X Hardhat X Safety Glasses X Safety Goggles X Hearing Protection X Flame Retardant Clothing X Gloves (Type: Nitrile) X Safety Toe Shoes	□ Fall Arrest Harness □ Personal Monitor (Type: H2S) □ Other:_____	**Full Face (Model: 3M 6x00)** □ Particulates □ Acid Gas □ Organic Vapor **Valid Fit Test?** _____ **Full Face (Model: Scott AV 2000)** □ Supplied Air Respirator □ SCBA **Valid Fit Test?** _____	**Escape Respirator** □ Type: _____

Do all task performers have required PPE? ❒ Yes ❒ No (If no, STOP and Take Action)

Print Name:	Sign Name:

Section F – Job Hazard Analysis / Job Breakdown (Identify **task specific** hazards and control methods)

Principle Steps Of Task	Potential Safety Hazards	Recommended Controls
Working outdoors	**Exposure to Animals/Insects and Environmental conditions**	**First aid kits, hydration liquids, protective clothing**
Working in areas with potentially contaminated materials.	**Dermal, oral or inhalation exposure to contaminants in the form of soil, water, vapor, mist, etc.**	**Safety glasses with side shields, face shields, chemical resistant nitrile gloves. NIOSH approved respirator cartridges should be used if vapors or mists exceed acceptable levels**
Working around noisy equipment	**Noise above 85 db from site equipment.**	**Hearing protection within 20 feet of operating equipment**
Underground (buried) utilities	**Fire, Explosion, Water and possible interruption of service (Electrical, Water, Gas, and telecommunications)**	**Contact line locater company prior to start of subsurface activities**
Working in areas that are cluttered or have limited mobility	**Slips, trips, and falls.**	**Hard hats, steeled toed shoes, visual awareness**
People in the area	**Injury to workers and non-essential personnel due to lack of training, PPE, job site knowledge, and disturbance**	**Limit site access to authorized and trained personnel only**
Traffic hazards	**Injuries to workers and vehicle operators**	**Traffic cones, barricades, caution tape, and spotters**

Equipment To Be Used	Inspection Requirements	Training Requirements
Hard hats, safety glasses with side shields, chemical resistant nitrile gloves, protective clothing, steel toed shoes	**Daily**	**HAZWOPER**

Section G – Critical Job Data

The Below Jobs Require Consultation With Akana Health & Safety Dept. And Issuance Of CJ# Prior To Performing Task			Akana Inc, HSE Dept.
□ IDLH or Hazardous Chemicals □ Respiratory Protection □ Confined Space □ Work from Height and/or Unstable Work Platform □ Change to Scope of Work □ Radiation Hazard	X PPE Requirements or Upgrades □ Carcinogenic Materials □ Any Job That Presents or Raises a Concern □ Severe Blow and Large Volume Leaks	Field MTCE □ > 800 F □ < -20 F □ > 1500 psi □ □	**Bill Renfroe: 503-939-2096** **Critical Job#_____-HSE**

Section H– Job Completion / Review

Was anyone injured, or did a close call or unplanned incident occur today during this task?	❒ Yes ❒ No ❒ N/A
If Yes, was the incident or injury reported to the Akana HSE Department and the Client?	❒ Yes ❒ No

Section I– Management Review

Supervisor	Safety Representative
Signature:	Signature:

ATTACHMENT D

Near Miss Reporting Forms

Akana Near Miss Report
Form HSE - 029

Section 1 - Incident Information

Occurrence Date and Time:	Date:	Time:	Facility:	
Date and Time Reported:	Date:	Time:	Unit/Location:	
Department:			Activity Time of Accident:	
			☐Travel	☐Sampling
			☐Drilling	☐Maintenance
			☐Physical/Chemical Exposure	☐Other

Description of Incident

Brief Description:

Detailed Description of Incident to include Who, What, When, Where, Why- including justification for classification of recordability:

Drug / Alcohol Information (Complete if employee involved in accident/incident.)

Was a drug & alcohol test administered?	☐No ☐Yes – within 2 hours ☐Yes – within 8 hours ☐Yes – within 32 hours (drugs only)
If No, why was the test not performed:	

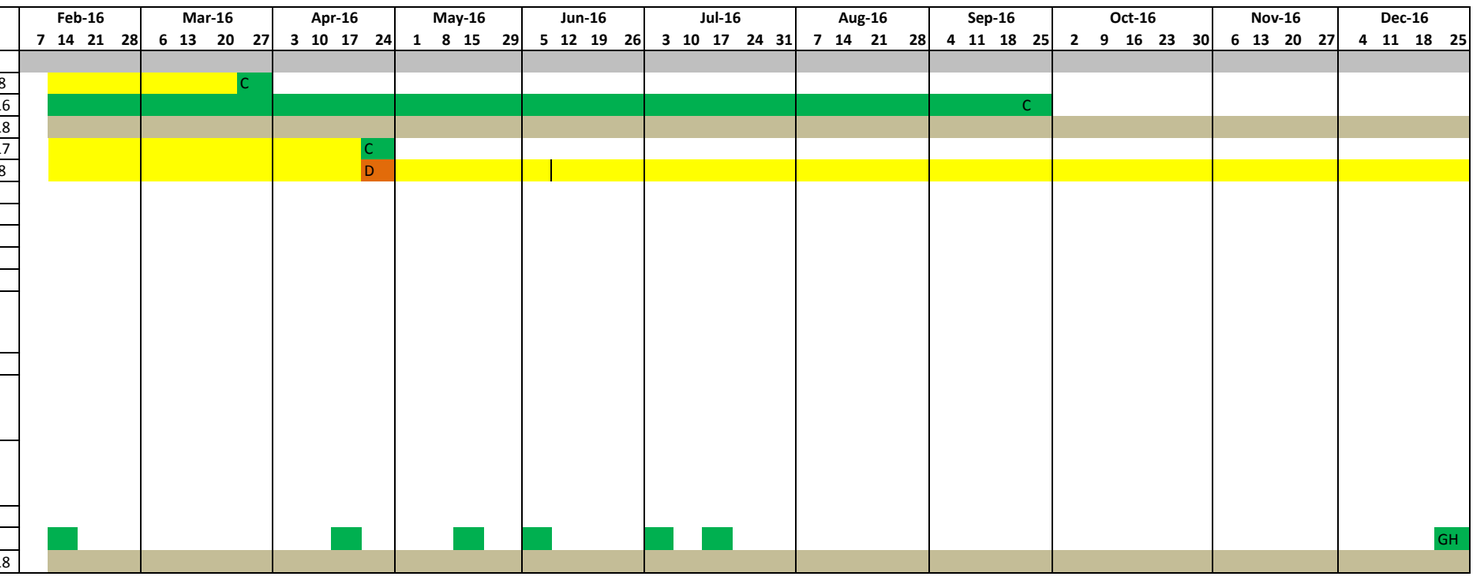
Incident Reported by:	Form Completed by:	Person in charge of activity at time of incident:	
Name:	Name:	Name:	
Phone:	Phone:	Phone:	Department:

APPENDIX K

GANTT CHART

(4 Page)

	Task Name (2016)	Duration	Start	Finish
Phase I		19 months		
Task 1	Records Review	2 weeks	2/21/2016	3/6/2018
Task 2	AO Review / GAP Analysis	10 weeks	2/21/2016	9/25/2016
Task 3	Site Visit/Meeting	8 hours	8/17/2018	8/17/2018
Task 4	Preliminary GW Sampling	1 week	4/25/2017	4/29/2017
Task 5	Project Work Plan	570 days	2/1/2016	9/1/2018
Phase II: Field Investigations and Reports		16 months		
Task 6	Well Installation and Soil Sampling	12 days		
Task 7	Elevation Surveying (4 x 2 days)	8 days		
Task 8	GW Sampling Event (3 x 3 days)	9 days		
Task 9	Remedial Investigation Report	90 days from end of GW monitoring period		
Phase III: Remedial Planning		13 months		
Task 10	Remedial Design Plan	180 days from RI Report		
Task 11	Remedial Implementation Work Plan	200 days from RI Report		
Teleconferences, Meetings and Support		26 months		
Task 12	Teleconferences (7 x 1.5 hrs)	10.5 hours		
	Technical Meeting (Owyhee, NV)	8 hours	8/17/2018	8/17/2018



Complete
In Progress /duration
Phase Duration
D = Draft Document
F = Final Document
To Be Determined

	Task Name (2017)	Duration	Start	Finish
Phase I		19 months		
Task 1	Records Review	2 weeks	2/21/2016	3/6/2018
Task 2	AO Review / GAP Analysis	10 weeks	2/21/2016	9/25/2016
Task 3	Site Visit/Meeting	8 hours	8/17/2018	8/17/2018
Task 4	Preliminary GW Sampling	1 week	4/25/2017	4/29/2017
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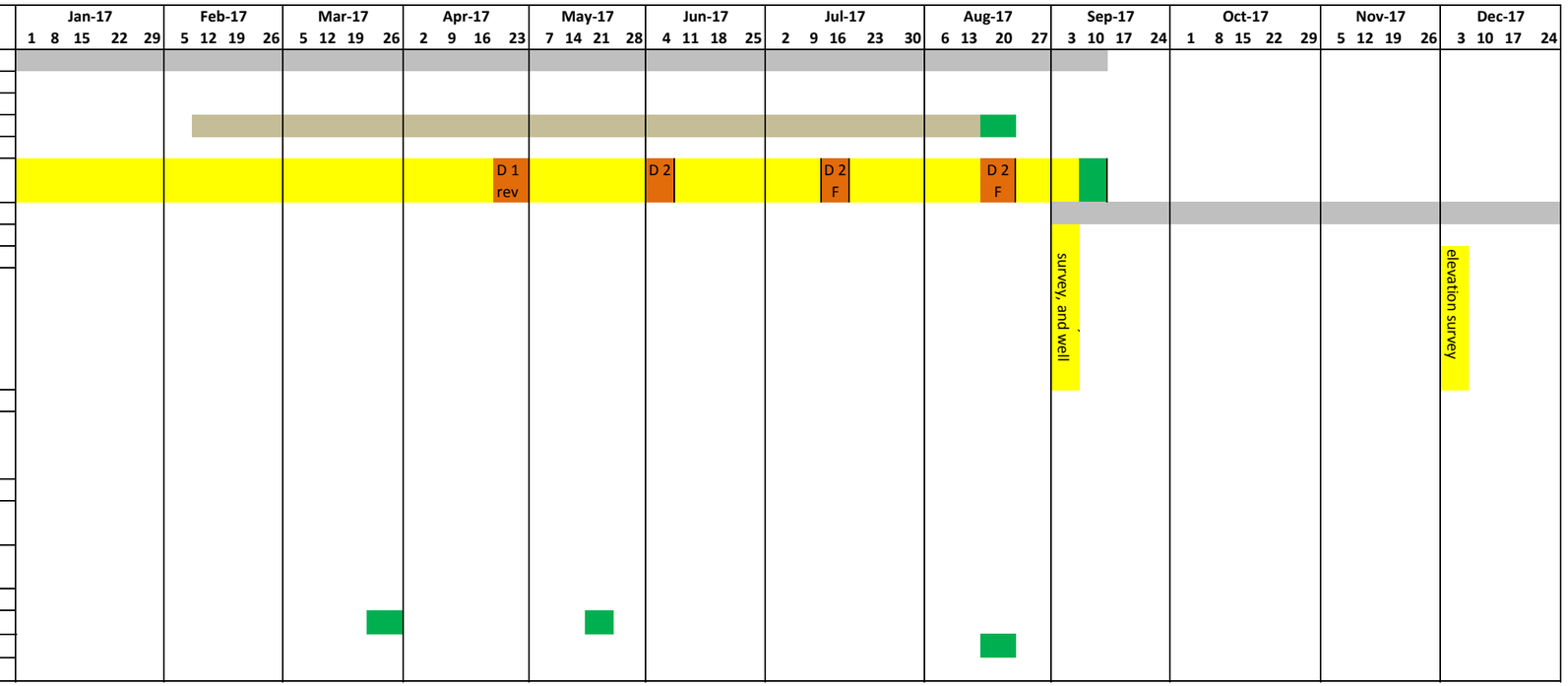

Complete
In Progress /duration
Phase Duration
D = Draft Document

	Task Name (2018)	Duration	Start	Finish
Phase I		19 months		
Task 1	Records Review	2 weeks	2/21/2016	3/6/2018
Task 2	AO Review / GAP Analysis	10 weeks	2/21/2016	9/25/2016
Task 3	Site Visit/Meeting	8 hours	8/17/2018	8/17/2018
Task 4	Preliminary GW Sampling	1 week	4/25/2017	4/29/2017
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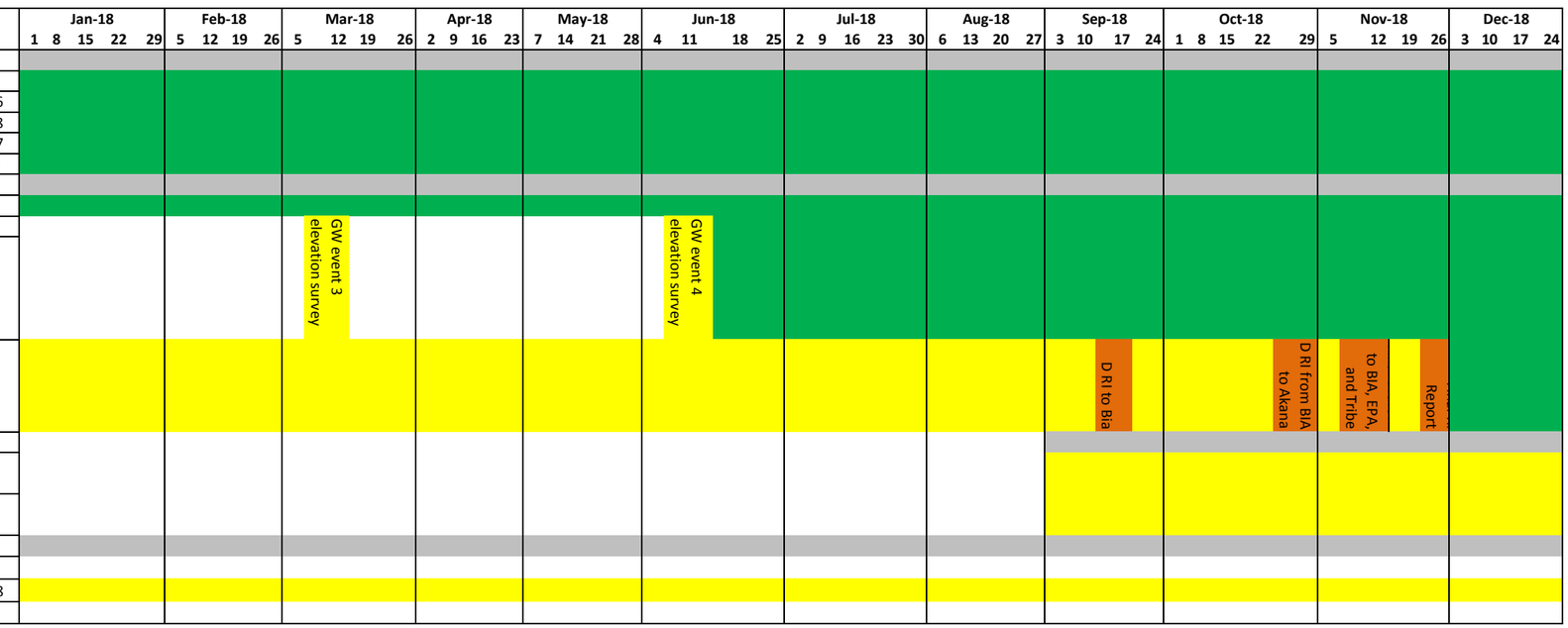

Complete
In Progress /duration
Phase Duration
D = Draft Document

	Task Name (2018)	Duration	Start	Finish
Phase I		19 months		
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Task 2	AO Review / GAP Analysis	10 weeks	2/21/2016	9/25/2016
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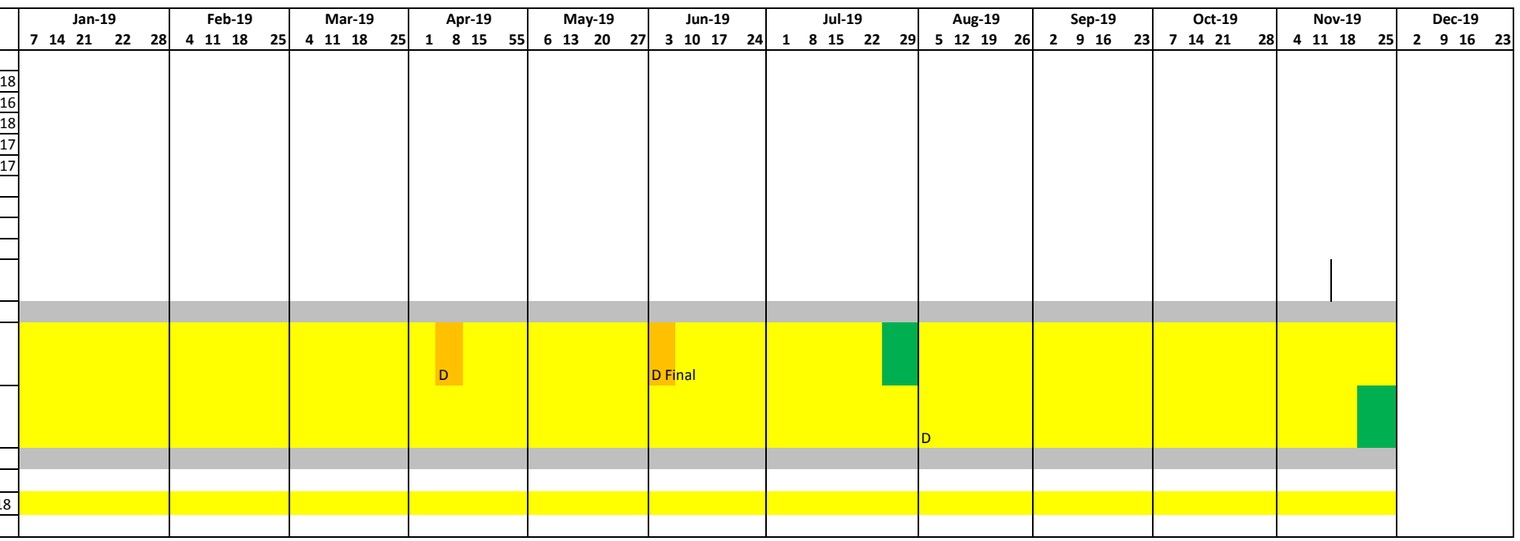

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Phase Duration