January 4, 2021

Mr. Mike Leigh
Nevada Division of Environmental Protection
Bureau of Sustainable Materials Management
901 S Stewart St Carson City, NV 89701

Ms. Alison Oakley
Nevada Division of Environmental Protection
Bureau of Corrective Actions
901 S Stewart St Carson City, NV 89701

Subject: NV Energy - Reid Gardner Generating
Station Administrative Order on Consent
SA-18 Waste and Site Characterization Sampling and
Analysis Plan, Final
Response to Comments

Dear Mr. Leigh and Ms. Oakley:

Based on your concurrence letter dated December 18, 2020, attached is a copy of the *SA-18 Waste and Site Characterization Sampling and Analysis Plan* with revised cover sheets dated December 2020, reflecting that the plan is considered final.

If you have any questions, please feel free to contact me directly at 702-402-5477.

Respectfully,

Mathew Johns
Director, Environmental Remediation
and Resource Development

CC: Cliff Banuelos, NDEP (electronic copy via FilesAnywhere)
Paul Eckert, NDEP SMM

NEVADA DIVISION OF
ENVIRONMENTAL
PROTECTION

STATE OF NEVADA
Department of Conservation & Natural Resources
Steve Sisolak, Governor
Bradley Crowell, Director
Greg Lovato, Administrator

December 18, 2020

Mike Rojo
Senior Project Manager
NV Energy
6226 W Sahara Ave M/S 30
Las Vegas, NV 89146

Re: **NV Energy Reid Gardner Station**
NDEP Facility ID #H-000530
Nevada Division of Environmental Protection Review and Concurrence: Responses to Comments regarding the Draft SA-18: Ash Settling Ponds 1-3, Former Clear Wells, and Former Fly Ash Disposal Area, NV Energy Property, Waste and Site Characterization Sampling and Analysis Plan

Dear Mr. Rojo:

The Nevada Division of Environmental Protection (NDEP) has received and reviewed NV Energy's responses to comments regarding the *Draft SA-18: Ash Settling Ponds 1-3, Former Clear Wells, and Former Fly Ash Disposal Area, NV Energy Property, Waste and Site Characterization Sampling and Analysis Plan* (SA-18 SAP). The responses to comments are dated December 4, 2020 and respond to NDEP comments dated November 19, 2020.

NDEP **concurs** with NV Energy's responses to comments regarding the SA-18 SAP. The work plan may be finalized.

Please contact me with any questions at (775) 687-9396 or aoakley@ndep.nv.gov

Sincerely,

Alison Oakley, CEM
Environmental Scientist III
Bureau of Corrective Actions
NDEP-Carson City Office

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Vickie Simmons, Moapa Band Of Paiutes Chairperson, chair.mbop@moapabandofpaiutes.org

cc Clark County Emergency Management, 500 S. Grand Central Parkway - 6th Floor, P.O. Box 551713, Las Vegas, NV 89155-1713

Document and Response to Comments Tracking Form
NV Energy – Reid Gardner Station
Administrative Order on Consent Implementation

Document Title NDEP Comments to the Draft SA-18: Ash Settling Ponds 1-3, Former Clear Wells, and Former Fly Ash Disposal Area, NV Energy Property Waste and Site Characterization Sampling and Analysis Plan

Preparer Jacobs

Draft #1

To NDEP	From NV Energy
Submittal Date October 30, 2020	Comment Date November 19, 2020
Response Date December 4, 2020	
Commenter Alison Oakley	Responder Michael Rojo

Comment #1
Section 5.1. Sampling Procedures, page 4: Please collect samples of sonic core at 2-foot intervals starting at 2 feet below ground surface and screen samples using a PID. In addition, please collect samples from stained intervals and screen using a PID after soil samples for lab analysis are collected. PID data should be recorded on the boring logs presented in subsequent characterization reports.

Comment #1 Response
Section 6 is specific to the sampling process.

Section 6.1.1 has been revised as follows:

"The borehole cores will be bagged at 2-foot intervals and screened using a PID instrument before opening the core bag for sample removal. PID Readings as well as presence of odor and staining will be recorded. The grab sample will be collected directly from the core corresponding to the depth with the highest detected PID reading. Absent any detectable PID reading, the interval exhibiting visual or olfactory evidence of hydrocarbons or other potential impacts, will be selected. Material for the grab sample will be removed from the core, placed into appropriate laboratory-provided sample containers; packed tightly to ensure no head space within the sample container and submitted to the laboratory for TCLP VOC and TPH-GRO analysis as well as TPH DRO and TPH ORO.

At least one grab sample will be selected from each boring. For borings where elevated PID readings, visual, or olfactory evidence is not observed, a grab sample will be selected for laboratory analysis at random."

The following sentence has been added to section 6.2:

"Any areas exhibiting staining or odor not identified during the grab sample process, will be screened with the PID and the measurement recorded in the bore log."

Comment #2
Section 5.1. Sampling Procedures, page 4: Sonic drill rigs can generate heat, potentially impacting volatile organic compounds in the soil core. If sonic drilling is performed and heat is generated, sampling methods should address the potential impact on volatile constituents. In the response to comment #5 to the SA-4 Units 1-2 and SA-4 WMU-I2 Coal Pile Areas Waste Profile Sampling and Analysis Plan, Reid Gardner Station, NV Energy suggested, "If difficult drilling is encountered at a borehole, slowing advance or requiring extra sonic energy, the borehole location will be moved within a 10-foot radius for a new attempt to sample that location. The redrilling will be advanced at a rate less than 2 minutes per foot to minimize potential heating." NDEP suggests a similar procedure be implemented during the SA-18 investigation work.

Comment #2 Response
The suggested clause has been added to Section 5.1

Comment #3
Section 5.2.1. Test Pit Observations, page 5: Please collect soil samples from the excavation sidewall at 2-foot depth intervals starting at 2 feet below ground surface and screen using a PID. In addition, please collect samples from stained intervals and screen using a PID. PID results should be included on the detailed logs representing the results of the test pits.

Comment #3 Response
Section 5.2.1 has been revised to include modified item h and new item i as follows. Note that samples will be taken from the excavator bucket to keep sampling personnel out of the potentially unsafe excavations:

"h. PID readings at each 2-foot interval of depth (samples collected from the excavator bucket)
i. PID readings where stain or odor is observed (samples collected from the excavator bucket)"

Comment #4
Section 8.2. Site Characterization, page 11: Please include a photograph log of each test pit as part of the characterization report.

Comment #4 Response
The following sentence has been added to section 8.2:

"A photographic log of the test pits will be included as part of the site characterization report."

Comment #5
Figure 3. SA-18 Sampling Locations: Please drill an additional boring near the center of each Raw Water Pond that is dry at the time of the investigation to confirm that all ash associated

with former ASF-1 was removed and not used as part of the construction of the Raw Water Ponds, and to assess underlying soil beneath former ASF-1.

Comment #5 Response
An additional borehole location has been added to the bottom of the east Raw Water Pond with the caveat that the holes are to be drilled if the ponds are dry at time of the investigation. The west raw water pond is currently in service and expected to remain so for the foreseeable future.

Final

To _____ From _____

Submittal Date _____ Comment Date _____

Response Date _____

Commenter _____ Responder _____

Jacobs

SA-18: Ash Settling Ponds 1-3, Former Clear Wells, and Former Fly Ash Disposal Area
NV Energy Property

Waste and Site Characterization Sampling and Analysis Plan
Reid Gardner Station

December 2020

NV Energy

Final

SA-18 Ash Pond and Disposal Area Removal

Project No:	NVE01914
Document Title:	Waste and Site Characterization Sampling and Analysis Plan
Document No.:	
Revision:	2
Document Status:	Final
Date:	December 29, 2020
Client Name:	NV Energy
Project Manager:	Ralph Dresel
Author:	Ralph Dresel, Jay Piper

CH2M HILL Engineers, Inc. (Jacobs)
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Document history and status

Revision	Date	Description	Author
0	10-30-2020	Initial Issue, review draft r1	Dresel, Piper
1	12-09-2020	Revised to address NDEP comments, review draft r2	Dresel
2	12-29-2020	Updated cover to Final per NDEP Acceptance	Dresel

Certifications

NV Energy Certification

I certify that this document and all attachments submitted to the Nevada Division of Environmental Protection were prepared under the direction or supervision of NV Energy in accordance with a system designed to gather and evaluate the information by appropriately qualified personnel. Based on my inquiry of the person or persons who manage the system(s) or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted and provided by NV Energy is, to the best of my knowledge and belief, true, accurate, and complete in all material respects. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature:	
Name:	Mathew Johns
Title:	Director, Environmental Remediation and Resource Development
Company:	NV Energy
Date:	December 8, 2020

Environmental Manager Jurat

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state, and local statutes, regulations, and ordinances.

Signature:	Jay Piper
Name:	Jay Piper
Title:	Project Manager
Company:	Jacobs
Date:	Dec. 4, 2020
CEM Cert. #:	CEM-1579
CEM Expire. Date:	Nov. 7, 2021

Contents

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1. Objectives

This work plan describes waste and site characterization sampling and analysis to be conducted on the NV Energy-owned portions of the SA-18: Ash Settling Ponds (ASPs) 1-3, Former Clear Wells, and Former Fly Ash Disposal Area (SA-18) at the Reid Gardner Station (RGS). As shown on Figure 1, the SA-18 area includes land owned by the Bureau of Land Management (BLM) as well as land owned by NV Energy. Sampling and analysis activities for the portions of the SA-18 area not on NV Energy property will be documented in a separate work plan to be issued at a future date after access is granted by the BLM.

The waste material located in the SA-18 area (both on and off NV Energy owned property) is as a mixture of ash and soil (ash/soil).

The objectives of this Sampling and Analysis Plan are as follows:

1. Collect representative waste characterization samples of the ash/soil fill material and test it to determine if the excavated material meets specific regulatory criteria[1] so that it can be placed in the onsite RGS Class III landfill (Permit Number SW138REV00).
2. Gather data to delineate the extent and quantity of ash/soil fill material present in the SA-18 area. This information will be used to support the excavation design.
3. Collect representative site characterization data to evaluate the nature and extent of impacts to underlying soil, if any, associated with the SA-18 area.

This sampling and analytical approach for waste characterization (objective 1 above) follows the approved Waste Profile Sampling and Analysis Plan (Jacobs, 2020) for the SA-4 Units 1-3 and SA-4 WMU12 Coal Pile Areas.

2. Background

The Preliminary Source Area Identification and Characterization Report (PSAICR) (Stanley Consultants, 2013) identified the area north and west of the existing Raw Water Ponds at the RGS as a potential source of contamination and designated it as SA-18; consisting of former ASP-1, ASP-2, ASP-3, Clear Wells, and a Fly Ash Disposal Area [(Waste Management Unit (WMU)-11)]. As shown on Figure 1, the SA-18 area encompasses land owned by NV Energy as well as the BLM. In addition, portions of the SA-18 area may exist within the Union Pacific Railroad (UPRR) right-of-way (ROW) located adjacent to SA-18 on the north side. Based on a review of historical documents, the PSAICR identified formaldehyde, general chemistry, metals, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and total petroleum hydrocarbons (TPH) as site related chemical parameter categories that reasonably could be anticipated to be present.

ASP-1 was constructed in about 1965 when generating Unit 1 was brought on-line. ASP-2 and ASP-3 were constructed after 1965 and prior to the installation of wet scrubbers on Units 1 and 2, which occurred in about 1974. Before the scrubbers were brought online, ash generated at the RGS was pumped as a wet slurry to the ash settling ponds, and the overflow water was most likely conveyed to the original plant P-ponds (located on the Mesa) and possibly to original Ponds C and D (that existed prior to former Pond E). After the wet scrubbers were installed on Units 1 and 2, ash generated by the RGS was either dry handled or sequestered in the scrubber effluent and conveyed to evaporation ponds D, E, F, and G.

Operation of ASP-1 was discontinued in 1982 when it was over-excavated to make way for construction of the Raw Water Ponds. Material excavated from the ASP-1 area was used by as fill to level the Unit 4 coal storage

[1] The principal criteria for assessing the appropriateness for disposal of the ash fill material to the onsite landfill are: (1) the material is not a Resource Conservation and Recovery Act (RCRA) hazardous waste; and (2) total petroleum hydrocarbon concentrations are less than 100 mg/kg.

area. Operation of ASP-2 and -3 was discontinued in 1986. ASP-2 (and possibly ASP-3) was apparently used again for a short time in 1990-91 to receive decant water from the diesel recovery system.

Notes on the final raw water pond construction documents (Fluor, 1981) indicate that ASP-1 was to be removed in its entirety and the new ponds constructed on clean fill. The base was to be constructed of compacted Type II material placed on a scarified and compacted subbase. There is no indication that ash was to be used. Data from a geotechnical evaluation (Converse 2008) of the raw water ponds in October 2008, showed no evidence of ash in 9 bore holes located in the embankments surrounding the ponds.

Three former clear wells, identified as Upper, Middle, and Lower (Figure 1), were located west of the ash settling ponds. The date of construction is unknown. In 2000/2001, approximately 7,100 cubic yards (cy) of ash were removed from four small settling ponds (possibly the former Clear Wells) located just west of the current Raw Water Ponds and deposited in the footprint of a fifth pond (which appears from historical drawings to be in the same location as ASP-2 and ASP-3) on the northwest side of the Raw Water Ponds.

WMU-11 is an ash disposal area located north of the Raw Water Ponds. The time frame of operation is uncertain, but it is likely that disposal in this area began during the early years of plant operation and ceased prior to the construction of the raw water ponds, which occurred in 1982.

Because material removed from ASP-1 in 1982 was placed as fill in the Unit 4 coal storage area, the characteristics of materials in the SA-18 area are expected to be similar to those in the Unit 4 Coal Pile Area, as documented in the *Station Area SA-4 Unit 4 Coal Pile Area Soil and Groundwater Characterization Report* (Stanley Consultants, 2019). The fill materials in the SA-18 area are anticipated to consist of an ash/soil mix containing minor amounts of unburned particulate coal. Petroleum product residuals may also be present in the ash/soil material, similar to those detected in the SA-4 area.

Quantities of ash/soil fill in the SA-18 area were estimated by comparing digitized historical and current ground surfaces. The quantity of ash/soil to be removed from the portion of SA-18 located on NV Energy property is estimated to be 222,000 cubic yards (cy).

The lowest bottom elevation of the ash/soil in the SA-18 area is estimated to be 1606 feet above mean sea level. Groundwater is not expected to be encountered during installation of borings or test pits; however, perched water may be encountered from possible leakage of water from the adjacent Raw Water Ponds. Groundwater elevations measured in the SA-18 area in the third quarter of 2019 were between 1588.45 and 1576.52 feet above mean sea level (Stanley Consultants, 2020).

3. Prior Investigation Results

Limited soil investigations have occurred in the vicinity of SA-18. According to information presented in the PSAICR (Stanley Consultants, 2013), two soil borings, RB-87 and RB-88, were installed in 2000 at a location east of WMU-11 to depths of about 55 feet below ground surface (bgs). As shown on Figure 2, low concentrations of trichloroethylene (TCE), TPH, and metals were detected in soil samples collected from RB-88. Total petroleum hydrocarbons at a concentration of 12 milligrams per kilogram (mg/kg) was detected in a surface soil sample collected at RB-87. No other VOCs were detected in these samples. No other soil samples have been collected in the area of SA-18.

Groundwater data has been collected from boreholes, Hydropunch ™ installations, and monitoring wells installed in the SA-18 area beginning in about 2000. Groundwater data from borehole water samples collected at RB-87 and RB-88 are summarized on Figure 2. Of note is that TCE was detected in RB-88 at 69 micrograms per liter (µg/L), above the Nevada Primary Maximum Contaminant Level (MCL) of 5 µg/L. NV Energy is not aware of any RGS activities in the SA-18 area that could have contributed to TCE in groundwater.

Hydropunch ™ groundwater samples were collected in 2000 by Kleinfelder (Nevada Power, 2002) at locations HP-9, HP-10, HP-11, and HP-12 (Figure 2). Groundwater samples were collected at two depths in each location,

except for HP-11, and analyzed for TDS, arsenic, boron, sodium, and calcium. Sodium and calcium data are provided only as a ratio in the report. Arsenic concentrations were below the federal MCL of 10 ug/L in all samples. Boron concentrations ranged from 0.89 milligrams per liter (mg/L) at HP-9 to 40 mg/L at HP-10. TDS concentrations ranged from 1,768 mg/L at HP-9 to 35,915 mg/L at HP-12. Figure 2 provides the highest TDS concentrations detected at each HP location that was sampled in 2000.

Groundwater samples have been collected from monitoring wells in the SA-18 area since 2005. Historically, groundwater samples were analyzed for a broad range of constituents, including VOCs and semi-VOCs (SVOCs), However, VOC and SVOC analyses were eliminated from the analyte list in 2016 because they were never detected in any well. Currently, groundwater samples are collected from wells IMW-9R, IMW-12.5R, IMW-13R, IMW-14R, and IMW-17 and analyzed for TDS, metals, and general chemistry. Table 1 provides a summary of the laboratory results for groundwater samples collected to date from these wells and Figure 2 lists the most recent TDS data (2018 or 2019) currently available for each of the monitoring wells. TDS concentrations to date in the five monitoring wells shown on figure 2, ranged from a minimum of 600 mg/L to a maximum of 3,000 mg/L.

A former asphalt plant was located on the adjacent UPRR property approximately 500 feet south of RB-88 (shown on Figure 2). Through the submittal of a Freedom of Information Act (FOIA) request to the Nevada Division of Environmental Protection (NDEP), NV Energy obtained additional information on a BLM led corrective action and cleanup that was conducted for this area in June 2016. According to the *Reid Gardner Drum Removal Project Final Report* (North Wind, 2016):

> *"The project included inventory, sampling, hazard categorization/hazardous characterization (HAZCAT), and transport of ninety-two 55-gallon drums, along with a number of other containers and debris that were illegally dumped on Bureau of Land Management (BLM) land. The project also included cleanup related to several breached drums that were leaking onto the surrounding ground…."*
>
> *"Inventory of the site included a total of ninety-two 55-gallon drums. Of the 92 drums, 70 were empty, 18 contained liquid and were labeled "Corrosive, Liquid Acid, Organophosphate," 3 were labeled "Tri-Act 2813" and tested as a strong acid, and 1 was an unmarked drum… in addition to the drums, the site contained thirty-five 5-gallon buckets of dried paints and tars, twenty-one 2.5 gallon containers of waste motor oil, and numerous pile of steel piping and wood debris. "*

Corrective action was completed between June 7 and July 8, 2016. The first phase of corrective action involved removal of solid waste debris from the site. Per the report, all waste materials were properly labeled, manifested, and shipped to US Ecology in Beatty, Nevada for proper disposal. After the waste was removed, impacted soils were excavated, visually inspected, and then an additional 4 to 6 inches of soil was excavated. Excavated soil was loaded into 20-cy roll-off bins and transported to US Ecology for disposal.

Confirmation soil sampling was conducted following soil excavation. A total of 8 grab surface soil samples were collected from within the excavated area and combined into two composite confirmation samples for laboratory analysis of VOCs, SVOCs, organochlorines pesticides, pH, diesel range organics (DRO), gasoline range organics (GRO) and oil range organics (ORO). None of these constituents were detected in the two composite soil samples. The excavated area was backfilled with clean fill obtained on site and contoured to match the surrounding terrain.

The NDEP subsequently issued a No Further Action Determination for the BLM drum removal project on September 2, 2016 (NDEP 2016). The locations where impacted soils were removed and where the composite confirmation samples were collected are shown on Figure 2.

4. Investigation Team and Approach

Jacobs will provide oversight for the field activities, with support from Stanley Consultants. NV Energy will provide survey assistance. Test pitting will be performed by a contractor selected and contracted by NV Energy. Cascade Drilling will provide sonic drilling services. Pace Analytical, a Nevada-certified laboratory, will be the primary laboratory for all analyses.

Field sampling will be performed as a joint effort by Jacobs and Stanley Consultants, followed by data validation and review performed independently. Stanley Consultants will collect, validate and review soil data for site characterization purposes to evaluate the nature and extent of impacts to native soil beneath the fill. Jacobs will collect, validate and review data for development of waste disposal profile(s) for the ash-soil fill material. Jacobs will also gather data to delineate the extent and quantity of ash/soil fill material present in the SA-18 area.

Each contractor will be responsible for providing its own Health and Safety Plan to NV Energy prior to site activities, in accordance with contract requirements. All field personnel are required to complete NV Energy contractor safety training prior to starting site work; this NV Energy contractor safety training will be conducted onsite by NV Energy personnel at the time of the site work.

5. Field Activities

NV Energy will install up to 11 borings (NSBH01 through NSBH11) and collect samples to characterize the ash/soil material proposed for excavation and disposal in the onsite landfill (Figure 3). Soil samples will also be collected beneath all 11 boring locations to characterize soil beneath the ash/soil fill. In addition, up to seven test pits (NSTP01 through NSTP07) will be excavated to help delineate the extent and quantity of ash material and to observe the nature of the excavation process as it may relate to development of the removal project design documents.

Boring and test pit locations will be staked in advance by the field team with final locations surveyed by NV energy after the sampling is complete. The USA North Call Before You Dig (811) will be contacted and the requirements of *Nevada Administrative Code (NAC) 455 – Excavations and High Voltage Power Lines* will be followed.

5.1 Sampling Procedures

Soil borings will be installed within the onsite area of SA-18 for waste characterization as shown on Figure 3. Borings are spaced to provide a representative sample distribution of the area. Cross-section drawings (Figures 4 and 5) have been used to determine the approximate location and depth of the limits of excavation in SA-18.

Borings will be installed using a sonic drilling rig equipped for continuous core collection. Drilling rate of advance will be adjusted to moderate the friction heating of the core barrel if drilling is difficult. If difficult drilling is encountered at a borehole (slow advancement or requiring extra sonic energy), the borehole location will be moved within a 10-foot radius for a new attempt to sample that location. The re-drilling will be advanced at rate less than 2 minutes per foot to minimize potential heating. Prompt sample collection from the sonic core will minimize disturbance to soil samples that will be analyzed for VOCs and TPH.

Drilling will extend a minimum of 3 feet below the total depth of the ash/soil material, as evidenced by a change in drill cutting composition. Estimated depth of ash fill may be up to 30 feet below current ground surface based on historical contour maps. The borings will be logged by the Unified Soil Classification System (USCS) in accordance with American Society for Testing and Materials (ASTM) D2488. Soil descriptions and observations will be recorded in the field logbook or on field summary sheets so that detailed boring logs can be developed. Photographs will be taken at each boring location documenting drilling and sampling activities from which a photographic log will be created.

Samples for chemical analyses will be collected as discussed in Section 6, Solids Sampling for Waste Characterization and Section 7, Soil Sampling for Site Characterization.

5.2 Test Pits

Up to seven test pits will be excavated to help identify the edges of the proposed excavation and to collect information to inform the design and proposed cutback of slopes for the excavation of the ash/soil material located onsite.

The proposed test pit locations are shown on Figure 3. Locations have been selected based on historical contour maps and current ground surfaces from recent ground survey data. The number and locations may shift as field conditions dictate.

5.2.1 Test Pit Observations

Test pit observations will include:

a. Color of fill and approximate depth of each layer in test pit

b. Presence of staining or odor

c. Ash locations on walls and bottom of test pit (for example, north side has 1' of ash, south side of test pit has 3' of ash)

d. Depth and horizontal size of test pit

e. Geographic coordinates of test pit center

f. Depth when native soil is reached

g. Depth to groundwater, if observed

h. PID readings at each 2-foot interval of depth (samples collected from the excavator bucket)

i. PID readings where stain or odor is observed (samples collected from the excavator bucket)

These observations will be documented in the field logbook. A detailed log of subsurface conditions and materials encountered will be developed.

Photographs will be taken of each test pit, documenting the depth of the ash and where the ash is located in the test pit. A log of photographs will be kept.

5.3 Field Equipment Calibration

The photo-ionization detector (PID) will be calibrated prior to mobilization and then will be calibrated daily or if conditions change. The calibration frequency meets the minimum requirements specified by the equipment manufacturer. This calibration will be documented in the field logbook.

5.4 Decontamination

Drilling and split-spoon sampling equipment will be decontaminated between each boring utilizing a pressure washer and in accordance with the NDEP-approved QAPP (Stanley Consultants, 2011). Sampling utensils (knives, spoons, trowels, etc) will be washed with Alconox® and tap water solution, rinsed with deionized (DI) water and air dried between uses. Decontamination liquids such as non-phosphate detergent and DI water will be collected and containerized for disposal.

5.5 Investigation Derived Waste

Residual ash/soil generated during drilling operations will be replaced down the originating borehole or adjacent to the borehole, because all the material will be removed and disposed of based on the waste characterization being performed in this Sampling and Analysis Plan (SAP).

U.S. Department of Transportation-specification drums will be provided by the driller to contain decontamination liquids.

5.6 Quality Control Samples

Equipment blanks (EB) will be collected to evaluate field sampling and decontamination procedures by pouring DI water over the decontaminated equipment and collecting this water for laboratory analysis Three EBs will be collected during the sampling event; one for the 11 samples described in section 6, and two for the 22 samples described in section 7 (a frequency of 5%). EBs will be analyzed by the laboratory for the same parameters specified for the soil samples. Laboratory-provided trip blanks will be shipped with samples submitted for VOC analyses.

5.7 Data Validation

Upon receipt of the soil laboratory data, it will be validated by Jacobs and Stanley.

6. Solids Sampling for Waste Characterization

Samples from ground surface to the base of the ash fill layer will be collected for waste characterization purposes. Samples from below the ash/soil interface will be collected to evaluate the nature and extent of impacts to underlying soil, if any, as discussed in Section 7 below.

Samples collected from ground surface to the base of the ash fill layer of each boring location (Figure 3) are considered representative of the material for waste characterization purposes. Analytical results associated with the ash material from each boring will be used to determine whether the ash is suitable for management at the onsite landfill or will require profiling for offsite disposal. Table 2 provides a summary of planned work activities.

Material from ground surface to the base of the ash fill layer in each boring will be composited into one sample for its respective location and analyzed for the non-volatile analytical parameters listed on Table 2. For the volatile parameters listed in Table 2 (Toxicity Characteristic Leaching Procedure [TCLP] VOCs and TPH-GRO), a grab sample from the boring's core with the highest PID reading will be collected.

6.1 Sampling Procedures

Solids samples for waste characterization will be collected for analysis in accordance with the NDEP-approved Quality Assurance Project Plan (QAPP) (Stanley Consultants, 2011).

6.1.1 Grab Samples

The bore hole cores will be bagged at 2-foot intervals and screened using a PID instrument before opening the core bag for sample removal. PID Readings as well as presence of odor and staining will be recorded. The grab sample will be collected directly from the core corresponding to the depth with the highest detected PID reading. Absent any detectable PID reading, the interval exhibiting visual or olfactory evidence of hydrocarbons or other potential impacts will be selected. Material for the grab sample will be removed from the core, placed into appropriate laboratory-provided sample containers; packed tightly to ensure no head space within the sample container and submitted to the laboratory for TCLP VOC and TPH-GRO analysis as well as TPH DRO and TPH ORO.

At least one grab sample will be selected from each boring. For borings where elevated PID readings, visual, or olfactory evidence is not observed, a grab sample will be selected for laboratory analysis at random.

6.2 Composite Samples

Aliquots of ash/soil material will be collected, including the grab samples from PID screening, as the borings are advanced until reaching the interface of ash/soil with the underlying soil. These aliquots will be homogenized to create a single composite sample from each boring for non-volatile analyses.

A decontaminated stainless steel scoop or spoon will be used to collect the aliquots and transfer them into a decontaminated stainless steel bowl. Aliquots will be collected throughout the length of the boring and at changes of material (e.g., texture, color, odor). Once aliquots from the entire length of the boring have been placed into the bowl, they will be thoroughly mixed. A stainless steel scoop or spoon will be used to transfer the sample from the bowl into the laboratory-provided sample containers.

Any areas exhibiting staining or odor not identified during the grab sample process, will be screened with the PID and the measurement recorded in the bore log.

6.3 Sample Handling

Samples will be logged by the field geologist and screened with a PID. Organic vapor readings and observations of odors and discolored soils will be documented in the field notes.

The TCLP VOC and TPH-GRO sample containers will be filled immediately to avoid the loss of analytes. The remaining non-volatile sample jars will then be filled. Samples will be placed in a cooler with ice, chilled to 4 degrees Celsius, and processed for shipment to the laboratory under a chain of custody (COC).

6.4 Sample Analysis

Composite samples will be extracted using the TCLP method and analyzed for non-volatile parameters, including TCLP metals, TCLP pesticides, TCLP herbicides, TCLP SVOCs, radionuclides (including Radium-226 and Radium-228), and pH. The composite samples will also be analyzed for TPH-DRO and TPH-ORO.

Grab samples will be analyzed for TCLP VOCs and TPH-GRO, as well as TPH-DRO and TPH-ORO. None of the TPH analyses will include TCLP extraction.

Note that twice the normal sample quantities for TPH (Table 3) will be collected at each sample location. If the total measured TPH concentration is greater than 100 mg/kg, the sample will need to undergo additional forensic analysis, as described below to determine if TPH detections are caused by the presence of coal or by the presence of petroleum.

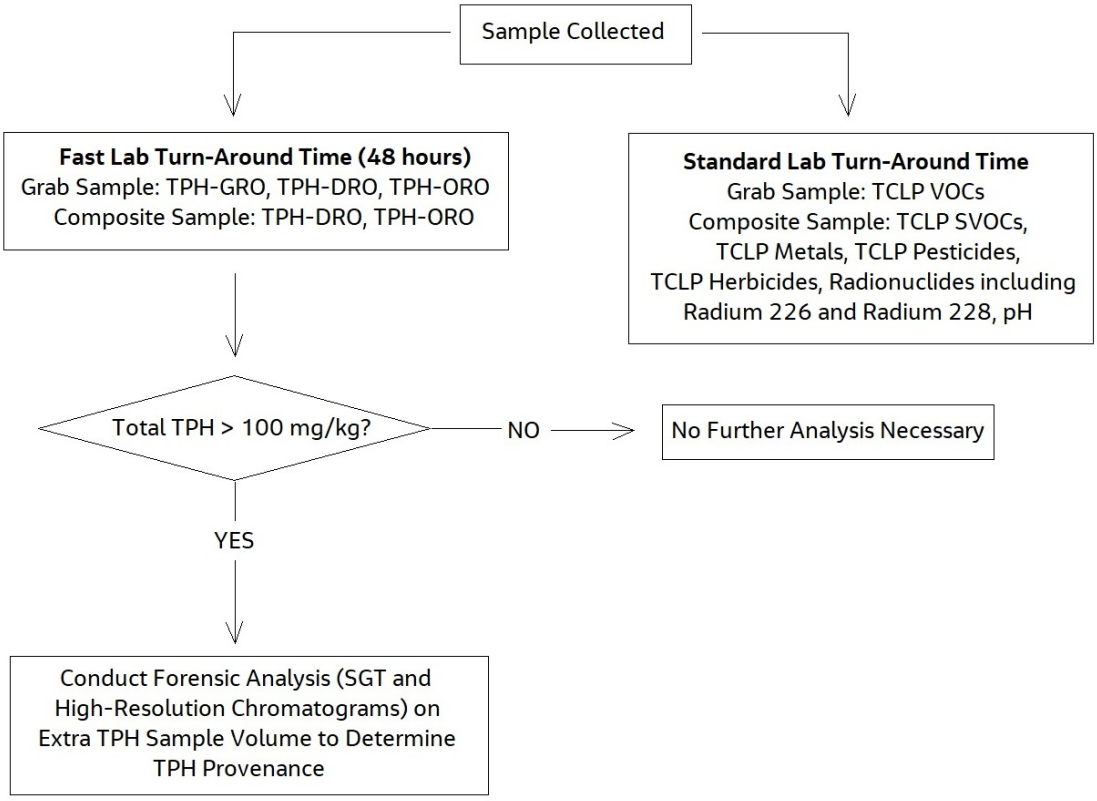
6.5 Laboratory Testing Methods

The laboratory will provide the appropriate sample containers and preservatives for all sampling events. Analytical methods, sample containers, holding times, and target method reporting limits are provided in Table 3.

Parameters for analysis include TCLP VOCs; TCLP SVOCs; TCLP metals; TCLP pesticides; TCLP herbicides; radionuclides (including Radium-226 and Radium-228); pH; and TPH as shown in Table 2 and the Flow Chart below.

Petroleum parameters consist of TPH-GRO, TPH-DRO, and TPH-ORO. Total TPH will be calculated by adding the detected concentrations of TPH-GRO, TPH-DRO, and TPH-ORO. Initial TPH samples collected for total TPH analysis will be sent to the laboratory for fast turnaround analysis (48 hours) to determine if total TPH concentrations exceed 100 mg/kg. Samples with total TPH concentrations greater than 100 mg/kg will undergo forensic analysis using silica gel treatment (SGT) followed by repeat TPH analysis, and TPH analysis with a high-

resolution chromatogram recorded. This forensic data will be used to evaluate whether detected TPH concentrations are associated with petroleum-derived TPH or coal-derived TPH.



7. Soil Sampling for Site Characterization

Samples of soil underlying the ash/soil fill will be collected for site characterization purposes. Sampling procedures are described in Section 7.1 and laboratory testing methods are described in Section 7.2. Table 4 provides a summary of planned work activities.

7.1 Sampling Procedures

Samples of underlying soil will be collected for analysis in accordance with the NDEP-approved Quality Assurance Project Plan (QAPP) (Stanley Consultants, 2011). Borings will be advanced using a sonic drilling rig equipped for continuous core collection. Discrete (grab) samples of soil underlying the ash/soil fill will be collected from approximately 0 to 1 foot below the ash/soil interface and from approximately 2 to 3 feet below the ash soil interface. Samples will be collected at each of the 11 soil boring locations shown on Figure 3.

7.2 Sample Handling

Samples will be logged by the field geologist and screened with a PID. Organic vapor readings and observations of odors and discolored soils will be documented in the field notes.

The VOC and TPH-GRO sample containers will be filled immediately to avoid the loss of analytes from areas of discoloration, odor, or highest PID readings. Sample containers for metals, PAHs, TPH-DRO, and TPH-ORO will be

filled next. Pertinent sample information (location identifier, depth, date, time, analytical method) will be recorded on the container label and in the field logbook for use in completing the chain-of-custody (COC). Samples will be placed in a cooler with ice, maintained below 4 degrees Celsius, and processed for shipment to the laboratory.

Note that twice the normal sample quantities for TPH (Table 5) will be collected at each sample location and depth interval. If the total measured TPH concentration is greater than 100 mg/kg, the sample will need to undergo additional forensic analysis, as described below to help determine if TPH detections are caused by the presence of coal or by the presence of petroleum.

7.3 Laboratory Testing Methods

The laboratory will provide the appropriate sample containers and preservatives for all sampling events. Analytical methods, sample containers, holding times, and target method reporting limits are provided in Table 5.

The soil parameter list was developed based on the following considerations:

1. Indicator constituents of concern approved by NDEP on May 6, 2015. These constituents have been shown by the U.S. Environmental Protection Agency (EPA) to be associated with coal-fired power plants and/or have been identified as specifically associated with the effluent discharged to the RGS evaporation ponds (NDEP , 2015). TDS is a constituent of concern on this list but is not applicable for solids analysis:

    - Antimony
    - Arsenic
    - Boron
    - Cadmium
    - Chloride
    - Chromium
    - Fluoride
    - Molybdenum
    - Phosphorous, Total
    - Selenium
    - Sodium
    - Sulfate
    - Thallium

2. Other parameters identified in the *SA-4 Unit 4 Coal Pile Area Soil and Groundwater Characterization Report* (Stanley, 2019) to exceed site specific background threshold values:

    - Barium
    - Calcium
    - Copper
    - Magnesium
    - Potassium

3. Other parameters identified in the *PSAICR* as site related chemical parameter categories that reasonably could be anticipated to be present:

    - VOCs
    - PAHs
    - TPH-GRO
    - TPH-DRO

- TPH-ORO

Petroleum parameters consisting of TPH-GRO, TPH-DRO, and TPH-ORO, will be evaluated as described in section 6.5 above.

Formaldehyde was originally identified as a possible site-related chemical based on a 2001 Toxics Release Inventory (TRI) document listing it as a possible component of coal and light oil. Historic concentrations detected in RGS evaporation pond area solids and soil samples were all below EPA industrial regional screening levels (RSLs). Formaldehyde is not included in this proposed characterization because it is not an indicator constituent of concern associated with plant operations.

8. Reporting

A waste characterization and ash evaluation report will be prepared to address the extent and quantity of ash material observed and the characterization of the ash material that will be excavated. Site characterization data describing the nature and extent of impacts (if any) to underlying soil will be provided in the same or a separate report.

8.1 Waste Characterization and Ash Evaluation

The waste characterization and ash evaluation report will include an evaluation of the onsite extent and characteristics of the ash fill.

8.1.1 Waste Characterization

Laboratory test results will be compared to the toxicity characteristic regulatory limits from Title 40 of the Code of Federal Regulations Part 261 Subpart C, landfill permit requirements (Southern Nevada Health District, 2014), NDEP regulatory requirements for solid waste landfills (NAC 444.570 through 444.7499), and the NDEP guideline of 100 mg/kg for TPH.[2]

- Exceedances of a toxicity characteristic regulatory limit—Material will be properly classified as indicated above. Because hazardous waste is not expected based on previous sampling and analyses, NV Energy will evaluate whether the value was the result of sampling, analysis, or calculation error. If data are substantially different from previous data or otherwise appear to be inconsistent, the sample material held at the laboratory may be re-extracted and reanalyzed. If this is not possible within holding times, or if the reanalyzed results are still inconsistent, a new solids sample may be collected and analyzed, if possible.
- Exceedances of NDEP TPH 100 mg/kg guideline limit—Samples exceeding the 100 mg/kg TPH guideline will undergo forensic TPH analyses to evaluate if the TPH profiles for these samples are petroleum-derived or coal-derived. The forensic analyses will consist of SGT before another TPH analysis, and TPH analysis reported with a high-resolution chromatogram.

Ash/soil from areas of SA-18, as defined on Figure 1, that are characterized as non-hazardous, comply with onsite landfill permit requirements and are less than the 100 mg/kg TPH guidance limit will be disposed of in the onsite landfill.

Ash/soil from areas of SA-18 that are characterized as hazardous or that otherwise do not meet the above requirements for placement in the onsite landfill will be disposed of at an appropriately permitted offsite receiving facility in accordance with applicable regulatory requirements.

[2] NDEP Guidelines for Acceptance of Petroleum Contaminated Soil at Landfills, April 1, 2020.

8.1.2 Ash Evaluation

The report will also include a discussion based on the information collected during test pitting. This evaluation will include a delineation of the potential onsite extent and quantity of ash material and additional data collected that may be useful to support design of the ash fill excavation.

8.2 Site Characterization

Soil data collected during the implementation of this SAP will be reviewed to evaluate the nature and extent of impacts (if any) to soil underlying the ash/soil fill material. Constituent concentrations in underlying soil will be compared with site-specific background soil concentrations or background threshold values (BTVs) from the *Background Conditions Report* (Stanley Consultants, 2014) as well as published EPA Regional Screening Levels (RSLs) for Industrial Soil. The results of these comparisons will be used to evaluate whether additional corrective action is required beyond removal of the overlying ash/soil fill.

A photographic log of the test pits will be included as part of the site characterization report.

9. Acronyms and Abbreviations

ASP	Ash Settling Pond
ASTM	American Society for Testing and Materials
bgs	below ground surface
BLM	Bureau of Land Management
BTV	background threshold value
COC	chain of custody
cy	cubic yard
DI	deionized
DRO	diesel range organics
EB	Equipment Blank
EPA	Environmental Protection Agency
FOIA	Freedom of Information Act
GRO	gasoline range organics
HAZCAT	Hazardous Categorization/Hazardous Characterization
µg/L	micrograms per liter
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
ORO	oil range organics
PAH	Polycyclic Aromatic Hydrocarbons
PID	photoionization detector
PSAICR	Preliminary Source Area Identification and Characterization Report
QAPP	Quality Assurance Project Plan
RGS	Reid Gardner Station
ROW	right of way
RSL	Regional Screening Level
SA	Station Area
SAP	Sampling and Analyses Plan
SGT	Silica Gel Treatment
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethylene
TCLP	toxicity characteristic leaching procedure
TDS	Total Dissolve Solids
TPH	Total Petroleum Hydrocarbons
TRI	Toxics Release Inventory
UPRR	Union Pacific Railroad

USCS	Unified Soil Classification System
WMU	Waste Management Unit
VOC	Volatile Organic Compound

10. References

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Tables

Table 1 Groundwater Data

Constituent	IMW 9R				IMW 12.5R				IMW 13R				IMW 14R				IMW 17			
	Concentration		No. of samples	No. of detections	Concentration		No. of samples	No. of detections	Concentration		No. of samples	No. of detections	Concentration		No. of samples	No. of detections	Concentration		No. of samples	No. of detections
	Minimum (mg/L)	Maximum (mg/L)			Minimum (mg/L)	Maximum (mg/L)			Minimum (mg/L)	Maximum (mg/L)			Minimum (mg/L)	Maximum (mg/L)			Minimum (mg/L)	Maximum (mg/L)		
TDS	1800	2240	27	27	600	1107	26	26	651	3200	27	27	3000	7600	27	27	1100	3000	26	26
Chloride	25	590	22	22	66.1	165	25	25	69	140	26	26	310	1300	26	26	92	180	25	25
Sulfate	790	1700	26	26	120	320	25	25	170	2000	26	26	1500	3800	26	26	420	1700	25	25
Antimony	0	0	4	0	0	0	3	0	0	0	0	0	0	0	4	0	0	0	4	0
Arsenic	0.017	0.068	26	20	0.0114	0.046	25	15	0.016	0.07	26	20	0.0105	0.11	26	19	0.0073	0.04	25	12
Boron	0.71	1	26	26	0.51	1.2	25	25	0.72	13	26	26	3.2	5.5	26	26	2	5.5	25	25
Cadmium	0	0	24	0	0.000026	0.000026	23	1	0.000053	0.000053	24	1	0.000028	0.000029	24	2	0.000049	0.000049	23	1
Calcium	140	180	26	26	31	81	25	25	16	130	26	26	45	120	26	26	15.3	140	25	25
Chromium	0.003	0.0043	26	3	0	0	25	0	0.003	0.0036	26	4	0.0031	0.0064	26	5	0.0089	0.0089	25	1
Fluoride	2.2	4.2	24	23	2.2	3.6	23	23	1.9	8.9	24	24	2.3	12	24	23	2.3	7.3	23	23
Iron	0	0	4	0	0.86	0.86	3	1	0	0	4	0	0.15	0.15	4	1	0	0	4	0
Magnesium	93	120	26	26	28	69	25	25	11	99	26	26	25	77	26	26	5.11	53	25	25
Manganese	0.0073	0.06	26	3	0.0085	0.095	25	13	0.022	0.19	26	8	0.0084	0.00951	26	2	0.0069	0.0076	25	2
Molybdenum	0.015	0.024	26	22	0.0069	0.013	25	8	0.0051	0.11	26	26	0.28	0.6	26	26	0.071	0.25	25	25
Potassium	19	24	8	8	16	21	6	6	11	33	8	8	21	63	8	8	15	37	8	7
Selenium	0.0063	0.023	26	13	0.002	0.002	25	1	0.0012	0.12	26	20	0.014	0.063	26	25	0.0041	0.037	25	11
Sodium	290	450	26	26	130	200	25	25	150	980	26	26	960	2400	26	26	281	790	25	25
Thallium	0	0	4	0	0	0	3	0	0	0	4	0	0	0	4	0	0	0	4	0

Table 2. Summary of Planned Work Activities for Waste Characterization

Location/Quantity		Field Measurements	Laboratory Analyses
Installation of 11 soil borings to characterize solids to evaluate acceptance of solids at onsite landfill			
NSBH01 NSBH02 NSBH03 NSBH04 NSBH05 NSBH06 NSBH07 NSBH08 NSBH09 NSBH10 NSBH11	For each boring location: ▪ Grab for TCLP VOCs, TPH GRO, TPH-DRO, TPH-ORO at highest PID reading ▪ Composite for non-VOC parameters	PID readings will be logged. Observations of odors, discolored soils will be logged	▪ TCLP VOCs ▪ TPH GRO ▪ TCLP SVOCs ▪ TCLP pesticides ▪ TCLP herbicides ▪ TCLP Metals ▪ pH ▪ Radionuclides (Ra-226, Ra-228) ▪ TPH DRO, ORO*

* Request Chromatograms
PID - photoionization detector
Ra-226 - radium-226
Ra-228 - radium-228

Table 3. Laboratory Analytical Summary, Waste Characterization

Analytical Parameter	Analytical Test Method	Sample Volume (Minimum)	Sample Container Type	Preservative	Holding Time (days)
TCLP VOCs	EPA SW-846 1311/ 8260B	4 ounces	Glass jar with Teflon closure	Cool 4°C	14/14*
TCLP SVOCs	EPA SW-846 1311/ 8270C	4 ounces			14/7/40**
TCLP Pesticides/ herbicides	EPA SW-846 1311/ 8081B/8151A	4 ounces			14/7/40**
TCLP Metals (Total)	EPA SW-846 6000/ 7000	4 ounces			180 (28-Mercury)
TCLP Extraction	EPA SW-846 1311	4 ounces			180 (28-Mercury)
pH	EPA OSW-9040C	4 ounces			15 minutes***
Radionuclides (Radium 226/228)	EPA SW-846 904	4 ounces			180 days
Standard TPH-DRO	EPA 8015M Lab will include a polar surrogate with all TPH analyses	8 ounces			14 days
Standard TPH-ORO	EPA 8015M Lab will include a polar surrogate with all TPH analyses	8 ounces			14/40****
Standard TPH-GRO	EPA 8015M Lab will include a polar surrogate with all TPH analyses	8 ounces			14 days
Forensic TPH (GRO, DRO, ORO)	SW-3550B (DRO/ORO) SW-5030B (GRO). If standard TPH results > 100 mg/kg: silica gel cleanup (SGT) then TPH. High-resolution chromatograms	8 ounces			14 days

* TCLP Leach to occur within 14 days of sample collection and analysis within 14 days after leach.
** TCLP Leach to occur within 14 days of sample collection, extraction of leachate to occur within 7 days to extract leachate and analysis within 40 days after extraction.
*** Analysis within 15 minutes of extraction.
**** 14 days to extraction, 40 days to analyze
°C degree(s) Celsius
> greater than
oz. ounce

Table 4. Summary of Planned Work Activities for Site Characterization

Location/Quantity		Field Measurements	Laboratory Analyses
Soil sampling below ash/soil interface at 11 total soil borings to evaluate the nature and extent of impacts			
NSBH01 NSBH02 NSBH03 NSBH04 NSBH05 NSBH06 NSBH07 NSBH08 NSBH09 NSBH10 NSBH11	▪ Grab soil samples at 0–1 and 2-3' below bottom of ash/soil interface in each boring.	All borings logged in field.	▪ Antimony ▪ Arsenic ▪ Barium ▪ Boron ▪ Cadmium ▪ Calcium ▪ Chloride ▪ Chromium (total) ▪ Copper ▪ Fluoride ▪ Molybdenum ▪ Magnesium ▪ Phosphorous, Total ▪ Potassium ▪ Selenium, ▪ Sodium ▪ Sulfate ▪ Thallium ▪ TPH - GRO* ▪ TPH - ORO* ▪ TPH - DRO* ▪ VOCs ▪ PAHs

* Request Chromatograms

Table 5. Laboratory Analytical Summary, Site Characterization

Analytical Parameter	Analytical Test Method	Target Method Reporting Limit (mg/kg)	Sample Volume (Minimum)	Sample Container Type	Preservative	Holding Time (days)
General Measurements and Inorganics (Dry Weight)						
Chloride	EPA 9056A	10	8 ounces	glass jar with Teflon closure	Cool, 4°C[a]	28 days
Fluoride	EPA 9056A	1.0				
Phosphorus, Total	SM 4500 PE	1.0				
Sulfate	EPA 9056A	50				
Metals (Dry Weight)						
Antimony	EPA 6020B	0.25	8 ounces	glass jar with Teflon closure	Cool, 4°C[a]	6 months
Arsenic	EPA 6020Bd	0.0159				
Boron	EPA 6010B	10				
Cadmium	EPA 6020	0.25				
Calcium	EPA 6010Bd	10				
Chromium (total)	EPA 6010B	2				
Molybdenum	EPA 6010B	2				
Selenium	EPA 6020B	0.2				
Sodium	EPA 6010Bd	20				
Thallium	EPA 6020Bd	0.0061				
VOCs						
VOCs (see table 6 for parameters)	8260		4-oz	glass jar with Teflon closure	Cool, 4°C[a]	
PAHs						
1-Methylphenanthrene	8270-SIM	0.05	4-oz	glass jar with Teflon closure	Cool, 4°C[a]	14 days/40 days[c]
2-Methylnapthlalene	8270-SIM	0.05				
Acenaphthene	8270-SIM	0.05				
Acenaphthylene	8270-SIM	0.05				
Anthracene	8270-SIM	0.05				
Benzo(a)anthracene	8270-SIM	0.005				

Benzo(a)pyrene	8270-SIM	0.005				
Benzo(b)fluoranthene	8270-SIM	0.05				
Benzo(g,h,i)perylene	8270-SIM	0.05				
Benzo(k)fluoranthene	8270-SIM	0.05				
Chrysene	8270-SIM	0.05				
Dibenzo(a,h)anthracene	8270-SIM	0.005				
Fluoranthene	8270-SIM	0.05				
Fluorene	8270-SIM	0.05				
Indeno(1,2,3-cd)pyrene	8270-SIM	0.05				
Napthalene	8270-SIM	0.05				
Phenanthrene	8270-SIM	0.05				
Pyrene	8270-SIM	0.05				
Petroleum						
GRO/DRO/ORO	EPA 8015B	20/25/75[b]	8 ounces	glass jar with Teflon closure	Cool, 4°C[a]	14 days
Forensic TPH (GRO, DRO, ORO)	SW-3550B (DRO/ORO) SW-5030B (GRO). If standard TPH results > 100 mg/kg: silica gel cleanup (SGT) then TPH. High-resolution chromatograms	Varies	8 ounces	glass jar with Teflon closure	Cool, 4°C[a]	14 days

°C degree(s) Celsius
> greater than
oz. ounce
[a] Cool to 4° C ± 2° C
[b] GRO/DRO/ORO RLs, respectively
[c] 14 days to extract, 40 days after extraction
[d] Report to Method Detection Limit (MDL)
* See Table 6

Table 6. Soil Volatile Organic Compounds (VOC) List of Parameters

Analytical Parameters	Analytical Test Method	Target Method Reporting Limit (RL) (ug/kg)	Target Method Detection Limit (MDL) (ug/kg)
1,1,1,2-Tetrachloroethane	8260	5.0	0.280
1,1,1-Trichloroethane		5.0	0.220
1,1,2,2-Tetrachloroethane		5.0	0.200
1,1,2-Trichloroethane		5.0	0.320
1,1-Dichloroethane		5.0	0.270
1,1-Dichloroethene		5.0	0.190
1,1-Dichloropropene		5.0	0.210
1,2,3-Trichlorobenzene		25	3.580
1,2,3-Trichloropropane		5.0	0.480
1,2,4-Trichlorobenzene		25	0.870
1,2,4-Trimethylbenzene		5.0	0.640
1,2-Dibromo-3-Chloropropane		50	3.390
1,2-Dibromoethane (EDB)		50	0.190
1,2-Dichlorobenzene		5.0	0.330
1,2-Dichloroethane		5.0	0.280
1,2-Dichloropropane		5.0	0.430
1,3,5-Trimethylbenzene		5.0	0.160
1,3-Dichlorobenzene		5.0	0.280
1,3-Dichloropropane		5.0	0.130
1,4-Dichlorobenzene		5.0	0.310
2,2-Dichloropropane		20	0.230
2-Butanone (MEK)		50	6.460
2-Chloroethylvinylether		5.0	----[3]
2-Chlorotoluene		5.0	0.230
2-Hexanone		5.0	----[3]
4-Chlorotoluene		5.0	0.290
4-Methyl-2-Pentanone		5.0	----[3]
Acetone		50	6.85
Acetonitrile		5.0	----[3]
Acrylonitrile		5.0	----[3]
Allyl Chloride		5.0	----[3]
Benzene		5.0	0.430
Bromobenzene		5.0	0.220
Bromochloromethane		5.0	0.240
Bromodichloromethane		5.0	0.390
Bromoform		10	0.220
Bromomethane		20	0.310
Carbon Disulfide		5.0	0.350
Carbon Tetrachloride		5.0	0.160
Chlorobenzene		5.0	0.300
Chlorodibromomethane		5.0	0.220
Chloroethane		20	0.260
Chloroform		5.0	0.390

Table 6. Soil Volatile Organic Compounds (VOC) List of Parameters

Analytical Parameters	Analytical Test Method	Target Method Reporting Limit (RL) (ug/kg)	Target Method Detection Limit (MDL) (ug/kg)
Chloromethane	8260	20	0.190
cis-1,2-Dichloroethene		5.0	0.270
cis-1,3-Dichloropropene		5.0	0.470
cis-1,4-Dichloro-2-Butene		5.0	----[3]
Dibromochloromethane		5.0	----[3]
Dibromomethane		5.0	0.170
Dichlorodifluoromethane		15	0.250
Dichloromethane (Methylene Chloride)		50	0.320
Ethyl Methacrylate		150	----[3]
Ethylbenzene		5.0	0.360
Hexachlorobutadiene		25	0.390
Hexane		25	0.280
Iodomethane		5.0	----[3]
Isopropyl benzene		5.0	0.10
m,p-xylene		150	----[3]
Methacrylonitrile		50	0.43
Methyl Methacrylate		300	----[3]
Methyl-tert-butyl ether (MTBE)		5.0	0.220
Naphthalene (VOC)		25	0.140
n-Butylbenzene		5.0	0.230
n-Propylbenzene		5.0	0.160
o-xylene		5.0	----[3]
Pentachloroethane		5.0	----[3]
p-Isopropyltoluene		5.0	0.160
Propionitrile		5.0	----[3]
sec-Butylbenzene		5.0	0.140
cis-1,2-Dichloroethene		5.0	0.270
cis-1,3-Dichloropropene		5.0	0.470
Styrene		5.0	0.110
tert-Butylbenzene		5.0	0.140
Tetrachloroethene		5.0	0.200
Toluene		5.0	0.350
trans-1,2-Dichloroethene		5.0	0.190
trans-1,3-Dichloropropene		5.0	0.180
trans-1,4-Dichloro-2-Butene		5.0	----[3]
Trichloroethene		5.0	0.200
Trichlorofluoromethane		20	0.220
Vinyl Acetate		50	----[3]
Vinyl Chloride		15	0.290
Xylenes, Total		15	1.01

[3] Indicates the lab normal MDL and LOQ will be acceptable.
ug/kg – micrograms per kilogram

Figures

Figure 1
SA-18
Location Map

RB-87 - Groundwater
7/27/2000

General Chemistry
Nitrate as N = 0.7 mg/L
Phosphorous (ortho) = 0.02 mg/L
TDS = 2100 mg/L

Metals
Barium = 0.013 mg/L
Boron = 0.86 mg/L
Calcium = 160 mg/L
Chromium = 0.013 mg/L
Iron = 2 mg/L
Magnesium = 95 mg/L
Manganese = 0.02 mg/L
Molybdenum = 0.008 mg/L
Potassium = 40 mg/L
Selenium = 0.041 mg/L
Sodium = 270 mg/L

*All other parameters reported below detection limits

RB-87 - Soil
7/24/2000

Depth: 1 ft
TPH
TPH = 12 mg/kg

*All other parameters at other depths reported below detection limits

RB-88 - Soil
8/10/2000

Depth: 1 ft
Metals
Arsenic = 6.7 mg/kg
Lead = 7 mg/kg
Selenium = 1.8 mg/kg

VOCs
Trichloroethene < 20 ug/kg

Depth: 20 ft
TPH
TPH = 26 mg/kg

VOCs
Trichloroethene < 20 ug/kg

Depth: 35 ft
TPH
TPH = 12 mg/kg

VOCs
Trichloroethene < 20 ug/kg

*All other parameters at other depths reported below detection limits

RB-88 - Groundwater
7/27/2000

Metals
Barium = 0.023 mg/L
Chromium = 0.024 mg/L
Selenium = 0.084 mg/L

TPH
TPH = 110 mg/L

VOCs
cis-1,2-Dichloroethene = 5 ug/L
Trichloroethene = 69 ug/L

*All other parameters reported below detection limits

HP-12 - Groundwater
3/13/2000
TDS = 35,915 mg/L

IMW-12.5R - Groundwater
August 2018
TDS = 980 mg/L

HP-11 - Groundwater
3/14/2000
TDS = 2,215 mg/L

IMW-13R - Groundwater
August 2019
TDS = 1,600 mg/L

IMW-14R - Groundwater
August 2019
TDS = 3000 mg/L

IMW-17 - Groundwater
August 2019
TDS = 3,000 mg/L

IMW-9R - Groundwater
August 2019
TDS = 2,200 mg/L

HP-9 - Groundwater
4/26/2000
TDS = 2,118 mg/L

HP-10 - Groundwater
4/26/2000
TDS = 2,012 mg/L

SA-18 ASPs 1-3,
CLEAR WELLS, AND FORMER
FLY ASH DISPOSAL AREA

RB-88

RB-87

HP-12

IMW-12.5R

HP-11

Raw
Water
Ponds

IMW-13R

IMW-14R

IMW-17

HP-9

IMW-9R

HP-10

Former Asphalt Plant

BUREAU OF LAND MANAGEMENT
DRUM REMOVAL PROJECT AREA

Legend

- Monitoring Well[2]
- March 2000 Hydro-punch TDS Concentration (mg/L)
- Soil Boring
- Drum Removal Project - Approximate Soil Sample Locations
- Drum Removal Project - Approximate Excavation Boundary
- RGS Property Boundary

N

250 125 0 250 500
Feet

1. Aerial LiDAR imagery provided by NV Energy; dated July 11-12, 2017.
   Northeast area of map extent supplemented with aerial photography from 2016.
2. RGS = Reid Gardner Station
3. TDS for HP locations represent the highest levels sampled in 2000
4. Monitoring Well data represents the most current available (2018-2019)

Stanley Consultants INC.

September 2020

REV	No.	REVISION DESCRIPTION	DATE	DRWN	CHKD	APVD
B		Draft for NV Energy review	9/23/20	EW	TK	BC
A		Draft for NV Energy review	8/18/20	EW	LB	MD

0 1 in.
At full size

1 inch = 350 feet

PRELIMINARY
FOR DISCUSSION
PURPOSES ONLY

20618.11.20

REV.
B

SOIL AND GROUNDWATER DATA
SA-18 Work Plan
NV Energy
Reid Gardner Station
Moapa, NV
Figure 2

Z:\GIS\Working\Data\Mxd\SA18\Fig2_SA-18.mxd © STANLEY CONSULTANTS

Figure 3
SA-18 Sampling Locations and Excavation Plan

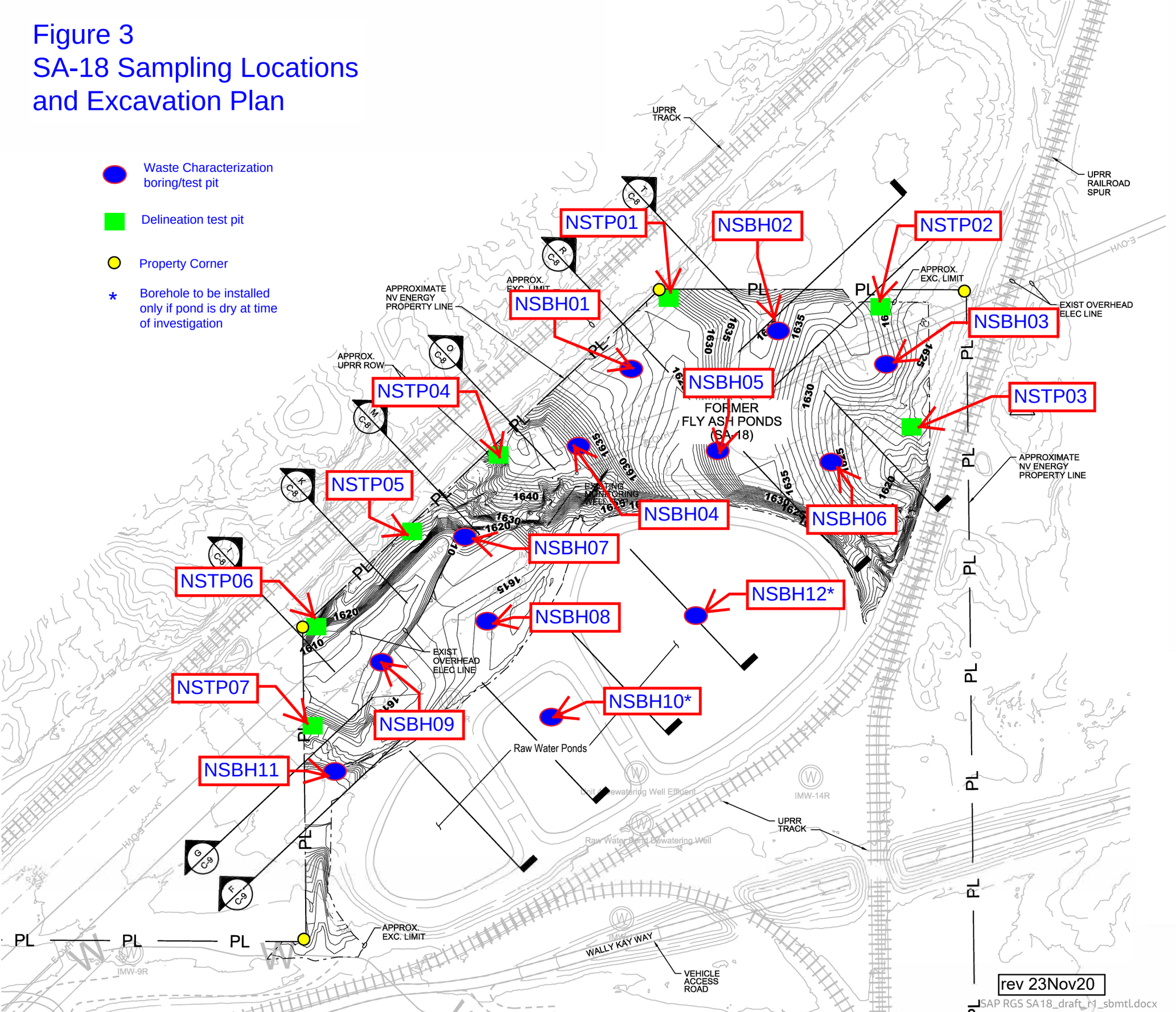
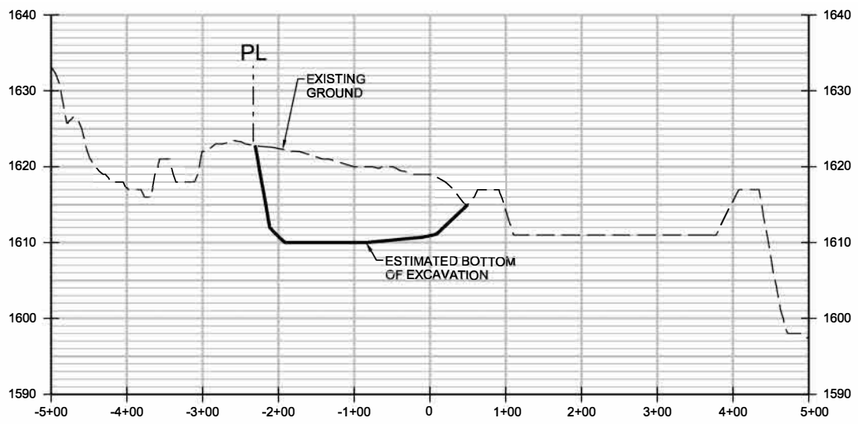
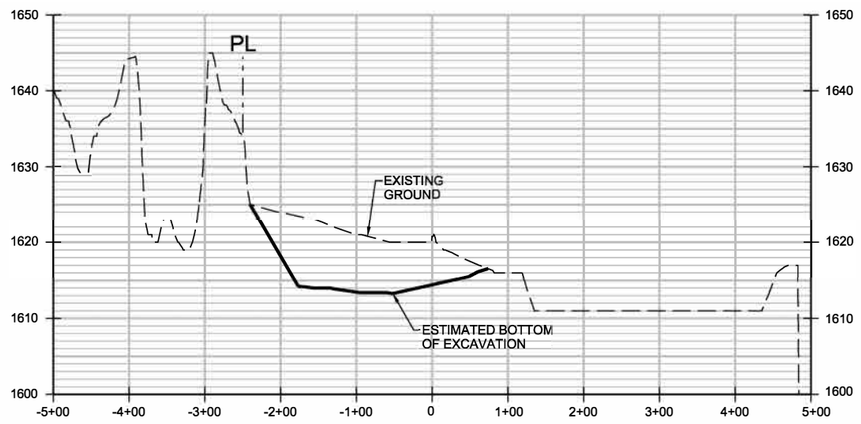


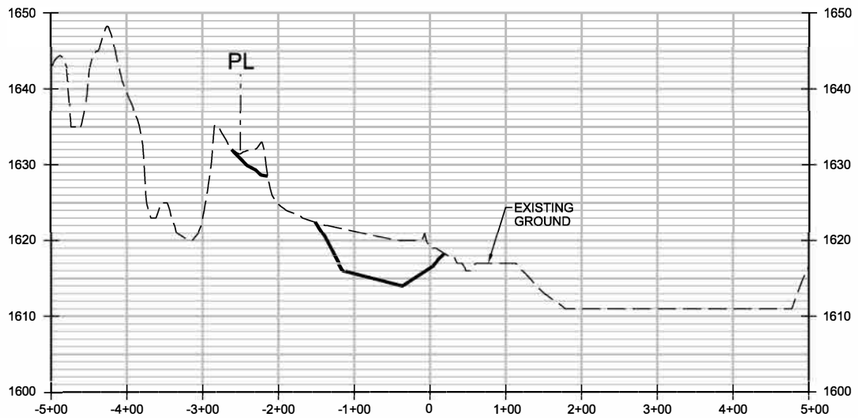
Figure 4 Sections



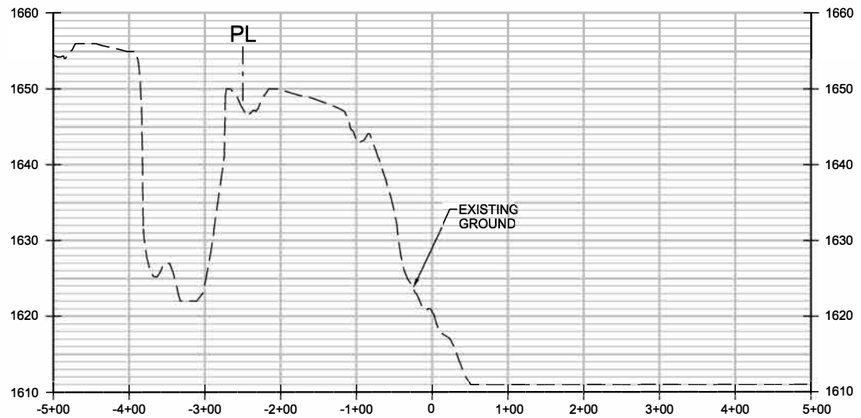
I C-7 SECTION - LOOKING NORTHEAST
H 1"=100'
V 1"=10'



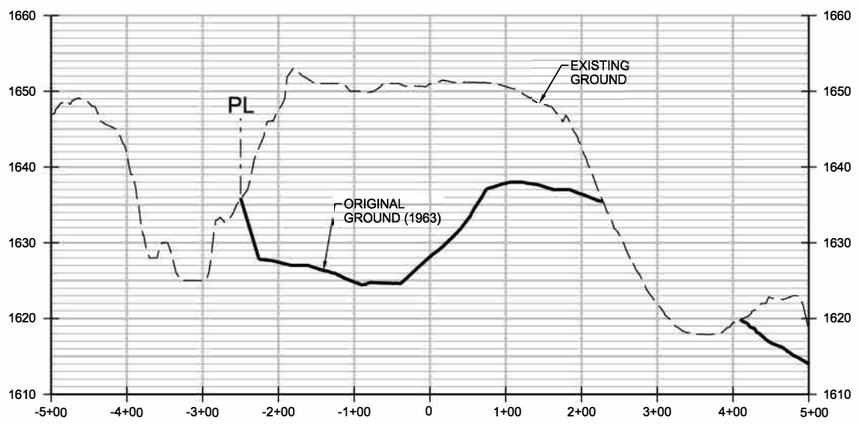
K C-7 SECTION - LOOKING NORTHEAST
H 1"=100'
V 1"=10'



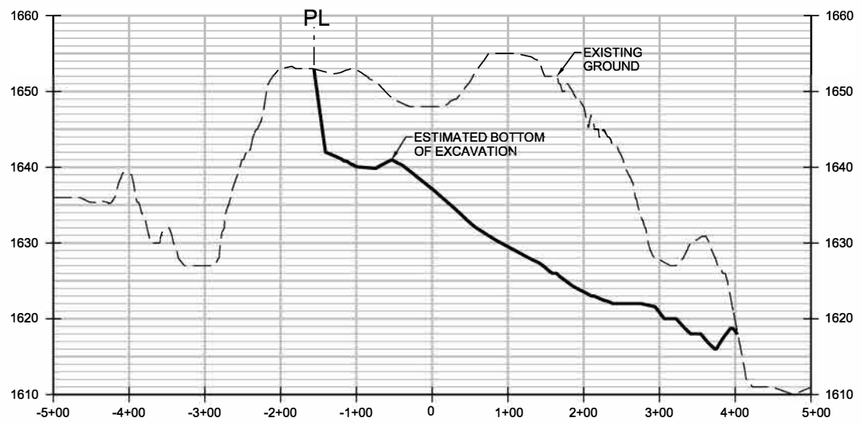
M C-7 SECTION - LOOKING NORTHEAST
H 1"=100'
V 1"=10'



O C-7 SECTION - LOOKING NORTHEAST
H 1"=100'
V 1"=10'



R C-7 SECTION - LOOKING NORTHEAST
H 1"=100'
V 1"=10'



T C-7 SECTION - LOOKING NORTHEAST
H 1"=100'
V 1"=10'

60% DRAWINGS

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD
0		R. DRESEL	S. BOURQUE	J. DEHNER	S. DETHLOFF

REVISION

JD BY APVD
SD

PRELIMINARY NOT FOR CONSTRUCTION

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-369-6175

REID GARDNER STATION
Moapa, Nevada

NVEnergy

JACOBS

ASH FILL REMOVAL PROJECT

SECTIONS (1 OF 2)
SA- 18
(FORMER FLY ASH PONDS)

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2018
PROJ	705712
DWG	C-8
SHEET	10 OF 16

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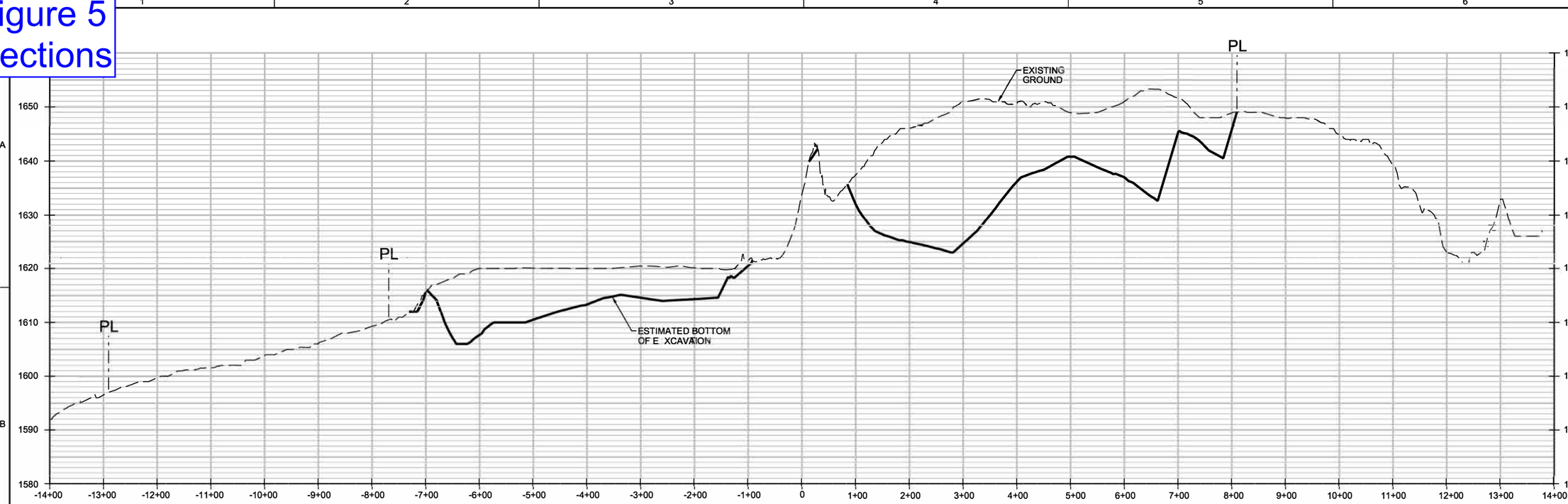
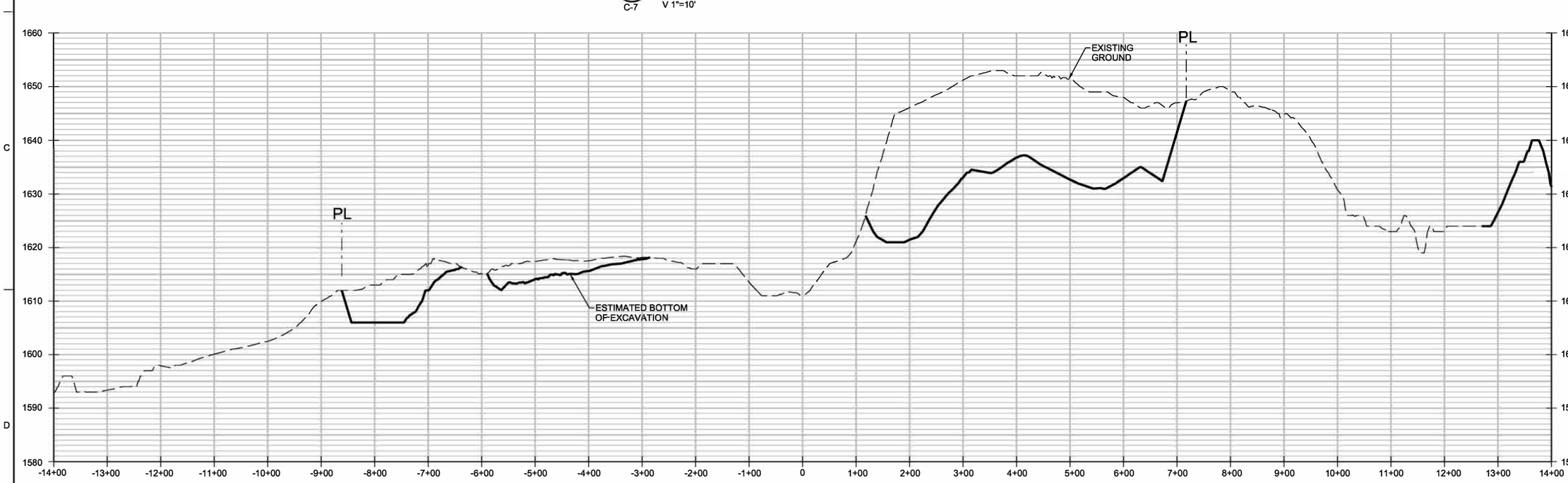
Figure 5
Sections



F C-7 SECTION - LOOKING NORTHWEST
H 1"=100'
V 1"=10'



G C-7 SECTION - LOOKING NORTHWEST
H 1"=100'
V 1"=10'

60% DRAWINGS

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD	REVISION
0		R. DRESEL	S. BOURQUE	J. DEHNER	S. DETHLOFF	
					BY	APVD
					JD	SD

2485 VILLAGE VIEW DRIVE, SUITE 350
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PHONE: 702-369-6175

REID GARDNER STATION
Moapa, Nevada

NVEnergy

JACOBS

ASH FILL REMOVAL PROJECT

SECTIONS (2 OF 2)
SA- 18
(FORMER FLY ASH PONDS)

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2018
PROJ	705712
DWG	C-9
SHEET	11 OF 16

PRELIMINARY NOT FOR CONSTRUCTION

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