Former Fearless Gas Station Remediation Schedule:

NDEP Public Comment Review End Date: July 8, 2024

Start of Corrective Action: on or before October 6, 2024

McGinley & Associates
A Universal Engineering Sciences Company

Reno
6995 Sierra Center Parkway
Reno, Nevada 89511
Ph: 775.829.2245

Las Vegas
4480 W Hacienda Ave #104
Las Vegas, NV 89118
Ph: 702.873.3478

www.mcgin.com

- Site Remediation
- Soil & Groundwater Investigations
- Geochemistry
- Hydrogeology
- Groundwater Modeling
- Biological Services
- Closure Optimization
- Air Quality Permitting & Modeling
- Brownfields Redevelopment
- Permitting & Compliance
- NEPA Studies
- Phase I Assessments
- Indoor Air Quality
- Storm Water & Spill Plans
- Underground Tank Services
- Geographic Information Systems
- Litigation Support & Expert Witness
- Mining Plans of Operations
- Mining Exploration Notices
- Abandoned Mine Lands

SAMPLING AND ANALYSIS PLAN AND CORRECTIVE ACTION PLAN

Former Fearless Farris
1010 6th Street
Wells, NV 89835
NDEP Contract #DEP22-001
Task MA30-23
Facility ID 6-000160

Prepared for:

State of Nevada
Department of Conservation and Natural Resources
Division of Environmental Protection
Bureau of Corrective Actions
Attn: Ruben Ramos-Avina
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701-5249

On Behalf of:

The City of Wells

May 24, 2024

Corrective Action Plan and Sampling and Analysis Plan for:

Former Fearless Farris Gas Station
1010 6th Street
Wells, Nevada

May 2024

McGinley Principal: _____
Joe McGinley, P.E., C.E.M.

McGinley Project Manager: _____
Caitlin Jelle, P.E., C.E.M.

McGinley QA Project Manager: _____
Anna Henry, C.E.M.

NDEP Brownfields Quality: Coordinator: _____
Michael Antoine

NDEP Brownfields Program Coordinator: _____
Ruben Ramos-Avina

TABLE OF CONTENTS

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

ASTM	American Society for Testing & Materials
CAP	Corrective Action Plan
CFR	Code of Federal Regulations
DQI	Data Quality Indicators
DQO	Data Quality Objectives
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
FSP	Field Sampling Plan
GPS	Global Positioning System
HASP	Health and Safety Plan
HUD	Department of Housing and Urban Development
MDL	Method Detection Limit
McGinley	McGinley & Associates
MQO	Measurement Quality Objective
NAC	Nevada Administrative Code
NBP	Nevada Brownfields Program
OSHA	Occupational Safety and Health Administration
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
PID	Photoionization Detector
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
REC	Recognized Environmental Condition
RL	Reporting Limit
RPD	Relative Percent Difference
SAP	Sampling and Analysis Plan (an integrated FSP and QAPP)
SD	Standard Deviation
SOP	Standard Operating Procedures
SRM	Standard Reference Material
UST	Underground Storage Tank

1. INTRODUCTION

McGinley and Associates, Inc. (McGinley) has prepared this Corrective Action Plan (CAP) and Sampling and Analysis Plan (SAP) for the investigation, excavation, and confirmation sampling activities to be conducted at the former Fearless Farris Stinker Station #81 located at 1010 6th Street in Wells, Nevada (Site). This CAP and SAP were prepared in accordance with the Nevada Division of Environmental Protection (NDEP) Quality Assurance Plan (QA Plan) prepared for the Nevada Brownfields Program (NBP) (NDEP, 2022).

The proposed activities described in this CAP/SAP includes an environmental site assessment to identify and excavate impacted site soils associated with the historical release(s) of gasoline and diesel from a former underground storage tank (UST) system. This SAP addresses sample collection, analytical procedures, quality control/quality assurance, and data review procedures for the collection and analysis of soil samples to evaluate potential impacts of total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylene (BTEX) and methyl tert-butyl ether (MTBE) in Site soils prior to and following excavation. The Site is located in an area slated for mixed-used redevelopment. However, the open NDEP case associated with the Site will complicate the proposed redevelopment. This evaluation will be used to determine the current conditions of onsite soil conditions to formulate a path to case closure and help prepare the Site for redevelopment.

1.1 Site Name

Former Fearless Farris Stinker Station #81 (Fearless Farris).

1.2 Site Location and Description

The Site is comprised of approximately 2.41 acres of generally vacant land which was formerly developed as a gasoline station consisting of a convenience store building and two dispenser islands. The Site is located at 1010 6th Street in Wells, Nevada and is listed with Elko County, Nevada as Assessor's Parcel Numbers (APNs) 002-760-001 and 002-760-002. Geographically, the Site is located in the NW ¼ of the SW ¼ of Section 10, Township 37 North, Range 62 East, of the Mount Diablo Baseline and Meridian. The location of the Site is indicated on Figure 1. The former layout of the Site, prior to demolition of the convenience store and dispenser islands, is illustrated on Figure 2.

1.3 Responsible Agency

This project is being conducted for the NDEP through the NBP. The investigation will conform to the requirements within the QA Plan (NDEP, 2022).

1.4 Project Organization

Title/Responsibility	Name	Phone
City of Wells		
Site Contact	Jason Pengelly	(775) 752-3355
NDEP		
Program Coordinator for the NBP – Project coordination, Quality Assurance (QA)	Ruben Ramos-Avina	(775) 687-9572
Quality Coordinator for the NBP – Review SAP, QA	Michael Antoine	(775) 687-9490
Supervisor and Technical Lead for the NBP	David Friedman	(775) 687-9385
US Environmental Protection Agency (EPA)		
USEPA Nevada Program Officer	Lisa Hanusiak	(415) 972-3152
McGinley and Associates, Inc.		
Principal – Senior review	Joe McGinley	(775) 829-2245
Project Manager – Project management, regulatory liaison, coordinate field activities, data review, report preparation.	Caitlin Jelle	(775) 829-2245
Quality Manager / Field Services Manager – Oversee implementation of SAP, review QA and Quality Control (QC) procedures, conduct sampling activities, data validation.	Anna Henry	(775) 829-2245
GIS Services – Mapping support	Heather Chambers	(775) 829-2245
Administrative Assistant – Administrative support	Sydney Wooten	(775) 829-2245
Contractors/Vendors		
Pace Analytical – Analytical Laboratory	Chris Ward	(615) 773-9712

2. BACKGROUND

A Phase I Environmental Site Assessment (ESA) of the Site was conducted by McGinley and dated April 15, 2020. The Phase I ESA report identified the following recognized environmental conditions (RECs):

- According to NDEP files reviewed, one underground storage tank (UST) was closed in place and four USTs were removed from the Site in 1998. Soil contamination exceeding the soil action level of 100 mg/kg total petroleum hydrocarbons (TPH) was identified and subsequent groundwater monitoring identified benzene concentrations exceeding the state action level of 5 µg/L. Several different environmental professionals had conducted work at the Site over time, and a variety of passive remediation activities were intermittently implemented. According to the most recent documentation from 2019, the NDEP has been attempting to obtain a work plan to investigate the extent of the contaminant plume, a schedule for installation of downgradient monitoring wells, and a Corrective Action Plan (CAP) to address the contaminant source from Fearless Farris since 2014. As this case remains active, an NDEP-approved CAP does not appear to be in place, recent years' groundwater and soil sampling efforts do not appear to have been properly conducted under the supervision of a certified environmental manager (CEM), and records indicate potential plume migration offsite; therefore, the Site release associated with historical Site operations represents a REC.

2.1 Site Description

According to the Elko County Assessor's Office, the Site is identified as APNs 002-760-001 and 002-760-002. The current property owner for both parcels is the City of Wells. CJSD Holdings, Inc. is the previous owner. The land use code of APN 002-760-001 is *Vacant Commercial,* and the zoning code is *Town Center*. APN 002-760-001 is listed as 1.41 acres in size and no improvements are listed by the Assessor for this parcel. The land use code of APN 002-760-002 is *Vacant Commercial,* and the zoning code is *Town Center*. APN 002-760-002 is listed as 1.00 acres in size and no improvements are listed by the Assessor for this parcel.

2.2 Operational History

The Site appears to have been first developed in the 1950s with a small structure which appeared similar to the existing convenience store building location; however, operations onsite during this time are unknown. By 1976, the Site was developed with a gasoline station and a convenience store building. The station has been vacant since at least 2014. Recently, the City of Wells demolished all of the structures on both parcels.

2.3 Previous Investigations/Regulatory Involvement

In February 1998, four USTs were removed from the ground: one 4,000-gallon gasoline tank; two 10,000-gallon gasoline tanks; and one 10,000-gallon diesel tank. One additional 10,000-gallon diesel tank was also located onsite but was closed in place due to proximity to the convenience store building. Contamination was identified in the vicinity of the UST systems that were removed, with a maximum of 1,320 mg/kg TPH in the gasoline range (GRO) and 11,000 mg/kg TPH in the diesel range (DRO). The groundwater at that time was recorded to be approximately 10 feet below ground surface (bgs). A Release/Spill (RSpill) letter was requested by NDEP for the Fearless Farris facility in March 1998. Additional Site assessment was performed in mid-1998 to further characterize soil and groundwater contamination. In the first quarter of 1999, remediation activities commenced at the Site. Several different environmental professionals have conducted work at the Site over time, and a variety of passive remediation activities have been implemented including intermittent soil vapor extraction (SVE) and phytoremediation.

As of 2012, the NDEP records indicated the majority of the passive phytoremediation trees had died, but that the turbines on the soil venting system appeared to be operating at the time. According to the NDEP, it was opined that a more aggressive remediation approach may be necessary as the passive phytoremediation system had been ineffective in stopping the expansion and migration of the plume offsite. Six wells were sampled and benzene was reported in the groundwater up to 2,600 µg/L in MW-11, which exceeds the action level of 5 µg/L. The 2012 records also identified that the water bailed from each well in the sampling process was being dumped onsite onto piles of dirt in the "back" of the property. These soil stockpiles were reportedly associated with the removal of contaminated soil during closure of three USTs in 1998. As such, the NDEP stated the stockpiled soils will need to be characterized prior to offsite disposal.

According to the documents provided during the 2010s, Fearless Farris representatives appeared to be collecting samples themselves and preparing the associated reports rather than utilizing a CEM. The most recent sampling data identified in the file was dated April 2018 and appeared to represent that the groundwater samples collected were below the associated action levels for the constituents sampled.

The most recent document identified in the file obtained from the NDEP was a letter from the NDEP to Fearless Farris representatives dated October 9, 2019. This letter indicates that since February 2014, the NDEP had requested a work plan to investigate the extent of the contaminant plume, a schedule for implementation of downgradient monitoring wells, and a CAP to address the contaminant source from Fearless Farris. Letters requesting this information were reportedly sent

in 2014, 2016, 2017, and 2018; however, the requested documentation had not been provided to the NDEP. The NDEP also stated they had not received the biannual sampling information required for 2016 and 2017. It also appears that the reports for 2018 and 2019 were not provided in the file and may not have been prepared either.

The Site is located along a section of 6th Street in the City of Wells, identified as a key feeder for visitor traffic coming from Interstate 80 and US Highway 93, and therefore a focus area for redevelopment. The city established this section of 6th Street as a redevelopment area (RDA) to provide tax and other incentives to developers and new businesses to promote desired redevelopment. The city recognized the Site, along with adjacent and nearby parcels, with blighted structures as barriers to achievement of the RDA's goals. The city engaged the NBP to assess and remediate the other 6th Street properties (e.g., Ranch Café and Casino). The former Fearless Farris gas station is an especially difficult property to redevelop because of the groundwater contamination issue. In consultation with the NDEP Bureau of Corrective Actions case officer and the NBP, the city acquired the Site and immediately began addressing the outstanding compliance issues pertaining to the groundwater contamination case.

Quarterly groundwater monitoring was conducted by McGinley, through the NBP, between the second quarter 2021 and the first quarter of 2022, and the second quarter of 2023 through second quarter of 2024. As of the most recent monitoring event (March 2024), benzene concentrations exceeding the action level of 5 µg/L were reported in six of the 11 sampled wells with concentrations ranging from 8.41 µg/L (MW-5) to 1,390 µg/L (MW-11). Ethylbenzene concentrations exceeding the action level of 700 µg/L were reported in three of the 11 wells sampled ranging from 833 µg/L (MW-5) to 1,330 µg/L (MW-13). The benzene plume is located north of the former building and dispenser islands and extends to the northeast. The downgradient edge of the plume is not fully delineated, as COCs exceeding state action levels were discovered in MW-13, the furthest down-gradient well.

2.4 Geological Information

The Site is located within the Basin and Range Physiographic Province at an elevation of approximately 5,645 feet above mean sea level. The geology underlying the Site has been mapped as Quaternary alluvial deposits. The deposit is described as relatively thin, coarse, and poorly sorted silt, sand, and gravel (Coats, 1975). The surficial soils found at the Site have been mapped as the Valmy-Enko association with slopes ranging from zero to four percent. The unit is classified as hydrologic soil group B, which is characterized by moderately low runoff potential when thoroughly wet as water transmission through the soil is unimpeded (NRCS, 2016).

There are no surface water bodies such as streams or wetlands located on the Site. The nearest major surface water body to the Site is the Humboldt River, which is located approximately 1.5 miles north of the Site. Multiple groundwater monitoring wells are located onsite and appear to have been installed for the Fearless Farris Corporation circa 1998, 1999, and 2004. Well logs reviewed indicate the wells were drilled to depths ranging from ten to 18 feet bgs and groundwater has fluctuated between approximately 6.75 to 15 feet bgs. Groundwater flow direction at the Site is generally toward the northeast.

2.5 Environmental and/or Human Impact

Based on the review of readily accessible public information and interviews conducted for the Phase I ESA, it does not appear that adverse human health effects associated with potential contamination at this Site have been reported or documented. However, the potential exists for receptors to interact with impacted soil and/or groundwater. If case closure is granted through the groundwater exemption pathway, a sensitive receptor analysis will be required prior to closure.

3. PROJECT DATA QUALITY OBJECTIVES

3.1 Project Task and Problem Definition

The purpose of this SAP/CAP is to identify and remove residual impacted soil associated with the historical releases of gasoline and diesel from the former UST system(s). Definitive data will be collected to determine existing conditions of soil contamination.

3.2 Data Quality Objectives (DQOs)

The DQO process (EPA 2006) is a systematic planning tool that is used to establish performance or acceptance criteria. These criteria, in turn, serve as the basis for designing a plan for collecting data of sufficient quality and quantity to support the goals of a study. The DQO process consists of seven iterative steps, as described in the following section.

3.2.1 Step 1: State the Problem

The Site has an ongoing groundwater contamination case due to historical UST releases at a former gas station facility. Residual petroleum impacted soil is suspected to remain in place in the vicinity of the former USTs and/or dispenser islands. Additional data is needed to define the nature and extent of contamination, if any, within the soil.

3.2.2 Step 2: Identify Decisions

Soil investigation and excavation activities are proposed to identify and remove residual petroleum impacted soil from the Site. Prior to soil excavation, an investigation will be conducted through test pitting at ten locations to identify where soil impacts are present. Excavation will be conducted based on investigative soil sampling results and results from quarterly groundwater monitoring events. Analytical data will be reviewed and provided to the NBP. The NBP will determine excavation locations which may include, but will not be limited to, areas which exceed action levels and/or exhibit detectable concentrations of COCs.

Analytical data from excavation confirmation sampling will be compared to the Analyte Specific Closure Levels for residential scenarios provided in Table 1 of the *NDEP BCA Petroleum in Soils Closure Checklists, July 2022,* (action levels) which summarizes the cleanup regulations for petroleum found in NAC 445A.226 to 445A.22755. Results of the confirmation sample results will be used to determine if additional remedial excavation is required.

3.2.3 Step 3: Identify Inputs

Information required to address project objectives includes historical data, proposed quantitative data to be collected under this study, Nevada action levels, analytical test results of collected samples, regulations regarding site cleanup, and regulations regarding waste disposal. Analytical testing of soil samples shall be conducted by a Nevada-certified laboratory.

3.2.4 Step 4: Define Study Boundaries

Ten test pits will be placed in the locations of the former tank basin, the former dispenser islands, adjacent to MW-10 roughly halfway between the former tank basin and MW-11, adjacent to MW-11, near the currently understood upgradient and downgradient edges of the groundwater plume, to the north of each former dispenser island, and adjacent to the sewer line to the east of the former dispenser islands. Proposed test pit locations are indicated in Figure 3. A Nevada Department of Transportation (NDOT) permit will be obtained for test pits located outside of the property boundary, within the NDOT right-of-way (ROW). Planned test pits outside of the property boundary, within the NDOT ROW, may be adjusted or removed if a permit cannot be obtained. A minimum of three confirmation soil samples will be collected from each test pit upon completion of excavation. Samples will be collected from 2.5 feet bgs, five feet bgs, the groundwater smear

zone (immediately above static water level), and from where impacts are observed through visual and olfactory indicators and photoionization detector (PID) readings.

The locations of excavation activities will be determined by the NBP and will be based on the analytical results of the test pit samples. Investigative analytical results and field screening observations will be used to determine the depth and extent of the excavation activities. A minimum of five confirmation samples will be collected from the completed excavation(s). Samples will be collected at a rate of one per sidewall with additional samples collected every 150 square feet or portion thereof and one sample from the floor with additional samples collected every 100 square feet or portion thereof. Sidewall samples will be collected from the depth at which impacts were encountered during the excavation.

Test pitting is anticipated to take three days to complete and the length of the excavation activities will depend on the extent of contamination identified during investigative activities.

3.2.5 Step 5: Develop Decision Rules

Decision rules describe actions based on qualitative and definitive data. Planned test pits outside of the property boundary, within the NDOT ROW, may be adjusted or removed if a permit cannot be obtained. Following review of the analytical results from the test pitting activities, the locations of the excavation(s) will be determined. If test pit investigation sample concentrations are less than 100 mg/kg TPH and/or less than the *Analyte Specific Closure Levels* for residential scenarios provided in Table 1 (action levels) of the *NDEP BCA Petroleum in Soils Closure Checklists, July 2022*, McGinley will consult with NDEP to determine appropriate next steps.

Selected excavation areas will be expanded laterally and vertically until professional judgement and field screening methods indicate impacted soil has been removed, at which point confirmation soil samples will be collected. If excavation confirmation sample results are less than action levels, no further remedial action will be required. If excavation confirmation sample concentrations are greater than the action levels, additional excavation may be required.

3.2.6 Step 6: Specify Tolerable Limits on Decision Errors

This is not a statistically based study; therefore, sampling locations will be selected based on professional judgement and Site knowledge. The NBP QA Plan, used to create the project quality control program for this study, establishes field and laboratory procedures, methods, and protocols that will be employed to minimize the level of error from the acquired data and subsequent decisions to be based on those data.

3.2.7 Step 7: Optimize the Sampling Design

The investigative sampling efforts will provide sufficient data points such that a decision can be made regarding the need for remedial action, and aid in selection of areas to proceed with excavation in the event impacted soils are identified.

3.3 Data Quality Indicators (DQIs)

Data quality objectives will be met through adherence of required sampling methodology, required laboratory analytical methods, and data review. Data are accepted and rejected based on the data quality objectives. If the data are near the regulatory limit and could be affected by variability and accuracy measures, such as low recovery for spikes or surrogates, then further evaluation may be conducted. DQIs (precision, accuracy, representativeness, completeness, comparability and sensitivity [i.e., PARCCS parameters]) refer to quality control criteria established for various aspects of data gathering, sampling, and/or analyses. The DQIs are as follows:

- **Precision**: The degree of mutual agreement between or among independent measurements of a similar property (usually reported as standard deviation (SD) or relative percent difference) and relates to the analysis of duplicate laboratory or field samples.

- **Accuracy**: The degree of agreement of a measurement with a known or true value and is determined by comparing the reported laboratory value for a sample to a known or true concentration (i.e. matrix spikes, surrogate spikes, laboratory control samples and performance samples).
- **Representativeness**: The expression of the degree to which data accurately and precisely represent a characteristic of an environmental condition or population and relates to the method of collecting samples and determining sampling locations.
- **Completeness**: Expressed as the percent of valid usable data obtained compared to the amount that was expected.
- **Comparability**: The degree of confidence with which one data set can be compared to another.
- **Sensitivity**: Defined by the laboratory detection limits and are generally expressed in terms of method detection limits (MDLs) or reporting limits (RLs).

3.3.1 Precision

Precision measurements are typically determined by the resolution of the instrument and through evaluation of field and laboratory duplicates. In this study, field duplicates will not be collected as soils and sediments are generally too heterogeneous to assess the precision of sample collection. Laboratory duplicates including required laboratory control sample (or blank spike) duplicates and matrix spike duplicates are used to evaluate precision of the laboratory process.

3.3.2 Accuracy

Accuracy is the amount of agreement between a measured value and the true value. For laboratory measures, accuracy is determined through field blanks, lab matrix spikes, certified reference material, and/or laboratory control samples. Accuracy performance of laboratory analyses will be assessed through calculation of Percent Recovery (%R). Acceptable performance for accuracy of laboratory values for %R are established in NBP QA Plan.

3.3.3 Representativeness

A minimum of three samples will be collected from each investigative test pit at 2.5 feet bgs, five feet bgs, the groundwater smear zone (immediately above static water level), and from where impacts are observed through visual and olfactory indicators and PID readings to ensure an accurate vertical representation of each area is achieved.

Following excavation activities, a minimum of five excavation confirmation soil samples will be collected from the floor and sidewalls of the completed excavation(s).The number of confirmation samples will adequately determine the magnitude and extent of remaining impacts following excavation activities.

3.3.4 Completeness

The project goal is to identify and remove grossly impacted soil such that residual contamination is not expected to present a risk to human health or the environment.

3.3.5 Comparability

Site characterization and soil investigation activities have been conducted on the Site in the past. Data collected from the confirmation sampling may be compared to historical analytical data collected during UST removal. Standard operating procedures, methods, and quality control measures required for sample collection and analyses are expected to make historical and recent data comparable.

3.3.6 Sensitivity

The laboratory reporting limits are adequate for this investigation when comparing those to action levels utilized for this project. The table below presents the constituents of concern (COCs) and

their associated reporting limits and action and/or screening levels. The screening level for TPH in soil is 100 mg/kg as listed in the *NDEP BCA Petroleum in Soils Closure Checklists, July 2022*. As the Site is currently slated for mixed-use redevelopment, and to err on the side of caution, the action levels for BTEX, MTBE, and naphthalene are based on the *NDEP Analyte-Specific Closure Levels* for residential soils.

COCs	Reporting Limit (RL)	Action Level
TPH – Gasoline Range Organics (GRO)	10 mg/kg	100 mg/kg
TPH – Diesel Range Organics (DRO)	10 mg/kg	100 mg/kg
TPH – Oil Range Organics (ORO)	10 mg/kg	100 mg/kg
Benzene	20 µg/kg	1.2 mg/kg
Toluene	20 µg/kg	4,900 mg/kg
Ethylbenzene	20 µg/kg	5.8 mg/kg
Total Xylenes	20 µg/kg	580 mg/kg
MTBE	20 µg/kg	47 mg/kg
Naphthalene	40 µg/kg	2.0 mg/kg

3.4 Data Review and Validation

Data verification is the process of evaluating the completeness, correctness, conformance, and compliance of a specific data set against the method, procedural, or contractual requirements. Data verification evaluates whether sampling protocols, Standard Operating Procedures (SOP), and analytical methods were followed during data generation. Verification also involves examining the data for errors or omissions. Field and laboratory staff will verify that the work is producing appropriate outputs.

Data validation is a systematic process for reviewing a body of data against a pre-established set of acceptance criteria defined in this plan. Data validation is an analyte- and sample-specific process that extends the evaluation of data beyond data verification and is performed to determine the analytical quality of a specific data set. Validation involves a detailed examination of the data package to determine whether measurement quality objectives (MQO) for precision, accuracy, and sensitivity have been met. For this environmental assessment, the intent of the data review and validation process is to verify that the specified levels of precision, accuracy, reproducibility, completeness, comparability, and analytical sensitivity of the final results are achieved, with respect to the project MQOs, and that the data fulfill project DQOs.

McGinley's QA officer will supervise or perform data quality assessment tasks. McGinley will consistently evaluate and document measurement data to monitor consistency with MQOs, to quantitatively assess data quality, and to identify potential limitations to data use. McGinley will review field and analytical laboratory data generated for this project, including the following:

- Chain of custody documentation;
- Laboratory batch QC frequency; and
- Results of batch and field QC analyses.

The laboratory will generate and review all laboratory data. Each data point will be assessed as non-qualified or qualified based upon the acceptance criteria. Data may be qualified as "estimated" (J-qualified); these data are used as is. Some data may be qualified as "rejected" (R-qualified) if critical QC parameters are not met; these data are unusable for any purpose. Sample re-analysis, for data not meeting MQOs, will be considered as a possible corrective action. Third-party data validation will not be performed.

3.5 Data Management

Sampling will be conducted in accordance with standard EPA SOPs. A unique identification number will be assigned to each sample. The number will be an alphanumeric sequence that serves as an acronym to identify the sample. The following sections define the format will be used for the sample designation.

3.5.1 Samples

Soil samples collected for this project will be identified based on the following unique identification system:

Test Pit investigation Samples

Sample ID: WELLS001-TP1@10'

WELLS001– McGinley project number

TP1 – Test pit number

@10' – Depth of soil sample (i.e.,10 feet bgs)

Excavation Confirmation Samples

Sample ID: WELL001-EX1-S1@10'

WELLS001 – McGinley project number

EX1 – Excavation number

S1 – Soil sample number **–** S = sidewall, F = floor

@10' – Depth of soil sample (i.e.,10 feet bgs)

Waste Characterization Samples

Sample ID: WELL001-Waste - SP1

WELLS001 – McGinley project number

Waste – Identifies the sample as waste

SP1 – Stockpile number

1 - Sample iteration number

3.5.2 Field Logs

Field logs shall be maintained throughout the project. The following information shall be included on the field logs: description of activities conducted, dates and times, field observations, deviations from sampling program, names of on-site personnel, and sampling locations.

3.6 Assessment Oversight

Prior to commencing with field activities, the CAP, SAP and Health and Safety Plan (HASP) will be reviewed by the Project Team. A copy of the HASP is located in Appendix A. The McGinley QA Officer will oversee QC of all field activities. If modifications to the proposed sampling program are required due to field conditions, the Project Manager shall be notified for direction.

Any modifications to the sampling plan will be documented in the field logs and in the project report as "deviations from the sampling plan."

4. SAMPLING AND EXCAVATION RATIONALE

As historical soil sampling data is limited and/or unavailable, investigative test pitting will be conducted to aid in the identification of impacted areas and to direct the primary excavation activities. The test pits will be located in suspected source areas (tank pit and dispenser islands) and in the vicinity of the groundwater plume as indicated in Figure 3. At least three analytical samples will be collected from each test pit to vertically delineate impacted soil. Test pitting activities and investigative sampling is further described in section 5.2.

The extent of the excavation area(s) will be determined based upon the results of the test pit sampling, discussions with the NBP, and field screening observations. Following the excavation activities, a minimum of five confirmation soil samples will be collected from the floor and sidewalls to assess the residual impacts. Excavation confirmation sampling is further described in Section 5.4

5. CORRECTIVE ACTION PLAN

Investigative test pitting and remedial excavation activities will be focused on the location of potential soil impacts including the former tank pit area, the vicinities of the former dispenser islands, and the area of the groundwater plume. Details on the CAP are provided in the following sections.

5.1 Pre-Field Activities

Prior to commencing with field activities, all investigation and excavation areas will be demarcated, and Underground Service Alert (USA call-before-you-dig) will be notified, and a private utility location service will be contracted to assess for the presence of underground utilities.

5.2 Impacted Soil Investigation (Test Pitting)

A test pitting investigation will be conducted prior to excavation. Field screening and sampling of test pits will be conducted to identify areas of impacted soils and to direct future excavation activities. Test pits will be advanced to groundwater (anticipated between six and nine feet bgs) with mechanical excavation equipment. Removed soil will be field screened for impacts using olfactory and visual indicators and PID readings.

A minimum of three analytical samples will be collected from each investigative test pit at 2.5 feet bgs, five feet bgs, the groundwater smear zone (immediately above static water level), and from where impacts are observed through visual and olfactory indicators and PID readings. Samples will not be collected from sidewalls for the purposes of this initial investigation.

Test pit investigative samples will be collected as described in Section 7.2. Collected samples will be analyzed for COCs that are typically associated with a petroleum product release from a service station as discussed in Section 6.1. Test pits will be backfilled with the removed material following sampling and demarcated for future activities.

5.3 Impacted Soil Excavation

A brief letter summarizing sample results, test pit locations, and proposed excavation activities will be provided to the NDEP prior to commencing with impacted soil excavation. McGinley may propose multiple smaller excavation areas and/or one larger area based on review of the test pitting sample results. Excavation boundaries will be expanded laterally and vertically, as necessary, to

remove impacted soil using mechanical excavation equipment. One 10,000-gallon diesel UST was closed in place near the former convenience store building. The condition of the tank will be inspected if encountered during excavation activities, and care will be taken to minimize tank disturbance. Excavation will continue until field screening indicates impacted soils have been removed. Field screening will be conducted using visual and olfactory observations and PID readings. Following completion of excavation activities, confirmation soil samples will be collected from the excavation area as described in Sections 5.4.

5.4 Excavation Confirmation Sampling

Confirmation soil samples will be collected from each excavation at a rate of one per floor and one per sidewall to assess for remaining impacts. In the event the floor of the excavation exceeds 100 square feet, an additional sample will be collected for each 100 square feet or portion thereafter. In the event the side wall exceeds 150 square feet, an additional sample will be collected for each 150 square feet or portion thereafter. Sidewall samples will be collected from the depth in which impacts were encountered during excavation. It should be noted that depending of the total depth of excavation in comparison to groundwater levels, collection of floor samples may not be feasible. Samples will be collected as described in Section 7.2. Collected samples will be analyzed for COCs that are typically associated with a petroleum product release from a service station as discussed in Section 6.1.

5.5 Soil Management

During test pitting, removed soil will be placed back in the test pits as backfill following completion of sampling activities. Clean overburden from remedial excavation activities will be segregated as practical to be used as backfill material. All contaminated soil will be placed on visqueen pending waste profiling and offsite disposal. Stockpiles will be limited in size to 80 cubic yards maximum to support characterization activities (see Section 5.6). If stockpiles are to be left in place for more than 12 hours (i.e., overnight or during a precipitation/wind event), the stockpile shall be covered with an impermeable material (i.e., visqueen or plastic) and secured to prevent erosion from precipitation and wind events. Stockpiles shall be bermed in order to prevent runoff during storm events. Berms shall be placed under the bottom visqueen layer, wrapped with the visqueen, and secured in place using sandbags in order to prevent runoff during storm events. If stockpiles are to remain in place for more than 60 days, best management practices (BMPs) shall include, at minimum, wire backed silt fence, orange construction fencing and signage indicating that soils are only suitable for fill material in specified areas. Trucks shall not enter the test pit or excavation areas or track through soils known to be impacted with TPH.

5.6 Waste Characterization

Samples will be collected from stockpiled soil for characterization purposes. Samples will be collected at a rate of one five-point composite sample per 40 cubic yards of excavated soil. To collect the sample, five sample aliquots will be collected from varying depths and at random locations around the stockpile. In the event one portion of the stockpile appears to be more impacted than others, based on field screening, sample aliquot locations will be biased in that area for a conservative approach. Samples will be collected as described in Section 7.3 and analyzed as indicated in Section 6.1.

6. REQUEST FOR ANALYSIS

6.1 Analyses Narrative

A minimum of three investigative samples will be collected from each test pit and a minimum of five confirmation soil samples will be collected from each excavation area. Investigative and confirmation soil samples will be collected as described in Sections 7.2.

Investigative samples will be analyzed for full suite TPH by EPA Method SW8015. Investigative samples that exceed the TPH in soil action level of 100 mg/kg will also be analyzed for full suite VOCs by EPA Method SW8260B and polynuclear aromatics (PNAs) by EPA Method SW8270-SIM.

All excavation confirmation samples will be analyzed for full suite TPH by EPA Method SW8015, full suite VOCs by EPA Method SW8260B and PNAs by EPA Method SW8270-SIM. It should be noted that PNAs are being analyzed to support regulatory closure by the NDEP Analyte-Specific Closure pathway.

Waste characterization samples will be analyzed for full suite TPH by method SW8015, full suite VOCs using the toxic characterization leach procedure (TCLP) and method SW8260B (totals and TCLP to be reported), and RCRA-8 Metals using TCLP and method SW6020 (only TCLP results to be reported).

6.2 Analytical Laboratory

Analytical testing of soil samples shall be conducted by Pace Analytical of Mt. Juliet, TN. Analytical testing and sample handling shall be conducted in accordance with their SOP. Pace Analytical is a State of Nevada certified laboratory.

7. FIELD METHODS AND PROCEDURES

7.1 List of Equipment Needed

- Field logbook and field data sheets;
- Personal protective equipment (Level D);
- Decontamination supplies;
- Terracore samplers;
- Laboratory provided glass sample containers;
- Cooler and ice;
- Sample labels; and
- Camera.

7.2 Soil Sampling Activities (Including Confirmation Sampling)

Based on the anticipated size and depth of the test pits and excavation areas, soil sample collection will be facilitated by the mechanical excavation equipment and soil samples will be collected directly from the center of the bucket of the excavator from at least four inches below the surface of material.

Samples intended for VOC analysis will be collected first by inserting a Terracore sampling device into undisturbed soil within the excavator bucket. The collected soil will be placed into laboratory VOA vials and preserved with methanol. A new Terracore sampler will be used for each sample.

Following the collection of samples intended for VOC analysis, the bulk sample for TPH and PNA analysis will be collected in a laboratory provided glass jar. Bulk sample will be collected from the

same location within the excavator bucket using a stainless-steel spoon. A new spoon will be used for each sample.

For all samples, care will be taken to prevent soil from remaining in the lid threads prior to being sealed to prevent potential contaminant migration to or from the sample. Following collection, samples will be labeled and stored in a chilled cooler. Efforts will be made to minimize sample agitation during shipment. Sample collection will be conducted in accordance with EPA's SOP as presented in Appendix B.

7.3 Waste Characterization Sampling

Waste characterization samples will be collected as five-point composite samples. To begin, five locations within the stockpile will be chosen for aliquot collection on a lateral basis. Samples will be biased towards observable impacts (i.e., odor and/or staining). Once an aliquot location is selected on the stockpile, a decontaminated hand auger and/or shovel will be used to access soil at least one foot below the surface and one foot above the base of the stockpile. Depths will be varied for each aliquot. One quarter cup of soil will be collected from this location and placed in a one-gallon ziplock bag which is immediately sealed. This process will be repeated for the remaining four locations. Following collection of the final aliquot, the bag will be sealed and homogenized. One analytical sample will be immediately extracted from the ziplock bag in laboratory provided containers sealed, labeled, and stored in a chilled cooler. Excess material will be discarded in the stockpile.

7.4 Decontamination Procedures

All field equipment which comes in contact with potentially contaminated soils and groundwater will be decontaminated in accordance with the EPA SOP as presented in Appendix B. Decontamination will occur after each use of a piece of equipment. Disposable equipment will be used as practicable.

7.5 Unanticipated Discoveries

This assessment is not anticipated to impact any known cultural resources; however, the potential of an unanticipated discovery at the site exists. An Unanticipated Discovery Plan is provided in Appendix C.

8. SAMPLE CONTAINERS, PRESERVATION AND STORAGE

Investigative, confirmation, and waste soil samples intended for VOC analysis will be collected using Terracore samplers from undisturbed soil, placed in laboratory provided 40 mL VOA vials, and chemically preserved with methanol, in general accordance with the EPA SOP in Appendix B.

Samples submitted for TPH and PNA analysis will not be chemically preserved and will be collected using stainless steel spoons in dedicated laboratory provided 4 oz. glass sample containers. All soil samples will be sealed, labeled, and chilled to 4°C in a cooler pending delivery to the laboratory for analysis. The soil samples will be delivered to the laboratory within an acceptable period of time in accordance with the EPA laboratory methods and NBP QA Plan. Samples analyzed for VOCs, TPH and PNAs will be analyzed within the 14-day holding time for EPA Methods SW8260, SW8015 and SW8270, respectively.

9. DISPOSAL OF RESIDUAL MATERIALS

Soil generated during excavation activities will be stockpiled on visqueen as discussed in Section 5.5. All waste will be disposed of in accordance with local, state, and federal regulatory requirements.

It is understood that the NBP and the City of Wells are working with the Bureau of Solid Materials Management (BSMM) to dispose of impacted soils in the Wells Landfill. McGinley will provide any necessary support to receive approval for this action. If this is not approved, there are several other landfills that may be utilized. All impacted soil will be disposed of in accordance with applicable regulations.

10. SAMPLE DOCUMENTATION AND SHIPMENT

10.1 Field Notes

10.1.1 Field Logs

Field logs will be completed describing all field activities. The following information will be included in the field logs:

- Project name and location;
- Test pit and excavation(s) extents and depths;
- Sampling locations and description utilizing a survey- or mapping-grade GPS unit;
- Site plan showing test pit locations, excavation boundaries, and soil sample locations;
- Sampler's name(s);
- Date and time of sample collection;
- Type of sampling equipment used;
- Field observations and details related to analysis or integrity of samples (e.g., noticeable odors, colors, etc.);
- Sample preservation;
- Sample identification numbers; and
- Name of recipient laboratory.

10.1.2 Photographs

Photographs will be taken at select sampling locations. They will serve to verify information entered in the field logbook. For each photograph taken, the following information, at a minimum, will be written in the logbook:

- Time, date, location, and weather conditions;
- Description of the subject photographed; and
- Name of person taking the photograph.

10.2 Labeling

All samples collected will be labeled in a clear and precise manner for proper identification in the field and for tracking in the laboratory. The samples will have pre-assigned, identifiable, and unique numbers, discussed in Section 3.5.1. At a minimum, the sample labels will contain the following information:

- Sample location;
- Date and time of collection;
- Analytical parameter(s) requested; and
- Method of preservation.

10.3 Sample Chain-of-Custody Forms and Custody Seals

All samples shall be delivered to the laboratory under chain-of-custody protocol. All chain-of-custody forms and sample labels will be signed and dated. A copy of the chain-of-custody form is provided in Appendix D.

10.4 Packaging and Shipment

Samples shall be placed in a sturdy cooler. Bubble wrap shall be placed in the bottom of the cooler. Ice shall be packed in zipper-locked, double plastic bags. Empty space in the cooler shall be filled with bubble wrap. All samples shall be shipped to the laboratory under chain-of-custody protocol.

11. QUALITY CONTROL

11.1 Field Quality Control Samples

Field quality control samples are intended to help evaluate conditions resulting from field activities and are intended to accomplish two primary goals including the assessment of field contamination and the assessment of sampling variability. The former looks for substances introduced in the field due to environmental or sampling equipment and are assessed using blanks of different types. The latter includes variability due to sampling technique and instrument performance as well as variability possibly caused by the heterogeneity of the matrix being sampled and is assessed using replicate sample collection.

11.2 Trip Blanks

Trip blanks will be prepared to evaluate if the delivery and handling procedures are introducing contaminants into the samples, and if cross contamination in the form of VOC migration has occurred between the collected samples. A minimum of one trip blank will be submitted to the laboratory for analysis for each cooler containing samples for VOC analysis. Trip blanks are 40-mL vials that have been filled with High Performance Liquid Chromatography (HPLC)-grade water that has been purged so it is VOC free and delivered with the empty sampling containers to the site or sampling area prior to sampling. The sealed trip blanks are not opened in the field, remain with the samples following collection, and are shipped to the laboratory in the same cooler with the samples collected for volatile analyses. The trip blanks will be preserved, packaged, and sealed in the manner described for the environmental samples. A separate sample number will be assigned to each trip blank sample.

11.3 Equipment Blanks

Dedicated sampling equipment is planned for use during the investigative and confirmation sampling. As such equipment blanks will not be collected.

11.4 Background Samples

No background samples are anticipated to be collected during this investigation.

11.5 Assessment of Field Variability (Field Duplicates or Co-located Samples)

Field-duplicate soil samples will not be collected for this project, as soils are generally too heterogeneous to assess the precision of sample collection.

11.6 Laboratory Quality Control Samples

Laboratory QC samples are analyzed as part of standard laboratory practice. The laboratory monitors the precision and accuracy of the results of its analytical procedures through analysis of QC samples. Typically, laboratory QC samples consist of matrix spike/matrix spike duplicate (MS/MSD) samples for organic analyses, and matrix spike and duplicate samples (MS/DS) for inorganic analyses. The term "matrix" refers to use of the actual media collected in the field (e.g., routine soil samples).

Laboratory QC (e.g., MS/MSD samples) samples will be collected at frequency of one per 20 samples or one per shipment batch for laboratory quality assurance. The MS/MSD will be analyzed to monitor the precision and accuracy of its analytical procedures. Two sample containers (double volume) will be collected from one soil sample location, noted as the MS/MSD volume on the chain of custody, and provided to the laboratory for QC purposes.

12. FIELD VARIANCES

As conditions in the field may vary, it may become necessary to implement minor modifications to sampling as presented in this SAP. Modifications to the approved SAP will be documented in the sampling project report.

13. FIELD HEALTH AND SAFETY PROCEDURES

A site-specific HASP is provided in Appendix A. The HASP shall be reviewed by all on-site personnel prior to commencing with field activities.

14. SCHEDULE FOR SAMPLING ACTIVITIES

McGinley will commence with the activities proposed herein upon receiving NDEP approval. It is anticipated that field activities will be completed within four weeks of receiving approval, pending contractor availability and weather conditions.

15. REFERENCES

Nevada Division of Environmental Protection, 2022. *Final Nevada Brownfields Program Quality Assurance Program Plan*.

Nevada Division of Environmental Protection, Bureau of Corrective Actions, 2022. *Petroleum in Soils Closure Checklists.*

Natural Resources Conservation Service, 2014. Web Soil Survey: Clark County, Nevada, South Part (NV788). Version 10, August 22, 2014. United States Department of Agriculture. (*http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx*)

FIGURES

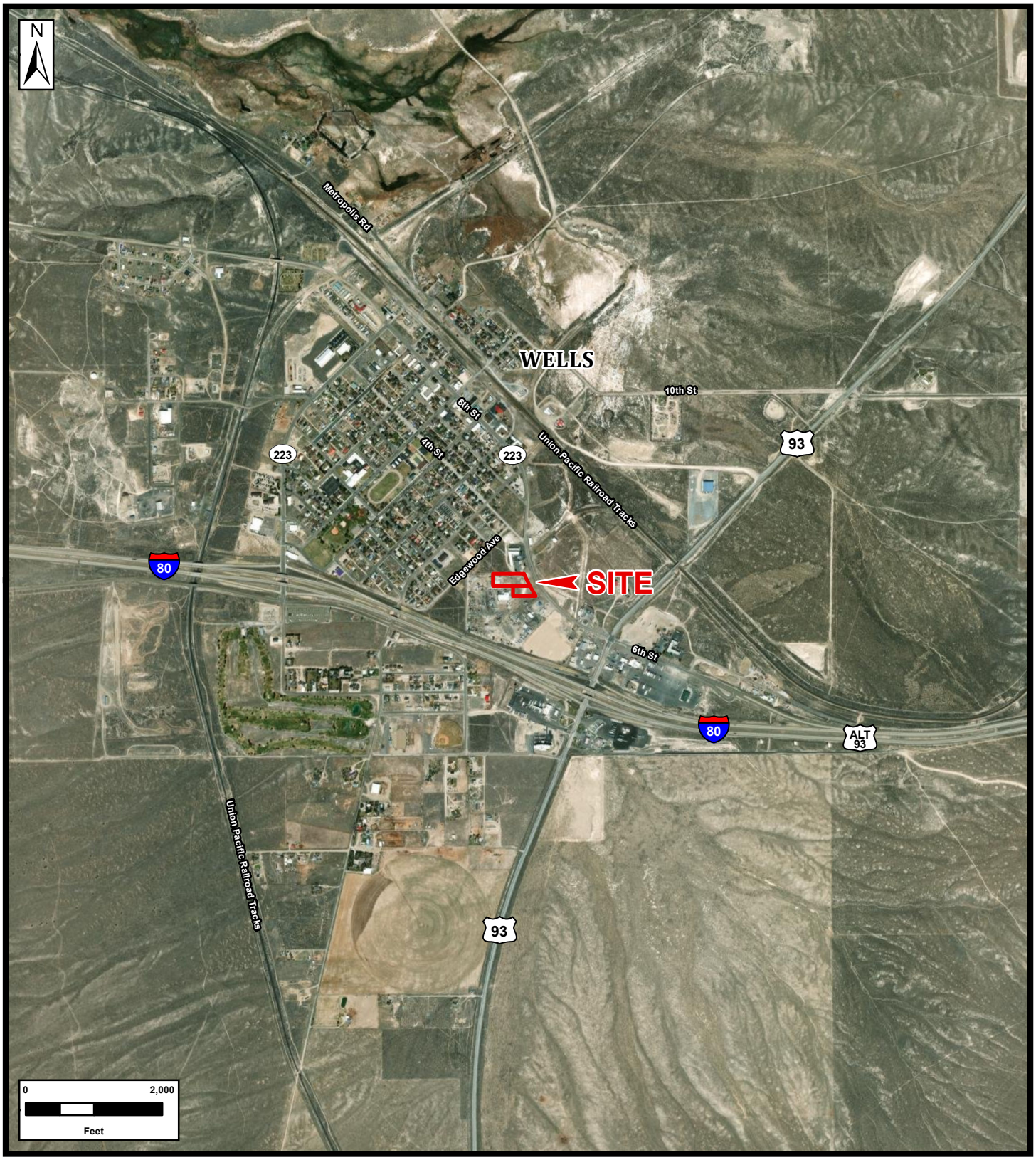


FIGURE 1

TITLE:

PROJECT LOCATION MAP
-SHOWING-
Former Fearless
Farris Gas Station
1010 6th St
Wells, Nevada

JOB NO.: **BRN099**

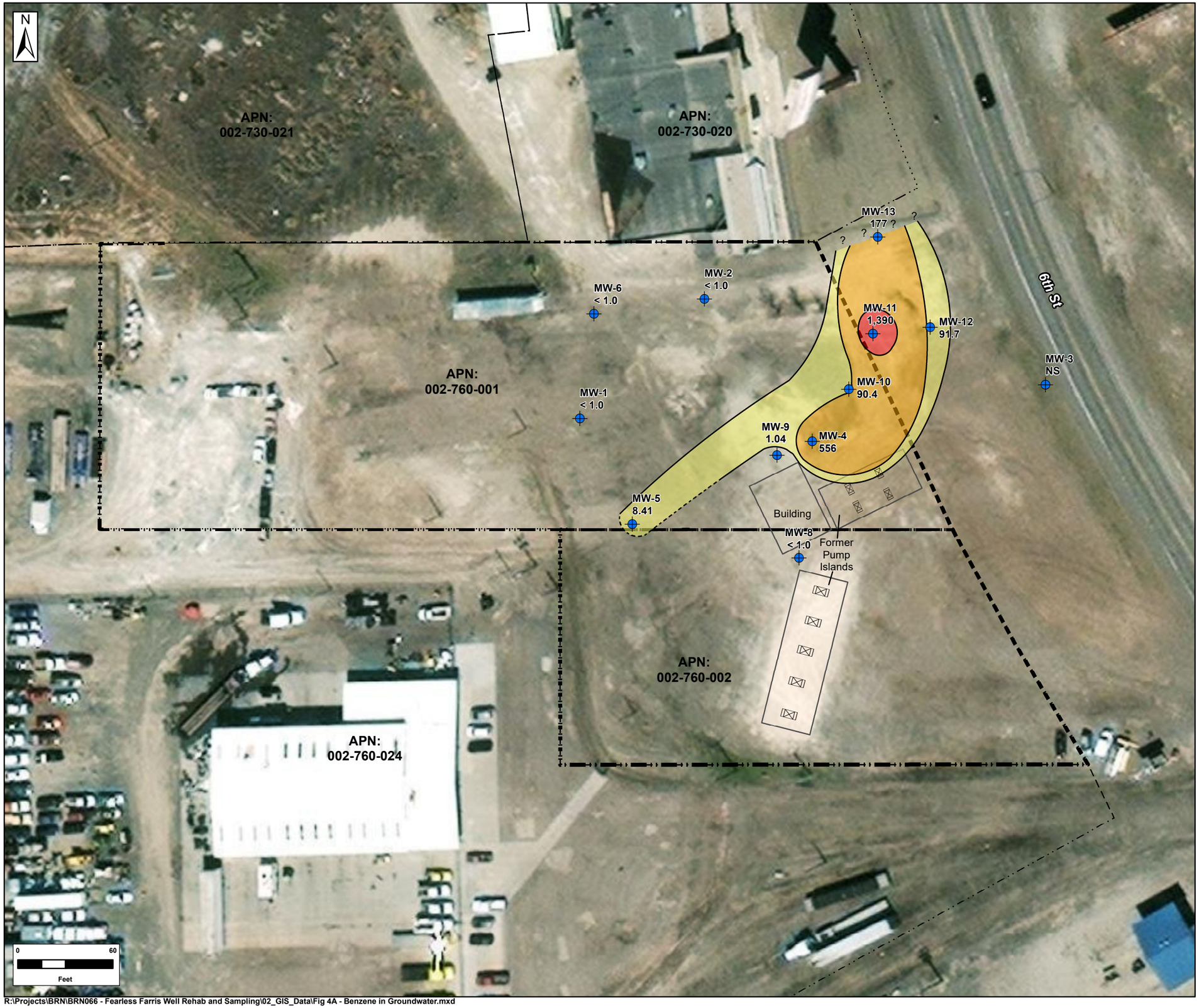
DATE: **7/18/2023**

McGinley & Associates
A Universal Engineering Sciences Company

FILE: **Fig 1 - Project Location Map**

COORDINATE SYSTEM: **NAD 1983 StatePlane Nevada East FIPS 2701 Feet**

REF.					REVISION:
	DESIGNED	AH	CHECKED	AH	-
	DRAWN	HC	APPROVED	CJ	



R:\Projects\BRN\BRN066 - Fearless Farris Well Rehab and Sampling\02_GIS_Data\Fig 4A - Benzene in Groundwater.mxd

FIGURE 2

TITLE:

Site Map
-SHOWING-
Groundwater Monitoring Wells and Inferred Lateral Distribution of Benzene Exceeding Action Level March 2024
Former Fearless
Farris Gas Station
1010 6th St
Wells, Nevada

MW-1 5640.02	Groundwater Monitoring Well Benzene Concentration (µg/L)
	Property Boundary
	Former Fuel Dispenser
APN	Assessor's Parcel Number
µg/L	Micrograms Per Liter
NS	Not Sampled

Benzene Concentration (µg/L)

- 5 - 100
- 100.1 - 1,000
- >1000

* MW-7 could not be located during site visit.

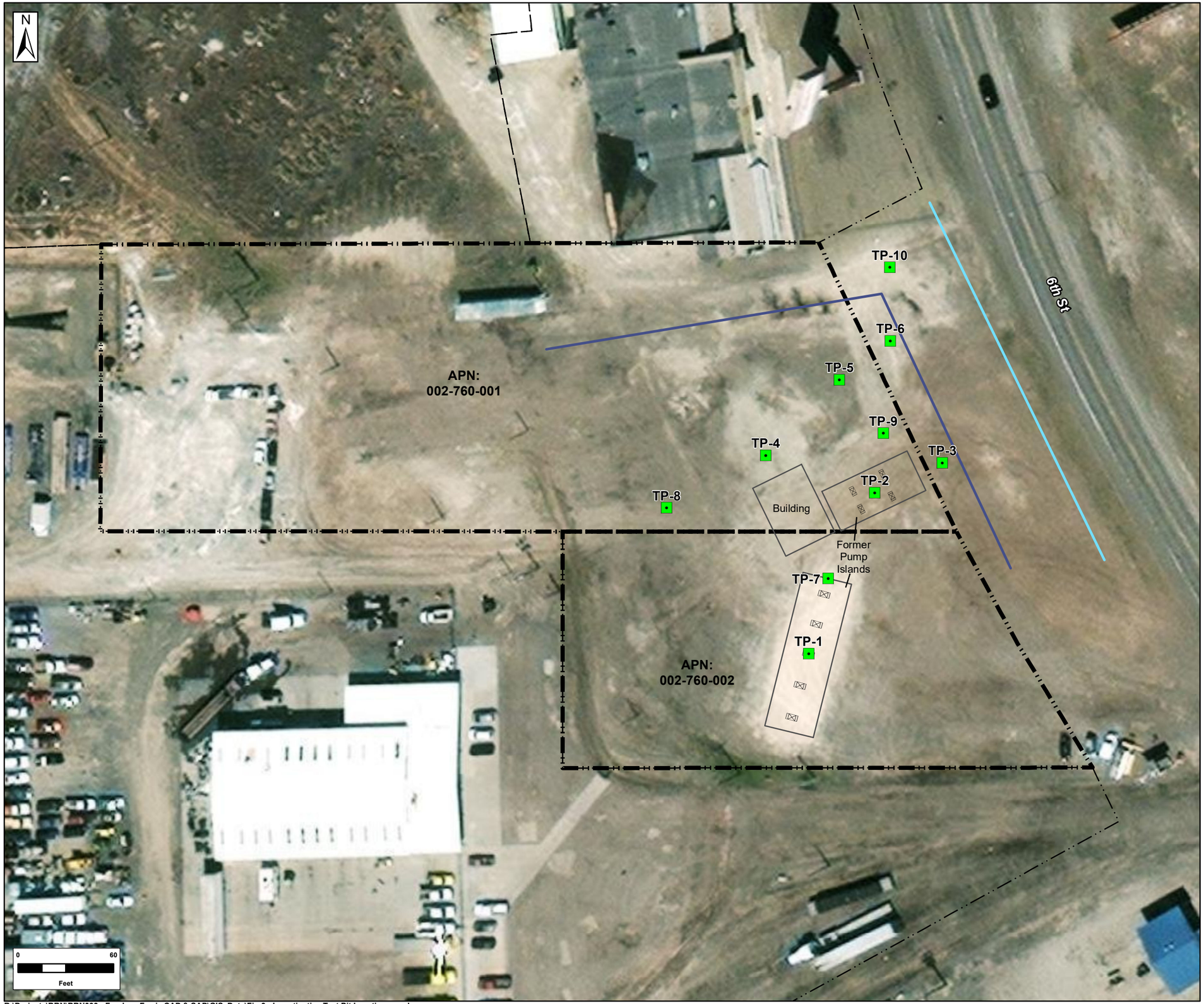
JOB NO.:
BRN099

FILE:
Fig 2 - Site Map

COORDINATE SYSTEM:
NAD 1983 StatePlane Nevada East FIPS 2701 Feet

DATE:
4/10/2024

McGinley & Associates
A Universal Engineering Sciences Company



R:\Projects\BRN\BRN099 - Fearless Farris CAP & SAP\GIS_Data\Fig 3 - Investigative Test Pit Locations.mxd

FIGURE 3

TITLE:

SITE MAP

-SHOWING-

Investigative Test Pit Locations
Former Fearless
Farris Gas Station
1010 6th St
Wells, Nevada

- Test Pit Locations
- Former Fuel Dispenser
- Expected Location of Sewer Line
- Expected Location of Water Line
- Polygons
- Property Boundary
- APN — Assessor's Parcel Number

*** MW-7 could not be located during site visit.**

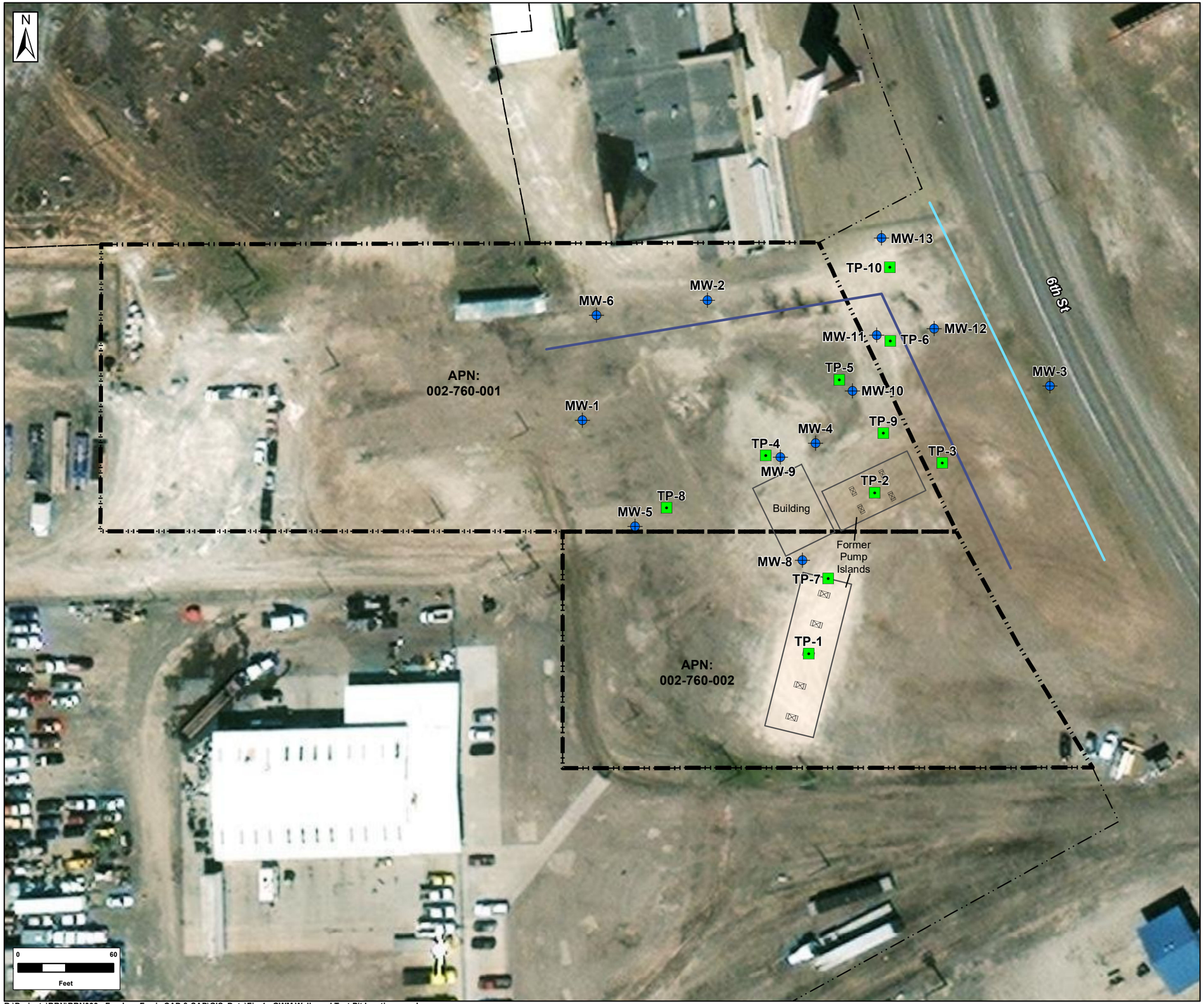
JOB NO.:
BRN099

FILE:
Fig 3 - Investigative Test Pit Locations

COORDINATE SYSTEM:
NAD 1983 StatePlane Nevada East FIPS 2701 Feet

DATE:
3/19/2024

McGinley & Associates
A Universal Engineering Sciences Company



R:\Projects\BRN\BRN099 - Fearless Farris CAP & SAP\GIS_Data\Fig 4 - GWM Wells and Test Pit locations.mxd

FIGURE 3

TITLE:

SITE MAP

-SHOWING-

Groundwater Monitoring Wells
and Test Pit locations
Former Fearless
Farris Gas Station
1010 6th St
Wells, Nevada

- Groundwater Monitoring Well
- Test Pit Locations
- Former Fuel Dispenser
- Expected Location of Sewer Line
- Expected Location of Water Line
- Polygons
- Property Boundary
- APN — Assessor's Parcel Number

*** MW-7 could not be located**

JOB NO.:
BRN099

FILE:
Fig 3 - GWM Wells and Test Pit locations

COORDINATE SYSTEM:
NAD 1983 StatePlane Nevada East FIPS 2701 Feet

DATE:
3/19/2024

McGinley & Associates
A Universal Engineering Sciences Company

APPENDIX A

Site Health and Safety Plan

McGinley & Associates
A Universal Engineering Sciences Company

Reno
5410 Longley Lane
Reno, Nevada 89511
Ph: 775.829.2245

Las Vegas
1915 N. Green Valley Parkway
Suite 200
Henderson, Nevada 89074
Ph: 702.260.4961

www.mcgin.com

- Site Remediation
- Soil & Groundwater Investigations
- Geochemistry
- Hydrogeology
- Groundwater Modeling
- Biological Services
- Closure Optimization
- Air Quality Permitting & Modeling
- Brownfields Redevelopment
- Permitting & Compliance
- NEPA Studies
- Phase I Assessments
- Indoor Air Quality
- Storm Water & Spill Plans
- Underground Tank Services
- Geographic Information Systems
- Litigation Support & Expert Witness
- Mining Plans of Operations
- Mining Exploration Notices
- Abandoned Mine Lands

HEALTH AND SAFETY PLAN

Former Fearless Farris Stinker Station #81
1010 6th Street
Wells, NV 89835
NDEP Contract #DEP17-026
Task MA25-21
Facility ID 6-000160

Prepared for:

State of Nevada
Department of Conservation and Natural Resources
Division of Environmental Protection
Bureau of Corrective Actions
Attn: Dave Friedman and Xavier Tarango-Castorena
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701-5249

August 24, 2023

TABLE OF CONTENTS

FIGURES

ATTACHMENTS

1. INTRODUCTION

McGinley & Associates Inc. (McGinley) is pleased to submit this Health and Safety Plan (HASP) detailing personal safety precautions being performed on behalf of the Nevada Division of Environmental Protection (NDEP) and the Nevada Brownfields Program (NBP). This HASP addresses activities associated with collection of soil samples. The sampling activities will be conducted at the former Fearless Farris Stinker Station located at 1010 6th Street in Wells, Nevada (Subject Property). The location of the subject property is displayed in Figure 1.

These activities will involve the following tasks:

- Mobilization and de-mobilization of site equipment;
- Excavation of test pits;
- Collection of soil samples from test pit areas;
- Excavation of impacted site soils;
- Collection of confirmation soil samples from excavation areas.

1.1 Scope and Applicability of the Site Health and Safety Plan

The purpose of this HASP is to define the requirements and designate protocols to be followed at the site during sampling activities. Applicability extends to all McGinley employees, contractors and subcontractors. Each person will also be expected to provide his or her own protective equipment.

All on-site personnel shall be informed of the site emergency response procedures and any potential fire, explosion, health, or safety hazards of the operation. This HASP summarizes hazards and defines protective measures planned for the site. This plan must be reviewed and signed by all site personnel prior to commencing with field activities. An agreement of compliance is provided in Appendix A.

During development of this plan consideration was given to current safety standards as defined by EPA/OSHA/NIOSH, health effects and standards for known contaminants, and procedures designed to account for the potential for exposure to unknown substances. Specifically, the following reference sources have been consulted:

- OSHA 29 CFR parts 1910.120, 1910.134, 1926.350 and 1926.650;
- U.S. EPA, OERR ERT Standard Operating Safety Guides
- NIOSH/OSHA/USCG/EPA Occupational Health and Safety Guidelines
- (ACGIH) Threshold Limit Values

1.2 On-Site Personnel

All personnel entering the designated work areas at the Site are responsible for the following:

- Taking all reasonable precautions to prevent injury to themselves and to their fellow employees, and being alert to potentially harmful situations;
- Obeying all applicable laws and regulations relating to health and safety;
- Ensuring that activities do not impact the neighboring community;
- Performing only those tasks that they have been trained to complete and can do safely;
- Notifying their supervisor of any special medical conditions (i.e., allergies, contact lenses, diabetes) that may affect their ability to perform certain tasks;

- Notifying their supervisor of any prescription and/or non-prescription medication that they may be taking that might cause drowsiness, anxiety, or other unfavorable side effects;
- Learning and complying with Site security requirements;
- Complying with the Site's prohibition on drug and alcohol use, smoking, horseplay, and restricted eating/drinking areas;
- Practicing good housekeeping by keeping the work areas neat, clean, and orderly;
- Immediately reporting all injuries, incidents and near-misses to the Health and Safety Officer (HSO);
- Properly using personal protective equipment (PPE) specified by this HASP.
- Properly maintaining their designated PPE per manufacturers' recommendations.
- Complying with the HASP and all health and safety recommendations and precautions.

In the event that a person does not adhere to the provisions of the HASP, he/she will be requested to leave the work area. All non-conformance incidents will be recorded in the site log.

2. KEY PERSONNEL

The Health and Safety Officer (HSO) has total responsibility for ensuring that the provisions of this HASP are adequate and implemented in the field. Changing field conditions may require decisions to be made concerning adequate protection programs. Therefore, it is vital that personnel assigned as HSO be experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120. The following personnel are critical to the planned activities at the Site. The organizational structure will be reviewed and updated periodically by the site supervisor. Table 1 below provides information regarding key personnel associated with this project.

Table 1: Key Project Personnel Contact Information and Responsibilities

Title	Name	Phone Number and Email Address	Responsibilities
City of Wells			
Wells City Manager	Jolene Supp	(775) 482-7319	Site coordination/access
McGinley and Associates, Inc.			
Principal	Joe McGinley	(775) 829-2245 jmcginley@teamues.com	Senior review, regulatory liaison
Sr. Project Manager	Caitlin Jelle	(775) 829-2245 cjelle@teamues.com	Project management, regulatory liaison; oversee implementation of SAP
Quality Manager/HSO	Anna Henry	(775) 829-2245 ahenry@teamues.com	Review QA/QC procedures, data validation; coordinate and conduct field activities; data review.
CAD Operator	Heather Chambers	(775) 829-2245 hchambers@mcgin.com	CAD support
Administrative Assistant	Sydney Wooten	(775) 829-2245 swooten@mcgin.com	Administrative support
Contractors/Vendors			
Alpha Analytical	Kathy Murray	(775) 335-1044 kathy@alpha-analytical.com	Analysis of samples

2.1 Site Specific Health and Safety Personnel

The HSO is also responsible for conducting site inspections on a regular basis in order to ensure the effectiveness of this plan. The HSO at the site is: Anna Henry, Project Engineer for McGinley.

2.2 Organizational Responsibility

NDEP	Party initiating investigation of suspected contamination.
McGinley:	Primary agent for NDEP providing field services and project oversight of sampling.
Subcontractors:	Various companies and organizations providing services or skilled trades.

3. TASK/OPERATION SAFETY AND HEALTH RISK ANALYSIS

3.1 Historical Overview of Site

The Subject Property is comprised of approximately 2.41 acres of land and generally consists of vacant land. The Subject Property is located at 1010 6th Street in Wells, Nevada and is listed with Elko County, Nevada as Assessor's Parcel Numbers (APNs) 002-760-001 and 002-760-002. Geographically, the Subject Property is located in the NW ¼ of the SW ¼ of Section 10, Township 37 North, Range 62 East, of the Mount Diablo Baseline and Meridian. The location of the site is indicated on Figure 1. The layout of the Subject Property is illustrated on Figure 2.

A Phase I Environmental Site Assessment (ESA) of the Subject Property was conducted by McGinley and dated April 15, 2020. The Phase I ESA report identified the following recognized environmental conditions (RECs):

- According to NDEP files reviewed, one underground storage tank (UST) was closed in place and four USTs were removed from the Subject Property in 1998. Soil contamination exceeding the soil action level of 100 mg/kg total petroleum hydrocarbons (TPH) was identified and subsequent groundwater monitoring identified benzene concentrations exceeding the NDEP Maximum Contaminant Level (MCL) of 5 ug/L. Several different environmental professionals had conducted work at the Subject Property over time, and a variety of active and passive remediation activities were intermittently implemented. According to the most recent documentation from 2019, the NDEP has been attempting to obtain a work plan to investigate the extent of the contaminant plume, a schedule for implementation of downgradient monitoring wells, and a Corrective Action Plan (CAP) to address the contaminant source from Fearless Farris since 2014. As this case remains active, an NDEP-approved CAP does not appear in place, recent years' groundwater and soil sampling efforts do not appear to have been properly conducted under the supervision of a certified environmental manager (CEM), and records indicate potential plume migration offsite, the Subject Property release associated with historical site operations represents a REC.

3.2 Chemical Hazards

The following sections provide descriptions of the principal health hazards of the potential contaminants affecting this investigation and include:

- Petroleum hydrocarbons
- Benzene
- Toluene
- Ethylbenzene
- Total xylenes
- Methyl tert-butyl ether (MTBE)

3.2.1 Petroleum Hydrocarbons

Petroleum hydrocarbons such as gasoline and diesel fuel are comprised of a wide range of substances, some of which may pose substantive human health hazards. Constituents including benzene, toluene, ethylbenzene, and xylenes (BTEX) and MTBE are generally a greater concern due to their potential exposure pathway through the lungs. In moderate exposures, BTEX and MTBE compounds all produce similar acute effects including headaches, narcosis, and anesthesia. Among these compounds, benzene is the primary substance of concern due to its status as a known carcinogen and its association with leukemia and aplastic anemia in chronic exposure situations.

As field activities will involve soil sampling for generally short periods of time, these pathways should be considered. Planning, development, and implementation of specific sampling protocol should be conducted to mitigate these potential concerns.

3.3 Biological Hazards

Biological hazards that may be encountered during sampling activities include spiders, snakes, and other types of natural hazards. Boots and protective clothing should be inspected for spiders prior to wearing. Snakes should be avoided to prevent snakebites. Site personnel should avoid disturbing objects that snakes may hide in or beneath. If a spider or snake bite occurs, the HSO shall be notified immediately and the victim should be transported to the Wells Rural Medical Clinic in Wells, NV.

3.4 General Hazards

General hazards that may be encountered during sampling activities and preventative measures are described in the following sections and include:

- Slips, trips, and falls;
- Elevated noise levels; and
- Hazards associated with lifting and carrying.

3.4.1 Slips, Trips, and Falls

Protection from slips and trips can be curbed by being aware of your surroundings. Falls are a leading cause of occupational fatalities. These fatalities are considered preventable with the use of fall protection systems and/or properly planning your walking route prior to carrying heavy or bulky equipment.

3.4.2 Elevated Noise Levels

During on-site activities requiring the use of mechanized excavation equipment, hearing protection may be required to be worn for certain tasks or in designated areas where noise

levels reach > 85 dBA. Training on proper use of hearing protection will be conducted prior to initiation of specified onsite work.

3.4.3 Hazards Associated with Lifting and Carrying

The human body is subject to severe damage in the form of back injury and/or hernia if caution is not observed in the handling process. General rules for minimizing injuries from manual lifting are:

- Get good footing.
- Place feet shoulder width apart.
- BEND AT KNEES to grasp object.
- Keep back straight.
- Get a good grip on object.
- Lift gradually by straightening the legs.
- GET HELP if object is too heavy for you to lift (usually 50-60 lbs lifting limit).

3.5 Task Hazard Analysis

The evaluation of hazards is based upon the knowledge of the site conditions and anticipated risks posed by the specific operations. The following sections describe each task/operation in terms of the associated specific hazards. In addition, the preventive measures to be implemented during initiation of those operations are also identified.

3.5.1 Mobilization and De-mobilization

General hazards encountered during initial mobilization and de-mobilization for site activities include the following:

- Physical hazards of using heavy equipment in mobilization procedures.
- Buried or overhead electrical utilities.
- Driving vehicles, placing trailers on uneven surfaces creates a possibility of the vehicle rolling, getting stuck in mud or ditches, or of an accident due to flat tires or striking obstacles, and the vehicles.
- Crushing or pinching hazard due to placing equipment, falling debris on operators, workers or observers.
- Noise from heavy equipment operations.

HAZARD PREVENTION

- Keep area clear of all observers; operators need to act with caution during the mobilization process.
- Obtain clearance from appropriate utility services prior to any digging.
- Proper vehicle maintenance will prevent avoidable vehicle breakdown in the field. In order to minimize accidents from uneven terrain, site surveillance should be performed on foot to choose a clear driving path.
- Verify that heavy equipment operations do not affect the existing overhead utilities.
- Heavy equipment operators should have proper training and experience, and documentation of both. The general provisions of CFR1910/1926 apply.
- Wear hearing protection in the immediate vicinity of heavy equipment.
- All overhead and buried utilities in work area shall be located.
- Be aware of the potential for vapors to reach explosive concentrations. Provide

adequate ventilation, allow no smoking, and keep hot motors/pumps and/or electrical equipment away from areas with vapors.

3.5.2 Excavation and Soil Handling

Hazards encountered during soil and tank excavation may include both chemical and physical hazards, and are as follows:

- Premature exposure of unknown piping.
- Unknown toxic or explosive vapors may be present in excavation areas.
- Sides of excavation can cave in. Possible burying or crushing of workers due to; absence of shoring, misjudgment of stability, defective shoring, and or undercut sides.
- Falling during access/egress or while monitoring or dismounting equipment, or stumbling into excavation.
- An overhead hazard can result from material, tools, structural members and/or soil falling into the excavation.
- Congested work area due to too many workers in a small area.
- The use of heavy equipment with limited visibility, caution of workers in area.

HAZARD PREVENTION

- Neoprene or nitrile gloves should be worn during sample collection.
- Practice good housekeeping - keep excess material well out of the way and in a neat pile. All tools and equipment should have its own place and when not in use they should be stored there;
- Use protective clothing, as warranted. Hardhats, close-fitting gloves, welding glasses, safety glasses, safety belts, safety boots, etc. will be worn when appropriate;
- Monitor for airborne contaminants. Allow excavation to purge and / or use personal protective equipment.
- Do not allow any personnel to enter the excavation areas. Or, provide adequate shoring or sloping of sides of the excavation if personnel are expected to enter the pits. Regularly inspect sidewalls for changing conditions.
- Provide ramps or ladders to trenches to allow safe access and egress.
- Provide an adequate barrier around open pits. Material from pit must be placed away from edge to prevent cave ins and instability of pit.
- To prevent overexertion, limit manual lifting and emphasize mechanical means where practical.
- Maintain ample room between equipment and workers.

4. PERSONNEL TRAINING REQUIREMENTS

Consistent with OSHA's 29 CFR 1910.120, regulation covering Hazardous Waste Operations and Emergency Response and, OSHA's 29 CFR 1926 Construction Industry Standards, workers are required to be trained in accordance with those standards. At a minimum, all personnel are required to be trained to recognize the hazards on-site and the provisions of this HASP.

4.1 Pre-assignment and Annual Refresher Training

Prior to arrival on site, each employer will be responsible for certifying that his/her employees meet the requirements of training, consistent with OSHA 29 CFR 1910.120 paragraph (e)(3) or (e)(9). The employer should be able to provide a document certifying that each general site

worker has received 40 hours of instruction off the site, and 24 hours of training for any workers who are on site only occasionally for a specific task. If an individual employee has work experience and/or training that is equivalent to that provided in the initial training, an employer may waive the 40-hour training so long as that equivalent experience is documented or certified. All personnel must also receive 8 hours of refresher training annually.

4.2 Training and Briefing Topics

The following items may be discussed by a qualified individual at the site pre-entry briefing(s) and at periodic tailgate safety meetings.

Physical Hazards	Chemical Hazards
Emergency Response Plan	Air Monitoring
Training Requirements	Animal Bites and Stings
Respiratory Protection	Medical Surveillance
Site Control	Personal Protective Equipment
Heavy Machinery	

5. PERSONAL PROTECTIVE EQUIPMENT TO BE USED

This section describes the general requirements of the EPA designated Levels of Protection (A-D), and the specific levels of protection required for each task at the site.

5.1 Levels of Protection

Personnel wear protective equipment when response activities involve known or suspected atmospheric contamination vapors, gases, or particulate that may be generated by site activities, or when direct contact with skin-affecting substances may occur. The specific levels of protection and necessary components for each have been divided into four categories according to the degrees of protection afforded:

Level A: Should be worn when the highest level of respiratory, skin, and eye protection are needed.

Level B: Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection. Level B is the primary level of choice when encountering unknown environments.

Level C: Should be worn when the criteria for using air-purifying respirators are met and a lesser level of skin protection is needed.

Level D: Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.

Modifications of these levels are permitted, and routinely employed during site work activities to maximize efficiency. For example, Level C respiratory protection and Level D skin protection may be required for a given task. Likewise the type of chemical protective ensemble (i.e., material, format) will depend upon contaminants and degrees of contact. The Level of Protection selected is based upon the following:

- Type and measured concentration of the chemical substance in the ambient atmosphere and its toxicity.
- Potential for exposure to substances in air, liquids, or other direct contact with material due to work being done.
- Knowledge of chemicals on-site along with properties such as toxicity, route of exposure, contaminant matrix, and adequate warning properties.

In situations where the type of chemical, concentration, and possibilities of contact are not known, the appropriate Level of Protection must be selected based on professional experience and judgment until the hazards can be better identified. For all unknown situations on this site, Level D is the highest level anticipated.

5.2 Recommended Levels of Protection – Task Specific

The following specific personal protective ensembles are recommended for the site:

***Mobilization and De-mobilization* - (Level D)**

- Outer Gloves – leather, canvas, or synthetic
- Hardhat
- Safety Vest
- Safety Glasses
- Steel-toed Boots

***Excavation and Soil Handling* - (Level D)**

- Outer Gloves - Nitrile
- Hardhat
- Safety Vest
- Safety Glasses
- Steel-toed Boots

5.3 Reassessment of Protection Program

The level of Protection provided by PPE selection shall be upgraded or downgraded based upon a change in site conditions or findings of investigations. When a significant change occurs, the hazards should be reassessed and the HASP updated. Some indicators of the need for reassessment are:

- Commencement of a new work phase, such as the start of unexpected sampling or work that begins on a different portion of the site;
- Change in job tasks during a work phase;
- Contaminants other than those previously identified are encountered;
- Change in ambient levels of contaminants;
- Change in work scope which affects the degree of contact with contaminants.

5.4 Standard Operating Procedure for Personal Protective Equipment

Proper inspection of PPE features several sequences of inspection depending upon specific articles of PPE and its frequency of use. The different levels of inspection are as follows:

- Inspection and operational testing of equipment received from the factory or distributor;

- Inspection of equipment as it is issued to workers;
- Inspection after use or training and prior to maintenance;
- Periodic inspection of stored equipment; and
- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.

The primary inspection of PPE in use for activities at the site will occur prior to immediate use and will be conducted by the user. This ensures that the specific device or article has been checked-out by the user and that the user is familiar with its use.

6. MEDICAL SURVEILLANCE REQUIREMENTS

Medical monitoring programs are designed to track the physical condition of employees on a regular basis as well as survey pre-employment or baseline conditions prior to potential exposures. The medical surveillance program is a part of each employers Health and Safety program. Exposure to toxic materials is not anticipated at the Site.

6.1 Exposure/Injury/Medical Support

As a follow-up to an injury or possible exposure above established exposure limits, all employees are entitled to and encouraged to seek medical attention and physical testing. Depending upon the type of exposure, it is critical to perform follow-up testing within 24-28 hours. It will be up to the employer's medical consultant to advise the type of test required to accurately monitor for exposure effects.

7. EXPOSURE MONITORING/AIR MONITORING

Exposure monitoring will not take place at the Site. During excavation operations, air monitoring will be conducted with a photoionization detector (PID). If volatile organic compound (VOC) concentrations are detected above the PEL, operations will be temporarily stopped until vapor dissipate and/or appropriate PPE is donned.

8. SITE CONTROL MEASURES

No hazardous waste operations are anticipated to require sampling for this project, so site control requirements are not needed.

8.1 Site Communication Plan

Successful communications between field teams and contact with personnel in the support zone is essential. The following communications systems will be available during activities at the site:

- Hand Signals
- Verbal
- Honk Vehicle Horn - Evacuate immediately

Signal Definition:

- Hands on top of head Need assistance
- Thumbs up OK/I am all right/I understand
- Thumbs down No/negative
- Arms waving upright Send backup support
- Grip partners wrist Exit area immediately

8.2 Safe Work Practices

The following is a list of standing orders for the duration of the project.

- No smoking, eating, or drinking in areas where there is a potential of cross contamination or risk of fire or explosion.
- No horseplay.
- Implement the communications system.
- Line of sight must be in position.
- Wear the appropriate level of protection as defined in the HASP.
- No unauthorized entry work area.

9. DECONTAMINATION PLAN

Consistent with the levels of protection required, the decontamination process provides a step by step representation of the personnel decontamination steps for level D and C. These procedures should be modified to suit site conditions and protective ensembles in use. Decontamination involves the orderly controlled removal of contaminants. All site personnel should minimize contact with contaminants in order to minimize the need for extensive decontamination.

9.1 Personnel Decontamination

All workers exposed to COCs will be required to enact an orderly removal of contaminated PPE. This can be accomplished through repeated change of disposable garments and or PPE wash at the end of the shift. Workers shall be instructed to the importance of decontamination to prevent cross contamination.

9.2 Sampling Equipment Decontamination

Sampling equipment and heavy equipment may be decontaminated in accordance with procedures as defined in the work plan or as follows:

- Sampling equipment will be rinsed using water and a 5% tri-sodium phosphate solution (or an acceptable substitute).
- Sampling equipment will be decontaminated between sample collections to prevent cross contamination.

Disposable sampling equipment shall be utilized wherever practical to minimize employee exposure and possible cross contamination between sampling events.

10. EMERGENCY RESPONSE/CONTINGENCY PLAN

This section describes contingencies and emergency planning procedures to be implemented at the Site. This plan is compatible with local, state, and federal disaster and emergency management plans as appropriate.

10.1 Pre-Emergency Planning

A field pre-construction/field activities meeting will be conducted at the project site prior to implementation of field services. The meeting will include personnel from McGinley and the selected contractors. Each of the activities and procedures presented will be reviewed during this meeting.

In addition, tailgate site safety discussions will be held daily. All employees will be trained in and reminded of provisions of the emergency response plan, communication systems, and evacuation

routes. The plan will be reviewed and revised if necessary, on a regular basis by the HSO. This will ensure that the plan is adequate and consistent with prevailing site conditions.

10.2 Emergency Recognition/Prevention

Section 3 provides a listing of chemical hazards onsite. Additional hazards as a direct result of site activities are listed in Section 3.2 as are prevention and control techniques/mechanisms. Personnel will be familiar with techniques of hazard recognition from pre-assignment training and site-specific briefings. The HSO is responsible for ensuring that prevention devices or equipment is available to personnel.

10.3 Evacuation Routes/Procedures

All individuals performing sample collection activities will be within shouting distance. Therefore, no special alarm system is anticipated to be necessary. If an emergency situation arises, contact appropriate emergency authorities. No situation calling for site evacuation is reasonably anticipated.

10.4 Emergency Contact/Notification System

The following list provides names and telephone numbers for emergency contact personnel. In the event of a medical emergency, personnel will take direction from the HSO and notify the appropriate emergency organization. In the event of a fire or spill, the site supervisor will notify the appropriate local, state, and federal agencies.

Organization	**Telephone**
Ambulance	911
Police	911
Fire	911
Wells Rural Medical Clinic	(775) 773-8010
NDEP	(775) 687-4670
EPA Emergency Response Team	(908) 321-6660
National Response Center	(800) 424-8802
Center for Disease Control	(404) 488-4100
Chemtrec	(800) 424-9555

10.5 Nearest Medical Assistance

The nearest medical facility is the Wells Rural Medical Clinic. The facility is located at 197 Baker Street, Wells, Nevada. A map of the route to this facility which can provide emergency care for individuals who may experience an injury or exposure on site is included in

Appendix B of this HASP. The route to the facility should be verified by the HSO prior to sampling activities, and should be familiar to all site personnel.

10.6 Emergency Medical Treatment Procedures

Any person who becomes ill or injured in the work area must be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination should be completed and first aid administered prior to transport. If the patient's condition is serious, at least partial decontamination should be completed (i.e., complete disrobing of the victim and redressing in clean coveralls or wrapping in a blanket). First aid should be administered while awaiting an ambulance or paramedics. All injuries and illnesses must immediately be reported to the Project Manager.

10.7 Fire or Explosion

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the project manager or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on site. If it is safe to do so, site personnel may:

- Use fire-fighting equipment available on site to control or extinguish the fire; and
- Remove or isolate flammable or other hazardous materials which may sustain a fire.

10.8 Emergency Equipment/Facilities

All emergency equipment will be located in the command post and/or support zone and shall include:

- First aid kit;
- Fire extinguisher; and
- Mobile telephone.

11. HAZARD COMMUNICATION

In order to comply with 29 CFR 1910.1200, Hazard Communication, the following written Hazard Communication Program has been established. All employees will be briefed on this program and have a written copy for review.

11.1 Container Labeling

All containers received on site will be inspected to ensure the following:

- All containers will be clearly labeled as to the contents;
- The appropriate hazard warnings will be noted; and
- The name and address of the manufacturer will be listed.

All secondary containers will be labeled with either an extra copy of the original manufacturer's label or with generic labels which have a block for identify and blocks for the hazard warning.

11.2 Safety Data Sheets (SDSs)

Copies of SDSs for all hazardous chemicals known on site will be maintained in the work area. SDSs will be available to all employees for review during each work shift.

11.3 Employee Training and Information

Prior to starting work, each employee will attend a health and safety orientation and will receive

information and training on the following:

- An overview of the requirements contained in the Hazard Communication Standard, 29 CFR 1910.1200;
- Chemicals present in their workplace operations;
- Location and availability of a written hazard program;
- Physical and health effects of the hazardous chemicals;
- Methods and observation techniques used to determine the presence or release of hazardous chemicals;
- How to lessen or prevent exposure to these hazardous chemicals through usage of control/work practices and personal protective equipment;
- Emergency procedures to follow if they are exposed to these chemicals;
- How to read labels and review SDSs to obtain appropriate hazard information;

FIGURES

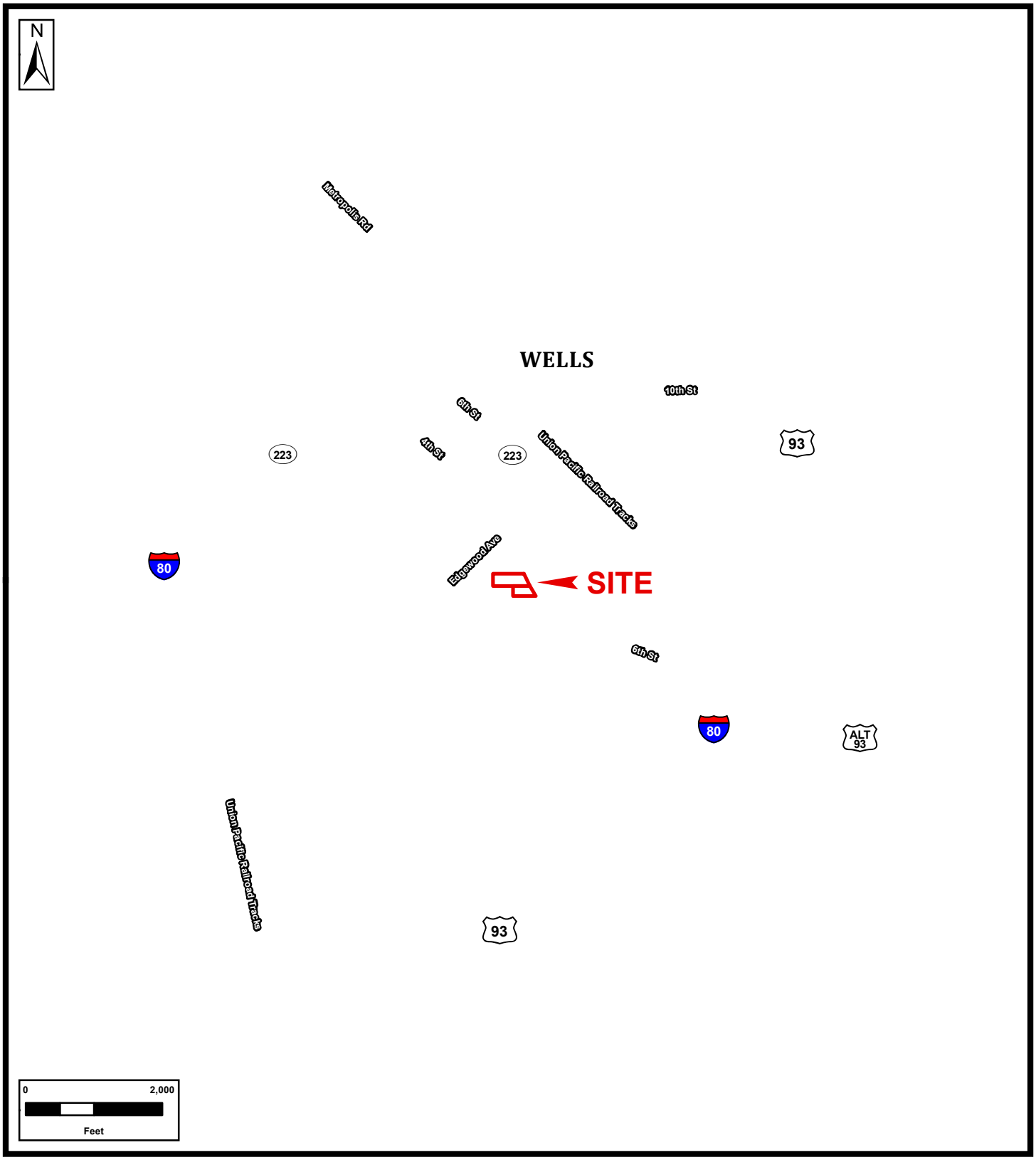


FIGURE 1

TITLE:

PROJECT LOCATION MAP
-SHOWING-
Former Fearless
Farris Gas Station
1010 6th St
Wells, Nevada

[redacted]

FILE:
Fig 1 - Project Location Map

COORDINATE SYSTEM:
NAD 1983 StatePlane Nevada East FIPS 2701 Feet

JOB NO.:	DATE:	REF.					REVISION:
BRN099	7/18/2023	DESIGNED	AH	CHECKED	AH		-
		DRAWN	HC	APPROVED	CJ		

ATTACHMENT A

Statement of Compliance

HASP

Statement of Compliance: Fearless Farris Soil Investigation and Excavation

I have read and understand the HASP for the site investigation of site soils for petroleum impacts at the project site located at 1010 6th Street located in the City of Wells, Nevada.

I agree to comply with the contents of the HASP and understand that not doing so may be reason for discharge from the site.

Signature: _____ Date: _____

Signature: _____ Date: _____

Signature: _____ Date: _____

Signature: _____ Date: _____

Signature: _____ Date: _____

Signature: _____ Date: _____

ATTACHMENT B

Route to Nearest Medial Assistance

Google Maps 1010 6th St, Wells, NV 89835 to Wells Rural Medical Clinic Drive 1.4 miles, 3 min

Imagery ©2020 Maxar Technologies, USDA Farm Service Agency, Map data ©2020 1000 ft

APPENDIX B

EPA SOPs

U.S.EPA REGION 9 LABORATORY

RICHMOND, CALIFORNIA

FIELD SAMPLING GUIDANCE DOCUMENT #1210

SOIL SAMPLING FOR VOLATILE COMPOUNDS

TABLE OF CONTENTS

1.0 Scope and Application

This Standard Operating Procedure (SOP) describes recently modified procedures for field collection, handling, and preparation of soil samples for analyses of volatile organic compounds (VOCs) in solid material (e.g., soils, sediments and solid waste). This SOP includes recent guidance published by EPA Office of Solid Waste (1998) and complements EPA Laboratory Methods 5035 (purge and trap) and 8015, 8021, 8260 (gas chromatography). The primary focus of this SOP is to explain four possible sampling techniques, yet it also describes some procedures to be completed in the laboratory prior to sample collection in the field. Field personnel must coordinate with the receiving laboratory to ensure the selected sampling methodology matches the analytical procedures used in the lab. Specialized equipment and containers are designed to maintain sample integrity for soil or solid materials which may contain contaminants with boiling points less than 200°C (e.g., BTEX).

Revision of these SW-846 field and laboratory procedures was a result of research conducted by both the private and public sector which showed that traditional sample collection techniques results in substantial losses of volatiles. These losses (an order of magnitude or more) are the culmination of volatilization and biodegradation losses that occur during the sampling, storage, and subsequent sub-sampling in the laboratory.

Under ideal circumstances, field instruments are available to prescreen samples for initial concentrations and subsequently utilize optimal sample collection, preservation and laboratory analyses. In lieu of prescreening samples on site, field personnel may need to collect samples with both low (<200 ug/kg) and medium (>200 ug/kg) level VOC concentrations. Two different field preservation and one laboratory preservation options are described here in order to address sampling for soils with various concentrations. It must be noted that field preservation options are inherently more difficult and increase chances of sample contamination as compared to using pre-preserved sample vials.

To address significant problems with soil VOC analyses, the method was dramatically revised in Update III of SW-846 (finalized in the June 13, 1997 Federal Register). In particular, Method 5030A was deleted for low-level soil analysis and was replaced with Method 5035. A revised medium-level method was also presented in Method 5035. Samples must be handled differently from the onset of sample collection, depending upon the action levels for the project and the anticipated concentrations of VOCs at the site.

2.0 Method Summary

Samples to be analyzed for VOC compounds are collected from freshly exposed soil. Approximately 5 grams of sample is obtained by one of several methods described in Table 1. Either a hand-held coring device or a modified plastic syringe is used to gather the soil plugs or solid material sample. (The modified syringe has had the front end sliced off and uses a plunger without lubricant.) If the plastic syringe is used, then field personnel extrude these soil plugs into vials containing preservatives (sodium bisulfate solution or methanol**).** Vials may be preweighed and pre-preserved in the laboratory or vials can be weighed and filled with preservatives in the field. Samples in vials are re-weighed after the sample aliquots are added to obtain the net sample weights. All weights must be recorded to within 0.2 g.

In addition to the samples collected for analysis, one co-located sample must be collected for a moisture content determination in order to report the VOC results on a dry-weight basis. Samples for moisture content determinations should not be chemically preserved and may be collected in conventional vials.

Table 1: Field Collection and Sample Preparation Options

Coring Device used in field, Laboratory Preservation (Protocol # 1)

- no field chemicals required
- limited to consolidated soils which can be collected in a coring device
- samples can be preserved in the laboratory using chemical preservatives or by freezing
- if samples are frozen until analysis, low level analyses can be performed in water
- limited suppliers of validated devices (e.g., Encore™ sampling equipment)

Low Level (<200 ug/kg) Sample Field Preserved with acidic solution (Protocol # 2)

- sodium bisulfate ($NaHSO_4$) solution added to vial in laboratory prior to sample collection in field
- limited to consolidated soils which can be collected in a coring device
- cannot be used on carbonaceous soils
- weighed in the field
- sample container (glass vial) also serves as the purge vessel
- bias may exist for some soil types (high clay or organic carbon)
- limited on the high end by instrument calibration which typically is 200 ug/Kg
- detection limits are based on the analyte, method, and laboratory capability, but typically range from 0.5 to 5 ug/kg
- VOA vial used as sparge vessel, samples cannot be diluted and VOA vials cannot be reanalyzed.
- additional samples required for QC and contingencies
- must comply with special DOT shipping requirements

Medium Level (>200 ug/Kg) Sample field preserved with Methanol preservation (Protocol # 3)

- methanol added to sample vial in laboratory prior to sample collection in field
- often referred to as preservation/extraction procedure
- aggregate and cemented materials can be collected by increasing sample size and volume of methanol
- negligible bias due to matrix effects
- method is not limited on the high end by instrument calibration since samples can be diluted and re-analyzed
- detection limits are based on the analyte, method, and laboratory capability
- analyzed by purge and trap
- must comply with special DOT shipping requirements

No Preservation (Protocol # 4)

- methodology selected as a last resort
- must be "clearly documented" in a sampling and analysis plan that is reviewed and approved by Region 9
- limited to unusual matrices
- data will be flagged as estimated

2.1 Selection of Sample Methodology

Part of the planning stages of the project is the selection of methodology. Potential contaminants of concern, often referred to as target analytes, must be carefully identified and defined relevant to data quality objectives. When the nature of the contamination is not well known, method-specified target analyte lists are typically selected by default. However, in many situations a target analyte list can be reduced based upon historic activities at the site. If there is no reason to suspect the presence of a contaminant it may be appropriate to omit it from the method analyte list. Since low-level analyses are usually more resource-intensive than medium-level analyses, it recommended that rationale for the testing of the more toxic contaminants be carefully evaluated prior to analytical testing (since these contaminants will possess the lowest action levels).

Action levels should be established once the contaminants of concern have been identified (e.g., using regulatory and risk-based criteria). Table 2 lists Region 9 Preliminary Remediation Goals (PRGs) for both residential and industrial soils for selected compounds. As shown in this table, for many analytes, the medium level method can provide acceptable quantitation levels.

Once action levels are established during the planning stages of the project, in order to select methodology with adequate sensitivity (i.e., to determine whether the high-level or low-level VOC analyses are more appropriate), **the action levels must be compared to the quantitation limits of the laboratory that will be performing the actual analyses**. (*It is important to note that laboratories frequently fail to report scientifically valid quantitation limits*.) Ideally, the action level for each target analyte should be at least two times greater than the laboratory's corresponding quantitation limits.

Table 2: Comparison of Region 9 PRGs to Laboratory Quantitation Limits

	Laboratory Quantitation Limit		Region 9 PRG	
Compound	Low Level	Medium Level	Industrial	Residential
Benzene	0.005	0.05	1.4	0.63
Bromodichloromethane	0.005	0.05	1.4	0.63
Carbon tetrachloride	0.005	0.05	0.5	0.23
Chloroform	0.005	0.05	0.53	0.25
1,2-Dibromo-3-chloropropane	0.005	0.05	1.4	0.32
1,2-Dibromoethane	0.005	0.05	0.02	**0.0049**
cis-1,4-Dichloro-2-butene	0.025	0.10	0.017	**0.0075**
1,2-Dichloroethane	0.005	0.05	0.55	0.25
1,1-Dichloroethene	0.005	0.05	0.08	**0.037**
1,2-Dichloropropane	0.005	0.05	0.68	0.31
cis-1,3-Dichloropropene	0.005	0.05	0.55	0.25
1,1,2,2-Tetrachloroethane	0.005	0.05	1.1	0.45
1,1,2-Trichloroethane	0.005	0.05	1.6	0.65
Vinyl chloride	0.005	0.05	0.035	**0.016**

Notes: Only compounds with PRGs > 1 ppm are shown. All values are in mg/kg. Values which exceed medium-level quantitation limit are shown in bold.

3.0 Sample Preservation, Containers, Storage and Handling

3.1 Preservation

Note: Method 5035 suggests several other options (e.g. freezing in water, freezing in the VOA vial, polyethylene glycol, etc.) None of these other preservation options have been validated and are not recommended by Region 9 unless validated prior to use.

3.2 Containers

Specific sample containers required will depend on the sampling methodology and corresponding laboratory analytical method. The most common soil VOC container is a 40 mL glass vial with a special frit and equipped with two TFE-faced silicon septa. These are large enough to contain at least 5 g of soil or solid material and at least 10 mL of liquid. 60 mL vials of equivalent materials and construction may also be used.

Another container is the plastic coring device which holds about 5 g of soil and can be tightly fitted with a cap equipped with a seal of inert rubber. These are commercially available (En Core); however, the receiving laboratory must have special tools to open this core.

3.3 Handling

3.3.1 Encore™ Samples (Protocol #1)

Ideally, the samples should be transferred to a VOA vial with a chemical preservative on the day of sample receipt. If this is done, a 14 day holding time will apply. If this action cannot be performed, either due to carbonaceous soils scheduled for low level analysis, or due to laboratory logistical issues, the samples should be stored in a freezer (-12°C) until the day of analysis. Such samples can be held for up to 7 days after sample collection.

3.4 Shipping & Storage

Once samples are collected, it is imperative that they be stored in conditions which maintain the integrity. All samples should be placed in shipping containers or other suitable containers with ice to reduce the temperature as soon as possible. Ideally, samples should be shipped the day of collection for overnight delivery to the laboratory. If overnight transit is not feasible due to site logistics, samples should be held at 4°C until shipping. Samples collected in the Encore™ sampler should be received at the laboratory within 4 days of sampling. *Note: DOT regulations associated with the use of preservatives in the field may be avoided by using Encore™ samplers.*

Chemically preserved samples should be stored at 4°C until analysis. A 14 day holding time is applicable.

Depending on the quantity and method of packaging, sodium bisulfate and methanol may be DOT Hazardous Materials and may be subject to the DOT and International Air Transportation Association (IATA) hazardous materials regulations.
Section 12 of this SOP provides a complete description of DOT regulatory considerations

4.0 Interferences and Potential Problems

Contamination of preservatives could result in a high bias of data. Personnel should optimize handling preservatives and sample vials in laboratory with controlled conditions. When samples are preserved in the field, it is especially critical to avoid the introduction of contamination from external sources. Consequently, personnel should work upwind of any possible source of VOCs (emissions from engines and backhoes, tobacco smoke, etc.) while adding preservatives to soil samples.

It is important to recognize that organic-free methanol can solubilize contaminants in ambient air. Forethought while sampling or handling vials is crucial to avoid possible contamination while using Protocol #3. The acidic solution used in Protocol #2 also has the potential for absorbing contaminants from ambient air. Do not leave vials open and exposed to ambient air.

Equipment blanks and field blanks are expected to be included in the sampling plan. For example, when samples are preserved with methanol in the field, a methanol blank should be exposed to field conditions during the sample collection process. Another example, if soil sample plugs are to be collected using the modified plastic syringe then "clean" soil should be extracted into the modified syringe then pushed into a

clean vial.

4.1 Instrumentation

The low level method requires a new autosampler which has two key features: 1. the ability to analyze low level samples without opening the vial and 2. a mechanical device for stirring the samples during analysis.

4.2 Operational Details

Screening at the laboratory is recommended regardless of whether samples were screened in the field (although laboratory screening is more important when field screening is not performed). When both medium-level and low-level samples are submitted to the laboratory, the laboratory must screen the samples prior to analysis or perform both medium-level and low-level analyses on a trial-and-error basis. For example, if the laboratory does not perform screening, then a sample is analyzed using the medium-level method, *but* VOCs are not detected or are detected below the quantitation limits, then the laboratory would be required to analyze the corresponding co-located low-level sample. Conversely, if the low-level sample is initially analyzed and exceeds the calibration range of the instrument, then the laboratory would be required to analyze the corresponding sample using the medium-level method.

5.0 EQUIPMENT/APPARATUS

- maps/site sample plan
- safety equipment
- GPS data logger and receiver
- plastic syringes, disposable, with barrel smaller than neck of sample vial, syringe end is cut off prior to sampling, one syringe per sample aliquot to be collected
- glass vials, 40 mL, screw cap, TFE lined, septum sealed
- magnetic stir bars, TFE or glass-coated
- portable top-loading balance ±0.01g (for protocol# 3); balance weights for reference and calibration once per day
- zip-type plastic bags
- logbook
- sample labels
- chain of custody forms
- custody seals
- field data sheets
- cooler(s)
- ice
- stainless steel, plastic, or other appropriate composition bucket
- decontamination supplies/equipment
- spade or shovel
- scoop
- bucket auger
- hand auger and extension rods

6.0 REAGENTS

Sodium bisulfate, reagent grade, and organic-free water are required for the low level method. High-purity methanol is required for the medium level method.
Decontamination solutions are specified in SOP #109, Sampling Equipment Decontamination.

7.0 Sampling Procedures

Whether sampling from the surface or from depth using such devices as a split spoon, collection of the sample will be the same. Samples should be collected as quickly as possible (< 10-15 seconds). *Temporary storage of soil in split spoons, jars, or ziplock bags is not permitted*. Field screening may still be used to decide which samples will be submitted for analysis but all potential samples must be immediately chemically preserved or placed in a coring device. All protocols have been written assuming that both medium and low level sample will need to be collected.

In order to help maintain the physical structure of samples, for cohesive granular material, a hand-operated coring device must be used to collect samples of appropriate size for laboratory analysis (e.g., cylindrical soil plugs are extruded into vials using disposable plastic syringes with the tapered front ends removed). Field personnel transfer samples into preweighed vials containing liquid preservatives(e.g., sodium bisulfate solution or methanol). The vials are weighed in the field before use and are subsequently reweighed after the sample aliquots are added to obtain the net sample weights.

7.1 Preparation of sample vials

Sample vials should be prepared in a fixed laboratory or other controlled environment, sealed and shipped to the field location. Gloves should be worn during the preparation steps.

Low level samples field-preserved with sodium bisulfate solution

- Add a clean magnetic stirring bar to each clean vial. If the purge and trap device employs a means of stirring the sample other than a magnetic stirrer (e.g., sonication or other mechanical means), then the stir bar is omitted.

- Add preservative to each vial. The preservative is added to each vial prior to shipping the vial to the field. Add approximately 1 g of sodium bisulfate to each vial. If sample volume is markedly smaller or larger than 5 g, adjust the amount of preservative at a ratio of 0.2 g preservative for each 1 g of sample. Enough sodium bisulfate should be present to ensure a sample pH of <2.

- Add 5 mL of organic-free reagent water to each vial. The water and the preservative will form an acid solution that will reduce or eliminate the majority of the biological activity in the sample, thereby preventing biodegradation of the volatile target analytes.

- Seal the vial with the screw-cap and septum seal. If the double-ended, fritted vials are used, seal both ends as recommended by the manufacturer.

- Affix a label to each vial. This eliminates the need to label the vials in the field and assures the tare weight of the vial includes the label. (The weight of any added markings is negligible.)

- Weigh the prepared vial ± 0.01 g, record the tare weight, and write it on the label.

- Because VOCs will partition into the headspace of the vial from the aqueous solution and will be lost when the vial is opened, surrogates, matrix spikes, and internal standards (if applicable) should only be added to the vials after the sample has been added to the vial. These standards must be introduced in the laboratory, either manually by puncturing the septum with a small-gauge needle or automatically by the sample introduction system, just prior to analysis.

Medium level samples field preserved/extracted with Methanol

♦ Add 10 mL of methanol to each vial.

♦ Seal the vial with the screw-cap and septum seal.

♦ Affix a label to each vial. This eliminates the need to label the vials in the field and assures the tare weight of the vial includes the label. (The weight of any added markings is negligible.)

♦ Weigh the prepared vial ± 0.01 g, record the tare weight, and write it on the label.

NOTE: Vials containing methanol should be weighed a second time the day they are used. Vials found to have lost methanol (reduced weight by >0.02g) should not be used for sample collection.

♦ Surrogates, internal standards and matrix spikes (if applicable) must be added to the samplein the laboratory and prior to analysis.

7.2 Sample Collection

7.2.1 Protocol #1: Field collection with coring type samplers followed by laboratory preservation

Expose a fresh surface using a clean spatula or other suitable tool. Collect a sample using a coring device (e.g., the hand-held Encore™) and immediately cap following manufacturer's directions. Collect two five gram cores for the low level (if needed) and one five gram core for the medium level. Label cores and transfer to laboratory on ice as soon as possible, but within four days.

7.2.1.1 Unconsolidated Materials

Certain soil types may not be sufficiently consolidated to collect a core sample. Two examples would be dry sand or sludges/sediments with a very high moisture content. In such cases, the plunger of the Encore™ should be pulled back and locked. The Encore™ should be held with the opening facing upward and the sample transferred by spatula or pouring until the Encore™ is filled. The Encore™ is then capped and handled as previously outlined. *Note: Samples which are unconsolidated should be labeled as such on the chain of custody so that the laboratory can handle these samples with additional caution.*

7.2.1.2 Aggregate or Cemented Material

The Encore™ sampler should not be used for these materials. It can only be used for soil types that can be collected using a small diameter coring device. For other materials, the only collection technique which will maintain the integrity of the sample is field collection with methanol–protocol #3.

7.2.2 Protocol #2: Low level soil samples field preserved with Sodium Bisulfate

The sample vials for the low-level method are designed to be placed directly in the laboratory's instrument so that they remain hermetically sealed until the VOCs are withdrawn during analysis. The entire content of each vial is processed during analysis. Hence, when low-level VOC analyses are required, it is necessary to collect at least two co-located samples. This gives the laboratory an opportunity to perform an additional analysis should the first analysis be unacceptable. Since the vials remain sealed, dilutions cannot be performed. When low-level VOC analyses are required, an extra co-located sample for the medium-level method must be collected with each set of low-level samples. Also aqueous acidic solutions are used to preserve samples for the low-level analyses; therefore, low-level samples must be initially tested for carbonate interferences in the field before samples are collected.

7.2.2.1 Laboratory Preparation

Add 1 gram sodium bisulfate, clean magnetic stir bar, and 5 mL of deionized water to a 40 mL VOA vial. Label vial and record weight ± 0.01 grams.

Note: VOA vials with special low bleed septa must be used to prevent false positives due to siloxane peaks from standard septa. Teflon coated stir bars absorb VOCs. This is a potential loss of VOCs. Disposable stir bars should be used or if stir bars are to be re-used, the stir bars should be cleaned and the cleanliness verified.

7.2.2.2 Field sampling

Whenever possible, samples should always be collected using a coring device (modified plastic syringe) as a transfer tool. A simple coring device can be made by cutting off the front part (with tip) of a disposable non-lubricated syringe, removing the rubber plunger tip and (with repeated experimentation) marking the length of core (2--3 cm) that corresponds to 5.0 ± 0.5 g. *Note: Use disposable syringes are NOT lubricated since so as to avoid contaminating the VOC sample.*

If the test sample passes the initial test for both effervescence and pH (section below), use the plastic syringe to collect approximately 5 g of sample as soon as possible after the surface of the soil or other solid material has been exposed to the atmosphere: generally within a few minutes at most.

Transfer the 5 g soil sample ("or plug") into the prepared and pre-labeled sample vial by placing the syringe tip inside the vial and squeezing the syringe plunger. Cap immediately and carefully wipe the exterior of the sample collection device with a clean cloth towel.

For each sampling point, use a new plastic syringe to collect soil. Quickly brush any soil off the vial threads and immediately seal the vial with the septum and screw-cap.

An initial test sample should be collected to evaluate effervescence and chemical preservation (pH $\leq$ 2). A five gram core should be placed in a VOA vial which contains the acid solution. If effervescence occurs, the sample should be collected in a VOA vial with no sodium bisulfate. (*Note: if effervescence does occur, immediately unscrew the cap to release built up pressure*.) The unpreserved sample should be analyzed within 48 hours, the holding time. Results from the analysis may be biased low and should be flagged as estimated.

The test sample must also have the pH evaluated either by a pH meter or test strip to ensure that the pH has been reduced to <2 to limit biodegradation. If the sample has not been properly acidified, there are two options:

- Vials can be used which contain a higher amount of sodium bisulfate. This additional sodium bisulfate should be added in the lab when the vial is prepared since addition in the field would affect tare weight. The exact amount of sodium bisulfate will be determined by the buffering capacity of the soil which makes prescreening of the site prior to the actual sampling event a necessity. Sodium bisulfate can be added in the field if the field personnel record the weights of the additional preservative and sample.

- Analyze the sample within the 48 hour holding time and flag the data as estimated.

Hints:
When practical, use a portable balance to weigh the sealed vial containing the sample to ensure that 5.0 g ± 0.5 g of sample were added. The balance should be calibrated in the field using an appropriate weight for the sample containers employed. Record the weight of the sealed vial containing the sample to the nearest 0.01 g.

Alternatively, collect several trial samples with plastic syringes. Weigh each trial sample and note the length of soil in the syringe that corresponds to 5.0 + 0.5 g. Discard each trial sample.

As with the collection of aqueous samples for volatiles, collect at least two replicate samples. This will allow the laboratory an additional sample for reanalysis. The second sample should be taken from the same soil stratum or the same section of the solid waste being sampled, and within close proximity to the location from which the original sample was collected.

In addition, since the soil vial cannot be opened without compromising the integrity of the sample, at least one additional aliquot of sample must be collected for screening, dry weight determination, and medium concentration analysis (if necessary). This third vial may be collected in a 60 ml vial or another 40 ml soil sample vial. However, this third vial must not contain the sample preservation solution, as an aliquot will be used to determine dry weight. If medium concentration samples are collected in vials containing methanol, then two additional vials should be collected, one for medium concentration analysis collected in a vial containing methanol, and another for the dry weight determination in a vial without either methanol or the low concentration aqueous preservative solution.

If samples are know or expected to contain target analytes over a wide range of concentrations, thereby requiring the analyses of multiple sample aliquots, it may be advisable and practical to take an additional sample aliquot in a low concentration soil vial containing the preservative, but collecting only 1- 2 g instead of 5 g as described in section 7.2.3.

NOTE: When the low level samples are strongly alkaline or highly calcareous in nature, the sodium bisulfate solution may not be strong enough to reduce the pH of the soil/water solution to below 2. Additional steps may be required to preserve the samples. Such steps include: addition of larger amount of the sodium bisulfate preservative to non-calcareous samples, storage of low level sample as -12°C, or significantly reduce the maximum holding time for low concentration soil samples. Whichever steps are employed, they should be clearly described in the sampling and QA project plans and distributed to both the field and laboratory personnel.

Record weight and transfer to ice.

A duplicate low level sample should be collected for the laboratory since low level samples cannot be reanalyzed. Ship to the laboratory per DOT regulations. (Corrosive.) *Note: Additional samples need to be collected for matrix spikes or other QC objectives.*

7.2.2.3 Aggregate or Cemented Material

Protocol #2 should not be used for these materials. For other materials, the only collection technique which will maintain the integrity of the sample is field collection with methanol–protocol #3.

7.2.3 Protocol # 3: Medium level samples field preserved with Methanol

This particular sampling protocol has been suggested by some as a combined preservation and extraction procedure. Carbonates are not problematic for methanol preservation and methanol sample extracts may be diluted in the laboratory when concentrations exceed the calibration range of the instrument. In addition, when samples are preserved with methanol, field personnel are not limited to single grab samples (as in the low-level method) but may composite subsamples from several locations.

7.2.3.1 Laboratory Preparation

Add 5 mL of methanol to a 40 mL VOA vial. Label vial and record weight ± 0.01 grams.

7.2.3.2 Field Sampling

Vials containing methanol must be reweighed (in the field) on the day of use to ensure that there has been no significant loss of methanol. Vials which exhibit a difference of greater than 0.2 grams should not be used. Quickly collect a 5 gram sample using a coring device as in 7.2.1 above and transfer soil plug into VOA vial containing methanol. Take care to ensure that no soil particles exist on vial threads.

Weigh to 0.2 grams and complete label. Ship to lab per DOT regulations. (Flammable liquid, Poison.) Samples which have been preserved but are not submitted to the laboratory must be treated as hazardous waste. *Note: Other sample sizes may be used. The 1:1 soil to methanol ratio by weight should be maintained and a larger bottle may be required.*

Using the appropriate sample collection device, collect approximately 5 g of sample immediately (15 mins.) after the surface of the soil or other solid material has been exposed to the atmosphere. Carefully wipe the exterior of the sample collection device with a clean cloth or towel.

Using the collection device, add about 5 g (2--3 cm) of soil to the vial containing 10 mL of methanol. Brush any soil off the vial threads and seal the vial with the septum and screw-cap. Total sampling time not to exceed 10 minutes. Store samples on ice at 4°C.

When practical, use a portable balance to weigh the sealed vial containing the sample to ensure that 5.0 g ± 0.5 g of sample were added. The balance should be calibrated in the field using an appropriate weight for the sample containers employed. Record the weight of the sealed vial containing the sample to the nearest 0.01 g.

Alternatively, collect several trial samples with plastic syringes. Weigh each trial sample and note the length of the soil column in the syringe. Use these data to determine the length of soil in the syringe that corresponds to 5.0 g ± 0.5 g. Discard each trial sample.

Other sample weights and volumes of methanol may be employed, provided that the analyst can demonstrate the sensitivity of the overall analytical procedure is appropriate for the intended application.

The collection of at least one additional sample aliquot is required for the determination of the dry weight, as described in sec. 7.3. Samples collected in methanol should be shipped as described in Sec. 12 and must be clearly labeled as containing methanol, so the that the samples are not analyzed using the closed-system purge and trap equipment described in this procedure.

NOTE: Collection of medium concentration soil samples that are NOT preserved in the field generally follow similar procedures as for the other types of samples described in section 7.2.4, with the obvious exception that the sample vials contain neither the aqueous preservative solution nor methanol. However, when field preservation is not employed, it is better to collect a larger volume sample, filling the sample container as full as practical in order to minimize the headspace. Such collection procedures generally do not require the collection of a separate aliquot for dry weight determination, but it may be advisable to collect a second sample aliquot for screening purposes, in order to minimize the loss of volatiles in either aliquot.

7.2.3.3 Large Aggregate and Cemented Materials

Sample will need to be placed in a larger, wide mouth, 4 0z. glass jar and preserved with a proportionately larger volume of methanol (to maintain the 1:1 ratio). In this event, the weight or volume of methanol must be recorded.

7.2.4 Protocol # 4: No preservation

Under limited circumstances, Region 9 will permit the collection of unpreserved samples, such as hard or cementitious materials, debris, or large aggregates which cannot be easily collected using the options above. Field methanol preservation is the preferred approach for these types of materials. Losses of VOCs are likely and all results should be considered as estimated values.

7.3 Moisture Content Sample

In addition to the samples collected as described above, a separate container must be collected to determine moisture content. This sample can be any conveniently sized container, of glass or plastic. Ordinary soil sampling procedure are used to collect samples to measure moisture content. If samples are being collected for other analytes (e.g. metals, semivolatiles) that sample container can serve as the container for moisture content.

8.0 Calculations

For low level analyses, the laboratory should correct surrogate concentrations for the percent moisture in the samples. Otherwise this section is not applicable to this field sampling SOP.

9.0 Quality Assurance/Quality Control

There are no specific quality assurance activities which apply to the implementation of these procedures. However, the following QA/QC procedures apply:

1. All data must be documented on field data sheets and in site logbooks.

2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibrations activities must occur prior to sampling/operation, and they must be documented.

10.0 Data Validation

This section is not applicable to this field sampling SOP.

11.0 Health and Safety

Methanol is a toxic and flammable liquid. Therefore, methanol must be handled with all safety precautions related to toxic and flammable liquids. Inhalation of methanol vapors must be avoided. Vials would be opened quickly during the sample preservation procedure. Methanol must be handled in a ventilated area. Protective gloves should be worn when vials containing methanol are handled. Methanol should be stored away from open flames, areas of extreme heat, and other ignition sources. Vials containing methanol should be refrigerated (e.g., stored in coolers with ice).

Aqueous sodium bisulfate is a strong mineral acid. Therefore, solutions must be handled with all safety precautions related to mineral acids. Protective clothing (gloves, safety glasses, etc.) should be worn when vials containing sodium bisulfate are handled.

12. Regulatory Considerations for Sample Shipping

Field personnel involved in the shipment of samples prepared in the field for laboratory analysis by Method 5035, should be aware of the pertinent EPA, Department of Transportation (DOT) and International Air Transportation Association (IATA) regulations so that regulatory compliance can be maintained. Three levels of regulations apply depending on type and quantity of preservative and method of packaging. These regulations are summarized as follows:

1. small quantity exception--($\leq$ 30 mL inner containers), *not subject* to Hazardous Material Regulations (HMR) *provided* package is in accordance with 49 CFR 173.4.

2. limited quantity DOT hazardous material--must meet regulatory requirements minus UN specification containers (49 CFR 172.700 training applies)

3. fully regulated DOT hazardous material--Ltd Qty exception not taken, package must be in *full* compliance with HMRs (49 CFR 172.700 training applies)

Note: DOT regulations associated with the use of preservatives in the field may be avoided by using Encore™ samplers.

12.1 Shipment as a Small Quantity Exception (49 CFR 173.4)

The DOT small quantity exception described in 49 CFR 173.4(a)(1)(i) states that the maximum quantity of material per inner container is limited to thirty (30) mL for authorized liquids, other than Division 6.1, Packing Group I materials (i.e., poisons). As applied to the preservatives of Method 5035, *if there is less than or equal to 30 mL of methanol or aqueous sodium bisulfate solution per inner container (VOC vial), this material is not subject to any other requirements of the hazardous materials regulations except those presented in 49 CFR 173.4.* However, aside from the 30 mL receptacle limit, there are additional

restrictions:

- Each inner receptacle with a removable closure, has its closure held securely in place with wire, tape or other positive means.
- Unless equivalent cushioning and absorbent material surrounds the inside packaging, each inner receptacle is securely packed in an inside packaging with cushioning and absorbent material that (i) will not chemically react with other material and (ii) is capable of absorbing the entire contents (if liquid) of the receptacle.
- The inside packaging is securely packed in a strong outside packaging.
- The completed package, as demonstrated by prototype testing, is capable of sustaining each of the following free drops made from a height of 1.8 m (5.9 feet) directly onto a solid unyielding surface without breakage or leakage from any inner receptacle and without a substantial reduction in the effectiveness of the package:
  - One drop flat on bottom
  - One drop flat on top
  - One drop flat on the long side
  - One drop flat on the short side
  - One drop on a corner at the junction of three intersecting edges
  - A compressive load as specified in 49 CFR 178.606(c)

The gross mass of the completed package must not exceed 29 kg (64 pounds). The package must not be opened or otherwise altered until it is no longer in commerce. The shipper must certify conformance with this section by marking the outside of the package with the statement: *This package conforms to 49 CFR 173.4,"* or, until 1 October 2001, with the statement: *This package conforms to the conditions and limitations specified in 49 CFR 173.4.* Furthermore, the shipper must indicate on the air waybill under nature and quantity of goods: *Dangerous Goods in Excepted Quantities.*

IATA also requires the application of an *excepted quantities label.* This label contains the certification language identified above. Label entries include shipper signature, title, date, address and indication of the hazard class and associated UN number.

One final restriction needs to be noted. While 49 CFR 173.4 does not have a total net quantity limitation, IATA Dangerous Goods Regulations (DGR Section 2.7.4.2) *does.* For packing group II materials (e.g., methanol and sodium bisulfate), the total net quantity limit is 500 mL. This equates to 60 inner containers (VOC vials) containing approximately 8 mL of material (sample plus preservative) per outer package (i.e., sample cooler).

When discussing the shipment of DOT hazardous materials in the air mode, shippers have additional restrictions that are identified in Columns 9A/9B of the 49 CFR 172.101 hazardous materials table. Net quantity limits for methanol for passenger and cargo aircraft are one (1) liter and sixty (60) liters, respectively. The net quantity limits for sodium bisulfate solutions are one (1) liter and thirty (30) liters, respectively. Shippers should note that these quantities exceed the IATA small quantity exception. **Therefore, if preservative volume (methanol or sodium bisulfate solution) is less than 30 mL per**

VOC vial (inner container) and the total net quantity per cooler (outer package) is limited to 500 mL, DOT HMRs or IATA DGR's quantity limits are never an issue provided packaging conforms with 49 CFR 173.4.

If more than 30 mL of methanol is used per VOC vial, shippers must address regulations for DOT-regulated hazardous material.

12.2 DOT Regulated Hazardous Materials Shipments, Limit Quantity

Personnel offering chemically preserved environmental samples for shipment in commerce in inner packaging (containers) containing more than 30 mL of methanol *are Hazmat employees* and are subject to the DOT training requirements in 49 CFR 172.700. If these individuals do not possess DOT training and do not have an employer certification, it is a violation of DOT regulations to offer these materials for transportation in commerce! Also, some generally used air shipping couriers *may not* ship hazardous materials or limited quantity hazardous materials. It is recommended that the proposed carrier be consulted in advance to determine if there are any company-specific requirements or limitations.

Methanol-preserved samples in greater than 49 CFR 173.4 inner-container quantities will void the 49 CFR 173.4 small quantity exception. These materials meet the definition of a DOT flammable liquid. On the shipping paper, these samples must be described using any of the following text:

- Methanol solution, 3, UN1230, PGII
- Methanol solution, 3, UN1230, PGII Limited Quantity
- Methanol solution, 3, UN1230, PGII Ltd Qty.

(Note that methyl alcohol may be substituted for "methanol.)

It is emphasized that DOT allows for a limited quantity exception. Under the limited quantity exceptions, packages need not be UN specification. Labels are not required *unless* the shipment is by air. Additionally, limited quantity shipments are not subject to placarding requirements. There are restrictions on the type of combination packaging that is acceptable for use. Since methanol is a PGII flammable liquid, 49 CFR 173.150 states the inner packaging limitation is one (1.0) liter. The outer packaging is described in the regulations as a strong outer package (i.e., a box, can, or cooler). Marking requirements must be met. An outline of the limited quantity exceptions and requirements for methanol is as follows:

Packaging:
Inner packaging: Plastic or glass < 1.0 liters
Outer Packaging: Strong outer package
Gross Weight: 66 lb (30 kg)

Labeling: Not required unless shipped by air
Primary Hazard: Flammable Liquid
Secondary Hazard: Poison

Marking: The outer package must be marked with the following items:

1. Proper shipping name: Methanol Solution
2. UN Number: Not required for Ltd Qty shipment/Otherwise required
3. DOT specification orientation arrows (See 49 CFR 172.312 for exception)
4. Shipper or receiving facility name and address
5. Cargo Aircraft only may be required depending on quantity shipped.

Shipping Paper:
1. Complete DOT shipping description
2. Number of containers (i.e., complete package)
3. Weight
4. Emergency Response information (ERG #)
5. Emergency Contact information

12.3 DOT Regulated Hazardous Materials Shipments, Fully Regulated

If shippers *do not* take a limited quantity exception and their materials are regulated in commerce, they must have DOT specification packages and would probably have to consider the cooler a DOT overpack (49 CFR 173.25). All inner packaging must be marked and labeled. Also, since the inner markings and labels will not be visible, the overpack must be marked and labeled on the outside *and* be marked with the following statement:

Inside (inner) packages comply with prescribed specifications

This means that the inner receptacles (glass jars or vials) must be in an authorized (UN specification) outer package. These combination packages would then be placed in the cooler (DOT overpack). For this case, all DOT shipping paper, labeling, marking (including UN numbers), and placarding requirements in 49 CFR 171 - 177 apply.

12.4 RCRA Regulations

The RCRA hazardous waste regulations are also be applicable to shipping of chemically preserved samples. 40 CFR 261.4 discusses the RCRA exemption for shipping samples. These regulations provide an exemption from the hazardous waste regulations for “samples” but not for materials which are not analyzed. Materials preserved with aqueous sodium bisulfate or methanol, which are not considered “samples,” would be classified as hazardous wastes due to characteristics (corrosivity and ignitability) and would need to meet the RCRA manifesting and shipping requirements in 40 CFR 262.

APPENDIX C

Unanticipated Discovery Plan

McGinley & Associates
A Universal Engineering Sciences Company

Reno
5410 Longley Lane
Reno, Nevada 89511
Ph: 775.829.2245

Las Vegas
1915 N. Green Valley Parkway
Suite 200
Henderson, Nevada 89074
Ph: 702.260.4961

www.mcgin.com

- Site Remediation
- Soil & Groundwater Investigations
- Geochemistry
- Hydrogeology
- Groundwater Modeling
- Biological Services
- Closure Optimization
- Air Quality Permitting & Modeling
- Brownfields Redevelopment
- Permitting & Compliance
- NEPA Studies
- Phase I Assessments
- Indoor Air Quality
- Storm Water & Spill Plans
- Underground Tank Services
- Geographic Information Systems
- Litigation Support & Expert Witness
- Mining Plans of Operations
- Mining Exploration Notices
- Abandoned Mine Lands

UNANTICIPATED DISCOVERY PLAN
Former Fearless Farris Gas Station
Wells, NV

Nevada Brownfields Program

Nevada Division of Environmental Protection
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701

NDEP

TABLE OF CONTENTS

1. INTRODUCTION

This Unanticipated Discovery Plan (UDP) presents procedures for the inadvertent discovery of cultural resources or human skeletal remains during ground disturbing (surface/subsurface) and/or environmental sampling field activities at the above-referenced site.

Cultural resources and human remains are protected under federal, state, and (where applicable) tribal laws and regulations and their disturbance, excavation, removal, or damage can result in criminal penalties. In the event of an unanticipated discovery, the proper actions must be taken to minimize damage to cultural resources and to ensure that applicable laws and requirements are identified and met.

In the unlikely event that an unanticipated discovery of cultural resources (e.g., archaeological material) or human remains occurs during a ground disturbing and/or environmental sampling field activity, this UDP outlines procedures for McGinley to follow.

2. RECOGNIZING CULTURAL RESOURCES

Cultural resources are defined as physical evidence of historic human activity. They are non-renewable resources that once destroyed, cannot be replaced. Cultural resources and human remains are protected under federal, state, and (where applicable) tribal laws. The unauthorized removal or intentional disturbance of cultural resources can result in fines and imprisonment. Accordingly, cultural resources encountered during the project must be treated appropriately and in compliance with all applicable laws. Unanticipated discoveries of cultural resources during the proposed field work can include, but are not limited to, the following situations:

1. Undocumented structural and engineering features or undocumented archaeological resources such as prehistoric pottery, chipped stone tools, waste flakes, changes in soil color/type, shells, and historic period items (items that are approximately 50 years old or greater) such as bottle glass, cans, ceramic, refuse dumps, tools, coins, old farm equipment, and features (e.g., architectural features, walls constructed of natural materials such as cobbles, surfaces paved by cobbles, brick, or other material), or other evidence of human occupation or activity;
2. Undocumented human remains or burial sites; or
3. Undocumented Native American grave sites, including human remains, funerary objects, sacred objects, or objects of cultural significance.

As a general rule of thumb for all field staff: **When in doubt, assume the material is a cultural resource!**

3. GENERAL UNANTICIPATED DISCOVERY PROCEDURES

If any unanticipated cultural resources or suspected cultural resources are encountered during the proposed field work, McGinley or McGinley's contractors will follow the general steps outlined below.

STEP 1: STOP WORK within a 100-foot (ft) radius of the observed cultural material and NOTIFY McGinley Project Management

Ensure all cultural items are left in place and that no further disturbance is permitted to occur. All vehicles, equipment, and unauthorized personnel will not be permitted to traverse the discovery site. If the discovery occurs at the end of the workday, the area must be secured in a

manner to prevent vandalism or biological disturbance (e.g., flooding, animal interference, etc.).

- The McGinley Field Services Manager (FSM) will notify the McGinley Project Manager (PM) or Program Manager subsequent to securing the discovery location. Refer to Section 5 below to contact the McGinley PM or Program Manager.

STEP 2: NOTIFY the NBP Program Coordinator

The FSM will contact the NBP Program Coordinator. The NBP Program Coordinator will make all subsequent calls and notifications. Refer to Section 5 below to contact the NBP Program Coordinator.

NBP, in consultation with the Nevada State Historic Preservation Office (SHPO) and qualified archaeologist (as applicable), will determine the subsequent course of action for appropriately treating and evaluating the significance of the cultural resources in accordance and compliance with applicable federal and state law(s).

- In the event unintentional damage occurs to a National Register of Historic Places (NRHP)-eligible site during field activities, the FSM will immediately notify the NBP Program Coordinator and document any damage. The NBP Program Coordinator will contact the SHPO if the SHPO is not already monitoring the site.

Invasive work will not proceed within the 100-ft radius around the discovery until the appropriate written authorization is obtained after consultation with the SHPO and/or qualified archaeologist (as applicable). The McGinley PM or FSM may direct invasive work in other on site areas located away from the discovery site prior to contacting the concerned parties to ensure NBP activities proceed in a safe and timely fashion.

4. HUMAN OR POTENTIAL HUMAN REMAINS

Human remains are physical remains of a human body or bodies including, but not limited to, bones, teeth, hair, and preserved soft tissues (mummified or otherwise preserved) of an individual. Remains may be articulated or disarticulated bones or teeth. If McGinley personnel identify human remains, funerary objects, sacred objects, or objects of cultural patrimony during subsurface investigations, the procedures in the following sections will apply. **All human skeletal remains will be treated with dignity and respect at all times.**

STEP 1: Immediately STOP WORK within a 100-ft radius of the observed potential human remain discovery

Invasive work will not proceed within the 100-ft radius around the discovery until the appropriate written authorization is obtained.

STEP 2: Immediately NOTIFY the local police department and county medical examiner/coroner and then notify the NBP Program Coordinator

Provide information of the nature and location of the discovery. The county medical examiner/coroner, with the assistance of the local police department, will determine whether the discovery is a crime scene or if it should be forwarded to the SHPO for the SHPO's review.

STEP 3: PROTECT the discovery with a tarp or other non-invasive material (as appropriate). If necessary, post a monitor to ensure the discovery is protected.

No skeletal remains or associated materials will be moved from the location of their discovery and ABOSUTELY NO photographs will be taken unless required as part of the identification process.

5. CONTACT INFORMATION

In the event cultural resources are encountered during the proposed field work, the following contacts have been identified:

Table 1: Contact Information in Case of Unanticipated Discovery

Name	Organization	Title	Email	Phone
Ruben Ramos-Avina	NDEP NBP	Program Coordinator	rramos-avina@ndep.nv.gov	775-687-9572
David Friedman	NDEP NBP	Program Supervisor	dfriedman@ndep.nv.gov	775-687-9385
Rebecca L. Palmer	Nevada SHPO	Administrator	rlpalmer@shpo.nv.gov	775-684-3443
Joe McGinley	McGinley	Principal	jmcginley@teamues.com	775-829-2245
Brett Bottenberg	McGinley	Brownfields Program Manager	bbottenberg@teamues.com	702-232-5247
Caitlin Jelle	McGinley	Brownfields Program Manager	cjelle@teamues.com	775-433-1513
Local Police	Local Police	Non-Emergency	N/A	311

6. PROCEEDING WITH INVASIVE WORK

Ground disturbing work may resume outside the 100-ft radius of the unanticipated discovery location while the cultural resource is assessed. Ground disturbing work may continue within the discovery location only after the process outlined in this plan is followed and state agencies (as applicable) determine compliance with applicable federal, state, and (where applicable) tribal laws is complete and the written approval notification to resume work is received.

7. CONFIDENTIALITY

To the extent permitted under applicable law, NBP and McGinley shall ensure that their personnel and contractors keep the discovery confidential. **No photographs, descriptions, or locational information of a discovery should be posted to social media accounts (e.g., Instagram, Facebook, X, etc.).** Any media, third-party, or public inquiries will be directed to the NBP. The NBP will coordinate with other stakeholders on media interests, as needed.

APPENDIX D

Chain-of-Custody Forms

Billing Information:

Company: _____
Attn: _____
Address: _____
City, State, Zip: _____
Phone Number: _____ Fax: _____

Alpha Analytical, Inc.
Main Laboratory: 255 Glendale Ave, Suite 21 Sparks, NV 89431 Phone: 775-355-1044
Fax: 775-355-0406

Satellite Service Centers:
Northern CA: 9891 Horn Road, Suite C, Rancho Cordova, CA 95827 Phone: 916-366-9089

Northern NV: 350 7th St. Elko, NV 89801 Phone: 775-388-7043

Consultant/ Client Info:

Company: _____
Address: _____
City, State, Zip: _____

Job and Purchase Order Info:

Job # _____
Job Name: _____
P.O. #: _____

Report Attention/Project Manager:

Name: _____
Email Address: _____
Phone #: _____
Cell #: _____

QC Deliverable Info:

EDD Required? Yes / No EDF Required? Yes / No
Global ID: _____
Data Validation Packages: III or IV

Samples Collected from which State? (circle one) AR CA KS NV OR WA DOD Site Other

Time Sampled (HHMM)	Date Sampled (MM/DD)	Matrix* (See Key Below)	Lab ID Number (For Lab Use Only)	Sample Description	TAT	Field Filtered? (Yes / No) Yes	Field Filtered? (Yes / No) No	# Containers** (See Key Below)	Analysis Requested											Remarks

ADDITIONAL INSTRUCTIONS:

I (field sampler) attest to the validity and authenticity of this sample(s). I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action. NAC 445.0636 (c) (2).

Sampled By:

Relinquished by: (Signature/Affiliation):	Date:	Time:	Received by: (Signature/Affiliation):	Date:	Time:
Relinquished by: (Signature/Affiliation):	Date:	Time:	Received by: (Signature/Affiliation):	Date:	Time:
Relinquished by: (Signature/Affiliation):	Date:	Time:	Received by: (Signature/Affiliation):	Date:	Time:

* Key: AQ - Aqueous AR-Air OT - Other SO - Soil WA-Waste **: B - Brass L - Liter O - Orbo OT-Other P-Plastic S-Soil Jar T - Tedlar V-VOA

NOTE: Samples are discarded 60 days after sample receipt unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for the report.