

Data Gap Investigation – Phase II Groundwater Quality Assessment

NERT Remedial Investigation – Downgradient Study Area Nevada Environmental Response Trust Site Henderson, Nevada

Final



Data Gap Investigation – Phase II Groundwater Quality Assessment, **Revision 0**

NERT Remedial Investigation – Downgradient Study Area Nevada Environmental Response Trust Henderson, Nevada

Responsible Certified Environmental Manager (CEM) for this Project

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.

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List of Abbreviations and Acronyms

plus or minusC degrees Celsius

% percent

 $egin{array}{lll} t & & {
m time} \\ V & {
m volume} \\ v & {
m velocity} \\ \end{array}$

DGIP

apparent velocity Darcy velocity v_d °F degrees Fahrenheit Α cross sectional area **ARCH** air rotary casing hammer bgs below ground surface cfs cubic feet per second С relative concentration C0 initial concentration CSM Conceptual Site Model DGI Data Gap Investigation

Endeavour American Pacific Corporation /Endeavour LLC
EPA United States Environmental Protection Agency

Data Gap Investigation Plan

ft/d feet per day

lb/d pounds per day

K hydraulic conductivity

LVW Las Vegas Wash

mg/L milligrams per liter

NDEP Nevada Division of Environmental Protection
NERT Nevada Environmental Response Trust

NERT On-Site Study Area former Kerr McGee/Tronox site

NMR Nuclear Magnetic Resonance

ppb parts per billion

RI Remedial Investigation
TDS total dissolved solids

µg/L microgram(s) per liter

UMCf Upper Muddy Creek formation
USCS Unified Soil Classification System
xMCf Transitional Muddy Creek formation

1.0 Introduction

This Data Gap Investigation (DGI) Technical Memorandum describes the locations, procedures and methods for the Phase II groundwater quality assessment along the Las Vegas Wash (LVW) in support of the Nevada Environmental Response Trust (NERT) Remedial Investigation (RI) of the Downgradient Study Area in Henderson, Nevada (herein referred to as the Project) (**Figure 1**). This DGI was implemented at the direction of the Nevada Division of Environmental Protection (NDEP) and per the rationale, procedures and methods described in the *Data Gap Investigation Plan (DGIP) – Phase II Groundwater Quality Assessment* (AECOM 2019a) as modified by the May 13, 2019, *Proposed Borehole Dilution Testing as an Alternative to Pump Testing for Hydraulic Conductivity Determination Memorandum* (AECOM 2019b). Consistent with NDEP protocols, this DGI Technical Memorandum was provided to stakeholders for review. The responses to stakeholder comments are provided in **Appendix A**.

The overall objective of the RI of the Downgradient Study Area is to identify subsurface pathways through which perchlorate-impacted groundwater is entering the LVW. The Phase II DGI was conducted to aid in meeting that objective. The DGI consisted of the installation of 14 groundwater wells, 11 observation wells, slug testing, tracer testing, dilution testing, the collection of groundwater data from 40 wells, and installation and monitoring of transducers in the 14 new groundwater wells. The DGIP included procedures for pump testing; however, slug testing performed in the target wells indicated higher well yields than anticipated in the DGIP. Therefore, borehole dilution testing was proposed in lieu of pump testing to determine the hydraulic properties of the target zone, thus avoiding the logistical issues associated with storing and disposing the large quantities of water that would have been generated during pump testing.

Perchlorate concentrations in the Downgradient Study Area are generally defined where concentrations exceed 1,000 micrograms per liter (µg/L), but additional data are required to address data gaps identified by the Phase I well installation, the groundwater sampling results conducted in July 2018, the LVW surface water data collected in April and May of 2018, and the data developed through the ongoing Las Vegas Wash Bioremediation Pilot Study Work Plan (LVW Bioremediation Pilot Study) (Tetra Tech 2017). As stated in the DGIP, the following data gaps were identified in 2016 and have been assessed or partially addressed through prior investigations conducted in the Downgradient Study Area, including investigation data collected in preparation for the LVW Bioremediation Pilot Study. The Phase II DGI was focused to address specific elements of the data gaps as indicated below. The section in the report that addresses the data gap is provided in parentheses.

- 1. Where are the high concentration $(1,000 \,\mu\text{g/L})$ or higher) perchlorate-impacted groundwater plumes along the north and south sides of the LVW?
 - The 14 Phase II wells were installed to refine the understanding of the extent of the high concentration plumes on both the northern and southern sides of LVW (Refer to sections 3.8, 4.3, 4.4, and 5.1).
- 2. Why are there noticeable differences in perchlorate concentrations in groundwater over relatively short distances?
 - No Phase II wells were installed to address this issue because the LVW Bioremediation Pilot Study provided significant data to address this data gap; however, useful data were developed during the tracer test that support addressing this data gap. The dye tracer test was designed to look at dispersion, dilution, seepage velocity, and travel time. The data obtained from the test can provide additional useful information regarding why there are noticeable differences in perchlorate concentrations over short distances (Refer to sections 3.6 and 5.1).
- 3. How deep are the high concentration perchlorate-impacted groundwater plumes?

No Phase II wells were installed to address this issue because the LVW Bioremediation Pilot Study has developed significant data to address this data gap.

4. Do the high-concentration perchlorate plumes follow distinct water-bearing zones within the alluvium or bedrock formations?

The tracer tests and the NMR logging can be used to distinguish between low- and high-permeability zones (Refer to sections 3.5, 4.4, and 5.1).

5. Where does faulting affect the movement of high-concentration perchlorate-impacted groundwater?

The Phase II wells near Three Kids Weir and Calico Ridge Weir can be used to evaluate geology, faulting, and changes in perchlorate concentrations in these areas (Refer to sections 3.1, 4.4, and 5.1).

6. Along the LVW, does groundwater flow generally in the same direction as the surface water?

The potentiometric surface of the groundwater generally follows the surface water flow direction. The Phase II wells and transducers can provide useful data regarding groundwater potentiometric surface gradients and overall flow directions. The tracer test can provide detailed information in the tracer test areas regarding specific groundwater flow paths (Refer to sections 3.3, 3.6, and 5.1).

7. Where does impacted groundwater discharge to the LVW?

Previous surface water studies indicate that perchlorate-impacted groundwater discharges at the base of Calico Ridge Weir and at the base of Three Kids Weir. The dye tracer test can be used to confirm the groundwater connection at these locations. Although groundwater elevations are higher than surface water elevations at Homestead Weir, the surface water data from 2018 do not indicate groundwater is entering the LVW at that location. A Phase II groundwater monitoring well installed adjacent to Homestead Weir can provide geologic and perchlorate concentration data for this area (Refer to sections 3.8, 4.0, and 5.1).

8. Where is the groundwater/surface water interface and how far is it from the LVW?

Prior to the Phase II Groundwater Assessment, the groundwater/surface water interface was identified by temperatures exceeding 78 degrees Fahrenheit (°F) and lower than expected total dissolved solids (TDS) concentrations (less than 3,000 milligrams per liter [mg/L]). A more robust evaluation of temperature data and TDS concentrations from Phase II wells can provide additional data regarding groundwater/surface water interface (Refer to sections 3.8.5, 4.4, and 5.1).

9. Is there an area of known or suspected perchlorate flux of sufficient magnitude where an interim remedial action would be appropriate?

Given that perchlorate concentrations in Lake Mead are well below NDEP's interim action level and that NERT is completing the LVW Bioremediation Pilot Study between Bostick and Homestead Weirs (an area with elevated perchlorate mass flux from groundwater to surface water), AECOM does not recommend additional interim or emergency remedial actions at this time (Refer to section 5.1).

10. Is perchlorate-impacted groundwater bypassing the Seep Well Field on its eastern side near monitoring well COH2B1?

Perchlorate concentrations are over 1,000 μ g/L in groundwater from well COH2B1. Additional sampling of this well can provide useful information; however, the source of perchlorate was not investigated within the scope of the Downgradient Study Area Investigation (Refer to sections 3.8 and 5.1).

11. Do high volumes of low-concentration, perchlorate-impacted groundwater provide more flux to the LVW than low volumes of high-concentration perchlorate-impacted groundwater?

The Phase II Groundwater Quality Assessment can provide additional information regarding high and low concentration sources of perchlorate (Refer to sections 3.6, 3.8, 4.0, and 5.1).

12. Do concentrations of perchlorate in groundwater fluctuate over time, seasonally, or after a rain event?

The Phase II Groundwater Quality Assessment in combination with previous sampling events provides information on changes in perchlorate concentrations in groundwater over time; however, it did not include evaluations of perchlorate concentrations seasonally or after rain events, which requires more frequent monitoring that is outside of the scope of the Downgradient Study Area investigation.

The data collected during this Phase II Groundwater Quality Assessment, in conjunction with previous groundwater quality assessments and several surface water sampling events, have been used to address the data gaps to the extent feasible based on the data collected as well as update the Conceptual Site Model (CSM), previously presented in the DGIP. As an interim deliverable, this document presents the sampling and analytical results of the samples collected per the DGIP. All data presented in this document, in addition to complementary data from adjacent areas within Operable Unit-3 (NERT RI Study Area north of Galleria Road), will be further evaluated by NERT during the preparation of the RI Report.

1.1 Rationale for Phase II Well Installation Locations

Perchlorate concentrations obtained from the July 2018 groundwater (AECOM 2019c) and May 2018 surface water analysis (AECOM 2019d) were used to identify key locations along the LVW where data gaps exist that could be addressed by the installation of groundwater monitoring wells completed in the shallow (0 to 90 feet below ground surface [bgs]) water-bearing zone. The data obtained along LVW indicate that there are significant perchlorate fluxes into the LVW near the toe of Calico Ridge Weir and near the toe of Three Kids Weir. There is also evidence that groundwater has the potential to discharge to the LVW below Homestead Weir but a corresponding increase in perchlorate flux is not evident at that location. The Phase II groundwater assessment was focused to obtain additional information at these key areas. **Table 1** presents the rationale for the installation of each well. **Figures 2, 3** and **4** show the 14 groundwater monitoring well locations in relation to the perchlorate concentrations in groundwater in July 2018 and in surface water and seeps in May 2018. Along with the perchlorate concentrations in groundwater and surface water, the figures show where warm temperature anomalies indicated discharge of groundwater to the LVW.

1.2 Site Background Information

1.2.1 Regional Geology

The Site is located within the Las Vegas Valley, which occupies a topographic and structural basin trending northwest-southeast and extending approximately 55 miles from near Indian Springs on the north to Railroad Pass on the south. The valley is bounded by the Las Vegas Range, Sheep Range, and Desert Range to the north; by Frenchman and Sunrise Mountains to the east; by the McCullough Range and River Mountains to the south and southeast; and the Spring Mountains to the west. The mountain ranges bounding the east, north, and west sides of the valley consist primarily of Paleozoic and Mesozoic sedimentary rocks (limestones, sandstones, siltstones, and fanglomerates), whereas the mountains on the south and southeast consist primarily of Tertiary volcanic rocks (basalts, rhyolites, andesites, and related rocks) that overlie Precambrian metamorphic and granitic rocks (ENSR 2007).

In the Las Vegas Valley, eroded Tertiary and Quaternary sedimentary and volcanic rocks comprise the unconsolidated basin deposits, which can be up to 13,000 feet thick (ENSR 2007). The valley floor consists of fluvial, paludal (swamp), playa, and lacustrine deposits surrounded by more steeply sloping alluvial fan aprons derived from erosion of the surrounding mountains. Generally, the deposits grade finer with increasing distance from their source and with decreasing elevation. The structure within the Quaternary and Tertiary-aged basin fill is characterized by a series of generally north-south trending fault scarps.

1.2.2 Local Geology

The local geology and hydrogeology are defined by data collected from soil borings and wells that have been installed in the LVW area. The Downgradient Study Area is composed of Quaternary alluvial deposits, the Muddy Creek formation, the Thumb formation, and the Horse Springs formation (**Figure 5**). These deposits are described in more detail below.

Alluvium. The alluvium consists of a reddish-brown heterogeneous mixture of fine- to coarse-grained angular sand and gravel with lesser amounts of silt, clay, and caliche. Boulders and cobbles are common. Due to the mode of deposition, no distinct beds or units are continuous over the LVW area. North of LVW the alluvium is primarily from the Frenchman Mountains and the clasts are generally composed of limestone, sandstone, siltstone, quartzite, with locally high concentrations of granite and gneiss (Bell and Smith 1980). South of LVW the alluvium is derived from the River Mountains and McCullough Range. The clasts present in the alluvium and derived from these mountains are dominantly composed of dacite, with basalt, tuff, and sedimentary rocks also present. Gypsum is also present in all of the alluvial deposits (Bell and Smith 1980).

South of the LVW a feature of the alluvial deposits is the stream-deposited sands and gravels that were laid down within paleochannels eroded into the surface of the Muddy Creek formation during infrequent flood runoff periods. These deposits vary in thickness and are narrow and generally linear. These are generally uniform sand and gravel deposits that exhibit higher permeability than the adjacent, well-graded deposits. Along the LVW the paleochannels are less distinct and have likely been reworked as the main channel of the LVW meandered and alternately cut downward and filled in with sediments through the course of seasonal storms, wastewater releases, and manmade channel alterations. The LVW has been and continues to be significantly modified through the installation and modification of erosion control features and improvements made to roads, bike paths, footpaths, and wildlife habitat within Clark County Wetlands Park.

The thickness of the alluvial deposits ranges from less than 1 foot to more than 90 feet in the Downgradient Study Area. Soil types identified in on-site soil borings include gravel, sandy gravel, silty gravel, clayey gravel, sand, silty sand, clayey sand, sandy clay, clay, sandy silt, and silt.

Transitional (or reworked) Muddy Creek formation. Where present, Transitional Muddy Creek formation (xMCf) is encountered at the base of the alluvium. The xMCf consists of reworked sediments derived from the Muddy Creek formation. The xMCf appears similar to the Muddy Creek formation, but it consists of reworked, less consolidated, and indurated sediments.

Muddy Creek formation. The Upper Muddy Creek formation (UMCf) of Pleistocene age occurs in the Las Vegas Valley as valley-fill deposits that are coarse grained near mountain fronts and become progressively finer grained toward the center of the valley. The Muddy Creek formation represents deposition in an alluvial apron environment from the Spring Mountains to the west, grading into fluvial, paludal (swamp), playa, and lacustrine environments further out into the valley center.

In Phase I and Phase II borings, the contact between the Quaternary alluvium and the UMCf (fine-grained member) is typically marked by gray-green to yellow-green gypsiferous clays and silts. The Muddy Creek formation can also be yellow brown or red brown. The UMCf is up to 325 feet thick (Bell and Smith 1980).

Horse Springs formation. As described in the geotechnical investigations conducted for the weir construction, the Horse Springs formation is composed of siliceous limestone interbedded with white to yellow silts and shales (GES 2007a). By Lower Narrows Weir it consists mostly of carbonate beds and is intruded by andesite sills with low-grade metamorphic contact aureoles. An aureole is the zone of altered rock that surrounds an intrusion. It consists of interbedded limestone, dolomite, and calcareous sandstone and claystone. Colors range from buff-white to pinkish gray to red brown. It is distinguished mainly by the fissile siltstone and claystone beds, variability of color over 6 inches to several feet, and an abundance of carbonate beds.

Thumb formation. As described in the geotechnical investigations conducted for the weir construction, the Thumb formation consists of red limestone, calcareous sandstone and siltstone (GES 2007b). Some parts of this formation are well bedded. The formation also contains volcanic flows and dikes. It is characterized by three sequences:

- 1. An <u>upper sequence</u> consisting of Precambrian gneiss, schist and granite clasts strongly cemented in a silica matrix. The clasts are typically angular. It becomes weakly cemented by the Frenchman fault zone.
- A <u>middle sequence</u> consisting of thinly laminated pink to reddish yellow claystone and siltstone. This
 sequence is 20 to 30 feet thick, weakly cemented and friable. It contains gypsum veins and cross
 bedding.
- 3. A <u>lower sequence</u> that is composed of interbedded medium-grained sandstone, siltstone and claystone. It is predominantly red to reddish brown in color, weakly to moderately cemented and has some greenish gray units. Individual beds are 0.5 to 8 inches thick. Generally, the sandstone beds are more strongly cemented than the siltstone and claystone beds. The silt and clay beds have low permeability. This unit dips at 8 to 30 degrees and the Frenchman fault deforms it.

Extrusive Igneous Rocks. North of LVW, an andesitic and basaltic sequence follows the trend of the Frenchman fault. It consists of an upper greenish black flow of porphyritic basalt that has green olivine phenocrysts in a black groundmass. Below this flow is float composed of brownish black basaltic andesite. The trend of this sequence is North 32 degrees West and it exhibits dips up to 60 degrees to the southwest (GES 2007a and GES 2007b).

1.2.3 Local Groundwater Hydrology

The local groundwater hydrology is based on data collected from existing wells that have been installed in the LVW area. The depth to groundwater within the Downgradient Study Area along the LVW varies from less than 3 feet bgs to over 40 feet bgs. Generally, when a well is physically near LVW shallow depth to water is observed; conversely, when a well is far away from the LVW a deeper depth to water is observed, which is mainly due to topographic elevation differences. Actual groundwater elevations increase with distance from the LVW. The groundwater flow direction is generally to the east at a gradient of 0.0079 feet per feet. The shallow flow zone has been defined as groundwater from 0 to 90 feet bgs, and this zone was the focus of the Phase I and Phase II investigations.

The groundwater quality along the LVW was evaluated by the Southern Nevada Water Authority (Zhou 2012). The data was based on samples collected from wells on a monthly or quarterly basis from 2001 to 2010. The pH values in groundwater were typically between 6.5 and 7.5. Dissolved oxygen was generally less than 5 mg/L. Total dissolved solids ranged from 1,400 to 6,800 mg/L and groundwater exhibiting TDS concentrations lower than 3,000 mg/L were suspected of being mixed with surface water from LVW (Zhou 2012).

1.2.4 Local Surface Water Hydrology

The local surface water hydrology in the LVW is largely controlled by wastewater treatment plant discharges and engineered erosion control structures. The LVW has been modified over many years to accommodate the increase in population and development in the area. Currently discharges from four major wastewater treatment plants in the valley represent the vast majority of flow in the LVW (Clark County Water Reclamation District, City of Las Vegas Water Pollution and Control Facility, City of Henderson Water Reclamation Facilities, and City of North Las Vegas Water Reclamation Facility). A series of weirs have been constructed to control erosion. A wetlands park is present along most of the Downgradient Study Area.

The surface water quality along the LVW has been evaluated over many years. The reaches from Pabco Weir to Rainbow Gardens Weir were the focus of the 2018 surface water investigations as well as the Phase I and Phase II groundwater quality assessments. Through the Downgradient Study Area investigation, two major studies were conducted in 2016 and 2018 (AECOM 2016 and AECOM 2019c).

2.0 Well Installation and Data Collection

Well installation, sampling, and data collection for this DGI were conducted consistent with the *DGIP – Phase II Groundwater Quality Assessment* (AECOM 2019a). Fourteen 4-inch diameter groundwater monitoring wells were installed, developed, and sampled as part of this DGI. In addition, eleven 2-inch diameter wells were installed and developed with the intent to be used as observation wells during pump and tracer testing. The wells are located within the Downgradient Study Area along the north and south banks of the LVW. The 14 new and 26 existing groundwater monitoring wells were sampled (**Figure 6**).

2.1 Pre-Field Activities

Work was conducted under the site-specific Health and Safety Plan (AECOM 2018) and Quality Assurance Project Plan (AECOM 2017) developed for the Downgradient Study Area and the planned field work. The existing NERT RI Quality Assurance Project Plan was adapted to include the proposed Downgradient Study Area investigations.

Access to install the new groundwater monitoring and observation wells on Clark County property was obtained by NERT. AECOM obtained a Use Permit from Clark County Wetlands Park for the activities described in the Phase II Work Plan. A Chemical Use Request (UIC Form U240) was obtained for the tracer dye testing from the Bureau of Water Pollution Control, Underground Injection Control Program. Two tracer dyes were approved for use, Rhodamine WT and Fluorescein. Copies of the tracer dye permits are provided in **Appendix B**. Although no wells were installed on U.S. Bureau of Reclamation property, notification of proposed work and schedule was provided.

NERT, in conjunction with the drilling subcontractor, obtained the standard well drilling approvals from the Nevada Division of Water Resources. Notification was made to Nevada's Underground Service Alert to have utilities near the proposed wells located and marked. A utility geophysical clearance survey was conducted at each boring location. Notice of Intent and Underground Service Alert tickets are provided in **Appendix B**.

2.2 Field Activities

To maintain consistency in the methods applied in the field for this assessment, field activities adhered to the procedures described in relevant Field Guidance Documents in the Field Sampling Plan for the NERT RI/Feasibility Study (ENVIRON 2014a).

2.2.1 Well Installation and Development

Well installation activities were conducted March 25 through April 27, 2019. A total of 25 wells were installed, fourteen 4-inch diameter groundwater monitoring wells and eleven 2-inch diameter observation wells to be used during tracer testing. Twenty-three soil borings were advanced using the rotary sonic drilling method and two soil borings (NERT3.35S1 and NERT3.58N1) were advanced using air rotary casing hammer (ARCH) drilling methods. The ARCH drilling method was used in boreholes where the sonic drilling method was unable to advance through the subsurface material encountered. The 11 observation wells were installed from April 22 to 26, 2019, using the rotary sonic drilling method. Four observation wells were installed downgradient and cross gradient of NERT3.60S1 and around NERT4.46S1. Three observation wells were installed downgradient and cross gradient of NERT3.58S1 because no water was encountered at the proposed location of the fourth observation well.

The new groundwater monitoring wells were identified as NERT (owner) followed by the approximate river mile to the nearest hundredth of a mile, followed by the N or S for the north or south side of the LVW, followed by

sequentially numbered wells (1,2,3, etc.) within that hundredth of a river mile. For example, the westernmost Phase II monitoring well was identified as NERT4.71S2.

Equipment was decontaminated prior to drilling, between boreholes and at the end of each workday. The total depth of each boring was determined in the field based on the depth of the UMCf or bedrock (if present), such as the Horse Spring formation or the Thumb formation, or until refusal was encountered, whichever came first (**Table 1**). Maximum borehole depth of the monitoring wells was 90 feet bgs and boreholes were 8 inches in diameter. Boreholes for the observation wells were 6 inches in diameter. The lithology at each soil boring was logged by the field geologist using the Unified Soil Classification System (USCS). Soil boring logs are provided in **Appendix C**.

Each borehole was backfilled to the desired total depth of the well by pouring in bentonite chips. Monitoring wells were constructed of 4-inch diameter schedule 40 PVC with a screened interval of 20 feet. Observation wells were constructed of 2-inch diameter schedule 40 PVC with a screened interval of 20 feet. The well depth and screened interval were selected to match the surrounding wells and to intercept the same flow zone of interest. Well completion depths were between 35.5 and 62 feet bgs (**Table 2**). The filter pack and screen slot size were selected based on previous well installations in the area by AECOM and NERT contractors. Monterey #3 sand was used as the filter pack and extended at least 2 feet above the well screen. The screen slot size was 0.020 inches. A minimum 2-foot hydrated bentonite seal was placed above the filter pack and the annular space was backfilled with bentonite chips to the surface. Well completions were flush mounted traffic-rated well boxes with a vault and lockable well cap. Well construction diagrams are provided in **Appendix D**.

Well development activities were conducted between April 8 and May 3, 2019, exceeding the minimum 72-hours waiting period after well completion as specified in the DGIP (**Table 2**). During well development, predevelopment groundwater was encountered between 10.43 and 39.41 feet bgs and after development between 18.31 and 39.65 feet bgs (**Table 2**). The wells were developed by bailing and surging to remove fine particles that may have gotten into the well or filter pack. Well development continued until the water was clear and field parameters stabilized. Stabilization of field parameters was over three readings as follows: pH plus or minus (±) 0.1, temperature ± 1 degree Celsius (°C), and within ±10 percent (%) for specific conductivity, dissolved oxygen, oxidation-reduction potential and turbidity. Well development records are provided in **Appendix E**.

2.2.2 Soil Property Testing

Soil property samples were collected from 10 of the 14 boring locations during the drilling activities. The sample locations were selected by the field geologists. The soil property testing included:

- grain-size distribution (ASTM-D422),
- moisture content (ASTM-D2216),
- dry bulk density (ASTM-D2937)
- porosity (API RP40)
- total organic carbon and fractional organic carbon (Walkley-Black)
- Atterberg limits (ASTM D4318), and
- USCS description (ASTM-D2487).

Samples were collected and shipped by Ramboll under chain-of-custody protocols to Core Laboratories in Bakersfield, California. Results of the soil property testing are provided on **Tables 3 through 5** and soil property laboratory reports can be found in **Appendix F.**

2.2.3 Water Level Measurements

During well installation activities and the groundwater sampling event, groundwater monitoring wells were sounded for depth to water. An electronic sounder, accurate to the nearest ± 0.01 feet, was used to measure

depth to water in each well. The electronic sounder was lowered down the casing to the top of the water column, and the graduated markings on the probe wire or tape were used to measure the depth to water from the surveyed point on the rim of the well casing and to the ground surface prior to the installation of the well casing.

2.2.4 Slug Testing

Slug tests were performed in three wells (NERT3.58S1, NERT3.60S1, and NERT4.64S1) to collect data for the estimation of hydraulic conductivity (K) values. Aquifer test analysis software, AQuifer TEst SOLVer© (AQTESOLV), and inferences made from other available site data were used to analyze falling head and rising head slug test data from each well.

A series of falling head and rising head slug tests were performed at wells NERT3.58S1, NERT3.60S1, and NERT4.64S1 between April 17 and April 19, 2019. Prior to commencement of slug testing at a given well, a pressure transducer was installed within the well at depths of 30 or 50 feet bgs. The transducers were programmed to record water elevations at a one-second interval. Water elevations were also measured periodically using a manual water level meter.

Initial tests conducted on April 17 and 18, 2019, used a solid slug of varying dimensions (2 and 3 feet long with a 2-inch diameter), which were quickly inserted into the water column to initiate the falling head slug test. After water levels stabilized to initial static groundwater level the slug was removed, thus initiating the rising head slug test. These slugs failed to produce enough displacement to allow for analysis in AQTESOLV because the displacement was too small, and the recovery was too rapid.

Each well was re-tested on April 19, 2019, using a 6-foot long slug with a 2-inch diameter; however, recovery was still near-instantaneous. The slug tests with the best results (i.e. highest initial displacement, least data "noise") were chosen for AQTESOLV analysis. Water levels were converted to displacement from test initiation (in feet) by subtracting pre-test static water levels from each measurement.

Each dataset was individually analyzed in AQTESOLV. Based on the site hydrogeology consisting primarily of unconsolidated alluvium of variable thickness, the Bouwer-Rice (1976) solution for an unconfined aquifer with a partially penetrating well was chosen for curve-matching to estimate K. Aquifer parameters were estimated through visual matching of the data. In all cases, full recovery was near-instantaneous (within the first three seconds of initial displacement), which complicated data analysis. To the degree practicable, curves were matched to this early-time response. The near-instantaneous recovery of water levels is attributed to the aquifer's high K relative to the amount of water displaced during slug testing. AQTESOLV analysis are provided in **Appendix G**.

2.2.5 Nuclear Magnetic Resonance Logging of Boreholes

Nuclear Magnetic Resonance (NMR) logging was conducted May 13 to 16, 2019, at each of the 14 new groundwater monitoring wells after the wells were constructed. Data collected through NMR logging was used to verify lithologic boundaries identified during field logging of the borehole. Based on the NMR logging, lithologic boundaries were not changed in the borehole logs. The NMR logging method uses the physics of nuclear magnetic resonance to directly measure hydrogen in the fluid state in groundwater. The NMR data are presented in **Appendix H**.

2.2.6 Groundwater Sampling

Groundwater sampling activities were conducted June 26 through July 9, 2019. Groundwater sampling was conducted using the low-flow method (in which low volumes of water were purged with little or no measurable drawdown) while allowing water quality field parameters to stabilize as specified in the field guidance document, if achievable, between three successive measurements. If field parameters did not stabilize by the time six volumes (about 6 liters) had been purged, then final water quality parameters were recorded, and a sample of groundwater was collected. The pump intake was positioned at the approximate midpoint of the well screen.

A flow-through cell equipped with a water quality meter was used during purging to track water quality field parameters and assess when stabilization of parameters had occurred. Samplers recorded measurements for depth to water, pH, electrical conductivity, dissolved oxygen, oxidation-reduction potential, turbidity and temperature of groundwater samples. Stabilization of field parameters was determined over three readings as follows: pH \pm 0.1, Temperature \pm 1°C, Specific Conductivity, Dissolved Oxygen, Oxidation-Reduction Potential and Turbidity within \pm 10 %. A water quality meter, calibrated as recommended by the manufacturer, was used to measure these parameters.

The identification system for the groundwater samples consisted of the well ID followed by the sample date in YYYYMMDD format. For example, a groundwater sample collected from monitoring well NERT3.35S1 on June 26, 2019, was identified as NERT3.65S1-20190626.

Groundwater samples from the 14 new groundwater monitoring wells were analyzed for the following constituents:

- Perchlorate (United States Environmental Protection Agency [EPA] Method 314.0);
- Chlorate (EPA Method 300.1);
- Chromium, Dissolved (EPA Method 200.8 [ICP-MS]);
- Hexavalent Chromium, Dissolved (Method 218.7); and
- TDS (Method SM 2540C).

Groundwater samples obtained from the 14 new wells for analyses of total dissolved chromium (i.e., combined trivalent and hexavalent chromium) and hexavalent chromium were filtered in the field using a 0.45-micron filter. Groundwater samples designated only for hexavalent chromium analysis were analyzed within 24 hours of sample collection or the sample was preserved by pH adjustment upon arrival at the laboratory (i.e., within 24 hours after sample collection) to allow for a longer holding time.

To obtain a more complete picture of the perchlorate and chlorate concentrations in groundwater along the LVW, the nine Phase I and 17 existing wells were also sampled during this timeframe. The 40 wells sampled are shown on **Figure 6**. The Phase I wells were analyzed for perchlorate, chlorate, and hexavalent chromium. The existing wells were only analyzed for perchlorate and chlorate. Groundwater sampling records are presented in **Appendix I**. Certified laboratory analytical reports are provided in **Appendix J**.

2.2.7 Transducer Installation

After Ramboll completed NMR logging, AECOM installed transducers in 11 wells. Transducer installation occurred between June 10 and July 9, 2019 (**Table 6**). Transducers were not installed in the three wells being used for dye injections (NERT3.58S1, NERT3.60S1, and NERT4.64S1) and one well (NERT4.71N1) that was not accessible during this timeframe due to a biological hazard (hornets). Transducers were installed in these four wells on August 13, 2019, when no dye remained in the injection wells and the hornets were gone. The transducers were set to automatically record groundwater level data every 15 minutes (96 times per day). Prior to the installation of each transducer and following installation of the transducer, a manual groundwater level measurement was collected using a water-level sounder. Static groundwater level readings were measured and recorded to the nearest 0.01 foot from the surveyed reference mark on the top north edge of the inner well casing.

The installation of each dedicated transducer typically consisted of placing the transducer at approximately 20 feet below the top of the water table and securing the transducer with a cable within the well head. As shown on **Table 6**, some wells have less than 20 feet of water column so for these wells the transducer was placed approximately 2 feet above the bottom of the well. These transducers recorded data for approximately two months before data were downloaded at the beginning of August 2019, currently with transducers in Phase I and

existing wells in the Downgradient Study Area. Automated readings from the transducers were corrected for barometric pressure fluctuations. Barometric data is available from the barometer in well WMW4.9S.

2.2.8 Surveying of New Groundwater Well Locations

New groundwater well locations and elevations (ground surface and top of casing) were surveyed by a licensed land surveyor. Locations were referenced to the State Plane Coordinate System and elevations were referenced to the North American Datum 83 Nevada East Zone (2701) with vertical datum based on NAVD 88 referenced to the City of Henderson Benchmark network. The survey data is presented on **Table 7** and the survey report is presented in **Appendix K**.

2.2.9 Preliminary Tracer Dye Sampling of LVW

To rule out background concentrations of tracer dye that may have already been present in the LVW, preliminary tracer dye sampling and analyses were conducted. Results were used to determine which tracer dye would be injected for the tracer testing and determine which sensor would be used in the tracer dye probes for monitoring the LVW.

Six surface water and charcoal sorbent samples were collected in the LVW in the vicinity of wells NERT4.64S1, NERT3.60S1, and NERT 3.58S1 (**Figures 2** and **4**). These locations were selected for background tracer dye analysis because these locations are where groundwater is considered most likely to enter the LVW from the selected injection wells (NERT4.64S1, NERT3.60S1, and NERT 3.58S1). Additionally, these locations are located close to observed surface water temperature 'anomalies' measured in February 2018 and, as discussed below, they are also the tracer test monitoring probe locations.

Samples were collected during daily low-water conditions to minimize the influence of upstream wastewater sources on surface water flow (and therefore dilution). Sampling consisted of collecting one grab water sample and deploying/collecting one charcoal sampler at each sampling location. A total of six groundwater samples and six charcoal samplers were collected.

Grab samples were collected in 50 milliliter glass vials. Charcoal samplers were anchored to the bottom of the LVW with a u-pin or stake and left in place for approximately 4 hours. Samplers were attached so that they extended outward from the anchor and did not lay flat on the bottom of the LVW. All samplers and equipment were removed from the LVW once sampling was complete.

Samples were collected on March 7, 2019, and analyzed for Fluorescein, Rhodamine WT, Eosine, and Sulforhodamine B by Ozark Underground Laboratory, in Protem, Missouri. Laboratory results are provided in **Appendix J**. Fluorescein dye was detected in charcoal samplers from five of the six locations in concentrations ranging from 0.186 parts per billion (ppb) to 0.851 ppb. Sulforhodamine B was detected in water samples from five of the six locations at concentrations ranging from 0.067 to 0.093 ppb. On this basis, Fluorescein and Sulforhodamine B were rejected as potential dyes for tracer testing. Since Rhodamine WT had been approved as an injection dye by the Nevada Underground Injection Control Program and was not detected in preliminary testing, it was selected for use in tracer dye testing.

2.2.10 Dye Tracer Testing

Dye tracer testing was proposed to establish positive proof of the connection between groundwater and surface water in the LVW, to provide additional lines of evidence regarding the velocity of groundwater towards the LVW in the test locations, and to provide additional information about the direction of the local groundwater gradient. This scope ultimately included three sets of dye measurements: 1) in the injection wells, 2) in the observation wells, and 3) in the LVW. The locations of the injection wells, observation wells and LVW probe locations are shown on **Figures 2, 4, 6, 9, 10, and 11**.

Wells NERT 3.58S1, NERT3.60S1, and NERT4.64S1 were selected for dye tracer testing (**Figures 2** and **4**). Slug test data was used to estimate the time required for the injected dye to travel from each injection well to the observation well and to the LVW. Based on the slug tests, average estimates of hydraulic conductivity in NERT 3.58S1, NERT3.60S1, and NERT4.64S1 were 452 feet per day (ft/d), 227 ft/d, and 136 ft/d, respectively.

Rhodamine WT for use in dye tracer testing was purchased from Ozark Underground Laboratory, Protem, Missouri. Each dye tracer test consisted of dye injection and monitoring declining dye concentrations in the test well and monitoring for dye detection in the LVW. Tests were conducted serially beginning with the furthest downstream well (NERT 3.58S1) to minimize the potential for interference. Three surface water locations were monitored using probes equipped with dye sensors (Eureka Water Probes, Austin, Texas) that allowed for continuous monitoring for dye concentration, temperature, and conductivity and reported those results via telemetry to a website for the duration of the testing (June 3, 2019, to August 8, 2019). Probe locations are shown in **Figures 2**, **4**, **9**, **10**, **and 11**. Probe installation consisted of connecting the data cable to the probe, installing the probe in a PVC housing and securing the housing and probe in the LVW via a stake. The data cable was then connected to the telemetry box on the shore. Data collection from each probe was verified before dye was introduced in the injection wells. Surface water monitoring was centered on locations where groundwater could be expected to enter the LVW, and approximately 50 feet upstream and downstream from the primary location. The telemetry unit reported data at 5-minute intervals, 24 hours a day, 7 days a week.

Dye measurements in the LVW using the probes showed some variability related to fouling. Occasional fouling (accumulation of dirt, plant matter, or algae) of the probe surface near the optical windows used for fluorescence measurement was observed and appeared to correlate with intermittent spikes in fluorescence measurement. Although these spikes complicate data interpretation, consistent fluorescence measurements lasting for periods of hours that then declined to baseline without intervention (cleaning of the probe) could be readily discerned in the data and were concluded to be measurements of dye entering the LVW. Measured conductivity and dye concentrations in the LVW related to injections at NERT 3.58S1 and NERT 3.60S1 are presented in **Figures 7** and **8**. Dye was not detected in the LVW following injection at NERT4.64S1.

The time from dye injection in the well to first detection in the LVW was used to estimate the seepage velocity in that area. The arrival time of the peak concentration of dye observed from the injection was also used to calculate estimated seepage velocity. Results from these measurements and calculations are presented in Section 3.6.

2.2.11 Borehole Dilution Testing

Step-drawdown testing proposed in the DGIP for wells NERT4.64S1, NERT3.60S1, and NERT 3.58S1 was replaced with borehole dilution testing due to the anticipated large quantity of water a pumping test would produce. The modification to the proposed scope was presented in a memorandum dated May 13, 2019 and was accepted via email dated May 16, 2019 (**Appendix L**). A borehole -dilution test was performed concurrently with the dye tracer tests at each location and used to estimate groundwater velocity (v).

In accordance with the procedures described in the memorandum, injection well sampling consisted of collecting sets of up to five samples at uniform time intervals in the injection well on the day the dye was introduced. On subsequent days, multiple samples were collected at each injection well to evaluate the dilution of dye in the well caused by groundwater movement through the well. Sampling included homogenization (mixing within the water column of the well prior to sample collection) to ensure a uniform concentration within the well and to minimize any vertical stratification. Samples were also collected from each observation well using the same methods and approximately the same schedule discussed in the following section. All samples were collected with sampling equipment dedicated to each well to be sampled.

Dye concentration was quantified by visual comparison to prepared standards. These standards were most effective in the range from 1,000 to 1 mg/L. A simple absorbance photometer was also used to supplement the visual analysis. For the photometer, measured dye intensities over time in the injection well were fit to a quadratic calibration curve, from which concentration data over time could be determined.

The memorandum specified that the dilution trend (decline in dye concentration) observed in the initial sampling of the injection well would be used to determine the timing for the next sampling event; however, the declines in concentration were sufficiently rapid that daily sampling was chosen to characterize dilution. Photologs containing images of groundwater samples from the injection wells following dye introduction are provided as **Appendix M**.

Concentration trends with time were used to evaluate groundwater velocity at each injection well. The concentration data (as determined by the photometer and its calibration curve) collected over the course of the borehole dilution test was converted to relative concentration, C/C0, where C0 is the initial concentration at the start of the test. Using these data, the following equation (1) from Lamontagne et al. 2002 can be solved:

Equation 1

$$C_{(t)} = e^{-\frac{v^*At}{V}}$$

 $C_{(t)}$ is concentration at time t, v^* is apparent velocity, A is the cross-sectional area of the well normal to groundwater flow, and V is the volume of water in the well. Apparent velocity of the water in the well is the combination of the Darcy Velocity (v_d) and the well shape factor (α):

Equation 2

$$v^* = \alpha v_d$$

Dividing v^* by the porosity of the formation (n) and the well shape factor (a) yields groundwater velocity (Freeze and Cherry 1979).

Equation 3

$$v = \frac{v^*}{\alpha n}$$

In order to arrive at a unique solution, and to allow relative comparison among the dilution tests, the value for well shape factor was assumed to be 2. This value is commonly assumed for well shape factors in other studies (Lamontagne et al. 2002). Porosity was also assumed to be 0.33 in all wells. While effective porosity elsewhere on the Site is lower, during well installation a conductive gravel layer was observed. Because of this, a higher effective porosity value was chosen (Johnson 1967).

Dye was not observed in observation well samples from the injections at NERT 3.58S1 and NERT 3.60S1 (Figures 9 and 10). Dye was detected in one observation well (NERT4.64S1D) from injection well NERT4.64S1 (Figure 11). Data collected from the observation wells was analyzed similarly to that collected in the LVW, i.e. arrival times were used to bracket velocities. The time to the initial detection of dye and the time to the peak observed dye concentration were used as bounds of the time needed for the groundwater to travel from the injection well to the observation point. Depending on the position of the observation well and the predominant groundwater flow direction at the time of measurement, this may not necessarily coincide with the predominant flow velocity of the aquifer.

2.2.12 Deviations from DGIP – Phase II Groundwater Investigation

The procedures for well installation and sampling were detailed in the DGIP – Phase II Groundwater Investigation. The following deviations from the work plan occurred.

- Well NERT3.70N1 was misnamed. Since this well is located downstream from NERT3.60N1 it was renamed NERT3.58N1.
- 2) The borings for eight wells (NERT3.35S1, NERT3.40S1, NERT3.58S1, NERT3.58N1, NERT3.63S1, NERT3.98S1, NERT4.64S1, and NERT4.70N1) were not drilled to their total planned depth of 90 feet due to drill rig refusal at shallower depths.
- 3) Observation well (NERT3.35S1D) was not installed due to refusal in the conglomerate unit of the Thumb formation at 36 feet bgs and because no water was encountered in the boring.
- 4) The three 12-hour pump tests were replaced with three borehole dilution tests. These modifications were presented in a technical memorandum titled *Proposed Borehole Dilution Testing as an Alternative to Pump Testing for Hydraulic Conductivity Determination* (AECOM 2019b) (Appendix L). These modifications were made due to the difficulty in storing and disposing the large quantities of water expected during the proposed pump test as estimated by slug testing performed in the target wells. The modifications were approved by NDEP (NDEP 2019).
- 5) Soil property samples were collected by Ramboll and testing was conducted on 14 samples from 10 boreholes instead of the 40 samples from 14 boreholes included in the work plan. Soil property testing was expanded to include porosity, dry bulk density, and organic carbon content. Based on comparing the soil laboratory test results to the field logging, the analysis of fewer samples has not compromised the study.

2.3 Data Validation

Data validation was conducted to assess the validity and usability of laboratory analytical data from the July 2019 groundwater sampling conducted in the Downgradient Study Area. Data generated from sampling activities were validated to Stage 2A per the Data Validation Guidance issued by NDEP on July 13, 2018 (NDEP 2018). All samples were analyzed as requested and all holding times were met. Due to low-level blank contamination in an associated equipment blank, the result for chromium for sample NERT4.71N1-20190709_20190709 was qualified as estimated ("J+"). No other data were qualified. Based upon the Stage 2A data validation, all other results are considered valid and usable for all purposes.

Overall, the data as qualified are useable for meeting DGI objectives. All results are valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for laboratory analysis for the DGI is 100%. Additionally, because all samples in each data set were collected and analyzed under similar prescribed conditions, the data are comparable. Details of the data validation are presented in the Data Validation Summary Report in **Appendix N**.

3.0 Phase II Groundwater Quality Assessment Results

3.1 Lithology

Sediments encountered in the Phase II boreholes drilled along the LVW included interbedded layers of poorly graded gravel, sandy gravel, poorly graded sand, silty sand, clayey sand, sandy silt, silt, and lean clay. These sediments were encountered from the surface to the maximum depth explored of 90 feet bgs. These sediments were observed at thicknesses of 15 feet to 90 feet and are typical of the fluvial depositional environment encountered in the Downgradient Study Area near the LVW.

Alluvium varied from unconsolidated to very well cemented. Within the alluvium, discontinuous beds of gravel, sand, silt and clay were observed. Caliche was encountered in one borehole (NERT3.58S1D). Bedrock formations were encountered in eight of the boreholes between 15 feet and 78 feet bgs (NERT3.35S1, NERT3.40S1, NERT3.58S1, NERT3.58S1D, NERT3.60S1, NERT3.63S1, and NERT3.98S1). In the remaining borings bedrock was not encountered.

The UMCf was encountered in three of the eastern boreholes south of the LVW at 23, 64, and 70 feet bgs. In the Phase II boreholes, the contact between the Quaternary alluvium and the UMCf is typically marked by gray-green to yellow-green gypsiferous clays and silts.

The Thumb formation was also encountered in five of six of the eastern boreholes (NERT3.35S1, NERT3.40S1, NERT3.58S1D, NERT3.63S1, and NERT3.98S1) at depths ranging from 27 to 57.5 feet bgs. The Thumb formation was encountered in one of the eastern borings (NERT3.58N1) on the north side of the LVW at a depth of 15 feet bgs. The Horse Springs formation was also encountered in two of the eastern borings (NERT3.58S1 and NERT3.60S1) at depths of 66 and 78 feet bgs, respectively. A summary of depths to the UMCf and bedrock for each borehole, if encountered, is provided in **Table 8.**

A fault is suspected to run between NERT3.58S1 and NERT3.58S1D based on the occurrence of the contact of the UMCf and Horse Springs formations in NERT3.58S1 at depths of 64 and 66 feet bgs, respectively, and the shallow occurrence of the Thumb formation (36 feet bgs) in borehole NERT3.58S1D. Borehole NERT3.58S1D was drilled approximately 40 feet east of NERT3.58S1, but was not converted to an. observation well due to refusal in the conglomerate unit of the Thumb formation and because no groundwater was encountered in the boring.

3.2 Soil Property Testing

Soil property testing was conducted on 14 samples from 10 borings (**Tables 3 through 5**). Testing included grain-size distribution, moisture content, dry bulk density, porosity, total organic carbon, fractional organic carbon, Atterberg limits, and USCS description. The USCS description from these analyses is shown on the boring logs at the depth that the sample was obtained. Moisture content ranged from 6.6 to 34.9 percent of dry weight. Dry bulk density ranged from 1.39 to 2.05 grams per cubic centimeter. Porosity as a percentage of bulk volume ranged from 23.7 to 48.6 percent. Total organic carbon ranged from 4,900 to 23,800 milligrams per kilogram (mg/kg).

3.3 Water Levels and Field Parameters

During groundwater sampling activities, groundwater elevations ranged from approximately 1,436 to 1,530 feet above mean sea level (**Table 7**). The depth to groundwater ranged from 2.96 to 43.58 feet bgs (**Table 7**). In general, groundwater elevations were highest at the western side of the Downgradient Study Area and lowest in the east side (**Figure 12**). In addition, when a well is physically near LVW, a shallow depth to water is observed; conversely, when a well is far away from LVW a deeper depth to water is observed, which is mainly due to topographic elevation differences. Actual groundwater elevations increase with distance from LVW. The 2018

groundwater elevations are shown in a schematic cross section along the LVW with weir profiles and surface elevations on **Figure 13**. The July 2019 groundwater elevations are shown in a schematic cross section along the LVW with the weir profiles and surface water elevations on **Figure 14**.

Based on the 2019 water level information and surface water investigations, there are five locations along the LVW, east of the Pabco Road Weir, where the groundwater elevation is equal to or higher than the elevation of the surface water in the LVW: Bostick Weir to Calico Ridge Weir, below Calico Ridge Weir, below Lower Narrows Weir, below Homestead Weir, and below Three Kids Weir (**Figure 14**).

Water quality field parameters were collected when each well was sampled. Field measurements for pH, electrical conductivity, dissolved oxygen, oxidation-reduction potential, turbidity and temperature were obtained and evaluated for stability (**Table 9**).

3.4 Slug Testing

Slug tests were performed on wells NERT4.64S1, NERT3.60S1, and NERT3.58S1 (**Figures 2** and **4**). Average estimates of K in NERT3.58S1, NERT3.60S1, and NERT4.64S1 were 452 ft/d, 227 ft/d, and 136 ft/d, respectively. Expected travel times were calculated for distances of 10, 30, 100, 200, and 400 feet. Uncertainty with these estimates is primarily attributed to insufficient initial displacement during slug testing The K values determined through AQTESOLV analysis are generally consistent with previous K estimates from other site aquifer tests performed in gravelly alluvium (Fetter 2008).

Expected travel times were used to determine the approximate distances of the observation wells for the planned 12-hour constant rate pumping tests. Ultimate placement of the observation wells was influenced by site conditions including the presence of underground utilities and surficial physical barriers limiting borehole advancement. Note that a dye dilution test was conducted in place of the pump tests as discussed in Section 2.2.12. Results of the dye dilution test are presented in Section 3.6.

3.5 NMR Logging

NMR logging was performed on the 14 Phase II groundwater monitoring wells. Data from the NMR logs was used to identify zones where higher hydraulic conductivity was indicated. Potentially high conductivity zones (of 100 ft/d) were identified in the following borings:

Well ID	High Conductivity Zone Depth (in feet bgs)
NERT3.35S1	34.5 to 35.5
NERT3.58N1	50 to 52
NERT3.58S1	37 to 40
NERT3.60N1	40 to 41
NERT3.60S1	39 to 53
NERT 3.63S1	22 to 33
NERT4.64S1	40 to 44 and 47 to 53
NERT 4.65N1	36 to 41
NERT4.71N1	29 to 33 and 39 to 43

The NMR data are presented in **Appendix H**. Comparing these high permeability zones determined by the NMR to the lithology shown in the boring logs indicated that most of these zones were in sandy and/or gravelly material. In two instances (NERT3.58N1 and NERT4.65N1) the high permeability zone was within or at the contact with bedrock. In two instances (NERT3.60N1 and NERT4.64S1) the high permeability zone was within silt and/or sandy silt material. This further supports the value of NMR logging because lithologic logging does not accurately identify all high permeability zones.

3.6 Dye Tracer Surface Water Testing Results

Three locations in the LVW were sampled for the presence of several tracer dyes to determine which dye to use for the tracer dye investigation. Results of these tracer dye analyses are presented on **Table 10.** As discussed above (Section 2.2.9), Fluorescein was consistently detected in charcoal sorbent samples, although the detected concentrations were less than 1 ppb. Sulforhodamine B was consistently detected in surface water samples at concentrations less than 0.1 ppb. Eosine and Rhodamine WT were not detected in surface water or charcoal sorbent samples.

Rhodamine WT dye was selected for the tests based on low or non-detect background concentrations in surface water and the permit obtained previously for this dye. Rhodamine WT was injected into three groundwater monitoring wells (NERT3.58S1, NERT3.60S1, and NERT4.64S1) for this investigation.

Graphs showing the dye concentration and conductivity data for the probes that detected dye in the LVW following injections at NERT3.58S1 and NERT3.60S1 are provided as **Figures 7** and **8**. Dye was not detected in the LVW following injection at NERT4.64S1. Conductivity and temperature (not shown on graphs) measurements indicated significant daily variation in the LVW. Temperatures at all probe locations (not shown) oscillated in a range from approximately 22°C to 29°C over the course of each day with the increasing temperature roughly concurrent with daylight hours and decreasing temperature at night. Conductivity also followed a daily cycle with a range from approximately 2,500 to 3,000 micro-siemens per centimeter. There was some variability in this range among the probes. For example, Probe #0 (the furthest upstream for injections at NERT3.58S1 and NERT3.60S1) had a daily conductivity range from 3,250 to 4,200 micro siemens per centimeter. One hypothesis is that the periods when conductivity is highest represent periods when groundwater infiltration has the most influence on water quality in the LVW.

The initial observation of dye at a concentration above background represents the minimum time required for groundwater from the injection point to reach the observation point. For the injection at NERT3.58S1, dye was first detected in Probe #2 10,270 minutes (7.1 days) following injection (**Figure 7**). Since probe #2 was approximately 175 feet from NERT 3.58S1, the first detection of dye indicated a seepage velocity of 0.017 feet per minute or approximately 25 ft/d between the injection point and probe #2 (**Figure 9**). For the injection at NERT3.60S1, dye was first detected 6,125 minutes (4.2 days) following injection (**Figure 8**). Since probe #0 was approximately 183 feet from NERT3.60S1, the first detection of dye indicated a seepage velocity of 0.03 feet per minute or approximately 43 ft/d (**Figure 10**). Fluorescence observations coincided with daily peaks in conductivity at NERT3.58S1 and NERT3.60S1 which may further support the hypothesis that groundwater influence is periodic rather than continuous.

The peak concentration observed is also used to estimate groundwater velocity. For the injection at NERT3.58S1, the peak dye concentration was detected 16,075 minutes (11.2 days) following injection (**Figure 7**). Since Probe #2 was approximately 175 feet from NERT 3.58S1, the peak concentration of dye indicated a seepage velocity of 0.011 feet per minute or approximately 16 ft/d. For the injection at NERT3.60S1, the peak dye concentration was detected 6,660 minutes (4.6 days) following injection (**Figure 8**). Since probe #0 was approximately 183 feet from NERT3.60S1, the peak detection of dye indicated a seepage velocity of 0.028 feet per minute or approximately 40 ft/d.

Previous studies have estimated seepage velocities in the shallow (25 to 35 feet bgs) water-bearing zone are on the order of 5 ft/d (Tetra Tech 2018a). NMR and slug test data show that hydraulic conductivity is variable in this

area and with depth which may result in variability in groundwater velocity. For NERT3.58S1 and NERT3.60S1, the groundwater velocity ranges estimated by observations of dye in the LVW were within the same order of magnitude (tens of ft/d) and within the range of 16 to 43 ft/d.

3.7 Borehole Dilution Testing Results

For dye injection at NERT3.58S1, dye declined from its initial concentration to an estimated concentration of 2 mg/L within 24 hours. The dilution model indicated that the groundwater velocity at NERT3.58S1 was 23 ft/d. At location NERT3.60S1, the dilution model indicated a faster groundwater velocity of 55 ft/d. The model indicated velocities at these two locations agreed with the velocity ranges estimated by dye transport time from the injection points to the probes in the LVW. The third dye injection location, NERT4.64S1, had the slowest groundwater velocity estimated by the model at 10 ft/d; however, dye was not detected in the wash following this injection. Dye was detected in observation well NERT4.64S1D (approximately 40 feet east of NERT4.64S1) within an hour of its injection (**Figure 11**). The groundwater velocity in this case was not consistent with the model output. In NERT4.64S1, dilution-based velocity was 10 ft/d. Despite a slow decrease in dye at the well, dye was observed at nearby observation well soon after injection. This suggests a low volume, high velocity channel near the injection location. A photolog including these samples is included in **Appendix M**. Model outputs are provided in **Appendix O**.

The lithology of the screened interval of the test wells is predominantly gravelly sands and silts. These sediments typically have high K values, in the tens to hundreds of ft/d, and porosities ranging from 25 to 40%. The values above are consistent with the lithologies observed in the screened intervals.

The range in calculated velocities based on borehole dilution agree with rough order of magnitude estimates of velocity based on dye-arrival times in the LVW, except for NERT4.64S1. Combined, these lines of evidence suggest the aguifer exhibits high transmissivity in this area.

3.8 Groundwater Sampling Results

Groundwater samples were collected from 40 wells: 14 new Phase II groundwater monitoring wells, and 26 existing wells, which include 9 wells installed during the Phase I Groundwater Quality Assessment. The existing wells were previously sampled in April 2018 (AECOM 2019d). The 17 wells that were installed before the Downgradient Study Area investigation were also sampled in April 2016 (AECOM 2016). The 14 Phase II groundwater monitoring wells were sampled for the five constituents listed in Section 2.2.6. The nine Phase I wells were sampled for perchlorate, chlorate, and hexavalent chromium; the 17 remaining existing wells were only sampled for perchlorate and chlorate. Analytical laboratory results are provided in **Appendix J**.

Of interest and relevance to the groundwater quality assessment is the initiation of the LVW Bioremediation Pilot Study. The LVW Bioremediation Pilot Study includes the installation of injection and monitoring wells along Transect 1B south of LVW in the vicinity of Bostick Weir and Calico Ridge Weir. Injection of carbon donors is planned following assessment activities (**Table 12** and **Figure 15**).

3.8.1 Perchlorate

Concentrations of perchlorate detected in groundwater in the new Phase II wells ranged from 57 to 3,200 μ g/L, and in the 26 existing wells from 12 to 4,000 μ g/L (**Table 11**). **Figure 15** presents the July 2019 perchlorate concentrations and perchlorate contours.

Perchlorate concentrations in groundwater exceeded the Nevada Interim Action Screening Level of 18 μ g/L at 34 of the 40 wells sampled in June and July 2019 (**Table 11**). Concentrations are highest in groundwater in well WMW5.58S (4,000 μ g/L) between Pabco Weir and Historic Lateral Expansion Weir. The area where the next highest concentrations are found is on the south side of Calico Ridge Weir. Downgradient of the Lower Narrows Weir, the perchlorate concentrations decrease.

Between Pabco Road Weir and Historic Lateral Weir Expansion, groundwater in two wells (WMW5.7N and NERT5.49S1) showed significantly lower concentrations (12 and 13 μ g/L, respectively) than other wells in the general vicinity. Between Bostick Weir and in the vicinity of Calico Ridge Weir, concentrations of perchlorate below 1,000 μ g/L (140 to 850 μ g/L) were detected in six wells (NERT4.64N1, NERT4.65N1, NERT4.70N1, NERT4.71N1, WMW4.9N, and WMW4.9S). Additionally, significantly lower perchlorate concentrations in groundwater (57 and 13 μ g/L) than surrounding wells were detected at two wells (MW-20 and MW-25, respectively) located on the northern boundary of the Henderson Landfill site. Groundwater from one well downgradient of Homestead Weir (NERT3.98S1) and at two wells upgradient of Rainbow Gardens Weir (NERT3.35S1 and NERT3.40S1) had non-detectable (<4.8 μ g/L) perchlorate concentrations.

A comparison of perchlorate concentrations of groundwater in the 26 wells that were sampled in July 2018 and July 2019 showed that concentrations were lower in 19 wells and higher in seven wells in 2019 (**Table 12**). Groundwater from well WMW5.58S showed a significantly higher concentration in July 2019 (4,000 μ g/L) exhibiting a 60% increase, from the July 2018 concentration (2,500 μ g/L). Groundwater from wells NERT4.93S1 and NERT5.11S1 showed 54% to 62% lower perchlorate concentrations in July 2019 as compared to July 2018. The biggest percentage increase in concentration was in wells WMW5.7N and NERT5.49S1 at 208% and 155%; however, these wells had significantly lower concentrations than other wells in the general vicinity (**Table 12** and **Figure 15**).

3.8.2 Chlorate

Concentrations of chlorate detected in the new Phase II wells ranged from 13 to 14,000 μ g/L, and in the 26 existing wells from 16 to 10,000 μ g/L (**Figure 16** and **Table 11**). Chlorate concentrations in groundwater equaled or exceeded the basic comparison level of 1,000 μ g/L in 22 of the 40 wells sampled in June and July 2019 (**Table 11**).

Chlorate concentration is relatively high in groundwater in well WMW5.58S (8,000 µg/L) between Pabco Weir and Historic Lateral Expansion Weir. Between Historical Lateral Weir and Calico Ridge Weir concentrations of chlorate are generally high (3,000 to 14,000 µg/L) with the highest concentrations detected in well NERT4.71S2.

Between Pabco Road Weir and Historic Lateral Weir Expansion, groundwater from four wells (COH2B1, NERT5.91S1, WMW5.7N and NERT5.49S1) showed significantly lower concentrations (<10 to 790 μ g/L) than other nearby wells. In the vicinity of Calico Ridge Weir, lower concentrations (<10 to 28 μ g/L) were also detected in groundwater from the north side of LVW (WMW4.9N, NERT4.71N1, NERT4.70N1, NERT4.65N1, and NERT4.64N1). Additionally, significantly lower concentrations (46 and 56 μ g/L) were detected in groundwater from two wells (MW-20 and MW-25) located on the northern boundary of the Henderson Landfill site. Downgradient and north of Three Kids Weir, groundwater from two wells (NERT3.60N1 and NERT3.58N1) showed significantly lower concentrations (24 and 27 μ g/L) than nearby wells. Groundwater from two wells upgradient of Rainbow Gardens Weir (NERT3.40S1 and NERT3.35S1) showed nondetectable concentrations (<10 μ g/L).

A comparison of chlorate concentrations in groundwater from the 26 wells sampled in July 2018 and July 2019 showed that concentrations were lower in 18 wells, higher in five wells, and exhibited no change in three wells in 2019.

The 2019 data shows a general correlation between perchlorate and chlorate concentrations. High chlorate concentrations were typically detected in wells with high perchlorate concentrations, and vice versa, low chlorate concentrations were detected in wells with low perchlorate concentrations (**Table 11**).

3.8.3 Dissolved Chromium

Concentrations of dissolved chromium detected in the new Phase II wells ranged from 0.55J to 20 μ g/L (**Figure 17 and Table 11**). None of the dissolved chromium concentrations exceeded the maximum contaminant level for drinking water of 100 μ g/L (**Table 11**). The highest concentration of dissolved chromium was detected at 20 μ g/L

in NERT4.64S1 located south of the LVW near Calico Ridge Weir. Chromium concentrations decrease to the west and east from NERT4.64S1. In general, dissolved chromium concentrations were lower on the north side of LVW.

The 2019 dissolved chromium concentrations were within the same order of magnitude of concentrations detected in nearby wells that were sampled in 2016 and 2018.

3.8.4 Hexavalent Chromium

Concentrations of hexavalent chromium detected in the new Phase II wells ranged from 8.54 to 38.2 μ g/L, and in the 10 Phase I wells from 14.2 to 37.4 μ g/L (**Figure 18 and Table 11**). Hexavalent chromium was below detection limits in groundwater from 14 wells (**Table 11**). The highest concentration of 38.2 μ g/L was in well NERT4.64S1 on the south side of LVW and downgradient of Calico Ridge Weir. None of the detected concentrations of hexavalent chromium exceeded the basic comparison level of 100 μ g/L.

3.8.5 Total Dissolved Solids

TDS concentrations in the new Phase II wells ranged from 1,800 to 9,000 mg/L (**Figure 19 and Table 11**). There is not a basic comparison level established for TDS. The TDS concentrations exceeded the secondary maximum contaminant level for drinking water of 500 mg/L in all 14 wells tested. Concentrations are highest at and to the east of Three Kids Weir. The highest concentration of TDS was detected at 9,000 mg/L in NERT3.40S1 located southwest of Rainbow Gardens Weir. The lowest concentrations were detected at 1,800 mg/L at NERT4.70N1 and NERT4.71N1 located on the north side of LVW near Calico Ridge Weir. TDS concentrations below 3,000 mg/L may be a result of surface water mixing with groundwater adjacent to LVW.

The 2019 TDS concentrations were generally within 30% of concentrations detected in nearby wells that were sampled in 2016 and 2018.

3.8.6 Investigative Waste Disposal

Soil and rock generated during the DGI was transported to a secure staging area on the NERT site. NERT managed the waste profiling and disposal of the waste along with other investigative-derived waste generated for the RI. The liquid investigative-derived waste was placed into polyethylene tanks and transported to the groundwater extraction and treatment system at the NERT Site. The liquid waste was discharged into the GW-11 pond, which receives groundwater pumped from extraction wells. The liquid waste was treated and discharged through the on-site treatment systems. The remaining investigative-derived waste was double-bagged in plastic trash bags and was disposed as municipal trash.

4.0 Conceptual Site Model Update

A CSM of the LVW and potential inputs of perchlorate was presented in the DGI Technical Memorandum Phase I Groundwater Quality Assessment (AECOM 2019a). A diagram of the CSM is provided in **Figure 20**, which depicts estimated perchlorate load (in pounds per day [lb/d]) in the LVW from surface water sampling data collected during April and May of 2018. During that sampling event, construction of the Sunrise Mountain Weir and the Historic Lateral Weir Expansion was ongoing. A large volume of groundwater was being pumped from those construction areas to a temporary treatment facility where perchlorate was removed prior to discharge back to the LVW upstream of the Pabco Road Weir. As a result of that dewatering and treatment program, perchlorate concentrations in the LVW were lower than would otherwise be expected, particularly within the reach between Upper Narrows and Calico Ridge Weirs. This section updates relevant elements of the CSM by incorporating the findings of the 2019 Phase II Groundwater Assessment presented in Section 3 of this technical memorandum.

4.1 Anthropogenic Sources of Discharge to the LVW

Discharges from the four major wastewater treatment plants in the valley represent the vast majority of flow in the LVW (Clark County Water Reclamation District, City of Las Vegas Water Pollution and Control Facility, City of Henderson Water Reclamation Facilities, and City of North Las Vegas Water Reclamation Facility). Outfalls from groundwater treatment plants (NERT, American Pacific Corporation /Endeavour LLC [Endeavour], and TIMET) join the channel conveying treated wastewater from the City of Henderson, entering LVW above Pabco Road Weir (Figure 20). The remaining flow in the LVW comes from Duck Creek and the C-1 Channel, as well as non-point sources including urban and stormwater runoff and shallow groundwater discharge. Comparison of surface water and groundwater elevations show that portions of LVW are below the groundwater table and, therefore, receive groundwater discharge (AECOM 2019d). Other parts of LVW are above the groundwater, which cause infiltration (loss) of the surface water. This condition is dynamic and changes depending on a wide variety of variables including, but not limited to, increases in flow rates from the wastewater treatment plants due to increased land development, diurnal fluctuations in wastewater flows, and seasonal fluctuations of the groundwater table.

The treatment plants contribute a relatively steady daily supply of water to the LVW throughout the year. The outfalls discharge continuously but at a predictably cyclic rate. That cycling causes a diurnal flow pattern similar to a tidal pattern, with daily high and daily low flows. Unless disrupted by rain storm events, daily high flows are on the order of 100% higher than the daily low. However, the constant daily discharge represents the vast majority of flow in the LVW, and the natural, seasonal variability in streamflow has largely been eliminated. On average, streamflow tends to be somewhat higher from October through March (290 to 340 cubic feet per second [cfs]) and lower from April through September (260 to 310 cfs) (USGS 2018).

Along with the general increase in flow in the LVW through the years, there has also been an increase in the magnitude of stormwater runoff draining into the LVW. Fifty years ago, the annual peak flow at Pabco Road was on the order of 300 cfs (median value of 280 cfs from 1957 to 1967), or similar to the current average annual flow (298 cfs). More recently, annual peak flows are on the order of 4,500 cfs (median value of 4,350 cfs from 2005 to 2015) (USGS 2017).

In an effort to protect the channel from the erosive forces of higher flows, a series of erosion control structures (weirs) have been constructed to slow the water velocities in the LVW. Where erosional forces have been allowed to run their course, the stream channel within the Downgradient Study Area is generally 40 feet or less in width. Near some of the weirs, the width increases to 300 feet or more.

The channel materials consist of loose, unconsolidated sediments that have been shifted and sorted by the energy of the flowing water. Most of the underlying material is alluvium that consists of both fine-grained materials

(silts and clays) and courser materials (sands and gravels). As the water carries those deposits downstream, sand and gravel are deposited in areas with higher velocity, providing a more solid streambed. Where streamflow slows down in natural pools and behind some of the weir structures, silts and clays are deposited, creating a soft bottom. The Horse Springs formation is present in the southern streambank east of Calico Ridge Weir, and the Thumb formation is present on the northern and southern streambanks between the Lower Narrows and Three Kids Weirs.

4.2 Known Sources of Perchlorate

The former Kerr McGee/Tronox site (NERT On-Site Study Area) (**Figure 1**) has been the location of industrial operations since 1942 when it was developed by the U.S. government as a magnesium plant to support World War II operations. Following the war, this area continued to be used for industrial activities, including production of perchlorate, boron, and manganese compounds. Former industrial and waste management activities conducted at the NERT On-Site Study Area, as well as those conducted at adjacent properties, resulted in contamination of environmental media, including soil, groundwater, and surface water. The Endeavour (formerly PEPCON/AMPAC) site has also released perchlorate to groundwater and operates a treatment system to the west of the NERT site. Data indicate that between 16 to 19 pounds per day of perchlorate enter the Athens Drainage Channel downgradient of the Endeavour plume (Endeavour 2018).

Since 1979, the NERT On-Site Study Area has been the subject of numerous investigations and removal actions. Soil removal actions were conducted in 2010 and 2011 from the NERT On-Site Study Area to minimize potential health risks from impacted soil. Additional soil removal was performed in 2013 when the eastern end of the Beta Ditch was excavated. The soil removal activities and post-removal conditions are described in detail in the *Revised Interim Soil Removal Action Completion Report* (ENVIRON 2012, ENVIRON, 2014b). On-site and off-site groundwater removal actions include the installation of the groundwater extraction and treatment system, designed to capture and treat perchlorate and hexavalent chromium in shallow groundwater.

In Spring 1999, SNWA hydrologists discovered a seep ("the original seep") discharging to the LVW at approximately 400 gallons per minute. Perchlorate concentrations in the seep exceeded 100,000 µg/L in 1999. The results of the seep samples indicated that a significant mass flux of perchlorate was entering the LVW. Kerr McGee subsequently implemented a capture system (consisting of a dam and sump structure) at the seep in November 1999 to reduce the migration of perchlorate to the LVW (ENSR 2005). The operation of the Seep Capture System and Seep Well Field has contained and treated a substantial mass of perchlorate that otherwise would have entered the LVW. To support the Downgradient Study Area investigation, surface water samples were collected from several locations in and near the LVW in May 2016. As part of that sampling program, a sample was collected from the sump immediately downgradient of the seep discovered by SNWA in 1999. The capture system that was subsequently implemented has significantly reduced both the perchlorate concentration and volume of groundwater discharging at the location. The 2016 sample had a perchlorate concentration of 85 µg/L, three orders of magnitude lower than samples collected in 1999. The seep was reported to be active only seasonally, with the small volume of flow terminating a short distance downstream in a topographic low where it seeps back into the ground and/or is evaporated into the air upgradient of its historic confluence with LVW. The seep was active during the May 2016 sampling, with discharge through the sump visible (AECOM 2016). In the fall of 2017 there was no longer visible evidence of the seep as it was completely filled in during activities associated with the construction of Sunrise Mountain Weir.

4.3 Perchlorate Patterns and Suspected Discharges with Phase II Updates

During the May 2016 sampling program (AECOM 2016) an attempt was made to locate the seeps that were sampled by Kerr McGee in 2000. Seeps that were successfully located, accessible, and flowing were subsequently sampled. It is surmised that weir construction, onshore riparian zone restoration, flooding and vegetative growth during intervening years, and the ongoing regional drought conditions may have affected the occurrence and, if present, the flow from the previously identified seeps. Because the installation of the weirs likely altered the seeps, attempts were made to relocate the seeps and, if possible, sample them. Of the 18 historic seep locations, only three (KM-45, KM-67 and KM-71) were located in May 2016. All other historic seeps

may have been buried by weir and bank construction, submerged by the expanded stream channel and associated sediments, temporarily dried up under the drought conditions of the time, or obscured by dense vegetation.

Two seeps (KM-67 and KM-71) were sampled in May 2016. The concentrations of perchlorate in the seeps were lower in 2016 than in 2000. At KM-71, the perchlorate concentration in 2016 (1.4 J µg/L) was substantially lower than in 2000 (3,400 µg/L). In 2000, KM-71 was located downgradient of the current location of the Sunrise Mountain Weir. The seep was located in 2016 immediately upstream of the KM-71 location in a backwater channel. The seep that was sampled in May 2016 immediately upstream of the KM-71 location could be a different seep than the seep sampled in 2000. At KM-67, located near the Three Kids Weir, the perchlorate concentration (1,500 µg/L) in 2016 was slightly lower than in 2000 (2,100 µg/L). Construction of Three Kids Weir was completed in July 2015. A riprap weir referred to as "Demonstration Weir" was constructed near this location in 1999. The Demonstration Weir was relocated and rebuilt in 2007 and was eventually dismantled in 2013 and replaced by the Three Kids Weir (LVW Coordination Committee 2016). Although a weir was in place in this location during both the 2000 and 2016 sampling events, it is not clear to what extent, if any, each weir affected the stream flow and sample results during the 2000 and 2016 sampling events.

During the January and February 2017 surface water sampling events, sampling locations and methodology were designed to further refine the understanding of where perchlorate enters the LVW, and what impact the varying flow regime has on perchlorate concentrations in surface water samples. Known and suspected regions of perchlorate discharge were selected to help pinpoint loci of discharge and where, along transects, that discharge may be occurring. By characterizing the flow regime during sample collection, estimates of actual perchlorate flux were calculated to represent flow-weighted sampling results.

Following water-temperature studies in the LVW in early 2018, a number of new and previously sampled surface water locations were selected for sampling in May 2018 (**Figures 21 and 22**). Locations were selected to target new potential locations of groundwater inputs identified as temperature anomalies during thermal infrared and fiber optic distributed temperature sensing surveys, to refine the understanding of perchlorate contributions in areas where perchlorate flux into the LVW were suspected, and to resample previous locations to evaluate changes over time. The Phase I groundwater monitoring wells were installed in July 2018 to provide additional groundwater data along LVW.

The results of the surface water and seep sampling conducted by Kerr McGee in 2000 and by AECOM in May 2016, December 2016, January and February 2017, and May 2018 indicate that there may be perchlorate discharge to the LVW, in the areas between the Upper Narrows Weir and Sunrise Mountain Weir (under construction during the 2018 sampling event), between the Historic Lateral Weir Expansion (under construction in 2018) and the Calico Ridge Weir. The results of these sampling events indicate that there is evidence of perchlorate discharge to the LVW particularly downstream of the Calico Ridge Weir, between the Lower Narrows and Homestead Weirs, and downstream of the Three Kids Weir (**Figures 21** and **22**).

Surface water sampling results indicate the potential for small, cumulative gains of perchlorate from the region near the Historic Lateral Weir Expansion down to the Three Kids Weir. The slow, relatively minor seepage of groundwater may be contributing to a slow general increase in perchlorate load. Larger gains observed in surface water sample results are more likely to be attributed to more focused discharge of groundwater with higher concentrations of perchlorate. These higher concentration discharges were detected near the toe of the Upper Narrows Weir, near the toe of the Calico Ridge Weir, and near the toe of the Three Kids Weir.

Surface water data were collected outside of the Downgradient Study Area between Rainbow Gardens Weir and the Lake Las Vegas Outlet at LW0.9. These surface water data indicate that no significant additional sources of perchlorate were identified along this section of the LVW (AECOM 2019).

In July 2018, 26 wells along the LVW were sampled. These wells were sampled to provide additional data on groundwater impacts in the Downgradient Study Area. Surface water elevations were compared to groundwater

elevations to evaluate where groundwater was likely entering LVW. As shown on **Figure 13**, groundwater elevations appeared to be equal to or higher than surface water elevations between Bostick Weir and Calico Ridge Weir, below Calico Ridge Weir, below Homestead Weir, and below Three Kids Weir indicating potential groundwater discharge to the LVW in these areas. In July 2019, 40 wells along the LVW were sampled to further investigate groundwater impacts and the potential groundwater surface water interaction. At this time, as shown on **Figure 14**, groundwater elevations appeared to be equal to or higher than surface water elevations between Bostick Weir and Calico Ridge Weir, below Calico Ridge Weir, below Lower Narrows Weir, below Homestead Weir, and below Three Kids Weir indicating potential groundwater discharge to the LVW in these areas.

Perchlorate flux into LVW is the measurement of the amount of perchlorate discharging into LVW per unit of time, for example 5 lb/d. Total perchlorate load in LVW is the amount of perchlorate estimated that is carried by the surface water in LVW at a specific location, for example 29 lb/d at Lower Narrows Weir. Perchlorate load and flux at various reaches along the LVW are discussed in detail below and presented on **Figure 20**. NERT also collects surface water samples on a monthly basis as part of its ongoing RI surface water sampling program. Perchlorate load is reported from these sampling events in the Semi-Annual Remedial Performance Memorandum and Annual Remedial Performance Report. Given the variances in sample collection dates and sample locations, variances in reported perchlorate load in the LVW are to be expected. The following discussion focuses on 2018 data and the 2018 cross section (**Figure 13**) because both surface water and groundwater were sampled at that time.

Perchlorate load in the LVW was estimated from transect and discrete sampling during daily low flow periods. During January to June 2018 dewatering and treatment was conducted at Sunrise Mountain Weir and Historic Lateral Weir construction areas. For this reason, the perchlorate load identified may not be representative of conditions when dewatering is not occurring. In addition, groundwater levels within the area of dewatering would not be representative of conditions when dewatering is not occurring.

<u>Upper Narrows to Pabco Road Weir:</u> Based on 2018 surface water samples, the perchlorate load above Pabco Road Weir was between 1 and 2 lb/d (AECOM 2019d). In 2018, the groundwater concentrations in this area varied from not detected (WMW6.15S1) to 1,600 μg/L (COH2B1). Surface water data was not collected in 2019.

Pabco Road Weir to Bostick Weir: Based on 2018 surface water samples, the estimated perchlorate load in LVW begins to increase slowly near the Historic Lateral weir. In 2018 the groundwater concentrations in this area varied from 3.9 μg/L (WMW5.7N) to 6,000 μg/L (NERT5.11S1). In 2019, the groundwater concentrations in this area varied from 13 μg/L (NERT5.49S1) to 4,000 μg/L (NERTWMW5.58S).

Bostick Weir to Calico Ridge Weir: Based on 2018 surface water samples, the estimated perchlorate load in the LVW increased to 5.3 lb/d below the Bostick Weir, and 7.0 lb/d as the water entered the Calico Ridge Weir. In 2018, the groundwater concentrations in this area varied from 930 μ g/L (WMW4.9S) to 3,900 μ g/L (NERT4.93S1). In 2019, the groundwater concentrations in this area varied from 140 μ g/L (NERT4.70N1) to 3,400 μ g/L (NERT4.71S1).

<u>Calico Ridge Weir to Lower Narrows Weir:</u> Based on 2018 surface water samples, the estimated perchlorate load in LVW increased from 7 lb/d to 29 lb/d by the time it reaches Lower Narrows Weir. Most of the 22 lb/d perchlorate flux is suspected to come from groundwater discharge near the toe of the Calico Ridge Weir. In 2018, the groundwater concentration in this area was available from only one well (NERT4.51S1) and was 3,100 μ g/L. In 2019, the groundwater concentrations in this area varied from 470 μ g/L (NERT4.65N1) to 3,200 μ g/L (NERT4.64S1).

<u>Lower Narrows Weir to Homestead Weir:</u> Based on 2018 surface water samples, the estimated perchlorate load in LVW increased slightly. In 2018, the groundwater concentrations in this area varied from 1,400 μ g/L (NERT4.38N1) to 2,200 μ g/L (NERT4.21N1). In 2019, the groundwater concentrations in this area varied from 1,400 μ g/L (LNDMW1) to 1,800 μ g/L (NERT4.38N1).

Homestead Weir to Three Kids Weirs: Based on 2018 surface water samples, the estimated perchlorate load in LVW was 32 to 33 lb/d. This represents a gain of 3 lb/d from the Lower Narrows Weir to the Three Kids Weir. In 2018, the groundwater concentrations in this area varied from 320 μg/L (WMW3.5N) to 1,100 μg/L (NERT3.80S1). In 2019, the groundwater concentrations in this area varied from not detected (<4.8 μg/L) (NERT3.98S1) to 1,200 μg/L (NERT3.63S1). Based on the 2019 perchlorate concentration in groundwater from well NERT3.98S1 (not detected or <4.8 μg/L), the groundwater adjacent to the south side of Homestead Weir is not impacted.

Three Kids Weir to Rainbow Gardens Weir: Based on 2018 surface water samples, the estimated perchlorate load in LVW was 40 to 56 lb/d. Downstream of the Three Kids Weir, discharge from the KM-67 seep enters on the south bank and begins to mix in with the waters of the LVW. In 2018, the groundwater concentrations in this area were available from only one well (WMW3.5S) and the perchlorate concentration was 1,500 μ g/L. In 2019, the groundwater concentrations in this area varied from not detected (<4.8 μ g/L)(NERT3.35S1 and NERT 3.40S1) to 1,600 μ g/L (NERT3.60S1).

4.4 Additional Phase II DGI Refinements to CSM

The 2019 Phase II Groundwater Quality Assessment also provided information to refine the CSM with regard to faulting, groundwater elevation changes over time, perchlorate concentration changes over time, and groundwater flow velocity.

<u>Faulting:</u> Based on the different geology and water levels, a fault may be present between observation wells NERT3.58S1B and NERT3.58S1D. Similarly, based on different geology and significantly different water levels a fault may be present between monitoring wells NERT3.40S1 and NERT3.35S1. The LVW Bioremediation Pilot Test investigation along Transect 1b, along the south side of the LVW between Bostick Weir, and Calico Ridge Weir, has identified a fault zone in the vicinity of Lower Narrows Weir.

Perchlorate Concentration Changes Between 2016 and 2019: Review of the 2016 to 2019 perchlorate concentration data show that, in general, the groundwater concentrations are stable or declining in most wells (Table 10). Comparisons of perchlorate concentrations in groundwater from the 26 wells sampled in July 2018 and July 2019 indicate that nine wells had concentrations that were within 10% of each other, five wells had concentrations that were 21 to 80% of each other, and three wells had concentrations that decreased over 200% (Table 12).

Groundwater/Surface Water Interface: Temperature and TDS data were used to identify the groundwater/surface water interface. Temperature data was reviewed from transducers placed in wells along the LVW. In general, groundwater temperatures did not vary more than 3 °F. TDS concentrations in groundwater from wells along LVW, that are not suspected to be influenced by surface water mixing, average 4,700 mg/kg. Based on TDS concentrations below 3,000 mg/L and temperature changes in groundwater as recorded by transducers over 5 °F, the groundwater/surface water interface along LVW has been identified between 0 to 885 feet (at well WMW4.9N) from the banks of the channel (Figure 23).

Groundwater Seepage Velocities: Slug tests indicated average seepage velocities of 136 ft/d to 452 ft/d. Dilution tests indicated seepage velocities of 9.6 ft/d to 55.2 ft/d. The pathway from groundwater to the LVW was confirmed by tracer testing in two injection wells (NERT3.58S1 and NERT 3.60S1) at Three Kids Weir. Seepage velocities based on dye travel time from the injection wells to LVW ranged from 16 to 43 ft/d in this area. Of interest was that dye was not detected in the Three Kids Weir area in observation wells ranging from 5 to 30 feet from the injection wells indicating that dispersion of dye and, therefore, mixing of groundwater may be minimal (Figures 9 and 10). For the dye tracer test at Calico Ridge Weir (Well NERT4.64S1), dye was not detected in the LVW, but it was detected within one hour in an observation well 40 feet downgradient of the injection well (NERT4.64S1D) (Figure 11). Dye was not detected in observation well NERT4.64B located15 feet from the injection well and between the injection well and NERT4.64S1D (Figure 11). These data suggest that dispersion

of dye and, therefore, mixing of groundwater are minimal, and that groundwater may flow in a relatively narrow circuitous path at a higher rate than the average velocity of groundwater in the Calico Ridge Weir area.

5.0 Conclusions and Recommendations

5.1 Conclusions

The following summarizes the conclusions of this Phase II DGI organized by the data gaps identified in Section 1.0. **Table 13** provides a summary of the investigation objectives, achievement of objectives and potential future work.

 Where are the high concentration (1,000 μg/L or higher) perchlorate-impacted groundwater plumes along the north and south sides of the LVW?

Based on groundwater samples collected in July 2019, perchlorate concentrations of 1,000 μ g/L or higher are present along the south side of the LVW except at monitoring wells NERT5.49S1 (13 μ g/L) east of Historic Lateral Weir Expansion Weir, WMW4.9S (850 μ g/L) between Bostick Weir and Calico Ridge Weir, and MW-20 (57 μ g/L) and MW-25 (13 μ g/L) at the Henderson Landfill site (**Figure 15**). The highest concentration of 4,000 μ g/L was detected at WMW5.58S south of LVW between Pabco Weir and Historic Lateral Weir Expansion. As most monitoring wells are greater than 500 feet apart, additional monitoring wells would add refinement to understanding the high concentration (1,000 μ g/L of higher) plumes.

There is limited data for the north bank of the LVW; however, based on the 12 locations sampled on the north, perchlorate concentrations of 1,000 μ g/L or higher are present in three wells (NERT4.38N1, NERT4.21N1, LNDMW2) between Lower Narrows Weir and Homestead Weir (**Figure 15**). Along the north side of the LVW additional monitoring wells are needed to define perchlorate concentrations of 1,000 μ g/L in groundwater in the areas between monitoring wells WMW5.7N and NERT4.71N1 (east of Historic Lateral Weir Expansion Weir to west of Bostick Weir) and between monitoring wells LNDMW2 and WMW3.5N (east of Homestead Weir to Three Kids Weir)

The eastern limits of perchlorate impacts in groundwater along the south side of the LVW are bounded by well NERT3.35S1 and NERT3.40S1 (**Figure 15**).

2. Why are there noticeable differences in perchlorate concentrations in groundwater over relatively short distances?

The groundwater monitoring data indicate that the perchlorate concentrations in groundwater are spatially highly variable. Since perchlorate is highly mobile in groundwater, this high variability in concentrations indicates that there are discrete flow zones within the alluvial sediments that are not in close communication. The lower perchlorate concentration of 850 µg/L at WMW4.9S is surrounded by impacted groundwater adjacent to nearby wells MW-13, NERT4.71S1, NERT4.71S2, and NERT4.93S1 with concentrations from 1,800 µg/L to 3,400 µg/L (**Figure 14**). Well WMW4.9S is screened over 30 feet while the surrounding wells are screened over 10-foot to 20-foot intervals. All of these wells are screened in gravelly sand to sand strata. One factor that may be contributing to the lower concentration may be related to the longer screened interval of well WMW4.9S. In addition, well WMW4.9S exhibits temperature variations as recorded by transducers greater than 5 °F which may indicate surface water mixing with groundwater that could also contribute to lower perchlorate concentrations.

Based on the fact that dye was injected at two wells (NERT3.58S1 and NERT3.60S1) but not detected in groundwater at observation wells located 5 to 30 feet away although it was detected in the LVW over 200 feet way from the injection point it is concluded that the dye followed a preferential pathway that bypassed the observation wells.

Based on the fact that dye from injection well NERT4.64S1 was detected in groundwater within 50 minutes at observation well NERT4.64S1D, which was located approximately 40 feet downgradient, and the dye concentration peaked within two hours of detection, it is concluded that the dye traveled about 0.8 feet per minute or 1,152 ft/d. Of interest is that no dye was detected from groundwater in well NERT4.64S1B, which is located 15 feet from the injection well and is located between the injection well and the observation well where the dye was detected. This further supports the conclusion that preferential pathways are present that do not necessarily conform to the generally observed groundwater gradient.

3. How deep are the high concentration perchlorate-impacted groundwater plumes?

No Phase II wells were installed to address this issue because the LVW Bioremediation Pilot Study has developed significant data to address this data gap.

4. Do the high-concentration perchlorate plumes follow distinct water-bearing zones within the alluvium or bedrock formations?

Distinct water-bearing zones were identified in the Phase II individual boring logs; however, distinct water-bearing zones were not identified as being continuous between nearby boreholes that had boring logs available for comparison. The NMR logs also identified discrete water-bearing zones varying in thickness from 1 to 9 feet. Cluster wells installed for the LVW Bioremediation Pilot Study have discrete screened intervals within the alluvial deposits and available data support the presence of discrete water-bearing zones. The cluster wells exhibit different water levels and different constituent concentrations indicating that the groundwater monitored in adjacent wells at depths of less than 90 feet bgs is from distinct and separate water-bearing zones.

5. Where does faulting affect the movement of high-concentration perchlorate-impacted groundwater?

Based on the data from the LVW Bioremediation Pilot Study, faulting affects the movement of groundwater between Calico Ridge Weir and Lower Narrows weir. Based on the geotechnical studies at Three Kids Weir, the observed seeps and the Phase I and II assessments faulting affects groundwater movement at Three Kids Weir and between Three Kids and Rainbow Gardens Weir.

6. Along the LVW, does groundwater flow generally in the same direction as the surface water?

The groundwater flow direction adjacent to LVW appears to flow generally to the east, similar to the surface water flow direction. However, as noted during the tracer test, local groundwater flow directions are not uniform and are much more variable than indicated by the overall flow directions determined from the potentiometric surface map.

7. Where does perchlorate-impacted groundwater discharge to the LVW?

As shown on **Figure 14** there are five locations along the LVW downstream of Pabco Road Weir (Bostick Weir, Calico Ridge Weir, Lower Narrows Weir, Homestead Weir and Three Kids Weir) where the groundwater elevation is equal to or higher than the elevation of the surface water in the LVW. These conditions allow for potential discharge of groundwater into the LVW because of the higher potentiometric surface of groundwater. Based on the potentiometric surface, surface water sampling, and dye tracer testing, perchlorate-impacted groundwater is discharging to the LVW downgradient of Calico Ridge Weir and Three Kids Weir. At three Kids Weir there are also a spring (K-67) that discharges perchlorate impacted water. Based on the perchlorate concentration in groundwater from NERT3.98S1 (<4.8 μ g/L) near Homestead Weir there does not appear to be a significant source of perchlorate in this area (**Figure 15**). Based on the lack of warm water temperature anomalies, there also does not appear to be groundwater discharge to the LVW in this area. This is consistent with the surface

water perchlorate data that indicates that there is not significant discharge of perchlorate-impacted groundwater to the LVW near Homestead Weir.

8. Where is the groundwater/surface water interface and how far is it from the LVW?

The groundwater/surface water interface is dynamic. As indicated by 2016 to 2019 TDS concentrations and groundwater temperature changes (as recorded by transducers) of 5 °F or more, the groundwater/surface water interface is immediately adjacent to LVW in some areas and up to 885 feet away at well WMW4.9N (Figure 23). Low TDS concentrations (less than 3,000 parts per million) have been detected in groundwater from wells NERT4.64N1, NERT4.65N1, NERT4.70N1, NERT4.71N1, NERT5.49S1, WMW4.9N, WMW4.9S, WMW5.5S, WMW5.58S, and WMW5.7N from 2016 to 2019.

9. Is there an area of known or suspected perchlorate flux of sufficient magnitude where an interim remedial action would be appropriate?

Given that perchlorate concentrations in Lake Mead are well below NDEP's interim action level and that NERT is completing the LVW Bioremediation Pilot Study between Bostick and Homestead Weirs (an area with elevated perchlorate mass flux from groundwater to surface water), AECOM does not recommend implementation of additional interim or emergency remedial actions at this time.

10. Is perchlorate-impacted groundwater bypassing the seep well field on its eastern side in the vicinity of monitoring well COH2B1?

Concentrations of perchlorate in groundwater from well COH2B1 were 1,800 µg/L in July 2019. This indicates that groundwater that is significantly impacted by perchlorate is present in this area. The source of the perchlorate in this well may be from the Endeavour plume (Ramboll 2018 and Endeavour 2018); however, the source of perchlorate was not investigated in the Phase II Groundwater Quality Assessment. NERT's Annual Remedial Performance Report indicates that the capture zone efficiency of the Seep Well Field is 97.8% within the shallow water bearing zone.

11. Do high volumes of low-concentration perchlorate-impacted groundwater provide more flux to the LVW than low volumes of high-concentration perchlorate-impacted groundwater?

Based on the 2016 to 2019 groundwater assessments and dye tracer tests it appears that the fluxes adjacent to Calico Weir and Three Kids Weir are likely composed of groundwater with high-concentration perchlorate. The groundwater assessments, however, did not provide data to quantify the high-concentration contributions versus low-concentration contributions.

12. Do concentrations of perchlorate in groundwater fluctuate over time, seasonally, or after a rain event?

Review of the 2016 to 2019 perchlorate concentration data show that, in general, the groundwater concentrations are stable or declining in most wells (**Table 10**). The Phase I and Phase II groundwater sampling was not coordinated to specifically observe seasonal fluctuations or rain events.

5.2 Recommendations

The Phase II Groundwater Quality Assessment was focused on refining the understanding of groundwater impacts at Calico Ridge Weir, Homestead Weir and Three Kids Weir. Based on the results of the 2016, 2017, and 2018 surface water investigations, the 2016 groundwater sampling, the 2017 to 2019 transducer data, and the Phase I and Phase II groundwater assessments, the following specific areas along the LVW still need additional investigation (**Table 13**).

1. Additional groundwater assessment should be conducted north of the LVW if definition of the extent of perchlorate impacts down to the BCL is required in that area.

- 2. Nested groundwater monitoring wells on the south side of the LVW adjacent to the Three Kids Weir are needed to better understand the geology, hydrology, and contaminant transport in this area.
- 3. Continued transducer measurements of the 43 transducer wells and periodic groundwater quality monitoring of the 44 groundwater monitoring wells listed on **Table 11** in conjunction with other wells in Operable Unit 3 should be considered to gain a better understanding of the behavior of the perchlorate plume over various seasons.

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Tables

Table 1 Rationale and Well Completion Details for Phase II Groundwater Monitoring Wells NERT RI - Downgradient Study Area

Henderson, Nevada

Phase II Well Groundwater Mor	Boring Depth in feet bgs ⁽¹⁾	Well Depth in feet bgs	Well Diameter ⁽²⁾	Depth to water	Well Screen in feet bgs ⁽³⁾	Sand Pack Interval in feet bgs ⁽⁴⁾	Rationale Based on Perchlorate Concentrations Detected in Groundwater and
							Surface Water ⁽⁵⁾
NERT3.35S1	57	57	4"	19.6	35 - 55	33 - 57	Determine concentrations about 280 feet east northeast of Phase II Well NERT3.40S1 on the south side of LVW to further characterize perchlorate impacts in groundwater between Three Kids weir and Rainbow Gardens Weir. This well may also provide additional information on faulting in the area. Surface water concentrations are 89 to 96 μg/L.
NERT3.40S1	65	57	4"	38.11	35 - 55	33 - 57	Determine concentrations south of the warm anomaly that was identified 180 feet east northeast of transect T3.5. Surface water concentrations are 90 µg/L in this area.
NERT3.58N1	62	62	4"	39.41	40 - 60	38 - 62	Determine concentrations about 200 feet northeast of Phase II Well NERT3.60N1 on the north side of LVW. Surface water concentrations are 200 µg/L.
NERT3.58S1	70	55.5	4"	34.95	35 - 55	33 - 56	Determine concentrations upgradient and on the south side of Three Kids Weir, west-southwest of WMW3.5S (total well depth of 59.8 feet bgs at 1,500 μg/L) on the south side of LVW to further characterize perchlorate impacts in groundwater near the former K67 seep. To also evaluate groundwater/surface water interactions in this area. This well may also provide additional data regarding faulting in the area. Surface water concentrations are 53 and 980 μg/L. The concentration in the channel near the former seep is 1600 μg/L.
NERT3.60N1	90	52.5	4"	38.65	32 - 52	30 - 52.5	Determine concentrations on the south side of Homestead Weir to obtain additional data on perchlorate impacts between wells LVWPS-MW216 (total depth 20.6 feet bgs and 1,200 µg/L) and NERT3.80S1 (total well depth 20 feet bgs and 1,100 µg/L). Surface water concentrations are 44 µg/L.
NERT3.60S1	90	56	4"	38.65	35 - 55	33 - 56	Determine concentrations upgradient and on the south side of Three Kids Weir. south-southwest of WMW3.5S (total well depth of 59.8 feet bgs at 1,500 µg/L) on the south side of LVW to further characterize perchlorate impacts in groundwater. This well may also provide additional data regarding faulting in the area. Surface water concentrations are 32 and 36 µg/L.
NERT3.63S1	60	35.5	4'	18.58	15 - 35	13 - 36	Determine concentrations east-northeast of well WMW3.5N (56 feet bgs at 320 µg/L) on the north side of LVW adjacent to Three Kids weir. Surface water concentrations are 200 µg/L.
NERT3.98S1	55	37.5	4"	10.36	15 - 35	13 - 37	Determine concentrations on the north side of Calico Ridge Weir to obtain additional data on perchlorate impacts in the area. Surface water concentrations are 93 µg/L.
NERT4.64N1	90	47.5	4"	23.03	25 - 45	23 - 47.5	Determine concentrations on the north side of Calico Ridge Weir between WMW4.9N (total well depth of 53 feet bgs at 680 µg/L) and well NERT4.38.N1 (total well depth 40.9 bgs and 1,400 µg/L) to obtain additional data on perchlorate impacts in the area. Surface water concentrations are 31 µg/L.
NERT4.64S1	56	55.5	4"	27.10	35 - 55	33 - 56	Determine concentrations on the north side and upgradient of Calico Ridge Weir to obtain additional data on perchlorate impacts in the area.
NERT4.65N1	90	47	4"	24.21	25 - 45	23 - 47	Determine perchlorate concentrations north of LVW and about 450 feet west and upgradient of Calico Ridge weir and south of well WMW4.9N (total well depth of 53 feet bgs and 680 µg/L).

Table 1 Rationale and Well Completion Details for Phase II Groundwater Monitoring Wells

NERT RI - Downgradient Study Area Henderson, Nevada

Phase II Well	Boring Depth in feet bgs ⁽¹⁾	Well Depth in feet bgs	Well Diameter ⁽²⁾	Depth to water	Well Screen in feet bgs ⁽³⁾	Sand Pack Interval in feet bgs ⁽⁴⁾	
NERT4.70N1	82	47	4"	27.87	25 - 45	23 - 47	Determine concentrations southeast of Phase II Well NERT3.60S1 on the south side of LVW to further characterize perchlorate impacts. This well may also provide additional information on faulting in the area. Surface water concentrations are 53 and 980 μg/L. The concentration in the channel by the former seep is 1600 μg/L.
NERT4.71N1	90	47	4"	27.87	25 - 45	23 - 47	Determine perchlorate concentrations between LVWPS-MW210A (total well depth of 55 feet bgs and 4,400 μ g/L) and LVWPS-MM219 to further characterize this area of perchlorate impact south of Calico Ridge Weir. To evaluate surface water/groundwater interactions in this area. Surface water concentrations are 1,500 to 3,100 μ g/L.
NERT4.71S2	55	55	4"	27.26	34.5 - 54.5	33 - 55	Determine perchlorate concentrations between LVWPS-205B (total well depth of 84 feet and 2,800 μ g/L) and LVWPS-MW210A (total well depth of 55 feet bgs and 4,400 μ g/L) to further characterize this area of perchlorate impact south and about 400 feet upstream of Calico Ridge Weir. To evaluate groundwater concentrations in this area.
Observation Well	S						Rational Based on Expected Hydraulic Conductivity
3 wells around NERT3.58S1	50 - 55	45	2"	34.58 - 35.26	25-45 & 35-55	19 - 55	The observation wells were placed 5 to 13 feet cross gradient and down gradient from the injection well to potentially intercept dye as it dispersed from the injection well.
4 wells around NERT3.60S1	55	55	2"	38.71 - 43.74	35-55	33 - 55	The observation wells were placed 5 to 30 feet cross gradient and down gradient from the injection well to potentially intercept dye as it dispersed from the injection well.
4 wells around NERT4.64S1	55	55	2"	26.91 - 27.14	35 - 55	33 - 55	The observation wells were placed 7.5 to 40 feet cross gradient and down gradient from the injection well to potentially intercept dye as it dispersed from the injection well.

Notes:

μg/L: micrograms per liter

bgs: below ground surface

Red text shows where depths or well identifications were changed from the work plan

⁽¹⁾ Borehole depth is similar to other NERT off site RI wells to provide stratigraphic information at comparable depths.

⁽²⁾ The borehole is 8 inches in diameter and sealed with bentonite from the total depth to the planned well screen.

⁽³⁾ Well casing is schedule 40 PVC and well screen slot size is 0.02 inches

⁽⁴⁾ Sand Pack size is No. 3.

⁽⁵⁾ Surface water concentrations are from May 2018 and groundwater concentrations are from July 2018

Table 2 Phase II Groundwater Monitoring Well Installation Details

NERT RI - Downgradient Study Area Henderson, Nevada

			W	ell Installatio	on			Well Develop	ment
Well ID	Drilling Completion Date	Pilot Boring Depth 1. (feet bgs)	Depth to Groundwater (feet bgs, TOC)	Well Completion Depth (feet bgs)	Well Screen ^{2.} (feet bgs)	Sand Pack Interval ^{4.} (feet bgs)	Date Developed	Depth to Groundwater (feet bgs)	Well Depth after Development (feet bgs)
NERT3.35S1	4/24/2019	57	19.6	55.5	35 - 55	33 - 57	4/29/2019	15.83	18.31
NERT3.40S1	4/16/2019	65	38.11	55.5	35 - 55	33 - 57	4/29/2019	38.11	38.80
NERT3.58N1	4/23/2019	62	39.41	62	40 - 60	38 - 62	5/3/2019	39.41	39.65
NERT3.58S1	3/28/2019	70	34.95	55.5	35 - 55	33 - 56	4/10/2019	34.86	34.97
NERT3.58S1A	4/24/2019	50	35.25	45	25 - 45 ^{3.}	23 - 45	4/30/2019	34.61	34.65
NERT3.58S1B	4/24/2019	50	34.56	45	25 - 45 ^{3.}	23 - 50	4/30/2019	33.80	33.85
NERT3.58S1C	4/24/2019	55	34.90	55	35 - 55 ^{3.}	33 - 55	4/30/2019	34.30	34.34
NERT3.58S1D	4/24/2019		V	/ell not installe	d. Hit bedrock at 3	6 feet bgs and	d borehole wa	is dry.	
NERT3.60N1	4/9/2019	90	38.02	52.5	32 - 52	30 - 52.5	5/3/2019	37.95	38.05
NERT3.60S1	3/27/2019	90	38.65	56	35 - 55	33 - 56	4/9/2019	38.62	38.60
NERT3.60S1A	4/23/2019	55	43.84	55	35 - 55 ^{3.}	33 - 55	4/30/2019	38.35	38.40
NERT3.60S1B	4/22/2019	55	38.73	55	35 - 55 ^{3.}	33 - 55	4/30/2019	38.15	38.16
NERT3.60S1C	4/23/2019	55	39.14	55	35 - 55 ^{3.}	33 - 55	5/1/2019	38.90	38.92
NERT3.60S1D	4/22/2019	55	38.71	55	35 - 55 ^{3.}	33 - 55	5/1/2019	38.54	38.60
NERT3.63S1	4/17/2019	60	18.58	35.5	15 - 35	13 - 36	5/1/2019	18.45	18.45
NERT3.98S1	4/2/2019	55	10.36	37.5	15 - 35	13 - 37	4/9/2019	10.43	19.01
NERT4.64N1	4/3/2019	90	23.03	47.5	25 - 45	23 - 47.5	4/10/2019	23.03	23.32
NERT4.64S1	3/25/2019	56	27.10	55.5	35 - 55	33 - 56	4/8/2019	27.01	27.09
NERT4.64S1A	4/26/2019	55	26.91	55	35 - 55 ^{3.}	33 - 55	5/2/2019	26.75	26.98
NERT4.64S1B	4/26/2019	55	26.78	55	35 - 55 ^{3.}	33 - 55	5/2/2019	26.61	26.75
NERT4.64S1C	4/26/2019	55	27.14	55	35 - 55 ^{3.}	33 - 55	5/2/2019	27.02	27.12
NERT4.64S1D	4/25/2019	55	26.91	55	35 - 55 ^{3.}	33 - 55	5/1/2019	26.68	27.00
NERT4.65N1	4/10/2019	90	24.21	45.5	25 - 45	23 - 47	5/3/2019	24.21	24.25
NERT4.70N1	4/11/2019	82	24.95	45.5	25 - 45	23 - 47	5/2/2019	24.85	25.07
NERT4.71N1	4/4/2019	90	27.89	45.5	25 - 45	22.5 - 47.5	4/10/2019	27.86	27.86
NERT4.71S2	4/1/2019	55	27.26	55	34.5 - 54.5	33 - 55	4/8/2019	27.30	27.51

Notes:

- 1. The borehole was 8 inches in diameter and sealed with bentonite from the total depth to the bottom of the well screen.
- 2. Well casing is 4-inch schedule 40 PVC and well screen slot size is 0.02 inches unless noted otherwise
- 3. Well casing is 2-inch schedule 40 PVC and well screen slot size is 0.02 inches.
- 4. Sand pack is Monterey No. 3 sand.

Red: Encountered refusal at specified depth. Final depth is a deviation from the Data Gap Investigation Plan Phase II Groundwater Assessment.

bgs - below ground surface

Table 3 Soil Physical Properties

NERT RI - Downgradient Study Area Henderson, Nevada

			Moisture	e Content	Dry Bulk Density		osity	Total Organic Carbon	Fractional Organic Carbon
			ACTM	D2216	ASTM D2937	API	RP40	Walk	ley-Black
	Depth below	Sample	ASTM D2216		ASTINI D2931	Total ²	Air Filled ³	T Walk	liey-black
Sample ID	ground in feet	Orientation ¹	%	ml/ml	g/cc	%Vb ⁴	%Vb ⁴	mg/kg	g/g
PT-NERT3.60S1-68.2-68.5	68.2-68.5	V	16.9	0.314	1.86	31.6	0.171	15200	1.52E-02
PT-NERT3.60S1-86.0-86.3	86.0-86.3	V	14.9	0.291	1.95	29.1	0.015	23800	2.38E-02
PT-NERT3.58S1-60.0-60.3	60.0-63.3		6.6	0.122	1.86	30.6	18.4	7000	7.00E-03
PT-NERT4.71S2-29.7-30.0	29.7-30.0	V	23.0	0.394	1.66	38.2	0.035	4900	4.90E-03
PT-NERT3.98S1-9.7-10.0	9.7-10.0	V	11.2	0.224	2.00	25.1	2.66	10700	1.07E-02
PT-NERT3.98S1-17.0-17.3	17.0-17.3	V	11.7	0.225	1.92	27.8	5.25	6200	6.20E-03
PT-NERT4.64N1-37.0-37.3	37.0-37.3	V	18.0	0.322	1.79	33.7	1.47	11100	1.11E-02
PT-NERT4.64N1-68.0-68.3	68.0-68.3	V	11.9	0.239	2.02	25.5	1.57	7600	7.60E-03
PT-NERT4.71N1-58.5-59.0	58.5-59.0	V	32.3	0.468	1.44	46.7	0.023	8400	8.40E-03
PT-NERT3.60N1-26.0-26.4	26.0-26.4	V	28.8	0.435	1.51	43.6	0.038	23400	2.34E-02
PT-NERT3.60N1-42.3-42.5	42.3-42.5	V	15.6	0.281	1.80	34.1	5.97	7100	7.10E-03
PT-NERT4.65N1-53.0-53.3	53.0-53.3	V	34.9	0.485	1.39	48.6	0.086	10200	1.02E-02
PT-NERT3.40S1-47.0-47.3	47.0-47.3	V	10.1	0.207	2.05	23.7	2.99	5000	5.00E-03
PT-NERT3.63S1-49.0-49.4	49.0-49.4	V	22.7	0.379	1.67	39.1	1.13	7100	7.10E-03

Notes:

- (1) Sample Orientation: H = horizontal; V = vertical; (--) = Sample received as loose grains in a bag.
- (2) Total Porosity = no pore fluids in place; all interconnected pore channels.
- (3) Air Filled Porosity= pore channels not occupied by pore fluids.
- (4) Vb = Bulk Volume in cubic centimeters

ml/ml = milliliter per milliliter

g/cc = grm per cubic centimeter

mg/kg = milligram per killigram

g/g = gram per gram

Table 4 Summary of Atterberg Limits

NERT RI - Downgradient Study Area Henderson, Nevada

			Atterberg Limit		USCS / Plasticity Chart Symbol (Fines: <#40	USCS Classification	USDA/SCS ² Soil Texture
	Depth below	Liquid Limit	Plastic Limit	Plasticity Index	Sieve)	Group Symbol Name	Scheme
Sample ID	ground in feet		ASTM D4318	3	ASTM D4318	ASTM D2487	USDA
PT-NERT3.60S1-68.2-68.5	68.2-68.5	32	20	12	CL	Lean Clay	Silty Clay Loam
PT-NERT3.60S1-86.0-86.3	86.0-86.3	27	16	11	CL	Lean Clay	Silty Clay Loam
PT-NERT3.58S1-60.0-60.3	60.0-60.3	31	16	15	CL	Lean Clay with Sand	Silt Loam
PT-NERT4.71S2-29.7-30.0	29.7-30.0	24	15	9	CL	Sandy Lean Clay	Loam
PT-NERT3.98S1-9.7-10.0	9.7-10.0	17	14	3	ML	Sandy Silt	Loam
PT-NERT3.98S1-17.0-17.3	17.0-17.3	15	13	2	ML	SM: Silty Sand	Sandy Loam
PT-NERT4.64N1-37.0-37.3	37.0-37.3	30	18	12	CL	Lean Clay	Silty Clay Loam
PT-NERT4.64N1-68.0-68.3	68.0-68.3	36	17	19	CL	Sandy Lean Clay	Loam
PT-NERT4.71N1-58.5-59.0	58.5-59.0	43	22	21	CL	Lean Clay	Silty Clay
PT-NERT3.60N1-26.0-26.4	26.0-26.4	34	23	11	CL	Lean Clay with Sand	Silty Clay Loam
PT-NERT3.60N1-42.3-42.5	42.3-42.5	31	16	15	CL	Lean Clay	Silty Clay Loam
PT-NERT4.65N1-53.0-53.3	53.0-53.3	51	20	31	CH	Fat Clay with Sand	Silt Loam
PT-NERT3.40S1-47.0-47.3	47.0-47.3	16	14	2	ML	SM: Silty Sand	Loam
PT-NERT3.63S1-49.0-49.4	49.0-49.4	38	21	17	CL	Lean Clay	Silty Clay

Notes:

USCS: Unified Soil Classification System USDA: US Department of Agriculture

SCS: Soil Conservation Service

(1) Silt assumed as fine fraction for NON-PLASTIC samples.

(2) Sand considered to be >No. 200 sieve for USDA SOIL TEXTURE SCHEME.

Table 5 Summary of Grain Size Analysis

		Grain Size	Median Grain			Com	ponent Percen	tages		
	Depth below	Description	Size			Sand Sized				Silt &
Sample ID	ground in feet	(Mean from Trask)	(millimeter)	Gravel	Coarse	Medium	Fine	Silt	Clay	Clay
PT-NERT3.60S1-68.2-68.5	68.2-68.5	Silt	0.0103	0.00	0.00	0.03	7.18	57.14	35.65	92.79
PT-NERT3.60S1-86.0-86.3	86.0-86.3	Silt	0.0120	0.00	0.00	0.00	7.90	56.97	35.13	92.10
PT-NERT3.58S1-60.0-60.3	60.0-60.3	Silt	0.0237	0.00	0.00	0.16	23.93	50.72	25.19	75.91
PT-NERT4.71S2-29.7-30.0	29.7-30.0	Fine Grain Sand	0.0456	0.00	1.64	16.95	24.25	40.08	17.09	57.17
PT-NERT3.98S1-9.7-10.0	9.7-10.0	Silt	0.0366	0.00	0.00	2.62	31.67	45.87	19.84	65.71
PT-NERT3.98S1-17.0-17.3	17.0-17.3	Fine Grain Sand	0.0891	0.00	0.00	2.96	50.54	28.21	18.29	46.50
PT-NERT4.64N1-37.0-37.3	37.0-37.3	Silt	0.0125	0.00	0.00	0.82	6.18	65.20	27.80	93.00
PT-NERT4.64N1-68.0-68.3	68.0-68.3	Silt	0.0313	0.00	0.00	5.99	24.98	47.92	21.10	69.02
PT-NERT4.71N1-58.5-59.0	58.5-59.0	Silt	0.0075	0.00	0.00	0.00	1.95	56.83	41.22	98.05
PT-NERT3.60N1-26.0-26.4	26.0-26.4	Silt	0.0095	0.00	0.00	0.00	19.46	42.76	37.78	80.54
PT-NERT3.60N1-42.3-42.5	42.3-42.5	Silt	0.0093	0.00	0.00	0.00	6.20	55.22	38.58	93.80
PT-NERT4.65N1-53.0-53.3	53.0-53.3	Silt	0.0149	0.00	0.00	2.15	18.14	52.99	26.73	79.71
PT-NERT3.40S1-47.0-47.3	47.0-47.3	Fine Grain Sand	0.0747	0.00	2.48	14.14	33.47	28.28	21.63	49.91
PT-NERT3.63S1-49.0-49.4	49.0-49.4	Silt	0.0047	0.00	0.00	0.00	1.41	43.52	55.07	98.59

Table 6 Transducer Installation Details NERT RI - Downgradient Study Area

Henderson, Nevada

Well ID	Transuducer ID	Date & Time of Install	Pre-Installation Depth to Groundwater (feet btoc)	Measured Well Depth (feet btoc)	Water Column (feet)	Estimated Transducer Depth (1) (feet btoc)	Transducer Depth Below Pre-Installation Depth to Groundwater ⁽²⁾ (feet)	Post-Installation Depth to Groundwater (feet btoc)
NERT3.35S1 ⁽³⁾	SN2103389	6/10/19 1230	16.81	55.18	38.37	36.50	19.69	16.16
		8/12/19 0750	15.60	55.18	39.58	36.50	20.90	15.60
NERT3.40S1 (3)	SN2103397	6/10/19 1300	38.23	57.00	18.77	52.10	13.87	38.23
		8/12/19 0805	38.12	54.32	16.2	52.10	13.98	38.12
NERT3.58N1 ⁽³⁾	SN2099333	6/10/19 1435	39.60	60.44	20.84	49.75	10.15	39.6
		7/2/19 0850	39.51	60.46	20.95	55.00	15.49	39.51
NERT3.58S1	SN0042103374	8/12/19 0845	31.85	55.3	23.45	50	18.15	38.58
NERT3.60N1 ⁽³⁾	SN2103394	6/10/19 1400	38.10	51.31	13.21	48.62	10.52	38.09
		7/2/19 0950	38.09	51.37	13.28	45.00	6.91	38.58
NERT3.60S1	SN0042103390	8/12/19 0845	34.85	55.30	20.45	50.00	15.15	34.85
NERT3.63S1 (3)	SN2103383	6/10/19 1320	18.71	34.72	16.01	33.62	14.91	18.71
		6/27/19 1050	18.68	34.83	16.15	30.00	11.32	18.68
NERT3.98S1 ⁽³⁾	SN2103375	6/10/19 1405	10.63	34.93	24.30	30.65	20.02	10.61
		6/29/19 1305	10.66	34.93	24.27	30.00	19.34	10.66

Table 6 Transducer Installation Details NERT RI - Downgradient Study Area

Henderson, Nevada

Well ID	Transuducer ID	Date & Time of Install	Pre-Installation Depth to Groundwater (feet btoc)	Measured Well Depth (feet btoc)	Water Column (feet)	Estimated Transducer Depth ⁽¹⁾ (feet btoc)	Transducer Depth Below Pre-Installation Depth to Groundwater ⁽²⁾ (feet)	Post-Installation Depth to Groundwater (feet btoc)
NERT4.64N1 ⁽³⁾	SN0042103377	6/10/19 1500	23.19	45.17	21.98	43.05	19.86	23.18
		7/2/19 1350	23.20	45.25	22.05	40.00	16.80	23.20
NERT4.64S1	SN2099355	8/12/19 1245	27.06	55.20	28.14	50.00	22.94	27.06
NERT4.65N1 ⁽³⁾	SN2103021	6/10/19 1530	24.18	45.51	21.33	44.13	19.95	24.17
		7/8/19 1240	24.19	45.5	21.31	40.00	15.81	24.19
NERT4.70N1 ⁽³⁾	SN2012672	6/10/19 1550	25.06	45.03	19.97	42.96	17.90	25.05
		7/9/19 1200	25.08	45.03	19.95	40.00	14.92	25.08
NERT4.71N1	SN2103382	8/13/19 1410	27.80	45.30	17.50	45.00	17.20	27.80
NERT4.71S2 ⁽³⁾	SN2102696	6/10/19 1340	27.31	54.35	27.04	47.46	20.15	27.31
		7/1/19 0930	27.30	54.40	27.10	50.00	22.70	27.30

Notes:

btoc: Below top of casing.

⁽¹⁾ Depth of the transducer is measured to the bottom of the transducer.

⁽²⁾ Transducers were installed approximately 20 feet below the pre-installation groundwater surface, or approximately 2 feet above the measured total depth of the well if water column was less than 22 feet.

⁽³⁾ Transducer initially installed with nylon rope. Second installation readings taken after nylon rope was replaced by Kevlar rope.

Table 7 Well Survey with Groundwater Elevations from June and July 2019

NERT RI - Downgradient Study Area Henderson, Nevada

			<u> </u>	I	Depth to	
			Elevation (1)		Water (feet,	Elevation
Well ID	Easting ⁽¹⁾	Northing ⁽¹⁾	(feet amsl, TOC)	Date Gaged	TOC)	(feet amsl)
AA-30	836125.80	26733691.92	1532.35	7/8/2019	19.08	1513.27
COH-2B1	832598.59	26733593.69	1546.95	7/3/2019	16.73	1530.22
LNDMW1	841145.67	26736145.45	1511.19	6/28/2019	36.81	1474.38
LNDMW2	840864.28	26737125.16	1501.98	7/5/2019	34.31	1467.67
MW-3	836835.36	26733434.90	1523.29	7/5/2019	6.12	1517.17
MW-4	836666.49	26733446.64	1526.35	7/5/2019	2.96	1523.39
MW-02	838994.12	26734478.11	1533.13	7/3/2019	39.62	1493.51
MW-13	838306.91	26734740.22	1529.84	6/28/2019	35.24	1494.60
MW-20	840590.41	26735460.67	1512.54	6/28/2019	32.64	1479.90
MW-25	839862.75	26734834.10	1531.65	7/3/2019	39.4	1492.25
NERT3.35S1	845391.59	26738372.78	1470.44	6/26/2019	16.05	1454.39
NERT3.40S1	845198.15	26738206.49	1474.58	6/26/2019	38.25	1436.33
NERT3.58N1	844188.45	26738048.58	1476.49	7/2/2019	34.49	1442.00
NERT3.58S1	844695.30	26737583.50	1474.30	6/27/2019	34.94	1439.36
NERT3.58S1A	844690.03	26737588.02	1474.53	6/18/2019	35.28	1439.25
NERT3.58S1B	844702.73	26737593.51	1473.94	6/18/2019	34.6	1439.34
NERT3.58S1C	844700.21	26737579.78	1474.27	6/18/2019	34.94	1439.33
NERT3.60N1	844016.02	26737827.79	1483.08	7/2/2019	38.09	1444.99
NERT3.60S1	844579.55	26737409.27	1478.23	7/1/2019	38.67	1439.56
NERT3.60S1A	844575.89	26737412.04	1478.50	7/1/2019	38.93	1439.57
NERT3.60S1B	844585.91	26737416.28	1478.24	7/1/2019	38.75	1439.49
NERT3.60S1C	844596.77	26737396.28	1478.74	7/1/2019	39.15	1439.59
NERT3.60S1D	844597.60	26737431.86	1478.31	7/1/2019	38.72	1439.59
NERT3.63S1	844152.61	26737071.55	1461.78	6/27/2019	18.68	1443.10
NERT3.80S1	843700.76	26736780.10	1460.54	6/27/2019	10.48	1450.06
NERT3.98S1	842522.48	26736678.95	1466.27	6/27/2019	10.67	1455.60
NERT4.21N1	841309.13	26736954.70	1502.07	7/2/2019	35.38	1478.87
NERT4.38N1	840337.59	26737140.64	1505.04	7/2/2019	32.61	1477.94
NERT4.51S1	840138.03	26735857.15	1506.24	6/27/2019	26.17	1480.07
NERT4.64N1	839271.62	26736269.47	1511.58	7/2/2019	23.20	1488.38
NERT4.64S1	839508.39	26735740.74	1513.00	7/1/2019	27.10	1485.90
NERT4.64S1A	839506.16	26735746.28	1512.73	7/9/2019	26.9	1485.83
NERT4.64S1B	839522.29	26735747.15	1512.55	7/9/2019	26.76	1485.79
NERT4.64S1C	839510.44	26735735.18	1512.98	7/9/2019	27.14	1485.84
NERT4.64S1D	839544.60	26735756.29	1512.63	7/9/2019	26.9	1485.73
NERT4.65N1	839107.82	26736244.72	1513.01	7/8/2019	24.19	1488.82
NERT4.70N1	838871.67	26736143.64	1514.91	7/9/2019	25.08	1489.83
NERT4.71N1	838600.29	26736123.87	1518.72	7/9/2019	27.91	1490.81
NERT4.71S1	838991.63	26735349.66	1519.29	7/1/2019	28.83	1490.46
NERT4.71S2	838770.32	26735408.27	1518.22	7/1/2019	27.3	1490.92
NERT4.93S1	837979.18	26734990.31	1523.33	7/1/2019	27.6	1495.73
NERT5.11S1	837144.38	26734881.04	1522.88	7/1/2019	20.81	1502.07
NERT5.49S1	835451.85	26734325.76	1543.37	7/8/2019	26.71	1516.66
NERT5.91S1	833571.59	26733845.83	1536.76	7/1/2019	13.32	1523.44
WMW3.5N	843836.97	26737791.35	1482.54	7/5/2019	35.31	1447.23
WMW3.5S	844697.76	26737275.90	1483.54	6/28/2019	43.58	1439.96
WMW4.9N	838408.40	26736756.98	1523.37	7/5/2019	31.8	1491.57
WMW4.9S	838411.85	26735290.15	1518.84	7/9/2019	26.45	1492.39
WMW5.58S ⁽²⁾	835070.11	26734647.03	1537.34	7/3/2019	16.87	1520.47
WMW5.5S	835768.11	26733971.74	1528.22	6/28/2019	13.89	1514.33
WMW5.7N	834471.76	26734425.52	1528.50	7/9/2019	8.42	1520.08
VVIVIVV J. / IN	00-1-11.10	20107720.02	1020.00	11312013	∪.⊤∠	1020.00

Notes:

amsl = Above mean sea level

TOC = Top of casing

⁽¹⁾ Well coordinates and elevations surveyed by licensed surveyor (Stanley). Coordinate system: State Plane Coordinate System; Elevations are referenced to the North American Datum (NAD) 83 Nevada East Zone (2701) with vertical datum based on NAVD 88 referenced to the City of Henderson Benchmark network.

⁽²⁾ Well WMW5.58S is identified as WMW5.7S in the state of Nevada records however, the owner, Southern Nevada Water Authority, prefers to keep analytical data under the WMW5.58S well identification.

Table 8 Summary of Depth to Bedrock - Phase II Groundwater Well Installation

NERT RI - Downgradient Study Area Henderson, Nevada

	Depth to Bedrock		
Well ID	(feet bgs)	Bedrock	Comments
NERT3.35S1	32	Thumb(?)	Drilled to 57 feet bgs.
NERT3.40S1	50	Thumb	Weathered Bedrock
	57.5	Thumb	Bedrock
NERT3.58N1	15	Thumb	Drilled to 60 feet bgs.
NERT3.58S1	64	UMCf	Refusal at 70 feet bgs.
	66	Horse Springs	
NERT3.58S1A	No bedrock encountered		Drilled to 50 feet bgs.
NERT3.58S1B	No bedrock encountered		Drilled to 50 feet bgs.
NERT3.58S1C	No bedrock encountered		Drilled to 55 feet bgs.
NERT3.58S1D	36	Thumb	Drilled to 36.5 feet bgs.
NERT3.60N1	No bedrock encountered		Drilled to 90 feet bgs.
NERT3.60S1	70	UMCf	Drilled to 90 feet bgs.
	78	Horse Springs	
NERT3.60S1A	No bedrock encountered		Drilled to 55 feet bgs.
NERT3.60S1B	No bedrock encountered		Drilled to 55 feet bgs.
NERT3.60S1C	No bedrock encountered		Drilled to 55 feet bgs.
NERT3.60S1D	No bedrock encountered		Drilled to 55 feet bgs.
NERT3.63S1	56	Thumb	Refusal at 60 feet bgs.
NERT3.98S1	23	UMCf	
	27	Thumb	Drilled to 55 feet bgs.
NERT4.64N1	No bedrock encountered		Drilled to 90 feet bgs.
NERT4.64S1	No bedrock encountered		Drilled to 55 feet bgs.
NERT4.64S1A	No bedrock encountered		Drilled to 55 feet bgs.
NERT4.64S1B	No bedrock encountered		Drilled to 55 feet bgs.
NERT4.64S1C	No bedrock encountered		Drilled to 55 feet bgs.
NERT4.64S1D	No bedrock encountered		Drilled to 55 feet bgs.
NERT4.65N1	No bedrock encountered		Drilled to 90 feet bgs.
NERT4.70N1	No bedrock encountered		Drilled to 82 feet bgs.
NERT4.71N1	No bedrock encountered		Drilled to 90 feet bgs.
NERT4.71S2	No bedrock encountered		Drilled to 55 feet bgs.

Notes:

bgs: below ground surface

UMCf: Upper Muddy Creek formation

-- Bedrock not encountered to the depth explored

(?) indicates identification of formation is tentative

Table 9

Water Quality Parameters June and July 2019

NERT RI - Downgradient Study Area Henderson, Nevada

Well ID	Sample Date	Screen Interval (feet, bgs)	Water- Bearing Zone	Lithology	Purge Volume Removed (Liters)	Temp (°C)	рН	EC (μS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Purge Flow Rate (mL/min)	Depth to Water (feet)	Color / Odor
AA-30	07/08/19	11.7 - 31.7	Shallow	Qal	8.2	24.75	7.06	6897	1.5	72.4	9.04	180	19.08	clear/ none
COH-2B1	07/03/19		Shallow		7.2	24.55	7.13	3205	1.45	49	9.82	180	16.73	clear/ none
LNDMW1	06/28/19		Shallow		6.4	24.83	6.97	5322	2.81	77.6	E	180	36.81	cloudy/ none
LNDMW2	07/05/19		Shallow		4.7	23.31	7.05	3145	1.53	60.1	487	200	34.31	tan/ none
MW-02	07/03/19	? - 45	Shallow		5.3	27.39	7.06	3435	6.27	69.1	14.2	180	39.62	clear/ none
MW-3	07/05/19		Shallow		collected grab sample from bailer	24.03	7.48	4081	7.35	55.2	8.22	NA	6.12	clear/ none
MW-4	07/05/19		Shallow		collected grab sample from bailer	23.01	7.68	5030	6.68	65.7	6.21	NA	2.96	clear/ none
MW-13	06/28/19	? - 48	Shallow	Qal	4.0	25.64	7.03	5941	4.75	74.5	14.6	200	35.24	clear/ none
MW-20	06/28/19		Shallow		4.8	26.21	7.43	6157	6.09	72.2	E	180	32.64	cloudy/ none
MW-25	07/03/19		Shallow		4.0	28.10	7.06	3979	5.15	69.9	69.8	180	39.40	cloudy/ none
NERT3.35S1	06/26/19	35 - 55	Shallow	Qal	4.3	27.36	7.43	9908	1.09	-51.6	1.08	140	16.05	clear/ none
NERT3.40S1	06/26/19	35 - 55	Shallow	Qal	4.5	27.56	7.29	13165	1.19	45.3	47.1	170	28.25	slightly cloudy/none
NERT3.58N1	07/02/19	40 - 60	Shallow	Qal	5.3	24.84	6.83	6956	1.93	62.5	19.8	180	39.49	clear/ none
NERT3.58S1	06/27/19	35 - 55	Shallow	Qal	4.7	24.39	6.89	4260	1.49	68.9	18.9	180	34.94	pink/ None
NERT3.60N1	07/02/19	32 - 52	Shallow	Qal	5.0	24.57	6.84	6835	1.11	57.3	27.7	180	38.09	clear/ none
NERT3.60S1	07/01/19	35 - 55	Shallow	Qal	5.5	25.28	7.01	4202	1.54	68.7	4.32	180	38.67	pink/ None
NERT3.63S1	06/27/19	15 -35	Shallow	Qal	4.0	23.81	6.95	3978	1.14	72	7.05	200	18.68	clear/ none
NERT3.80S1	06/27/19	10 - 20	Shallow	Qal	4.3	24.34	6.69	3972	1.59	66.9	5.82	20	10.48	clear/ none
NERT3.98S1	06/27/19	15 - 35	Shallow	Qal	4.8	24.01	6.99	6100	0.75	-63.5	39.3	180	10.67	clear/ none
NERT4.21N1	07/02/19	45 - 55	Shallow	Qal	5.4	24.67	7.08	3933	4.21	72.7	2.23	200	35.38	clear/ none
NERT4.38N1	07/02/19	30 - 40	Shallow	Qal	4.0	25.51	6.91	3567	5.12	62.8	26.3	200	32.61	clear/ none
NERT4.51S1	06/27/19	40 - 50	Shallow	Qal	3.3	28.98	6.96	5508	4.05	66.4	1.22	200	26.17	clear/ none
NERT4.64N1	07/02/19	25 - 45	Shallow	Qal	2.5	25.18	7.12	2410	1.3	46.8	1.09	200	23.20	clear/ none
NERT4.64S1	07/01/19	35 - 55	Shallow	Qal	4.8	23.59	7.11	5648	4.06	83.7	1.9	180	22.10	clear/ none
NERT4.65N1	07/08/19	25 - 45	Shallow	Qal	4.0	25.20	7.13	2306	1.05	40.1	3.48	180	24.19	clear/ none
NERT4.70N1	07/09/19	25 - 45	Shallow	Qal	6.1	23.93	7.18	1908	1.14	161.1	7.34	200	25.08	clear/ none
NERT4.71N1	07/09/19	25 -45	Shallow	Qal	5.0	23.67	7.16	1947	0.97	140.9	12.9	200	27.91	clear/ none
NERT4.71S1	07/01/19	40 - 50	Shallow	Qal	4.2	25.48	7.04	5874	3.26	71.2	20.1	180	28.83	clear/ none
NERT4.71S2	07/01/19	34.5 - 54.5	Shallow	Qal	5.9	24.09	7.01	4970	1.59	71.6	163	180	27.30	cloudy/ none
NERT4.93S1	07/01/19	45 - 55	Shallow	Qal	4.9	26.53	7.00	3988	1.85	70.7	13.1	180	27.60	clear/ none
NERT5.11S1	07/01/19	35 - 45	Shallow	Qal	6.25	25.11	7.01	4051	0.74	68.4	15.9	250	20.81	clear/ none
NERT5.49S1	07/08/19	30 - 40	Shallow	Qal	4.8	24.89	7.43	1648	0.99	39.8	6.73	200	26.74	clear/ none
NERT5.91S1	07/01/19	40 - 50	Shallow	Qal	3.8	26.38	7.02	4074	0.93	62.3	38.3	220	13.32	clear/ none
WMW3.5N	07/05/19		Shallow		5.4	24.62	6.97	6123	6.05	84.4	Е	180	35.31	clear/ none
WMW3.5S	06/28/19		Shallow		4.8	23.48	6.98	4046	1.23	71.3	10.59	180	43.58	clear/ none
WMW4.9N	07/05/19		Shallow		5.5	24.72	7.03	2643	1.64	53.6	287	200	21.80	cloudy/ none
WMW4.9S	07/09/19		Shallow		5.9	24.29	7.04	2453	3.38	132.4	5.41	200	26.45	clear/ none
WMW5.58S ⁽¹⁾	07/03/19		Shallow		4.2	24.39	7.23	4426	1.09	-69.1	219	100	16.87	tan/ none
WMW5.5S	06/28/19		Shallow		4.7	23.62	7.17	3058	2.9	63	7.42	180	13.89	clear/ none
WMW5.7N	07/09/19		Shallow		4.5	29.69	7.21	1751	0.95	81.3	4.09	200	8.42	clear/ none

Notes:

(1) Well WMW5.58S is identified as WMW5.7S in the state of Nevada records however, the owner, Southern Nevada Water Authority, prefers to keep analytical data under the WMW5.58S well identification.

-- = No data available mL/min = milliliters per minute

bgs = below ground surface mV = millivolts
°C = Degrees Celsius NA = Not applicable

DO = Dissolved Oxygen NTU = Nephelometric Turbidity Units

EC = Electrical Conductivity Qal = Alluvium

ORP - Oxidation reduction potential μ S/cm = microSiemens per centimeter

mg/L = milligrams per liter

Table 10

Preliminary Tracer Dye Analysis Results

NERT RI - Downgradient Study Area Henderson, Nevada

Sample	Date/Time	Date/Time	Fluor	escein	Eos	sine	R	WT	SRB	
Name	Placed	Collected	Peak (nm)	Conc (ppb)						
T4.60C	3/7/19 0755	3/7/19 1210	516.8 *	0.186	ND		ND		ND	
T4.61C	3/7/19 0800	3/7/19 1215	513.4 *	0.355	ND		ND		ND	
T4.62C	3/7/19 0805	3/7/19 1220	ND		ND		ND		ND	
T3.60C	3/7/19 0825	3/7/19 1240	516.0	0.585	ND		ND		ND	
T3.58C	3/7/19 0830	3/7/19 1245	516.2	0.728	ND		ND		ND	
T3.57C	3/7/19 0845	3/7/19 1250	516.4	0.851	ND		ND		ND	
T4.60	NA	3/7/19 1210	ND		ND		ND		581.8	0.087
T4.61	NA	3/7/19 1215	ND		ND		ND		582.2	0.081
T3.60	NA	3/7/19 1240	ND		ND		ND		582.0	0.093
T3.58	NA	3/7/19 1245	ND		ND		ND		580.8	0.067
T3.57	NA	3/7/19 1250	ND		ND		ND		582.6	0.081

Notes:

Sample name incorporates the approximate river mile. C indicates that it was a sample collected via charcoal adsorption

-- = Data not reported

ND = No dye detected

NA = Not Applicable

RWT = Rhodamine WT

SRB = Sulforhodamine B

nm = nanometers

ppb = parts per billion

^{* =} A fluorescence peak is present that does not meet all the criteria for a positive dye result.

Table 11 Analytical Results of Groundwater Well Sampling July 2019

		Sample ID Method	Perchlorate (µg/L) 314	Chlorate (μg/L) 300.1B	Total Dissolved Chromium (µg/L) 200.8	Hexavalent Chromium (μg/L) 218.7	Total Dissolved Solids (mg/L) SM 2540C
		Screening Level	18 μg/L	1,000	100 μg/L	100 μg/L	500 mg/L
Well ID	Sample Date	Source	BCL	BCL	MCL	BCL	2nd MCL
AA-30	07/08/19	AA-30-20190708	3300	9500			
COH-2B1	07/03/19	COH2B1-20190703	1800	790			
LNDMW1	06/28/19	LNDMW1-20190628	1400	3700			
LNDMW2	07/05/19	LNDMW2-20190705	1500	4600		-	
MW-02	07/03/19	MW-02-20190703	1700	2400			
MW-3	07/05/19	MW-3-20190705	2900	6000			
MW-4	07/05/19	MW-4-20190705	2700	5900			
MW-13	06/28/19	MW13-20190628	3100	9400			
MW-20	06/28/19	MW20-20190628	57	46			
MW-25	07/03/19	MW-25-20190703	13	56			
NERT3.35S1	06/26/19	NERT3.35S1-20190626	< 4.8	< 10	0.57J	< 1.00	6900
NERT3.35S1	06/26/19	NERT3.35S1-20190626-FD	< 4.8	< 10	0.64J	< 1.00	6900
NERT3.40S1	06/26/19	NERT3.40S1-20190626	< 4.8	< 20	0.71J	< 1.00	9000
NERT3.58N1	07/02/19	NERT3.58N1-20190702	88	24	1.3J	< 1.00	6600
NERT3.58S1	06/27/19	NERT3.58S1-20190627	1000	2700	5.5	9.09	3400
NERT3.60N1	07/02/19	NERT3.60N1-20190702	57	27	< 0.50	< 1.00	6400
NERT3.60S1	07/01/19	NERT3.60S1-20190701	1600	4900	9.9	14.7	3300
NERT3.63S1	06/27/19	NERT3.63S1-20190627	1200	3900	8.6	8.54	3100
NERT3.80S1	06/27/19	NERT3.80S1-20190627	820	1400		< 1.00	
NERT3.80S1	06/27/19	NERT3.80S1-20190627-FD	820	1400		< 1.00	
NERT3.98S1	06/27/19	NERT3.98S1-20190627	< 4.8	< 20	0.79J	< 1.00	5100
NERT4.21N1	07/02/19	NERT4.21N1-20190702	1800	5500		27.1	
NERT4.38N1	07/02/19	NERT4.38N1-20190702	1500	340		< 1.00	
NERT4.51S1	06/27/19	NERT4.51S1-20190627	2400	8200		36.8	
NERT4.64N1	07/02/19	NERT4.64N1-20190702	500	28	0.55J	< 1.00	2000
NERT4.64N1	07/02/19	NERT4.64N1-20190702-FD	500	28	0.72J	< 1.00	2000
NERT4.64S1	07/01/19	NERT4.64S1-20190701	3200	8900	20	38.2	4900
NERT4.65N1		NERT4.65N1-20190708	470	13	0.59J	< 1.00	2400
NERT4.70N1		NERT4.70N1-20190709	140	< 10	< 0.50	< 1.00	1800
NERT4.71N1	07/09/19	NERT4.71N1-20190709	160	< 10	0.69 J+	< 1.00	1800
NERT4.71S1	07/01/19	NERT4.71S1-20190701	3400	10000		37.4	
NERT4.71S2	07/01/19	NERT4.71S2-20190701	2900	14000	19	26.6	4100
NERT4.93S1	07/01/19	NERT4.93S1-20190701	1800	8600		16.8	
NERT5.11S1	07/01/19	NERT5.11S1-20190701	2300	10000		14.2	

Table 11 Analytical Results of Groundwater Well Sampling July 2019

NERT RI - Downgradient Study Area Henderson, Nevada

		Sample ID	Perchlorate (µg/L)	Chlorate (µg/L)	Total Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L)	Total Dissolved Solids (mg/L)
		Method	314	300.1B	200.8	218.7	SM 2540C
		Screening Level	18 μg/L	1,000	100 μg/L	100 μg/L	500 mg/L
Well ID	Sample Date	Source	BCL	BCL	MCL	BCL	2nd MCL
NERT5.49S1	07/08/19	NERT5.49S1-20190708	13	< 10		< 1.00	
NERT5.91S1	07/01/19	NERT5.91S1-20190701	2800	450		< 1.00	
WMW3.5N	07/05/19	WMW3.5N-20190705	260	300			
WMW3.5S	06/28/19	WMW3.5S-20190628	1300	3500			
WMW3.5S	06/28/19	WMW3.5S-20190628-FD	1300	3400			
WMW4.9N	07/05/19	WMW4.9N-20190705	660	16			
WMW4.9S	07/09/19	WMW4.9S-20190709	850	3000			
WMW5.58S ⁽¹⁾	07/03/19	WMW5.58S-20190703	4000	8000			
WMW5.5S	06/28/19	WMW5.5S-20190628	1000	3500			
WMW5.7N	07/09/19	WMW5.7N-20190709	12	< 10			

⁽¹⁾ Well WMW5.58S is identified as WMW5.7S in the state of Nevada records however, the owner, Southern Nevada Water Authority, prefers to keep analytical data under the WMW5.58S well identification.

BCL - Basic Comparison Level: Residential water basic comparison levels in NDEP July 2017 BCL spreadsheet (NDEP 2017). BCL for MCL - Maximum Contaminant Level: Primary United States Environmental Protections Agency Maximum Contaminant Level (USEPA 40 2nd MCL - Secondary Maximum Contaminant Level: National Secondary Drinking Water Regulations (USEPA, 40 CFR Part 143). Gray Shading - Exceeds screening level.

- -- Not analyzed
- FD field duplicate
- ND not detected above the sample quantitation limit (SQL). The SQL is the method detection limit adjusted for dilutions etc.
- J Result is less than the Practical Quantitation Limit but greater than or equal to the Sample Quantitation Limit and the concentration is an approximate value. The J flag may also indicate the result is estimated due to QC outliers.
- J+ The result is an estimated detection with a potential high bias.
- µg/L Micrograms per liter
- mg/L Milligrams per liter

Table 12 Analytical Results of Groundwater Well Sampling April and May 2016, July 2018, and July 2019

							Chloride /	Dissolved	Hexavalent	Total Dissolved
		Sample ID	Perchlorate	Chlorate	Chloride	Bromide	Bromide	Chromium	Chromium	Solids
		Campio 12	(µg/L)	(µg/L)	(mg/L)	(mg/L)	Ratio	(µg/L)	(µg/L) ⁽²)	(mg/L)
		Method	314	300.1B	300.0	300.0	110.0.0	200.8	218.7	SM 2540C
		Screening Level	18 μg/L	1,000	250 mg/L	11.3		100 μg/L	100 μg/L	500 mg/L
Well ID	Sample Date	Source	BCL	BCL	2nd MCL	BCL		MCL	BCL	2nd MCL
AA-30		AA-30-20160422	4400	14000	1300	<5.0	>260	49	46	6900
AA-30		AA-30-20180713	3900	9400						
AA-30		AA-30-20190708	3300	9500						
COH-2B1		COH2B1-20160421	5600	8900	1100	<2.5	>440	6.8	9.0	4800
COH-2B1		COH2B1-20180713	1600	1000						
COH-2B1		COH2B1-20190703	1800	790						
LNDMW1		LNDMW1-20160422	1900	4800	680	<2.5	>272	14	21	4100
LNDMW1		LNDMW1-20180711	1600	4700						
LNDMW1		LNDMW1-20190628	1400	3700						
LNDMW2		LNDMW2-20160427	1500	4300	470	3.5 J-	134	5.1 J	8.0	3000
LNDMW2	7/17/2018	LNDMW2-20180717	1700	6000						
LNDMW2	7/5/2019	LNDMW2-20190705	1500	4600						
MW-02	4/28/2016	MW-02-20160428	2100	2800	380 J-	<1.3	>292	8.6 J	12	3800
MW-02	7/12/2018	MW-02-20180712	1900	2600						
MW-02	7/12/2018	MW-02-20180712-FD	1900	2600						
MW-02	7/3/2019	MW-02-20190703	1700	2400						
MW-13	4/21/2016	MW-13-20160421	3800	15000	860	<2.5	>344	48	39	5100
MW-13	7/12/2018	MW-13-20180712	3700	14000						
MW-13	6/28/2019	MW13-20190628	3100	9400						
MW-20	4/22/2016	MW-20-20160422	160	120	970	<2.5	>388	<1.0	< 1.00	4600
MW-20	7/12/2018	MW-20-20180712	48	78 J						
MW-20	6/28/2019	MW20-20190628	57	46						
MW-25		MW-25-20160421	4.7	ND (<50)	490	<1.3	>377	15	20	3400
MW-25		MW-25-20180712	4.3 F1	57						
MW-25		MW-25-20190703	13	56						
MW-3		MW-3-20160426	2300	4600	610	<2.5	>244	16 J	17	4600
MW-3		MW-3-20180712	3300	6200						
MW-3		MW-3-20190705	2900	6000						
MW-4		MW-4-20160426	2600	5200	610	<2.5	>244	17 J	19	4500
MW-4	7/12/2018	MW-4-20180712	3000	5900						
MW-4		MW-4-20190705	2700	5900						
NERT3.35S1		NERT3.35S1-20190626	< 4.8	< 10				0.57	< 1.00	6900
NERT3.35S1		NERT3.35S1-20190626-FD	< 4.8	< 10				0.64	< 1.00	6900
NERT3.40S1		NERT3.40S1-20190626	< 4.8	< 20				0.71	< 1.00	9000
NERT3.58N1	_	NERT3.58N1-20190702	88	24				1.3	< 1.00	6600
NERT3.58S1		NERT3.58S1-20190627	1000	2700				5.5	9.09	3400
NERT3.60N1		NERT3.60N1-20190702	57	27				< 0.50	< 1.00	6400
NERT3.60S1		NERT3.60S1-20190701	1600	4900				9.9	14.7	3300
NERT3.63S1		NERT3.63S1-20190627	1200	3900				8.6	8.54	3100
NERT3.80S1		NERT3.80S1-20180709	1100	1700	480	<2.5	>192	1.8 J		3100
NERT3.80S1		NERT3.80S1-20190627	820	1400					< 1.00	
NERT3.80S1	6/27/2019	NERT3.80S1-20190627-FD	820	1400					< 1.00	

Table 12 Analytical Results of Groundwater Well Sampling April and May 2016, July 2018, and July 2019

	1		1			Ι	Chloride /	Dissolved	Hexavalent	Total Dissolved
		Sample ID	Perchlorate	Chlorate	Chloride	Bromide	Bromide	Chromium	Chromium	Solids
		Sample 15	(µg/L)	(µg/L)	(mg/L)	(mg/L)	Ratio	(µg/L)	(µg/L) ⁽²)	(mg/L)
		Method	314	300.1B	300.0	300.0	ratio	200.8	218.7	SM 2540C
		Screening Level	18 μg/L	1,000	250 mg/L	11.3		100 μg/L	100 μg/L	500 mg/L
Well ID	Sample Date	Source	BCL	BCL	2nd MCL	BCL		MCL	BCL	2nd MCL
NERT3.98S1		NERT3.98S1-20190627	< 4.8	< 20				0.79	< 1.00	5100
NERT4.21N1		NERT4.21N1-20180716	2200	6800	570	<2.5	>228	15	< 1.00 	4000
NERT4.21N1		NERT4.21N1-20190702	1800	5500		~2.0			27.1	
NERT4.38N1		NERT4.38N1-20180716	1400	300	510	<2.5	>204	2.5 B		3600
NERT4.38N1		NERT4.38N1-20190702	1500	340					< 1.00	
NERT4.51S1		NERT4.51S1-20180710	3100	10000	710	<2.5	>284	19		4900
NERT4.51S1		NERT4.51S1-20190627	2400	8200					36.8	
NERT4.64N1		NERT4.64N1-20190702	500	28				0.55	< 1.00	2000
NERT4.64N1		NERT4.64N1-20190702-FD	500	28				0.72	< 1.00	2000
NERT4.64S1		NERT4.64S1-20190701	3200	8900				20	38.2	4900
NERT4.65N1		NERT4.65N1-20190708	470	13				0.59	< 1.00	2400
NERT4.70N1		NERT4.70N1-20190709	140	< 10				< 0.50	< 1.00	1800
NERT4.71N1	7/9/2019	NERT4.71N1-20190709	160	< 10				0.69 J+	< 1.00	1800
NERT4.71S1	7/10/2018	NERT4.71S1-20180710	3800	14000	830	<5.0	>166	26		5200
NERT4.71S1		NERT4.71S1-20190701	3400	10000					37.4	
NERT4.71S2	7/1/2019	NERT4.71S2-20190701	2900	14000				19	26.6	4100
NERT4.93S1	7/10/2018	NERT4.93S1-20180710	3900	19000	770	<2.5	>308	15		4300
NERT4.93S1	7/10/2018	NERT4.93S1-20180710-FD	3900	18000	770	<2.5	>308	14	-	4300
NERT4.93S1		NERT4.93S1-20190701	1800	8600					16.8	
NERT5.11S1		NERT5.11S1-20180710	6000	25000	910	<2.5	>364	13		4700
NERT5.11S1		NERT5.11S1-20190701	2300	10000					14.2	
NERT5.49S1		NERT5.49S1-20180716	5.1	<100	250	0.27 J	>228	1.3 J B		1400
NERT5.49S1		NERT5.49S1-20190708	13	< 10					< 1.00	
NERT5.91S1		NERT5.91S1-20180716	2900	660	570	<2.5	>228	1.5 J B		3100
NERT5.91S1		NERT5.91S1-20190701	2800	450					< 1.00	
WMW3.5N		WMW3.5-N-20160427	340	480	1000	<2.5	>400	<5.0	<1.00	5200
WMW3.5N		WMW3.5N-20160427-FD	360	480	1000	<2.5	>400	<5.0	<1.00	5100
WMW3.5N		WMW3.5N-20180717	320	640						
WMW3.5N		WMW3.5N-20190705	260	300						
WMW3.5S		WMW3.5S-20160428	1400	3800	480	3.2	150	9.9 J	9.9	3100
WMW3.5S		WMW3.5S-20180716	1500	3900						
WMW3.5S		WMW3.5S-20190628	1300	3500						
WMW3.5S		WMW3.5S-20190628-FD	1300	3400	400					
WMW4.9N		WMW4.9N-20160427	890	ND (<200)	400	<1.3	>103	<5.0	<1.00	2600
WMW4.9N		WMW4.9N-20180717	680	13 J						
WMW4.9N WMW4.9S		WMW4.9N-20190705 WMW4.9S-20160422	660 270	16 580	290 J-	<0.50	 >580	<1.0	2.0	1500
WMW4.9S		WMW4.9S-20180713	930	2700	290 J- 	<0.50	>580	<1.0	2.0	1500
WMW4.9S		WMW4.9S-20180713-FD	900	2700						
WMW4.9S		WMW4.9S-20190709	850	3000						
						17	100	 -0 F0	-1.00	1000
WMW5.58S ⁽¹⁾	5/5/2016	WMW5.58S-20160505	510	<50	320	1.7	188	<0.50	<1.00	1800

Table 12

Analytical Results of Groundwater Well Sampling April and May 2016, July 2018, and July 2019

NERT RI - Downgradient Study Area Henderson, Nevada

		Sample ID	Perchlorate (μg/L)	Chlorate (µg/L)	Chloride (mg/L)	Bromide (mg/L)	Chloride / Bromide Ratio	Dissolved Chromium (µg/L)	Hexavalent Chromium (µg/L) ⁽²)	Total Dissolved Solids (mg/L)
		Method	314	300.1B	300.0	300.0		200.8	218.7	SM 2540C
		Screening Level	18 μg/L	1,000	250 mg/L	11.3		100 μg/L	100 μg/L	500 mg/L
Well ID	Sample Date	Source	BCL	BCL	2nd MCL	BCL		MCL	BCL	2nd MCL
WMW5.58S ⁽¹⁾	7/13/2018	WMW5.58S-20180713	2500	3200						
WMW5.58S ⁽¹⁾	7/3/2019	WMW5.58S-20190703	4000	8000						
WMW5.5S	4/22/2016	WMW5.5S-20160422	3200	6400	570	2.2 J	259	<1.0	3.0	2800
WMW5.5S	7/13/2018	WMW5.5S-20180713	3100	11000						
WMW5.5S	6/28/2019	WMW5.5S-20190628	1000	3500						
WMW5.7N	4/28/2016	WMW5.7N-20160428	4.8	<50	280	1.6	175	<5.0	<1.00	1500
WMW5.7N	7/17/2018	WMW5.7N-20180717	3.9 J F1	<100						
WMW5.7N	7/9/2019	WMW5.7N-20190709	12.0	< 10						

Notes:

Gray Shading - Value equals or exceeds screening level

- (1) Well WMW5.58S is identified as WMW5.7S in the state of Nevada records however, the owner, Southern Nevada Water Authority, prefers to keep analytical data under the WMW5.58S well identification
- (2) Based on discussion with Silver State Laboratory, the limit for some 2016 samples was changed from previous reports. The reporting limit (1.0 ug/L) more accurately reflects sample analysis than the historically reported detection limit (0.09 ug/L).
- BCL Basic Comparison Level: Residential water basic comparison levels in NDEP July 2017 BCL spreadsheet (NDEP 2017). BCL for perchlorate is identified as 18 µg/L to be consistent with the Nevada Interim Action Level.
- MCL Maximum Contaminant Level: Primary United States Environmental Protections Agency Maximum Contaminant Level (USEPA 40 CFR Part 141).

2nd MCL - Secondary Maximum Contaminant Level: National Secondary Drinking Water Regulations (USEPA, 40 CFR Part 143).

Bold Values - Constituent was detected at reportable concentration by the laboratory.

- -- Not analyzed
- < : Less than the method detection limit.
- >: Greater than than the value shown.
- B Compound was found in the blank and sample
- F1 Matrix spike and/or matrix spike duplicate recovery is outside acceptable limits
- FD Field duplicate
- J Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
- J- Estimated The associated numerical value is an estimated quantity with a negative bias. The analyte was detected but the reported value may not be accurate or precise.
- J+ Estimated The associated numerical value is an estimated quantity with a positive bias. The analyte was detected but the reported value may not be accurate or precise.
- µg/L Micrograms per liter
- mg/L Milligrams per liter

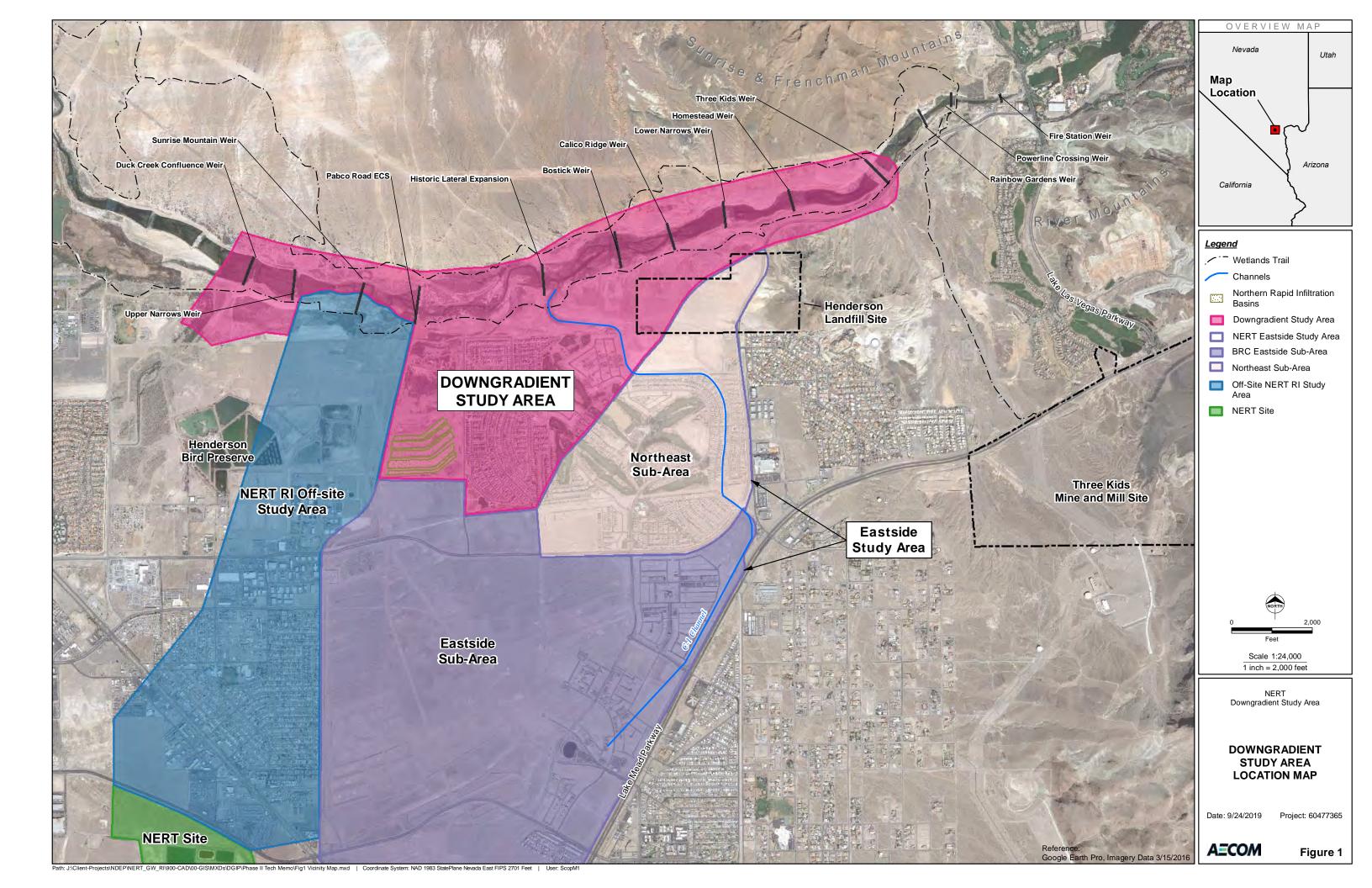
Table 13 Achievement of Investigation Objectives and Potential Future Work

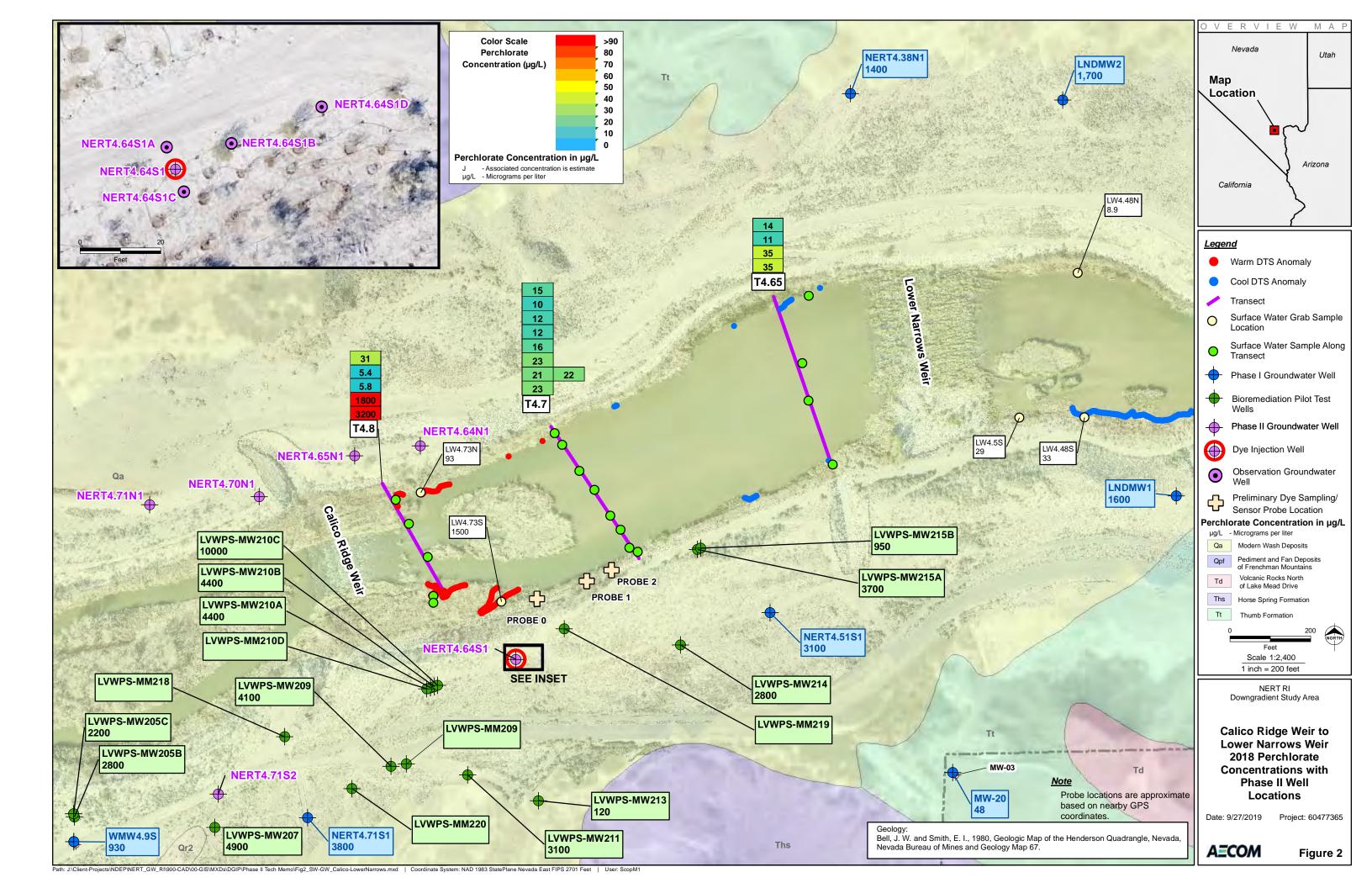
Investigation Objective	Achievement of Objective	Potential Future Work
1) Where are the high concentration (1,000 µg/L or	The Phase I and Phase II wells and the LVW Bioremediation	Additional wells to define perchlorate
higher) perchlorate-impacted groundwater plumes?	Pilot Study wells provided further definition of the high	impacts on the north side of LVW.
	concentration (>1,000 µg/L) perchlorate-impacted groundwater plumes on the north and south sides of LVW.	
	planes on the north and south sides of LVVV.	
	Data gaps remain the north side of LVW.	
2) Why are there noticeable differences in	High variability in perchlorate concentrations indicates	None.
perchlorate concentrations in groundwater over relatively short distances?	separate discrete flow zones within the alluvium.	
	Surface water mixing with groundwater in some areas may	
	dilute the perchlorate concentrations.	
3) How deep are the high concentration perchlorate-	High perchlorate concentrations at depths <90 feet bgs are	Additional deeper wells are needed to
impacted groundwater plumes?	well defined	further define the extent of perchlorate
	Data was a serie for days a serie book at a serie 'finally and the	impacts below 100 feet bgs.
	 Data gaps remain for deeper groundwater specifically south of Calico Ridge Weir 	
	· ·	
4) Do the high-concentration perchlorate plumes	Distinct water-bearing zones have been identified through	None.
follow distinct water-bearing zones within the alluvium or bedrock formations?	NMR logging in individual wells but these zones were not identified as being continuous between wells.	
alluvium of bedrock formations?	lideritined as being continuous between wells.	
	Results of tracer tests indicate that specific flow zones do	
	not conform to the generally observed groundwater gradient.	
5) Where does faulting affect the movement of high-	The LVW Bioremediation Pilot Study indicates faulting	Additional studies are needed to define
concentration perchlorate-impacted groundwater?	affects the movement of groundwater between Calico Ridge	the effect faulting has on perchlorate
	Weir and Lower Narrows weir.	movement.
	Prior geotechnical studies, the observed seeps and the	
	Phase I and II assessments indicate faulting affects	
	groundwater movement at Three Kids Weir and between Three	
	Kids and Rainbow Gardens Weirs.	
6) Along the LVW, does groundwater flow generally	The potentiometric surface of the groundwater generally	Continue to obtain and evaluate
in the same direction as the surface water?	follows the surface water direction.	transducer data.

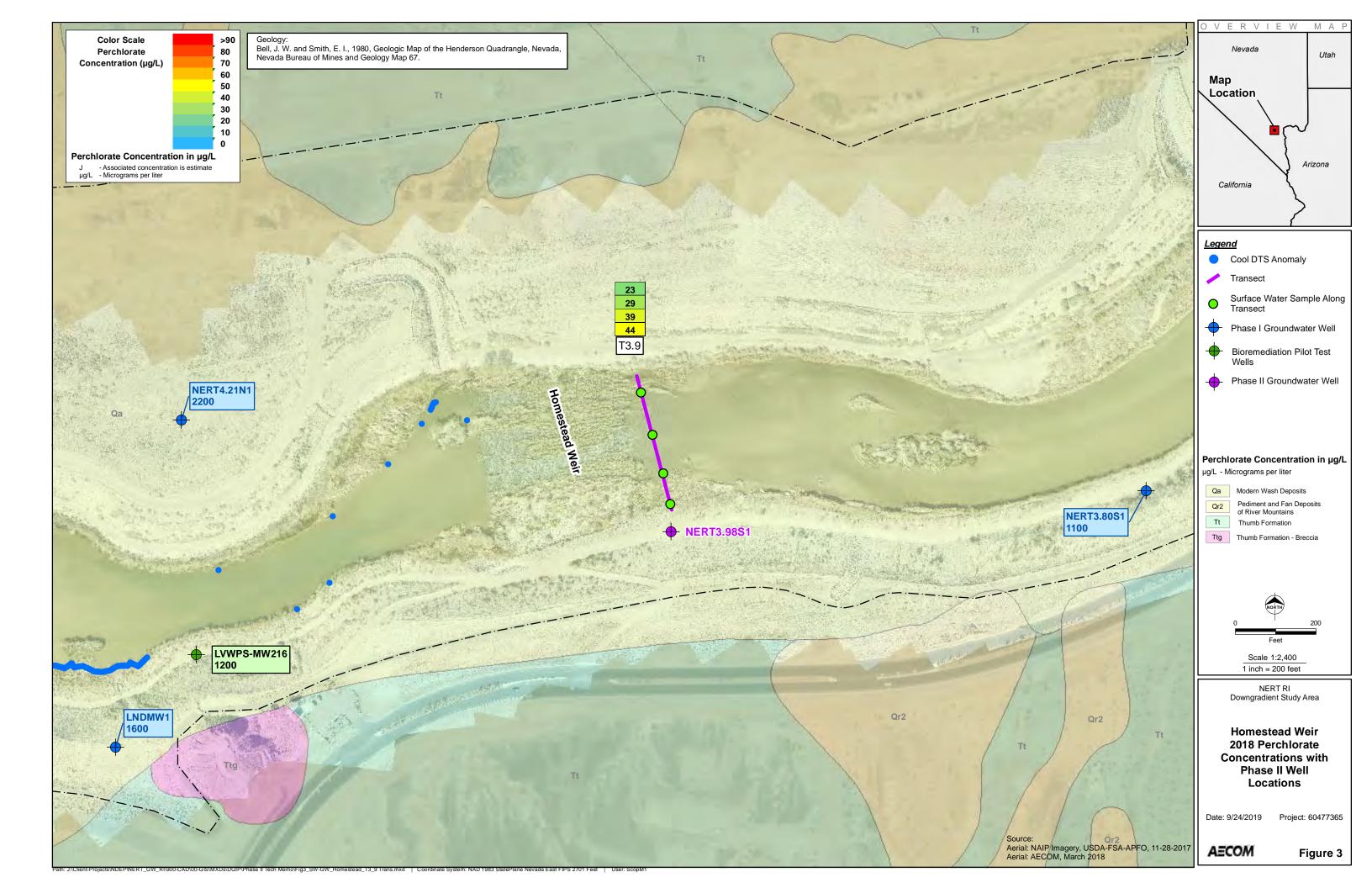
Table 13 Achievement of Investigation Objectives and Potential Future Work

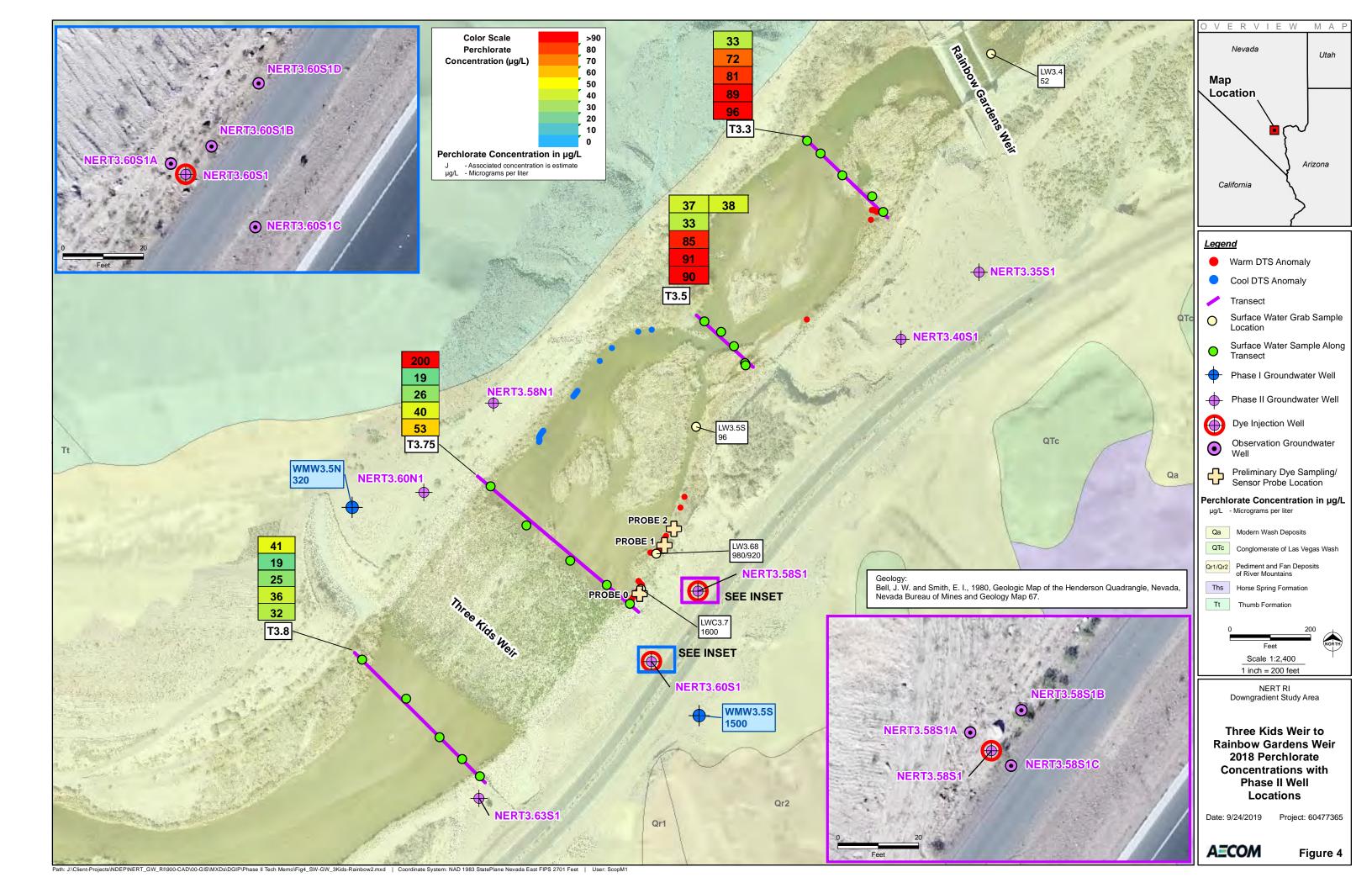
Investigation Objective	Achievement of Objective	Potential Future Work
7) Where does impacted groundwater discharge to the LVW?	 The GW and SW studies show that the main impacted groundwater discharges to LVW occur below Calico Ridge Weir and below Three Kids Weir. Some evidence of more diffuse discharges along other 	None.
	reaches of LVW.	
8) Where is the groundwater/surface water interface and how far is it from the LVW?	• As indicated by total dissolved solids concentrations and temperature variations, the groundwater/surface water interface varies from 0 - 885 feet away from the LVW.	None.
9) Is there an area of known or suspected perchlorate flux of sufficient magnitude where an interim remedial action would be appropriate?	Perchlorate concentrations in Lake Mead are well below NDEP's interim action level, so interim/emergency actions are not needed.	None.
	NERT is completing a pilot study between Bostic and Homestead Weirs that may be considered an interim action.	
	NERT's Annual Remedial Performance Report indicates that the capture zone efficiency of the Seep Well Field is 97.8 percent.	Continue sampling of COH-2B1 is planned. Consider a tracer test to determine the source of perchlorate in this area.
11) Do high volumes of low-concentration, perchlorate-impacted groundwater provide more flux to the LVW than low volumes of high-concentration perchlorate-impacted groundwater?	 Based on surface water data, nearly 45 lb/day (>70%) of perchlorate flux is contributed by two high concentration areas: 22 lb/day at Calico Ridge Weir and ~23 lb/day at Three Kids Weir. 	Refine contribution estimates by 24-hour sampling and time composite load estimates in key locations.
12) Do concentrations of perchlorate in groundwater fluctuate over time, seasonally, or after a rain event?	Comparison of perchlorate concentrations from 17 sampled wells in 2016 and 2018 indicated: • 5 wells changed <10% • 9 wells changed 20-80% • 3 wells changed >200 %.	Continue to evaluate seasonal changes and changes after rain events.

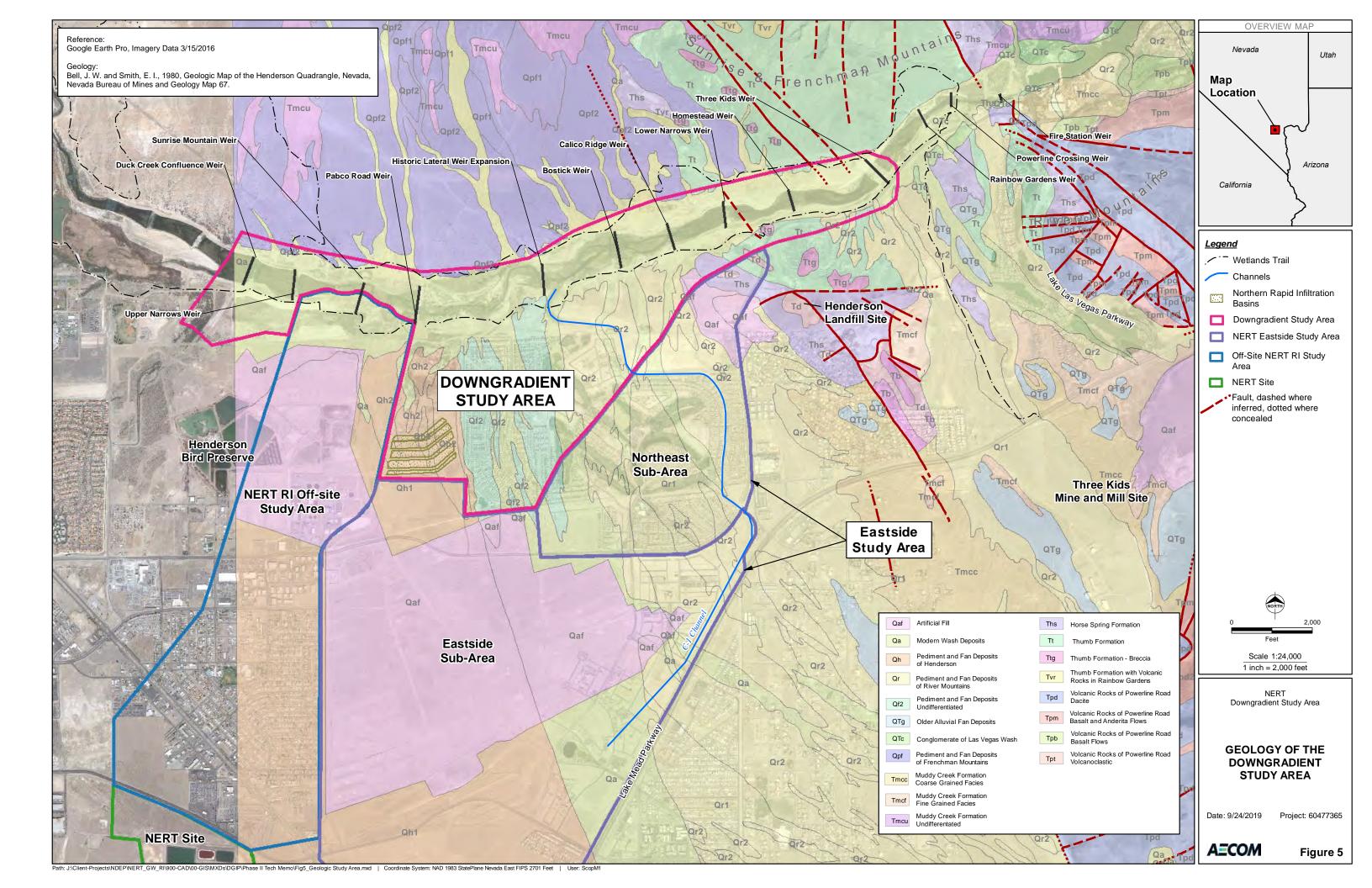
Figures

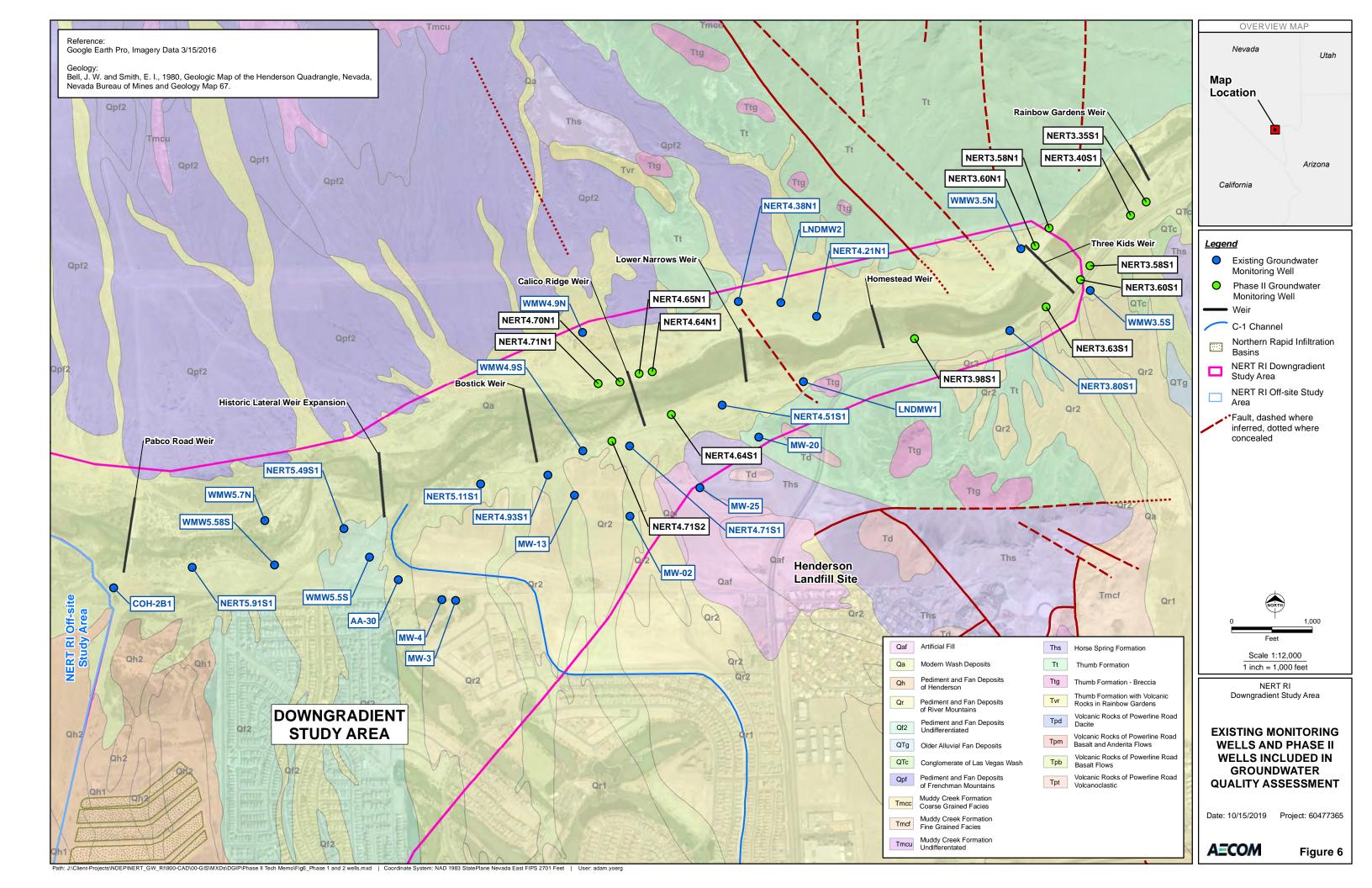


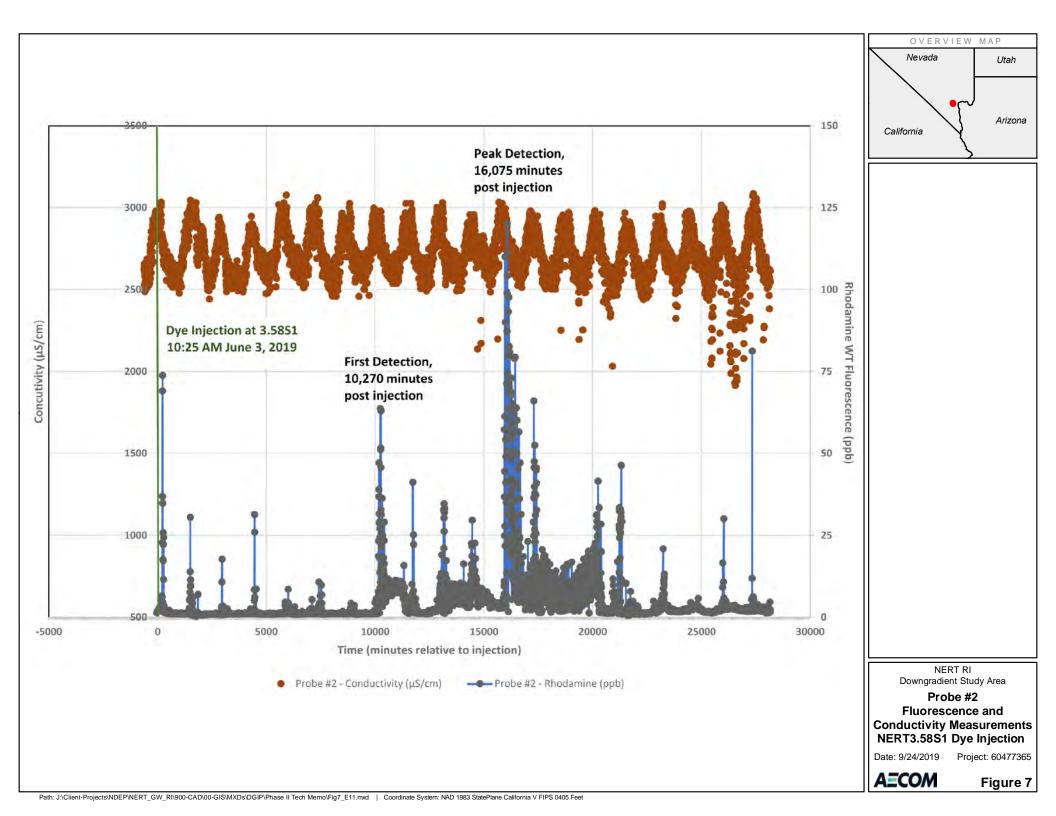


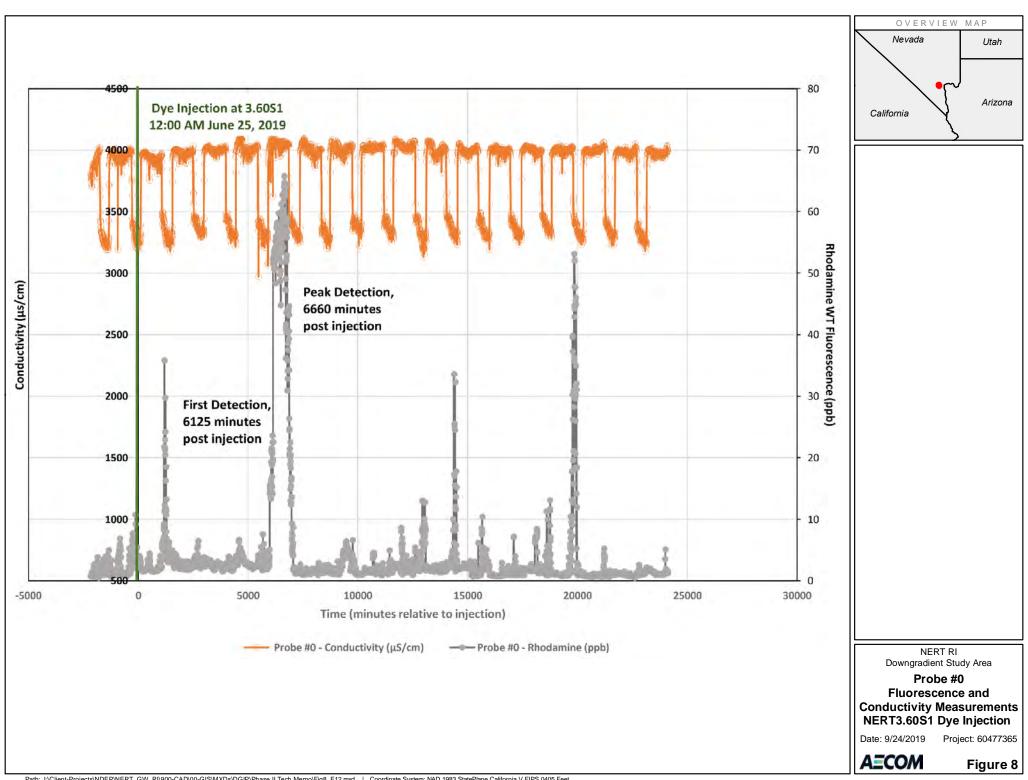








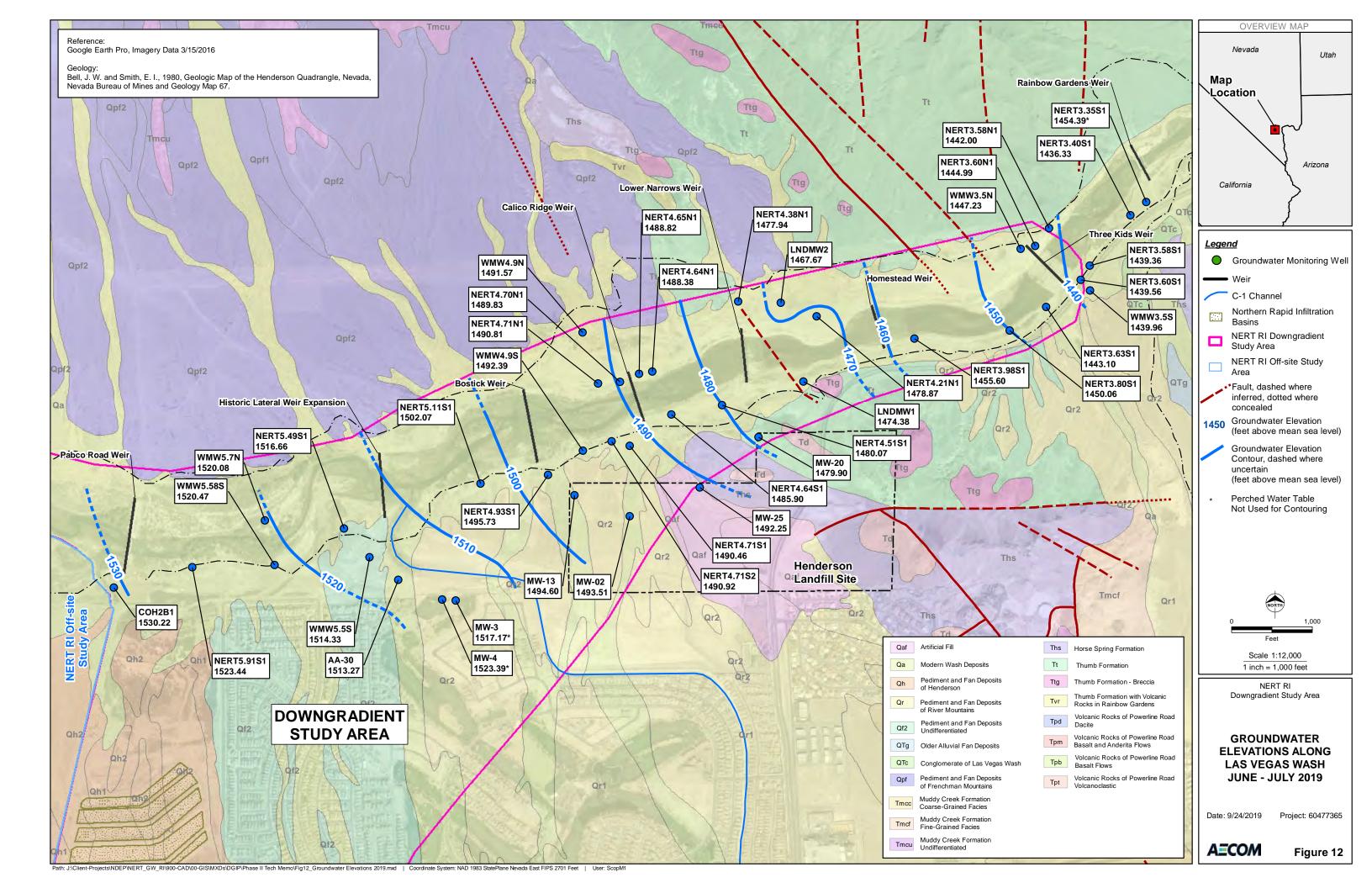


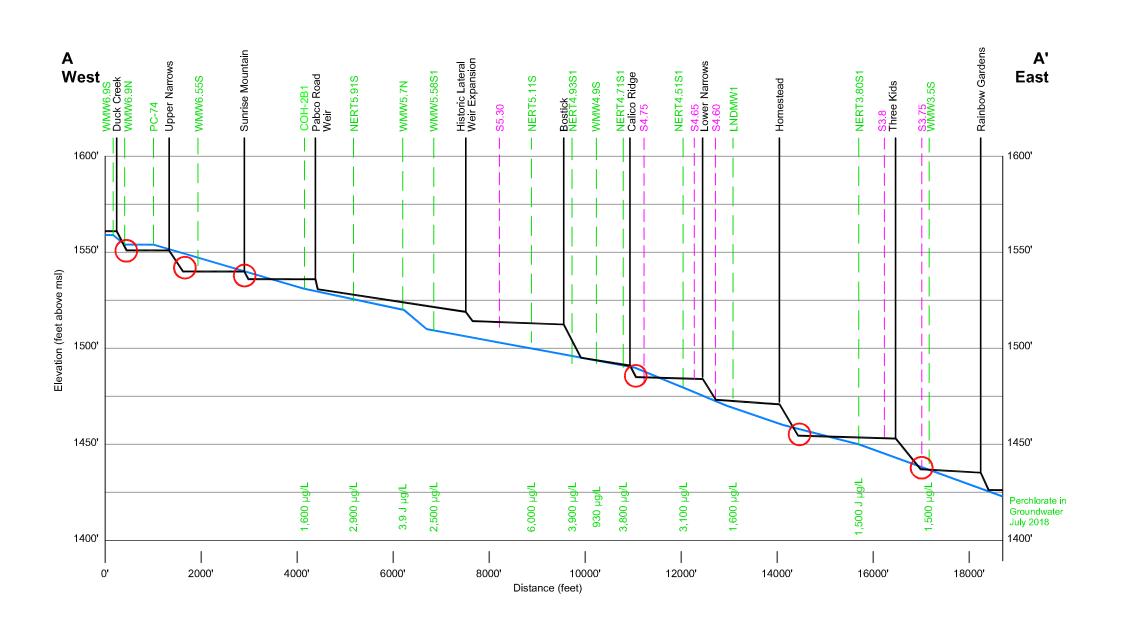














Legend

Surface Water Elevation: Based on AECOM survey of Pabco Road Weir, Las Vegas Wash grade control structures, general elevation information updated 3/22/2018, survey information 6/29/2018, and elevations from Staff Gage Transducers (July 9 to 17, 2018)

Groundwater Elevation: Based on depth to water measurements on (July 9 to 17, 2018).

Location of Surface Water Gage

Location of Transducers in Monitoring Wells

Location of Weir

Area Where Groundwater Elevation is Higher Than Surfacewater Elevation

Groundwater elevations in the vicinity of Historic Lateral Weir Expansion were affected by dewatering activities associated with construction.

> NERT Downgradient Study Area

SCHEMATIC CROSS **SECTION OF SURFACE WATER AND GROUNDWATER ELEVATIONS ALONG** LAS VEGAS WASH 2018

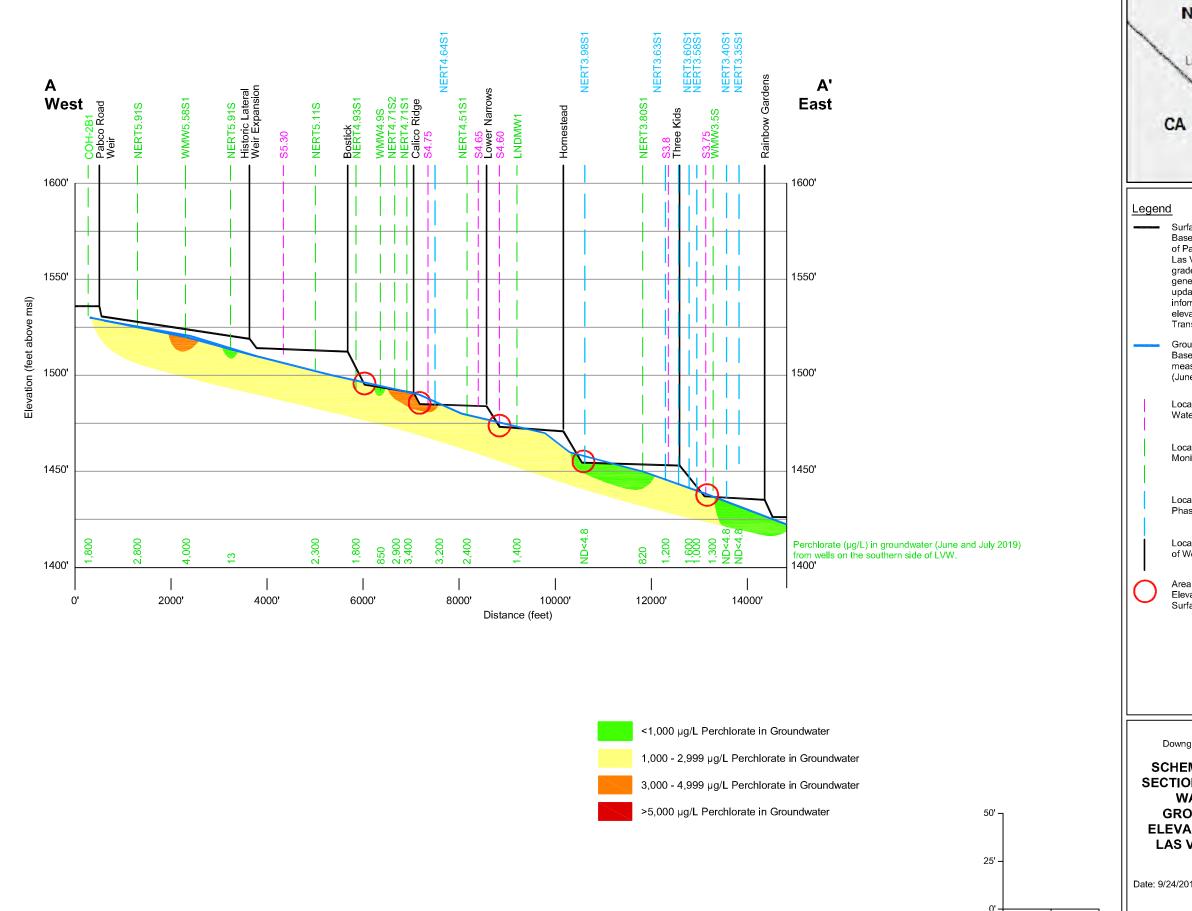
Date: 9/24/2019 Project: 60477365



Figure 13

25' -1000' 2000'

50' -





Surface Water Elevation: Based on AECOM survey of Pabco Road Weir, Las Vegas Wash grade control structures, general elevation information updated 3/22/2018, survey information 6/29/2018, and elevations from Staff Gage Transducers (July 9 to 17, 2018)

Groundwater Elevation: Based on depth to water measurements on (June 26 to July 9, 2019).

Location of Surface Water Gage

Location of Transducers in Monitoring Wells

Location of Transducers in Phase II Monitoring Wells

Location of Weir

> Area Where Groundwater Elevation is Higher Than Surfacewater Elevation

NERT Downgradient Study Area

SCHEMATIC CROSS **SECTION OF SURFACE WATER AND GROUNDWATER ELEVATIONS ALONG** LAS VEGAS WASH 2019

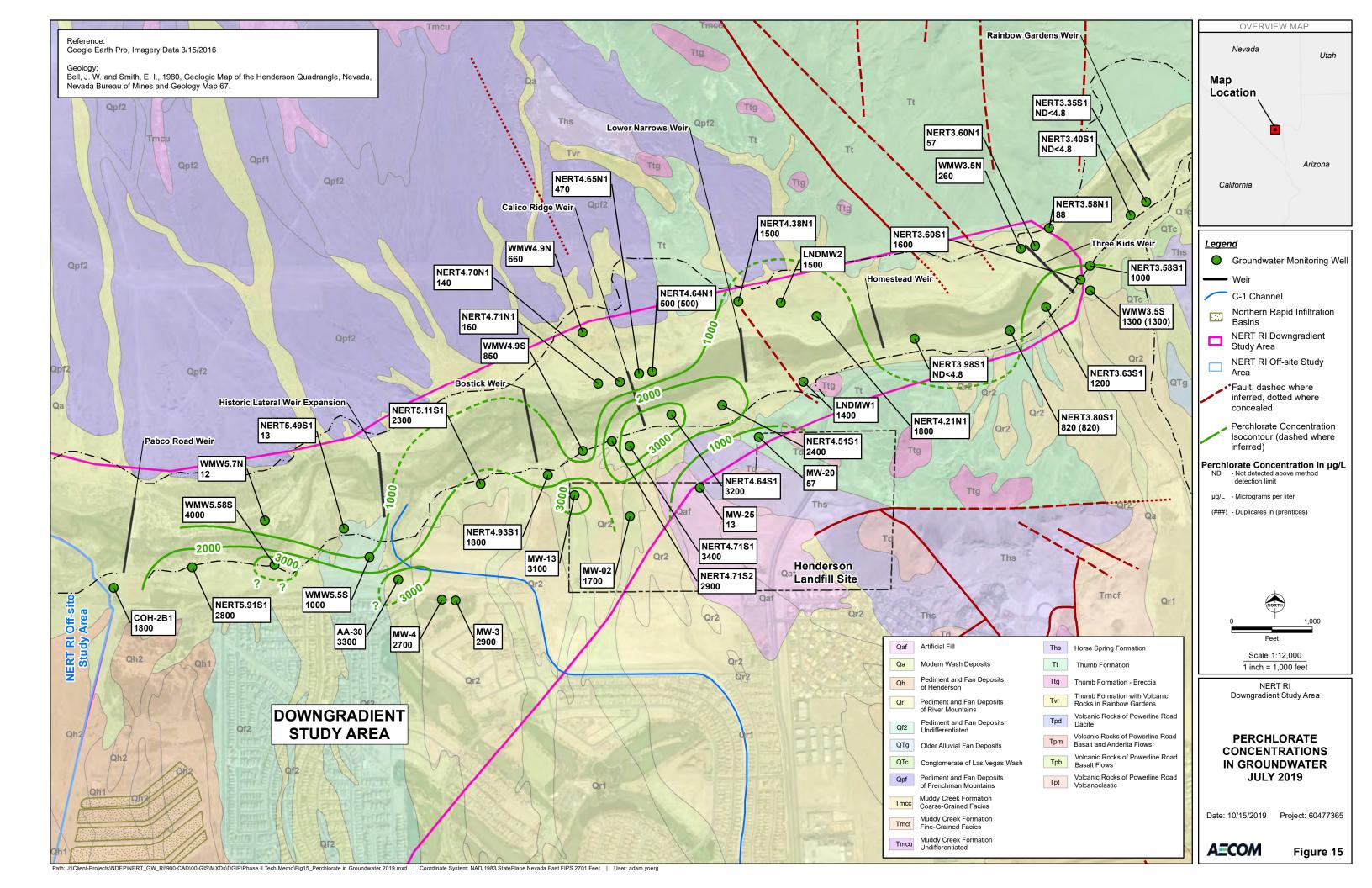
Date: 9/24/2019 Project: 60477365

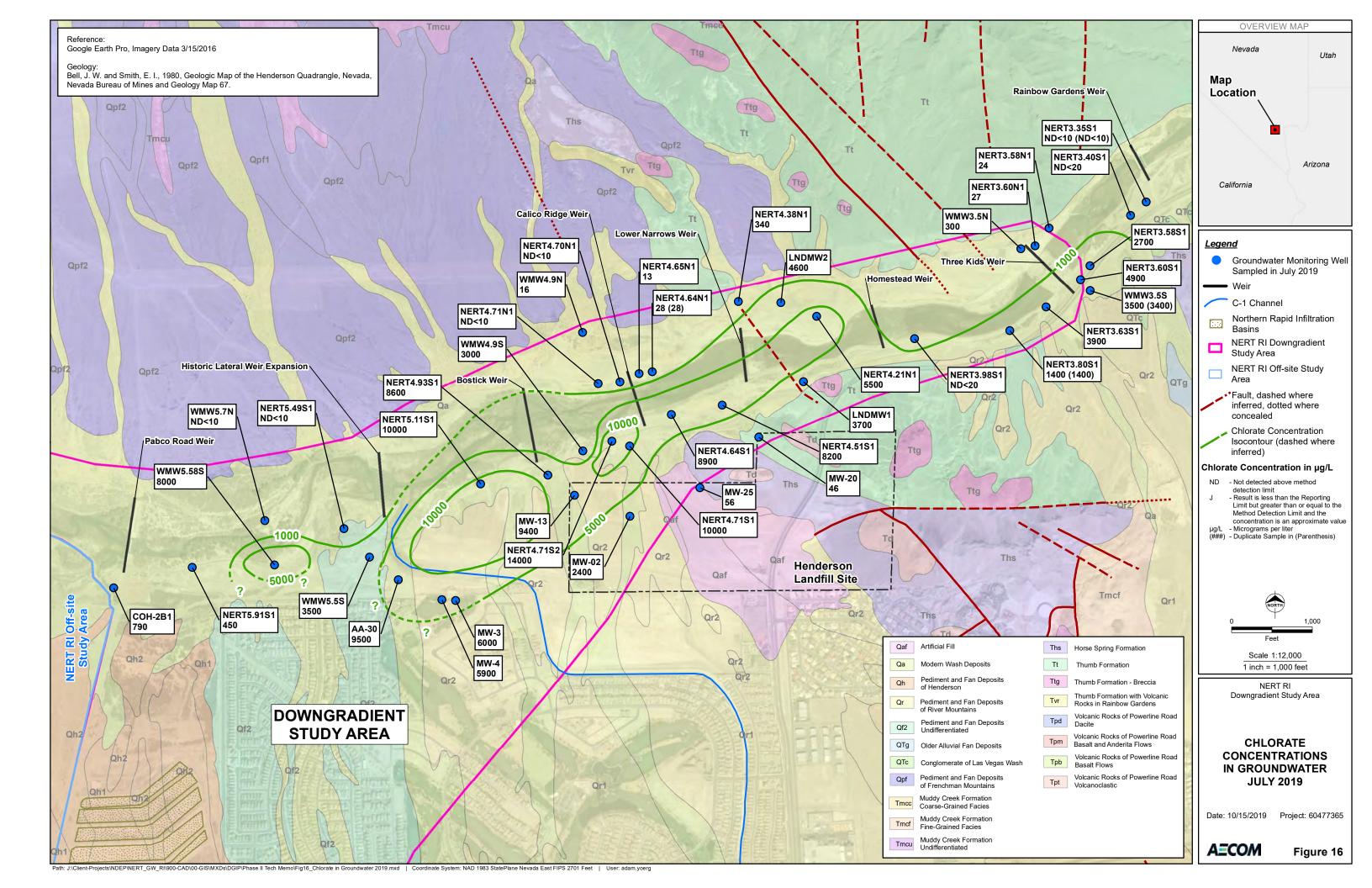


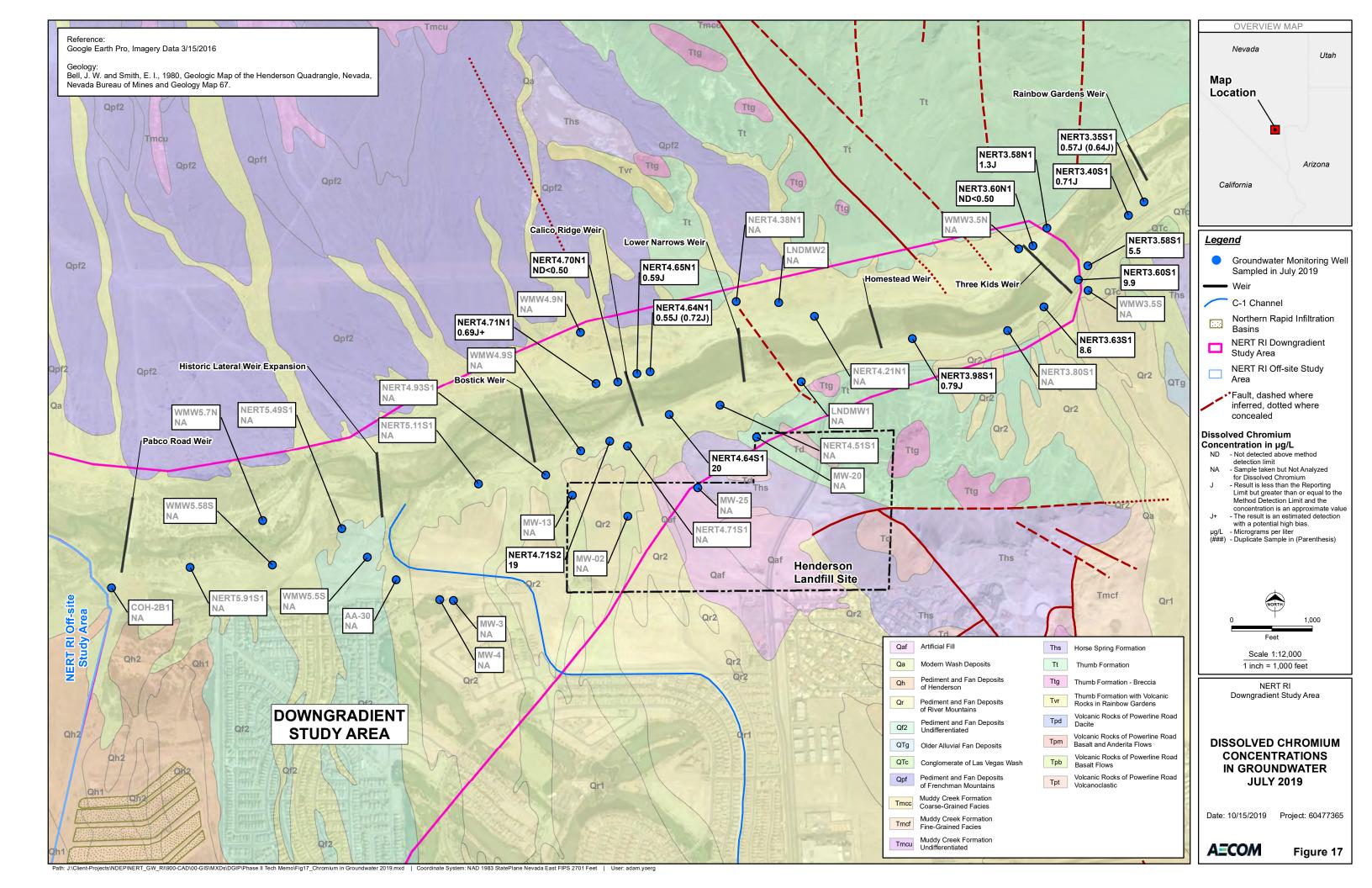
1000'

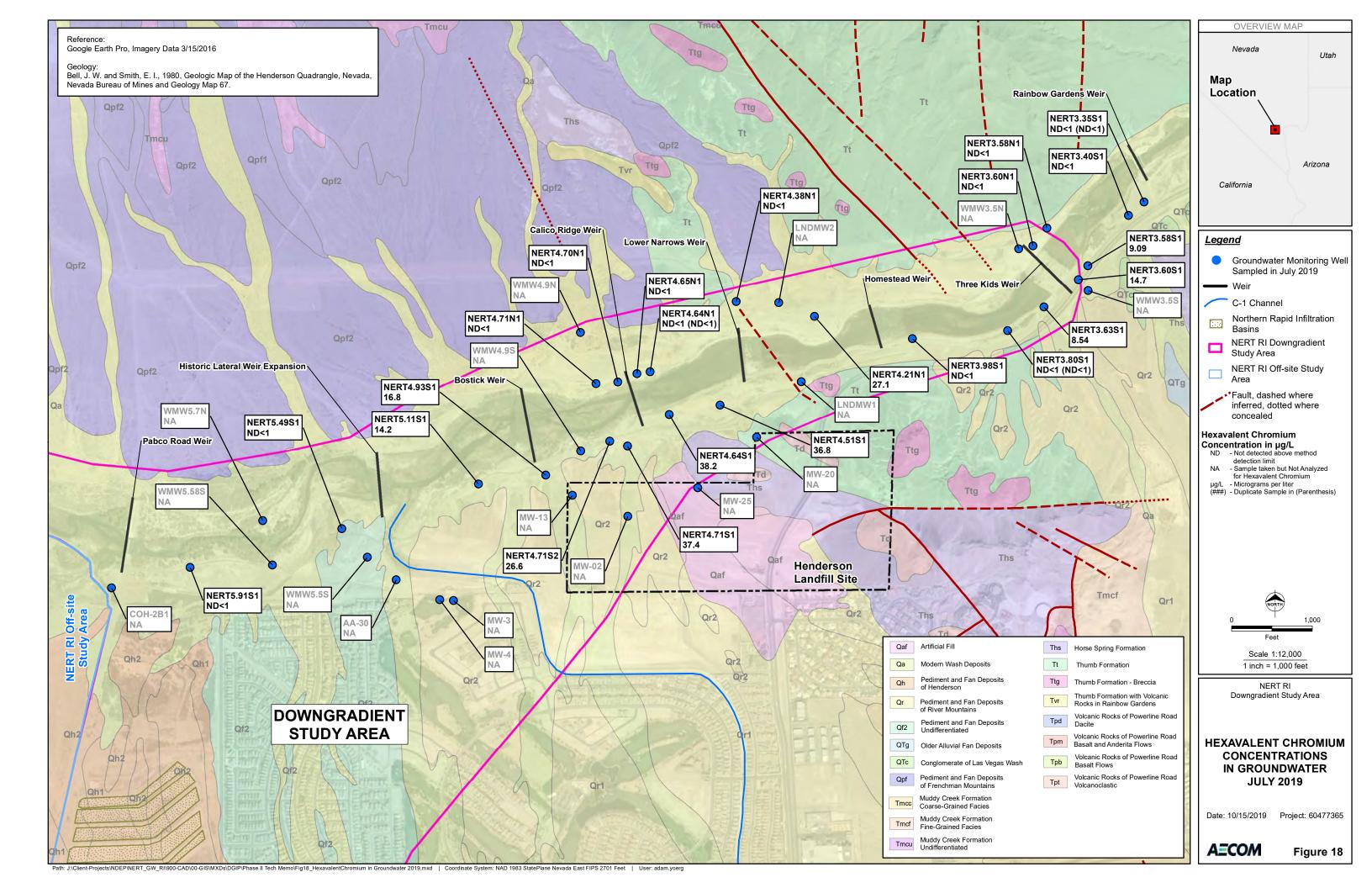
2000'

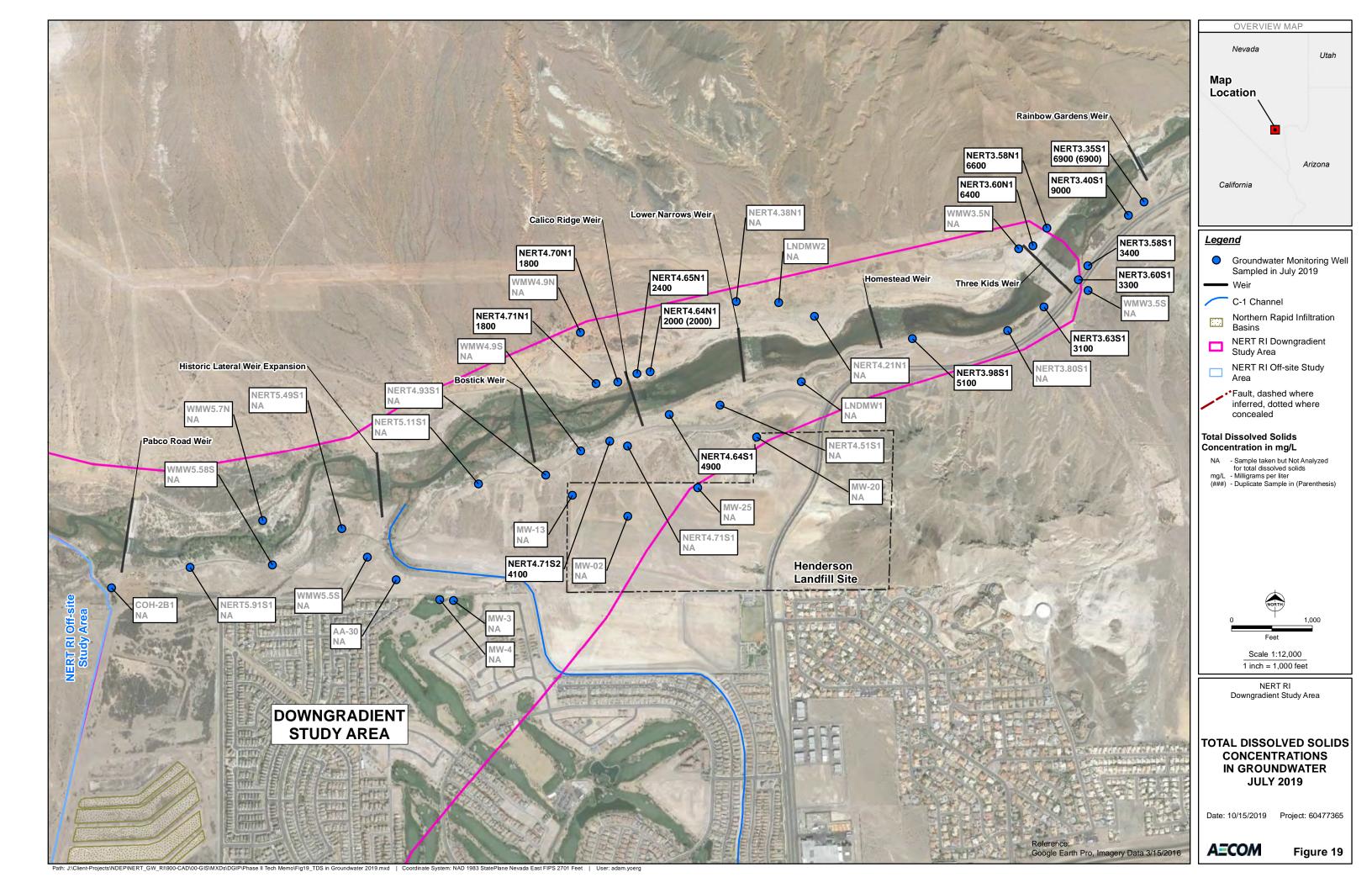
Figure 14

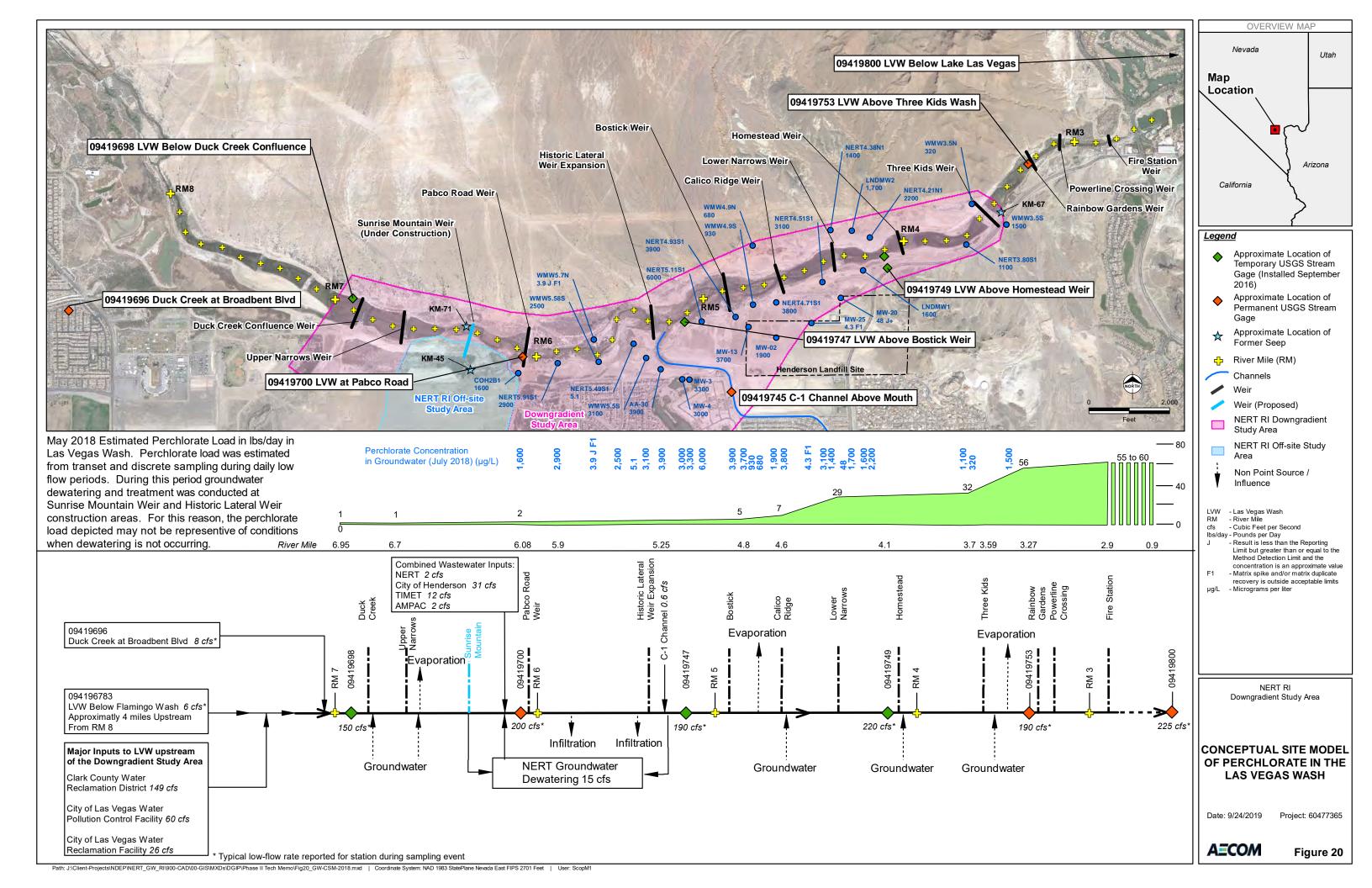


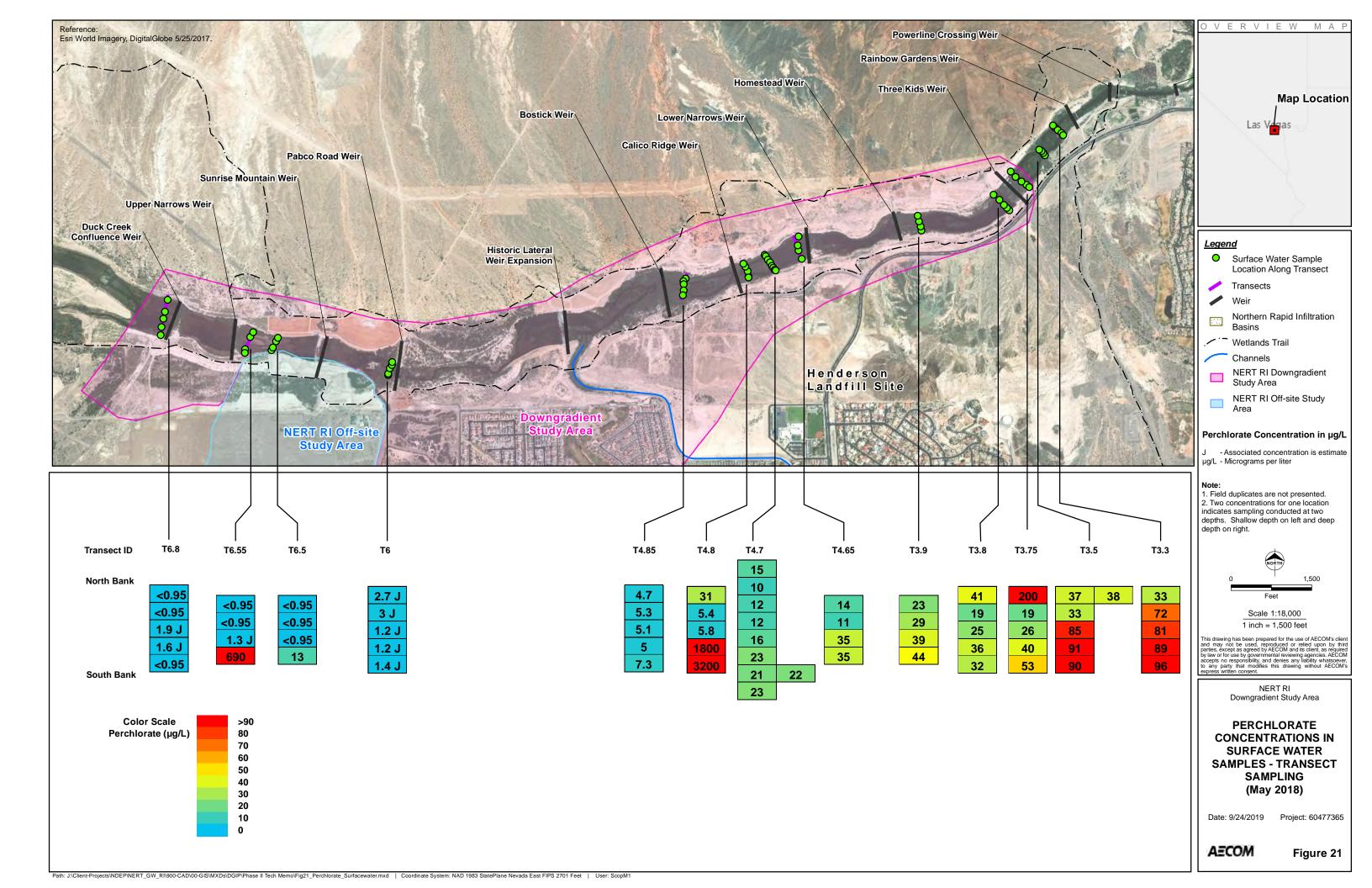


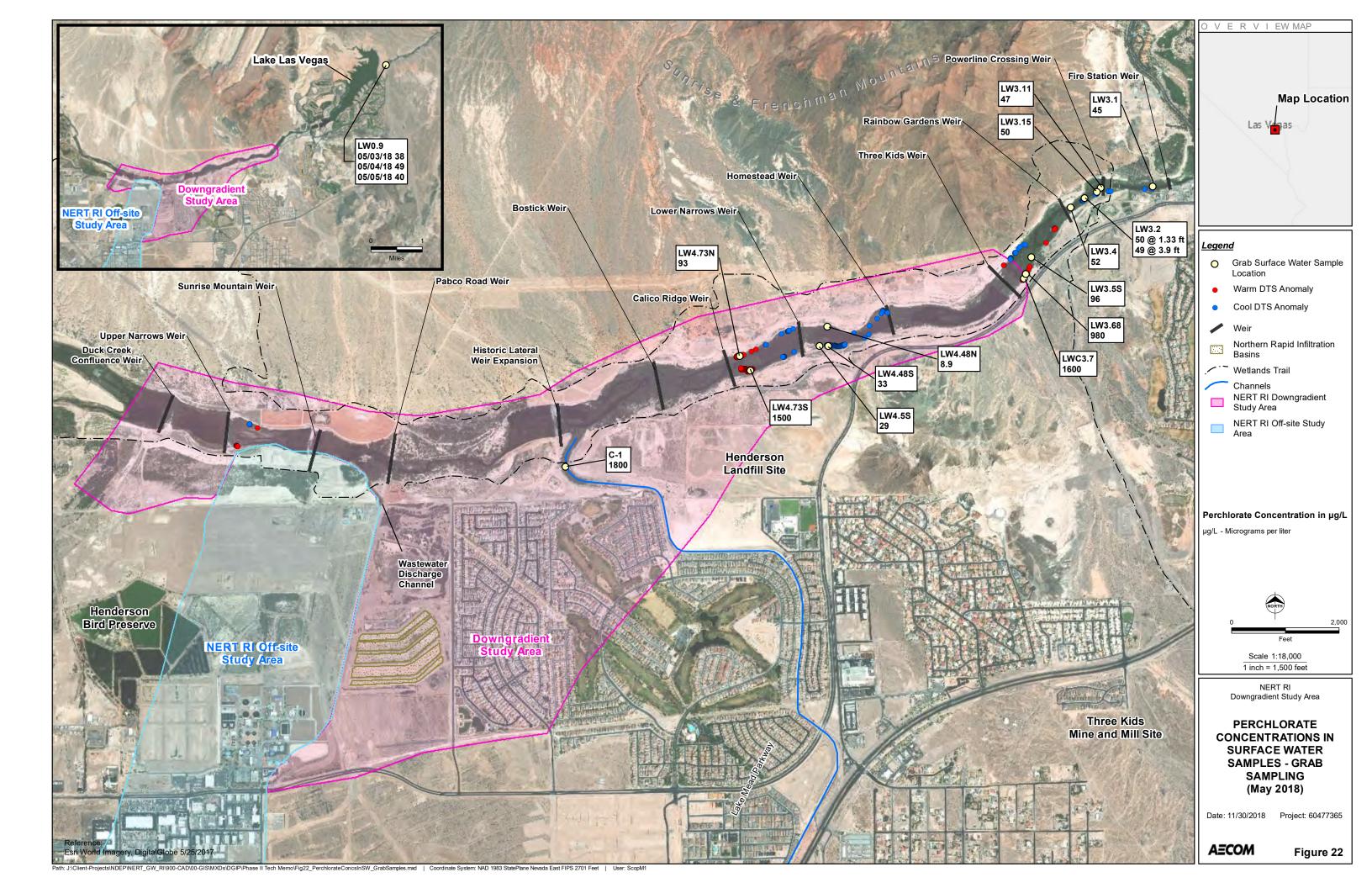


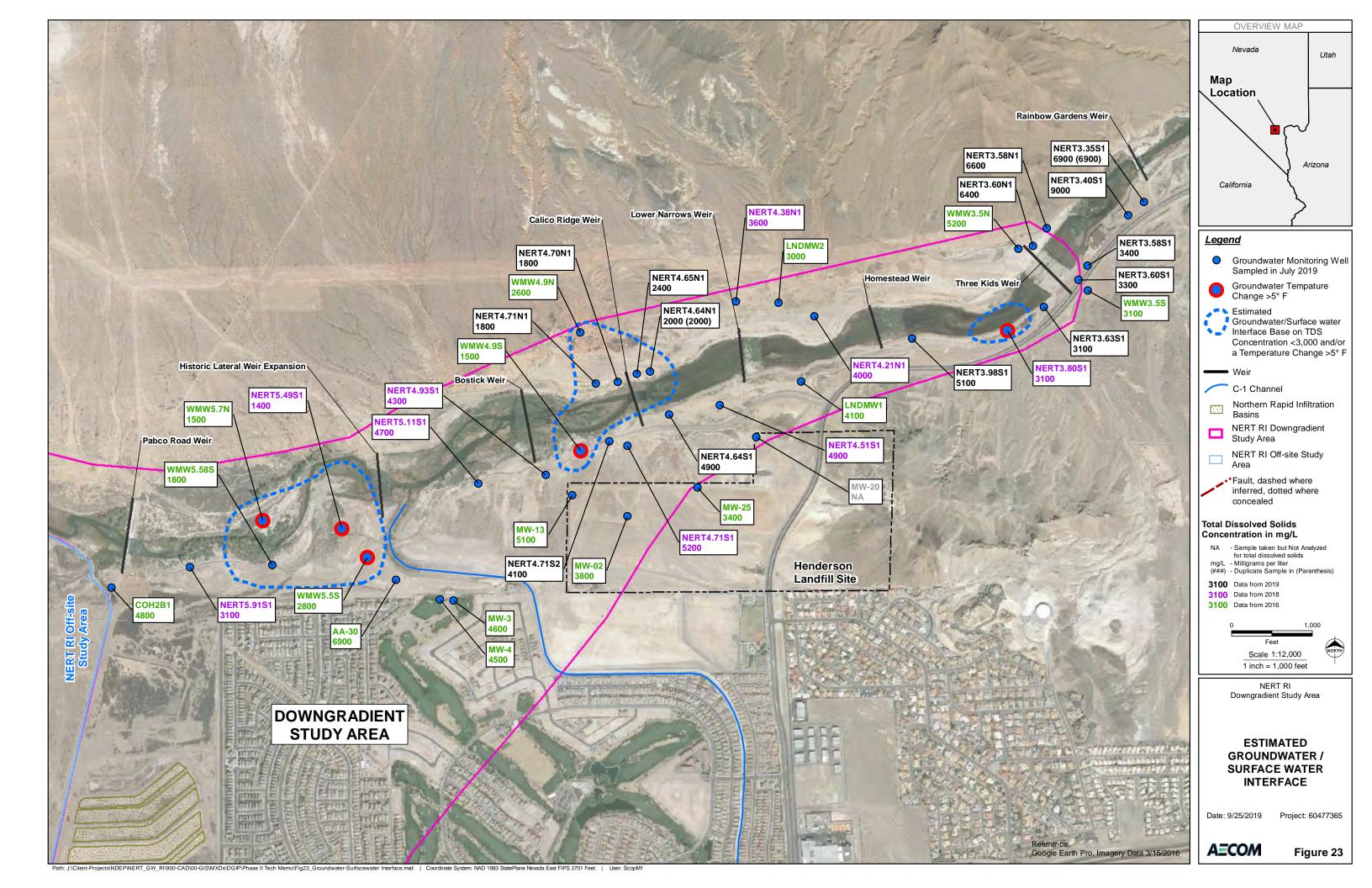












Appendix A

Response to Stakeholder Comments

Memorandum

То	NDEP: Carlton Parker, J.D. Dotchin Pages 3				
CC	AECOM: Carmen Caceres-Schnell				
Subject	Response to Comments – Downgradient Study Area: Final Draft Data Gap Investigation - Phase II Groundwater Quality Assessment Technical Memorandum				
From	AECOM: Sally Bilodeau/ Harry Vandenberg				
Date	October 31, 2019				

This memorandum summarizes AECOM's responses to comments (RTCs) on the Downgradient Study Area (DGS): Final Draft Data Gap Investigation - Phase II Groundwater Quality Assessment Technical Memorandum received from Maria Lopez, Metropolitan Water District of Southern California (MWD), via email dated October 21, 2019. For context of the comments and RTCs, AECOM provided the portions of the text that the comments pertain to in italics, where applicable. Proposed technical memorandum text revisions are also presented in italics. A new table (Table 13) has been prepared in response to Comment 3 and is attached to this RTC memorandum.

General Comments:

Comment 1: The data gaps identified in the Phase II DGI were the same data gaps identified in the Phase I DGI, with the exception of three additional data gaps [1) How deep are the high concentration perchlorate-impacted groundwater plumes?; 2) Where does faulting affect the movement of highconcentration perchlorate-impacted groundwater?; and 3) Do high volumes of low-concentration perchlorate-impacted groundwater provide more flux to the LVW than low volumes of highconcentration perchlorate-impacted groundwater?]. Two of the three new data gaps (#1 and #2) were addressed by the data results from the LVW Bioremediation Study and not the Phase II DGI.

RTC 1: The data gaps were identified jointly with NDEP, NERT, and AECOM at the start of the downgradient investigation in 2016. The subsequent investigations by all parties have been used to efficiently address the data gaps and further the understanding of perchlorate occurrence and movement in the DSA. Refences to studies performed by others are identified, where applicable, in the discussion of each of the individual data gaps. The following sentence was added: As stated in the DGIP, the following data gaps were identified in 2016 and have been assessed or partially addressed through prior investigations conducted in the Downgradient Study Area, including investigation data collected in preparation for the LVW Bioremediation Pilot Study.

Comment 2: For some of the original data gaps, the conclusions presented in the Phase II DGI are the same as those presented in the Phase I DGI, and it is not clear how the additional monitoring work and tracer tests provided a better understanding of the data gap questions. For example, the Phase II DGI confirmed that the perchlorate-impacted groundwater is bypassing the seep well field on its eastern side near monitoring well COH2B1. The Phase II DGI also confirmed the groundwater flow direction is generally the same as the surface water flow direction, east to west, adjacent to the LVW, and the tracer tests only confirmed variability in the groundwater flow directions.

RTC 2: The comment is correct in that the Phase II Groundwater Quality Assessment did not provide additional data that changed the Phase I Groundwater Quality Assessment conclusions for some of the original data gaps, but it did provide further confirmation of those Phase I Groundwater Quality Assessment conclusions. Note that the confirmed groundwater (and surface water) flow direction is

AECOM

from west to east, not east to west as stated in the comment. No change to the Tech Memo is required.

<u>Comment 3:</u> Overall, the Phase II DGI identifies additional data gaps within the Conclusion and Recommendations, and it is not clear how the Phase II DGI further supports the Downgradient Study Area investigation or what additional information is required to further support NERT's completion of the OU-3 RI Report and Feasibility Study. We recommend including an executive summary that clearly identifies the specific findings of the Phase II DGI and the specific data gaps that still need to be addressed to support the OU-3 RI and the groundwater model.

2

<u>RTC 3</u>: Table 13 has been added to the Phase II technical memorandum to clarify where additional work is needed to further address data gaps.

Specific Comments:

1. Section 2.2.6 Groundwater Sampling, page 2-4

<u>Comment 1</u>: This section states that the Phase I wells were analyzed for perchlorate, chlorate, and hexavalent chromium, but the existing wells were only analyzed for perchlorate and chlorate. Please explain why the existing wells were not analyzed for hexavalent chromium.

RTC 1: Consistent with the approved work plan, analysis for hexavalent chromium was not needed in the existing wells because, as shown on Table 12, they had been sampled for hexavalent chromium in 2016. In addition, hexavalent chromium is not widespread in groundwater in the Downgradient Study Area and, where present, it is at concentrations below 50 ug/L. No change to the Tech Memo is required.

2. Section 2.2.12 Deviations from DGIP - Phase II Groundwater Investigation

<u>Comment 2</u>: Item 5 states that Ramboll collected soil property samples, and testing was conducted on 14 samples from 10 boreholes instead of the 40 samples from 14 boreholes included in the work plan. "Based on comparing the soil laboratory test results to the field logging, the analysis of fewer samples has compromised the study." Please explain how and to what extent the study has been compromised (such as whether the entire Phase II DGI has been compromised and, if so, in what way).

RTC 2: The word "not" was inadvertently omitted from the sentence. The text has been changed to: Based on comparing the soil laboratory test results to the field logging, the analysis of fewer samples has not compromised the study.

3. Section 3.8, Dissolved Chromium

<u>Comment 3</u>: This section mentions that none of the dissolved chromium concentrations exceeded the maximum contaminant level for drinking water of 100 μ g/L. This statement should be clarified to explain that U.S. EPA's MCL for total chromium is 100 μ g/L, and California's MCL for total chromium is 50 μ g/L.

RTC 3: The EPA MCL for total chromium applies to drinking water in Nevada. For reference the maximum concentration detected was 46 ug/l as presented in Table 12. No change to the Tech Memo is required.

4. Section 4.3, Perchlorate Patterns and Suspected Discharges with Phase II Updates

<u>Comment 4</u>: The following sentences are on page 4-4: "During January to June 2018 dewatering and treatment was [sic] conducted at Sunrise Mountain Weir and Historic Lateral Weir construction areas. For this reason, the perchlorate load identified may not be representative of conditions when dewatering is not occurring. In addition, groundwater levels within the area of dewatering would not be representative of conditions when dewatering is not occurring." If the identified perchlorate load and groundwater levels may not be representative of conditions when dewatering is not occurring (which is most of the time), please explain how they would be different when dewatering is not

occurring.

RTC 4: Groundwater levels would be higher when dewatering is not occurring. Based on a comparison of the surface water data in 2017, before dewatering occurred, to the 2018 data, during dewatering, the perchlorate load profile along the LVW showed significant decreases in 2018 adjacent to the dewatering area; however, the total perchlorate load estimated at Rainbow Garden did not change appreciably between the 2017 and 2018 events. Although several plausible explanations might be offered for these observations, it would be speculative to do so. In addition, since the dewatering was a unique event, it is not considered important to the overall interpretation of the study. No change to the Tech Memo is required.

3

5. Section 4.3, Perchlorate Patterns and Suspected Discharges with Phase II Updates

<u>Comment 5</u>: This section provides information on the surface water and groundwater conditions in 2018, but not in 2019. It states that surface water data was not collected in 2019. Was groundwater data also not collected in 2019? If so, please state that.

RTC 5: Groundwater samples were collected in 2019. The following sentence is in section 4.3, paragraph 8: In July 2019, 40 wells along the LVW were sampled to further investigate groundwater impacts and the potential groundwater surface water interaction. No change to the Tech Memo is required.

6. Section 5.1, Conclusions

Comment 6: Conclusion statements 9 and 10 disregard the plume with concentrations in excess of 3,000 µg/L south of LVW in the area of the Calico Ridge Weir. This plume appears to be an arm of the plume that emanates from the NERT principal paleochannel that is diverted to the east near the former Rapid Infiltration Basins. A more complete discussion on the occurrence of this portion of the plume should be provided, such as: is this portion of the plume being continuously fed from the west? Or has it been bifurcated based on the weir dewatering or other actions? As in-situ bio treatment is being tested in this area, how should the high variability in aquifer transmissivity be considered in the implementation of the remedial treatability study? More specific recommendations based on the study findings should be provided for consideration during design and implementation of remedial studies in the down-gradient study area.

RTC 6: The comment relates to perchlorate sources and ongoing and future remedial studies, which are outside the scope of the Downgradient Study Area investigation. A more detailed study of the perchlorate plumes in the vicinity of Calico Ridge Weir is being conducted by NERT and will be answered in the full RI for OU-1 and OU-2 by Ramboll in about March 2020 and the full RI for OU-3 in about November 2020. No change to the Tech Memo is required.

Attachment:

Table 13 - Achievement of Investigation Objectives and Potential Future Work

Table 13 Achievement of Investigation Objectives and Potential Future Work

NERT RI - Downgradient Study Area Henderson, Nevada

Investigation Objective	Achievement of Objective	Potential Future Work
1) Where are the high concentration (1,000 µg/L or	The Phase I and Phase II wells and the LVW Bioremediation	Additional wells to define perchlorate
higher) perchlorate-impacted groundwater plumes?	Pilot Study wells provided further definition of the high	impacts on the north side of LVW.
	concentration (>1,000 µg/L) perchlorate-impacted groundwater plumes on the north and south sides of LVW.	
	planes on the north and south sides of LVVV.	
	Data gaps remain the north side of LVW.	
2) Why are there noticeable differences in	High variability in perchlorate concentrations indicates	None.
perchlorate concentrations in groundwater over relatively short distances?	separate discrete flow zones within the alluvium.	
	Surface water mixing with groundwater in some areas may	
	dilute the perchlorate concentrations.	
3) How deep are the high concentration perchlorate-	High perchlorate concentrations at depths <90 feet bgs are	Additional deeper wells are needed to
impacted groundwater plumes?	well defined	further define the extent of perchlorate
	Data was a serie for days a serie book at a serie 'finally and the	impacts below 100 feet bgs.
	 Data gaps remain for deeper groundwater specifically south of Calico Ridge Weir 	
	· ·	
4) Do the high-concentration perchlorate plumes	Distinct water-bearing zones have been identified through	None.
follow distinct water-bearing zones within the alluvium or bedrock formations?	NMR logging in individual wells but these zones were not identified as being continuous between wells.	
alluvium of bedrock formations?	lidentified as being continuous between wells.	
	Results of tracer tests indicate that specific flow zones do	
	not conform to the generally observed groundwater gradient.	
5) Where does faulting affect the movement of high-	The LVW Bioremediation Pilot Study indicates faulting	Additional studies are needed to define
concentration perchlorate-impacted groundwater?	affects the movement of groundwater between Calico Ridge	the effect faulting has on perchlorate
	Weir and Lower Narrows weir.	movement.
	Prior geotechnical studies, the observed seeps and the	
	Phase I and II assessments indicate faulting affects	
	groundwater movement at Three Kids Weir and between Three	
	Kids and Rainbow Gardens Weirs.	
6) Along the LVW, does groundwater flow generally	The potentiometric surface of the groundwater generally	Continue to obtain and evaluate
in the same direction as the surface water?	follows the surface water direction.	transducer data.

Table 13 Achievement of Investigation Objectives and Potential Future Work

NERT RI - Downgradient Study Area Henderson, Nevada

Investigation Objective	Achievement of Objective	Potential Future Work
7) Where does impacted groundwater discharge to the LVW?	 The GW and SW studies show that the main impacted groundwater discharges to LVW occur below Calico Ridge Weir and below Three Kids Weir. Some evidence of more diffuse discharges along other 	None.
	reaches of LVW.	
8) Where is the groundwater/surface water interface and how far is it from the LVW?	• As indicated by total dissolved solids concentrations and temperature variations, the groundwater/surface water interface varies from 0 - 885 feet away from the LVW.	None.
9) Is there an area of known or suspected perchlorate flux of sufficient magnitude where an interim remedial action would be appropriate?	Perchlorate concentrations in Lake Mead are well below NDEP's interim action level, so interim/emergency actions are not needed.	None.
	NERT is completing a pilot study between Bostic and Homestead Weirs that may be considered an interim action.	
	NERT's Annual Remedial Performance Report indicates that the capture zone efficiency of the Seep Well Field is 97.8 percent.	Continue sampling of COH-2B1 is planned. Consider a tracer test to determine the source of perchlorate in this area.
11) Do high volumes of low-concentration, perchlorate-impacted groundwater provide more flux to the LVW than low volumes of high-concentration perchlorate-impacted groundwater?	 Based on surface water data, nearly 45 lb/day (>70%) of perchlorate flux is contributed by two high concentration areas: 22 lb/day at Calico Ridge Weir and ~23 lb/day at Three Kids Weir. 	Refine contribution estimates by 24-hour sampling and time composite load estimates in key locations.
12) Do concentrations of perchlorate in groundwater fluctuate over time, seasonally, or after a rain event?	Comparison of perchlorate concentrations from 17 sampled wells in 2016 and 2018 indicated: • 5 wells changed <10% • 9 wells changed 20-80% • 3 wells changed >200 %.	Continue to evaluate seasonal changes and changes after rain events.

Appendix B

Permits, NOIs, and Underground Alert Tickets

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f Environmental Protection

Bureau of Water Pollution Control - Underground Injection Control Program 901 S. Stewart St Ste 4001 Carson City Nevada 89701

UIC Form U240 – Chemical Use Request

The Nevada Division of Environmental Protection is requiring the following information for any entity seeking approval for chemical use, including chemicals for scale inhibitors, corrosion inhibitors, well rehab or cleaning, cooling towers, water well treatment, etc. (Note: for standard operating procedures using standard industry chemicals approved by Division of Minerals on Class 2 and geothermal wells, this form is not required, however NDEP reserves the right to require for certain situations/chemicals)

1. This form will be returned if all blanks are not completed.

2. Fill out a separate form for each chemical. Attach separate sheets if needed to answer questions.

3. A copy of the approved request shall be maintained in UIC O&M manual or UIC records for as long as the chemical is used.

4. NDEP approval below is only for the action stated on the approved form. Any changes in chemical use,	location or amounts must be approved with a new request.		
FACILITY AND PERMIT INFORMAT	ION		
1) UIC Permit No.:	3) City/Valley: Henderson/ Las Vegas Valle		
2) Project/Facility Name: NERT Remedial Investigation - Downgradient Study Area	4) County: Clark		
5) The water this chemical will come in contact with is: Cooling tower water Well water [x] other	er: Groundwater		
6) Discuss where the water (in Item #5) will be discharged: Dye will be added to 3 Monitoring	wells		
7) List other chemicals used in this water: None			
CHEMICAL INFORMATION — Note: Chemical information shall be submitted to the Division that what concentration/mass). If the information is not provided, the Division will not approve this chemical. P	clearly states the chemical composition (what's in it and at roprietary information may be submitted confidentially.		
8) Chemical Name: Rhodamine WT			
9) Chemical formula: C ₂₉ H ₂₉ CIN ₂ Na ₂ O ₅	10) CAS No.: 37299-86-8		
11) Manufacturer's name, phone and address: Cole Parmer, 625 E. Bunker Ct. Vernon H			
12) Is the chemical radioactive? YES [X] NO Describe:			
13) Is a MSDS sheet available for this chemical? [X] YES ☐ NO If YES, attach Is an Environmental D	ata Sheet (EDS) available? YES X NO If YES, attach		
4) At working concentration ¹ , is the chemical hazardous or toxic to humans, livestock, fish, wildlife? If Yes, what entity and at what concentrations?:			
15) If water is discharged to surface at any time, has the NV Division of Wildlife been consulted?	☐ YES [X] NO		
CHEMICAL FEED INFORMATION			
16) Estimated use start date: March of 2019			
17) Describe where the chemical is applied to the water: The dye will be introduced to three monitoring	wells approximately 200 feet from the Las Vegas Wash		
18) Describe how the chemical is applied: The dye will be poured into the well and then mixed for a u	niform concentration within the well casing.		
19) Purpose of chemical: scale inhibitor corrosions inhibitor biocide algaecide dispersant	□ surfactant [X] Other: □ Dye Tracer Study		
20) Describe the frequency of application: One time at each well location			
21) What is the feed rate of the chemical as it is fed into the water: Estimated use per month: Four gallons of a 25 grams per liter solution will be a	idded once at each of three well locations.		
22) What is the final, effective concentration of chemical mixture immediately prior to application: 25 gl	rams per liter		
23) What is the <u>"working" concentration</u> of chemical after mixing with the water in the cooling towe	r/well/etc.: approximately 15 g/L		
) Is the bulk storage container properly marked with the chemical name and information? [X] YES NO			
25) Describe the chemical monitoring before and after application: Dye concentration will be monitored period concentration will also be monitored contin	ically in downgradient and cross- gradient wells. Dye uously in the adjacent surface water.		
26) Discuss the interaction between the proposed chemicals/additives and chemicals already in use, and the by-products Rhodamine WT dye is a non-reactive, conservative tracer. No reactions	s of their interaction: are expected.		
FORM COMPLETION			
Print Name of Person Completing Form: Chad Roper, PhD			
Signature: C/ChaoL/f—	Date: January 17, 2018		
1. Working concentration is the chemical concentration within the final water system (e.g. coolin	ng tower system), found under Item 23 above.		

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Title

UIC Form 240

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> Bureau of Water Pollution Control - Underground Injection Control Program 901 S. Stewart St Ste 4001 Carson City Nevada 89701

UIC Form U240 – Chemical Use Request

The Nevada Division of Environmental Protection is requiring the following information for any entity seeking approval for chemical use, including chemicals for scale inhibitors, corrosion inhibitors, well rehab or cleaning, cooling towers, water well treatment, etc. (Note: for standard operating procedures using standard industry chemicals approved by Division of Minerals on Class 2 and geothermal wells, this form is not required, however NDEP reserves the right to require for certain situations/chemicals)

1. This form will be returned if all blanks are not completed.

2. Fill out a separate form for each chemical. Attach separate sheets if needed to answer questions.

Title

FACILITY AND PERMIT INFORMA	TION
1) UIC Permit No.:	3) City/Valley: Henderson/ Las Vegas Valley
2) Project/Facility Name: NERT Remedial Investigation – Downgradient Study Are	a 4) County: Clark
5) The water this chemical will come in contact with is: Cooling tower water Well water [x] of	her: Groundwater
6) Discuss where the water (in Item #5) will be discharged: Dye will be added to 3 Monitorin	g wells
7) List other chemicals used in this water: None	
CHEMICAL INFORMATION — Note: Chemical information shall be submitted to the Division the what concentration/mass). If the information is not provided, the Division will not approve this chemical	at clearly states the chemical composition (what's in it and at Proprietary information may be submitted confidentially.
8) Chemical Name: Fluorescein	
9) Chemical formula: C ₂₀ H ₁₂ O ₅	10) CAS No.: 2321-07-5
11) Manufacturer's name, phone and address: Cole Parmer, 625 E. Bunker Ct. Vernon	Hills, IL, 60061
12) Is the chemical radioactive? ☐ YES [X] NO Describe:	
13) Is a MSDS sheet available for this chemical? [X] YES NO If YES, attach Is an Environmental	Data Sheet (EDS) available? ☐ YES [X] NO If YES, attach
14) At working concentration¹, is the chemical hazardous or toxic to humans, livestock, fish, wildlife? If Yes, what entity and at what concentrations?:	☐ YES [X] NO
15) If water is discharged to surface at any time, has the NV Division of Wildlife been consulted?	☐ YES [X] NO
CHEMICAL FEED INFORMATION)N
16) Estimated use start date: March of 2019	
17) Describe where the chemical is applied to the water: The dye will be introduced to three monitori	ng wells approximately 200 feet from the Las Vegas Wash
18) Describe how the chemical is applied: The dye will be poured into the well and then mixed for a	uniform concentration within the well casing.
19) Purpose of chemical: ☐ scale inhibitor ☐ corrosions inhibitor ☐ biocide ☐ algaecide ☐ dispersant	t ☐ surfactant [X] Other: Dye Tracer Study
20) Describe the frequency of application: One time at each well location	
21) What is the feed rate of the chemical as it is fed into the water: Estimated use per month: One gallon of a 100 grams per liter solution will be	
22) What is the <u>final, effective concentration</u> of chemical mixture immediately prior to application:	0 grams per liter
23) What is the <u>"working" concentration</u> of chemical after mixing with the water in the cooling to	wer/well/etc.: approximately 12.5 g/L
24) Is the bulk storage container properly marked with the chemical name and information?	X YES NO
25) Describe the chemical monitoring before and after application: Dye concentration will be monitored period concentration will also be monitored concentration.	odically in downgradient and cross- gradient wells. Dye tinuously in the adjacent surface water.
26) Discuss the interaction between the proposed chemicals/additives and chemicals already in use, and the by-produced Fluorescein dye is a non-reactive, conservative tracer. No reactions are	
FORM COMPLETION	
Print Name of Person Completing Form: Chad Roper, PhD	
Signature: C/ChaoL/f—	Date: January 17, 2018
1. Working concentration is the chemical concentration within the final water system (e.g. coo	
NDF form full DO NOT WRITE, IN THIS SP /	8/17

UIC Form 240

Date reviewed: March 19, 2019



TIM WILSON, P.E. Acting State Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES

400 Shadow Lane, Suite 201 Las Vegas, Nevada 89106 (702) 486-2770 · Fax (702) 486-2781 http://water.nv.gov

NOTICE OF INTENT CARD REVIEW FORM

To:	Neil Hale		Date:	March	19, 2019		
Facs	imile No.:	or E-mail Address:	nhale@ca	scade-er	ıv.com		
	This document was:	✓ E-mailed	Faxed				
NOI	Card Number: S2019-146	✓ Appro	ved		Rejected	(See reason	s below)
	Work performed		ı	nissing		invalid	
	Proposed use of well		1	nissing		invalid	
	Intended start date		1	nissing		invalid	
	Waiver/Permit number if applicable	:	1	nissing		invalid	
	Well location (legal description, GF	'S coordinates)	1	nissing		invalid	
	Parcel number		ı	nissing		invalid	
	Address at well location		ı	nissing		invalid	
	Permit number		1	nissing		invalid	
	Waiver number or NDEP Facility II	D Number	1	nissing		invalid	
	Address of Client		t	nissing		invalid	
	Name of client/owner		1	nissing		invalid	
	Contractor's license number		1	nissing		invalid	
	Onsite well driller's license number			nissing		invalid	
	Drilling company name/address		1	nissing		invalid	
	Driller's signature		1	nissing		invalid	
	Replacement well			Yes		No	✓
	If yes, existing well must b pursuant to NAC 534.300		e replacem	ent well	is drilled	l,	
Inst	ructions: Please note that you must (2) monitor wells within 3 hesitate to give our office	30 days of completion					
Pers	on reviewing NOI Card: Christi Co	oper, waiver issued by	y Tracy Get	er			

STEVE SISOLAK
Governor

BRADLEY CROWELL Director



TIM WILSON, P.E. Acting State Engineer

JOHN GUILLORY, P.E. Supervising Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES SOUTHERN NEVADA BRANCH OFFICE

400 Shadow Lane, Suite 201
Las Vegas, Nevada 89106
(702) 486-2770 • Fax (702) 486-2781
http://water.nv.gov

March 19, 2019

MO-3622

Neil Hale Field Supervisor Cascade Drilling, LP 4221 West Oquendo Road Las Vegas, Nevada 89118

RE: Request for waiver to install two (2) temporary monitor wells to collect groundwater samples and analyze the samples as requested by Nevada Division of Environmental Protection (NDEP) Order Number H-000539, located at 201 Via Antincendio, Clark County, Nevada and within the Las Vegas Valley Basin (212).

Dear Mr. Hale:

As provided in Nevada Administrative Code (NAC) § 534.450 of the Regulation for Water Well and Related Drilling, permission is herewith **granted** to install two (2) temporary monitor wells to assess water conditions as described in your request received March 12, 2019. Your statement ensuring Nevada Environmental Response Trust responsibility for abandonment of the well upon project completion was received in this office on March 18, 2019.

The two (2) proposed monitor wells referenced in your letter are listed below:

Well Name	Legal Description	GPS Coordinates (NAD 83/ WGS 84)
NERT3.40S1	NE¼, NE¼ Section 28, T.21S, R63E	36.0987694509° N, -114.94362959° W
NERT3.35S1	NE¼, NE¼ Section 28, T.21S, R63E	36.0992883191° N, -114.942838735° W

This office also waives the following regulations:

- 1) NAC § 534.4351. The purpose of this well is to collect groundwater samples and analyze the samples as requested by NDEP Order Number H-000539, located at 201 Via Antincendio, Clark County, Nevada. The wellhead shall be protected from damage due to vandalism or sunlight. If polyvinyl chloride (PVC) casing is used, then the well must be completed with ASTM F-480 (Sch. 40 or heavier) well casing as provided in NAC § 534.362.
- NAC 534.4357(1c) "If water or vapors which are being monitored in a monitoring well are not encountered within 5 feet below the surface of the ground, the well driller shall place in the annual space of the well: From the seal placed pursuant to paragraph (b) to the surface, a seal, with a minimum thickness of 20 feet below the surface, consisting of cement grout, neat cement or concrete grout." Due to the shallow depth and large screen intervals of the proposed monitor well, you are allowed to install the sanitary seal as shown in your waiver request.

Glued casing joint connections will not be allowed. Full compliance with the remainder of the statute and regulation is required.

A plot map showing the actual location of the completed wells must be submitted upon completion of the drilling operations. Please include an accurate description of the location of the monitor well on the completion reports (GPS coordinates are required).

The well driller's reports shall bear this waiver number: MO-3622.

Authorization to drill under this waiver expires one (1) year from the date of this letter.

The well driller must have a copy of this waiver in possession at all times during drilling activities pertaining to this project. This well may only be pumped when necessary to obtain samples.

Please note that you must notify the Nevada Division of Environmental Protection (NDEP) for possible permitting requirements for groundwater or temporary surface discharge permits, which may include Underground Injection Control (UIC) or National Pollution Discharge Elimination System (NPDES) Permit Numbers. For more information regarding the permitting process with NDEP, please contact NDEP Water Pollution Control Department at (775) 687-4670.

Cascade Drilling, LP MO-3622 March 19, 2019 Page 3

The wells shall be plugged and abandoned, as provided by regulation, upon project completion. The current owner of Assessor's Parcel Number 160-28-501-003 is shown as Clark County (Parks and Community Services) by the records of the Clark County Assessor's office. This waiver does not imply or grant any land use agreements between Clark County (Parks and Community Services) and any land owners. It is expressly understood that this authorization does not relieve the operator of the requirements of any other state, federal or local agencies.

If you have any questions, please contact this office at 702-486-2770.

Sincerely,

Tracy Geter

Drilling Supervisor

cc:

File

Carson City Office

Christi Cooper, SNBO Office

Jay A. Steinberg, President, Nevada Environmental Response Trust, Chicago, IL

BRADLEY CROWELL Director





DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES

400 Shadow Lane, Suite 201 Las Vegas, Nevada 89106 (702) 486-2770 · Fax (702) 486-2781 http://water.nv.gov

NOTICE OF INTENT CARD REVIEW FORM

To:	Neil Hale		Date:	March	19, 2019		-
Facs	imile No.: This document was:	or E-mail Address: ✓E-mailed	nhale@ca	scade-en	v.com		
NOI	Card Number: S2019-148	✓ Appro	ved		Rejected ((See reaso	ns below)
	Work performed Proposed use of well Intended start date Waiver/Permit number if applicable Well location (legal description, GP		1 1	missing missing missing missing missing		invalid invalid invalid invalid invalid	
	Parcel number Address at well location Permit number Waiver number or NDEP Facility II Address of Client Name of client/owner Contractor's license number	ŕ	1 1 1 1	missing missing missing missing missing missing missing missing missing		invalid invalid invalid invalid invalid invalid invalid	
	Onsite well driller's license number Drilling company name/address Driller's signature Replacement well If yes, existing well must b		1	missing missing missing Yes	is drilled	invalid invalid invalid No	
10	pursuant to NAC 534.300 : ructions: Please note that you must (1) monitor wells within 3 hesitate to give our office	provide a copy of the 0 days of completion a call.	. If you hav	∕e any qu			
	on reviewing NOI Card: Christi Coorreviewed: March 19, 2019	oper, waiver issued by	y Tracy Get	er			

STEVE SISOLAK

BRADLEY CROWELL Director



TIM WILSON, P.E. Acting State Engineer

JOHN GUILLORY, P.E. Supervising Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES SOUTHERN NEVADA BRANCH OFFICE

400 Shadow Lane, Suite 201 Las Vegas, Nevada 89106 (702) 486-2770 • Fax (702) 486-2781 http://water.nv.gov

March 19, 2019

MO-3623

Neil Hale Field Supervisor Cascade Drilling, LP 4221 West Oquendo Road Las Vegas, Nevada 89118

RE: Request for waiver to install one (1) temporary monitor well (NERT3.98S1) to collect groundwater samples and analyze the samples as requested by Nevada Division of Environmental Protection (NDEP) Order Number H-000539, located on vacant land just west of 201 Via Antincendio, Clark County, Nevada, within the SE¼ of the NW¼ of Section 28, T.21S, R.63E (Lat: 36.0945914292° N, Long: -114.95261906° W, NAD 83/ WGS 84), and within the Las Vegas Valley Basin (212).

Dear Mr. Hale:

As provided in Nevada Administrative Code (NAC) § 534.450 of the Regulation for Water Well and Related Drilling, permission is herewith **granted** to install one (1) temporary monitor well to assess water conditions as described in your request received March 18, 2019. Your statement ensuring Nevada Environmental Response Trust responsibility for abandonment of the well upon project completion was received in this office on March 18, 2019.

This office also waives the following regulations:

1) NAC § 534.4351 (1). The purpose of this well is to collect groundwater samples and analyze the samples as requested by NDEP Order Number H-000539, located on vacant land just west of 201 Via Antincendio, Clark County, Nevada. The wellhead shall be protected from damage due to vandalism or sunlight. If polyvinyl chloride (PVC) casing is used, then the well must be completed with ASTM F-480 (Sch. 40 or heavier) well casing as provided in NAC § 534.362.

Cascade Drilling, LP MO-3623 March 19, 2019 Page 2

2) NAC 534.4357(1c) - "If water or vapors which are being monitored in a monitoring well are not encountered within 5 feet below the surface of the ground, the well driller shall place in the annual space of the well: From the seal placed pursuant to paragraph (b) to the surface, a seal, with a minimum thickness of 20 feet below the surface, consisting of cement grout, neat cement or concrete grout." Due to the shallow depth and large screen intervals of the proposed monitor well, you are allowed to install the sanitary seal as shown in your waiver request.

Glued casing joint connections will not be allowed. Full compliance with the remainder of the statute and regulation is required.

A plot map showing the actual location of the completed wells must be submitted upon completion of the drilling operations. Please include an accurate description of the location of the monitor well on the completion reports (GPS coordinates are required).

The well driller's reports shall bear this waiver number: MO-3623.

Authorization to drill under this waiver expires one (1) year from the date of this letter.

The well driller must have a copy of this waiver in possession at all times during drilling activities pertaining to this project. This well may only be pumped when necessary to obtain samples.

Please note that you must notify the Nevada Division of Environmental Protection (NDEP) for possible permitting requirements for groundwater or temporary surface discharge permits, which may include Underground Injection Control (UIC) or National Pollution Discharge Elimination System (NPDES) Permit Numbers. For more information regarding the permitting process with NDEP, please contact NDEP Water Pollution Control Department at (775) 687-4670.

The wells shall be plugged and abandoned, as provided by regulation, upon project completion. The current owner of Assessor's Parcel Number 160-28-201-003 is shown as Clark County (Parks and Community Services) by the records of the Clark County Assessor's office. This waiver does not imply or grant any land use agreements between Clark County (Parks and Community Services) and any land owners. It is expressly understood that this authorization does not relieve the operator of the requirements of any other state, federal or local agencies.

If you have any questions, please contact this office at 702-486-2770.

Tracy Geter

Sincerely.

Drilling Supervisor

cc:

File

Carson City Office

Christi Cooper, SNBO Office

Jay A. Steinberg, President, Nevada Environmental Response Trust, Chicago, IL

Date reviewed: March 19, 2019



TIM WILSON, P.E. Acting State Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES

400 Shadow Lane, Suite 201 Las Vegas, Nevada 89106 (702) 486-2770 · Fax (702) 486-2781 http://water.nv.gov

NOTICE OF INTENT CARD REVIEW FORM

То:	Neil Hale		Date:	March	19, 2019		
Facs	imile No.:	or E-mail Address:	nhale@ca	scade-er	ıv.com		
	This document was:	✓ E-mailed	Faxed				
NOI	Card Number: S2019-147	✓ Appro	ved		Rejected	(See reason	ıs below)
	Work performed		r	nissing		invalid	
	Proposed use of well		r	nissing		invalid	
	Intended start date		r	nissing		invalid	
	Waiver/Permit number if applicable		r	nissing		invalid	
	Well location (legal description, GP	S coordinates)	t	nissing		invalid	
	Parcel number		r	nissing		invalid	
	Address at well location		1	nissing		invalid	
	Permit number		1	nissing		invalid	
	Waiver number or NDEP Facility II) Number	ı	nissing		invalid	
	Address of Client		ı	nissing		invalid	
	Name of client/owner		1	nissing		invalid	
	Contractor's license number		ı	nissing		invalid	
	Onsite well driller's license number		ı	nissing		invalid	
	Drilling company name/address		ı	nissing		invalid	
	Driller's signature		1	nissing		invalid	
	Replacement well		7	Yes		No	\checkmark
	If yes, existing well must be pursuant to NAC 534.300 l		e replacem	ent well	is drille	d,	
Inst	ructions: Please note that you must (2) monitor wells within 3 hesitate to give our office	0 days of completion					
Pers	on reviewing NOI Card: Christi Coo	per, waiver issued by	y Tracy Get	er			

STEVE SISOLAK
Governor

BRADLEY CROWELL Director



TIM WILSON, P.E. Acting State Engineer

JOHN GUILLORY, P.E. Supervising Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES SOUTHERN NEVADA BRANCH OFFICE

400 Shadow Lane, Suite 201
Las Vegas, Nevada 89106
(702) 486-2770 • Fax (702) 486-2781
http://water.nv.gov

March 19, 2019

MO-3624

Neil Hale Field Supervisor Cascade Drilling, LP 4221 West Oquendo Road Las Vegas, Nevada 89118

RE: Request for waiver to install two (2) temporary monitor wells to collect groundwater samples and analyze the samples as requested by Nevada Division of Environmental Protection (NDEP) Order Number H-000539, located at 201 Via Antincendio, Clark County, Nevada and within the Las Vegas Valley Basin (212).

Dear Mr. Hale:

As provided in Nevada Administrative Code (NAC) § 534.450 of the Regulation for Water Well and Related Drilling, permission is herewith **granted** to install two (2) temporary monitor wells to assess water conditions as described in your request received March 18, 2019. Your statement ensuring Nevada Environmental Response Trust responsibility for abandonment of the well upon project completion was received in this office on March 18, 2019.

The two (2) proposed monitor wells referenced in your letter are listed below:

Well Name	Legal Description	GPS Coordinates (NAD 83/ WGS 84)
NERT3.60N1	NW14, NE14 Section 28, T.21S, R63E	36.0978287866° N, -114.94742318° W
NERT3.58N1	NW14, NE14 Section 28, T.21S, R63E	36.09839600000° N, -114.94689100° W

This office also waives the following regulations:

- 1) NAC § 534.4351. The purpose of this well is to collect groundwater samples and analyze the samples as requested by NDEP Order Number H-000539, located at 201 Via Antincendio, Clark County, Nevada. The wellhead shall be protected from damage due to vandalism or sunlight. If polyvinyl chloride (PVC) casing is used, then the well must be completed with ASTM F-480 (Sch. 40 or heavier) well casing as provided in NAC § 534.362.
- 2) NAC 534.4357(1c) "If water or vapors which are being monitored in a monitoring well are not encountered within 5 feet below the surface of the ground, the well driller shall place in the annual space of the well: From the seal placed pursuant to paragraph (b) to the surface, a seal, with a minimum thickness of 20 feet below the surface, consisting of cement grout, neat cement or concrete grout." Due to the shallow depth and large screen intervals of the proposed monitor well, you are allowed to install the sanitary seal as shown in your waiver request.

Glued casing joint connections will not be allowed. Full compliance with the remainder of the statute and regulation is required.

A plot map showing the actual location of the completed wells must be submitted upon completion of the drilling operations. Please include an accurate description of the location of the monitor well on the completion reports (GPS coordinates are required).

The well driller's reports shall bear this waiver number: MO-3624.

Authorization to drill under this waiver expires one (1) year from the date of this letter.

The well driller must have a copy of this waiver in possession at all times during drilling activities pertaining to this project. This well may only be pumped when necessary to obtain samples.

Please note that you must notify the Nevada Division of Environmental Protection (NDEP) for possible permitting requirements for groundwater or temporary surface discharge permits, which may include Underground Injection Control (UIC) or National Pollution Discharge Elimination System (NPDES) Permit Numbers. For more information regarding the permitting process with NDEP, please contact NDEP Water Pollution Control Department at (775) 687-4670.

Cascade Drilling, LP MO-3622 March 19, 2019 Page 3

The wells shall be plugged and abandoned, as provided by regulation, upon project completion. The current owner of Assessor's Parcel Number 160-28-501-003 is shown as Clark County (Parks and Community Services) by the records of the Clark County Assessor's office. This waiver does not imply or grant any land use agreements between Clark County (Parks and Community Services) and any land owners. It is expressly understood that this authorization does not relieve the operator of the requirements of any other state, federal or local agencies.

If you have any questions, please contact this office at 702-486-2770.

Sincerely,

Tracy Geter

Drilling Supervisor

cc:

File

Carson City Office

Christi Cooper, SNBO Office

Jay A. Steinberg, President, Nevada Environmental Response Trust, Chicago, IL

Date reviewed: March 21, 2019



TIM WILSON, P.E. Acting State Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES

400 Shadow Lane, Suite 201 Las Vegas, Nevada 89106 (702) 486-2770 · Fax (702) 486-2781 http://water.nv.goy

NOTICE OF INTENT CARD REVIEW FORM

То:	Neil Hale		Date:	March	21, 2019		
Facs	imile No.:	or E-mail Address:	nhale@ca	scade-er	ıv.com		
	This document was:	✓E-mailed	Faxed				
NOI	Card Number: S2019-149	Appro	ved		Rejected	(See reason	ıs below)
	Work performed		r	nissing		invalid	
	Proposed use of well		r	nissing		invalid	
	Intended start date		r	nissing		invalid	
	Waiver/Permit number if applicable	;	r	nissing		invalid	
	Well location (legal description, GF	S coordinates)	r	nissing		invalid	
	Parcel number		r	nissing		invalid	
	Address at well location		r	nissing		invalid	
	Permit number		r	nissing		invalid	
	Waiver number or NDEP Facility II	D Number	r	nissing		invalid	
	Address of Client		r	nissing		invalid	
	Name of client/owner		r	nissing		invalid	
	Contractor's license number		r	nissing		invalid	
	Onsite well driller's license number		r	nissing		invalid	
	Drilling company name/address		r	nissing		invalid	
	Driller's signature		r	nissing		invalid	
	Replacement well			Yes		No	\checkmark
	If yes, existing well must b pursuant to NAC 534.300		e replacem	ent well	is drilled	l ,	
Inst	ructions: Please note that you must (3) monitor wells within 3 hesitate to give our office	0 days of completion					
Pers	on reviewing NOI Card: Christi Coo	oper, waiver issued by	y Tracy Get	er			

STEVE SISOLAK
Governor

BRADLEY CROWELL

Director



TIM WILSON, P.E.
Acting State Engineer

JOHN GUILLORY, P.E. Supervising Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES SOUTHERN NEVADA BRANCH OFFICE

400 Shadow Lane, Suite 201 Las Vegas, Nevada 89106 (702) 486-2770 • Fax (702) 486-2781 http://water.nv.gov

March 21, 2019

MO-3629

Neil Hale Field Supervisor Cascade Drilling, LP 4221 West Oquendo Road Las Vegas, Nevada 89118

RE: Request for waiver to install three (3) temporary monitor wells to collect groundwater samples and analyze the samples as requested by Nevada Division of Environmental Protection (NDEP) Order Number H-000539, located on vacant land, just northwest of 1720 East Galleria Drive, Clark County, Nevada and within the Las Vegas Valley Basin (212).

Dear Mr. Hale:

As provided in Nevada Administrative Code (NAC) § 534.450 of the Regulation for Water Well and Related Drilling, permission is herewith **granted** to install three (3) temporary monitor wells to assess water conditions as described in your request received March 18, 2019. Your statement ensuring Nevada Environmental Response Trust responsibility for abandonment of the well upon project completion was received in this office on March 18, 2019.

The three (3) proposed monitor wells referenced in your letter are listed below:

Well Name	Legal Description	GPS Coordinates (NAD 83/ WGS 84)
NERT4.65N1	SW1/4, NE1/4 Section 29, T.21S, R63E	36.0935780874° N, -114.96407649° W
NERT4.70N1	SW¼, NE¼ Section 29, T.21S, R63E	36.0935934952° N, -114.965031037° W
NERT4.64N1	SW1/4, NE1/4 Section 29, T.21S, R63E	36.0936439611° N, -114.963599094° W

This office also waives the following regulations:

- 1) NAC § 534.4351. The purpose of this well is to collect groundwater samples and analyze the samples as requested by NDEP Order Number H-000539, located on vacant land, just northwest of 1720 East Galleria Drive, Clark County, Nevada. The wellhead shall be protected from damage due to vandalism or sunlight. If polyvinyl chloride (PVC) casing is used, then the well must be completed with ASTM F-480 (Sch. 40 or heavier) well casing as provided in NAC § 534.362.
- 2) NAC 534.4357(1c) "If water or vapors which are being monitored in a monitoring well are not encountered within 5 feet below the surface of the ground, the well driller shall place in the annual space of the well: From the seal placed pursuant to paragraph (b) to the surface, a seal, with a minimum thickness of 20 feet below the surface, consisting of cement grout, neat cement or concrete grout." Due to the shallow depth and large screen intervals of the proposed monitor well, you are allowed to install the sanitary seal as shown in your waiver request.

Glued casing joint connections will not be allowed. Full compliance with the remainder of the statute and regulation is required.

A plot map showing the actual location of the completed wells must be submitted upon completion of the drilling operations. Please include an accurate description of the location of the monitor well on the completion reports (GPS coordinates are required).

The well driller's reports shall bear this waiver number: MO-3629.

Authorization to drill under this waiver expires one (1) year from the date of this letter.

The well driller must have a copy of this waiver in possession at all times during drilling activities pertaining to this project. This well may only be pumped when necessary to obtain samples.

Please note that you must notify the Nevada Division of Environmental Protection (NDEP) for possible permitting requirements for groundwater or temporary surface discharge permits, which may include Underground Injection Control (UIC) or National Pollution Discharge Elimination System (NPDES) Permit Numbers. For more information regarding the permitting process with NDEP, please contact NDEP Water Pollution Control Department at (775) 687-4670.

Cascade Drilling, LP MO-3629 March 21, 2019 Page 3

The wells shall be plugged and abandoned, as provided by regulation, upon project completion. The current owner of Assessor's Parcel Number 160-29-601-001 is shown as Clark County (Parks and Community Services) by the records of the Clark County Assessor's office. This waiver does not imply or grant any land use agreements between Clark County (Parks and Community Services) and any land owners. It is expressly understood that this authorization does not relieve the operator of the requirements of any other state, federal or local agencies.

If you have any questions, please contact this office at 702-486-2770.

Sincerely,

Tracy Geter

Drilling Supervisor

cc:

File

Carson City Office

Christi Cooper, SNBO Office

Jay A. Steinberg, President, Nevada Environmental Response Trust, Chicago, IL

Date reviewed: March 21, 2019



TIM WILSON, P.E. Acting State Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES

400 Shadow Lane, Suite 201 Las Vegas, Nevada 89106 (702) 486-2770 · Fax (702) 486-2781 http://water.nv.gov

NOTICE OF INTENT CARD REVIEW FORM

To: <u>N</u>	eil Hale		Date:	March	21, 2019		
Facsimile No.: or E-mail Addr		or E-mail Address:	nhale@cas	scade-er	v.com		
	This document was:	✓E-mailed	Faxed	_			
NOI Card Number: S2019-144		✓ Appro	ved	ed Rejected (See reasons below			ıs below)
W	ork performed		п	nissing		invalid	
Pr	oposed use of well			nissing		invalid	\Box
In	Intended start date			nissing	$\bar{\sqcap}$	invalid	Ħ
Waiver/Permit number if applicable				nissing		invalid	
Well location (legal description, GPS coordinates)				nissing		invalid	\Box
Pa	rcel number		n	nissing		invalid	$\overline{\Box}$
Ad	ldress at well location		m	nissing		invalid	$\overline{\Box}$
Pe	rmit number			nissing		invalid	Ē
W	Waiver number or NDEP Facility ID Number			nissing		invalid	Ē
Ac	ldress of Client			nissing		invalid	
Na	me of client/owner		m	nissing		invalid	\Box
Co	ontractor's license number		m	nissing		invalid	$\overline{\Box}$
Onsite well driller's license number			m	nissing		invalid	$\overline{\Box}$
Drilling company name/address			m	issing		invalid	$\overline{\Box}$
Driller's signature			m	issing		invalid	$\overline{\Box}$
Replacement well			Y	es		No	7
	If yes, existing well must be pursuant to NAC 534.300 R	plugged at time the eplacement Well.	replaceme	ent well	is drilled	,	
Instructions: Please note that you must provide a copy of the well (7) monitor wells within 30 days of completion. If y hesitate to give our office a call.				s report any que	for the in estions, p	stallation of lease do no	f seven t
Person r	eviewing NOI Card: Christi Coop	per, waiver issued by	Tracy Gete	r			

TIM WILSON, P.E. Acting State Engineer

JOHN GUILLORY, P.E. Supervising Engineer

BRADLEY CROWELL Director



DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES SOUTHERN NEVADA BRANCH OFFICE

400 Shadow Lane, Suite 201
Las Vegas, Nevada 89106
(702) 486-2770 • Fax (702) 486-2781
http://water.nv.gov

March 21, 2019

MO-3630

Neil Hale Field Supervisor Cascade Drilling, LP 4221 West Oquendo Road Las Vegas, Nevada 89118

RE: Request for waiver to install seven (7) temporary monitor wells to collect groundwater samples and analyze the samples as requested by Nevada Division of Environmental Protection (NDEP) Order Number H-000539, located on vacant land, just west of 1720 East Galleria Drive, Clark County, Nevada and within the Las Vegas Valley Basin (212).

Dear Mr. Hale:

As provided in Nevada Administrative Code (NAC) § 534.450 of the Regulation for Water Well and Related Drilling, permission is herewith **granted** to install seven (7) temporary monitor wells to assess water conditions as described in your request received March 18, 2019. Your statement ensuring Nevada Environmental Response Trust responsibility for abandonment of the well upon project completion was received in this office on March 18, 2019.

The seven (7) proposed monitor wells referenced in your letter are listed below:

Well Name	Legal Description	GPS Coordinates (NAD 83/ WGS 84)
NERT4.64S1	NW14, SE14 Section 29, T.21S, R63E	36.0920826981° N, -114.96288901° W
NERT4.71S2	NW14, SE14 Section 29, T.21S, R63E	36.0912669927° N, -114.965090327° W
NERT4.71N1	NW14, SE14 Section 29, T.21S, R63E	36.0931815206° N, -114.965868739° W
OBS4.64S1-A	NW14, SE14 Section 29, T.21S, R63E	36.092150000° N, -114.96284000° W
OBS4.64S1-B	NW4, SE4 Section 29, T.21S, R63E	36.0921260000° N, -114.9629770° W
OBS4.64S1-C	NW4, SE4 Section 29, T.21S, R63E	36.09215000000° N, -114.9628400° W
OBS4.64S1-D	NW14, SE14 Section 29, T.21S, R63E	36.09204000000° N, -114.96280100° W

This office also waives the following regulations:

- 1) NAC § 534.4351. The purpose of this well is to collect groundwater samples and analyze the samples as requested by NDEP Order Number H-000539, located on vacant land, just west of 1720 East Galleria Drive, Clark County, Nevada. The wellhead shall be protected from damage due to vandalism or sunlight. If polyvinyl chloride (PVC) casing is used, then the well must be completed with ASTM F-480 (Sch. 40 or heavier) well casing as provided in NAC § 534.362.
- 2) NAC 534.4357(1c) "If water or vapors which are being monitored in a monitoring well are not encountered within 5 feet below the surface of the ground, the well driller shall place in the annual space of the well: From the seal placed pursuant to paragraph (b) to the surface, a seal, with a minimum thickness of 20 feet below the surface, consisting of cement grout, neat cement or concrete grout." Due to the shallow depth and large screen intervals of the proposed monitor well, you are allowed to install the sanitary seal as shown in your waiver request.

Glued casing joint connections will not be allowed. Full compliance with the remainder of the statute and regulation is required.

A plot map showing the actual location of the completed wells must be submitted upon completion of the drilling operations. Please include an accurate description of the location of the monitor well on the completion reports (GPS coordinates are required).

The well driller's reports shall bear this waiver number: MO-3630.

Cascade Drilling, LP MO-3630 March 21, 2019 Page 3

Authorization to drill under this waiver expires one (1) year from the date of this letter.

The well driller must have a copy of this waiver in possession at all times during drilling activities pertaining to this project. This well may only be pumped when necessary to obtain samples.

Please note that you must notify the Nevada Division of Environmental Protection (NDEP) for possible permitting requirements for groundwater or temporary surface discharge permits, which may include Underground Injection Control (UIC) or National Pollution Discharge Elimination System (NPDES) Permit Numbers. For more information regarding the permitting process with NDEP, please contact NDEP Water Pollution Control Department at (775) 687-4670.

The wells shall be plugged and abandoned, as provided by regulation, upon project completion. The current owner of Assessor's Parcel Number 160-29-701-002 is shown as Clark County (Parks and Community Services) by the records of the Clark County Assessor's office. This waiver does not imply or grant any land use agreements between Clark County (Parks and Community Services) and any land owners. It is expressly understood that this authorization does not relieve the operator of the requirements of any other state, federal or local agencies.

If you have any questions, please contact this office at 702-486-2770.

Sincerely,

Tracy Geter

Drilling Supervisor

cc:

File

Carson City Office

Christi Cooper, SNBO Office

Jay A. Steinberg, President, Nevada Environmental Response Trust, Chicago, IL

STEVE SISOLAK
Governor

BRADLEY CROWELL Director



TIM WILSON, P.E. Acting State Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES

400 Shadow Lane, Suite 201 Las Vegas, Nevada 89106 (702) 486-2770 · Fax (702) 486-2781 http://water.nv.gov

NOTICE OF INTENT CARD REVIEW FORM

To:	Neil Hale		Date:	March	25, 2019		
Facs	imile No.:	or E-mail Address:		ascade-en	iv.com		
	This document was:	✓E-mailed	Faxed				
NOI	Card Number: S2019-145	Approv	ved		Rejected ((See reasor	ns below)
	Work performed		1	missing		invalid	
	Proposed use of well		(missing		invalid	
	Intended start date		1	missing		invalid	
	Waiver/Permit number if applicable	2	1	missing		invalid	
	Well location (legal description, GF	PS coordinates)	1	missing		invalid	
	Parcel number		1	missing		invalid	
	Address at well location		I	missing		invalid	
	Permit number		ı	missing		invalid	
	Waiver number or NDEP Facility I	D Number		missing		invalid	
	Address of Client		:	missing		invalid	
	Name of client/owner			missing		invalid	
	Contractor's license number			missing		invalid	
	Onsite well driller's license number	•		missing		invalid	
	Drilling company name/address			missing		invalid	
	Driller's signature			missing		invalid	
	Replacement well			Yes		No	\checkmark
	If yes, existing well must be pursuant to NAC 534.300		e replacen	ient well	is drilled	,	
Inst Ø	ructions: Please note that you must (11) monitor wells within hesitate to give our office	30 days of completio		-			
Pers	on reviewing NOI Card: Christi Co	oper, waiver issued by	Tracy Ge	ter			
	reviewed: March 25, 2019		-				

STEVE SISOLAK
Governor

BRADLEY CROWELL Director



TIM WILSON, P.E. Acting State Engineer

JOHN GUILLORY, P.E. Supervising Engineer

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES SOUTHERN NEVADA BRANCH OFFICE

400 Shadow Lane, Suite 201
Las Vegas, Nevada 89106
(702) 486-2770 • Faπ (702) 486-2781
http://water.nv.gov

March 25, 2019

MO-3631

Neil Hale Field Supervisor Cascade Drilling, LP 4221 West Oquendo Road Las Vegas, Nevada 89118

RE: Request for waiver to install eleven (11) temporary monitor wells to collect groundwater samples and analyze the samples as requested by Nevada Division of Environmental Protection (NDEP) Order Number H-000539, located at 201 Via Antincendio, Clark County, Nevada and within the Las Vegas Valley Basin (212).

Dear Mr. Hale:

As provided in Nevada Administrative Code (NAC) § 534.450 of the Regulation for Water Well and Related Drilling, permission is herewith **granted** to install eleven (11) temporary monitor wells to assess water conditions as described in your request received March 18, 2019. Your statement ensuring Nevada Environmental Response Trust responsibility for abandonment of the well upon project completion was received in this office on March 18, 2019.

The eleven (11) proposed monitor wells referenced in your letter are listed below:

Well Name	Legal Description	GPS Coordinates (NAD 83/ WGS 84)
NERT3.58S1	SW¼, NE¼ Section 28, T.21S, R63E	36.0971835166° N, -114.94516383° W
NERT3.60S1	SW¼, NE¼ Section 28, T.21S, R63E	36.0966616622° N, -114.945606514° W
NERT3.63S1	SW4, NE4 Section 28, T.21S, R63E	36.0956390516° N, -114.947091481° W
OBS3.60S1-A	SW1/4, NE1/4 Section 28, T.21S, R63E	36.0966180000° N, -114.945652000° W
OBS3.60S1-B	SW14, NE14 Section 28, T.21S, R63E	36.0967210000° N, -114.94572100° W
OBS3.60S1-C	SW1/4, NE1/4 Section 28, T.21S, R63E	36.0967380000° N, -114.94565300° W
OBS3.60S1-D	SW1/4, NE1/4 Section 28, T.21S, R63E	36.09664600000° N, -114.94550400° W
OBS3.58S1-A	SW1/4, NE1/4 Section 28, T.21S, R63E	36.0971160000° N, -114.94522200° W
OBS3.58S1-B	SW1/4, NE1/4 Section 28, T.21S, R63E	36.09724000000° N, -114.9452400° W
OBS3.58S1-C	SW1/4, NE1/4 Section 28, T.21S, R63E	36.09725000000° N, -114.9451000° W
OBS3.58S1-D	SW1/4, NE1/4 Section 28, T.21S, R63E	36.09715700000° N, -114.94506500° W

This office also waives the following regulations:

- 1) NAC § 534.4351. The purpose of this well is to collect groundwater samples and analyze the samples as requested by NDEP Order Number H-000539, located at 201 Via Antincendio, Clark County, Nevada. The wellhead shall be protected from damage due to vandalism or sunlight. If polyvinyl chloride (PVC) casing is used, then the well must be completed with ASTM F-480 (Sch. 40 or heavier) well casing as provided in NAC § 534.362.
- NAC 534.4357(1c) "If water or vapors which are being monitored in a monitoring well are not encountered within 5 feet below the surface of the ground, the well driller shall place in the annual space of the well: From the seal placed pursuant to paragraph (b) to the surface, a seal, with a minimum thickness of 20 feet below the surface, consisting of cement grout, neat cement or concrete grout." Due to the shallow depth and large screen intervals of the proposed monitor well, you are allowed to install the sanitary seal as shown in your waiver request.

Cascade Drilling, LP MO-3631 March 25, 2019 Page 3

Glued casing joint connections will not be allowed. Full compliance with the remainder of the statute and regulation is required.

A plot map showing the actual location of the completed wells must be submitted upon completion of the drilling operations. Please include an accurate description of the location of the monitor well on the completion reports (GPS coordinates are required).

The well driller's reports shall bear this waiver number: MO-3631.

Authorization to drill under this waiver expires one (1) year from the date of this letter.

The well driller must have a copy of this waiver in possession at all times during drilling activities pertaining to this project. This well may only be pumped when necessary to obtain samples.

Please note that you must notify the Nevada Division of Environmental Protection (NDEP) for possible permitting requirements for groundwater or temporary surface discharge permits, which may include Underground Injection Control (UIC) or National Pollution Discharge Elimination System (NPDES) Permit Numbers. For more information regarding the permitting process with NDEP, please contact NDEP Water Pollution Control Department at (775) 687-4670.

The wells shall be plugged and abandoned, as provided by regulation, upon project completion. The current owner of Assessor's Parcel Number 160-28-501-003 is shown as Clark County (Parks and Community Services) by the records of the Clark County Assessor's office. This waiver does not imply or grant any land use agreements between Clark County (Parks and Community Services) and any land owners. It is expressly understood that this authorization does not relieve the operator of the requirements of any other state, federal or local agencies.

If you have any questions, please contact this office at 702-486-2770.

Sincerely,

Tracy Geter

Drilling Supervisor

cc:

File

Carson City Office

Christi Cooper, SNBO Office

Jay A. Steinberg, President, Nevada Environmental Response Trust, Chicago, IL

From: notification@usan.org

Sent: Thursday, January 24, 2019 12:02 PM

To: Capotrio, Joseph

Subject: USA North 811 Confirmation for Ticket W902400335-00W

EMLCFM 00394 USANW 01/24/19 11:01:30 W902400335-00W NORM NEW POLY LREQ

Message Number: W902400335 Rev: 00W Received by USAN at 10:59 on 01/24/19

Work Begins: 01/31/19 at 07:00 Notice: 040 hrs Priority: 2

Night Work: Weekend Work:

Expires: 02/21/19 at 23:59 Update By: 02/19/19 at 00:00

Field Meet Requested - Please Call and Confirm

Caller: JOSEPH CAPOTRIO

Company: AECOM

Address: 8985 S EASTERN AVE, SUITE 130

City: LAS VEGAS State: NV Zip: 89123

Business Tel: 720-376-8791 Fax:

Email Address: joseph.capotrio@aecom.com

Nature of Work: INSTALL ENVIRONMENTAL MONITORING WELLS Done for: N.D.E.P. Explosives:

Foreman: CARMEN CACERES-SCHNELL

Cell Tel: 818-517-3126

Area Premarked: Y Premark Method: FLAGS, STAKES, WHITE PAINT

Permit Type: NO

Excavation Enters Into Street Or Sidewalk Area: N

Location:

Street Address: LAKE LAS VEGAS PKWY

Cross Street: E GALLERIA DR

AT A POINT .53 MILES SW AS CROW FLIES OF LAKE LAS VEGAS PKWY & E.GALLERIA DR GPS: 36.099288, -114.942840, 2)300'SW OF 1 GPS: 36.09877, -114.94363, 3)800'SW OF 2 GPS: 36.09718, -114.94516, 4)250'SW OF 3, 36.09666, -114.94560, 5)600'SW OF 4 GPS: 36.09564, -114.94709, 6)800' N OF 5 36.09783, -114.94742 , 7)200' NE OF 6, 36.09830, -114.94697, 8)2160' SW OF 7, 36.09459, -114.95262, 10' RADIUS AT

Place: HENDERSON /U County: CLARK State: NV

Long/Lat Long: -114.939260 Lat: 36.092742 Long: -114.954182 Lat: 36.101455

Comments:

CUSTOMER REQUESTS FIELD MEET PLEASE CONTACT CUSTOMER TO SCHEDULE

Sent to:

BAWACO = BASIC WATER COMPANY CENTE2 = CENTURYLINK COXLVE = COX COMMUNICATIONS LAS VEGAS CTYHEN = CITY HENDERSON

NENGSO = NV ENERGY SNVWTR = SO NEV WTR AUTHORITY

SWGLVE = SWGAS LAS VEGAS

From: notification@usan.org

Sent: Thursday, January 24, 2019 12:14 PM

To: Capotrio, Joseph

Subject: USA North 811 Confirmation for Ticket W902400349-00W

EMLCFM 00407 USANW 01/24/19 11:14:06 W902400349-00W NORM NEW POLY LREQ

Message Number: W902400349 Rev: 00W Received by USAN at 11:01 on 01/24/19

Work Begins: 01/31/19 at 07:00 Notice: 040 hrs Priority: 2

Night Work: Weekend Work:

Expires: 02/21/19 at 23:59 Update By: 02/19/19 at 00:00

Field Meet Requested - Please Call and Confirm

Caller: JOSEPH CAPOTRIO

Company: AECOM

Address: 8985 S EASTERN AVE, SUITE 130

City: LAS VEGAS State: NV Zip: 89123

Business Tel: 720-376-8791 Fax:

Email Address: joseph.capotrio@aecom.com

Nature of Work: INSTALL ENVIRONMENTAL MONITORING WELLS Done for: N.D.E.P. Explosives:

Foreman: CARMEN CACERES-SCHNELL

Cell Tel: 818-517-3126

Area Premarked: Y Premark Method: FLAGS, STAKES, WHITE PAINT

Permit Type: NO

Excavation Enters Into Street Or Sidewalk Area: N

Location:

Street Address: LAKE LAS VEGAS PKWY

Cross Street: E GALLERIA DR

AT A POINT 1.78 MILES SW AS CROW FLIES OF LAKE LAS VEGAS PKWY & E.GALLERIA DR GPS:36.09358, -114.96408, 2)150' E OF 1 GPS:36.09364, -114.96359, 3)450' SW OF 2 GPS:36.09325, -114.96490, 4) 250' SE OF 3, GPS:36.09208, -114.96289, 5) 730'SW

OF 4 GPS: 36.09127, -114.96509, 6)780' NW OF 5 GPS: 36.09318, -114.96587,

INCLUDE 10' RADIUS AT EACH

Place: HENDERSON /U County: CLARK State: NV

Long/Lat Long: -114.959582 Lat: 36.089920 Long: -114.969079 Lat: 36.095427

Sent to:

BAWACO = BASIC WATER COMPANY CENTE2 = CENTURYLINK CTYHEN = CITY HENDERSON NENGSO = NV ENERGY

SWGLVE = SWGAS LAS VEGAS

From: notification@usan.org

Sent: Wednesday, March 20, 2019 1:26 PM

To: Greg Kinsall

Subject: USA North 811 Confirmation for Ticket X907902102-00X

EMLCFM 04105X USAN 03/20/19 12:26:25 X907902102-00X NEW NORM POLY LREQ

Ticket: X907902102 Rev: 00X Created: 03/20/19 12:26 User: KMB Chan: CSR

Work Start: 03/25/19 09:00 Legal Start: 03/25/19 09:00 Expires: 04/17/19 23:59

Response required: Y Priority: 2

Excavator Information

Company: RAMBOLL ENVIRONMENTAL

Co Addr: 2111 E.HIGHLAND AVE STE 402

City : PHOENIX State: AZ Zip: 85016 Created By: GREG KINSALL Language: ENGLISH Office Phone: 614-579-3330 SMS/Cell: 614-579-3330

Office Email: gkinsall@ramboll.com

Site Contact: GABE MICLETTE

Site Phone: 707-223-3731 Site SMS/Cell: 707-223-3731

Site Email: gmiclette@ramboll.com

Excavation Area

State: NV County: CLARK Place: HENDERSON

Zip: 89015,89011,89156

Location: Address/Street: LAKE LAS VEGAS PKWY

: X/ST1: E GALLERIA DR

:

: AT A PT 1.78 MI SW OF INTERSECTION OF LAKE LAS VEGAS PKWY & E.

: GALLERIA DR (AS A CROW FLIES, 2) 150' E OF LOCATION 1, 3) 450' SW OF LOCATION 2, 4) 250' SE OF LOCATION 3, 5) 730' SW OF LOCATION 4, 6)

: 780' NW OF LOCATION 5

Delineated Method: WHITE PAINT Work Type: ENVIRONMENTAL SAMPLES

Work For : N.E.R.T.

Permit: Job/Work order:

1 Year: N Boring: V Street/Sidewalk: N Vacuum: N Explosives: N

Lat/Long

Center Generated (NAD83): 36.110591/-114.978143 36.110591/-114.922533

: 36.063700/-114.978143 36.063700/-114.922533

Excavator Provided: 36.093580/-114.964080

Map link:

https://newtin.usan.org/newtinweb/map_tkt.nap?TRG=CETeJkGeHcFhAec-5

Members:

BAWACO = BASIC WATER COMPANY CENTE2 = CENTURYLINK COXLVE = COX COMMUNICATIONS LAS VEGAS CTYHEN = CITY HENDERSON

LVVWTR = LAS VEGAS VLY WTR NENGSO = NV ENERGY

SNVWTR = SO NEV WTR AUTHORITY SWGHPT = SOUTHWEST GAS (HIGH PRESS LO

SWGLVE = SWGAS LAS VEGAS

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From: notification@usan.org

Sent: Wednesday, March 20, 2019 1:32 PM

To: Greg Kinsall

Subject: USA North 811 Confirmation for Ticket X907902120-00X

EMLCFM 04131X USAN 03/20/19 12:32:20 X907902120-00X NEW NORM POLY LREQ

Ticket: X907902120 Rev: 00X Created: 03/20/19 12:32 User: KMB Chan: CSR

Work Start: 03/22/19 17:00 Legal Start: 03/22/19 17:00 Expires: 04/17/19 23:59

Response required: Y Priority: 2

Excavator Information

Company: RAMBOLL ENVIRONMENTAL

Co Addr: 2111 E.HIGHLAND AVE STE 402

City : PHOENIX State: AZ Zip: 85016 Created By: GREG KINSALL Language: ENGLISH Office Phone: 614-579-3330 SMS/Cell: 614-579-3330

Office Email: gkinsall@ramboll.com

Site Contact: GABE MICLETTE

Site Phone: 707-223-3731 Site SMS/Cell: 707-223-3731

Site Email: gmiclette@ramboll.com

Excavation Area

State: NV County: CLARK Place: HENDERSON /U

Zip: 89011

Location: Address/Street: LAKE LAS VEGAS PKWY

: X/ST1: E GALLERIA DR

:

: AT A PT .53 MI SW OF INTERSECTION OF LAKE LAS VEGAS PKWY & E. GALLERIA : DR (AS A CROW FLIES, 2) 300' SW OF LOCATION 1, 3) 800' SW OF LOCATION : 2, 4) 250' SW OF LOCATION 3, 5) 600' SW OF LOCATION 4, 6) 800' N OF

: LOCATION 5, 7) 200' NE OF LOCATION 6, 8) 2160' SW OF LOCATION 7

Delineated Method: WHITE PAINT Work Type: ENVIRONMENTAL SAMPLES

Work For : N.E.R.T.

Permit: Job/Work order:

1 Year: N Boring: V Street/Sidewalk: N Vacuum: N Explosives: N

Lat/Long

Center Generated (NAD83): 36.106181/-114.962105 36.105800/-114.937367

: 36.085389/-114.962425 36.085008/-114.937687

Excavator Provided: 36.099288/-114.942840

Map link:

https://newtin.usan.org/newtinweb/map_tkt.nap?TRG=4FEt2Fp3sFeBe9A-d

Members:

BAWACO = BASIC WATER COMPANY CENTE2 = CENTURYLINK COXLVE = COX COMMUNICATIONS LAS VEGAS CTYHEN = CITY HENDERSON

LVVWTR = LAS VEGAS VLY WTR NENGSO = NV ENERGY

SNVWTR = SO NEV WTR AUTHORITY SWGHPT = SOUTHWEST GAS (HIGH PRESS LO

SWGLVE = SWGAS LAS VEGAS

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From: notification@usan.org

Sent: Thursday, April 18, 2019 7:45 AM

To: Greg Kinsall

Subject: USA North 811 Confirmation for Ticket X910800110-00X

EMLCFM 00456X USAN 04/18/19 06:44:58 X910800110-00X NEW NORM POLY LREQ

Ticket: X910800110 Rev: 00X Created: 04/18/19 06:44 User: JBM Chan: CSR

Work Start: 04/22/19 17:00 Legal Start: 04/22/19 17:00 Expires: 05/16/19 23:59

Response required: Y Priority: 2

Excavator Information

Company: RAMBOLL ENVIRONMENTAL

Co Addr: 2111 E.HIGHLAND AVE STE 402

City : PHOENIX State: AZ Zip: 85016 Created By: GREG KINSALL Language: ENGLISH Office Phone: 614-579-3330 SMS/Cell: 614-579-3330

Office Email: gkinsall@ramboll.com

Site Contact: GABE MICLETTE

Site Phone: 707-223-3731 Site SMS/Cell: 707-223-3731

Site Email: gmiclette@ramboll.com

Excavation Area

State: NV County: CLARK Place: HENDERSON /U

Zip: 89011

Location: Address/Street: LAKE LAS VEGAS PKWY

: X/ST1: E GALLERIA DR

:

: AT A PT .53 MI SW OF INTERSECTION OF LAKE LAS VEGAS PKWY & E. GALLERIA : DR (AS A CROW FLIES, 2) 300' SW OF LOCATION 1, 3) 800' SW OF LOCATION : 2, 4) 250' SW OF LOCATION 3, 5) 600' SW OF LOCATION 4, 6) 800' N OF

: LOCATION 5, 7) 200' NE OF LOCATION 6, 8) 2160' SW OF LOCATION 7

Delineated Method: WHITE PAINT Work Type: ENVIRONMENTAL SAMPLES

Work For : N.E.R.T.

Permit: Job/Work order:

1 Year: N Boring: V Street/Sidewalk: N Vacuum: N Explosives: N

Lat/Long

Center Generated (NAD83): 36.105328/-114.961642 36.105328/-114.938292

: 36.085606/-114.961642 36.085606/-114.938292

Excavator Provided: 36.099288/-114.942840

Map link:

https://newtin.usan.org/newtinweb/map_tkt.nap?TRG=92mHhJo5sxvzuuM-N

Members:

 BAWACO
 BASIC WATER COMPANY
 COLEN WATTS
 702-429-8969

 CENTE2
 CENTURYLINK
 TOM STURMER
 303-453-9927

 COXLVE
 COX COMMUNICATIONS LAS VEGAS
 CHERYL BUTTS
 623-328-4101

- 700 067 0703
e 702-267-2783
702-258-3879
702-258-3192
702-402-4465
800-778-9140
702-691-5372
702-258-3192
702-651-2111
800-447-5422
702-651-2111
800-447-5422
California and Nevada.

From: notification@usan.org

Sent: Thursday, April 18, 2019 7:55 AM

To: Greg Kinsall

Subject: USA North 811 Confirmation for Ticket X910800135-00X

EMLCFM 00536X USAN 04/18/19 06:54:59 X910800135-00X NEW NORM POLY LREQ

Ticket: X910800135 Rev: 00X Created: 04/18/19 06:54 User: MAB Chan: CSR

Work Start: 04/22/19 17:00 Legal Start: 04/22/19 17:00 Expires: 05/16/19 23:59

Response required: Y Priority: 2

Excavator Information

Company: RAMBOLL ENVIRONMENTAL

Co Addr: 2111 E.HIGHLAND AVE STE 402

City : PHOENIX State: AZ Zip: 85016 Created By: GREG KINSALL Language: ENGLISH Office Phone: 614-579-3330 SMS/Cell: 614-579-3330

Office Email: gkinsall@ramboll.com

Site Contact: GABE MICLETTE

Site Phone: 707-223-3731 Site SMS/Cell: 707-223-3731

Site Email: gmiclette@ramboll.com

Excavation Area

State: NV County: CLARK Place: HENDERSON

Zip: 89011

Location: Address/Street: LAKE LAS VEGAS PKWY

: X/ST1: E GALLERIA DR

:

: AT A PT 1.78 MI SW OF INTERSECTION OF LAKE LAS VEGAS PKWY & E.

: GALLERIA DR (AS A CROW FLIES, 2) 150' E OF LOCATION 1, 3) 450' SW OF LOCATION 2, 4) 250' SE OF LOCATION 3, 5) 730' SW OF LOCATION 4, 6)

: 780' NW OF LOCATION 5

Delineated Method: WHITE PAINT Work Type: ENVIRONMENTAL SAMPLES

Work For : N.E.R.T.

Permit: Job/Work order:

1 Year: N Boring: V Street/Sidewalk: N Vacuum: N Explosives: N

Lat/Long

Center Generated (NAD83): 36.099821/-114.970552 36.098725/-114.956766

: 36.088664/-114.971439 36.087568/-114.957653

Excavator Provided: 36.093580/-114.964080

Map link:

https://newtin.usan.org/newtinweb/map_tkt.nap?TRG=D2z7r4zvyvzwtvP-O

Members:

 BAWACO BASIC WATER COMPANY
 COLEN WATTS
 702-429-8969

 EMERGENCY 1
 702-429-8969

 CENTE2 CENTURYLINK
 TOM STURMER
 303-453-9927

 EMERGENCY
 702-244-4213

 CTYHEN CITY HENDERSON
 Name not available
 702-267-2783

NENGSO NV ENERGY	BOB WARD	702-402-4465
	DAMAGES/EMERGENCY	800-778-9140
SNVWTR SO NEV WTR AUTHORITY	SAM HERNDON	702-691-5372
	LVVWD DISPATCH	702-258-3192
SWGLVE SWGAS LAS VEGAS	DISPATCH	702-651-2111
	For emergencies	800-447-5422
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Appendix C
Soil Boring Logs

NDEP Client: Boring No. NERT3.35S1 **AECOM** 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Coordinates: 26738372.779 N 845391.591 E Elevation: 1470.443 FT AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 1 of 2 Drilling Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: Yes 805-388-3775 Grab 8 IN Sample Type(s): Boring Diameter: Screened Interval: 35-55 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 04-24-19 Depth of Boring: 57 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-24-19 Water Level: 19.6 FT BGS 6"/RQD (mdd) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine € Log ₽ grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Recovery Headspace (Well Diagram Sample Graphic grained material (sand and gravel), structural or Blows per mineralogical features, density or stiffness, moisture content, odors or staining. POORLY GRADED SAND WITH SILT AND GRAVEL, light SM brown (7.5YR 6/3), 10% non-plastic silt, 75% fine to medium-grained subrounded sand, 15% fine to medium gravel with 1.5-inch max gravel size, loose, dry, hand augered to 5 feet bas SILTY SAND, brown (7.5YR 4/4), 25% non-plastic silt, 65% fine to medium-grained subrounded sand, 10% medium gravel SM with 2-inch max gravel size, loose, dry SP-POORLY GRADED SAND WITH SILT, brown (7.5YR 4/4), 10% SM non-plastic silt, 80% fine to coarse-grained subrounded and subangular sand, 10% fine to mediumd gravel with 10 R1 SM 1.5-inch max gravel size, loose, dry SILTY SAND, brown (7.5YR 4/4), 25% non-plastic silt, 65% fine to medium-grained subrounded sand, 10% medium to coarsed gravel with 3-inch max gravel size, loose, dry -@12 feet - 30% silt, 65% medium-grained sand, 5% gravel with 1-inch max gravel size 15 POORLY GRADED SAND WITH SILT, brown (7.5YR 4/4), 10% SM non-plastic silt, 90% fine to medium-grained subrounded sand, loose, dry -@17.5 feet - 10% silt, 75% fine to coarse-grained subangular sand, 15% medium gravel with 1.5-inch max gravel size POORLY GRADED SAND, dark brown (7.5YR 3/2), 5% SF 20 non-plastic silt, 85% fine to medium-grained subrounded R2 SIV sand, 10% medium gravel with 1-inch max gravel size, loose, dry SILTY SAND, brown (7.5YR 5/3), 20% non-plastic silt, 75% fine SP to coarse-grained subangular sand, 5% fine gravel with SM 0.10-inch max gravel size
POORLY GRADED SAND WITH SILT AND GRAVEL, brown (7.5YR 5/3), 10% non-plastic silt, 75% fine to coarse-grained subangular sand, 15% medium gravel with 2-inch max gravel size, loose, dry, siliceous limestone -@25 feet - color change to 7.5YR 4/3, 25 POORLY GRADED SAND WITH GRAVEL, brown (7.5YR 4/3), 5% non-plastic silt, 70% fine to medium-grained subangular to angular sand, 25% medium to coarse gravel SP with 3-inch max gravel size 30 R3 hvdrated bentonite BEDROCK, hard pulverized bedrock or large boulder -@34 feet - grey cemented sandstone 35 @35 feet - refusal with sonic rig -@35 to 57 feet - ARCH rig used to drill borehole SILT, strong brown (7.5YR 5/6), 100% medium to high plastic ML fines, stiff, wet

Notes: ARCH rig drilled through grout to approximate 33 feet bgs. R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

8/9/19

CA GDT

ENSR

GP.I

BORING

ENSR BLOG

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AECOM 1220 Avenida Acaso Camarillo, CA 93012 805-388-3775 Client: **NDEP** Boring No. NERT3.35S1 Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Elevation: 1470.443 FT 26738372.779 N 845391.591 E Sheet: 2 of 2 Drilling Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: Yes Sample Type(s): Grab 8 IN. Screened Interval: 35-55 FT BGS Boring Diameter: Depth of Boring: 57 FT BGS Logged By: C. Grimes Date/Time Started: 04-24-19

Approved Bur. S. Biladeau									Lagrand But C. Crimos	Determine Determine		Depth of Boring: 57 FT BGS	
Approved By: S. Bilodeau									Logged By: C. Grimes	Date/Time Started: 04-24-19		- ·	
Drilling	ng Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-24-19 Water Level: 19.6 FT BGS						Water Level: 19.6 FT BGS						
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log		MATERIAL IDENTIFICATION, color, description of fine grained material (silt and clay) description of coarse grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining.		Well Diagram		
						ML			plastic fines, 25% ve	n (7.5YR 5/6), 65% medium to high ry fine to medium-grained subangular gravel with 0.1-inch max gravel size		schedule 40 PVC	
45													
									-@45 feet - color change to coarse-grained sand cemented siltstones	o 7.5YR 4/6, 70% fines, 25% fine to , 5% gravel, medium stiff, weakly and sandstones		Monterey #3 Sand	
50										c silt, 30% medium to coarse-grained			
										% fine gravel with 0.3-inch max gravel th gravels are broken up siltsones			
55													
										o high plastic fines, 25% very fine to angular sand, 10% very fine gravel avel size, stiff			

Total Depth = 57 feet Boring Terminated Target depth achieved

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/9/19

AECOM 1220 Avenida Acaso Camarillo, CA 93012

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 9/16/19

 Client:
 NDEP

 Project Number:
 60477365

 Site Description/Location:
 Las Vegas Wash, Henderson, NV

 Coordinates:
 26738206.492 N 845198.154 E
 Elevation: 1474.579 FT

Drilling Equipment/Method: /Sonic Rig

Ambient PID Reading: NA

Boring No. NERT3.40S1

Sheet: 1 of 2

Weather: 70 and cloudy and breezy

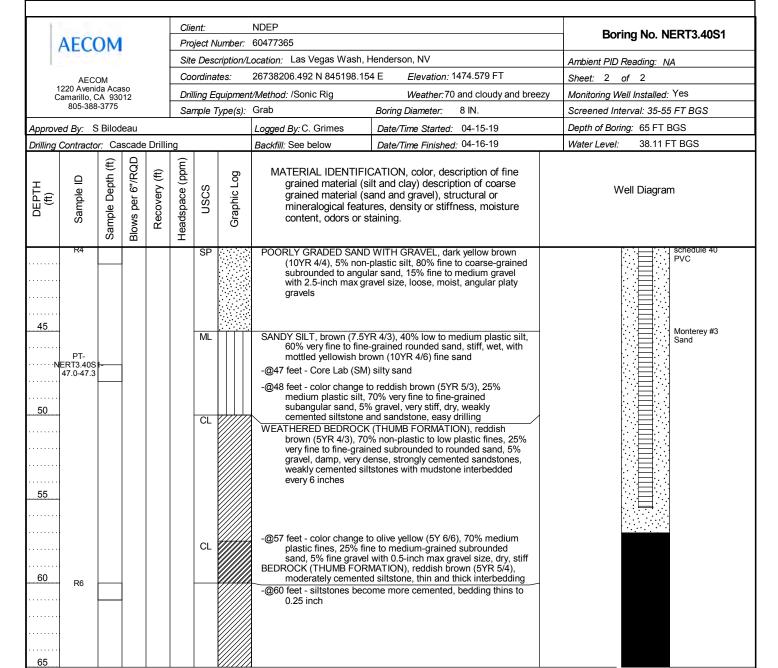
Monitoring Well Installed: Yes

Roying Diameter: 8 IN

Screened Interval: 35-55 ET I

C	amarillo, 0 805-388		112					Grah	Paring Diameter: 9 IN	,
		N D'I			Sar	ripie i	ype(s):		Boring Diameter: 8 IN.	Screened Interval: 35-55 FT BGS
	d By:							Logged By: C. Grimes	Date/Time Started: 04-15-19	Depth of Boring: 65 FT BGS
Drilling (Contracto	r: Ca		Drillir	ng		I	Backfill: See below	Date/Time Finished: 04-16-19	Water Level: 38.11 FT BGS
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (si grained material (si	CATION, color, description of fine lit and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture taining.	Well Diagram
5						SM		very fine to medium-	(7.5YR 6/4), 20% low plastic silt, 70% grained subrounded sand, 10% fine ax gravel size, loose, dry, hand gs	
10	R1					SP		5% non-plastic silt, 8		bentonite grout
15						SM		to coarse-grained su	R 4/4), 25% low-plastic silt, 65% fine brounded and subangular sand, 10% el with 1-inch max gravel size, loose,	
20	R2							non-plastic silt, 75% -@23 feet - 1.5 inch thick l	o dark brown (7.5YR 3/2), 15% coarse-grained sand, 10% fine gravel ayer of sand with silt as angular with max gravel size of 1.5 c silt, 75% sand, 10% gravel	
30	R3					SP- SM		yellow brown (10YR coarse-grained subroundium gravel with moist possibly from	sand with silt 10% silt, 80% sand, 10%	hydrated bentonite
40						SM		non-plastic silt, 70%	EL, brown (7.5YR 4/3), 15% fine to coarse-grained sand, 15% fine th 1-inch max gravel size, loose, moist	

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.



Refusal at 65 feet. Boring Terminated

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 9/16/19



Client: NDEP

Project Number: 60477365

Site Description/Location: Las Vegas Wash, Henderson, NV

Coordinates: 26738048.58 N 844188.45 E Elevation: 1476.55 FT

Sheet: 1 of 2

Drilling Equipment/Method: Sonic Rig and ARCH Rig Weather: 90 and sunny

Monitoring Well Installed: Yes

Sample Type(s): Grab Boring Diameter: 8 IN.

Screened Interval: 40-60 FT BGS

45004	Coordinates: 26	738048.58 N 844188.45 E	Elevation: 1476.55 FT	Sheet: 1 of 2		
AECOM 1220 Avenida Acaso			CH Rig Weather:90 and sunny	Monitoring Well Installed: Yes		
Camarillo, CA 93012 805-388-3775	Sample Type(s):	-	Boring Diameter: 8 IN.	Screened Interval: 40-60 FT BGS		
Approved By: S. Bilodeau		Logged By: C. Grimes	Date/Time Started: 04-08-19	Depth of Boring: 60 FT BGS		
Drilling Contractor: Cascade Drilling	1	Backfill: See below	Date/Time Finished: 04-23-19	Water Level: 52 FT		
	Headspace (ppm) USCS Graphic Log	MATERIAL IDENTIFION grained material (single g	CATION, color, description of fine ilt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture	Well Diagram		
	SM SM	fine to medium-grain loose, dry, hand augustic loose, dry, hand augustic loose, dry, hand augustic loose, dry, hand augustic loose, dry, relation of the sand, powdery, relation of the sand, powdery, relation of the sand, loose, loose	gray (5YR 5/1), 30% silt, 70% rounded ively homogenous bunded sand sand, gray calcerous sandstone very fine to medium-grained ed sand, 15% medium to coarse gravel el size ze gravel MATION), yellowish Red (5 YR 5/6), e-grained subrounded sand, very formation, strongly cemented to coarse-grained sand, 10% gravel to coarse-grained sand, 10% gravel o yellowish red (4/6), 100% very fine to brounded to rounded sand, sandstone ly 0.75 inches across TONE-@25 feet - Sandstone, color red (5YR 4/6), 30% low-plastic silt, dium-grained subangular to ense, friable, platy siltstone with o brown (7.5YR 5/4), 15% silt, 65% led subangular to rounded sand, 20% inch max gravel size, very dense	hydrated bentonite		

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram. 4/8/2019 - Sonic drilled to 17 feet (refusal). ARCH rig used to complete boring to 60 feet.

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/6/19



AECOM 1220 Avenida Acaso Camarillo, CA 93012 805-388-3775

_					
	Client:	NDEP			Paring No. NEDT2 59N4
ı	Project Number:	60477365			Boring No. NERT3.58N1
	Site Description/Lo	ocation: Las Vegas Wash, F	lenderson, NV		Ambient PID Reading: NA
I	Coordinates: 267	38048.58 N 844188.45 E	Elevation: 1476.55 FT		Sheet: 2 of 2
	Drilling Equipment	:/Method: Sonic Rig and ARC	H Rig Weather: 90 and	d sunny	Monitoring Well Installed: Yes
I	Sample Type(s):	Grab	Boring Diameter: 8 IN	N.	Screened Interval: 40-60 FT BGS
-					

							700(0).			22:00:100 111		
Approved By: S. Bilodeau								Logged By: C. Grimes	Date/Time Started: 04-08-19	Depth of Bor	oth of Boring: 60 FT BGS	
	ng Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-23-19 Water Level:						52 FT BGS					
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (si grained material (si	CATION, color, description of fine It and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture taining.	V	Vell Diagram	
								100% very fine to fine dense, dry, Thumb F sandstone (continue) -@40 feet - color change to medium-plastic silt, sand, 40% gravel with -@45 feet - damp, low plass -@50 feet - 20% silt, 60% gravel with 0.5-inch r -@52 feet - moist to wet	o yellowish red (5YR 5/6), 10% low to 50% very fine to medium subrounded h 0.75-inch max gravel size stic silt, max gravel size of 0.10 inch wery fine to coarse-grained sand, 20% max gravel size, moist, medium dense dium plastic fines, 60% fine to bunded sand, 10% gravel with		schedule 40 PVC Monterey #3 Sand	
	•							Total Depth = 60 feet	<u>'</u>			

Boring Terminated
Target depth achieved

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/6/19

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram. 4/8/2019 - Sonic drilled to 17 feet (refusal). ARCH rig used to complete boring to 60 feet.

AECOM 1220 Avenida Acaso Camarillo, CA 93012 805-388-3775 Approved By: S. Bilodeau Drilling Contractor: Cascade Drilling Sample Depth (ft) ₽ DEPTH (ft) Sample

10

15

20

25

30

35

40

9/12/19

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BORING

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R1

R2

R3

Blows per 6"/RQD

NDEP Client: Boring No. NERT3.58S1 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Elevation: 1474.297 FT Coordinates: 26737583.504 N 844695.297 E Sheet: 1 of 2 Drilling Equipment/Method: /Sonic Rig Weather: Partially sunny and windy Monitoring Well Installed: Yes Grab Sample Type(s): Boring Diameter: 8 IN Screened Interval: 35-55 FT BGS Logged By: C. Grimes Date/Time Started: 03-27-19 Depth of Boring: 70 FT BGS Backfill: See below Date/Time Finished: 03-28-19 Water Level: 34.95 FT BGS (mdd) MATERIAL IDENTIFICATION, color, description of fine € Log grained material (silt and clay) description of coarse uscs Recovery Headspace (Well Diagram Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. SILTY SAND, light reddish brown (7.5YR 6/3), artifical fill composed of 15% nonplastic silt, 75% fine to coarse-grained subangular sand, 10% fine gravel with 0.25inch max gravel size, loose, dry LEAN CLAY, dark brown (7.5 YR 3/2), artificial fill composed of 95% medium-plastic CL fines, 5% sand SILTY SAND, dark brown (7.5 YR 3/2), 25% low plastic silt, 65% fine to medium-SM grained subrounded sand, 10% fine gravel with 0.25-inch max gravel size SANDY SILT, gray (5Y 5/1), 60% low plastic silt, 40% fine-grained subrounded sand ML SILTY SAND, brown (7.5YR 5/4), 35% low plastic silt, 60% medium-grained SIV subangular sand, 5% fine to medium gravel with 1-inch max gravel size bentonite SILT, olive (5Y 5/4), 100% medium plastic fines MI grout SP POORLY GRADED SAND, dark reddish brown (5 YR 3/4), 5% silt, 85% fine to medium-grained subrounded sand, 10% fine gravel with 0.10-inch max gravel size SANDY SILT, dark reddish brown (5 YR 3/4), 70% low plastic silt, 25% fine-grained subrounded sand, 5% fine gravel POORLY GRADED SAND WITH SILT AND GRAVEL, brown (7.5 YR 4/3), 10% non-SP SM plastic silt, 75% fine-grained subrounded to angular sand, 15% fine to coarse gravel with 3-inch max gravel size ML SILT, gray (5Y 5/1), 90% medium plastic fines, 10% fine-grained subrounded sand, SP SILTY SAND WITH GRAVEL, brown (7.5 YR 4/3), 20% low plastic silt, 65% medium to coarse-grained subrounded to subangular sand, 15% fine to coarse gravel with 5inch max gravel size, loose -@29 feet - becomes coarser CL LEAN CLAY, 10YR 5/4, 65% medium plastic clay, 20% fine gravel with 0.25 -nch max gravel size, 15% medium to coarse-grained subangular sand, loose, moist SILTY SAND WITH GRAVEL, yellowish dark brown (7.5 YR 3/3), 15% non-plastic silt, hydrated SM bentonite 70% medium coarse-grained subrounded sand, 15% fine to coarse gravel with 2-inch nax gravel size, loose, moist POORLY GRADED SAND, yellowish dark brown (7.5 YR 3/3), 5% silt, 95% fine to SP coarse-grained subrounded to subangular sand, loose, moist

> -@36 feet - color change to brown (7.5YR 4/4), 15% non-plastic silt, 70% medium to coarse-grained sand, 15% fine to coarse gravel with 2-inch max gravel size

> POORLY GRADED SAND WITH SILT AND GRAVEL, brown (7.5YR 4/4), 10% non-

plastic silt, 65% medium to coarse-grained subrounded sand, 25% fine to coarse

gravel with 3-inch max gravel size, loose, moist, becomes coarser

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

SM



ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 9/12/19

Client:	NDEP		Poring No. NEDT2 5991
Project Number.	60477365		Boring No. NERT3.58S1
Site Description	/Location: Las Vegas Wash, I	Henderson, NV	Ambient PID Reading: NA
Coordinates:	26737583.504 N 844695.29	7 E <i>Elevation:</i> 1474.297 FT	Sheet: 2 of 2
Drilling Equipme	ent/Method: /Sonic Rig	Weather: Partially sunny and windy	Monitoring Well Installed: Yes
Sample Type(s)	: Grab	Boring Diameter: 8 IN.	Screened Interval: 35-55 FT BGS
	Logged By: C. Grimes	Date/Time Started: 03-27-19	Depth of Boring: 70 FT BGS

Water Level:

34.95 FT BGS

Date/Time Finished: 03-28-19

DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	NSCS	Graphic Log	MATERIAL IDENTIFICATION, color, description of fine grained material (silt and clay) description of coarse grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining.	Well Diagram	
	R4					ML		GRAVELLY SILT WITH SAND, brown (7.5YR 4/4), 65% low plastic silt, 25% medium		schedule 40 PVC
						IVIL		to coarse gravel with 3-inch max gravel size, 10% fine-grained subrounded to subangular sand, loose, moist, becomes finer		
						SM		SILTY SAND WITH GRAVEL, dark reddish brown (5YR 3/4), 20% low plastic silt,		
45								65% fine to medium-grained subangular sand, 15% medium to coarse gravel with 2-inch max gravel size, loose, moist		Monterey #3 sand
						SP- SM		POORLY GRADED SAND WITH SILT AND GRAVEL, brown (7.5YR 5/4), 10% non- plastic silt, 75% fine to coarse-grained subrounded to subangular sand, 15% fine		
						Oivi		gravel with 0.5-inch max gravel size, loose, wet		
						SM		SILTY SAND WITH GRAVEL, 5% non-plastic silt, 80% fine to coarse-grained sand,	7::=::1	
50	D.							15% fine gravel with 1-inch max gravel size, gravel becomes larger		
	R5									
						SM		SILTY SAND TO SANDY SILT, light red brown (5 YR 6/4), 45% low plastic silt, 45%		
55								fine-grained rounded sand, 10% gravel, medium dense, wet		
						ML		SILT WITH SAND, olive gray (5Y 4/2), 70% low to medium plastic silt, 10% clay,		
								10% fine to medium-grained subangular sand, 10% medium to coarse gravel with 4-inch max gravel size, medium dense, wet		
60 N	PT- ERT3.58S									
	60.0-60.3					ML	HHT	@ 60 feet - LEAN CLAY, Core Lab (CL) Lean Clay with Sand GRAVELLY SILT, olive (5YR 4/3), 75% low plastic silt, 20% medium to coarse		
						"		gravel with 3-inch max gravel size, 5% medium-grained subangular sand, medium, wet		
								-@62.5 feet - dry		
65						ML		SILT WITH GRAVEL, gray (5/1), 80% low plastic silt, 20% coarse gravel with 5-inch		
								max gravel size, dry, Muddy Creek Formation? Siltsone		
						ML		GRAVELLY SILT, very dark gray (5YR 3/1), 60% silt, 40% subangular gravel, dense,		
								Horse Spring Formation, limestone with siltstone, silicious limestone, inclusions -@67.5 feet - color change to light gray (5Y 7/2), 70% silt, 20% gravel, 10% sand,		
								weakly cemented to well cemented		
70										

Refusal at 70 feet. Boring Terminated

Backfill: See below

 $\textbf{Notes:} \ \mathsf{R} \ \mathsf{denotes} \ \mathsf{Ramboll} \ \mathsf{grab} \ \mathsf{sample.} \ \mathsf{For} \ \mathsf{backfill} \ \mathsf{information,} \ \mathsf{refer} \ \mathsf{to} \ \mathsf{well} \ \mathsf{completion} \ \mathsf{diagram.}$

Client: **NDEP** Boring No. NERT3.58S1A **AECOM** Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA 26737588.02 N 844690.03 E Elevation: 1474.98 FT Coordinates: AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 1 of 2 Drilling Equipment/Method: /Sonic Rig Weather: Monitoring Well Installed: Yes 805-388-3775 Grab 6 IN Screened Interval: 25-45 FT BGS Sample Type(s): Boring Diameter: Approved By: S. Bilodeau Depth of Boring: 50 FT BGS Logged By: C. Schnell Date/Time Started: 04-24-19 Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-24-19 Water Level: 35.25 FT BGS Blows per 6"/RQD Headspace (ppm) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine Recovery (ft) Ьg ₽ grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Well Diagram Sample Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. ML SILT, pinkish gray (5YR 7/2), 85% non-plastic silt, 10% subangular sand, 5% coarse ML gravel, loose, dry -@5 to 10 feet - no recovery 10 -@11 feet - color change to light gray (5YR 7/1), 95% silt, 5% gravel -@12 feet - 95% silt, 5% sand -@12.5 feet - 6-inch peat layer -@13 feet - color change to pinkish gray (5YR 7/2), 100% silt 15 -@15 feet - color change to 6/2 -@17.5 feet - color change to 7/2 20 SILTY SAND, light reddish brown (5YR 6/3), 20% non-plastic silt, 75% fine to coarsegrained subrounded to angular sand, 5% fine to coarse gravel with 0.25 max gravel size, loose, dry 25 SP POORLY GRADED SAND, reddish brown (5YR 4/4), 5% non-plastic silt, 85% fine to coarse-grained subrounded to angular sand, 10% fine to coarse gravel with 0.5-inch max gravel size, loose, moist 30 ML SILT, pinkish gray (5YR 7/2), 95% non-plastic silt, 5% very fine-grained sand, loose, dry 2-inch diameter schedule 40 PVC -@31 feet - 10% silt, 80% sand, 10% gravel 8/20/19 POORLY GRADED SAND WITH GRAVEL, light grayish brown (5YR 6/2), 5% high SP plastic silt, 75% very fine subangular sand, 20% medium to coarse gravel with 0.75-CA.GDT inch max gravel size, loose, moist, large cobbles 35 Monterey #3 sand -@35 feet - color change to reddish brown (5YR 5/3), 5% non-plastic silt, 80% fine to coarse-grained, subangular 15% fine to coarse gravel with 0.75-inch max gravel ENSR size, wet, loose

LEAN CLAY, reddish yellow (5YR 6/6), 95% high plastic fines, 5% sand, loose, moist

SILT WITH CLAY, light reddish brown (5YR 6/3), 95% low plastic fines, 5% fine to

coarse-grained subangular to angular sand, 10% fine to coarse gravel with 0.5-inch

hydrated bentonite

Notes:

BORING LOGS.GPJ

ENSR BLOG

40

CL

ML

max gravel size, loose, wet



AECOM 1220 Avenida Acaso Camarillo, CA 93012 805-388-3775

Client:	NDEP		Doring No. NEDT2 F0C4 A			
Project Number:	60477365		Boring No. NERT3.58S1A			
Site Description/L	ocation: Las Vegas Wash, H	lenderson, NV		Ambient PID Reading: NA		
Coordinates:	26737588.02 N 844690.03 E	FT	Sheet: 2 of 2			
Drilling Equipment	t/Method: /Sonic Rig	Weather:		Monitoring Well Installed: Yes		
Sample Type(s):	Grab	Boring Diameter:	6 IN.	Screened Interval: 25-45 FT BGS		
	Logged By: C. Schnell	Date/Time Started:	04-24-19	Depth of Boring: 50 FT BGS		

Approve	ed By: S	. Biloc	deau				Logged By: C. Schnell	Logged By: C. Schnell Date/Time Started: 04-24-19 Depth of Boring: 50 FT BGS		
Drilling (Contracto	r: Ca	scade	Drillir	ng		Backfill: See below	Date/Time Finished: 04-24-19	Water Level: 35.25 FT BGS	
DEPTH (ft)	Samil Samil Re Heac				uscs	MATERIAL IDENTIFIC grained material (si grained material (sc mineralogical featur content, odors or st	Well Diagram			
45						ML3	coarse-grained subangular max gravel size, loose, we	ddish brown (5YR 6/3), 95% low plastic fines, to angular sand, 10% fine to coarse gravel wit (continued) o pinkish gray (5YR 6/2), 80% silt, 20% sand, d	ith 0.5-inch	
50							-@48 feet - color change to	white (5YR 8/1), 80% non-plastic silt, 20% sar	nd, dry, dense	

Total Depth = 50 feet. Boring Terminated Target depth achieved

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Notes:		

AECOM 805-388-3775 Sample Depth (ft) ₽ DEPTH (ft) Sample

NDEP Client: Boring No. NERT3.58S1B 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading Coordinates: 26737588.02 N 844690.029 E Elevation: 1474.526 FT AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 1 of 2 Drilling Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: Yes Grab 6 IN Sample Type(s): Boring Diameter: Screened Interval: 25-45 FT BGS Approved By: S. Bilodeau Logged By: C. Schnell Date/Time Started: 04-24-19 Depth of Boring: 50 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-24-19 Water Level: 34.56 FT BGS Blows per 6"/RQD Headspace (ppm) MATERIAL IDENTIFICATION, color, description of fine € Log grained material (silt and clay) description of coarse USCS Recovery Well Diagram Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. ML SILT, gray (5YR 5/1), loose, dry, hand augured to 5 feet, organic smell, floated in VOA -@2 to 7.5 feet - no recovery -@8 feet - color change pinkish gray (5YR 7/2), 100% non-plastic silt, dry, loose 10 SILTY SAND, 30% non-plastic silt, 65% fine to coarse-grained sand, 5% fine gravel, loose, dry -@14 feet - color change to 7.5YR 6/2, dense 15 MI SILT, very dark gray (5YR 3/1), 90% non-plastic silt, 10% fine to coarse-grained sand, loose, siltstone, organic material peat SP 6 inches thick POORLY GRADED SAND WITH GRAVEL, light reddish brown (5YR 6/3), 5% non-plastic silt, 80% fine to coarse-grained subangular sand, 15% fine to coarse gravel with 1.5-inch max gravel size 20 hydrated SILT, gray (5YR 6/1), 95% non-plastic silt, 5% fine to MI bentonite coarse-grained subangular sand, oxidized roots SP POORLY GRADED SAND WITH GRAVEL, 5% non-plastic silt, 25 65% fine to coarse-grained angular sand, 30% fine to coarse gravel with 1.5-inch max gravel size, dense, dry, slightly cemented -@25 to 27.5 feet - no recovery SP POORLY GRADED SAND, light reddish brown (5YR 6/3), 60% non-plastic silt, 40% fine to coarse-grained angular sand, medium dense, moist 30 2-inch POORLY GRADED SAND WITH SILT AND GRAVEL, 10% diameter SM non-plastic silt, 60% fine to coarse-grained subangular schedule 40 sand, 30% fine to coarse gravel with 1.5-inch max gravel PVC size, loose, dry SILTY SAND WITH GRAVEL, light gray (5YR 7/1), 40% 35 non-plastic silt, 45% fine to coarse-grained angular sand, Monterey #3 ML 15% fine to coarse gravel with 1.5-inch max gravel size, medium dense, dry SANDY SILT, light reddish brown (5YR 6/3), 60% non-plastic silt, 30% fine to medium-grained subangular sand, 10% coarse gravel with 1-inch max gravel size, dense, moist SM SILTY SAND WITH GRAVEL, pinkish gray (5YR 6/2), 30% non-plastic silt, 50% fine to medium-grained subangular

Notes:

8/12/19

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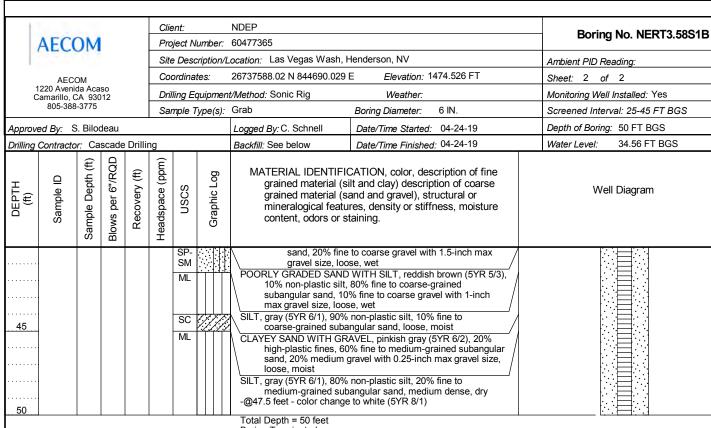
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Total Depth = 50 feet Boring Terminated Target depth achieved

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Notes:

Client: **NDEP** Boring No. NERT3.58S1C Project Number: **AECOM** 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: Elevation: 1473.941 FT 26737593.505 N 844702.727 E Coordinates: AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 1 of 2 Drilling Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: Yes 805-388-3775 Grab 6 IN. Screened Interval: 35-55 FT BGS Sample Type(s): Boring Diameter: Depth of Boring: 55 FT BGS Approved By: S. Bilodeau Logged By: C. Schnell Date/Time Started: 04-25-19 Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-25-19 Water Level: 34.90 FT BGS Blows per 6"/RQD Sample Depth (ft) Headspace (ppm) MATERIAL IDENTIFICATION, color, description of fine Recovery (ft) Log ₽ grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Well Diagram Sample Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. SILT WITH SAND, pinkish gray (5YR 6/2), 85% non-plastic silt, ML 15% very fine sand, loose, dry ML SILT, white (5YR 8/1), 100% non-plastic silt, loose, dry 10 15 -@15 to 17.5 feet - no recovery 20 SILTY SAND, pink (5YR 7/3), 30% non-plastic silt, 60% fine to coarse-grained subangular sand, 10% fine to medium SM SP gravel with 0.25-inch max gravel size, medium dense, dry SC POORLY GRADED SAND WITH CLAY AND GRAVEL, pinkish 25 gray (5YR 7/2), 10% non-plastic silt, 70% fine to coarse-grained subangular sand, 20% fine to coarse gravel with 0.5-inch max gravel size, loose, dry -@25-27.5 feet - no recovery 30 ML SILT, white (5YR 8/1), 100% non-plastic silt, loose, dry

POORLY GRADED SAND WITH CLAY AND GRAVEL, pinkish

gray (5YR 7/2), 10% non-plastic silt, 70% fine to coarse-grained subangular sand, 20% fine to coarse-grained subangular sand, 20% fine to coarse gravel with 0.5-inch max gravel size, loose, dry

POORLY GRADED SAND WITH SILT, brown (7.5YR 5/2), 10% non-plastic silt, 85% fine to coarse-grained subangular sand, 5% fine gravel with 0.5-inch max gravel size, loose,

hvdrated bentonite

Notes:

8/9/19

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ML

SM

moist -@35 feet - wet



AECOM 1220 Avenida Acaso Camarillo, CA 93012 Client: NDEP

Project Number: 60477365

Site Description/Location: Las Vegas Wash, Henderson, NV

Coordinates: 26737593.505 N 844702.727 E Elevation: 1473.941 FT

Sheet: 2 of 2

Drilling Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: Yes

Sample Type(s): Grab Boring Diameter: 6 IN. Screened Interval: 35-55 FT BGS

Califallio, CA 930	J12		<u>.</u>	700	announce:		monitoring rron	montoning from motamour 194		
805-388-3775		Sai	mple 7	ype(s):	Grab	Boring Diameter: 6 IN.	Screened Interv	/al: 35-55 FT BGS		
Approved By: S. Bilo	deau				Logged By: C. Schnell Date/Time Started: 04-25-19		Depth of Boring	Depth of Boring: 55 FT BGS		
Drilling Contractor: Ca	scade Drill	ing			Backfill: See below	Date/Time Finished: 04-25-19	Water Level:	34.90 FT BGS		
DEPTH (ft) Sample ID Sample Depth (ft)	Blows per 6"/RQD Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (si grained material (sa	CATION, color, description of fine lt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture raining.	Wel	l Diagram		
45 50			SP-SM ML SP-SM		non-plastic silt, 85% sand, 5% fine gravel moist (continued) SILT, light brown (7.5YR 6, POORLY GRADED SAND non-plastic silt, 85% sand, 5% fine gravel moist POORLY GRADED GRAV (5YR 6/3), 5% non-pl			Z-incm diameter schedule 40 PVC Monterey #3 Sand		

Total Depth = 55 feet Boring Terminated Target depth achieved

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Notes:



AECOM

NDEP Client: Boring No. NERT3.58S1D Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: Not Surveyed Coordinates: Elevation: Sheet: 1 of 1

1220 Avenida Acaso Camarillo, CA 93012 Drilling E					Drii	lling E	ing Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: No						
	805-388							Grab	Boring Diameter: 6 IN.	Screened Interval:			
Approve	ed By: S	S. Biloo	deau					Logged By: C.Schnell	Date/Time Started: 04-24-19	Depth of Boring: 37 FT BGS			
Drilling	Contracto	r: Ca	scade	Drilli	ng			Backfill: See below	Date/Time Finished: 04-24-19	Water Level: Not Encountered			
ОЕРТН (ft)	Sample ID Sample ID Sample ID Sample ID Sample ID Recovery (ft) Headspace (ppm) USCS Graphic Log						Graphic Log	grained material (s grained material (s mineralogical feat content, odors or s	MATERIAL IDENTIFICATION, color, description of fine grained material (silt and clay) description of coarse grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining.				
5						SP- SM			D WITH GRAVEL, pinkish gray (5YR 7/2), 5% 5% fine to coarse gravel with 1.5-inch max gra				
						ML		SII T white (5YR 8/1) 90	% non-plastic silt, 10% fine to coarse-grained	subangular sand, medium dense, dry			
						"		-@7.5 to 10 feet - slightly	cemented, no recovery	Subungular Sana, mediam dense, dry			
10													
								-12 feet - 6-inch thick silts	stone				
15													
						SM			VEL, light reddish brown (5YR 6/4), 20% non- 0% fine to coarse gravel with 2-inch max grave				
20													
								실 					
						ML		SILT white (5YR 8/1) 10	0% non-plastic silt, medium dense, dry, slightl	v cemented/caliche?			
25							$ \ \ \ $	5.E1, W.1.C (011(0/1), 10	o / piadad din, mediam dende, diy, digita	, como district			
							$ \ \ \ $						
							$ \ \ \ $						
						SM			5YR 7/1), 40% non-plastic silt, 50% fine to coa	rse-grained subangular sand, 10% fine to			
30						ML		coarse gravel, loose SILT, light gray (5YR 7/1)	e, dry , 100% non-plastic silt, dense, dry, weathered	siltstone			
								-@31 to 32 feet - 6-inch o					
35													
								BEDROCK (THUMB FORMATION), gray (7.5YR N6), dense, dry					
		_						Total Depth = 37 feet Boring Terminated Target depth achieved					

Notes: No water encountered, no well installed.

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AECOM

NDEP Client: Boring No. NERT3.60N1 Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Elevation: 1483.076 FT 26737827.785 N 844016.018 E Coordinates: Sheet: 1 of 3

1		AECOM Coordinates:						26737827.785 N 844016.01	8 E <i>Elevation:</i> 1483.076 FT	Sheet: 1 of 3		
005 000 0775						ng Equ	iipmen	t/Method: /Sonic Rig	Monitoring Well Installed: Yes			
805-388-3775 Sample Type(s).							pe(s):	Grab	Screened Interval: 32-52 FT BGS			
Approved By: S. Bilodeau								Logged By: C. Grimes	Depth of Boring: 90 FT BGS			
Drilling (Contracto	r: Ca		Drillir	ng			Backfill: See below	Date/Time Finished: 04-09-19	Water Level: 38.02 FT BGS		
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (si grained material (si	CATION, color, description of fine lit and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture taining.	Well Diagram		
	R1 R2 PT- ER13.60N 26.0-26.4	1-				SP-SM SP-SM SP-SM SP-SM SM SP-SM ML ML		to coarse-grained su 0.10-inch max gravel feet bgs -@2.5 feet- gravel up to 1 if eet bgs -@2.5 feet- gravel up to 1 if eet bgs -@2.5 feet- gravel up to 1 if eet bgs -@3.5 feet- color change to fine to coarse-grained very fine to coarse-grained subround feet each of the subround feet each of the subround feet each of the subround fine-grained fine-grained fine-grained fine-grained rounded fine-grained rounded fine-grained fine-grained subround fine-grained fine-grained fine-grained fine-grained fin	brown (7.5YR 5/3) 40% silt, 60% very d sand to light grey (7.3YR 7/1), 20% silt, 75% rained subrounded sand, 5% gravel avel size ic silt, 60% very fine to d, semi-consolidated silt units (max WITH SILT, yellow brown (10YR 5/6), 90% very fine to fine-grained rounded in (10YR 5/6), 25% silt, 75% very fine to ded sand, loose, dry WITH SILT, dark yellowish brown in-plastic silt, 80% very fine to ded sand, 10% fine gravel with size, loose, dry R 5/3), 15% non-plastic silt, 80% fine gravel with a size, loose, dry In brown (10YR 5/3), 5% non-plastic medium-grained subrounded sand, 50% medium plastic fines, medium Lean Clay with Sand ine-grained sand layer to light brown (2.5YR 6/2), 90% to medium dense, 10% very fine to	bentonite grout schedule 40 PVC		

NDEP Client: Boring No. NERT3.60N1 **AECOM** 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Elevation: 1483.076 FT 26737827.785 N 844016.018 E AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 2 of 3 Drilling Equipment/Method: /Sonic Rig Weather: 90 and sunny Monitoring Well Installed: Yes 805-388-3775 Grab Sample Type(s): Boring Diameter: 8 IN Screened Interval: 32-52 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 04-08-19 Depth of Boring: 90 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-09-19 Water Level: 38.02 FT BGS Blows per 6"/RQD Headspace (ppm) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine Recovery (ft) Log grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Well Diagram Sample Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. ML medium-plastic silt, 15% fine to coarse-grained Monterey subrounded to subangular sand, 20% fine to medium PTgravel with 1.5-inch max grain size, stiff, wet, some bedding structures T3.60N 42.3-42.5 45 50 R5 ML 55 SILT, yellow red (5YR 4/6), 80% medium-plastic silt, 10% coarse-grained subangular to angular sand, 10% fine gravel with 0.25-inch max gravel size, moist, hard drilling -@42.3 feet - Core Labs (CL) Lean Clay @45 feet - 70% medium-plastic silt, 15% fine to coarse-grained subangular to angular sand, 15% fine to medium gravel 60 with 2-inch max gravel size R6 46 feet - 2-inch red standstone @47 feet - 75% fines, stiff, 5% very fine to fine angular sand, 10% gravel with 0.75-inch max gravel size WITH GRAVEL, yellow red (2.5Y 6/6), 65% medium plastic fines, stiff, 25% fine to coarse gravel with 6-inch max gravel size, dry bedding structures -@55 feet - color change to reddish yellow (5 YR 6/6), 80% silt, 5% fine-grained sand, 15% fine to medium gravel with SF 65 2-inch max gravel size, moderately cemented silt to siltsone/mudstone @60 feet - 85% fines, dense, 15% medium gravel with 3-inch max gravel size, dry CL POORLY GRADED SAND, grayish green (5GY 5/2), 100% very fine to medium-grained subangular sand, very dense, dry LEAN CLAY WITH GRAVEL, grayish green (5GY 3/2), 75% medium plastic fines, stiff, 25% fine to coarse gravel with 70 R7 5-inch max gravel size, moist GRAVELY SILT, grayish green (5GY 6/1), 70% low to ML medium-plastic silt, 5% coarse-grained subangular to angular sand, 25% medium to coarse gravel with 6-inch max gravel size, stiff, moist -@72.5 feet - color change to greenish grey (5G 4/2), 50% low plastic silt, 25% medium to coarse-grained sand, 25% 75 gravel, increasing sand -@75 feet - color change to greenish grey (5G 4/2), 55% medium plastic silt, 15% clay, 5% fine-grained sand, 25% fine to medium gravel with 2-inch max gravel size 80 Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

9/17/19

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AECOM 1220 Avenida Acaso Camarillo, CA 93012 805-388-3775

	Client:	NDEP	Doring No. NEDT2 CON4		
l	Project Number:	60477365			Boring No. NERT3.60N1
l	Site Description/L	ocation: Las Vegas Wash, F	lenderson, NV		Ambient PID Reading: NA
I	Coordinates:	26737827.785 N 844016.01	BE Elevation: 148	33.076 FT	Sheet: 3 of 3
I	Drilling Equipment	t/Method: /Sonic Rig	Weather:90 a	and sunny	Monitoring Well Installed: Yes
I	Sample Type(s):	Grab	Boring Diameter:	8 IN.	Screened Interval: 32-52 FT BGS
		Logged By: C. Grimes	Date/Time Started:	04-08-19	Depth of Boring: 90 FT BGS

Approve	ed By: S	. Biloc	deau					Logged By: C. Grimes Date/Time Started: 04-08-19		Depth of Boring: 90 FT BGS		
Drilling	Contracto	r: Ca	scade	Drilli	ng			Backfill: See below	Date/Time Finished: 04-09-19		Water Level: 38.02 FT BG	SS
DEPTH (ft) Sample ID Sample Depth (ft) Blows per 6"/RQD Recovery (ft) Headspace (ppm) USCS Graphic Log					USCS		MATERIAL IDENTIFICATION, color, description of fine grained material (silt and clay) description of coarse grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining.		Well Diagram			
	K8					SP			, grayish green (5GY 4/2), 100% fine ubangular to angular sand, dry			
85						ML			reen (5GY 4/2), 65% low plastic silt, nd, 25% fine to medium gravel with ze, moist			
						ML		very fine to fine-grain semi to firmly cemen	(7.5YR 5/2), 75% low plastic silt, 25% ed angular to subrounded sand, dry, ted silts-@85 feet - Silt with Sand, b low plastic silt, 25% very fine to			
90	R9								to subrounded sand, dry,			

Total Depth = 90 feet. Boring Terminated Target depth achieved

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AECOM

NDEP Client: Boring No. NERT3.60S1 Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA

	AEC				Co	ordina	tes:	26737579.776 N 844700.21	4 E Elevation: 1474.267 FT	Sheet: 1 of 3	Sheet: 1 of 3	
1: C:	220 Avenio amarillo, C	da Aca CA 930	so 12		Drii	ling E	quipmen	t/Method: /Sonic Rig	Weather: 85 and sunny	Monitoring Well Installed	∄: Yes	
	805-388	-3775			Sai	mple 7	ype(s):	Grab Boring Diameter: 8 IN.		Screened Interval: 35-8	55 FT BGS	
Approved By: S. Bilodeau								Logged By: C. Grimes Date/Time Started: 03-26-19 Depth of Boring:		Depth of Boring: 90 FT	: 90 FT BGS	
Drilling Contractor: Cascade Drilling								Backfill: See below	Date/Time Finished: 03-27-19	Water Level: 38.75	FT BGS	
ОЕРТН (ft)	(ft) (ft) (galaxia)					nscs	Graphic Log	grained material (si grained material (sa	CATION, color, description of fine lt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture raining.	Well Diagra	am	
5 10 15 20 25 30 35 40	R1					SP-SM SM SM		non-plastic silt, 60% sand, 15% fine to me gravel size, loose, dr -@7.5 feet - color change to silt, 70% medium to 0.10-inch max grain PORLY GRADED SAND silt, 55% medium to medium to coarse grained subangular sand, 15% sand, 15% medium gloose, dry -@15 feet - color change to silt, 80% subangular medium gravel with 0.5 subangular sand, 10% SILTY SAND, 25% non-plasubangular sand, 10% -@21 feet - 15% silt, 75% 0.5-inch max gravel -@26 feet - color changed medium plastic silt, 6 subrounded sand SANDY SILT, 70% medium medium-grained subangular sand, 10% POORLY GRADED SAND (7.5YR 5/4), 10% low coarse-grained subangular sand, 10% SILTY SAND, reddish brow fine to medium-grain silt, 65% fine to coars to medium gravel with 0.25-inch staining SILTY SAND WITH GRAV BILTY SAND WITH GRAV plastic silt, 65% fine			bentonite grout	

 $\textbf{Notes:} \ \mathsf{R} \ \mathsf{denotes} \ \mathsf{Ramboll} \ \mathsf{grab} \ \mathsf{sample.} \ \mathsf{For} \ \mathsf{backfill} \ \mathsf{information,} \ \mathsf{refer} \ \mathsf{to} \ \mathsf{well} \ \mathsf{completion} \ \mathsf{diagram.}$

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 9/12/19

NDEP Client: Boring No. NERT3.60S1 60477365 **AECOM** Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA 26737579.776 N 844700.214 E Elevation: 1474.267 FT AECOM 1220 Avenida Acaso Camarillo, CA 93012 Coordinates. Sheet: 2 of 3 Drilling Equipment/Method: /Sonic Rig Weather: 85 and sunny Monitoring Well Installed: Yes 805-388-3775 Grab Boring Diameter: Sample Type(s): 8 IN Screened Interval: 35-55 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 03-26-19 Depth of Boring: 90 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 03-27-19 Water Level: 38.75 FT BGS Blows per 6"/RQD Headspace (ppm) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine € Log ₽ grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Recovery Well Diagram Sample Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. -@40 feet - 0.25 inch clay layer PVC SP POORLY GRADED SAND WITH SILT AND GRAVEL, dark brown (7.5YR 3/2), 10% low plastic silt, 70% medium to coarse-grained sand, 20% fine to medium gravel with SM ML 0.75-inch max gravel size SANDY SILT, brown (7.5YR 5/2), 55% low to medium plastic silt, 35% medium to coarse-grained subangular sand, 10% fine SP 45 to medium gravel, medium dense, interbedded clay layers, Monterey #3 Sand drv POORLY GRADED SAND WITH GRAVEL, brown (7.5YR 5/3), 5% low plastic silt, 75% medium to coarse-grained subangular sand, 20% fine to medium to gravel with 1.5-inch max gravel size, loose, wet -@46 feet - color change to brown (7.5YR 4/3), 5% silt, 55% subangular sand, 40% medium to coarse gravel, 50 R5 conglomerate layer -@50 feet - 5% silt, 70% sand, 25% fine gravel with 0.25-inch max gravel size ML SANDY SILT, light brown (7.5YR 6/3), 60% low plastic silt, 30% fine to medium-grained subrounded sand, 10% fine gravel, loose, wet SF POORLY GRADED SAND WITH GRAVEL, dark brown (7.5YR 3/2), 5% silt, 75% fine to coarse-grained subangular sand, 55 ML 20% fine to medium gravel with 0.5-inch max gravel size, loose, wet WITH SAND, reddish brown (5YR 4/4), 75% low plastic silt, SM 25% fine-grained subrounded sand POORLY GRADED SAND WITH SILT, brown (7.5YR 4/3), 10% non-plastic silt, 80% fine to coarse-grained subangular SF sand, 10% fine to medium gravel with 0.25-inch max gravel size, loose, wet, interbedded conglomerate 60 R6 POORLY GRADED SAND WITH SILT AND GRAVEL, brown ML (7.5YR 5/3), 10% non-plastic silt, 70% fine to coarse-grained subangular sand, 20% fine to medium SANDY SILT, light brown (7.5YR 6/4), 65% low plastic silt, 20% SP medium to coarse-grained subangular sand, 15% fine to medium gravel with 2-inch max gravel size, medium dense, 65 POORLY GRADED SAND WITH GRAVEL, light brown (7.5YR 4/3), 5% non-plastic silt, 65% medium to coarse-grained CL subrounded to subangular sand, 30% fine to medium gravel with 3-inch max gravel size, loose, wet LEAN CLAY WITH SAND, reddish brown (5YR 5/3), 70% NERT3.60S medium plastic clay, 25% medium to coarse-grained 68.2-68.5 subrounded to subangular sand, 5% fine gravel with 0.25-inch max gravel size, dense, moist 70 -@68.2 feet - Core Lab (CL) Lean Clay ML BEDROCK (MUDDY CREEK FORMATION), gray and reddish brown (5YR 5/5), 80% non-plastic to medium plastic fines, 15% medium to coarse-grained subrounded sand, 5% gravel with 0.10-inch max gravel size, interbedded with lithified siltstone and claystone ML gray and reddish brown (5YR 5/5), 85% medium plastic fines, 15% fine to medium-grained subangular sand, dry, 75 medium dense, interbedded, friable CL LEAN CLAY, reddish brown (5YR 5/3), 95% medium plastic fines, 5% sand, loose -@76 feet - cemented claystone to friable claystone/sandstone BEDROCK (HORSE SPRING FORMATION), 90% fines, 10% CL fine-grained subangular to subrounded gravel, dense, moist, 6 inch plug of limestone 80

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

9/12/19

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AECOM 1220 Avenida Acaso

NDEP Client: Boring No. NERT3.60S1 Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA 26737579.776 N 844700.214 E Elevation: 1474.267 FT Coordinates: Sheet: 3 of 3

	camarillo, C				Dri	lling E	quipmen	t/Method: /Sonic Rig	Weather:85	and sunny	Monitoring Well	Installed: Yes
	805-388	-3775			Sa	mple T	Гуре(s):	Grab	Boring Diameter:	8 IN.	Screened Inter	val: 35-55 FT BGS
Approv	ed By: S	6. Biloo	deau					Logged By: C. Grimes	Date/Time Started:	03-26-19	Depth of Boring	: 90 FT BGS
Drilling	Drilling Contractor: Cascade Drilling							Backfill: See below	Date/Time Finished	<u>r</u> : 03-27-19	Water Level:	38.75 FT BGS
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	MATERIAL IDENTIFIO grained material (si grained material (si mineralogical featu content, odors or si	ilt and clay) descrip and and gravel), sti res, density or stiff	otion of coarse ructural or	We	ll Diagram
						CL		BEDROCK (HORSE SPRI fine-grained subangu moist, 6 inch plug of	ılar to subrounded gi	ravel, dense,		
 85 	PT- ERT3.60S 86.0-86.3	1-				CL		SILT WITH LEAN CLAY, r plastic fines, 10% me limestone LEAN CLAY, Gray (5Y 5/1) dense -@86 feet - Core Lab (CL) -@86.5 feet - 3 inch cobble -@87 feet - color change to medium plastic fines 0.75-inch max gravel	edium-grained sand,), 100% medium plas Lean Clay es o reddish brown (5YI , 15% medium to co	6 inch plug of stic clay, medium		

-@90 feet - color change to gray (5Y 5/3), 100% fines, siltstone, friable claystone

Total Depth = 90 feet.

Boring Terminated

Target depth achieved



NDEP Client: Boring No. NERT3.60S1A Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: 26737409.271 N 844579.552 E Elevation: 1478.228 FT Coordinates: Sheet: 1 of 2

Ι,	AECC				Co	ordina	tes:	26737409.271 N 844579.55	52 E Elevation: 14	78.228 F I	Sheet: 1 of 2	
Gamaino, 671 66612						ling E	quipmen	t/Method: Sonic Rig	Weather:	Monitoring Well Installed: Yes		
805-388-3775 Sample Type(s).							ype(s):	Grab Boring Diameter: 6 IN.			Screened Interval: 35-55 FT BGS	
Approved By: S. Bilodeau								Logged By: C. Schnell	Date/Time Started:	04-23-19	Depth of Boring: 55 FT BGS	
	Contracto			Drilli	na			Backfill: See below	Date/Time Finished:		Water Level: 43.84 FT BGS	
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (s	CATION, color, descilt and clay) descript and and gravel), structures, density or stiffr	cription of fine tion of coarse uctural or	Well Diagram	
						ML			n gray (5YR 7/2), 75% nd, 5% coarse gravel v se, dry, hand auguerd	with 0.25-inch		
						SP			silt, 80% fine to coars 5% fine to coarse grav se, moist	se-grained rel with 1-inch		
								-@10 feet - color change to non-plastic silt, 75% gravel size, dry, dens	sand, 20% gravel wit			
15								-@15 feet - no recovery -@17.5 feet - color change 70% sand, 25% grav	e to pinkish gray (5YR	. 7/2), 5% silt,		
20								-@20 to 21 feet- sand laye -@21 feet - 5% non-plastic sand, 5% fine gravel -@22.5 color change to lig	er c silt, 90% fine-graine I with 0.25-inch max g ght reddish brown (5Y)	ravel size R 6/3), 5% silt,		
25								coarse gravel, dry, lo		d sandstone		
30						ML		SILT, pinkish gray (5YR 7/ subangular sand, de siltstone -@30 to 30.5 feet - coarse size	ense, moist, slightly co	onsolidated	hydrated	
						SP		moist	fine-grained subangu	ilar sand, loose,	bentonite	
35						SP			silt, 80% fine to coars ar sand, 15% fine to c	se-grained		
40								-@37.5 feet - 5% silt, 70% 2-inch max gravel siz		% gravel with		

Notes: 5 feet north of NERT3.60S1

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/7/19



AECOM 1220 Avenida Acaso Camarillo, CA 93012 Client: NDEP

Project Number: 60477365

Site Description/Location: Las Vegas Wash, Henderson, NV

Coordinates: 26737409.271 N 844579.552 E Elevation: 1478.228 FT

Drilling Equipment/Method: Sonic Rig

Weather: Monitoring Well Installed: Yes

Sample Type(s): Grab

Boring Diameter: 6 IN.

Screened Interval: 35-55 FT BGS

Second Property Sample Type (s): Grab Boring Diameter: 6 IN. Screened Interval: 35-55 FT BGS	Ca	marillo, C		12		D111	mig L	Juipinen	TWELTIOU. COING TAIS	vvcatrior.	Workoning We	i iriotalica. 100		
Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-23-19 Water Level: 43.84 FT BGS		805-388	-3775			Sai	mple 7	ype(s):	Grab	Boring Diameter: 6 IN.	Screened Inte	Screened Interval: 35-55 FT BGS		
HELE WILLIAM OF STATE	Approved By: S. Bilodeau								Logged By: C. Schnell	Date/Time Started: 04-23-19	Depth of Boring	g: 55 FT BGS		
grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. SP SP SM SP-SM S									Backfill: See below	Date/Time Finished: 04-23-19	Water Level:	43.84 FT BGS		
SP- SM POORLY GRADED SAND WITH SILT, light reddish brown (5YR 6/3), 10% non-plastic silt, 80% fine to coarse-grained subangular sand, 10% fine to coarse gravel with 1-inch max gravel size, loose, wet SP- SM POORLY GRADED SAND WITH SILT AND GRAVEL, pinkish gray (5RY 6/2), 10% non-plastic silt, 50% coarse-grained subangular sand, 40% coarse gravel with 1.5-inch max gravel size, loose, wet SP- SM POORLY GRADED SAND, pinkish gray (5RY 6/2), 5% non-plastic silt, 85% fine to coarse-grained subangular sand, 10% medium to coarse gravel with 0.5-inch max gravel size, loose, wet	DЕРТН (ft)	Sample ID	Depth	per	Recovery (ft)	eadsbace		Graphic Log	grained material (si grained material (sa mineralogical featu	It and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture	We	Ü		
fine to coarse-grained subangular sand, 5% medium to coarse gravel with 0.5-inch max gravel size, loose, wet							SP- SM		6/3), 10% non-plastic subangular sand, 10' max gravel size, loos POORLY GRADED SAND gray (5RY 6/2), 10% subangular sand, 40' gravel size, loose, we POORLY GRADED SAND non-plastic silt, 85% sand, 10% medium t gravel size, loose, we POORLY GRADED SAND fine to coarse-graine	e silt, 80% fine to coarse-grained % fine to coarse gravel with 1-inch e, wet WITH SILT AND GRAVEL, pinkish non-plastic silt, 50% coarse-grained % coarse gravel with 1.5-inch max et pinkish gray (5RY 6/2), 5% fine to coarse-grained subangular o coarse gravel with 0.5-inch max et WITH SILT, 10% non-plastic silt, 85% d subangular sand, 5% medium to		PVC Monterey #3		

Total Depth = 55 feet Boring Terminated Target depth achieved

Notes: 5 feet north of NERT3.60S1



Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV

NDEP

Client:

Elevation: 1478.497 FT

Ambient PID Reading: Sheet: 1 of 2

Boring No. NERT3.60S1B

26737412.039 N 844575.892 E Coordinates: AECOM 1220 Avenida Acaso Camarillo, CA 93012 Drilling Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: Yes 805-388-3775 Grab 6 IN Screened Interval: 35-55 FT BGS Sample Type(s): Boring Diameter: Approved By: S. Bilodeau Depth of Boring: 55 FT BGS Logged By: C. Schnell Date/Time Started: 04-22-19 Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-22-19 Water Level: 38.73 FT BGS Blows per 6"/RQD Headspace (ppm) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine Recovery (ft) Ьg ₽ grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Well Diagram Sample Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. POORLY GRADED SAND WITH GRAVEL, light brown (7.5YR 5/4), 5% non-plastic silt, 80% fine to coarse-grained subangular sand, 15% fine to medium gravel with 0.25-inch max gravel size, loose, dry, hand augured to 4.5 feet 10 -@10 feet - color change to dark grayish brown (10YR 4/3), 5% silt, 80% sand, 15% fine to coarse gravel with 1.5-inch max gravel size 15 POORLY GRADED SAND WITH SILT AND GRAVEL, dark grayish brown (10YR 4/3), 10% non-plastic silt, 75% fine to coarse-grained subangular sand, 15% fine to coarse gravel SM with 1.5-inch max gravel size, loose, dry 20 POORLY GRADED SAND WITH GRAVEL, brown (7.5YR 5/2), 5% non-plastic silt, 80% fine to coarse-grained subangular sand, 15% fine to coarse gravel with 1-inch max gravel size, loose, dry 25 -@25 feet - color change brown (7.5YR 4/4), 6-inch clay layer SILT, dark brown (7.5YR 3/4), 95% low to medium plastic fines, ML 5% gravel, medium dense, moist 30 hvdrated bentonite SP POORLY GRADED SAND, brown (7.5YR 5/4), 5% low plastic silt, 90% fine to coarse-grained subangular sand, 5% fine to coarse gravel with 0.25-inch max gravel size, medium 35 dense, moist POORLY GRADED SAND WITH GRAVEL, dark brown (7.5YR 3/4), 5% low plastic silt, 70% fine to coarse-grained SP SM subangular sand, 25% fine to coarse gravel with 2-inch max gravel size, loose, moist 40

Notes:

8/7/19

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ENSR BLOG



Client: NDEP
Project Number: 60477365

Site Description/Location: Las Vegas Wash, Henderson, NV

Coordinates: 26737412.039 N 844575.892 E Elevation: 1478.497 FT

Sheet: 2 of 2

Drilling Equipment/Method: Sonic Rig

Weather: Monitoring Well Installed: Yes

Sample Type(s): Grab

Boring Diameter: 6 IN.

Screened Interval: 35-55 FT BGS

	AEC	MC			Co	ordina	tes:	26737412.039 N 844575.89	2 E Elevation: 1478.497 FT	Sheet: 2	of 2
	220 Aveni amarillo, 0				Dri	lling E	quipmen	t/Method: Sonic Rig	Weather:	Monitoring V	Vell Installed: Yes
	805-388-3775 Sample Type(s)						Type(s):	Grab	Boring Diameter: 6 IN.	Screened In	terval: 35-55 FT BGS
Approve	Approved By: S. Bilodeau							Logged By: C. Schnell	Date/Time Started: 04-22-19	Depth of Bo	ring: 55 FT BGS
Drilling (Contracto	r: Ca	scade	Drilli	ng			Backfill: See below	Date/Time Finished: 04-22-19	Water Level	38.73 FT BGS
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (s grained material (s	CATION, color, description of fine lilt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture taining.	\	Vell Diagram
45						SP- SM		brown (7.5YR 6/4), 1 coarse-grained suba with 1.5-inch max gr cemented sandstone -@42 feet - color change t silt, 75% fine to coar to coarse gravel with POORLY GRADED SAND (10YR 4/4), 5% non- subangular sand, 20 max gravel size, loos POORLY GRADED SAND 5/6), 10% non-plastic	o brown (7.5YR 4/3), 10% non-plastic se-grained subangular sand, 15% fine 2-inch max gravel size, wet, loose WITH GRAVEL, dark yellowish brown plastic silt, 75% coarse-grained % fine to coarse gravel with 0.25-inch se, wet WITH SILT, strong brown (7.5YR c silt, 85% medium-grained subangular		Schedule 40 PVC Monterey #3 Sand
55								loose, wet, 2-inch thi	rse gravel with 2-inch max gravel size, ck black siltstone		

Total Depth = 55 feet Boring Terminated Target depth achieved

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/7/19



Client: NDEP
Project Number: 60477365

Site Description/Location: Las Vegas Wash, Henderson, NV
Ambient PID Reading:

Coordinates: 26737431.857 N 844597.596 E Elevation: 1478.305 FT Sheet: 1 of 2

Drilling Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: Yes

Sample Type(s): Grab Boring Diameter: 6 IN. Screened Interval: 35-55 FT BGS

	Description/Location. Las vegas was		Ambient PID Reading:		
AECOM	rdinates: 26737431.857 N 844597	7.596 E <i>Elevation</i> : 1478.305 FT	Sheet: 1 of 2		
1220 Avenida Acaso Camarillo, CA 93012	ng Equipment/Method: Sonic Rig				
805-388-3775	ple Type(s): Grab	Boring Diameter: 6 IN.	Screened Interval: 35-55 FT BGS		
oved By: S. Bilodeau	Logged By: C. Schnell	Date/Time Started: 04-23-19	Depth of Boring: 55 FT BGS		
ng Contractor: Cascade Drillir	Backfill: See below	Date/Time Finished: 04-23-19	Water Level: 39.14 FT BGS		
Sample ID Sample Depth (ft) Blows per 6"/RQD Recovery (ft)	grained materia grained materia grained materia mineralogical fe content, odors of		Well Diagram		
	SM 5/8), 10% non-pla 0.25-inch max gr feet SP POORLY GRADED SA (5YR 6/4), 5% no	AND WITH SILT, strong brown (7.5YR astic silt, 85% fine sand, 5% gravel with ravel size, loose, dry, hand augured to 5 AND WITH GRAVEL, light reddish brown on-plastic silt, 80% fine to coarse-grained 1, 15% medium to coarse gravel with 1-inch lose, dry			
	-@15 to 17.5 feet - no	recovery			
	-@25 to 27.5 feet - no	recovery			
	moist -@34 feet - color change	5YR 8/2), 100% non-plastic silt, loose, ge to light brown (6/4), 90% non-plastic e sand moist loose slightly cemented	hydrated bentonite		
	ML SILT, pinkish white (7.9 moist -@34 feet - color chang silt, 10% very fine siltstone SM SILTY SAND, light red 70% fine to coars	5YR 8/2), 100% non-plastic silt, loose,	hydrabento		

Notes:

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/7/19



Client: NDEP
Project Number: 60477365

Site Description/Location: Las Vegas Wash, Henderson, NV
Ambient PID Reading:
Coordinates: 26737431.857 N 844597.596 E Elevation: 1478.305 FT
Sheet: 2 of 2
Drilling Equipment/Method: Sonic Rig
Weather: Monitoring Well Installed: Yes
Sample Type(s): Grab
Boring No. NERT3.60S1C

Ambient PID Reading:
Sheet: 2 of 2
Monitoring Well Installed: Yes
Screened Interval: 35-55 FTBGS

	000 000	, 0, , 0			Sa	mple ī	Type(s):	Grab	Boring Diameter: 6 IN.	Screened Interval: 35-55 FTBGS
Approved By: S. Bilodeau								Logged By: C. Schnell	Date/Time Started: 04-23-19	Depth of Boring: 55 FT BGS
Drilling	Drilling Contractor: Cascade Drilling							Backfill: See below	Date/Time Finished: 04-23-19	Water Level: 39.14 FT BGS
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (s grained material (s	CATION, color, description of fine ilt and clay) description of coarse and and gravel), structural or ires, density or stiffness, moisture staining.	Well Diagram
45						SM		70% fine to coarse-opto coarse gravel with moist, 1-inch thick la -@40 feet - color change f	n brown (5YR 6/4), 20% non-plastic silt, grained subangular sand, 10% medium 1.5-inch max gravel size, loose, ayer of silt (continued) o light brown (7.5YR 6/4), 20% silt, yel with 1-inch max gravel size, wet,	Schedule 40 PVC Monterey #3 Sand
						SP- SM		very fine-grained san cemented silt POORLY GRADED SAND	0 WITH SILT, 10% non-plastic silt, 90% nd, loose, wet, 6-inch layer of slightly 0, brown (7.5YR 4/2), 5% non-plastic	
50						SP		coarse gravel with 0 POORLY GRADED SAND 75% fine to coarse-g	rse-grained subangular sand, 5% .25-inch max gravel size, loose, wet WITH GRAVEL, 10% non-plastic silt, grained sand, 15% fine to coarse gravel yel size, loose, wet, slightly cemented	
55										

Total Depth = 55 feet Boring Terminated Target depth achieved

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/7/19

Notes:		

AECOM AECOM 1220 Avenida Acaso

NDEP Client: Boring No. NERT3.60S1D Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: 26737416.279 N 844525.909 E Elevation: 1478.239 FT Coordinates: Sheet: 1 of 2

						/Method: Sonic Rig	Weather:	Monitoring Well Installed: Yes		
Sample Type(s).						nple T	ype(s):		Boring Diameter: 6 IN.	Screened Interval: 35-55 FT BGS
Approved By: S. Bilodeau Drilling Contractor: Cascade Drilling								Logged By: C. Schnell	Date/Time Started: 04-22-19	Depth of Boring: 55 FT BGS
Orilling C	Contracto			Drillir				Backfill: See below	Date/Time Finished: 04-22-19	Water Level: 38.71 FT BGS
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	NSCS	Graphic Log	grained material (si grained material (si	CATION, color, description of fine It and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture taining.	Well Diagram
						SM			n (7.5YR 4/4), 30% non-plastic silt, grained subangular sand, 5% medium	KA KA
								to coarse gravel with	0.75-inch max gravel size, hand	
								augured to 4 feet		
5										
						SP			WITH GRAVEL, light brown (7.5YR silt, 75% fine to medium-grained	
									% medium to coarse gravel, loose	
10										
						6-		POODLY OF A STATE OF A	abilish are (F) (D T(0), CCC) 5	
						SP			, pinkish gray (5YR 7/2), 80% fine to ngular sand, 20% fine to coarse gravel	
								with 1-inch max grav		
15								045.6		
								-@15 feet - no recovery		
						CD		DOODLY CDARED CAND	MUTULOLAY AND ODAYEL 400/	
						SP- SC		non-plastic silt, 70%	WITH CLAY AND GRAVEL, 10% fine to coarse-grained subangular	
20								sand, 20% fine to co size, loose, dry	arse gravel with 1-inch max gravel	
								,,		
25						ML		SILT, light gray (5YR 7/1), dry, siltstones with la	100% non-plastic silt, medium dense,	
								ary, ortotories with it		
20										
30										
										hydrated bentonite
						SP		POORLY GRADED SAND	WITH GRAVEL, pinkish gray (5YR	
								7/2), 5% non-plastic subangular sand, 20	silt, 75% fine to coarse-grained % gravel with 0.75-inch max gravel,	漢語
35								loose, dry, 3-inch pe		
						ML		SANDY SILT light reddish	brown (5YR 6/3), 55% non-plastic silt,	
								35% fine to coarse-g	rained subangular sand, 10% gravel,	
						SP		loose, moist POORLY GRADED SAND	, light reddish brown (5YR 6/3), 95%	1
40								medium to coarse-gi	rained subangular sand, 5% coarse	
	Notes:									



AECOM	Client: NDEP Project Number: 60477365	Boring No. NERT3.60S1D	
1,200	Site Description/Location: Las Vegas W	ash, Henderson, NV	Ambient PID Reading:
AECOM	Coordinates: 26737416.279 N 8445	25.909 E <i>Elevation:</i> 1478.239 FT	Sheet: 2 of 2
1220 Avenida Acaso Camarillo, CA 93012	Drilling Equipment/Method: Sonic Rig	Monitoring Well Installed: Yes	
805-388-3775	Sample Type(s): Grab	Boring Diameter: 6 IN.	Screened Interval: 35-55 FT BGS
Approved By: S. Bilodeau	Logged By: C. Schnell	Date/Time Started: 04-22-19	Depth of Boring: 55 FT BGS
Drilling Contractor: Cascade Dri	ling Backfill: See below	Date/Time Finished: 04-22-19	Water Level: 38.71 FT BGS
(#)	E MATERIAL IDEN	ITIFICATION, color description of fine	

schedule PVC

Monterey #3 Sand

GP- GM ML GR ML	Dimining Co	00.11.00.01.						Zate in the interior	
SILTY SAND/SILT WITH SAND, light reddish brown (5YR 6/3), 45% low plastic silt, 45% medium to coarse-grained subangular sand, 10% medium to coarse gravel with 2-inch max gravel size, loose, moist SILTY SAND WITH GRAVEL, light reddish brown (5YR 6/3), 15% low plastic silt, 65% medium to coarse-grained subangular sand, 20% medium to coarse gravel, increasing gravel PORLY GRADED GRAVEL WITH SILT, light reddish brown (5YR 6/3), 10% non-plastic silt, 90% medium to coarse subangular to angular gravel with 3-inch max gravel size, loose, wet, cemented coarse-grained sandstone conglomerate SILT WITH SAND, light reddish brown (5YR 6/3), 60% non-plastic silt, 45% fine to coarse-grained subangular to angular sand, 5% fine to coarse gravel with 1-inch max	DEPTH (ft)	Sample ID	e D	. l o	Headspace (ppm)	nscs	Graphic Log	grained material (silt and clay) description of coarse grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture	Well Diagram
-@47.5 feet - 1-foot thick gravel with volcanics	50					SM : GP- GM ML		SILTY SAND/SILT WITH SAND, light reddish brown (5YR 6/3), 45% low plastic silt, 45% medium to coarse-grained subangular sand, 10% medium to coarse gravel with 2-inch max gravel size, loose, moist SILTY SAND WITH GRAVEL, light reddish brown (5YR 6/3), 15% low plastic silt, 65% medium to coarse-grained subangular sand, 20% medium to coarse gravel, increasing gravel POORLY GRADED GRAVEL WITH SILT, light reddish brown (5YR 6/3), 10% non-plastic silt, 90% medium to coarse subangular to angular gravel with 3-inch max gravel size, loose, wet, cemented coarse-grained sandstone conglomerate SILT WITH SAND, light reddish brown (5YR 6/3), 60% non-plastic silt, 45% fine to coarse-grained subangular to angular sand, 5% fine to coarse gravel with 1-inch max gravel size, loose, wet -@47.5 feet - 1-foot thick gravel with volcanics SILTY SAND WITH GRAVEL, dark brown (7.5YR 4/4), 15% non-plastic silt, 75% fine to coarse-grained subangular sand, 15% fine to coarse gravel with 2-inch max gravel size, loose, wet, with sandstone conglomerates as above	Mc Sa

Boring Terminated
Target depth achieved

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/7/19

NDEP Client: Boring No. NERT3.63S1 **AECOM** 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA 26737071.551 N 844152.61 E Elevation: 1461.775 FT AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 1 of 2 Drilling Equipment/Method: /Sonic Rig Weather: 70 and cloudy and breezy Monitoring Well Installed: Yes 805-388-3775 Grab Sample Type(s): Boring Diameter: 8 IN Screened Interval: 15-35 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 04-17-19 Depth of Boring: 60 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-17-19 Water Level: 18.58 FT BGS 6"/RQD Headspace (ppm) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine € Log \Box grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Recovery Well Diagram Sample Graphic grained material (sand and gravel), structural or Blows per mineralogical features, density or stiffness, moisture content, odors or staining. SILTY SAND, brown (7.5YR 4/4), 15% low plastic silt, 75% fine to coarse-grained subrounded sand, 10% fine gravel with 0.5-inch max gravel size, loose, dry, mostly fine to medium sand bentonite @5 feet - color change to brown (7.5YR 5/4), 15% silt, 70% very fine to coarse subrounded to angular sand, 15% fine to coarse angular gravel with 2.5-inch to 6-inch max gravel size, moist -@6 feet - 6 inches of volcanics 10 R1 SP POORLY GRADED SAND WITH GRAVEL, brown (7.5YR 5/3), 5% low plastic silt, 65% medium to coarse-grained subrounded to angular sand, 30% fine to medium angular gravel with 2-inch max gravel size, loose, moist SIV SILTY SAND WITH GRAVEL, brown (7.5YR 6/4), 15% low plastic silt, 70% fine to coarse-grained subrounded to 15 angular sand, 15% fine to medium gravel with 1-inch max gravel size, loose, moist SILTY SAND, light brown (7.5YR 6/2), 40% low to medium plastic silt, 10% clay, 50% very fine to coarse-grained sand, 20 R2 schedule 40 POORLY GRADED SAND WITH SILT AND GRAVEL, dark SM brown (7.5YR 3/2), 10% low plastic silt, 65% medium to coarse-grained subangular to angular sand, 25% fine to medium gravel with 2-inch max gravel size, loose, wet, increasing gravel to 23 feet -@23 feet - 10% silt, 50% sand, 40% gravel 25 No 3 -@25 feet - 10% silt, 65% sand, 25% gravel Monterey Sand POORLY GRADED GRAVEL WITH SILT AND SAND, dark GP brown (7.5YR 3/2), 10% low plastic silt, 30% medium to ĠΜ coarse-grained subangular to angular sand, 60% fine to SM 30 R3 medium gravel, loose, wet SILTY SAND, dark brown (7.5YR 3/2), 30% low plastic silt, 70% very fine to fine-grained rounded sand, medium dense, wet -@31 feet - 15% silt, 65% fine to coarse-grained subrounded to angular sand, 20% fine to medium gravel with 2-inch max gravel size, loose, mostly coarse sand -@34 feet - 15% silt, 80% subrounded to subangular sand, 5% 35 fine subangular gravel with 0.3-inch max gravel size @35 feet - 15% silt, 70% sand, 15% fine to coarse gravel with 3-inch max gravel size SC 40

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

9/17/19

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BORING

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Approved By: S. Bilodeau

Client: **NDEP** Boring No. NERT3.63S1 Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Elevation: 1461.775 FT 26737071.551 N 844152.61 E Coordinates: Sheet: 2 of 2 Drilling Equipment/Method: /Sonic Rig Weather: 70 and cloudy and breezy Monitoring Well Installed: Yes Sample Type(s): Grab Boring Diameter: 8 IN. Screened Interval: 15-35 FT BGS Date/Time Started: 04-17-19 Depth of Boring: 60 FT BGS Logged By: C. Grimes Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-17-19 Water Level: 18.58 FT BGS

DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	MATERIAL IDENTIFICATION, color, description of fine grained material (silt and clay) description of coarse grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining.	Well Diagram
50	PT- ERT3.63S 49.0-49.4 R5	1-				CL		plastic silt, 10% clay, 60% very fine to fine-grained rounded sand, medium dense, wet <i>(continued)</i> SILT WITH SAND, light red (7.5YR 6/6) with light olive gray (5Y 6/2), 60% low to medium plastic silt, 20% clay, 20% very fine to fine-grained sand, stiff, wet, thin (0.3") to thick (3") beds -@42 feet - Silty Sand with Gravel, 15% silt, 70% sand, 15% gravel LEAN CLAY, light reddish brown (5YR 6/4), 30% medium to high plastic silt, 70% clay, dry, very stiff, blocky peds, break horizontally -@49 feet - Core Labs (CL) Lean Clay -@50 feet - beds become more cemented -@52.5 feet - color change to mottled with light olive gray (5Y	
55								6/2), 40% silt, 60% clay, damp/moist, beds become more cemented, moisture may be from water used for drilling BEDROCK, reddish brown (5Y 4/3), Cemented Sandstone (Middle Thumb Formation) -@56 to 60 feet - very hard drilling	
60								Polycal at 60 feet	

Refusal at 60 feet. **Boring Terminated**

NDEP Client: Boring No. NERT3.98S1 **AECOM** 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Elevation: 1466.271 FT 26736678.945 N 842522.475 E Coordinates: AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 1 of 2 Drilling Equipment/Method: /Sonic Rig Weather: 80 and sunny Monitoring Well Installed: Yes 805-388-3775 Grab Sample Type(s): Boring Diameter: 8 IN Screened Interval: 15-35 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 04-02-19 Depth of Boring: 55 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-02-19 Water Level: 10.36 FT BGS Blows per 6"/RQD Headspace (ppm) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine Recovery (ft) Log grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Well Diagram Sample Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. SILTY SAND, light brown (7.5YR 6/2), 20% non-plastic silt, 75% fine to medium-grained subrounded sand, 5% medium to coarse gravel with 2-inch max gravel size, loose, dry SM SILTY SAND WITH GRAVEL, brown (7.5YR 5/2), 15% non-plastic silt, 55% medium to coarse-grained subangular to angular sand, 30% medium to coarse gravel with 3-inch max gravel size, loose, wet SM SILTY SANDSTONE, 25% low plastic silt, 70% medium to coarse-grained subrounded sand, 5% coarse gravel with 10 NERT3.98S 6-inch max gravel size, medium to dense, wet @9.7 feet - Core Lab (ML) Sandy Silt -@10 feet - color change to red brown (2.5 YR 5/4), 35% low plastic silt, 60% fine to medium-grained subangular sand, 5% medium gravel with 1.5-inch max gravel size, damp bentonite almost moist, medium dense ML SILT, red brown (2.5YR 5/4), 90% low to medium plastic fines, 10% medium-grained subrounded sand, dense, dry 15 SM SILTY SAND, red brown (2.5YR 5/4), 40% low to medium plastic fines, 60% very fine to fine-grained subrounded to rounded sand, medium to dense, moist, cemented fragments PT-ERT3.98S -@17 feet - Core Lab (SM) Silty Sand 17.0-17.3 SILT, 90% low to medium plastic fines, 10% fine to MI medium-grained subrounded sand, dense, moist 20 schedule 40 -@20 feet - color change to red brown (2.5YR 4/3), 90% high plastic fines, 10% fine-grained subrounded sand, dry, BEDROCK (MUDDY CREEK FORMATION), 5YR 3/4, 100% fines, cemented, lithified sediments interbedded light brown with dark brown layers, difficult drilling, gypsum 25 crystals with vesicles No 3 Monterey Sand -@27 feet - Thumb formation? crystalized rock BEDROCK (THUMB FORMATION), 80% low to medium plastic fines, 20% subrounded sand, 6-inch thick crystalized rock 30 R3 @30 feet - color change to brown (7.5YR 4/4), 90% medium plastic fines, 10% medium to coarse-grained sand, gypsum content increases, cemented siltstone -@34 feet - thinly bedded gypsum layer 35 -@37 feet - bedding has become homogenous, strong with cemented sandstone 40

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

9/17/19

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	Client:	NDEP		Paring No. NEDT2 0994	
	Project Number:	60477365	Boring No. NERT3.98S1		
ı	Site Description/L	ocation: Las Vegas Wash, F	Henderson, NV	Ambient PID Reading: NA	
	Coordinates:	26736678.945 N 842522.47	5 E Elevation: 1466.271 FT	Sheet: 2 of 2	
	Drilling Equipmen	t/Method: /Sonic Rig	Weather: 80 and sunny	Monitoring Well Installed: Yes	
	Sample Type(s):	Grab	Boring Diameter: 8 IN.	Screened Interval: 15-35 FT BGS	
		Logged By: C. Grimes	Date/Time Started: 04-02-19	Depth of Boring: 55 FT BGS	

Approve	ed By: S	S. Biloo	deau					Logged By: C. Grimes	Date/Time Started: 04-02-19	Depth of Boring: 55 FT BGS
	Contracto			· Drilli	na			Backfill: See below	Date/Time Finished: 04-02-19	Water Level: 10.36 FT BGS
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	SOSU	Graphic Log	MATERIAL IDENTIFION grained material (singular)	CATION, color, description of fine It and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture	Well Diagram
45	R4							fines, 20% subround (continued) -@42 feet - 90% low to me fine-grained subroun 4-inch max gravel siz -@43 feet - gypsum -@45 feet - gypsum -85% fines, 10% very fine fine fine-grained gravel with 5-inch max gravel with 5-inch grained gravel with 5-ined grav	MATION), 80% low to medium plastic ed sand, 6-inch thick crystalized rock dium plastic fines, 5% very fine to ded sand, 5% coarse gravel with re, strongly cemented sandstone of fine-grained sand, 5% coarse gravel el size, cemented sandstone brown (7.5YR 4/5) and red brown 10% low to medium plastic fines, 15% ith 2 inch max gravel size, very litstones to sandstones, gypsum	
55										

Total Depth = 55 feet. Boring Terminated Target depth achieved

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NDEP Client: Boring No. NERT4.64N1 **AECOM** 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Coordinates: 26736269.465 N 839271.619 E Elevation: 1511.580 FT Sheet: 1 of 3 1220 Avenida Acaso Camarillo, CA 93012 Drilling Equipment/Method: /Sonic Rig Weather: 80 and sunny Monitoring Well Installed: Yes 805-388-3775 Grab Boring Diameter: Sample Type(s): 8 IN Screened Interval: 25-45 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 04-03-19 Depth of Boring: 90 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-03-19 Water Level: 23.03 FT BGS 6"/RQD (mdd) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine € Log \Box grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Recovery Headspace (Well Diagram Sample Graphic grained material (sand and gravel), structural or Blows per mineralogical features, density or stiffness, moisture content, odors or staining. SILTY SAND, light brown (7.5YR 6/4), 25% non-plastic silt, 70% very fine to medium-grained subrounded sand, 5% medium gravel with 2-inch max gravel size, loose, dry -@5 feet - color change to brown (7.5YR 5/4), 65% very fine to fine-grained rounded sand, 35% low plastic silt -@8 feet - very homogenous, can be compacted easily 10 R1 bentonite arout 15 -@15 feet - 15% non-plastic silt, 85% fine-grained rounded sand POORLY GRADED SAND WITH SILT, 10% non-plastic silt, 90% SIV fine-grained rounded sand, loose, moist 20 R2 -@20 feet - Sand with Silt and Gravel, color change to dark brown (7.5YR 3/2), 10% non-plastic silt, 75% medium to coarse-grained subrounded sand, 15% fine to medium gravel with 0.5-inch max gravel size, moist, loose SP SAND WITH GRAVEL, 10% non-plastic silt, 65% sand, 25% medium gravel with 1.5-inch max gravel size -@24 feet - 5% non-plastic silt, 60% medium to coarse-grained 25 sand, 35% fine to medium gravel with 1-inch max gravel SIV size, wet SILTY SAND, light brown (7.5YR 6/4), 15% non-plastic silt, 75% fine to coarse-grained subrounded sand, 10% fine gravel SP with 0.25-inch max gravel size, loose, wet SM SAND WITH SILT, red brown (5YR 4/4), 10% non-plastic silt, 90% fine-grained rounded sand SM SILTY SAND, dark brown (7.5YR 3/2), 15% non-plastic silt, 75% 30 medium to coarse-grained subrounded to subgangular sand, 10% fine gravel with 0.5-inch max gravel size, loose, SM wet SAND WITH SILT AND GRAVEL, light brown (7.5YR 6/4), 10% high-plastic silt, 70% medium to coarse-grained subangular to angular sand, 20% medium to coarse gravel with 4-inch max gravel size, loose, wet, becomes coarser -@31 feet - matrix supported. 20% silt, 55% sand, 25% gravel 35 schedule 40 CL LEAN CLAY, yellow red (5YR 5/6), 20% medium to high plastic silt, 80% clay, stiff, moist, interbedded clays PT--@37 feet - 20% silt, 75% clay, 5% fine gravel with 0.25-inch max 37.0-37.3

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

ML

gravel size -@37 feet - Core Lab (CL) Lean Clay

9/17/19

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NDEP Client: Boring No. NERT4.64N1 60477365 **AECOM** Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA 26736269.465 N 839271.619 E Elevation: 1511.580 FT AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 2 of 3 Drilling Equipment/Method: /Sonic Rig Weather: 80 and sunny Monitoring Well Installed: Yes 805-388-3775 Grab Sample Type(s): 8 IN Screened Interval: 25-45 FT BGS Boring Diameter: Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 04-03-19 Depth of Boring: 90 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-03-19 Water Level: 23.03 FT BGS 6"/RQD Headspace (ppm) Sample Depth (ft MATERIAL IDENTIFICATION, color, description of fine Log grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Recovery Well Diagram Sample Graphic grained material (sand and gravel), structural or Blows per mineralogical features, density or stiffness, moisture content, odors or staining. ML SANDY SILT, brown (7.5YR 5/4), 60% medium plastic silt, 10% Monterey clay, 20% medium to coarse-grained subangular sand, 10% fine to medium gravel with 1-inch max gravel size, dense, moist, gypsum crystals present (continued)
-@42 feet - color change to strong brown (7.5YR 5/6), 60% low plastic silt, 5% clay, 35% very fine to medium-grained subrounded sand SAND WITH SILT, 10% silt, 85% very fine to medium-grained 45 SM subrounded sand, 5% gravel, medium dense, moist, weakly cemented -@46 feet - color change to light brown (7.5YR 6/4), 15% low plastic silt, 74% very fine to fine-grained sand, 15% fine gravel with 0.3-inch max gravel size SIV SILTY SAND WITH GRAVEL, brown (7.5 YR 5/4), 35% low plastic silt, 50% fine to coarse-grained angular sand, 15% medium gravel with 1.5-inch max gravel size, medium 50 dense, dry, hand drilling ML SILT WITH SAND, light olive brown (2.5YR 5/4), 80% medium plastic silt, 10% medium-grained sand, 10% fine to coarse gravel with 4-inch max gravel size, medium dense, wet, conglomerate matrix CL LEAN SILT WITH GRAVEL AND SAND, 50% medium plastic silt, 20% very fine-grained rounded sand, 30% fine angular 55 gravel with 0.1-inch max gravel size, dense, moist, semi SM cemented between red laywers SILTY SAND WITH GRAVEL, dark brown (7.5YR 3/2), 15% low plastic silt, 70% medium to coarse-grained subrounded to rounded sand, 15% fine to medium gravel with 1.5-inch max gravel size, loose, wet, black speckled staining SANDY SILT WITH GRAVEL, light brown (7.5YR 6/4), 65% low to medium plastic silt, 20% medium to coarse-grained MI 60 subangular sand, 15% medium to coarse gravel with 3-inch max gravel size, loose, wet, conglomerate weakly -@62 feet - interbedded conglomerates -@63 feet - color change to dark brown (7.5YR 3/2). 10% silt, 70% medium to coarse-grained rounded sand, 20% fine to coarse gravel with 0.5-inch max gravel size, wet, loose, 65 more cemented SILTY SAND, red (2.5YR 5/6), 25% low plastic silt, 75% very fine to fine-grained rounded sand, dense, dry, strongly cemented -@67 feet - thin gypsum, crossbeds, vein, stratified T4 64N -@68 feet - Core Lab (CL) Sandy Lean Clay 68.0-68.3 70 -@70 feet - color change to reddish brown (5YR 4/4), 30% silt, 70% sand, beds not flat, dip and thicken, vesicular strata 75 ML , 65% medium plastic silt, 35% fine to coarse-grained subrounded to subangular sand, hard, dry -@77 feet - color change to light brown (4.5YR 6/2) and dark yellow (5Y 8/2), 80% medium plastic silt, 20% subrounded to subangular sand, dry, hard 80 Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

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Client:	NDEP		Poring No. NEDT4 64N4
Project Number:	60477365		Boring No. NERT4.64N1
Site Description/L	ocation: Las Vegas Wash, F	Henderson, NV	Ambient PID Reading: NA
Coordinates:	26736269.465 N 839271.61	9 E <i>Elevation:</i> 1511.580 FT	Sheet: 3 of 3
Drilling Equipmen	t/Method: /Sonic Rig	Weather: 80 and sunny	Monitoring Well Installed: Yes
Sample Type(s):	Grab	Boring Diameter: 8 IN.	Screened Interval: 25-45 FT BGS
	Logged By: C. Grimes	Date/Time Started: 04-03-19	Denth of Boring: 90 FT BGS

					Oui	ripic i	<i>ypc</i> (3).	Olub	Donnig Diameter. 0 iiv.	Screened Interval. 25-45 F F DOS
Approve	ed By: S	S. Biloc	deau					Logged By: C. Grimes	Date/Time Started: 04-03-19	Depth of Boring: 90 FT BGS
Drilling	Contracto	r: Ca	scade	Drilli	ng			Backfill: See below	Date/Time Finished: 04-03-19	Water Level: 23.03 FT BGS
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (si grained material (sa	CATION, color, description of fine lt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture aining.	Well Diagram
85						SP- SM		medium plastic silt, ' subangular sand, hai -@83 feet - thin yellow (7.5 brown (7.5YR 6/4)	o red (2.5YR 4/6) and light	

Total Depth = 90 feet. Boring Terminated Target depth achieved

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Client: **NDEP** Boring No. NERT4.64S1 **AECOM** 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA 26735740.735 N 839508.389 E Coordinates: Elevation: 1513.004 FT AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 1 of 2 Drilling Equipment/Method: Sonic Rig Weather: 78 and sunny Monitoring Well Installed: Yes 805-388-3775 Grab Sample Type(s): Boring Diameter: 8 IN Screened Interval: 35-55 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 03-25-19 Depth of Boring: 55 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 03-25-19 Water Level: 27.10 FT BGS Blows per 6"/RQD Headspace (ppm) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine € Log ₽ grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Recovery Well Diagram Sample Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. ML SILT, strong medium brown (7.5YR 4/6), 95% non-plastic silt, 5% very fine sand, loose, dry 10 -@10 feet - Silt with Sand, 65% silt, 30% very fine-grained subrounded sand, 5% gravel with 0.3 inch max gravel size 15 SM SILTY SAND WITH GRAVEL, brown (7.5 YR 4/4), 30% non-plastic silt, 50% medium-grained subrounded sand, 20% subangular gravel with 0.75-max gravel size, loose, dry SP POORLY GRADED SAND WITH SILT AND GRAVEL, brown SM (7.5YR 4/3), 10% non-plastic silt, 75% medium to coarse-grained subrounded sand, 15% gravel with 20 0.10-inch max gravel size, loose, dry -@22.5 feet - no silt SF SAND, brown (7.5YR 5/6), 95% fine to medium-grained subrounded sand, 5% gravel, loose, dry, with bedding 25 lavers POORLY GRADED SAND WITH SILT AND GRAVEL, brown SM (7.5YR 4/3), 10% non-plastic silt, 75% medium to coarse-grained sunbangular sand, 15% gravel with 0.25-inch max gravel size SF POORLY GRADED SAND WITH GRAVEL, reddish yellow 30 (7.5YR 6/6), 5% non-plastic silt, 60% fine to coarse-grained SP subangular sand, 35% gravel with 5-inch max gravel size, loose, moist, basalt cobbles hydrated POORLY GRADED SAND WITH GRAVEL TO POORLY bentonite GRADED GRAVEL WITH SAND, brown (7.5 YR 4/3), 50% ML fine to coarse-grained sunbangnular sand, 50% subrounded gravel with 0.25-inch max gravel size, loose, SP SM moist 35 SILT, brown (7.5 YR 5/5), 95% low plastic fines, 5% fine-grained sand, loose, moist POORLY GRADED SAND WITH SILT, 10% low plastic silt, 80% fine to medium-grained subangular sand, 10% subrounded gravel with 0.30-inch max gravel size, loose, moist

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

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17.	Client:	NDEP		
AECOM	Project Number:			Boring No. NERT4.64S1
/ LCO!	Site Description/L	ocation: Las Vegas Wash, H	enderson, NV	Ambient PID Reading: NA
AECOM	Coordinates:	26735740.735 N 839508.389	E Elevation: 1513.004 FT	Sheet: 2 of 2
1220 Avenida Acaso Camarillo, CA 93012	Drilling Equipment	t/Method: Sonic Rig	Weather: 78 and sunny	Monitoring Well Installed: Yes
805-388-3775	Sample Type(s):	Grab	Boring Diameter: 8 IN.	Screened Interval: 35-55 FT BGS
Approved By: S. Bilodeau		Logged By: C. Grimes	Date/Time Started: 03-25-19	Depth of Boring: 55 FT BGS
Drilling Contractor: Cascade Drillin	g	Backfill: See below	Date/Time Finished: 03-25-19	Water Level: 27.10 FT BGS
DEPTH (ft) Sample ID Sample Depth (ft) Blows per 6"/RQD Recovery (ft)	Headspace (ppm) USCS Graphic Log	grained material (sil grained material (sa mineralogical featur content, odors or st	<u> </u>	Well Diagram
45	GM O CL SP-SC SP-S	silt, 35% medium to o medium to coarse-gr. max gravel size, loos -@40 feet - increasing clay GRAVELLY LEAN CLAY, li plastic clay, 35% medium plastic clay, 35% medium plastic subrounded sand, 10 size, medium plastic subrounded sand, 10 size, medium dense, POORLY GRADED SAND brown (7.5YR 6/2), 11 coarse-grained subar 0.25-inch max gravel CLAYEY SAND, light brown fines, 65% fine to coamedium dense, wet -@48 feet - 30% clay, 60% gravel size, wet POORLY GRADED SAND 5% silt, 75% medium 20% gravel with 2-inc -@52 feet - 60% sand, 40% -@53 feet - 35% sand, 65% POORLY GRADED GRAVE (6/3), 10% silt, 10% si	ght brown (7.5YR 6/3), 65% medium dium to coarse subangular gravel with e, medium dense, wet WITH CLAY, dark brown (7.5YR 3/3), clay, 80% medium to coarse-grained gravel with 0.10-inch max gravel moist, with clay clasts WITH SILT AND GRAVEL, very dark 0% non-plastic silt, 70% medium to ngular sand, 20% gravel with size, loose, wet n (7.5YR 6/3), 35% medium plastic urse-grained subrounded sand, sand, 10% gravel with 0.5-inch max WITH GRAVEL, brown (7.5YR 4/3), to coarse-grained subrounded sand, h max gravel size, wet	Schedule 40 PVC Monterey #3 Sand
Notes: R denotes Ramb	oll grab sample. F	For backfill information, refe	er to well completion diagram.	

AECOM AECOM 1220 Avenida Acaso Camarillo, CA 93012 805-388-3775 Approved By: S. Bilodeau Drilling Contractor: Cascade Dri Sample Depth (ft) \Box DEPTH (ft) Sample II

10

15

20

25

30

35

Blows per 6"/RQD

	Client:	NDEP 60477365		Boring No. NERT4.64S1A						
	Project Number		50477365							
	Coordinates:	267356746.283 N 839506.1		Ambient PID Reading:						
		nt/Method: Sonic Rig		Sheet: 1 of 2 Monitoring Well Installed: Yes						
	Sample Type(s,		Weather: Boring Diameter: 6 IN.	Screened Interval 35-55 FT BGS						
	Sample Type(s)	Logged By: C. Schnell	Date/Time Started: 04-26-19	Depth of Boring: 55 FT BGS						
Drilli	ing	Backfill: See below	Date/Time Finished: 04-26-19							
Recovery (ft)	Headspace (ppm) USCS Graphic Log	grained material (si grained material (sa	CATION, color, description of fine lt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture	Water Level: 26.91 FT BGS Well Diagram						
	ML	SILT, pink (5YR 7/3), 100% augured to 5 feet bgs -@5 to 7 feet - no recovery -@15 to 18.5 - no recovery								
	SP SP	non-plastic silt, 85% sand, 10% fine to me size, loose, dry SILTY SAND WITH GRAV plastic silt, 80% fine	reddish brown (5YR 6/3), 5% fine to coarse-grained subangular dium gravel with 0.25-inch max gravel eL, reddish brown (5YR 5/3), 5% non to coarse-grained subangular sand, ravel with 0.5-inch max gravel size sand, 15% gravel, wet							

SILT, 90% non-plastic silt, 10% fine to coarse-grained angular

POORLY GRADED SAND WITH SILT AND GRAVEL, reddish

SILT, pink (5YR 7/3), 100% medium-plastic silt, dry

gray (5YR 5/2), 5% non-plastic silt, 80% fine to coarse-grained subangular sand, 15% fine to coarse gravel with 0.5-inch max gravel size, loose, wet

hydrated bentonite

sand, loose, wet

SP-SM

ML

40 Notes:

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/6/19



Client: NDEP
Project Number: 60477365

Site Description/Location: Las Vegas Wash, Henderson, NV
Ambient PID Reading:
Coordinates: 267356746.283 N 839506.159 E Elevation: 1512.733 FT
Sheet: 2 of 2

Drilling Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: Yes

Sample Type(s): Grab Boring Diameter: 6 IN.
Screened Interval: 35-55 FT BGS

Camarillo, CA 93012	Drilling Equipmen	nt/Method: Sonic Rig	Weather:	Monitoring Well Installed: Yes
805-388-3775	Sample Type(s):	Grab	Boring Diameter: 6 IN.	Screened Interval: 35-55 FT BGS
Approved By: S. Bilodeau		Logged By: C. Schnell	Date/Time Started: 04-26-19	Depth of Boring: 55 FT BGS
Drilling Contractor: Cascade Dril	ing	Backfill: See below	Date/Time Finished: 04-26-19	Water Level: 26.91 FT BGS
Sample ID Sample Depth (ft) Sample Depth (ft) Blows per 6"/RQD Recovery (ft)	Headspace (ppm) USCS Graphic Log	grained material (si grained material (si	CATION, color, description of fine lt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture taining.	Well Diagram
	ML		6 medium-plastic silt, dry <i>(continued)</i> to light reddish brown (5YR 6/3), 85% [5% sand, dry	schedule 40 PVC
	SM	coarse-grained suba	EL, 30% non-plastic silt, 50% fine to ngular sand, 20% fine to coarse gravel ravel size, loose, wet	Sand
	SP- SM	fine to medium-grain	WITH SILT, 10% non-plastic silt, 85% ed subangular sand, 5% fine to 0.25-inch max gravel size, loose, wet	
	SP	75% fine to coarse-g	WITH GRAVEL, 5% non-plastic silt, rained subangular sand, 20% fine to 75-inch max gravel size, loose, wet	
	GP OC	non-plastic silt, 95%	EL, dark reddish gray (5YR 4/2), 5% coarse subangular gravel with size, loose, wet, with small pebbles	
55				

Total Depth = 55 feet Boring Terminated Target depth achieved

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/6/19



NDEP Client: Boring No. NERT4.64S1B Project Number: 60477365

					Site	e Desc	cription	Location: Las Vegas Wash, I		Ambient PID Reading:
	Odinamio, O/C 00012							26735747.147 N 839522.29	3 E Elevation: 1512.546 FT	Sheet: 1 of 2
	amarillo, C	CA 930						nt/Method: Sonic Rig	Weather:	Monitoring Well Installed: Yes
					Sar	mple T	Type(s).	Grab	Boring Diameter: 6 IN.	Screened Interval:35-55 FT BGS
Approve	ed By: S	S. Biloo	deau					Logged By: C. Schnell	Date/Time Started: 04-26-19	Depth of Boring: 55 FT BGS
Drilling (Contracto	r: Ca	scade	Drillir	ng			Backfill: See below	Date/Time Finished: 04-26-19	Water Level: 26.78 FT BGS
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (s grained material (s	CATION, color, description of fine ilt and clay) description of coarse and and gravel), structural or ires, density or stiffness, moisture taining.	Well Diagram
10						ML			non-plastic silt, 5% coarse subangular nax gravel size, loose, dry, hand s	
20						SP		6/4), 80% fine to coa	overy O WITH GRAVEL, light brown (7.5YR irse-grained subangular sand, 20% with 0.75-inch max gravel size, dry,	
25						SP		POORLY GRADED SAND), 5% non-plastic silt, 85% very fine to	\dashv
								fine-grained subang	ular sand, 10% medium to coarse max gravel size, loose, dry	
						L				
						SM		30% fine to coarse-g	n brown (5YR 6/3), 60% non-plastic silt, grained subangular sand, 10% fine to .15-inch max gravel size, loose, wet	
_30						ML), 95% non-plastic silt, 5% fine to	
							$ \ \ \ $		ingular sand, medium dense, wet	hydrated bentonite
										bentonite
										200 200
							$ \ \ \ $			
35						SP		POORLY GRADED SAND	WITH GRAVEL, light reddish brown	-
								(5YR 6/3), 5% non-p	lastic silt, 80% fine to coarse-grained % fine to coarse gravel with 0.25-inch	
						SM		max gravel size, loos SILTY SAND WITH GRAN non-plastic silt, 50%	se, wet /EL, pinkish gray (5YR 7/2), 30% fine to coarse-grained subangular	
40									arse gravel with 0.75-inch max gravel	
4 0							1. 1. 1	3125, 10035, WEL		<u> </u>
	Notes:									



AECOM

Client:	NDEP			Doring No. NEDT4 6464D
Project Number:	60477365			Boring No. NERT4.64S1B
Site Description	/Location: Las Vegas Wash, F	Henderson, NV		Ambient PID Reading:
Coordinates:	26735747.147 N 839522.29	3 E Elevation: 1	512.546 FT	Sheet: 2 of 2
Drilling Equipme	nt/Method: Sonic Rig	Weather:		Monitoring Well Installed: Yes
Sample Type(s)	Grab	Boring Diameter:	6 IN.	Screened Interval: 35-55 FT BGS

1220 Avenida Acaso Camarillo, CA 93012	Drilling Equipment/Method: So	onic Rig Weather:		Monitoring Well Installed: Yes
805-388-3775	Sample Type(s): Grab	Boring Diameter:	6 IN.	Screened Interval: 35-55 FT BGS
Approved By: S. Bilodeau	Logged By:	c. C. Schnell Date/Time Started:	04-26-19	Depth of Boring: 55 FT BGS
Drilling Contractor: Cascade Drilli	ng Backfill: Se	ee below Date/Time Finished	04-26-19	Water Level: 26.78 FT BGS
DEPTH (ft) Sample ID Sample Depth (ft) Blows per 6"/RQD Recovery (ft)	gra gra gra gra mir	ERIAL IDENTIFICATION, color, des ained material (silt and clay) descrip ained material (sand and gravel), str neralogical features, density or stiffintent, odors or staining.	tion of coarse uctural or	Well Diagram
45	ML SANDY S MC S	AND, pinkish gray (5YR 6/2), 15% non- y fine to medium-grained subangular s avel with 0.25-inch max gravel size with sse, wet TH SAND, pinkish gray (5YR 7/2), 85% wery fine to fine-grained subangular sidium gravel with 0.25-inch max gravel nse, moist GRADED SAND WITH GRAVEL, pin 1), 5% non-plastic silt, 75% fine to coar brandlar sand, 20% fine to coarse grav ax gravel size, loose, wet SILT WITH GRAVEL TO GRAVELY SI nt gray (5YR 7/1), 50% non-plastic silt, arse grained subangular sand, 25% fin h 0.75-inch max gravel size, loose, wei	and, 5% coarse small pebbles, non-plastic silt, sand, 5% fine to size, medium kish gray (5YR se-grained el with 0.25-inch	Schedule 40 PVC Monterey #3 Sand
55	-@52 fee 0.25	et - color change to light reddish brown 25-inch max gravel size with small pebb	(5YR 6/3), lles to cobbles	

Total Depth = 55 feet Boring Terminated Target depth achieved

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/6/19



NDEP Client: Boring No. NERT4.64S1C Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV

					Site	e Des	crip	tion/L	ocation: Las Vegas Wash, I	Henderson, NV	Ambient PID Reading:	
	AECOM 1220 Avenida Acaso Coordinates:					ordina	ates	:	26735735.178 N 839510.44	E <i>Elevation:</i> 1512.976 FT	Sheet: 1 of 2	
	amarillo, C	A 930			Drii	lling E	quij	omen	t/Method: Sonic Rig	Weather:	Monitoring Well Installed: Yes	
	805-388-3775 Sample Type(s):				Тур	e(s):	Grab	Boring Diameter: 6 IN.	Screened Interval: 35-55 FT BGS			
Approve	oved By: S. Bilodeau				Logged By: C. Schnell	Date/Time Started: 04-26-19	Depth of Boring: 55 FT BGS					
Drilling	Contracto	r: Ca	scade	Drillin	ng				Backfill: See below	Date/Time Finished: 04-26-19	Water Level: 27.14 FT BGS	
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	NSCS		Graphic Log	grained material (s grained material (s	CATION, color, description of fine ilt and clay) description of coarse and and gravel), structural or ures, density or stiffness, moisture taining.	Well Diagram	
						ML			SILT, pink (5YR 7/3), 100%	% non-plastic silt, loose, dry		
10									-@5 to 11 feet- no recover	у		
									-@15 to 16.5 feet - no rec	•		
						ML			SANDY SILT, light reddish	brown (5YR 6/3), 60% non-plastic silt, grained sand, loose, moist		
									40 % line to mediani	gramed sand, 10030, moist		
20						SP			coarse-grained suba	0, 5% non-plastic silt, 85% fine to angular sand, 10% fine to medium a max gravel size, loose, dry		
									non-plastic silt, 80%	o reddish brown (5YR 5/3), 5% fine to coarse-grained subangular arse gravel with 0.75-inch max gravel		
30						SP- SM			coarse-grained suba	/EL, 20% non-plastic silt, 65% fine to ingular sand, 15% fine to coarse gravel gravel size, loose, wet	hydrated	
						R AI		44	CILT 000/ non aleatic all	100/ fine grained send westime	bentonite	
35						SP- SM			dense, wet SILTY SAND WITH GRAV 15% non-plastic silt,			

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/6/19



NDEP Client: Boring No. NERT4.64S1C Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: Elevation: 1512.976 FT 26735735.178 N 839510.44 E Sheet: 2 of 2 Drilling Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: Yes Sample Type(s): Grab 6 IN. Screened Interval: 35-55 FT BGS Boring Diameter:

					Jai	npic i	<i>γρ</i> υ(3).	- Ciub	Borning Blanneter. O IIV.	Screened interval. 30-33 FT BOS	
Approv	ed By: S	. Biloc	leau					Logged By: C. Schnell	Date/Time Started: 04-26-19	Depth of Boring: 55 FT BGS	
Drilling	Contracto	r: Ca	scade	Drilli	ng			Backfill: See below Date/Time Finished: 04-26-19		Water Level: 27.14 FT BGS	
DEPTH (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (si grained material (sa	CATION, color, description of fine lt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture raining.	Well Diagram	
45						SP- SM ML		fine to coarse-graine cemented SILT, pinkish gray (5YR 7/2 dense, dry POORLY GRADED SAND 6/2), 5% non-plastic subangular sand, 20' max gravel size, med	(5YR 7/2), 40% non-plastic silt, 60% d subangular sand, loose, wet, 2), 100% non-plastic silt, medium WITH GRAVEL, pinkish gray (5YR silt, 75% fine to coarse-grained % fine to coarse gravel with 0.25-inch lium dense, wet	Monterey #3 Sand	
						IVIL		light gray (5YR 7/1), coarse-grained suba with 0.75-inch max g	50% non-plastic silt, 25% fine to ngular sand, 25% fine to coarse gravel ravel size, wet, with small cobbles b light reddish brown (5YR 6/3), with		

Total Depth = 55 feet Boring Terminated Target depth achieved

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/6/19



NDEP Client: Boring No. NERT4.64S1D Project Number: 60477365

1220 Aver Camarillo, 805-38 Approved By: Orilling Contract H (#) Og et al. (#	or: Casc	au ade D	Prilling	Sample		26735756.291 N 839544.60° at/Method: Sonic Rig Grab Logged By: C. Schnell Backfill: See below	Weather: Boring Diameter: 6 IN. Date/Time Started: 04-25-19	Sheet: 1 of 2 Monitoring Well Installed: Yes Screened Interval: 35-55 FT BGS Depth of Boring: 55 FT BGS		
Camarillo, 805-38 Approved By: Drilling Contract	CA 93012 8-3775 S. Bilodes or: Cascs	au ade D	Prilling	Sample		Grab Logged By: C. Schnell	Boring Diameter: 6 IN. Date/Time Started: 04-25-19	Screened Interval: 35-55 FT BGS		
Approved By: Orilling Contract Approved By: Orilling Contract Approved By: Orilling Contract Approved By: Orilling Contract By: Orilling Contract Approved By: Orilling Contract Approved By: Orilling Contract By: Orilling Contract Approved By: Orilling Contract Approved By: Orilling Contract By: Orilling Contract Approved By:	S. Bilodea or: Casca (#) utded	ade D	rilling		Type(s):	Logged By: C. Schnell	Date/Time Started: 04-25-19			
Orilling Contract (#) Quadratic Contract Qu	or: Casc	ade D		Î				Depth of Boring: 55 FT BGS		
OEPTH (ft) (ft) Sample ID	e Depth (ft)	ąΤ		Î	Τ	Rackfill: See below				
	Sample Depth (ft)	oer 6"/RQD	(#) (#)	<u> </u>	1	Badrum: eee selett	Date/Time Finished: 04-25-19	Water Level: 26.91 FT BGS		
		Blows p	Recovery (ft)	neauspace (ppin)	Graphic Log	grained material (sil grained material (sa mineralogical featur content, odors or st	Š	Well Diagram		
						hand augured to 5 feet bgs	3			
5						-@5 to 10 feet - no recover				
15				ML		SILT, pink (5YR 7/4), 100% -@14.5 feet - color change silt, 10% sand, 5% gr cementation	to pink (5YR 7/2), 85% non-plastic avel, dry, loose, increased			
20				en.		-@17.5 to 20 feet - no reco				
25				SP-SM		fine to coarse-grained gravel with 0.25-inch -@22.5 to 25 feet - no reco SILTY SAND, light brown (fine to coarse-grained gravel with 0.15-inch moist -@27 feet - color change to non-plastic silt, 30%	WITH SILT, 10% non-plastic silt, 90% d subangular sand, 10% fine to coarse max gravel size, loose, dry very 7.5YR 6/4), 20% non-plastic silt, 75% d subangular sand, 5% fine to coarse max gravel size, medium dense, o light reddish brown (5YR 6/3), 60% fine to coarse-grained subangular arse gravel with 0.15-inch max gravel			
35				SP		non-plastic silt, 80% sand, 15% fine to coa size, loose, wet SILT, light brown (7.5YR 6/	reddish brown (5YR 5/3), 5% fine to coarse-grained subangular arse gravel with 0.5-inch max gravel (4), 95% non-plastic silt, 5% fine to ngular sand, medium dense, moist			
Notes					111	1				



NDEP Client: Boring No. NERT4.64S1D Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: 26735756.291 N 839544.601 E Elevation: 1512.630 FT Sheet: 2 of 2 Drilling Equipment/Method: Sonic Rig Weather: Monitoring Well Installed: Yes Sample Type(s): Grab 6 IN. Screened Interval: 35-55 FT BGS Boring Diameter:

							71(-)-					
Approved By: S. Bilodeau								Logged By: C. Schnell	Date/Time Started: 04-25-19	Depth of Borin	Depth of Boring: 55 FT BGS	
Drilling Contractor: Cascade Drilling								Backfill: See below	Date/Time Finished: 04-25-19	Water Level:	26.91 FT BGS	
DЕРТН (ft)	Sample ID	Sample Depth (ft)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (s grained material (s mineralogical featu content, odors or s		W	ell Diagram	
						ML			i/4), 95% non-plastic silt, 5% fine to ingular sand, medium dense, moist		Schedule 40	
45						SP- SM		6/3), 10% non-plasti subangular sand, 10	WITH SILT, light reddish brown (5YR c silt, 80% fine to coarse-grained % fine to coarse gravel with 0.5-inch se, wet, with large pebbles		Monterey #3	
								POORLY GRADED SAND 6/2), 5% non-plastic	WITH GRAVEL, pinkish gray (5YR silt, 75% fine to coarse-grained % fine to coarse gravel with 0.5-inch			
50						ML			/EL, 70% non-plastic silt, 10% 0% fine to coarse gravel with 0.75-inch se, wet, with cobbles			
55								coarse-grained suba	/EL, 5% non-plastic silt, 5% fine to ingular sand, 90% fine to el with 0.75-inch max gravel size,			
								Total Depth = 55 feet				

Boring Terminated
Target depth achieved

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 8/6/19

AECOM AECOM 1220 Avenida Acaso Camarillo, CA 93012 805-388-3775 Approved By: S. Bilodeau Drilling Contractor: Cascade Dril Sample Depth (ft) DEPTH (ft) Sample I 10 R1

9/17/19

CA.GDT

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BORING

ENSR BLOG

Blows per 6"/RQD

	Clie	ent:		NDEP		Doving No. NEDT4 CEN4	
	Pro	ject N	umber:	60477365		Boring No. NERT4.65N1	
	Site	e Desc	ription/L	ocation: Las Vegas Wash, H	Ambient PID Reading: NA		
	Cod	ordina	tes:	26736244.72 N 839107.823 E	E Elevation: 1513.006 FT	Sheet: 1 of 3	
	Drill	ling Ed	quipmen	t/Method: /Sonic Rig Weath	Monitoring Well Installed: Yes		
	Sar	nple T	ype(s):	Grab	Screened Interval: 25-45 FT BGS		
				Logged By: C. Grimes	Date/Time Started: 04-10-19	Depth of Boring: 90 FT BGS	
Drillin	ng			Backfill: See below	Date/Time Finished: 04-10-19	Water Level: 24.21 FT BGS	
Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	grained material (si grained material (sa	CATION, color, description of fine lt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture taining.	Well Diagram	
		SM			(R 5/4), 40% low plastic silt, grained rounded sand, loose, dry, et		

grout

schedule 40

-@12 feet - 20% silt, 80% sand 15 -@17 feet - medium dense sand compacted to max 2-inch blocks POORLY GRADED SAND WITH SILT, brown (7.5YR 4/4), 10% SP-SM low plastic silt, 90% fine to medium-grained rounded sand, 20 loose, moist R2 -@20 feet - 10% non-plastic silt, 80% coarse-grained subrounded to angular sand, 10% fine to medium angular -@22 feet - color change to dark brown 7.5YR 3/2), 10% silt, 75% very fine to coarse-grained sand, 15% gravel with 0.25-inch max gravel size, wet 25 -@27 feet - color change to brown (7.5YR 5/4), 10% silt, 90% fine to medium-grained rounded sand, medium dense SM SILTY SAND WITH GRAVEL, brown (7.5YR 5/4), 15% non-plastic silt, 65% fine to coarse-grained subangular 30 sand, 20% fine to medium angular gravel with 1-inch max R3 gravel size, medium dense SM SM 35 angular gravel with 1.5-inch max gravel size, wet ML to medium plastic silt, 25% fine to coarse-grained 4-inch max gravel size 40

-@5 feet - 30% silt, 70% sand -@5 to 15 feet - homogeneous fill

POORLY GRADED SAND WITH SILT AND GRAVEL, dark brown (7.5YR 3/3), 10% low plastic silt, 65% very fine to coarse-grained subangular sand, 25% fine to coarse angular gravel with 2-inch max gravel size, loose, wet SILTY SAND WITH GRAVEL, 20% low plastic silt, 60% very fine to coarse-grained subangular sand, 20% fine to coarse -@34 feet - 6-inch thick conglomorate, matrix supported SANDY SILT WITH GRAVEL, light brown (7.5YR 6/2), 55% low subangular sand, 20% fine to medium angular gravel with

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

NDEP Client: Boring No. NERT4.65N1 **AECOM** 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Elevation: 1513.006 FT Coordinates: 26736244.72 N 839107.823 E AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 2 of 3 Drilling Equipment/Method: /Sonic Rig Weather: 74 and partially sunny to cloudy Monitoring Well Installed: Yes 805-388-3775 Grab Boring Diameter: Sample Type(s): 8 IN Screened Interval: 25-45 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 04-10-19 Depth of Boring: 90 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-10-19 Water Level: 24.21 FT BGS Blows per 6"/RQD Headspace (ppm) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine Recovery (ft) Log ₽ grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Well Diagram Sample Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. SILTY SAND, 25% low plastic silt, 65% fine to coarse grained Monterey subangular sand, 10% fine to medium angular gravel with 1.5-inch max gravel size, loose, wet, less conglomorates and gravels ML SANDY SILT WITH GRAVEL, 55% low plastic silt, 25% fine to coarse grained subangular sand, 20% fine to medium angular gravel with 6-inch max gravel size, loose, wet, conglomorates reappear 45 ML SILT WITH SAND, pinkish gray (7.5YR 7/2), 80% medium plastic fines, 15% fine to medium-grained subangular sand, 5% fine gravel with 0.25-inch max gravel size, stiff, moist, interbedded cemented siltstones 50 CL LEAN CLAY, light gray (5Y 7/2), 100% medium plastic silt, very stiff, moist -@50 to 59 feet - thin interbedded reddish brown (5YR 5/4) PT-NERT4.65N -@53 feet - Core Lab (CH) Fat Clay with Sand 53.0-53.3 55 GRAVELLY SILT WITH SAND, light brown (7.5YR 6/2), 60% ML medium plastic silt, 20% fine to coarse-grained subangular sand, 20% fine to medium angular gravel with 2-inch max ML gravel size, medium dense, wet WITH GRAVEL, pale brown (10YR 7/4), 85% low to medium plastic silt, 15% fine subangular gravel with 60 R6 0.25-inch max gravel size, stiff, moist GRAVELLY SILT WITH SAND, pinkish gray (7.5YR 7/2), 70% low to medium plastic silt, 15% fine to coarse-grained subangular sand, 20% fine to medium angular gravel with MI 65 2-inch max gravel size, medium dense, wet SM SILTY SAND WITH GRAVEL, light brown (7.5YR 6/2), 20% low plastic silt, 55% fine to coarse grained subangular sand, 25% fine to coarse angular gravel with 6-inch max gravel ML size, loose, wet SANDY SILT, light yellow brown (4R 6/4), 65% low plastic silt, 25% fine to coarse grained subangular sand, 10% fine gravel with 1.5-inch max gravel size, medium dense, moist, 70 R7 sharp contact SM SILTY SAND, pink (7.5YR 7/3), 15% non-plastic silt, 85% very fine to medium-grained subrounded to rounded sand, dense, moist, interbedded sands with silty sands, some dense layers 75 -@75 to 80 feet - no recovery 80 Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

9/17/19

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BORING

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Client:	NDEP		Doring No. NEDT4 CEN4	
Project Number:	60477365	Boring No. NERT4.65N1		
Site Description/L	ocation: Las Vegas Wash, F	Ambient PID Reading: NA		
Coordinates:	26736244.72 N 839107.823	Elevation: 1513.006 FT	Sheet: 3 of 3	
Drilling Equipmen	t/Method: /Sonic Rig	Weather: 74 and partially sunny to cloudy	Monitoring Well Installed:Yes	
Sample Type(s):	Grab	Boring Diameter: 8 IN.	Screened Interval: 25-45 FT BGS	
	Logged By: C. Grimes	Date/Time Started: 04-10-19	Depth of Boring: 90 FT BGS	

	Sample Type(s).	Orab Buring Diameter. 6 iiv.		Screened Interval. 25-45 FT BGS	
Approved By: S. Bilodeau		Logged By: C. Grimes	Date/Time Started: 04-10-19	Depth of Boring: 90 FT BGS	
Drilling Contractor: Cascade Drilling	ng	Backfill: See below	Date/Time Finished: 04-10-19	Water Level: 24.21 FT BGS	
DEPTH (ft) Sample ID Sample Depth (ft) Blows per 6"/RQD Recovery (ft)	imple ID le Depth (ft) per 6"/RQD covery (ft) pace (ppm) JSCS Iphic Log		CATION, color, description of fine lt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture taining.	Well Diagram	
85	85 R9 R9		7/3), 15% non-plastic silt, 85% very ed subrounded to rounded sand, sidded sands with silty sands, some nued) to dark brown (7.5YR 3/2), 25% low fine to coarse-grained subrounded with with 0.25-inch max gravel size, wet, to brown (7.5YR 4/3), 30% silt, 70% grained rounded sand		

Total Depth = 90 feet. Boring Terminated Target depth achieved

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NDEP Client: Boring No. NERT4.70N1 **AECOM** 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Coordinates: 26736143.637 N 838871.668 E Elevation: 1514.906 FT AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 1 of 3 Drilling Equipment/Method: Sonic Rig Weather: 73 and sunny to partially sunny Monitoring Well Installed: Yes 805-388-3775 Grab Boring Diameter: Sample Type(s): 8 IN Screened Interval: 25-45 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 04-11-19 Depth of Boring: 82 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-11-19 Water Level: 24.95 FT BGS Blows per 6"/RQD Headspace (ppm) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine € Log \Box grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Recovery Well Diagram Sample Graphic grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining. SILTY SAND, brown (7.5YR 6/3), 20% low plastic silt, 70% very fine to fine-grained subrounded sand, 10% medium rounded gravel with 2-inch max gravel size, loose, dry, hand augered to 5 feet bgs @5 feet - coor change to brown (7.5YR 5/4), 35% silt, 65% rounded sand -@5 to 15 feet - homogeneous 10 R1 15 -@15 feet - 15% silt, 70% sand, 15% gravel POORLY GRADED SAND WITH SILT, reddish brown (5YR 5/4), SM 10% non-plastic silt, 90% very fine to medium-grained rounded sand, loose, moist 20 R2 -@20 feet - 10% silt, 75% very fine to coarse-grained subangular sand, 15% fine rounded gravel with 0.75-inch max gravel size, dry SM SILTY SAND, 15% low plastic silt, 85% very fine to 25 medium-grained rounded sand, loose, moist SM POORLY GRADED SAND WITH SILT, brown (7.5YR 8/4), 10% silt, 80% very fine to medium subrounded sand, 10% fine rounded gravel with 0.5-inch max gravel size, loose, moist 30 R3 SM SILTY SAND, 20% low plastic silt, 75% fine to coarse-grained subrounded sand, 5% fine gravel with 0.3-inch max gravel SM size, medium dense, moist SILTY SAND WITH GRAVEL, dark brown (7.5YR 3/2), 15% low plastic silt, 65% fine to coarse-grained subrounded sand, 20% fine to medium angular gravel with 1.5-inch max gravel size, loose, wet POORLY GRADED SAND AND GRAVEL, 10% low plastic silt,

Notes: R denotes Ramboll grab sample. from 45 to 82 feet, hard drilling. For backfill information, refer to well completion diagram.

gravel size, loose, wet -@35 to 45 feet - limited recovery

60% fine to coarse-grained subrounded sand, 30% fine to

10% fine to medium subangular gravel with 0.9-inch max

coarse gravel with 4-inch max gravel size, loose, wet

SILTY SAND WITH GRAVEL, light brown (7.5YR 6/3), 25% low plastic silt, 65% fine to coarse-grained subrounded sand,

schedule 40

8/12/19

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BORING

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SM

SP-

SM

NDEP Client: Boring No. NERT4.70N1 60477365 **AECOM** Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA 26736143.637 N 838871.668 E Elevation: 1514.906 FT AECOM 1220 Avenida Acaso Camarillo, CA 93012 Coordinates. Sheet: 2 of 3 Weather: 73 and sunny to partially sunny Monitoring Well Installed: Yes Drilling Equipment/Method: Sonic Rig 805-388-3775 Grab Boring Diameter: Sample Type(s): 8 IN Screened Interval: 25-45 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 04-11-19 Depth of Boring: 82 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-11-19 Water Level: 24.95 FT BGS 6"/RQD (mdd) Sample Depth (ft) MATERIAL IDENTIFICATION, color, description of fine Log \Box grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Recovery Headspace (Well Diagram Sample Graphic grained material (sand and gravel), structural or Blows per mineralogical features, density or stiffness, moisture content, odors or staining. SILTY SAND WITH GRAVEL, light brown (7.5YR 6/3), 25% low Monterey SM plastic silt, 65% fine to coarse-grained subrounded sand, 10% fine to medium subangular gravel with 0.9-inch max gravel size, loose, wet (continued) 45 -@45 feet - hard drilling, color change to pink (7.5YR 7/3), 15% silt, 65% subrounded sand, 20% angular gravel with 0.75-inch max gravel size, loose to dense -@46 feet - corebarrel size conglomerate 50 R5 SILTY SAND, light brown (7.5YR 6/4), 15% low plastic silt, 75% SM fine to coarse-grained subangular sand, 10% fine angular gravel with 0.10-inch max gravel size, wet, densely cemented units, hard drilling @50 to 60 feet - conglomerate every 1 inch SANDY SILT WITH GRAVEL, 40% low plastic silt, 35% medium to fine-grained angular sand, 25% medium to coarse gravel ML 55 SP with 3-inch max gravel size SM POORLY GRADED SAND WITH SILT AND GRAVEL, 10% non-plastic silt, 65% fine to coarse-grained subangular sand, 25% fine to coarse angular gravel with 4-inch max gravel size, moist, 8 inch thick conglomerate SANDY SILT, strong brown (7.5YR 5/6), 60% low to medium MI 60 plastic silt, 40% very fine to fine-grained rounded sand, R6 stiff moist SILTY SAND, brown (7.5YR 5/4), 35% low plastic silt, 65% very ML fine to fine-grained rounded sand, dense, wet 65 -@65 feet - color change to dark brown (7.5YR 3/2), 20% silt, 70% fine to coarse-grained subrounded sand, 10% fine to medium subangular gravel with 1-inch max gravel size SM SILTY SAND WITH GRAVEL, 35% low to medium plastic silt, 45% fine to coarse-grained subangular sand, 20% fine to coarse angular gravel with 2.5-inch max gravel size, semi-cemented siltstones 70 R7 -@70 feet - color change to dark yellowish brown (10YR 4/4), 15% low plastic silt, 65% sand, 20% gravel with 4-inch max -@72 feet - color change to yellow brown (10YR 5/4), 35% low to medium plastic silt, 45% medium to coarse-grained sand, 20% fine to medium gravel, moist, sand and gravel in silty cohesive matrix 75

Notes: R denotes Ramboll grab sample. from 45 to 82 feet, hard drilling. For backfill information, refer to well completion diagram.

with 0.4-inch max gravel size, wet

SIV

SM

POORLY GRADED SAND WITH SILT AND GRAVEL, light gray

coarse-grained subangular sand, 30% fine rounded gravel

non-plastic silt, 50% fine to coarse subangular sand, 25%

(7.5YR 7/1), 10% non-plastic silt, 60% fine to

SILTY SAND WITH GRAVEL, light gray (7.5YR 7/1), 25%

fine to coarse gravel with 6-inch max gravel size -@77 to 78 feet - 6-inch matrix supported conglomerates

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1 - 2 - 3		Clie	ent:		NDEP		Boring No. NERT4.70N1		
AECOM				oject N	lumber:	60477365		Borning No. NEX 14.70N1	
105576		Site	e Desc	cription/L	ocation: Las Vegas Wash, F	Henderson, NV	Ambient PID Reading: NA		
AECOM			Co	ordina	tes:	26736143.637 N 838871.66	8 E <i>Elevation:</i> 1514.906 FT	Sheet: 3 of 3	
1220 Avenida Acaso Camarillo, CA 93012				Drilling Equipment/Method: Sonic Rig Weather: 73 and sunny to partially sunny				Monitoring Well Installed: Yes	
805-388-377	75		Sample Type(s):			Grab Boring Diameter: 8 IN.		Screened Interval: 25-45 FT BGS	
Approved By: S. Bilodeau						Logged By: C. Grimes Date/Time Started: 04-11-19		Depth of Boring: 82 FT BGS	
illing Contractor: (Cascac	le Drill	ing			Backfill: See below Date/Time Finished: 04-11-19		Water Level: 24.95 FT BGS	
(ft) (tt) (tt)				nscs	Graphic Log	grained material (si grained material (si	CATION, color, description of fine llt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture taining.	Well Diagram	
R8				SM		POORLY GRADED SAND	WITH SILT AND GRAVEL, 10%		

non-plastic silf, 60% fine to coarse-grained subangular sand, 30% fine gravel with 0.4-inch max gravel size

Total Depth = 82 feet
Boring Terminated
Target depth achieved

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NDEP Client: Boring No. NERT4.71N1 Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV

Approved E Drilling Cor	narillo, 0 805-388 <i>By:</i> S	da Acaso CA 93012 -3775 S. Bilodea or: Casc (1) (1) (4) (6)	au	Dri.	mple T	quipmen Type(s):	26736123.869 N 838600.288 E Elevation: 1518.722 FT t/Method: /Sonic Rig Weather: 80 and sunny Grab Boring Diameter: 8 IN. Logged By: C. Grimes Date/Time Started: 04-04-19 Backfill: See below Date/Time Finished: 04-04-19	Sheet: 1 of 3 Monitoring Well Installed: Yes Screened Interval: 25-45 FT BGS Depth of Boring: 90 FT BGS Water Level: 27.89 FT BGS
Approved EDrilling Cor	narillo, (805-388 By: S	A 93012 3775 S. Bilodea or: Casc	au ade Dril	Sai	mple T	Type(s):	Grab Boring Diameter: 8 IN. Logged By: C. Grimes Date/Time Started: 04-04-19	Screened Interval: 25-45 FT BGS Depth of Boring: 90 FT BGS
Approved I	By: S	S. Bilodea or: Casc	ade Dril	lling			Logged By: C. Grimes Date/Time Started: 04-04-19	Depth of Boring: 90 FT BGS
Drilling Cor HLAGO 5 10	ontracto	r: Casc	ade Dril					
HLd H) 5		epth (ft)	6"/KQD ry (ft)				Backfill: See below Date/Time Finished: 04-04-19	Water Level: 27.89 FT BGS
5	Sample ID	Sample Depth (ft)	ws per 6"/RQL (ecovery (ft)	(ppm)			1	
10				Headspace (ppm)	nscs	Graphic Log	MATERIAL IDENTIFICATION, color, description of fine grained material (silt and clay) description of coarse grained material (sand and gravel), structural or mineralogical features, density or stiffness, moisture content, odors or staining.	Well Diagram
10					SM		SILTY SAND, brown (7.5YR 5/4), 20% non-plastic silt, 75% very fine to fine-grained rounded sand, 5% fine gravel with max	
10							gravel size of 0.5-inch, loose, dry, hand augured to 5 feet	
10							bgs	
10								
10								
10							-@5 feet - low plastic silt	
10								
10								
10								
	R1	\square						
		\square						
					SP-		POORLY GRADED SAND WITH SILT AND GRAVEL, dark	
					SM		brown (7.5YR 3/2), 10% non-plastic silt, 75% medium to coarse-grained subangular sand, 15% fine gravel with	
							0.75-inch max gravel size, loose, moist -@17 to 19 feet - poorly graded sand with silt	
							ישיר וט וא ופפנ - poorry graded salld with silt	
20	R2						-@20 feet - color change to brown (7.5 YR 5/3), fine to medium	
							gravel with 1-inch max gravel size	
								. 회사 기계
25							©25 fact, color change to light brown (7.5 VD C/A), law plactic	
							-@25 feet - color change to light brown (7.5 YR 6/4), low plastic silt, fine to coarse-grained subangular to angular sand, fine	
							to medium angular gravel with 2-inch max gravel size	
30	R3						-@29 to 35 feet - interbedded clay layers with large cobbles	
	1.0				L			
					SM		SILTY SAND WITH GRAVEL, light brown (7.5YR 6/4), 15% low plastic silt, 55% very fine to coarse-grained subrounded	
							sand, 30% fine to coarse angular gravel with 3-inch max	
							gravel size, loose to medium dense, wet	
35							-@34 feet - weakly cemented sandstone with gravel in matrix	
							-@35 feet - color change to 7.5YR 6/3, fine to coarse-grained	schedule 40
							sand -@36 feet - Sandstone, color change to brown (7.5YR 6/3)	
							GII 100. Gallactorio, Gold Gharige to Blown (1.0111 0/0)	
					SP- SM			
40					Jivi	<u>r : H.</u>		
N	Notes:	R deno	tes Rai	mboll g	rab s	ample. I	For backfill information, refer to well completion diagram.	

NDEP Client: Boring No. NERT4.71N1 **AECOM** 60477365 Project Number: Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA 26736123.869 N 838600.288 E Elevation: 1518.722 FT AECOM 1220 Avenida Acaso Camarillo, CA 93012 Sheet: 2 of 3 Drilling Equipment/Method: /Sonic Rig Weather: 80 and sunny Monitoring Well Installed: Yes 805-388-3775 Grab Boring Diameter: Sample Type(s): 8 IN Screened Interval: 25-45 FT BGS Approved By: S. Bilodeau Logged By: C. Grimes Date/Time Started: 04-04-19 Depth of Boring: 90 FT BGS Drilling Contractor: Cascade Drilling Backfill: See below Date/Time Finished: 04-04-19 Water Level: 27.89 FT BGS 6"/RQD Headspace (ppm) MATERIAL IDENTIFICATION, color, description of fine € Sample Depth Log ₽ grained material (silt and clay) description of coarse DEPTH (ft) **USCS** Recovery Well Diagram Sample Graphic grained material (sand and gravel), structural or Blows per mineralogical features, density or stiffness, moisture content, odors or staining. POORLY GRADED SAND WITH SILT, red (2.5YR 4/8), 10% low Monterey SM plastic silt, 90% very fine to fine-grained rounded sand, loose, wet (continued) SILTY SAND, 15% low plastic silt, 75% very fine to fine-grained rounded sand, 10% fine angular gravel with 0.5-inch max gravel size, loose, wet 45 @44 feet - color change to yellowish red (5YR 5/6), 25% silt, 70% very fine to medium-grained subrounded sand, 5% gravel -@ 47 feet - conglomerate -@48 feet - 35% fines, 70% very fine to fine-grained subrounded sand, 10% medium angular gravel with 2-inch max gravel 50 R5 -@52 feet - 30% silt, 5% clay, 55% fine to coarse-grained sand, 10% fine to medium gravel with 1.5-inch max gravel size -@54 feet - 6 inches of weekly cemented sandstone 55 LEAN CLAY WITH GRAVEL, red (2.5YR 5/6) to yellowish red (5YR 5/6), 85% high-plastic fines, 15% very fine-grained CL rounded sand, stiff, moist, 2-inch bedding irregular PT-NERT4.71N -@58.5 feet - Core Labs (CL) lean clay 58.5-59.0 60 -@60 feet - 85% medium plastic fines, 0 to 15% sand (varies) 65 SILT WITH SAND, yellowish red (5YR 5/5), 75% low to medium plastic fines, 25% very fine to fine-grained rounded sand, ML medium dense, moist SM SILTY SAND, yellowish red (5YR 4/6), 40% low plastic fines, 60% very fine to fine-grained rounded sand, medium dense, moist 70 R7 -@72 feet - color change to red (2.5YR 5/6), 35% silt, 60% sand, 5% gravel, wet -@73 feet - sharp color change to light brown (7.5YR 6/4), 65% low plastic silt, 30% very fine-grained rounded sand, 5% fine gravel with 0.25-inch max gravel size, wet, medium 75 SM SILTY SAND, dark brown (7.5 YR 3/2), 15% non-plastic silt, 85% fine to coarse-grained subrounded sand, loose, wet

Notes: R denotes Ramboll grab sample. For backfill information, refer to well completion diagram.

-@79 feet - thinly bedded sandstone

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	Client:	NDEP		Paring No. NEDT4 74N4
ı	Project Number:	60477365	Boring No. NERT4.71N1	
	Site Description/L	ocation: Las Vegas Wash, F	Ambient PID Reading: NA	
I	Coordinates:	26736123.869 N 838600.28	8 E Elevation: 1518.722 FT	Sheet: 3 of 3
	Drilling Equipmen	t/Method: /Sonic Rig	Weather: 80 and sunny	Monitoring Well Installed: Yes
	Sample Type(s):	Grab	Boring Diameter: 8 IN.	Screened Interval: 25-45 FT BGS
		Logged By: C. Grimes	Data/Time Started: 04.04.10	Denth of Boring: 90 FT BGS

Camanio, OA 33012				7 · /·	· · · · · · · · · · · · · · · · · · ·							
	805-388	805-388-3775 Sample Type(s):					Type(s):	Grab	Boring Diameter: 8 IN.	Screened Inte	Screened Interval: 25-45 FT BGS	
Approved By: S. Bilodeau								Logged By: C. Grimes	Date/Time Started: 04-04-19 Depth of Boring: 90 F		g: 90 FT BGS	
Drilling Contractor: Cascade Drilling								Backfill: See below	Date/Time Finished: 04-04-19	Water Level:	27.89 FT BGS	
H ID ID pth (ft) "/RQD (ft) (ppm)		eadspace (ppm) USCS Graphic Log			grained material (si grained material (sa	CATION, color, description of fine lt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture raining.	W	ell Diagram				
85	R8					SM		fine to coarse-graine (continued) -@82 feet - color change to silt, 70% very fine to SILTY SAND WITH GRAV plastic silt, 60% med 15% medium gravel medium dense, wet -@86 feet - 25% silt, 40% silt.				

Total Depth = 90 feet. Boring Terminated Target depth achieved

ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 9/16/19

AECOM AECOM 1220 Avenida Acaso Camarillo, CA 93012 805-388-3775

NDEP Client: Boring No. NERT4.71S2 Project Number: 60477365 Site Description/Location: Las Vegas Wash, Henderson, NV Ambient PID Reading: NA Elevation: 1518.222 FT 26735408.272 N 838770.32 E Sheet: 1 of 2 Drilling Equipment/Method: /Sonic Rig Weather: Monitoring Well Installed: Yes Sample Type(s): Grab 8 IN. Screened Interval: 34.5-54.5 FT BGS Boring Diameter:

nnmund Di		ilodo	211					Logged Bur C. Grimes	Date/Time Started: 04-01-19	Depth of Boring	a: 55 FT BGS
Approved By Drilling Conti				Drillir	na -			Logged By: C. Grimes Backfill: See below	Date/Time Started: 04-01-19 Date/Time Finished: 04-01-19	Water Level:	27.26 FT BGS
(ft) (ft) (ft)	€	Ceptin (iii)	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	nscs	Graphic Log	MATERIAL IDENTIF grained material (grained material (ICATION, color, description of fine silt and clay) description of coarse sand and gravel), structural or ures, density or stiffness, moisture		ell Diagram
	- -71S2-		B			SM SP SM ML SM SSM		fine to medium-gra with 1-inch max gra graph of the property of the gravel with 0.2: -@8 feet - color change to silt, 70% medium to coarse phynocrysts, volcar graph of the graph	to brown (7.5YR 4/4), 25% silt, 70% fine gravel with 0.25-inch max gravel to brown (7.5YR 4/4), 25% silt, 70% fine gravel with 0.25-inch max gravel to brown (7.5YR (5/4), 15% non-plastic dium-grained subangular to subrounded barse gravel with 3-inch max gravel comes coarser liver (7/2), 90% low to medium plastic sand, medium dense to dense, moist, of the tocoarse-grained subangular nedium gravel with 2-inch max gravel liver (2.5Y 7/4), 75% low to medium plastic to fine-grained subrounded sand, lose, wet riser site is silt, 75% medium to coarse-grained angular sand, 10% fine to coarse gravel is gravel size, wet, loose coarse gravel with 1.5-inch max gravel size, gravel with dspar subrounded sand, 20% fine to 1.5-inch max gravel size, gravel with dspar subrounded sand, 10% medium gravel subrounded sand, 10% medium gravel		bentonit



AECOM 1220 Avenida Acaso Camarillo, CA 93012 Client: NDEP

Project Number: 60477365

Site Description/Location: Las Vegas Wash, Henderson, NV

Ambient PID Reading: NA

Coordinates: 26735408.272 N 838770.32 E Elevation: 1518.222 FT Sheet: 2 of 2

Drilling Equipment/Method: /Sonic Rig Weather: Monitoring Well Installed: Yes

Sample Type(s): Grab Boring Diameter: 8 IN. Screened Interval: 34.5-54.5 FT BGS

Garrianno, 671 50012		Juipinen	Triction. Teerine 1 kig	Would ici.	Worldoning Wen	motanea.				
805-388	3-3775			Sar	nple T	ype(s):	Grab	Boring Diameter: 8 IN.	Screened Inter	val: 34.5-54.5 FT BGS
Approved By: S. Bilodeau				Logged By: C. Grimes	Date/Time Started: 04-01-19	Depth of Boring	: 55 FT BGS			
Drilling Contracto	or: Caso	ade D	Orillin	g			Backfill: See below	Date/Time Finished: 04-01-19	Water Level:	27.26 FT BGS
DEPTH (ft) Sample ID	_ D	Blows per 6"/RQD	Recovery (ft)	Headspace (ppm)	uscs	Graphic Log	grained material (si grained material (si	CATION, color, description of fine lt and clay) description of coarse and and gravel), structural or res, density or stiffness, moisture taining.	We	II Diagram
45 85 85 85 85 85 85 85 85 85 85 85 85 85					SP-SM SM SM		non-plastic silt, 70% subrounded sand, 15 2-inch max gravel siz 2-inch max gravel siz 3-inch max gravel siz 5-inch max gravel siz 5-inch max gravel siz 6-inch max gravel siz 6-inch max gravels with 0.75-inch max gravels with mix 6-inch max gravels gravels with mix 6-inch max gravels gr	R 4/4), 20% non-plastic silt, 75% very ed subrounded sand, 5% fine gravel ravel size ic silt, 75% medium to coarse-grained low gravel with 1.5-inch max gravel ca and quartz matrix WITH SILT, dark yellow brown (10YR c silt, 90% very fine to fine-grained		Monterey #3 Sand

Total Depth = 55 feet. Boring Terminated Target depth achieved

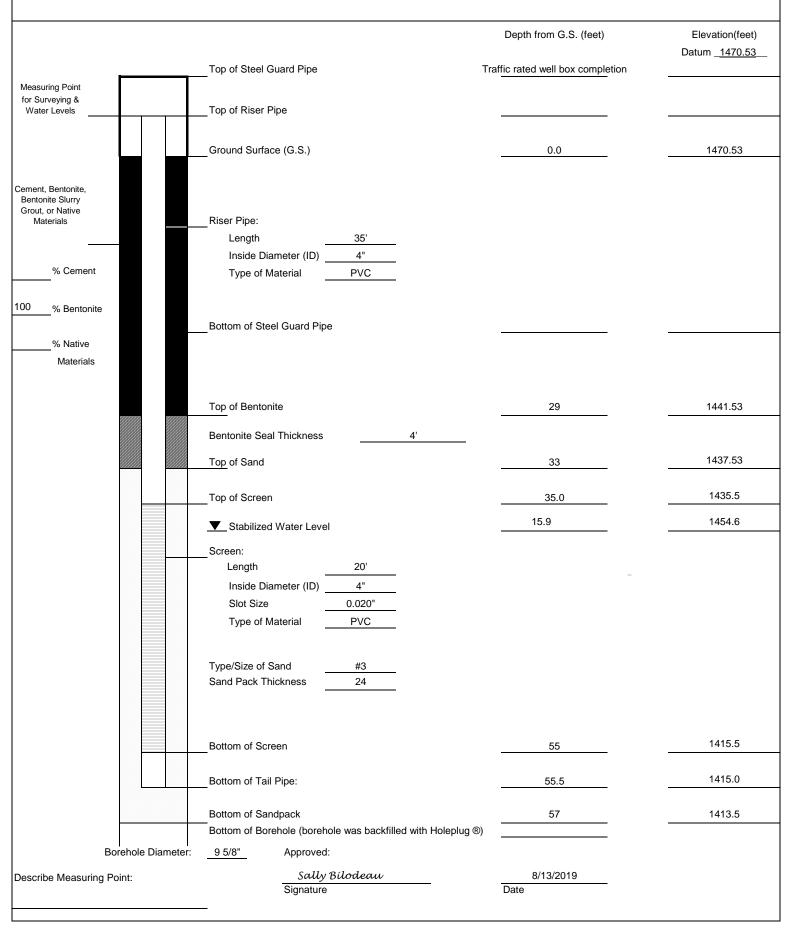
ENSR BLOG BORING LOGS.GPJ ENSR CA.GDT 9/17/19

Appendix D

Well Construction Diagrams

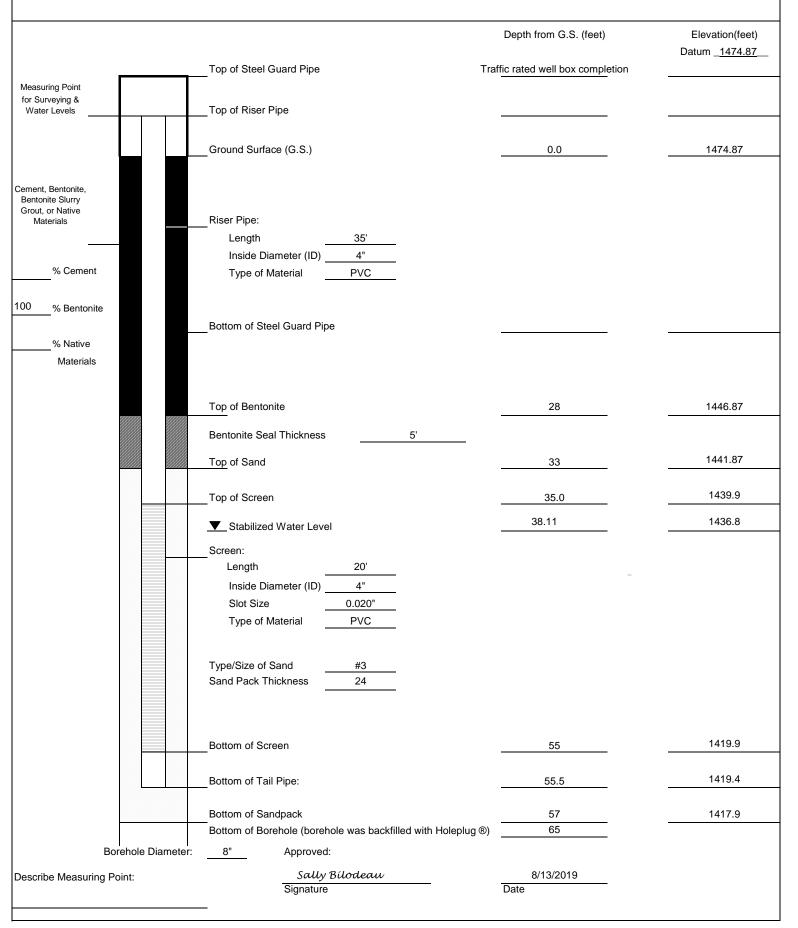


Client: Nevada Division of Environmental	WELL ID: NERT3.35S1	
Project Number: 60477365-2018-171-01	,,22212,1,2110,0001	
Site Location: Las Vegas Wash, Henderson	Date Installed: 4/25/2019	
Well Location: River Mile 3.35	Coords: 26738372.78 N 845391.59 E	Inspector: Sally Bilodeau
Method: Sonic		Contractor: Cascade



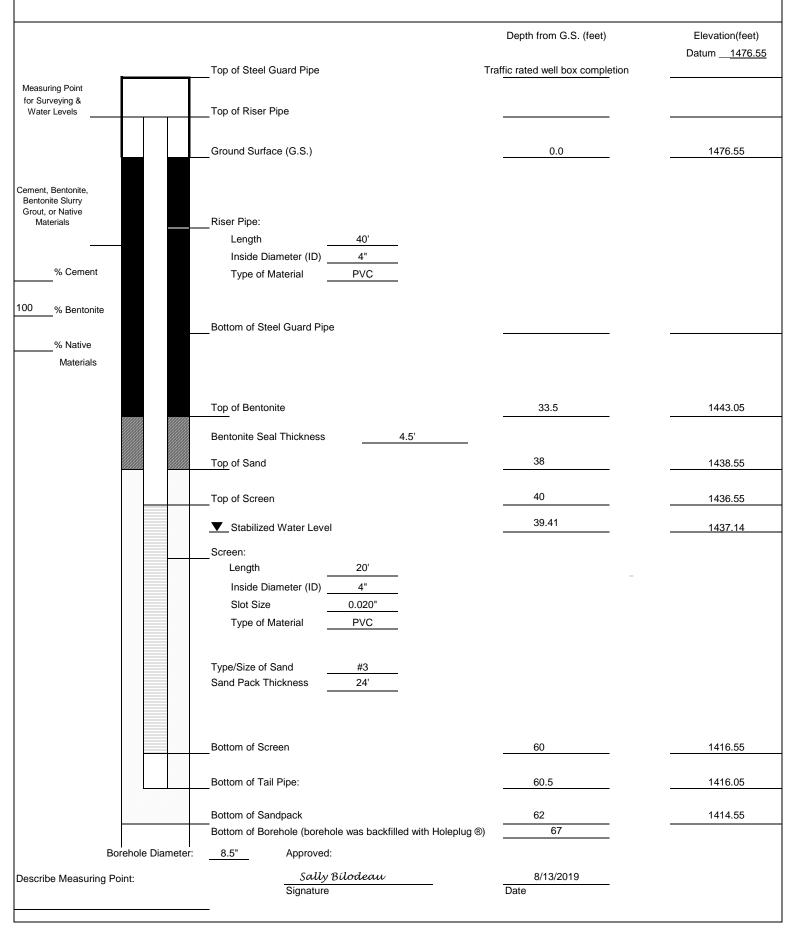


Client: Nevada Division of Environmental Protection	WELL ID: NERT3.40S1	
Project Number: 60477365-2018-171-01		
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 4/16/2019	
Well Location: River Mile 3.40 Coords: 26738206.49 N 845198.15 E	Inspector: Sally Bilodeau	
Method: Sonic	Contractor: Cascade	



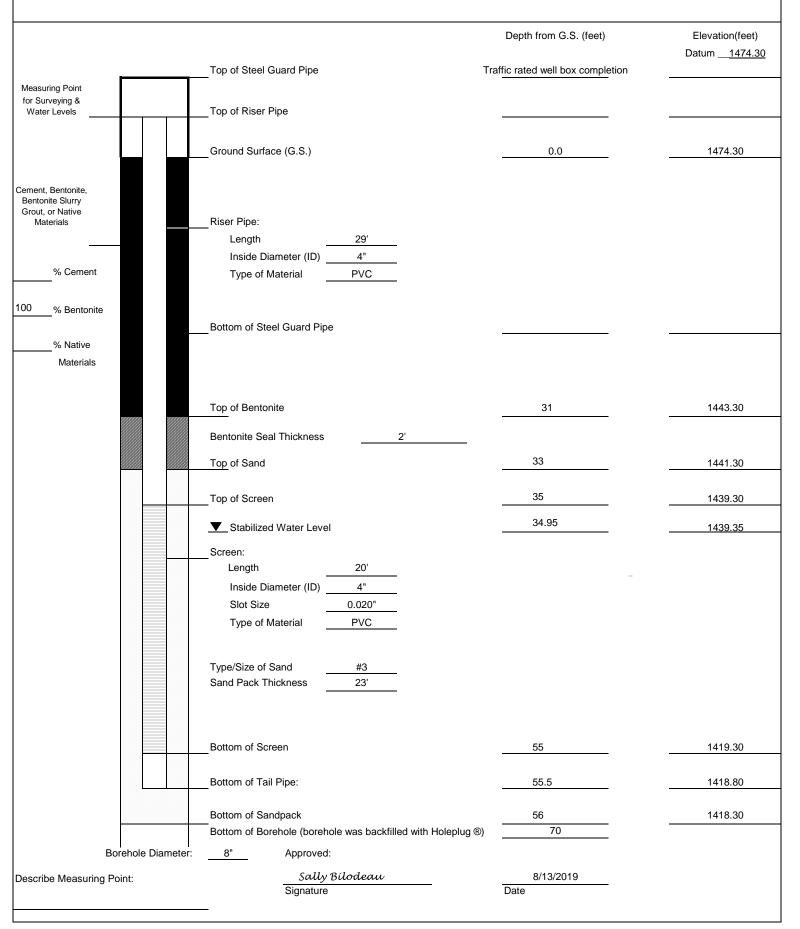


Client: Nevada Division of Environmental Protection	WELL ID: NERT3.58N1		
Project Number: 60477365-2018-171-01	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 4/23/2019		
Well Location: River Mile 3.58 Coords: 26738048.58 N 844188.45 E	Inspector: Sally Bilodeau		
Method: Sonic	Contractor: Cascade		



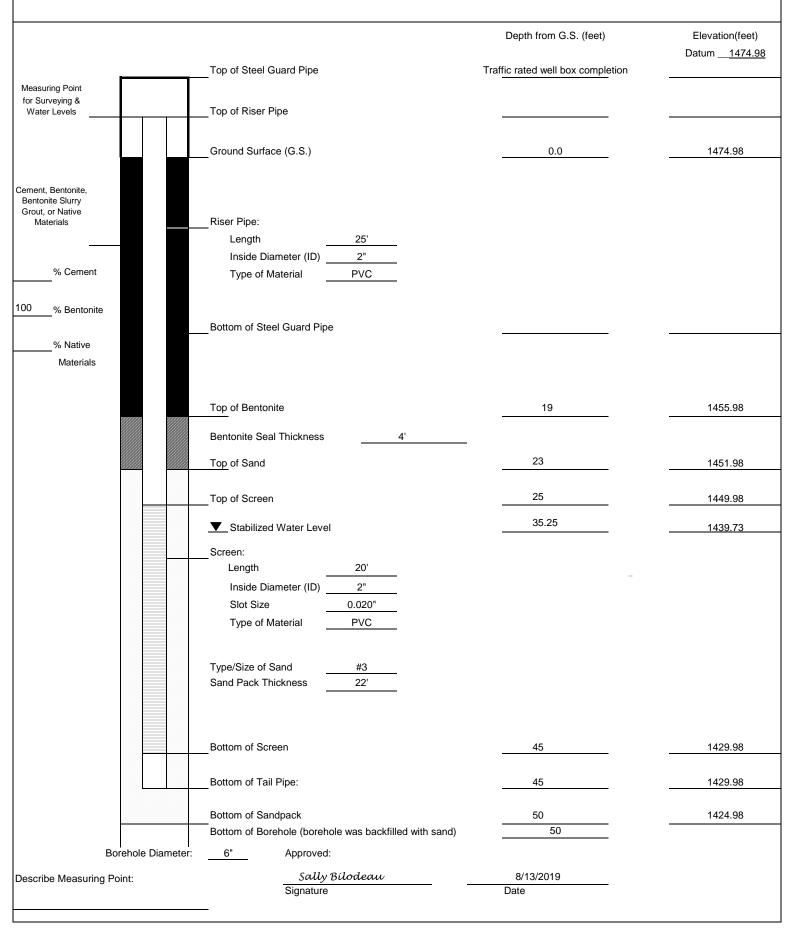


Client: Nevada Division of Environmental Protection	WELL ID: NERT3.58S1	
Project Number: 60477365-2018-171-01		
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 3/28/2019	
Well Location: River Mile 3.58 Coords: 26737583.5 N 844695.3 E	Inspector: Sally Bilodeau	
Method: Sonic	Contractor: Cascade	



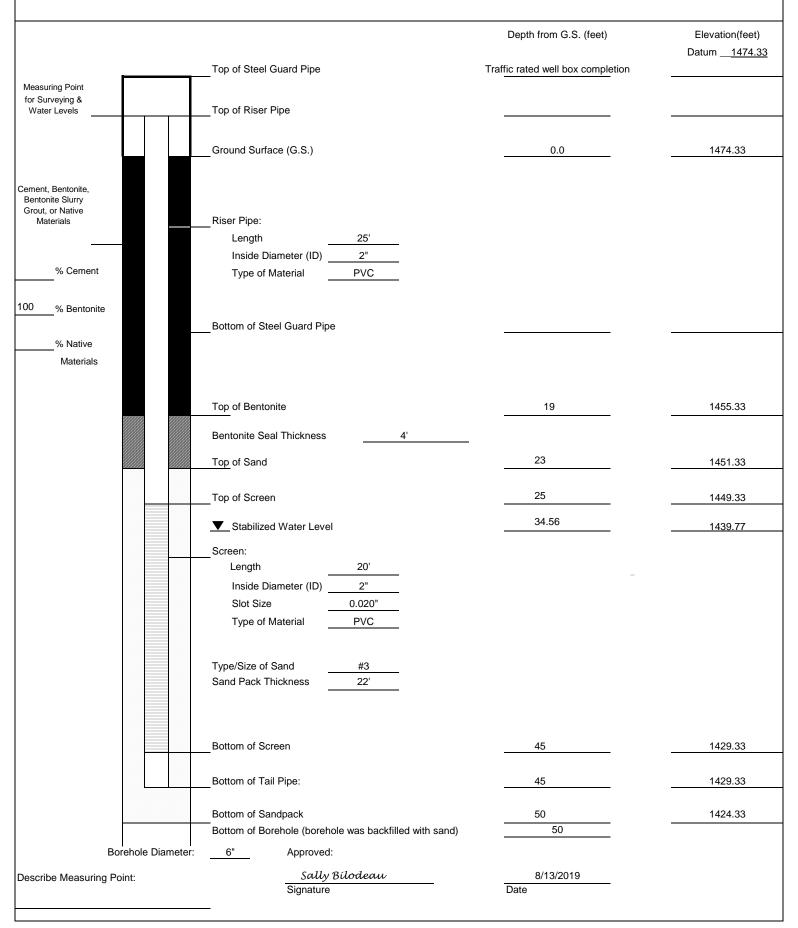


Client: Nevada Division of Environmental Protection	WELL ID: NERT3.58S1A	
Project Number: 60477365-2018-171-01		
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 4/24/2019	
Well Location: River Mile 3.58 Coords: 26737588.02 N 844690.03 E	Inspector: Sally Bilodeau	
Method: Sonic	Contractor: Cascade	



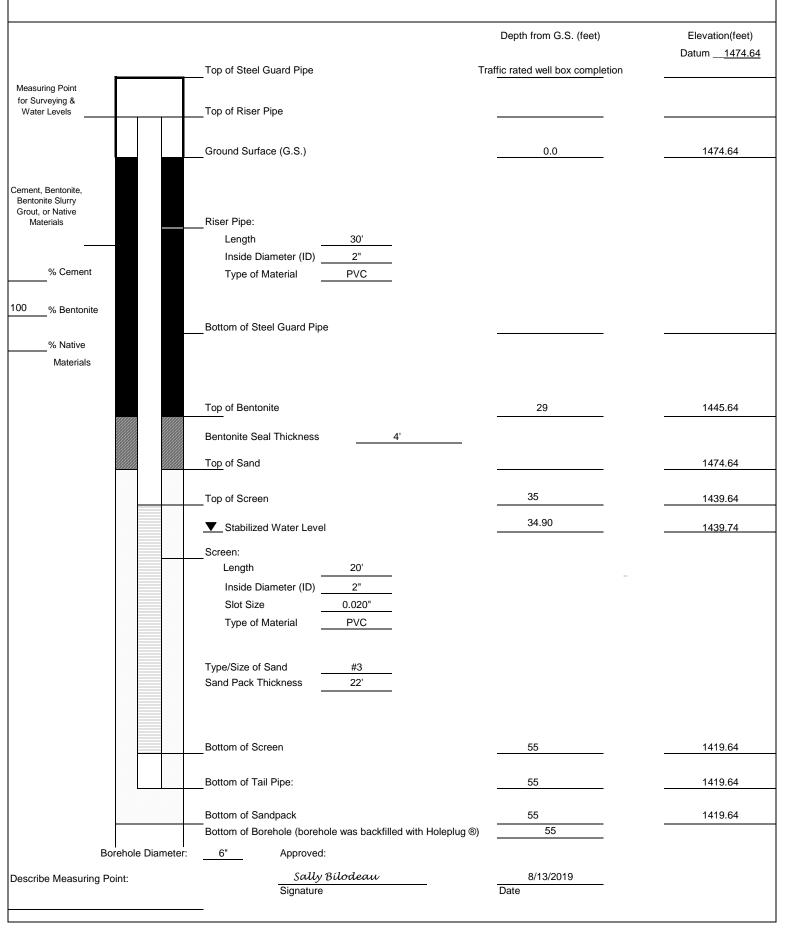


Client: Nevada Division of Environmental Protection	WELL ID: NERT3.58S1B	
Project Number: 60477365-2018-171-01		
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 4/25/2019	
Well Location: River Mile 3.58 Coords: 26737593.51 N 844702.73 E	Inspector: Sally Bilodeau	
Method: Sonic	Contractor: Cascade	





Client: Nevada	Division of Environm	WELL ID: NERT3.58S1C		
Project Number.	60477365-2018-17	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Site Location: L	as Vegas Wash, Hend	Date Installed: 4/25/2019		
Well Location:	River Mile 3.58	Coords: 26737579.78 N 844700.21 E	Inspector: Sally Bilodeau	
Method: Sonic			Contractor: Cascade	





Client: Nevada Division of Environn	WELL ID: NERT3.60N1	
Project Number: 60477365-2018-17	WEEL ID: IVERTOIONI	
Site Location: Las Vegas Wash, Hend	Date Installed: 4/9/2019	
Well Location: River Mile 3.60	Coords: 26737827.79 N 844016.02 E	Inspector: Sally Bilodeau
Method: Sonic		Contractor: Cascade

		Depth from G.S. (feet)	Elevation(feet) Datum <u>1483.14</u>
	Top of Steel Guard Pipe	Traffic rated well box completion	
Measuring Point			
for Surveying & Water Levels	Top of Riser Pipe		
	Ground Surface (G.S.)	0.0	1483.14
Cement, Bentonite, Bentonite Slurry			
Grout, or Native	D: D:		
Materials	Riser Pipe: Length 32'		
	Inside Diameter (ID) 4"		
% Cement	Type of Material PVC		
100 % Bentonite			
	Bottom of Steel Guard Pipe		
% Native			
Materials			
	Top of Bentonite	27	1456.14
			-
	Bentonite Seal Thickness 4'		
	Top of Sand	30	1453.14
	Top of Screen		1451.14
	Stabilized Water Level	38.02	1445.12
	Screen:		
	Length 20'		
	Inside Diameter (ID) 4"	-	
	Slot Size 0.020"		
	Type of Material PVC		
	· · · · · · · · · · · · · · · · · · ·		
	Tuna/Cita of Cond #2		
	Type/Size of Sand #3 Sand Pack Thickness 22.5'		
	Bottom of Screen	52	1431.14
	Pottom of Tail Ding.	E0 F	4400.04
	Bottom of Tail Pipe:	52.5	1430.64
	Bottom of Sandpack	52.5	1430.64
	Bottom of Borehole (borehole was backfilled with Holeplug		
 Borehole Diameter			
	Sally Bilodeau	8/13/2010	
Describe Measuring Point:	Signature	8/13/2019 Date	
	<u> </u>		



Client: Nevada Division of Environmental Protection	WELL ID: NERT3.60S1		
Project Number: 60477365-2018-171-01	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 3/27/2019		
Well Location: River Mile 3.60 Coords: 26737409.27 N 844579.55 E	Inspector: Sally Bilodeau		
Method: Sonic	Contractor: Cascade		

			Depth from G.S. (feet)	Elevation(feet) Datum <u>1478.48</u>
		Top of Steel Guard Pipe	Traffic rated well box completion	
Measuring Point for Surveying &				
Water Levels		Top of Riser Pipe		
		Ground Surface (G.S.)	0.0	1478.48
Cement, Bentonite, Bentonite Slurry Grout, or Native Materials		Riser Pipe: Length 29' Inside Diameter (ID) 4" Type of Material PVC		
% Bentonite % Native		Bottom of Steel Guard Pipe		
Materials		Top of Bentonite	29	1449.48
				1743.40
		Bentonite Seal Thickness 4'	20	
		Top of Sand	33	1445.48
		Top of Screen	35	1443.48
		▼ Stabilized Water Level	38.75	1439.73
		Screen:		
		Length 20'	_	
		Inside Diameter (ID)4"		
		Slot Size 0.020"		
		Type of Material PVC		
		Type/Size of Sand #3 Sand Pack Thickness 23'		
		Bottom of Screen	55	1423.48
		Bottom of Tail Pipe:	55.5	1422.98
		Bottom of Sandpack	56	1422.48
		Bottom of Borehole (borehole was backfilled with Holeplug (
Во	rehole Diameter:	8" Approved:	· · · · · · · · · · · · · · · · · · ·	
Describe Measuring Po		 Sally Bílodeau	8/13/2019	
		Signature	Date	
		-		

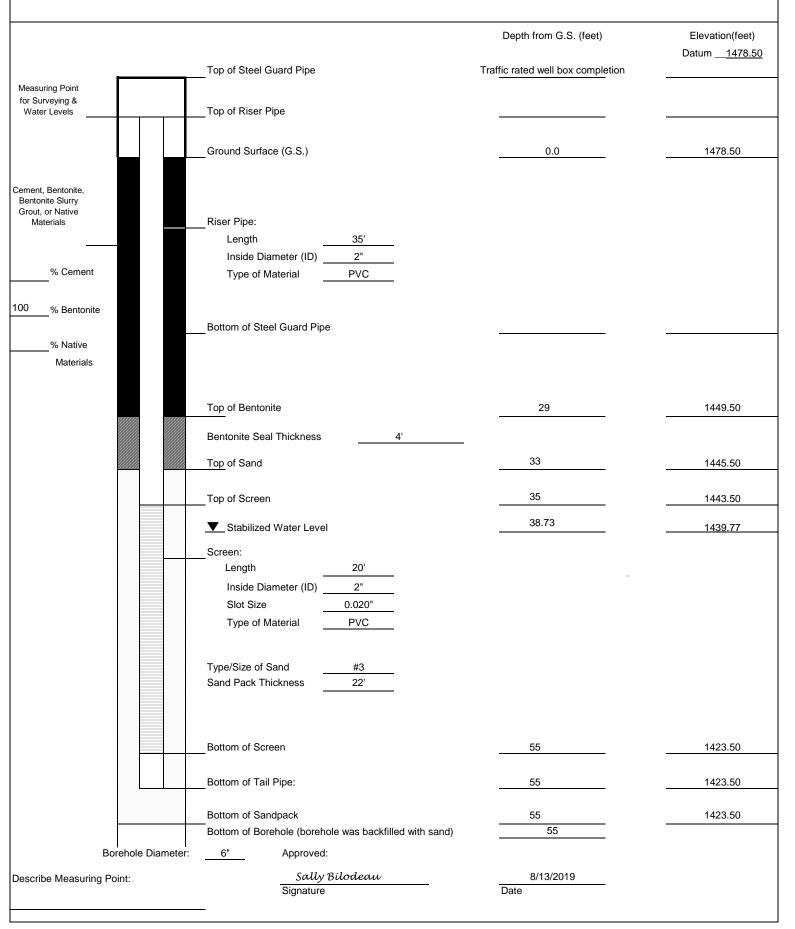


Client: Nevada Division of Environmental Protection	WELL ID: NERT3.60S1A
Project Number: 60477365-2018-171-01	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 4/23/2019
Well Location: River Mile 3.60 Coords: 26737412.04 N 844575.89 E	Inspector: Sally Bilodeau
Method: Sonic	Contractor: Cascade

		Depth from G.S. (feet)	Elevation(feet) Datum1478.60
· ·	Top of Steel Guard Pipe	Traffic rated well box completion	
Measuring Point for Surveying & Water Levels	Top of Riser Pipe		
	Ground Surface (G.S.)	0.0	1478.60
Cement, Bentonite, Bentonite Slurry Grout, or Native Materials	Riser Pipe: Length 35'		
% Cement	Inside Diameter (ID) 2" Type of Material PVC		
100 % Bentonite — % Native Materials	Bottom of Steel Guard Pipe		
	Top of Bentonite	29	1449.60
	Bentonite Seal Thickness 4'		
	Top of Sand	33	1445.60
	Top of Screen	35	1443.60
	▼ Stabilized Water Level	43.84	1434.76
	Screen:		
	Length 20'	-	
	Inside Diameter (ID)2"Slot Size 0.020"		
	Type of Material PVC		
	Type/Size of Sand #3 Sand Pack Thickness 22'		
	Bottom of Screen	55	1423.60
	Bottom of Tail Pipe:	55	1423.60
	Bottom of Sandpack Bottom of Borehole (borehole was backfilled with sand)	55 	1423.60
Borehole Diameter:	6" Approved:		
Describe Measuring Point:	Sally Bilodeau Signature	8/13/2019 Date	

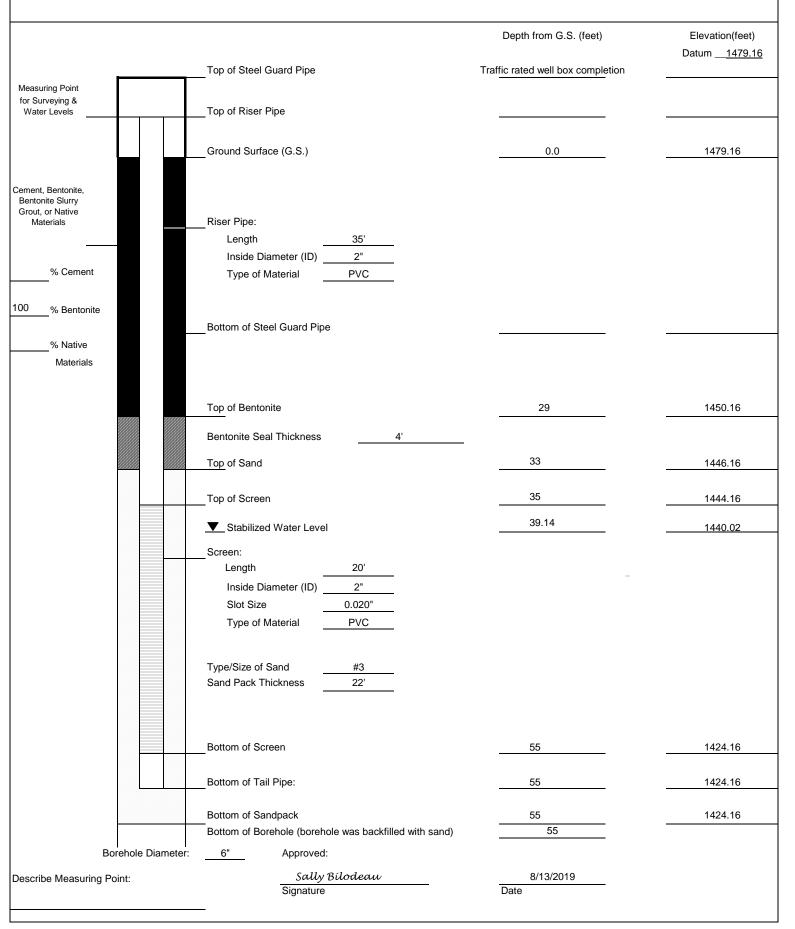


Client: Nevada Division of Environmental Protection	WELL ID: NERT3.60S1B
Project Number: 60477365-2018-171-01	WIED ID. IVERTO.OUSID
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 4/22/2019
Well Location: River Mile 3.60 Coords: 26737416.28 N 844585.91 E	Inspector: Sally Bilodeau
Method: Sonic	Contractor: Cascade



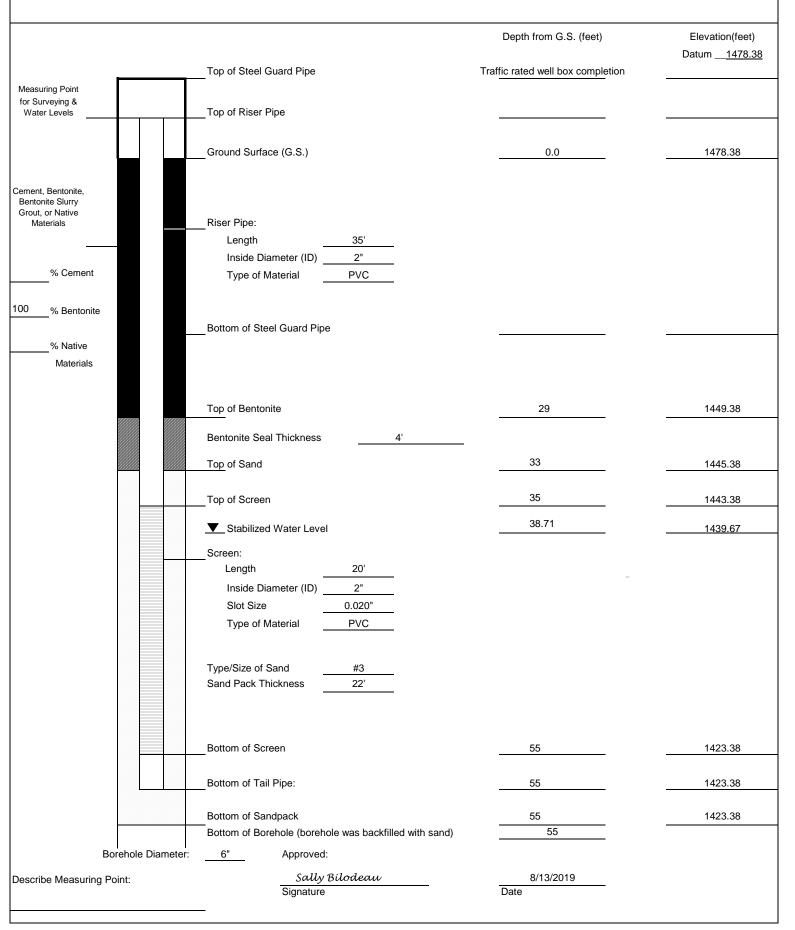


Client: Nevada Division of Environmental Protection	WELL ID: NERT3.60S1C
Project Number: 60477365-2018-171-01	WIED ID. IVERTOODSTC
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 4/23/2019
Well Location: River Mile 3.60 Coords: 26737396.28 N 844596.77 E	Inspector: Sally Bilodeau
Method: Sonic	Contractor: Cascade





Client: Nevada Division of Environmental Protection	WELL ID: NERT3.60S1D
Project Number: 60477365-2018-171-01	WIED ID. IVERTO.OUSIE
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 4/22/2019
Well Location: River Mile 3.60 Coords: 26737431.86 N 844597.6 E	Inspector: Sally Bilodeau
Method: Sonic	Contractor: Cascade





Client: Nevada Division of Environmental Protect	ction	WELL ID: NERT3.63S1
Project Number: 60477365-2018-171-01		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Site Location: Las Vegas Wash, Henderson NV		Date Installed: 4/17/2019
Well Location: River Mile 3.63 Coord	ds: 26737071.55 N 844152.61 E	Inspector: Sally Bilodeau
Method: Sonic		Contractor: Cascade

	- 10. 10. 1B	Depth from G.S. (feet)	Elevation(feet) Datum _1461.96
Measuring Point	Top of Steel Guard Pipe	Traffic rated well box completion	-
for Surveying & Water Levels	Top of Riser Pipe		
	Ground Surface (G.S.)	0.0	1461.96
Cement, Bentonite, Bentonite Slurry Grout, or Native Materials	_ Riser Pipe: Length15		
% Cement	Inside Diameter (ID) 4" Type of Material PVC		
% Bentonite	Bottom of Steel Guard Pipe		
	Top of Bentonite	8	1453.96
	Bentonite Seal Thickness 5'		
	Top of Sand	13	1448.96
	Top of Screen	15.0	1447.0
	▼_Stabilized Water Level	18.58	1443.4
	Screen: Length	-	
	Sand Pack Thickness 23	Q.F.	1427.0
	Bottom of Screen	35	1427.0
	Bottom of Tail Pipe:	35.5	1426.5
	Bottom of Sandpack Bottom of Borehole (borehole was backfilled with Holeplug ®	36 60	1426.0
Borehole Diameter:	8" Approved:		
Describe Measuring Point:	Sally Bilodeau Signature	8/13/2019 Date	



Client: Nevada Division of Environmental Protection	WELL ID: NERT3.98S	:1
Project Number: 60477365-2018-171-01	,, <u>222 12 (172111 01</u> 3 08	
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 4/2/2019	
Well Location: River Mile 3.98 Coords: 26736678.95 N	Inspector: Sally Bilodeau	
Method: Sonic	Contractor: Cascade	

			Depth from G.S. (feet)	Elevation(feet) Datum1466.49
		Top of Steel Guard Pipe	Traffic rated well box completion	
Measuring Point				
for Surveying & Water Levels		_Top of Riser Pipe		
		Ground Surface (G.S.)	0.0	1466.49
Cement, Bentonite, Bentonite Slurry				
Grout, or Native		Diagraphics		
Materials		_ Riser Pipe: Length 15'		
		Inside Diameter (ID) 4"		
% Cement		Type of Material PVC		
00 % Bentonite				
		Bottom of Steel Guard Pipe		
% Native				
Materials				
2000000	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Top of Bentonite	8	1458.49
		Bentonite Seal Thickness 5'		
		Top of Sand	13	1453.49
		Top of Saroan	15	1451 40
		_ Top of Screen		1451.49
		▼ Stabilized Water Level	10.36	1456.13
		Screen:		
		Length 20'	_	
		Inside Diameter (ID)4"		
		Slot Size0.020"		
		Type of Material PVC		
		Type/Size of Sand #3		
		Sand Pack Thickness 24'		
		Bottom of Screen	35	1431.49
		Bottom of Tail Pipe:	35.5	1430.99
		D (0	0.7	
		Bottom of Sandpack Bottom of Borehole (borehole was backfilled with Holeplug ®	37 55	1429.49
	Diament		پار <u> </u>	
Borehole [טוameter:	8" Approved:		
Describe Measuring Point:		Sally Bilodeau	8/13/2019	
		Signature	Date	



Client: Nevada Division of Environmental Protection	WELL ID: NERT4.64N1
Project Number: 60477365-2018-171-01	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Site Location: Las Vegas Wash, Henderson NV	Date Installed: 4/4/2019
Well Location: River Mile 4.64 Coords: 26736269.47 N 839271.62 E	Inspector: Sally Bilodeau
Method: Sonic	Contractor: Cascade

		Datum <u>1511.58</u>
Top of Steel Guard Pipe	Traffic rated well box completion	
Measuring Point		
for Surveying & Water LevelsTop of Riser Pipe	<u></u>	
	 	
Ground Surface (G.S.)	0.0	1511.58
ement, Bentonite,		
Bentonite Slurry Grout, or Native		
Materials Riser Pipe:		
Length25'	_	
Inside Diameter (ID)4"	_	
% Cement Type of Material PVC	-	
00 % Bentonite		
Bottom of Steel Guard Pipe		-
% Native		
Materials		
Top of Bentonite	20	1491.58
Parkerite Coal Thister are		
Bentonite Seal Thickness	3'	
Top of Sand	23	1488.58
Top of Screen	25	1486.58
▼ Stabilized Water Level	23.03	1488.55
		1100.00
Screen:		
Length 20'	-	
Inside Diameter (ID) 4"	-	
Slot Size 0.020"	-	
Type of Material PVC	-	
Type/Size of Sand #3	_	
Sand Pack Thickness 24.5'	_	
Bottom of Screen	45	1466.58
Bottom of Tail Pipe:	45.5	1466.08
Bottom of Sandpack	47.5	1464.08
Bottom of Borehole (borehole was backfill	led with Holeplug ®) 90	
Borehole Diameter: 8" Approved:		
Describe Measuring Point: Sally Bilodeau	8/13/2019	
Signature	Date	

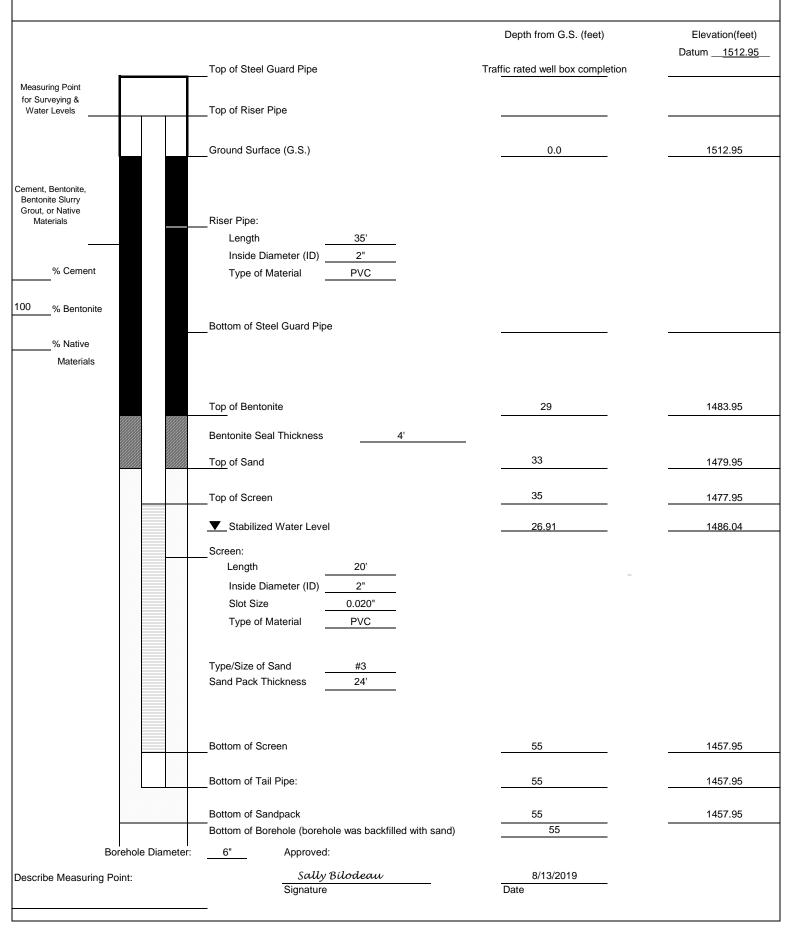


	Client: Nevada Division of Environmental Protection	WELL ID: NERT4.64S1	
Project Number: 60477365-2018-171-01		,, EEE 15, 1, ER1 no is1	
Site Location: Las Vegas Wash, Henderson NV		Date Installed: 3/26/2019	
	Well Location: River Mile 4.64 Coords: 26735740.74 N 839508.39 E	Inspector: Sally Bilodeau	
	Method: Sonic	Contractor: Cascade	

## Materials Top of Bentonite	Datum <u>1513.21</u>	Depth from G.S. (feet)		
Top of Riser Pipe	vell box completion	affic rated well box comple	Guard Pipe Ti	Managering Point
Riser Pipe: Length 30' Inside Diameter (ID) 4' Slot Size 0.020' Type of Material PVC Type of Material PVC Type of Material PVC Type Size of Sand #3 Sand Pack Thickness 23' Bottom of Screen 55 Bottom of Tail Pipe: 55.5 Bottom of Sandpack Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Bottom of Borehole (borehole was backfilled with Holeplug ®)			Pipe	for Surveying &
Riser Pipe: Length 30°	0.0 1513.21	0.0	ce (G.S.)	
Inside Diameter (ID)				Bentonite Slurry Grout, or Native
% Cement Type of Material PVC				
Bottom of Steel Guard Pipe			· · · · · · · · · · · · · · · · · · ·	
## Native Materials Top of Bentonite			Material PVC	% Cement
Bentonite Seal Thickness 3' 33 33 33 34 35 35 35 35			el Guard Pipe	% Native
Top of Sand Top of Screen 35 ▼ Stabilized Water Level Screen: Length Soft Size 10.020" Type of Material 10.020" Type of Material 10.020" Type/Size of Sand Sand Pack Thickness 10.020" 10	30 1483.21	30	nite	
Top of Screen Screen: Length Inside Diameter (ID) Islot Size O.020" Type of Material PVC Type/Size of Sand Sand Pack Thickness 23' Bottom of Screen Bottom of Sandpack Bottom of Sandpack Bottom of Borehole (borehole was backfilled with Holeplug ®) Borehole Diameter: 8' Approved:			al Thickness 3'	
Screen: Length 20' Inside Diameter (ID) 4" Slot Size 0.020" Type of Material PVC Type/Size of Sand #3 Sand Pack Thickness 23' Bottom of Screen 55 Bottom of Tail Pipe: 55.5 Bottom of Sandpack 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8" Approved:	1480.21	33	_	
Screen: Length 20' Inside Diameter (ID) 4" Slot Size 0.020" Type of Material PVC Type/Size of Sand #3 Sand Pack Thickness 23' Bottom of Screen Bottom of Tail Pipe: Bottom of Sandpack Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8" Approved:	1478.21	35	n	
Length 20' Inside Diameter (ID) 4" Slot Size 0.020" Type of Material PVC Type/Size of Sand #3 Sand Pack Thickness 23' Bottom of Screen 55 Bottom of Tail Pipe: 55.5 Bottom of Sandpack 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8" Approved:	.1 1486.11	27.1	l Water Level	
Inside Diameter (ID) 4" Slot Size 0.020" Type of Material PVC Type/Size of Sand #3 Sand Pack Thickness 23' Bottom of Screen 55 Bottom of Tail Pipe: 55.5 Bottom of Sandpack 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8" Approved:				
Slot Size 0.020" Type of Material PVC Type/Size of Sand #3 Sand Pack Thickness 23' Bottom of Screen 55 Bottom of Tail Pipe: 55.5 Bottom of Sandpack 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8" Approved:	_			
Type of Material PVC Type/Size of Sand #3 Sand Pack Thickness 23' Bottom of Screen 55 Bottom of Tail Pipe: 55.5 Bottom of Sandpack 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8' Approved:			· ,	
Type/Size of Sand #3 Sand Pack Thickness 23' Bottom of Screen 55 Bottom of Tail Pipe: 55.5 Bottom of Sandpack 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8" Approved:				
Bottom of Screen Bottom of Tail Pipe: Bottom of Sandpack Bottom of Sandpack Bottom of Borehole (borehole was backfilled with Holeplug ®) Borehole Diameter: 8" Approved:			Material PVC	
Bottom of Tail Pipe: 55.5 Bottom of Sandpack 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8" Approved:				
Bottom of Sandpack 56 Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8" Approved:	1458.21	55	een	
Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8" Approved:	.5 1457.71	55.5	Pipe:	
Bottom of Borehole (borehole was backfilled with Holeplug ®) 56 Borehole Diameter: 8" Approved:	1457.21	56	odnack	
Borehole Diameter: 8" Approved:				
				Borehole Diameter:
Describe Managuring Deint: Sally Kiladogur 9/12/2010	13/2019	8/13/2019	Sally Bílodeau	
Describe Measuring Point: Sally Bilodeau 8/13/2019 Signature Date	10/2010			Describe ivieasuring Point:



	Client: Nevada Division of Environmental Protection	WELL ID: NERT4.64S1A	
Project Number: 60477365-2018-171-01		,,22212,1,22111010111	
Site Location: Las Vegas Wash, Henderson NV		Date Installed: 4/26/2019	
	Well Location: River Mile 4.64 Coords: 26735746.28 N 839506.16 E	Inspector: Sally Bilodeau	
	Method: Sonic	Contractor: Cascade	



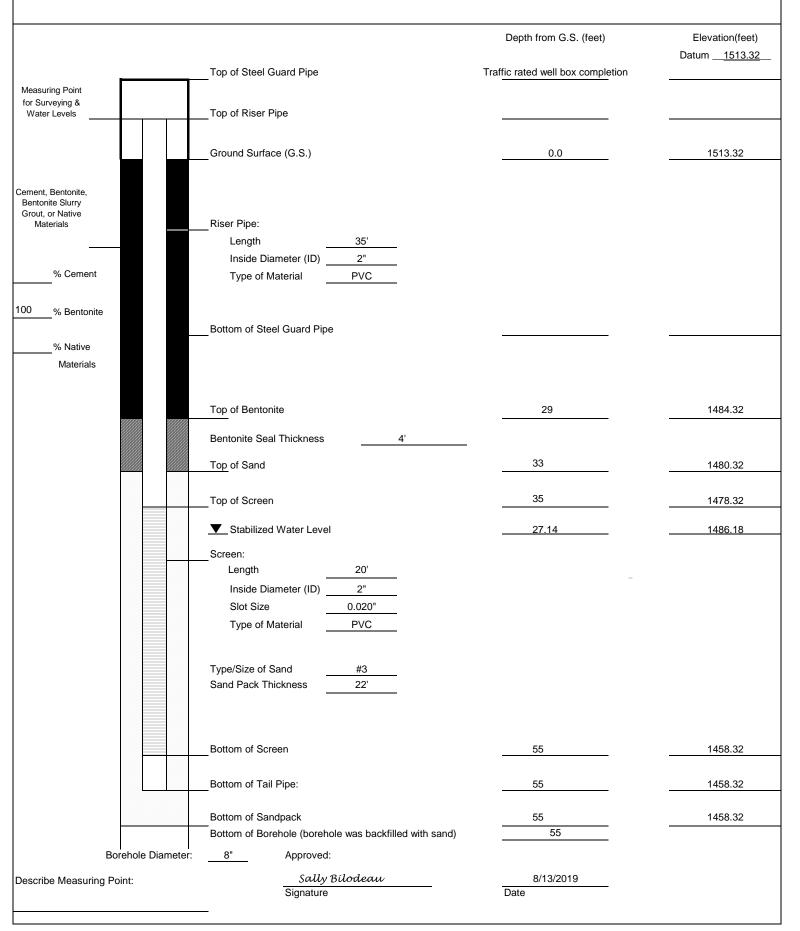


	Client: Nevada Division of Environmental Protection		WELL ID: NERT4.64S1B	
	Project Number: 60477365-2018-171-01		,, ZZZ ZZ, I,ZXI NO ISIZ	
Site Location: Las Vegas Wash, Henderson NV		Date Installed: 4/26/2019		
	Well Location: River Mile 4.64	Coords: 26735747.15 N 839522.29 E	Inspector: Sally Bilodeau	
	Method: Sonic		Contractor: Cascade	

		Depth from G.S. (feet)	Elevation(feet) Datum1513.04
	Top of Steel Guard Pipe	Traffic rated well box completion	
Measuring Point for Surveying & Water Levels	_Top of Riser Pipe		
	Ground Surface (G.S.)	0.0	1513.04
Cement, Bentonite, Bentonite Slurry Grout, or Native Materials	Riser Pipe: Length35' Inside Diameter (ID) 2"		
% Cement	Type of Material PVC		
% Bentonite % Native Materials	Bottom of Steel Guard Pipe		
	Top of Bentonite	29	1484.04
	Bentonite Seal Thickness 4'		
	Top of Sand	33	1480.04
	Top of Screen	35	1478.04
	▼ Stabilized Water Level	26.78	1486.26
	Screen:		
	Length 20' Inside Diameter (ID) 2"	-	
	Slot Size 0.020" Type of Material PVC		
	Type/Size of Sand #3 Sand Pack Thickness 24'		
	Bottom of Screen	55	1458.04
	Bottom of Tail Pipe:	55	1458.04
	Bottom of Sandpack Bottom of Borehole (borehole was backfilled with sand)	55 55	1458.04
 Borehole Diameter:	6" Approved:		
Describe Measuring Point:	Sally Bilodeau Signature	8/13/2019 Date	



Client: Nevada I	Division of Environmer	ntal Protection	Protection WELL ID: NERT4.64S1C	
Project Number: 60477365-2018-171-01		,, <u>222 12, 1, 231 110 131</u> 0		
Site Location: Las Vegas Wash, Henderson NV		Date Installed: 4/26/2019		
Well Location:	River Mile 4.64	Coords: 26735735.18 N 839510.44 E	Inspector: Sally Bilodeau	
Method: Sonic			Contractor: Cascade	





	Client: Nevada Division of Environmental Protection	WELL ID: NERT4.64S1D
Project Number: 60477365-2018-171-01		WEEL IN THE INTERIOR
Site Location: Las Vegas Wash, Henderson NV		Date Installed: 4/25/2019
	Well Location: River Mile 4.64 Coords: 26735756.29 N 839544.6 E	Inspector: Sally Bilodeau
	Method: Sonic	Contractor: Cascade

		Depth from G.S. (feet)	Elevation(feet) Datum <u>1512.9</u>
	Top of Steel Guard Pipe	Traffic rated well box completion	
Measuring Point			
for Surveying & Water Levels	Top of Riser Pipe		
	Ground Surface (G.S.)	0.0	1512.90
	<u> </u>		
ement, Bentonite,			
Bentonite Slurry			
Grout, or Native Materials	Riser Pipe:		
	Length35'		
	Inside Diameter (ID)		
% Cement	Type of Material PVC		
% Bentonite			
	Bottom of Steel Guard Pipe		
% Native			
Materials			
	Top of Bentonite		
			-
	Bentonite Seal Thickness 5'		
	Top of Sand		
			-
	Top of Screen	35	1477.90
	▼ Stabilized Water Level	26.91	1485.99
	Screen:		
	Length 20'		
	Inside Diameter (ID) 2"		
	Slot Size0.020"		
	Type of Material PVC		
	Type/Size of Sand #2		
	Type/Size of Sand #3 Sand Pack Thickness 22'		
	Bottom of Screen	55	1457.90
	Bottom of Tail Pipe:		
	D (0		
	Bottom of Sandpack Pottom of Porcholo (horobolo was backfilled with sand)	<u>55</u> 55	1457.90
	Bottom of Borehole (borehole was backfilled with sand)		
Borehole Diamete	r: 8" Approved:		
escribe Measuring Point:	Sally Bilodeau	8/13/2019	
-	Signature	Date	

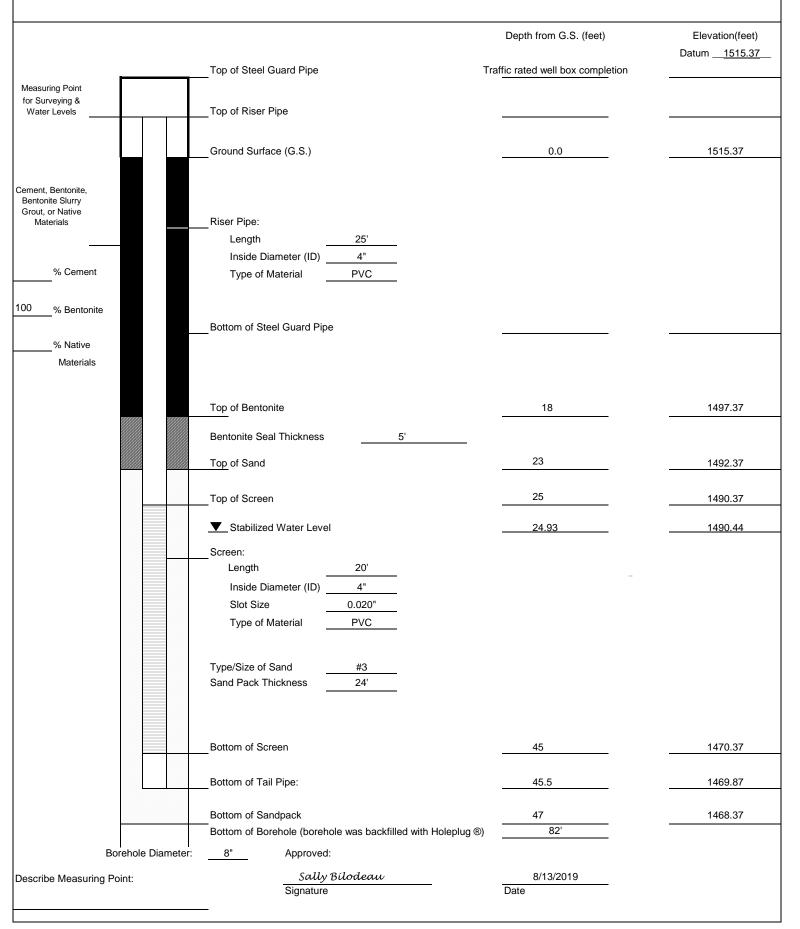


	Client: Nevada Division of Environmental Protection	WELL ID: NERT4.65N1	
Project Number: 60477365-2018-171-01		WEEL TO THE ROOT T	
Site Location: Las Vegas Wash, Henderson NV		Date Installed: 4/10/2019	
	Well Location: River Mile 4.65 Coords: 26736244.72 N 839107.82 E	Inspector: Sally Bilodeau	
	Method: Sonic	Contractor: Cascade	

		Depth from G.S. (feet)	Elevation(feet) Datum <u>1513.34</u>
	Top of Steel Guard Pipe	Traffic rated well box completion	
Measuring Point			
for Surveying & Water Levels	Top of Riser Pipe		
	Ground Surface (G.S.)	0.0	1513.34
Cement, Bentonite, Bentonite Slurry			
Grout, or Native	Diego Diego		
Materials	Riser Pipe: Length 25'		
	Inside Diameter (ID) 4"		
% Cement	Type of Material PVC		
100 % Bentonite			
	Bottom of Steel Guard Pipe		
% Native			
Materials			
nanan nanan	Top of Bentonite	18	1495.34
	Bentonite Seal Thickness 5'		
		•	
	Top of Sand		1490.34
	Top of Screen	25	1488.34
	Top of Screen		1400.34
	▼ Stabilized Water Level	24.21	1489.13
	Screen:		
	Length 20'	_	
	Inside Diameter (ID)4"		
	Slot Size0.020"		
	Type of Material PVC		
	Type/Size of Sand #3		
	Sand Pack Thickness 24'		
	Bettern of Course	45	4400.01
	Bottom of Screen	45	1468.34
	Bottom of Tail Pipe:	45.5	1467.84
	Bottom of Sandpack	47	1466.34
	Bottom of Borehole (borehole was backfilled with Holeplug	®) 90	
I Borehole Diamete	r: <u>8"</u> Approved:		
Describe Measuring Point:	Sally Bílodeau	8/13/2019	
	Signature	Date	

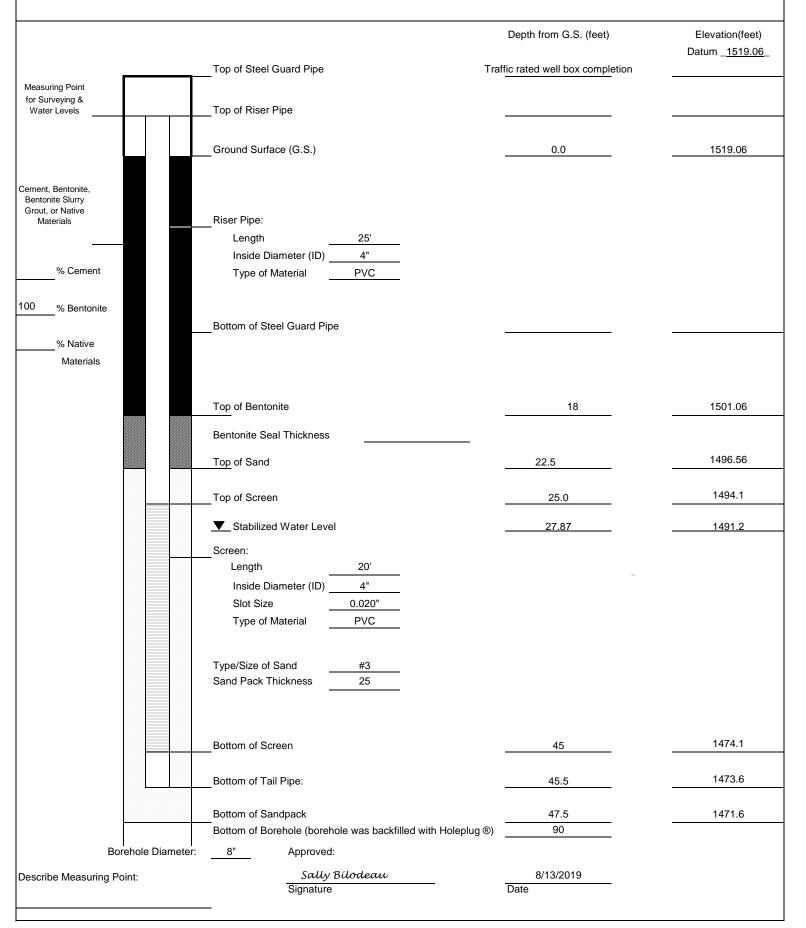


	Client: Nevada Division of Environmental Protection	WELL ID: NERT4.70N1	
Project Number: 60477365-2018-171-01		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Site Location: Las Vegas Wash, Henderson NV		Date Installed: 4/11/2019	
	Well Location: River Mile 4.70 Coords: 26736143.64 N 838871.67 E	Inspector: Sally Bilodeau	
	Method: Sonic	Contractor: Cascade	



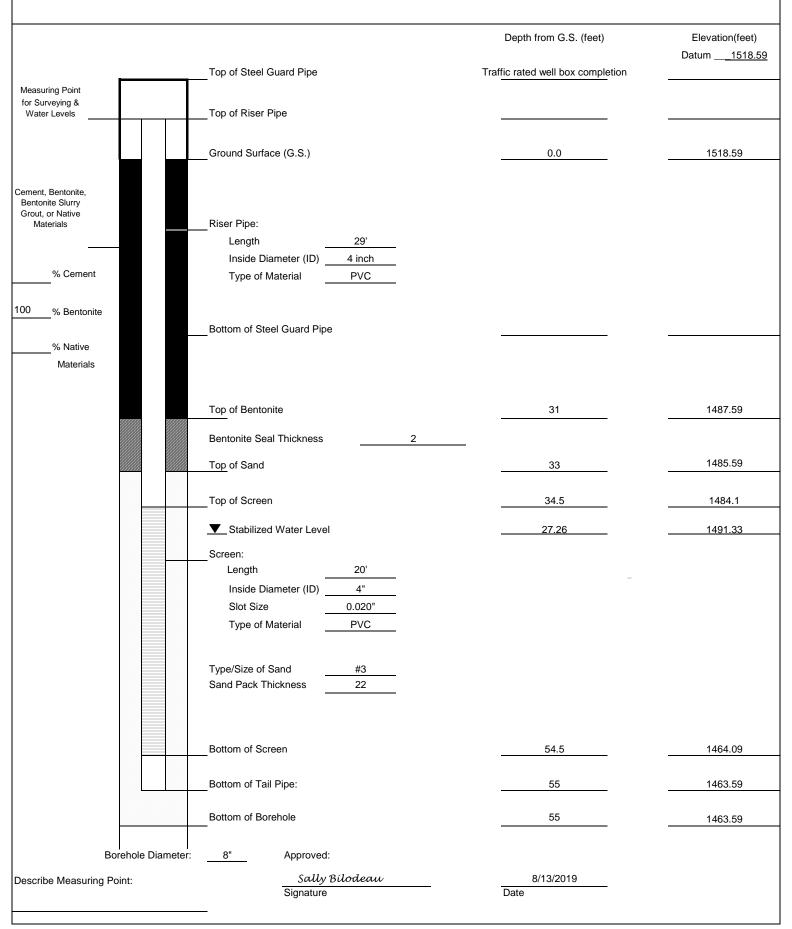


	Client: Nevada Division of Environmental Protection	WELL ID: NERT4.71N1	
Project Number: 60477365-2018-171-01		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Site Location: Las Vegas Wash, Henderson NV		Date Installed: 4/5/2019	
Well Location: River Mile 4.71 Coords: 26736123.87 N 838600.29 E		Inspector: Sally Bilodeau	
	Method: Sonic	Contractor: Cascade	





Client: Nevada	Division of Environm	nental Protection	WELL ID: NERT4.71S2		
Project Number	: 60477365-2018-17	1-01	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
Site Location: L	.as Vegas Wash, Hena	lerson NV	Date Installed: 4/1/2019		
Well Location:	River Mile 4.71	Coords: 26735408.27 N 838770.32 E	Inspector: Sally Bilodeau		
Method: Sonic	_		Contractor: Cascade		



Appendix E

Well Development Records

Well/Piez. ID:	
Well/Piez. ID: NERT 3.35S	

Client:	NDEP			Site Location:	LV Wash		- 1			
Project No	6047736	<u>5-2016-170</u>		Developer	J Capotrio/	F Verduzco)	Date:	4/29/	9
WELL/PIE	ZOMETER DAT	ΓA								
Well 🗵		Piezomete	r 🗆		Diameter _	4"		Material:	Sched 40 PVC	<u> </u>
Measuring	Point Description	on	тос			Geology a	t Screen Into	erval		
Depth to T	op of Screen (ft.	.)	35							
•	lottom of Screen	ı (ft.)	55		e.			leasurement	07.30	
Total Well Depth (ft.)				37			Purge Volun		180.257	7
Depth to S	itatic Water Leve			43		Disposal M		Poly IDW Tar		
Original M	fall Davidanas		57	Dedevolenmen	nt 🗆	Wellhead I			N/A	
Original vv	ell Developmen			Redevelopmer	п. Ш	Date of Of	iginal Devel	ортелі		
DEVELOP	MENT METHO	D	Steel Ba	il/ Surge Block		PURGE M	ETHOD	Submersible	Pump	
Field Testi	ng Equipment U	lsed:		Mak	ke .	Mo	odel	Serial	Number	
				Horiba			U-52		P1MTDYFE	_
Field Testi	ng Calibration D	ocumentati	on Found	d in Field Noteb	ook #		Page #_			
т:	Volume	T: (0/E)	_11	Spec. Cond	Turbidity	50	150 love	04	0-1	Water
Time	Removed (gal)	·	pH	(umhos)	(NTUs)	863	-ORP	Odor	Color	
1000	77	21.73	7.37 80	9.35	<i>>999</i> >999	2.24	17.12	Nora "	Brown	15
10 10			504					,,	Tan	-6 -8
1030	115	21.38	¥.60	9,36	7999	2.14	2245	11	Tan	
1040	145	21.45	7.93	9.44	960	1.66	22.50	"	Cherry	-12
1050	175	21.26	7.92	9.46 9.44	37/	1.21	22.55	11	11	-22 -30
1100	Z05	21.23 20.92	7.90	9.48		1.28	22.60	"/	77	-41
1115	235	20.90	7.49	9.49	358 39/	1.29		1/	11	
1120	25°	20.90	7.48	9.44			22.60	11	11	-38
	1 1	W176	7,38	7, 47	375	1.26	2740			-40
Com	deto			4	5/19					
				7/0	5/19					if there is
Min. Purge Maximum	NCE CRITERIA e Volume (7-10 b Turbidity Allower on of parameters	orehole vo	lumes)	/ <mark>%0 g</mark> allons	•		een reache lized			sufficient recharge but not over 4 hrs
all others 1	-									
Pump Set				Purge Rate @	3 GPM	<u>L</u> :	Developme	ent Complete	1120 3	65
Time			l W	ater Level	Total	Depth		Com	ments	
		built		19.6	57		Screen =	35-17		
0730	1 .	rrive		6.83	55.5	26				3- 3-3
0884-6		t bail		7.68	55.	37	7. Gal re	removed		
0845-0		ırge	1	7.46	155.			2000	2.472 = 24.4 = 19	0.29
0910-09	735 2nd	d bail	15	(,31	55.3	55.37 /5 Gal removed				
Signature		2	1/2		3	_	Date:	4	1/29/4	

Well/Piez. ID: NERI 3.4051

Client:	NDEP		_	Site Location:	LV Wash						
Project No:	6047736	5-2016-170	<u>)</u>	Developer:	J Capotrio/	F Verduzco	ı	Date:	4/29/19		
WELL/PIE	ZOMETER DAT	Α									
Well 🗹		Piezomete	er 🗆		Diameter _	4"		Material:	Sched 40 PV	<u> </u>	
Measuring	Point Description	on	TOC			Geology a	t Screen Inte	erval			
•	op of Screen (ft.	•	35								
Depth to Bottom of Screen (ft.)				5				/leasurement	1145		
Total Well Depth (ft.)				1.67	-		Purge Volur		75.25-107	,	
Depth to Static Water Level (ft.)			10.75	,13		Disposal N Wellhead		Poly IDW Tar	N/A		
Original Well Development			Will	Redevelopmer	nt 🔲			opment			
DEVELOP	MENT METHO	D	Steel Ba	ail/ Surge Block		PURGE M	ETHOD	Submersible	Pump		
Field Testi	ng Equipment U	ised:		Mal	ke	Mo	odel	Serial	Number		
				Horiba			U-52		P1MTDYFE	_	
Field Testi	ng Calibration D	ocumentat	ion Foun	d in Field Notel	ook#	_/	Page #				
	Volume			Spec. Cond	Turbidity		l			Water	
Time	Removed (gal)	T° (C/F)	рН	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level	
1300	70	21.20	8.10	10.7	921	8.51	91	None	Brown	34.10	
1315	57	20.84	7.42	9.12	286	3.41	48	11	Clear	40.90	
1325	82	19.98	7.75	8.88	9.7.3	3.89	38	11	1/	40.70	
1335	107	18.61	7.78	8.65	21.7	3.65	46	11	H	40.55	
1345	137	20.09	7.70	8.56	14.7	2.95	42	d	H	40.45	
1300	145	20.11	7.69	8.51	14.3	3.02	45	P	*/	40.40	
1355	157	20.07	7.71	4.55	14.3	2.98	45	11	11	4440	
lean	eleta										
•	_										
					9/2	>/_					
	٠					1/9					
Min. Purge Maximum	NCE CRITERIA Volume (7-10 t Turbidity Allowe In of parameters	orehole vo	lumes)	75 gallons	Has require Have paran	d turbidity b	een reache lized		N/A	if there is sufficient recharge but not over 4 hrs	
all others 1											
	@ <u>~173</u> ft			Purge Rate @	Z.T GPM	-	Developme	ent Complete	1355	160 gel	
Time			W	ater Level	Total	Depth	<u> </u>	Com	ments	_ 04	
		built		8.//	57		Screen =	35-55			
1145	Aı	rrive	3°	8.13	54.13	2					
1155-12		t bail	40	14.	54.65		スァ Gal r	emoved			
12K- 12		ırge		5.75	54.5						
1240-12	2nd	d bail	3	8.50	54.04	√					
Sionature		1.16	1	100			Date:	4/29/	15		

Well/Piez. ID: NERT 3.58 N I

Client:	NDEP		-	Site Location:	Lv wasn						
Project No	o: 6047736	5-2016-170	<u>)</u>	Developer:	J Capotrio/	F Verduzco)	_Date:	5/3/1	9	
WELL/PIE	ZOMETER DA	ГА									
Well 🞾		Piezomete	er 🗆		Diameter _	4111		Material:	Sched 40 PV	С	
Measuring	Point Descripti	on	TOC		_	Geology a	t Screen In	terval			
Depth to T	Top of Screen (ft)	41	, —							
Depth to E	Bottom of Screer	n (ft.)	60		*** •)	Time of W	ater Level I	Measurement	1210		
Total Well Depth (ft.)				.60	-		Purge Volu	95.7-1	37		
Depth to S	Static Water Lev			.55		Disposal N		Poly IDW Ta			
			3.7		_	Wellhead			N/A		
Original W	/ell Developmen	t 🔼		Redevelopme	nt 🔲	Date of Or	iginal Deve	lopment			
DEVELOF	PMENT METHO	D	Steel B	ail/ Surge Block		PURGE M	ETHOD	Submersible Pump			
Field Testi	ing Equipment L	Jsed:		Mal	ke	Me	odel	Serial	Number		
				Horiba			U-52		P1MTDYFE	_	
Field Testi	ing Calibration D	Ocumentat	ion Foun	d in Field Notel	oook #	1	Page #				
	Volume		T	Spec. Cond	Turbidity	Τ	Π	1		Water	
Time	Removed (gal)	T° (C/F)	pΗ	(umhos)	(NTUs)	DO	ORP	Odor	Союг	Level	
1300	10	24.66	7.47	7.70	>999	268	119	None	Brown	39.80	
1335	97.5	21,13	7.31	7.66	96.8	2.87	156	None	clain	39.50	
1340	109110.0	20.76	7.13	7.71	12.0	1.98	153	"	21	11	
1345	122.5	20.81	7.14	7.72	13.6	1.87	155	17	11	1	
1300	145.0	20.79	7.14	7.72	11.8	1.88	103	- 1	11))	
Can											
4	1					20				1	
					5/3						
					- 5/	19					
			 			 				+	
				 							
Min. Purge Maximum	ANCE CRITERIA e Volume (7-10 Turbidity Allowe	borehole vo	olumes)	<u>%</u> gallons	Has require	ed turbidity t	een reache	ed 💆 🗀	N/A	if there is sufficient recharge but not over 4 hrs	
pH +-0.1	on or parameter	5 1070			Have parar	neters stabi I/A explain I		<u> </u>	. —	OVE: 4 11[5	
temp 1 de	лгее С				יו וט טוו וו	WA exhibit i	DEIOW.				
all others	_										
Pump Set				Purge Rate @	ZIGPM	1	Developm	ent Complete	1300	14/6	
Time	e		Tw	ater Level	Total	Depth		Con	nments	E.S.	
		s built	1	39.41	62		Screen =	40-60			
1210		rrive		9.55	60.5						
12K-1		t bail	_	9.60	60.60		3 Gal	removed			
1225-12	245 S	urge	7	7.57	will						
124-1	200 2n	d bail	39	1.65	60.60		3 Gal	removed			
0:	The same	11	/	100	TO A TOWN OF THE PARTY OF THE P		D = 4 = ==	5/2	6		

Well/Piez, ID:	
NERT 3.58SI	

WELL/PII	ZOMETER DAT	ГА								
Well 🗵	2.	Piezomete	er 🔲		Diameter 4/			Material	Sell 40	PL
Measuring	Point Descripti	on		00	_		it Screen In	terval		
Depth to 1	Гор of Screen (ft	:-)	_ 3	35		(if known)				
Depth to I	Bottom of Screer	n (ft.)		5		Time of W	ater Level	Measurem	ent	0740
Total Wel	Depth (ft.)		31	1.8656	,	Calculate	Purge Volu	me (gal.)		96-1373
	Static Water Lev	el (ft.)		4.46		Disposal I	Method	Pol T	ow Ton	1 trails
		()	13.74			Wellhead		0//		
Original M	ifell Developmen	101		Padaualas:	nont 🗇					
	Vell Developmen		1 / .	Redevelopn			riginal Deve		.,,	2
DEVELO	PMENT METHO	D 5	elle.	il/surge	funt	PURGE N	TETHOD	Silon	usibl f	ung
Field Test	ting Equipment L	Jsed:		14-	Make	U.S	odel		ial Number	
				House	Qo.	01-3		*****	LUYFE	
Field Test	ting Calibration E	Documenta	ition Houi	na in Fleia Ni	DIEDOCK #		Page #			
Field Tes	Volume		ition Foul	Spec. Cond	ı		l age #		ORP	740,1
Time	Volume Removed (gal)	T° (C/F)	рН	Spec. Cond (umhos)	f Turbidity (NTUs)		Color	Odor	orp Other	Livel
	Volume Removed (gal)	T° (C/F)	pH	Spec. Cond	Turbidity (NTUs)	DO 2.32	Color	None	ORP Other 2/0	
Time	Volume Removed (gal)	T° (C/F)	рН	Spec. Cond (umhos)	f Turbidity (NTUs)	2.32	Color		210	34.92
Time 09:00	Volume Removed (gal)	T° (C/F)	pH 6.34 6.65	Spec. Cond (umhos) 3.97	Turbidity (NTUs)	2.32	Color Brown Clay	Nene	210	34.52
Time 09:00 09:15 09:20 09:25 09:30	Volume Removed (gal) 85 105 125	T° (C/F) 19.44 19.32	pH 6.34 6.65	Spec. Conc (umhos) 3.97 3.97	Turbidity (NTUs) 2999 82.5	2.32 1.67 6.86	Color Brown Clay	Neve Nove Nove	210 150 113	34.92 34.92 34.92
Time 09:00 09:15 09:20 09:25	Volume Removed (gal) 85 105 125	T° (C/F) 19.44 19.32 19.37	pH 6.34 6.65 6.66	Spec. Conc (umhos) 3.97 3.97 3.86	Turbidity (NTUs) 2999 82.5 19.4 20.3	2.32 1.07 0.86 0.85	Color Brown Clay Clen Clen	Nene none None None	210 150 113 106	34.92 34.92 34.92 34.92
Time 09:00 09:15 09:20 09:25 09:30	Volume Removed (gal) 85 105 125	T° (C/F) 19.44 19.32 19.37	pH 6.34 6.65 6.66	Spec. Conc (umhos) 3.97 3.97 3.86	Turbidity (NTUs) 2999 82.5 19.4 20.3	2.32 1.07 0.86 0.85	Color Brown Clay Clen Clen	Nene none None None	210 150 113 106	34.92 34.92 34.92 34.92
Time 09:00 09:15 09:20 09:25 09:30	Volume Removed (gal) 85 105 125	T° (C/F) 19.44 19.32 19.37	pH 6.34 6.65 6.66	Spec. Conc (umhos) 3.97 3.97 3.86	Turbidity (NTUs) 2999 82.5 19.4 20.3	2.32 1.07 0.86 0.85	Color Brown Clay Clen Clen	Nene none None None	210 150 113 106	34.92 34.92 34.92 34.92
Time 09:00 09:15 09:20 09:25 09:30	Volume Removed (gal) 85 105 125	T° (C/F) 19.44 19.32 19.37	pH 6.34 6.65 6.66	Spec. Conc (umhos) 3.97 3.97 3.86	Turbidity (NTUs) 2999 82.5 19.4 20.3 20.1	2.32 1.07 0.86 0.85	Color Brown Clay Clen Clen	Nene none None None	210 150 113 106	34.92 34.92 34.92 34.92
Time 09:00 09:15 09:20 09:25 09:30	Volume Removed (gal) 85 105 125	T° (C/F) 19.44 19.32 19.37	pH 6.34 6.65 6.66	Spec. Conc (umhos) 3.97 3.97 3.86	Turbidity (NTUs) 2999 82.5 19.4 20.3 20.1	2.32 1.07 0.86 0.85	Color Brown Clay Clen Clen	Nene none None None	210 150 113 106	34.92 34.92 34.92 34.92
Time	Volume Removed (gal) 85 105 125 195	T° (C/F) 19.44 19.32 19.33 19.34	pH 6.34 6.65 6.66 6.66 6.66 6.66	Spec. Conc (umhos) 3.97 3.97 3.86 3.96 3.98	Turbidity (NTUs) 2999 82.5 19.4 20.3 20.1	2.32 1.67 6.46 0.85 6.42	Color Brown Clan Clan Clan Clan	Neve Nove Nove Nove None Non	210 150 113 106	34.92 34.92 34.92 34.92
Time	Volume Removed (gal) 25 25 105 145 ANCE CRITERIA e Volume (7-10	T° (C/F) 19.24 19.33 19.34 4 (from we borehole v	pH 6.34 6.65 6.66 6.66 6.66 6.66 column or solumn or sol	Spec. Conc (umhos) 3.97 3.97 3.86 3.96 3.98	Turbidity (NTUs) 2999 82.5 19,4 20.3 20.1	2.32 1.07 0.46 0.45 0.42	Color Brown Clay Clan Clan Clan	Nene none None None	2/0 //3 /06 99	34.92 34.52 34.92 34.92 34.92
Time O900 0915 0920 0925 O930 Lamy ACCEPT/ Min. Purg Maximum	Volume Removed (gal) 25 25 25 25 25 25 25 25 25 25 25 25 25	T° (C/F) 19.24 19.33 19.34 A (from we borehole ved N/A N	pH 6.34 6.65 6.66 6.66 6.66 6.66 column or solumn or sol	Spec. Conc (umhos) 3.97 3.97 3.86 3.96 3.98	Turbidity (NTUs) 299 82.5 19,4 20.3 20.1 Has required vol Has required turk	2.32 1.07 0.95 0.92 ume been pidity been	Color Rown Clay Clan Clan Clan Clan Clan	Neve Nove Nove Nove None Non	2/0 //3 /06 99	34.92 34.52 34.92 34.92 34.92 if there is surecharge bu
Time O900 0915 0920 0930 Cany ACCEPT/ Min. Purg Maximum Stabilizati	Volume Removed (gal) 25 25 105 145 ANCE CRITERIA e Volume (7-10	T° (C/F) 19.24 19.33 19.34 A (from we borehole ved N/A N	pH 6.34 6.65 6.66 6.66 6.66 6.66 column or solumn or sol	Spec. Conc (umhos) 3.97 3.97 3.86 3.96 3.98	Turbidity (NTUs) 2999 82.5 19,4 20.3 20.1 Has required vol Has required turl Have parameters	2.32 1.07 0.86 0.85 0.92 ume been pidity been stabilized	Color Rown Clay Clan Clan Clan clan clan clan	Neve Nove Nove Nove None Non	2/0 //3 /06 99	34.92 34.52 34.92 34.92 34.92
Time O900 0915 0920 0930 Cany ACCEPT Min. Purg Maximum Stabilizati pH +-0.1	Volume Removed (gal) 25 25 25 25 25 25 25 25 25 25 25 25 25	T° (C/F) 19.24 19.33 19.34 A (from we borehole ved N/A N	pH 6.34 6.65 6.66 6.66 6.66 6.66 column or solumn or sol	Spec. Conc (umhos) 3.97 3.97 3.86 3.96 3.98	Turbidity (NTUs) 299 82.5 19,4 20.3 20.1 Has required vol Has required turk	2.32 1.07 0.86 0.85 0.92 ume been pidity been stabilized	Color Rown Clay Clan Clan Clan clan clan clan	Neve Nove Nove Nove None Non	2/0 //3 /06 99	34.92 34.52 34.92 34.92 34.92 if there is surecharge bu
Time O915 0915 0926 O930 Lamy ACCEPT/ Min. Purg Maximum Stabilizati pH +-0.1 temp 1 de	Volume Removed (gal) 25 25 25 25 25 25 25 25 25 25 25 25 25	T° (C/F) 19.24 19.33 19.34 A (from we borehole ved N/A N	pH 6.34 6.65 6.66 6.66 6.66 6.66 column or solumn or sol	Spec. Conc (umhos) 3.97 3.97 3.86 3.96 3.98	Turbidity (NTUs) 2999 82.5 19,4 20.3 20.1 Has required vol Has required turl Have parameters	2.32 1.07 0.86 0.85 0.92 ume been pidity been stabilized	Color Resun Clay Clan Clan Clan Clan Clan Clan Clan Clan	New Nord New	2/C //3 /06 99	34.92 34.52 34.92 34.92 34.92 if there is surecharge bu
Time O915 0915 0926 O930 Lamy ACCEPT/ Min. Purg Maximum Stabilizati pH +-0.1 temp 1 de	Volume Removed (gal) 25 25 25 25 25 25 25 25 25 25 25 25 25	T° (C/F) 19.24 19.33 19.34 A (from we borehole ved N/A N	pH 6.34 6.65 6.66 6.66 6.66 6.66 column or solumn or sol	Spec. Conc (umhos) 3.97 3.97 3.86 3.96 3.98	Turbidity (NTUs) 2999 82.5 19,4 20.3 20.1 Has required vol Has required turl Have parameters	2.32 1.07 0.86 0.85 0.92 ume been pidity been stabilized	Color Rown Clay Clan Clan clan clan clan	New Nord New Mane New New New New New New New New New Ne	2/C //3 /06 99	34.92 34.52 34.92 34.92 34.92 if there is surecharge bu
Time O900 0915 0920 0925 0930 Luny ACCEPT/ Min. Purg Maximum	ANCE CRITERIA e Volume (7-10 Turbidity Allower on of parameters	T° (C/F) 19.24 19.33 19.34 A (from we borehole ved N/A N	pH 6.34 6.65 6.66 6.66 6.66 6.66 column or solumn or sol	Spec. Conc (umhos) 3.97 3.97 3.86 3.96 3.98	Turbidity (NTUs) 2999 82.5 19,4 20.3 20.1 Has required vol Has required turl Have parameters	2.32 1.07 0.86 0.85 0.92 ume been pidity been stabilized	Color Resun Clay Clan Clan Clan Clan Clan Clan Clan Clan	Yes O930	2/C //3 /06 99	34.92 34.52 34.92 34.92 34.92 if there is surecharge bu
ACCEPT/Min. Purg Maximum Stabilizati pH +-0.1 temp 1 de all others	ANCE CRITERIA e Volume (7-10 Turbidity Allower on of parameters	T° (C/F) 19.24 19.33 19.34 A (from we borehole ved N/A N	pH 6.34 6.65 6.66 6.66 6.66 6.66 column or solumn or sol	Spec. Conc (umhos) 3.97 3.97 3.86 3.96 3.98	Turbidity (NTUs) 2999 82.5 19,4 20.3 20.1 Has required vol Has required turl Have parameters	2.32 1.07 0.86 0.85 0.92 ume been pidity been stabilized	Color Rown Clay Clan clan	Yes O930	2/C 1/3 1/06 99 No N/A	34.92 34.52 34.92 34.92 34.92 if there is surecharge bu



Well/Piez. ID: NERT 3.58S/A

Client:	NDEP		•	Site Location:	LV Wash					
Project No	: 6047736	5-2016-170	<u>•</u>	Developer:	J Capotrio/	F Verduzco		Date:	4/30/1	9
WELL/PIE	ZOMETER DAT	ľΑ								
Well 🔼		Piezomete	r 🗆		Diameter _	2"		Material:	Sched 40 PVC	
Measuring	Point Description	on	TOC		_	Geology at	Screen Int	erval		
•	op of Screen (ft.	•	25	_						
Depth to Bottom of Screen (ft.)								Level Measurement		
				66	•		Purge Volur			
Depth to Static Water Level (ft.)			1.77	6	•	Disposal M Wellhead I		Poly IDW Tai	N/A	
Original W	ell Developmen	-	,,,,	Redevelopmer	nt 🔲			lopment		
DEVELOP	MENT METHO	D	Steel Ba	ail/ Surge Block	•	PURGE M	ETHOD	Submersible	Pump	
Field Testi	ng Equipment U	sed:		Mak	ке	Мо	odel	Serial	Number	
	•			Horiba			U-52		P1MTDYFE	_
Field Testi	ng Calibration D	ocumentat	ion Foun	d in Field Notet	ook #	/	_ Page#_		130000 10000	
	Volume			Spec. Cond	Turbidity					Water
Time	Removed (gal)	T° (C/F)	pН	(umhos)	(NTUs)	ĐQ	ORP	Odor	Color	Level
1040	5	18.75	7.52	4.27	7999	5.30	99	Worl	Bun/Kin	34,65
1045	17	19.36	7.32	4.22	944	3.53	84	11	Churchy	11
1050	29	19.54	7.33	4.16	32.8	2.64	84	4	Elevery	34.70
1055	4/	19.29	7.3/	4.20	19,3	2.49	88	n	clear	4
1100	5.3	19.34	7.28	4.19	8.4	2.24	93	//	-1	#/
1105	65	19.16	7.3/	4.20	4.9	2.19	99	"	н	34.75
1110	つフ	19.21	7.27	4,19	3.7	2.18	104	"	21	11
long	leto.				A					
					9/30/1	2				
										:E 44 1-
ACCEPTANCE CRITERIA (from workplan) Min. Purge Volume (7-10 borehole volumes) Maximum Turbidity Allowed W/P NTUs Stabilization of parameters 10% pH +-0.1 temp 1 degree C all others 10%					Have param		ized	ed 🗾 🗔	N/A 	if there is sufficient recharge but not over 4 hrs
Pump Set	@ <u>~ 44</u> ft			Purge Rate @	Z.4 GPM		Developme	ent Complete	1110 7	7501
Time			l W	ater Level	Total	Depth		Corr	ments	
		built		-	45		Screen =	25-45		
0945		rrive	34	1.61	45.5		HE CANALAN			
0956-0		t bail		1,65	45.6		Gal r	emoved		
1004-10		ırge	1	1,66	45.3					
1025-1c	/35 2nd	d bail	34	1.65	45.	0	Gal r	emoved		
Signature			1	12			Date	4/30/5	,	

Well/Piezometer Development Record

Well/Piez. ID: NERT 3.58S/B

Client:	NDEP		•	Site Location:	LV Wash					
Project No	: 6047736	5-2016-170		Developer	J Capotrio/	F Verduzco)	Date:	4/30/	19
WELL/PIE	ZOMETER DAT	ΓΑ								
Well 🗵		Piezomete	r 🗆		Diameter	2"		Material:	Sched 40 PV	С
_	Point Description		TOC		•	Geology a	t Screen Int	erval		
Depth to Top of Screen (ft.)						T:5144			4	
			45				ater Level N Purge Volur	Measurement	12.5-17	
			33.		•	Disposal N	-	Poly IDW Tar		1
/128			-	•••		Wellhead		1 01/1017 101	N/A	
Original W	ell Developmen		, , ,	Redevelopmer	nt 🗆	Date of Or	riginal Devel	opment		
DEVELOP	MENT METHO	D	Steel Ba	ail/ Surge Block		PURGE M	IETHOD	Submersible	Pump	
Field Testin	ng Equipment U	sed:		Mak	(e	Me	odel	Serial	Number	
			_	Horiba		,	U-52		P1MTDYFE	_
Field Testi	ng Calibration D	ocumentati	on Foun	d in Field Noteb	000K #		Page # _			
	⁷ Volume		1	Spec. Cond	Turbidity					Water
Time	Removed (gal)		pН	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
0905	7	17:22	6.64	4.42	753	3.67	69	None	Tan	33.80
0910	19	18-58	7,00	4.36	394	3.92	67	11	Churchy	"
0915	3/	19,61	7.26	4.23	29.3	2.63	74	"	Char	4
0920	43	19.06	7.31	4.24	2.3	2.72	86	,,	»)	_
0925	55	19.14	7.32	4,22	0.2	2.66	84	"		4
0930	67	19.13	7.32	4.21	0.1	2.65	86		p+	"
Con	nglete					_				1
			 		-	2				-
					1/30	/				
					130	/9				
Min. Purge Maximum ⁻ Stabilizatio pH +-0.1	NCE CRITERIA Volume (7-10 to Furbidity Allower n of parameters	lumes)	<u>/Z</u> .€ gallons	Has require Have param	d turbidity b	oeen reache lized	d 🗷 🗆	N/A	if there is sufficient recharge but not over 4 hrs	
temp 1 deg all others 1	•									
Pump Set	@ -44 ft			Purge Rate @	2.4 GPM		Developme	ent Complete	0930	67501
Time			W	ater Level	Total I	Depth		Com	ments	
		built	-	-	45		Screen =	25-45		
6750		rive		3.80	44,1					
0755-0		t bail		3.8/ = 4	44,9		⊘ Gal r	emoved		
0815-0		ırge d bail		3. % 3. KT	44,3		Z Galr	emoved		
0835-0	χη [2110	a Dell		2	44.9		_ Gail	7723	,	
Signature	1/11	in	1	2	-		Date:	4/30/1	9	

Well/Piez. ID: NERT 3.58SIC

Client:	ent: NDEP			Site Location:	LV Wash					
Project No	: 6047736	5-2016-170	<u>.</u>	Developer:	J Capotrio/ F Verduzco			_Date:	4/30/19	
WELL/PIE	ZOMETER DAT	ΓΑ								
Well 🗹		Piezomete	r 🔲		Diameter _	2"		Material :	Sched 40 PVC	
Measuring	Point Description	on	TOC		_	Geology at	t Screen Int	erval		
Depth to T	op of Screen (ft	.)	35							
Depth to Bottom of Screen (ft.)			55			Time of Water Level				
Total Well Depth (ft.)			55.		•		Purge Volui		23.4- 33.3	?
Depth to Static Water Level (ft.)			3/	30	-	Disposal M		Poly IDW Tai		
			3.37	5.1	. \Box	Wellhead I			N/A	
Original VV	ell Developmen	t 🔀		Redevelopmer	nt 📙	Date of Or	iginal Deve	lopment		
DEVELOP	MENT METHO	D	Steel Ba	ail/ Surge Block		PURGE M	ETHOD	Submersible	Pump	
Field Testi	ng Equipment U	lsed:		Mal	ке	Мо	odel	Serial	Number	
				Horiba			U-52		P1MTDYFE	_
Field Testi	ng Calibration D	ocumentat	ion Foun	d in Field Notel	ook#		Page # .			
	Volume			Spec. Cond	Turbidity				1	Water
Time	Removed (gal)	T° (C/F)	рН	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
1225	7	21.74	7.66	4.12	2999	5.40	122	None	Rown	34.35
1235	32	20.45	7.50	4.16	64.6	2.21	120	11	Clear	.1
1240	UK.T	2011	7.41	4.19	19.2	2.18	121	"		11
1245	59.0	20.12	7.39	4.17	9.4	2.09	122	н		11
1200	72.5	2007	7.36	4.18	3.3	1.97	119	11	3/	11
1522	86.0	70.09	7.33	4.19	2.9	1.97	120	11	*/	"
Min, Purge Maximum Stabilization pH +-0,1 temp 1 deg	-	oorehole vo	lumes)	23.4 gallons	Has require Have paran	d turbidity b	ieen reache lized	ed <u></u> 도	N/A	if there is sufficient recharge but not over 4 hrs
all others 1					arry and					0.000
Pump Set	@ <u>~54</u> ft			Purge Rate @	Z.7 GPM	_	Developm	ent Complete	1255 8	6 gal
Time			W	ater Level	Total	Depth		Сол	ments	
		built			55		Screen =	35-55		
1/30		rrive		30	55.0					
1138-119		t bail		1,33	55.16		/ Galr	emoved		
1145-1		irge d beit		.34	54,9		0-1-		- 17	
1205-1	2,0 2nd	d bail	34	34	55.14	2) Gair	emoved		
Signature		1	-	1			Date:	4/30/	9	

Well/Piezometer Development Record

Well/Piez. ID:	
NERT3.60N/	

Client: **NDEP** Site Location: LV Wash 5/3/19 Project No: 60477365-2016-170 J Capotrio/ F Verduzco Developer: Date: **WELL/PIEZOMETER DATA** Diameter 4" Well 💹 Piezometer Material: Sched 40 PVC **Measuring Point Description** Geology at Screen Interval Depth to Top of Screen (ft.) Depth to Bottom of Screen (ft.) 22 Time of Water Level Measurement 1000 Total Well Depth (ft.) SHF 55.5 Calculate Purge Volume (gal.) 88-1 80-114 Poly IDW Tank Trailor Depth to Static Water Level (ft.) 37.95 Disposal Method Sug 114 Wellhead PID/FID N/A X Original Well Development Redevelopment Date of Original Development **DEVELOPMENT METHOD** Steel Bail/ Surge Block **PURGE METHOD** Submersible Pump Field Testing Equipment Used: Make Model Serial Number Horiba P1MTDYFE U-52 Field Testing Calibration Documentation Found in Field Notebook # Page # Volume Spec. Cond **Turbidity** Water Time Removed (gal) T° (C/F) pΗ (umhos) (NTUs) DO **ORP** Odor Color Level 15 1100 73.36 736 5.66 >999 7.20 119 None Brown 1125 80 20.93 5.48 1.23 7.28 189 123 Z4.20 92.5 11 1130 20.15 7.21 5.48 33. Y 2.06 132 11 1134 105.0 5.56 Z .37 11 20.04 7,18 9.3 132 11 11 19.97 5.56 8.1 2.24 7.17 133 11 5.56 4.0 11 1145 19.98 130.0 7.16 2.31 134 if there is ACCEPTANCE CRITERIA (from workplan) No N/A Yes sufficient Min. Purge Volume (7-10 borehole volumes) 30 gallons Has required volume been removed recharge Maximum Turbidity Allowed MTUs Has required turbidity been reached but not Stabilization of parameters 10% Have parameters stabilized over 4 hrs pH +-0.1 If no or N/A explain below: temp 1 degree C all others 10% Development Complete 112K 130 31 Pump Set @ ~54/ ft Purge Rate @ 25 GPM Time Water Level Total Depth Comments As built 38.65 52.0 Screen = 1000 Arrive 37.95 50,44 1005-1000 1st bail 34.00 Gal removed 51.50 38.00 55-50 5/50 1015-1030 surge 1034-1050 2nd bail 38-05 55-50 Gal removed

Signature Date:

Well/Piez. ID:	_
vveii/Piez. ID.	
NIERT3.60S)
	•

Client:	NDEP			Site Location		V WO	ash				
Project No.	60477365	5-2018-171		4/9/18 Arrive 10		Developer	JCA	ACTRIO	10 ma	ORE	
WELL/PIE	ZOMETER DAT	TA .		Para							
Well 🔀		Piezomete	r 🗆		Diameter 4"	_		Material _	541461	ac	
Measuring	Point Description	on	10	c			it Screen Int	terval			
Depth to T	op of Screen (ft.	.)	3	-		(if known)					
Depth to B	ottom of Screen	ı (ft.)	5	5		Time of W	/ater Level I	Measuremo	ent	1230	
Total Well	Depth (ft.)		5	6		Calculate	Purge Volu	me (gal.)		71-113	3241
Depth to S	itatic Water Leve	el (ft.)	39	8.62		Disposal N	Method	Poly I	De tenk		
			11,3			Wellhead	PID/FID	NA			
Original W	/ell Developmen	ı M		Redevelopm	ent 🔲	Date of Or	riginal Deve	lopment			
_	MENT METHO			when Kin		PURGE N	•		waith ,	Pung	
Field Test	ing Equipment U	Jsed:		Her	Make		odel	Serie	al Number	<u> </u>	
Field Test	ing Calibration D	Documentat	ion Four	d in Field No	tebook#		Page #	4			
	Volume		1	Spec. Cond			Ι	1	OR P 40ther	1/201	
1405	Removed (gal)	T° (C/F)	pH 4.55	(umhos)	Turbidity (NTUs)	3.12	Color	Odor	198	39.61	
14120	77.5	14.55		4.16	6.0	1.32	Clas	ALA	1/3	38.61	
1430	1/2.5	18.54	6.80		0.0	0.96	de	Nene	108	39.61	
1440	147.5	1854	680	41.15	0.0	0.93	clu	nlese	167	34.61	
1450	1825	18,54	6.81	4-14	0.0	0.91	clu	shere	107	34.61	
			9	75			1				
	9		2)		con 1.	1					
				117	fun	-					
										-	
	,		L								
Min. Purg Maximum		borehole vo		gallon	Has required vol Has required turk Have parameter If no or N/A ex	bidity been s stabilized oplain belov	reached I w:	Yes O	NO NVA	if there is s recharge t 4 hrs	sufficient out not over
Signature							Date:				•
1	R.H.	11.0	741	5 to	c/ (un 35	= 1				
1230	Accive	1600	3-61	2 10	- 54.42	11					
1-1514	Pest Revil	1 1/2	0P 39	1.62 T) = 55.32	,12	99/1				
ou- /32	lost aures	2 th	ve 30	1.57 1	0 = 55.27	1.0	0				
12 /34/	Fort Beil	2 14	06	7,00	7) = 55.31	,12	981	_			

Well/Piez. ID: NERT3.60S1 A

Client:	NDEP		-	Site Location:	LV Wasn	-				
Project No	60477365	5-2016-170	<u>)</u>	Developer:	J Capotrio/	F Verduzco		_Date:	4/30/19	
WELL/PIE	ZOMETER DAT	'A								
Well 🔯		Piezomete	er 🗀		Diameter _	۷"_		Material:	Sched 40 PV	С
Measuring	Point Description	on	TOC		_	Geology at	Screen Int	erval		
Depth to Te	op of Screen (ft.)	35							
•	ottom of Screen	(ft.)	_ 55			Time of Wa	ater Level N	/leasurement	1540	10 1000
	Depth (ft.)			75			Purge Volur		19.5 - 27:	8
Depth to S	tatic Water Leve	el (ft.)		35		Disposal M		Poly IDW Tai		
Original W	ell Development	×	2.14	Redevelopmer	nt 🗆	Wellhead I		lopment	N/A	
DEVELOP	MENT METHO	ם	Steel Ba	ail/ Surge Block	_	PURGE M	ETHOD	Submersible	Pump	
Field Testin	ng Equipment U	sed:		Mal	(e	Mo	odel	Serial	Number	
				Horiba			U-52		P1MTDYFE	_
Field Testi	ng Calibration D	ocumentat	ion Foun	d in Field Notet	ook#		_ Page #_			
	Volume			Spec. Cond	Turbidity					Water
Time	Removed (gal)	T° (C/F)	рH	(umnos)	(NTUs)	- DO	ORP	Odor	Color	Level
1645	5	14.45	7.70	4.15	7999	5,62	89	None	Brown	38.40
1650	17	n.93	7.58	4,10	111	3.26	48	1)	Cleur	D.
1655	79	17.93	7,42	4.12	7.4	2.38	42	ıt	11	et
1700	41	17.97	7.49	4.12	27	2.45	44	N ₁	41	77
1705	43	17.98	1.57 4.11	1.5	2.44	47	p	al	11	
Con	Net	,								
	0									
					*	•				
					1/3					
					Seff					
				,						
Min, Purge Maximum	NCE CRITERIA Volume (7-10 b Turbidity Allowed In of parameters	orehole vo	lumes)	19.5 gallons	Has require Have param	d turbidity b	een reache ized	ed 🔽 🗀	N/A	if there is sufficient recharge but not over 4 hrs
all others 1	•									
Pump Set	@ ~54 ft			Purge Rate @	Z.Y GPM		Developme	ent Complete	1705	~35e/
Time			W	ater Level	Total	Depth		Com	ments	
	As	built			55		Screen =	31-1-		
1540		Tive		.35	55.20					_
1545-160		t bail		. 36	55.50		/ Gal r	emoved		
16K-16.		ırge		.40 .	55.7					
167cm 16	ко 2 по	d bail	38	,40	55.5	4	Z.∉ Gal r	emoved	- 1	NV.0004 5
Signature							Date	alle	10	

Well/Piez. ID: NERT36091 R

Client:	NDEP		_	Site Location:	LV Wash	<u> </u>	<u>.</u>			
Project No	6047736	5-2016-170	<u>)</u>	Developer.	J Capotrio/	F Verduzco)	_Date:	4/30/	19
WELL/PIE	ZOMETER DAT	ГА								
Well		Piezomete	ег 🗆		Diameter 2"			Material:	<u> </u>	
Measuring	Point Description	วก	TOC			Geology a	t Screen Int	terval		
	op of Screen (ft	•	<u>32</u>		•					
•	ottom of Screer	ı (ft.)	_ 55					Measurement	1410	
Total Well				5.3			Purge Volu		183-262	2
Depth to S	tatic Water Leve	el (ft.)		15		Disposal N		Poly IDW Tai		
Original W	'ell Developmen	t 🗵	2.62	Redevelopmer	nt 🔲	Wellhead Date of Or	PID/FID iginal Deve	lopment	N/A	<u> </u>
DEVEL OF	MENT METHO		Stool B	nil/ Surao Block		DUDGEN	IETUOD	Cubraccible	Dump	
			oleei ba	ail/ Surge Block	-	PURGE M		Submersible		
Field Testi	ng Equipment U	lsed:		Mal	ke	M	odel	Serial	Number	
Ciald Task	aa Calibaatiaa G		ion Form	Horiba	الد ماه ما	1	U-52		P1MTDYFE	-
rieid Tesii	ng Calibration D	ocumentat	ion Foun	a in Piela Notet	JOOK #		Page #			
	Volume			Spec. Cond	Turbidity					Water
Time	Removed (gal)	T° (C/F)	pН	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
1515			7.44	3.99	162.1	3.32	141	plone	Clear	38.20
1520	22.5	19.03	7.43	4.08	5.2	3.44	129	11	11	#
1525	35	14.29	7.51	4.08	0.0	264	112	11	"	P
1+30	47.5	18.04	7.73	4.62	0.0	2.59	108	21	11	11
1535	10.0	14.4	7.52	4.14	0.0	3.53	107	30	10	"
Cen	plete									
						70				
					4)					
					1/50	1/5				
						'				
		/								-
Min, Purge Maximum	More	orehole vo	lumes)	<u>冷</u> 子 gallons	Has require Have paran	ed turbidity b	een reache lized	ed 🗵 🗀	N/A	if there is sufficient recharge but not over 4 hrs
Pump Set @ 13 ft				Purge Rate @	2.5 GPM	_	Developm	ent Complete	XX	60gul
Time			W	ater Level	Total	Depth		Com	ments	
		built		_	55		Screen =	35-55		
1410		rrive	1	8.15	54,4					
14K-14		t bail		8.18	54.5		// Gal r	removed		
	43c-14co surge 38.16				54.0		3 0-1			120
1400-1	- cc 2nd	d bail	1 3.	8.14e	54.	17	Z Galr	removed		
Signature		2/		1			Date:	4/2/	4	

Well/Piez. ID: NERT360S1 C

Client:	NDEP		_	Site Location:	LV Wash					
Project No	6047736	5-2016-170	<u>)</u>	Developer:	J Capotrio/ F Verduzco			_Date:	5/1/19	
WELL/PIE	ZOMETER DAT	ГА								
Well 💹		Piezomete	er 🗆		Diameter 2"			Material : Sched 40 PVC		
Measuring	Point Description	on	TOC		_	Geology a	t Screen Int	terval		
Depth to 1	Top of Screen (ft	.)	35	V-33	-					
•	Bottom of Screen	(ft.)	22	5	_			Measurement	47.35	
	Depth (ft.)		55	60		Calculate I	Purge Volu		18.7-26.7	
Depth to S	Static Water Leve	el (ft.)		1.90		Disposal N		Poly IDW Tai		
		V-17	2.67			Wellhead			N/A	
Original W	/ell Developmen	t 22		Redevelopme	nt 🔲	Date of Or	iginal Deve	lopment		
DEVELOR	PMENT METHO	D	Steel Ba	ail/ Surge Block	<u> </u>	PURGE M	ETHOD	Submersible	Pump	
Field Test	ing Equipment U	lsed:		Mal	ke	Mo	odel	Serial	Number	
	_ , ,			Horiba			U-52		P1MTDYFE	
Field Test	ing Calibration D	ocumentat	ion Foun	d in Field Notet	oook#	1	_ Page #			_
	Volume			Spec. Cond	Turbidity					Water
Time	Removed (gal)	T° (C/F)	pН	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
6845	5	15.79	7.49	4.34	7999	6.25	48	None	Brown	38.95
0850	20	16.52	7.46	4.25	56.4	2.42	55	11	Clar	Al
6857	35	16.95	7.57	4.25	29.6	294	57	"	j)	"
0900	50	14.90	748	4.25	23.6	2.70	57	"	11	11
0905	65	16.56	7.47	4.27	10.1	2.17	57	11	11	11
0910	80	16.55	7.47	4.27	6.8	2.12	58	0	11	39.00
0915	95	16.57	7.48	426	7.7	220	59	"	11	11
Cen										
					20					
					-) /					
				-	2/1/19	1				
Min. Purge Maximum Stabilization pH +-0.1 temp 1 de	-	oorehole vo	lumes)	gallons	Has require Have paran		een reache lized	ed 🗹 🗀	N/A	if there is sufficient recharge but not over 4 hrs
all others				D	3 001	1	Davides	ant Carrelat	00.17	9/ 1
Pump Set	@ <u>~54\ ft</u>	•		Purge Rate @	GPM	<u>-</u>	Developm	ent Complete	<u> </u>	9(50)
Time			W	ater Level		Depth			ments	
0735		built		- (4)	55		Screen =	35-K		
1740-0		rrive	3	4.90	54,99		1500			
4755-0		t bail		34.90 34.97	55.6		パー Gal r	removed		
surge 34.92 tsqu-083c 2nd bail 34.92					54.4		/ Gal r	emoved		
10-				1			, , ,		1	2.57
Signature		11		11/2	25		Date:	5/1	118	

Well/Piez. ID: NERT3.60SID

Client:	NDEP		_	Site Location:	LV Wash					
Project No	: 6047736	5-2016-170	<u> </u>	Developer.	J Capotrio/	F Verduzco)	_Date:	5/1/19	<u> </u>
WELL/PIE	ZOMETER DAT	TA .								
Well 💢		Piezomete	er 🗆		Diameter _	צ"		Material:	Sched 40 PV	c
Measuring	Point Description	on	TOC			Geology a	t Screen Int	terval		
Depth to T	op of Screen (ft	.)	35		9					
•	ottom of Screen	(ft.)						Measurement	6940	
Total Well				45	•		Purge Volu		19.4-28	
Depth to S	tatic Water Leve	el (ft.)		6.54	•	Disposal N		Poly IDW Tar		
			2.8		. \square	Wellhead			N/A	
Original W	ell Developmen	ı 💢		Redevelopmer	ıt 🔲	Date of Or	iginal Deve	lopment		
DEVELOP	MENT METHO	D	Steel Ba	ail/ Surge Block		PURGE M	ETHOD	Submersible	Pump	
Field Testi	ng Equipment U	sed:		Mal	ke	Mo	odel	Serial	Number	
				Horiba			U-52		P1MTDYFE	_
Field Testi	ng Calibration D	ocumentati	ion Foun	d in Field Noteb	ook#	1	_ Page #			
	Volume			Spec. Cond	Turbidity					Water
Time	Removed (gal)	T° (C/F)	рН	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
loss	5					3.89	85	None	Brown	38.60
1)00	२०	19,25	7.59	4.09	45.6	2.53	66	n	Clear	11
lios	35	18.81	7.56	4,13	8.4	1.86	66	41	H_{ij}	38.65
1110	50	14.92	7.44	4.13	4.9	1.49	65	4)	i)	<i>1</i> 1
ms	65	14.49	7.45	4.13	3.2	1.51	65	p)	p)	*1
1,50	80	18,93	7.44	4.14	1.0	1.47	65	θ	11	11
Can	dete									
						22				
										:
					3/1/	4				
							,		9 2 00	
Min. Purge Maximum ⁻ Stabilizatio pH +-0.1 temp 1 deg	-	orehole vo	lumes)	<u>19,4</u> gallons	Has require Have parar	ed volume be ed turbidity b meters stabil NA explain b	een reache lized	a 🔼 🗀	N/A 	if there is sufficient recharge but not over 4 hrs
all others 1)				.17	al I
Pump Set	@ <u>~54 ft</u>			Purge Rate @	3 GPW	-	Developm	ent Complete	1/40 4	Ugal
Time				ater Level		Depth			ments	
4164		built		CU	55		Screen =	3555		
0940		Tive		.54 .56	55.6 55.8		1 0-1-	omayad		
1010-10		t bail		,54	55.40		/ Gall	emoved		
1030-10		ırge 1 bail		60	22.7		2 Gala	emoved		-
,000,0	2111	//			* * * * *		, C Garr) /	
Signature	1/1	12					Date:	5/1	19	



Well/Piez. ID: NERT 3.63SI

Client:	NDEP			Site Location:	LV Wash					
Project No	6047736	5-2016-170	<u> </u>	Developer:	J Capotrio/	F Verduzco		Date:	5/1	/19
WELL/PIE	ZOMETER DAT	A								
Well 🔯		Piezomete	er 🗀		Diameter _	4"		Material:	Sched 40 PVC	
_	Point Description		TOC		•	Geology at	Screen Int	erval		
•	op of Screen (ft									
•	ottom of Screen	(ft.)	35		•			/leasurement	1230	
Total Well			35.				Purge Volui		75.5-10	8
Depth to S	tatic Water Leve	el (ft.)	18.	44	•	Disposal M		Poly IDW Tar		
O 3 - 3 13 A 4	(-# D -		10:74	5 - 1 1	. \Box	Wellhead I			N/A	
Original Well Development				Redevelopmer	nt 📙	Date of Or	iginal Deve	iopment		
DEVELOP	MENT METHO	ס	Steel Ba	ail/ Surge Block	•	PURGE M	ETHOD	Submersible	Pump	
Field Testi	ng Equipment U	sed:		Mak	:e	Mo	odel	Serial	Number	
				Horiba			U-52		P1MTDYFE	
Field Testi	ng Calibration D	ocumentat	ion Foun	d in Field Notet	ook #	/	_ Page #	**		
	Volume			Spec. Cond	Turbidity		ĺ	ľ .		Water
Time	Removed (gal)	T° (C/F)	pH	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
1335	12	20.94	7,84	3.82	> 999	5.75	100	None	Brewn	19.45
1355	72	14.2	7.56	3.84	153	3.55	151	- 11	Char	14.50
12103	102	14.31	7,46	3.87	24.7	1.73	149	11	F1	11
14110	117	18.48	7.39	3.87	8.6	1,44	151	11		11
1415	132	14.43	2.41	3.94	8.0	1.47	149	27	21	11
14120	147	14.42	7.41	3.97	8.4	1.48	149	pt	il	11
lon	dete									
	ľ					10				
						2				
					5/	13				
									,	
Min, Purge Maximum ¹ Stabilizatio pH +-0,1 temp 1 dec	A	orehole vo	lumes)	<u>7<</u> gallons	Have paran	ed volume be ed turbidity b neters stabil I/A explain b	een reache lized		N/A	if there is sufficient recharge but not over 4 hrs
all others 1	10%									
Pump Set	@ <u>~34</u> ft	,		Purge Rate @	3 GPM	-	Developm	ent Complete	1420	14/150/
Time			W	ater Level		Depth			ments	
		built		55%	36		Screen =	15-35		
1236		rive	T	.45	34,3		101			
1240-12		bail	11	.49	35.05		7, Gal r	emoved		
				.45	34.90		2 0 0 -1	ادعريم		
131-1	<u>500 200</u>	d bail	/3	1.45	35.0		2.5 Gal r		4	
Signature		7		1			Date:	5/	1/19	

Well/Piez. ID: NERT 3.955/

	NDEP 60477365-20			Location: _	LVL	Developer:	J CAN	OTRIO		4
ct No:	60477365-20	10-171 000								
L/PIEZOÑ	METER DATA			Die	ameter 4"		М	aterial 🏂	1 40 PV	'o
ı 🔯	Pie	zometer [3	Dis		Geology at S				
asuring Poi	int Description	-	TOC	((if known)				
pth to Top	of Screen (ft.)	_	15				11 840		7. 1	0934
oth to Botto	om of Screen (f	t.)	35			Time of Wal				12-161
· ital Well De		_	35	20_		Calculate Po		gal.)		
	ic Water Level	(ft.)	10	43		Disposal Me	ethod _		ank Ive	IVE.
shiii in aiar		ī	6-18			Wellhead P	ID/FID	NI	4	
	B	120	F	ledevelopmer	nt 🗆	Date of Orig	ginal Develo	pment _		81 4
	Development			- / surge		PURGE ME	THOD	Jup	mersible	punt
	ENT METHOD		beile		lake	Mo	del	Serial	Number	
ield Testing	g Equipment Us	sed:			ake ba	U-		PIMI	DYFE	_
						1 /	2#	X4		
Field Testin	g Calibration D	ocumentatio	n Foun	d in Field Note	ebook # Vor	where to	Page #	1	_	
1010				*	1/9/14 tales	THE CO			OCP Other	1/20
	Volume	T° (C/F)	На	Spec. Cond (umhos)	Turbidity (NTL	ls) DO	Color	Odor	43	10.56
	Removed (gal)	17.94	6.57	5.09	>999	4.21	Cleden	None	34	15.31
1005	-Seo 75	11-67	6.42	2.91	797	354	ricar	New	35	18.95
1035	NS	16.86	6.92	3.//	349	2.88	chan	ilm	34	19.32
	120	16.98	6.83	3.20	319		0/4	nhor	32	19.65
1105	135	17.01	6.93	3.19	292	2.96	Class	none	37	
1115		1702	6.42	3.17	299		Cita			
1125	1.50	17.0						+		
1130		 								
					40					
	 				4/9/1					
	ļ		-							
Min. Purg Maximum Stabilizat	ANCE CRITER ge Volume (7-16 n Turbidity Allow tion of paramete	ved w/A	Official) 117 gallo	Have param	l volume beel I turbidity bee eters stabilize A explain bel	2 0	Yes M 		if there is sufficient recharge but not 4 hrs
nH +-0.1					Develor	Con	dele	100		
temp 1 d	legree C				amon	0 -8	4 Jul	M	15 041	min
all others	s 10%			11	pung	Perte	15011		101	
		7	1/	1/1	>		Date:	4	19119	
Signatur	re	-	2	272	saur 15	35				
	built 1	20 10.36	TD	TO 3458	- 9890					
CIS		14 . IA LA		T U P 3 1133						
_ <u>CS</u>	zrive.	The West	071.10	5 10.	35.191	2500	Scot			
CIS CONTRACT	t Buil I	1470	0 21.15	1.0	35.19	****	15 600			

A=COM

Well/Piezometer Development Record

Well/Piez. ID:	-
NERT4.64NI	

Site Location: 1 V Week **NDEP** Client: Developer: J CAPOTRIO (1) MODRE 60477365-2018-171 Date: 4/10/19 Project No: WELL/PIEZOMETER DATA Material Sels 40 PMC Diameter Well 🔣 Piezometer TUC Geology at Screen Interval Measuring Point Description (if known) Depth to Top of Screen (ft.) Time of Water Level Measurement Depth to Bottom of Screen (ft.) Calculate Purge Volume (gal.) /02-/45 Total Well Depth (ft.) Rely IDEN Tenk transer Disposal Method Depth to Static Water Level (ft.) Wellhead PID/FID Redevelopment Original Well Development Date of Original Development submirable punt Stuel Brilow Suge block **DEVELOPMENT METHOD PURGE METHOD** Serial Number Field Testing Equipment Used Model PIMTOYFE 4-52 Field Testing Calibration Documentation Found in Field Notebook #__ Page # Und Volume Spec. Cond GRP **Turbidity (NTUs)** DO Color Odor Time Removed (gal) T° (C/F) (umhos) 23.31 2.7/ 4/29 3.27 -25 سے رسمار 18.06 23.31 2.71 -21 1525 18.27 7.04 Name 23.31 6.98 1530 100 14.29 2.71 Var 233/ 1535 10.9 -19 125 18,33 6.95 2,71 406 NOND 23.31 -18 14.34 1.94 2.71 1840 100 10.1 1.06 work 1545 2.71 10.2 **ACCEPTANCE CRITERIA (from workplan)** Min. Purge Volume (7-10 borehole volumes) 22 gallon: Has required volume been removed if there is sufficient Maximum Turbidity Allowed MA NTUs Has required turbidity been reached recharge but not over Stabilization of parameters 10% Have parameters stabilized If no or N/A explain below: pH +-0.1 temp 1 degree C all others 10% Date: Signature ... 00 23.03:47.5 HOC 23.03. 1400 Arrive TO=4543, 12, gal 146e 21.11 140 C 2305 Raw 2 - Hour 23:32 TO= 45.45 /2 gg/

Well/Piez. ID:	_
NERTY.6451	

Client	NDEP			Site Location	LV u	Vach				
Project No	6047736	5- <u>2018-171</u>	Date:	4/8/19		Develope	50	PETRI	0/0	Moore
WELL/PIE	ZOMETER DA	ГА								
Well 🔀		Piezomete	r 🔲		Diameter	_		Material	Sed 40	AC
Measuring	Point Descripti	on	1	ie			ıt Screen Int	erval		
Depth to T	op of Screen (fi)	34			(if known)				
Depth to B	lottom of Screer	n (ft.)	33	-		Time of W	/ater Level N	/leasuremo	ent	1310
Total Well	Depth (ft.)		_2	.48		Calculate	Purge Volur	ne (gal.)		129-184
Depth to S	tatic Water Lev	el (ft.)	27	7.01		Disposal A	Method	Pol,	TOW TO	Emle trader
						Wellhead	PID/FID		1A	
Original W	/ell Developmer	nt 🖟		Redevelopm	ent 🔲	Date of Or	riginal Deve	opment		
DEVELOP	MENT METHO	D 5/4		11/5 mag		PURGE M			service to	pump
Field Testi	ing Equipment l						odel		al Number	
	ang Equipment			Itarih	4		-52		TOYFE	
Field Testi	ng Calibration E		ion Four	ms/cm Spec. Cond		on Cent	Page # !	/		The.
Time	Removed (gal)		pH	(umhos)	Turbidity (NTUs)		Color	Odor	-Other	- level
143cc 1450	118	18.71	6.92	5.63 5.69	>999 43.2	11.01	Brown ter	Nun	143	27.04
1455	140.5	19.01	6.92	5.76	46.7	4.48	Chur	m	131	2703
1500	163	18/71	6.92	5.70	445	4.33	clew	dona	130	27.03
1505		4/1			,					\dashv
	9	KI		- 62	167					
		. 277.		Itali						
					- 16C-1					_
	<u></u>				14/			-		-
							1			
Min. Purge Maximum	Turbidity Allowe on of parameters gree C	borehole vo	rkplan) rlumes) rUs	129 gallon	Has required volumes required turb Has required turb Have parameters If no or N/A ex	oidity been stabilized	reached		No N/A	if there is sufficient recharge but not over 4 hrs
		1/4	1	1	, ,	74		- 1	, ,	
Signature	4/1	11/1	SI		_		Date:	4/1	7/19	-
- /	30 As his	e 27.01	7	55,01	55 , Same	34.5	sr.r	Flor	n Rate =	4. Kgallmin
5-1330	Peat Suree	7	20e2		55.48	B gal		_		
-1415	Post Beil	7 Ho		109, TD	55.48 1	Sal				

Well/Piez. ID: NERTY-USIA

Client	NDEP		-	Site Location:	LV vvasn					
Project No	: 6047736	5-2016-170	<u>)</u>	Developer:	J Capotrio/	F Verduzco		Date:	5/2/1	7
WELL/PIE	ZOMETER DAT	ГА								
Well 🛣		Piezomete	er 🗆		Diameter _	Z"_		Material:	Sched 40 PV	<u>c</u>
Measuring	Point Description	on	TOC		_	Geology at	Screen Int	erval		
Depth to T	op of Screen (ft	.)	3	~						
•	ottom of Screer	ı (ft.)	5	5		Time of Wa	ater Level N	/leasurement		
Total Well			55	.65	- C	Calculate F	ourge Volur	ne (gal.)	37.4-4	162
Depth to S	tatic Water Lev	el (ft.)		6.75	-			Poly IDW Tar		
<u>~</u>			4.62		_	Wellhead I			N/A	
Original W	'ell Developmen	t 🗷		Redevelopmer	nt 📙	Date of Ori	iginal Devel	lopment		
DEVELOP	MENT METHO	D	Steel Ba	ail/ Surge Block	<u> </u>	PURGE M	ETHOD	Submersible	Pump	
Field Testi	ng Equipment L	Jsed:		Mal	ke	Mo	odel	Serial	Number	
				Horiba		U-52			P1MTDYFE	_
Field Testi	ng Calibration D	ocumentat	ion Foun	d in Field Notel	ook#	- 1/2000 1 1 a	Page # _			
	Volume			Spec. Cond	Turbidity					Water
Time	Removed (gal)	T° (C/F)	pН	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
1225	5	22.13	7.32	5.22	333	347	121	None	Cloude	26.90
1235	40	20.52	7.12	5.7/	3.4	2.05	144	11	Oleer	26.85
1240	57.5	19.81	7.05	5.34	0.6	1.98	1441	21	11	17
124	75	19.21	7.04	5.38	0.0	1.94	147	11	11	11
1750	92.5	19.25	2.04		0,0	1.99	147	11	21	11
Cem	Note -									
1. 0					11				İ	
					5/3/1					
	,				707				Ì	
ACCEPTA	NCE CRITERIA	(from wo	kplan)					Yes No	N/A	if there is sufficient
-	Volume (7-10		-	32.4 gallons	•			_ = _	. <u></u>	recharge
	Turbidity Allowe	and a facility of the street of the same	ΓUs		Has require	-			!	but not
	on of parameters	s 10%			Have param				. 🗆	over 4 hrs
pH +-0.1	_				If no or N	/A explain t	elow:			
temp 1 deg	-									
all others 1	10%								F-22-4-0-2	V A
Pump Set @ ft Purge Ra				Purge Rate @	J. TGPM		Developme	ent Complete	1250 9	2.5 50
Time			W	ater Level	Total I	Depth		Com	ments	
As built -			55		Screen =	35-55				
		rrive	7.6.75 55.55							
1135-110		t bail		.96	554C / Gal removed					
1145-17		urge		.98	55.10		/ * # 35			
					55.6	•	Gal r	emoved		
6 1	-	1	-				0-4-	- 1	110	

Well/Piez. ID: WELT 4.64SIB

Client: NDEP				Site Location:	LV Wash					
Project No	6047736	5-2016-170	<u>)</u>	Developer,	J Capotrio/	F Verduzco		Date	5/2/19	
WELL/PIE	ZOMETER DAT	Α								
Well 🛭	•	Piezomete	er 🗆		Diameter _	2"		Material:	Sched 40 PV	3
_	Point Description		TOC		_	Geology a	t Screen Int	erval		
•	op of Screen (ft		35		<u> </u>			_		
•	ottom of Screen	(ft.)	35		-			Measurement	0740	1
Total Well		-1 /64 \	55.				Purge Volur		32-48.7	
Depin to S	tatic Water Levi	er (11.)	4.57	ا ما،	•	Disposal N Wellhead		Poly IDW Tai	N/A	
Original W	'ell Developmen	M	7.3 /	Redevelopme	nt 🔲			lopment		
DEVELOP	MENT METHO	D	Steel B	ail/ Surge Block		PURGE M	ETHOD	Submersible	Pump	
Field Testi	ng Equipment U	sed:		Mal	ke	Me	odel	Serial	Number	
				Horiba			U-52		P1MTDYFE	
Field Testi	ng Calibration D	ocumentat	ion Four	d in Field Notel	oook #	1	_ Page #			•
Time	Volume Removed (gal)	T° (C/F)	pH	Spec. Cond (umhos)	Turbidity (NTUs)	DO	ORP	Odor	Color	Water Level
0845	5	16.89	5.94	5.6/	360	4,40	227	None	Tenlling	55.2.26
0850	24.4	1768	6.64	5.40	24-1291	3.85	188	11	Clear	1'
0855	54.0	17.99	6.90	5.56	13-6136	3.43	152	"	"	11
0900	73.5	18.05	7.01	5.58	121	3.01	129	71	n	11
0905	93.0	16.27	7.04	5.56	120	3.26	121	11	11	"
0910	112.5	16.22	7.06	5.56	122	3.15	123	73	71	2)
leon	lete -									
7					1	1	····	Ì		
					=1			Ì	1	
					5/2/19					
Min. Purge Maximum [*] Stabilizatio pH +-0.1 temp 1 deg	•	orehole vo	lumes)	32 gallons	Has require Have paran	d turbidity b	een reache lized		N/A 	if there is sufficient recharge but not over 4 hrs
all others 1	10% @ ∢5 ∜ ft			Purge Rate @	3.9 GPM		Developme	ent Complete	0910	112501
					(100 tax	7				
			ater Level	Total	Depth	0		ments		
			27	55	<u> </u>	Screen =	11-72			
Arrive 26.6				54.5 55.2		Z Galr	emoved			
6767-085 1st bail 26.47 0806 -0826 surge 26.47					54.4		Gall	CHIOVEU		
0820-08		d bail	7	・・フィ	55.0		/ Gal r	emoved		
ショノローロュ										

Well/Piez. ID: NERT 4.64 S / C

Client	NDEP		Site Location:	LV Wash					. <u></u> .	
Project No	6047736	5-2016-170		Developer:	J Capotrio/	F Verduzco		_Date:	5/2/1	9
WELL/PIE	ZOMETER DAT	ГА								
Well 🖾		Piezomete	r 🗆		Diameter _	2"		Material:	Sched 40 PVC	<u> </u>
Measuring	Point Description	on	TOC			Geology at	Screen Int	erval		
	op of Screen (ft		_	35	2					
•	ottom of Screen	ı (ft.)		5				Measurement	0920	
Total Well				5.06			Purge Volur		314-44	9
				2017		Disposal N		Poly IDW Tar		
		_	1.49		. —	Wellhead			N/A	
Original W	ell Developmen	t 🗷		Redevelopmer	nt 🗀	Date of Or	iginal Devel	lopment		
DEVELOP	MENT METHO	D	Steel Ba	ail/ Surge Block	<u>:</u>	PURGE M	ETHOD	Submersible	Pump	
Field Testi	ng Equipment U	lsed:		Mal	(e	Мо	odel	Serial	Number	
				Horiba			U-52		P1MTDYFE	_
Field Testi	ng Calibration D	ocumentati	on Foun	d in Field Notel	ook #	/	_ Page #			_
	Volume			Spec. Cond	Turbidity				<u> </u>	Water
Time	Removed (gal)	T° (C/F)	pH	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
	Tremoved (gas)	20,41	7.3	5.43	7999	4.65	118		1	27,15
1040	35	19.71		5.34			140	None	Clear	11
070			7.21		73.7	2.62		21	n	"
1055	_ <i>5</i> o	18.96	7.11	5.40	87.3	2.27	133	11	11	11
1100	65	19.22	フル	5.34	83.1	z. 33	134		•	"
1105	80	19.05	プル	5.39	84,4	2.26	136			
Cem	Mete									
	<u> </u>				-6/0					
					5			ļ		
					101	5				
		•								
Min. Purge Maximum	NCE CRITERIA Volume (7-10 to Turbidity Allowe on of parameters	oorehole vo d <u>w/4</u> Ni	lumes)	3/4 gallons	Has require Has require Have param If no or N	d turbidity b	een reache lized	ed 🛂 🔲	N/A	if there is sufficient recharge but not over 4 hrs
all others 1	10%									
Pump Set	@ -54 ft			Purge Rate @	3 GPM	93	Developm	ent Complete	110x 8	0501
Time			W	ater Level	Total	Depth		Com	ments	
				55		Screen =	35-55			
			7.07	5417	2					
0930 - 0946 1st bail 27101				55.0	6	/ Galr	emoved			
			7.14	45.6	Ø	17.54				
1615 -1025 2nd bail 27,12					55.10		1_ Galr	emoved		
Signature		2/	-	1			Date:	5/3/	-	

Well/Piez. ID: WERT 4.44S1D

Client. NDEP		-	Site Location:	LV vvasn		 				
Project No:	6047736	5-2016-170	•	Developer	J Capotrio/	F Verduzco)	Date:	5/1/19	
WELL/PIE	ZOMETER DAT	Α								
Well 🔀		Piezomete	r 🗆		Diameter _			Material:	Sched 40 PV	С
Measuring	Point Description	on	TOC		_	Geology a	t Screen Inte	erval		
•	op of Screen (ft.	•	3<		•					
-	ottom of Screen	(ft.)	55					leasurement	1500	
Total Well I				76			Purge Volun		31.8-45.5	
Depth to St	tatic Water Leve	el (ft.)	36.1	8	•	Disposal N		Poly IDW Tai		
Original We	ell Development	×		Redevelopmer	nt 🔲	Wellhead PID/FID Date of Original Development			_N/A	
DEVELOP	MENT METHO	D	Steel Ba	ail/ Surge Block	_	PURGE M	ETHOD	Submersible	Pump	
Field Testir	ng Equipment U	lsed:		Mak	ке	Mo	odel	Serial	Number	
Field Testin	ng Calibration D	ocumentati		Horiba	ook#	,	Page # _		P1MTDYFE	_
Tield Testi		Cournement	T Carr				_ rage #_		1	1
***	Volume	TR (0/E)	l	Spec. Cond	Turbidity		000	٠,		Water
	Removed (gal)		pH	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
1620	5	21.77	7.93	5.48	2999	2.84	97	None	Brown	26.95
1625	21.5	19.88	7,64	5.69	167	2.37	90	//	Char	26.45
1630	38	19.76	7.52	5.74	29.2	1.87	97	"	11	26.80
1635	54.5	19.48	7.50	5.80	9.2	1.89	101			76.46
1640	71	19.28	7.46	5.85	4.8	1.92	103	"	11	26.75
1645	86.5	19.30	7,47	5.43	3,5	1.96	103	11	11	26.70
Con	mpleto					2				
	•									
			ļ		5/	1/4				\perp
					,	///				
Min, Purge Maximum 1	NCE CRITERIA Volume (7-10 t Furbidity Allower n of parameters	orehole vo	lumes)	37 gallons	Has require Have paran	d turbidity b	een reache lized	d 🔯 🗀	N/A	if there is sufficient recharge but not over 4 hrs
all others 1	0%									
Pump Set (@ <u>~54</u> ft			Purge Rate @	3.3 GPM	-	Developme	ent Complete	164K ~	87gcl
Time				ater Level		Depth		Com	ments	
	As	built	n	27	5.5		Screen =	35-85		
1500 Arrive 26.65					55,10					
	1s		.47	55.70		2 Gal re	emoved			
	SL		7-20	55.23						
k (687-	į 2nd	d bail	2	7.06	55.7	6	7 Galr	emoved		
Signature	1/1	hx	1				Date:	5/1/19	2	

Well/Piez. ID: NEET 4.65 N1

Client: NDEP			Site Location:	LV Wash						
Project No	o:6047736	5-2016-170	<u>)</u>	Developer:	J Capotrio/	F Verduzco	ı	Date:	5/3/19	
WELL/PIE	EZOMETER DAT	ΓΑ								
Well 🔼	Ľ	Piezomete	ег 🗆		Diameter _	LIN		Material:	Sched 40 PV	c
Measuring	Point Description	on	TOC		Geology at Screen Inte			erval		
	Top of Screen (ft	•	_ 2							
•	Bottom of Screen	ı (ft.)	44		•			/leasurement	0745	
	Depth (ft.)			70			Purge Volur		98-140	
Depth to Static Water Level (ft.)				1.11	-	Disposal M		Poly IDW Tar		
			17,0		. \Box	Wellhead I			N/A	
Original Well Development				Redevelopme	nt 📙	Date of Or	iginal Devel	opment		
DEVELOR	PMENT METHO	D	Steel Ba	ail/ Surge Block	<u>:</u>	PURGE M	ETHOD	Submersible	Pump	
Field Test	ing Equipment U	lsed:		Mal	ke	Мо	odel	Serial	Number	
				Horiba			U-52		P1MTDYFE	_
Field Test	ing Calibration D	ocumentat	ion Foun	d in Field Notel	ook #	Page #				_
	Volume			Spec. Cond	Turbidity					Water
Time	Removed (gal)	T° (C/F)	pH	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
US35	10	16.79	657	2.72	>999	3.33	15	None	Brown	24.25
0905	100	18.58	7.05	2.59	574	2.56	80	11	Clouds	24.20
0910	115	18.82	7.27	2.65	181	7.01	29	11	Clean	24.20
0915	130	18.88	7.36	2.62	136	1.71	18	71	of .	N
0920	145	18.95	7.36	2.64	94.2	1,78	15	11	متر	11
0925	160	19,01	7.36	2.63	106.3	1.72	16	11		i)
	white	77107	7.08	2.63	100,3	1.16	/6	-	<u> </u>	+
Cur	- July									
					53					
			-		9//	 				
					<u> </u>					If there is
ACCEPTA	NCE CRITERIA	(from wor	kplan)						N/A	sufficient
	e Volume (7-10 b			78 gallons						recharge
	Turbidity Allowe		ľUs		Has require					but not
	on of parameters	10%			Have paran			M	! Ш	over 4 hrs
pH +-0.1	_				if no or N	/A explain b	elow:			
temp 1 de	_									
all others	10%				- C				5.4834 LTS 55	. 1
Pump Set	@ - <u>44</u> ft	,		Purge Rate @	3 GPM	-	Developme	ent Complete	0925 /	60 gel
Time			W	ater Level	Total	Depth		Com	ments	
			24	1.21	47		Screen =	24-45		
Gruge Arrive 24			11	4K.66						
750 - 755 1st bail 24.			20	45.70	<u>, </u>	_ 3 Gal r	Gal removed			
755 - 814 surge 24.2				45.60						
<u> ₹15 − 82 5 2nd bail 24.7</u>			25	45.70		3 Galr	emoved	,		
Signature		71	/	1			Date:	5/2	10	

Well/Piez. ID: NERTY,70N1

Client: NDEP		Site Location:		LV Wash						
Project No	o:6047736	5-2016-170	<u>.</u>	Developer	J Capotrio/	F Verduzco)	Date:	5/2/19	7
WELL/PIE	ZOMETER DA	TA								
Well 🖬		Piezomete	r 🗀		Diameter _	4"		Material:	Sched 40 PVC	,
Measuring	Point Descripti	on	TOC			Geology at	t Screen Int	erval		
•	op of Screen (ft	,	25							
•	Bottom of Screer	n (ft:)	45			Time of W	ater Level N	/leasurement	1410	
	Depth (ft.)		20	45.24			Purge Volur		92.75-13	2.5
Depth to S	Static Water Lev		24	1.85		Disposal N		Poly IDW Tar	nk Trailor	
_			3.25		_	Wellhead I			N/A	
Original W	/ell Developmen	it 🔀		Redevelopmer	nt 📙	Date of Or	iginal Deve	lopment		
DEVELOR	MENT METHO	D	Steel Ba	ail/ Surge Block	_	PURGE M	ETHOD	Submersible	Pump	
Field Testi	ing Equipment L	Jsed:		Mak	(e	Мо	odel	Serial	Number	
	·			Horiba			U-52		P1MTDYFE	
Field Testi	ing Calibration E	Documentati	on Foun	d in Field Noteb	ook#	1	Page #		musica.	
l l	Volume			Spec. Cond	Turbidity					Water
Time	Removed (gal)	T° (C/F)	pН	(umhos)	(NTUs)	DO	ORP	Odor	Color	Level
1520	15	24.79	7.40	2.29	7999	4.25	-9	None	Brown	25.10
1550	105	22.22	7.38	1.42 2.19	2999	1.42	-51	None	Rounltan	26.40
1600	135	20.75	7.30	2.16	>999	1.30	-69	12	"	26.40
1610	165	20.18	7.18	2-18	577	1.05	-58	11	Cloudy	26.40
1615	180	20.32	7.13	7.20	132	0.93	-58	11	Clear	26,40
1620	195	20.04	7,13	7.20	62.7	0.76	-56	"	21	76,40
	210	19.98	7.12	2.17	20.6	0.89	-49	11	11	11
1625	7.40	19.94			22.3	0.94	-48	11	11	7)
1630			7,10	2.18	20.8			11	ام	//
1634	270	19.98	7.11	2.20	N	0.97	-47			
Clon	let				110					
			- X-030		TR/19					if there is
	NCE CRITERIA			PA-CON-			1000		N/A	sufficient
	Volume (7-10 l			92.75 gallons						recharge
	Turbidity Allowe		Us		Has require	•				but not
	on of parameters	s 10%			Have paran			F4 -	l []	over 4 hrs
pH +-0.1	0				It no or N	I/A explain b	elow:			
temp 1 deg all others 1	4.9									
				Purge Rate @	3 GPM	<u></u>	Developme	ent Complete	1635 2	70 gol
Time			W	ater Level	Total	Depth		Com	ments	
As built 27, %		7.47	56		Screen =	30-50				
1410 Arrive 24.45		43.0	, S		AND THE PERSON OF THE PERSON O					
1970 - 1430 1st bail 76.40			45.3	VÝ.	💪 Gal r	emoved				
1435-1455 surge 24.09				45.20			2018			
1455 1505 2nd bail 75.07					45.2	29	Galr ⊘	emoved		
Signature		11	11	7		Date:	1/2	13		

Well/Piez_ID:	
NERT 4.7/NI	

Client:	NDEP	<u> </u>		Site Location		wash					
Project No	60477365	-2018-171	Date	4/10/19		Developer	J	AROTE	210/10	MOORE	
WELL/PIE	ZOMETER DAT	Ά			· ·	,					
Well 🔀		Piezomete	r 🗆		Diameter			Material	Sehl 40 P	'VC	
Measuring	Point Description	on .	10	C			t Screen In	terval			
Depth to T	op of Screen (ft.	.)	25	5		(if known)					
Depth to B	lottom of Screen	(ft.)	45			Time of W	ater Level I	Measurem	ent	1130	
Total Well	Depth (ft.)		4/4	5.5		Calculate	Purge Volu	me (gal.)		80-115	
Depth to S	static Water Leve	el (ft.)	2	7.86		Disposal N	/lethod	Poly I	Dhy Temb	+rilor	
			11.4	フ		Wellhead	PID/FID	NH	9		
Original W	/ell Developmen	1 1		Redevelopm	ent 🔲	Date of Or	iginal Deve	lopment			
DEVELOF	MENT METHO	D 5th	1 Rid	- Surge	lune	PURGE M	ETHOD	Juline	wilk p	und	
Field Test	ing Equipment U				Make		odel	Şeri	al Number		
Sald Took	ine Coliberties 5	.	ion Fau	and in Field No.	tohook #		Page #	1		_	
rield Test	ing Calibration D	ocumenta	uon rou	no in Field No	(edook #/		rage #	Ь			
	Volume		١.,	Spec. Cond				0.1	off	120 VOI	•
Time	Removed (gal)	T° (C/F)	pH /-84	(umhos)	Turbidity (NTUs)	3.70	Brown	Odor	2-14	27.96	
1300	65	1857	1.97	2.11	41.9	1.76	Clan	New	-10	27.90	
1305	88	14.55	6.93	2.10	19.4	1.62	de	None	-16	77.90	
1320	105	14.56	1 4	2.10	18.7	0.99	Cler	whene	-16	27.90	
	_	14.56		2.10	14.8	0.97	1		-16	1294	
1315	125	74.16	6.79	0.10	/50.8	7.7	Cen	Noc	-16		
			-		-3.			1			
-	 				4/1/2/10			+	<u> </u>		
			-		1/10/19						
Min. Purg Maximum Stabilizati pH +-0.1 temp 1 de	Turbidity Allower on of parameters egree C	borehole ve	olumes)	S gallon	Has required vol Has required turk Have parameters If no or N/A ex	bidity been s stabilized	reached	Yes 🖂	No N/A	if there is su recharge bu 4 hrs	
all others	10%			1	Purce Rate	9 80/	/min	770	-		
		1	11	1	Development	Cample	a - 15	4.1	1.10		
Signature		111	3				Date:	4//	0117		
A R	with 4	40 27	87	TDE 4	75 Screen	25-45	_				-
1130	SO Rot R	11/20	400	7787 -00	4862 12 00/			_			-
1855 - 12	20 Peat Sm.	e -	The P.	2792 70	= 4815 47	54					
1285- 12	To Post Re	WZ-	Thee	U290 / TL	= 45,4	12 gal					
				,		-					

AAI-II/E	ion ID:
ivveli/#	lez. ID:
AIL	リサレ ノノミフ
IJUE	
NE	iez. ID: 2 <i>T4-7/S</i> Z

Client:	NDEP		_	Site Location	: LV L	rech				
Project No	6047736	<u>5-2018-171</u>	Date:	4/8/19			JCAR	CTRIC	10 M	WRE_
WELL/PIE	ZOMETER DAT	TA								
Well 🔀		Piezomete	er 🔲		Diameter <u>4"</u>			Material _	Sell 401	NC.
Measuring	Point Description	on	10	×			t Screen Int	erval		
Depth to T	op of Screen (ft	t.)	34	15		(if known)				
Depth to B	Bottom of Screer	n (ft.)	54	1.5		Time of W	ater Level N	/leasurem	ent	1000
Total Well	Depth (ft.)		_5	5		Calculate	Purge Volur	ne (gal.)		123-177
Depth to S	Static Water Lev	el (ft.)	1	7.51		Disposal N	/lethod	Bly I	DW Tank	trenter.
						Wellhead	PID/FID	_N	/A	
Original W	/ell Developmen	nt 🔀		Redevelopm	ent 🔲	Date of Or	riginal Devel	opment		
DEVELOR	PMENT METHO	D JA	al Bai	1/ Surge	block	PURGE M	ETHOD	Tubm	with pe	me
Field Test	ing Equipment L	Jsed:		Uhrid	Make	U S	odel	Seria	al Number	
								,		⊇′
Field Test	ing Calibration E	Documentat	tion Four	nd in Field No	tebook # Vend	Cert	Page #	/	_	
	Volume			Spec. Cond					ORP	1/20,
//30	Removed (gal)	T° (C/F)	pH 6.68	(umhos) 5.65	Turbidity (NTUs)	5.33	Brown/fe-	Odor	J IO	1evel 2735
1145	49	1901	7,01	5.02	724	2.94	Char	1	58	27:34
1200	114	18.93	7.00	5.02	453	2.4/	1		62	22.35
1245	129	18.99	7.00	5.03	274	2.53			67	27.35
1210	144	18.98	6.99	5.03	196	2.34	1		67	27.38
1215	159	18.97	6.98	5.03	167	2.29	1	L	67	27,30
1220	174	18.96	6.98	5.03	158	2.26	1	1	67	27.35
1225	189 .	18.97	6.94	5.03	149	z.23	<u> </u>	4-	67	27.36
				2						4
			3	10%						-
			-	19/19						
Min. Purge Maximum Stabilization pH +-0.1 temp 1 de	Turbidity Allowers on of parameters gree C	borehole vo	olumes)	/23 gallon	Has required volutions required turb Has required turb Have parameters If no or N/A ex	oidity been s stabilized	reached	Yes O	hlue	if there is sufficient recharge but not over 4 hrs
all others	10%			2	0 + -	7 ,/		/		1 1 1 1 1 1 1
		. 11	//		_ Rule =	Sgall	איר	/	, ,	
Signature	1	by	5/	7			Date:	4	19/18	
1	built 1	400	27.2	6 1n-	55 Fre	m 34,5	545			
915- Km	Por Band	HUP S	2/2	1027.)			17. 94/	R.		
1005	Post Bail	1600	27.5		4.64	12	92/			
5-1055	Post Surel	1200	P 22.4				0			
1100	Pest Bail	2 14	CPE	750 1	= 54.63	12	gal			

Appendix F

Soil Property Lab Reports



Physical Properties Data

Petroleum Services

Core Lab File No.: 1901575

Project Name: NERT Phase 3 Modification 6

Project Number : 1690011200-050

Ramboll US Corporation

		METHODS:			ASTM D2937	API RP40		Walkley-Black	
				Moisture			osity	Total Organic	Fractional
Sample	Depth	Sample ¹		tent	Density	Total ²	Air Filled ³	Carbon	Organic Carbon
ID.	ft.	Orientation	%	ml/ml	g/cc	%Vb ⁴	%Vb ⁴	mg/kg	g/g
PT-NERT3.60S1-68.2-68.5	68.2-68.5	V	16.9	0.314	1.86	31.6	0.171	15200	1.52E-02
PT-NERT3.60S1-86.0-86.3	86.0-86.3	V	14.9	0.291	1.95	29.1	0.015	23800	2.38E-02
PT-NERT3.58S1-60.0-60.3	60.0-63.3		6.58	0.122	1.86	30.6	18.4	7000	7.00E-03
PT-NERT4.71S2-29.7-30.0	29.7-30.0	V	23.0	0.394	1.66	38.2	0.035	4900	4.90E-03
PT-NERT3.98S1-9.7-10.0	9.7-10.0	V	11.2	0.224	2.00	25.1	2.66	10700	1.07E-02
PT-NERT3.98S1-17.0-17.3	17.0-17.3	V	11.7	0.225	1.92	27.8	5.25	6200	6.20E-03
PT-NERT4.64N1-37.0-37.3	37.0-37.3	V	18.0	0.322	1.79	33.7	1.47	11100	1.11E-02
PT-NERT4.64N1-68.0-68.3	68.0-68.3	V	11.9	0.239	2.02	25.5	1.57	7600	7.60E-03
PT-NERT4.71N1-58.5-59.0	58.5-59.0	V	32.3	0.468	1.44	46.7	0.023	8400	8.40E-03
PT-NERT3.60N1-26.0-26.4	26.0-26.4	V	28.8	0.435	1.51	43.6	0.038	23400	2.34E-02
PT-NERT3.60N1-42.3-42.5	42.3-42.5	V	15.6	0.281	1.80	34.1	5.97	7100	7.10E-03
PT-NERT-4.65N1-53.0-53.3	53.0-53.3	V	34.9	0.485	1.39	48.6	0.086	10200	1.02E-02
PT-NERT3.40S1-47.0-47.3	47.0-47.3	V	10.1	0.207	2.05	23.7	2.99	5000	5.00E-03
PT-NERT3.63S1-49.0-49.4	49.0-49.4	V	22.7	0.379	1.67	39.1	1.13	7100	7.10E-03

⁽¹⁾ Sample Orientation: H = horizontal; V = vertical; (--) = Sample received as loose grains in a bag.

⁽²⁾ Total Porosity = no pore fluids in place; all interconnected pore channels.

⁽³⁾ Air Filled Porosity= pore channels not occupied by pore fluids.

⁽⁴⁾ Vb = Bulk Volume, cc.



ATTERBERG LIMITS AND SOIL CLASSIFICATION DATA

PETROLEUM SERVICES

Core Lab File No.: 1901575

Ramboll US Corporation

Project Name : NERT Phase 3 Modification 6 Project Number : 1690011200-050

	METHODS:		ASTM D4318		ASTM D4318	ASTM D2487	USDA
			Atterberg Limits	1	USCS / Plasticity	USCS	USDA/SCS ²
Sample	Depth,	Liquid Limit	Plastic Limit	Plasticity Index	Chart Symbol	Classification	Soil Texture
ID	ft.	LL	PL	PI	(Fines: <#40 Sieve)	Group Symbol: Name	Scheme
PT-NERT3.60S1-68.2-68.5	68.2-68.5	32	20	12	CL	Lean Clay	Silty Clay Loam
PT-NERT3.60S1-86.0-86.3	86.0-86.3	27	16	11	CL	Lean Clay	Silty Clay Loam
PT-NERT3.58S1-60.0-60.3	60.0-60.3	31	16	15	CL	Lean Clay with Sand	Silt Loam
PT-NERT4.71S2-29.7-30.0	29.7-30.0	24	15	9	CL	Sandy Lean Clay	Loam
PT-NERT3.98S1-9.7-10.0	9.7-10.0	17	14	3	ML	Sandy Silt	Loam
PT-NERT3.98S1-17.0-17.3	17.0-17.3	15	13	2	ML	SM: Silty Sand	Sandy Loam
PT-NERT4.64N1-37.0-37.3	37.0-37.3	30	18	12	CL	Lean Clay	Silty Clay Loam
PT-NERT4.64N1-68.0-68.3	68.0-68.3	36	17	19	CL	Sandy Lean Clay	Loam
PT-NERT4.71N1-58.5-59.0	58.5-59.0	43	22	21	CL	Lean Clay	Silty Clay
PT-NERT3.60N1-26.0-26.4	26.0-26.4	34	23	11	CL	Lean Clay with Sand	Silty Clay Loam
PT-NERT3.60N1-42.3-42.5	42.3-42.5	31	16	15	CL	Lean Clay	Silty Clay Loam
PT-NERT-4.65N1-53.0-53.3	53.0-53.3	51	20	31	СН	Fat Clay with Sand	Silt Loam
PT-NERT3.40S1-47.0-47.3	47.0-47.3	16	14	2	ML	SM: Silty Sand	Loam
PT-NERT3.63S1-49.0-49.4	49.0-49.4	38	21	17	CL	Lean Clay	Silty Clay

USCS: Unified Soil Classification System USDA: US Department of Agriculture SCS: Soil Conservation Service

⁽¹⁾ Silt assumed as fine fraction for NON-PLASTIC (NP) samples.

⁽²⁾ Sand considered to be >No. 200 sieve for USDA SOIL TEXTURE SCHEME.



SIEVE and LASER PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422/D4464M)

Petroleum Services

CL File No.: 1901575

Company: Ramboll US Corporation Project Name: NERT Phase 3 MOD 6

Date: 8/29/2019

Project Number: 1690011200-050

	Grain Size	Median				nent Perce	ntages		
	Description**	Grain Size,			Sand Sized				Silt &
Depth (ft)	(Mean from Trask)	mm	Gravel	Coarse	Medium	Fine	Silt	Clay	Clay
Nert 3.60 S1-68.2-68.5	Silt	0.0103	0.00	0.00	0.03	7.18	57.14	35.65	92.79
									
Nert 3.60 S1-86.0-86.3	Silt	0.0120	0.00	0.00	0.00	7.90	56.97	35.13	92.10
Nert 3.58 S1-60.0-60.3	Silt	0.0237	0.00	0.00	0.16	23.93	50.72	25.19	75.91
Nert 3.56 S1-60.0-60.3	SIIL	0.0237	0.00	0.00	0.16	23.93	50.72	25.19	75.91
Nert 4.71S2-29.7-30.0	Fine Grain Sand	0.0456	0.00	1.64	16.95	24.25	40.08	17.09	57.17
11011 4.7 102 20.7 00.0	Tine Oralli Gana	0.0400	0.00	1.04	10.00	27.20	40.00	17.00	07.17
Nert3.98S1-9.7-10.0	Silt	0.0366	0.00	0.00	2.62	31.67	45.87	19.84	65.71
Nert3.98S1-17.0-17.3	Fine Grain Sand	0.0891	0.00	0.00	2.96	50.54	28.21	18.29	46.50
Nert4.64N1-37.0-37.3	Silt	0.0125	0.00	0.00	0.82	6.18	65.20	27.80	93.00
									
Nert4.64N1-68.0-68.3	Silt	0.0313	0.00	0.00	5.99	24.98	47.92	21.10	69.02
Nert4.71N1-58.5-59.0	Silt	0.0075	0.00	0.00	0.00	1.05	EC 02	44.00	00.05
Nett4.7 IN 1-56.5-59.0	SIIL	0.0075	0.00	0.00	0.00	1.95	56.83	41.22	98.05
Nert3.60N1-26.0-26.4	Silt	0.0095	0.00	0.00	0.00	19.46	42.76	37.78	80.54
110110.00111 20.0 20.4	Ont	0.0000	0.00	0.00	0.00	10.40	72.70	07.70	00.04
Nert3.60N1-42.3-42.5	Silt	0.0093	0.00	0.00	0.00	6.20	55.22	38.58	93.80
Nert4.65N1-53.0-53.3	Silt	0.0149	0.00	0.00	2.15	18.14	52.99	26.73	79.71
Nert3.40S1-47.0-47.3	Fine Grain Sand	0.0747	0.00	2.48	14.14	33.47	28.28	21.63	49.91
Nert3.63S1-49.0-49.4	Silt	0.0047	0.00	0.00	0.00	1.41	43.52	55.07	98.59

^{**}USCS Scale



SIEVE and LASER PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422/D4464M)

Petroleum Services

Company: Ramboll US Corporation Project Name: NERT Phase 3 MOD 6 Project Number: 1690011200-050 CL File No.: 1901575

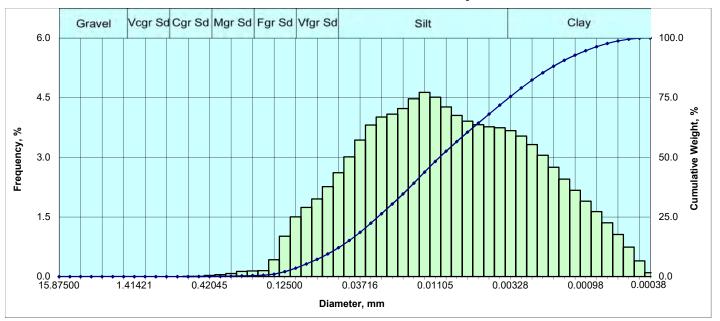
Date: 8/29/2019

	Grain Size	Median Component Percentages * Grain Size, Sand Size						1			
Depth (ft)	Description** (Mean from Folk)	Grain Size, mm	Gravel	VCoarse	Coarse	Sand Size Medium	Fine	VFine	Silt	Clay	Silt & Clay
Бериі (іі)	(Mean Hom Fork)	111111	Glavei	V Coarse	Coarse	Medium	TITIE	VIIIIC	Oilt	Clay	Clay
Nert 3.60 S1-68.2-68.5	Silt	0.0103	0.00	0.00	0.00	0.28	1.73	7.46	62.39	28.14	90.53
Nert 3.60 S1-86.0-86.3	Silt	0.0120	0.00	0.00	0.00	0.00	1.51	9.74	59.97	28.78	88.75
Nert 3.58 S1-60.0-60.3	Silt	0.0237	0.00	0.00	0.02	2.32	10.00	15.64	51.97	20.05	72.02
Nert 4.71S2-29.7-30.0	Silt	0.0456	1.64	5.14	9.06	11.08	8.67	9.76	41.56	13.09	54.65
Nert3.98S1-9.7-10.0	Silt	0.0366	0.00	0.26	1.58	5.37	13.26	18.12	45.67	15.74	61.41
Nert3.98S1-17.0-17.3	Silt	0.0891	0.00	1.60	0.70	11.08	26.96	15.81	29.18	14.67	43.85
Nert4.64N1-37.0-37.3	Silt	0.0125	0.00	0.00	0.65	0.85	1.19	6.61	70.35	20.35	90.70
Nert4.64N1-68.0-68.3	Silt	0.0313	0.00	2.07	3.03	5.05	9.89	14.74	49.03	16.19	65.22
Nert4.71N1-58.5-59.0	Silt	0.0075	0.00	0.00	0.00	0.00	0.33	2.50	65.85	31.33	97.17
Nert3.60N1-26.0-26.4	Silt	0.0095	0.00	0.00	0.00	1.30	10.75	9.17	49.35	29.42	78.78
Nert3.60N1-42.3-42.5	Silt	0.0093	0.00	0.00	0.00	0.00	0.87	7.86	60.19	31.08	91.27
Nert4.65N1-53.0-53.3	Silt	0.0149	0.00	0.47	0.92	4.82	7.87	8.06	57.63	20.24	77.88
Nert3.40S1-47.0-47.3	Silt	0.0747	2.48	6.61	6.13	8.01	14.79	15.09	29.05	17.85	46.90
Nert3.63S1-49.0-49.4	Silt	0.0047	0.00	0.00	0.00	0.00	0.21	1.80	53.78	44.21	97.99

^{**}Wentworth Scale



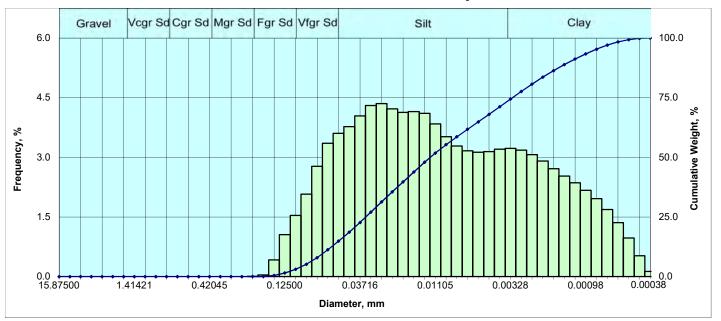
CL File No.: 1901575 Depth (ft): Nert 3.60 S1-68.2-68.5



		Particl	e Size Distrib	ution			Sor	ting Statistics	s (Folk)	
	7110 March 3		neter			tht %	Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[•]	[Incl.]	[Cum.]				
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9.50000 4.75000	-3.25 -2.25	0.000	0.00				
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0004	0.0004	0.0004
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0103	0.0103	0.0103
	10	0.092913	2.00000	-1.00	0.000	0.00	(''''')	0.0103	0.0103	0.0103
	12	0.066212	1.68179	-0.75	0.000	0.00	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.000	0.00				
Sand	16	0.046819 0.039370	1.18921	-0.25	0.000	0.00	(in)	0.0006	0.0004	0.0004
	1 <u>8</u> 20	0.039370	1.00000 0.84090	0.00 0.25	0.000 0.000	0.00 0.00	(mm)	0.0157	0.0095	0.0098
Coarse	25 25	0.027839	0.70711	0.50	0.000	0.00	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0.0137	0.0093	0.0096
Sand	30	0.023410 0.019685	0.59460	0.75	0.000	0.00	Sorting		Very poor	
	35 40	0.019685	0.70711 0.59460 0.50000 0.42045	1.00 1.25	0.004 0.027	0.00 0.03				
Medium	40 45	0.016553 0.013919	0.42045 0.35355	1.25 1.50	0.027 0.049	0.03 0.08		2.878	2.157	2.076
Sand	50	0.013919	0.33333	1.75	0.077	0.16	Skewness	l N	ear symmetric	al
Guna	60 70	0.009843	0.25000	2.00 2.25	0.130 0.140	0.29			our cymmouric	,ui
	70	0.008277	0.21022	2.25	0.140	0.29 0.43		0.939	0.072	0.052
Fine	80	0.006960	0.17678	2.50	0.149	0.57	Kt ! -			
Sand	100 120	0.005852 0.004921	0.14865	2.75 3.00	0.423 1.015	1.00	Kurtosis		Platykurtic	
	140	0.004321	0.12500 0.10511	3.25	1.503	2.01 3.52	1 1	0.208	0.525	0.884
V. Fine	170	0.003480	0.08839	3.50	1.741	5.26		0.200	0.020	0.00
Sand	200	0.002926	0.07433	3.75	1.952	7.21		mponent Perce		
	230	0.002461 0.002069	0.06250	4.00	2.263	9.47 12.09	Gravel Sand	Silt	Clay	Silt + Clay
	270 325	0.002069	0.05256	4.25 4.50	2.614	12.09 15.10	0.00 9.47	62.39	28.14	90.53
	325 400	0.001463	0.04419 0.03716	4.50 4.75	3.014 3.436	18.54	0.00	02.00	20.14	00.00
Silt	450	0.001230	0.03125	5.00	3.814	22.35		_		
J. C.II.	500 635	0.001035 0.000870	0.03125 0.02628 0.02210	5.00 5.25 5.50	4.015 4.086	15.10 15.10 18.54 22.35 26.36 30.45	Percentile [Weight, %]	[in.]	article Diamet	er [phi]
	000	0.000732	0.01858	5.75	4.226	34.68 39.15		1	,,,,,,	i joini
		0.000615	0.01858 0.01562	5.75 6.00	4.226 4.473	39.15	5	0.0036	0.0909	3.4603
		0.000517	0.01314	6.25	4.634	43.78	10	0.0024	0.0605	4.0471
		0.000435 0.000366	0.01103	6.50 6.75	4.512 4.270	52.57	10	0.0024	0.0003	4.0471
		0.000308	0.00781	7.00 7.25	4.056 3.908	43.78 48.30 52.57 56.62 60.53	16	0.0017	0.0424	4.5614
		0.000259	0.01105 0.00929 0.00781 0.00657 0.00552	7.25 7.50	3.908	60.53	25	0.0011	0.0000	E 1601
		0.000217 0.000183	0.00552	7.75	3.769	64.35 68.12	25	0.0011	0.0280	5.1601
		0.000154	0.00465 0.00391	8.00	3.819 3.769 3.745	71.86	40	0.0006	0.0152	6.0427
		0.000129	0.00328 0.00276	8.25 8.50	3.673 3.534 3.321 3.053 2.752	75.54 79.07	F0	0.0004	0.0102	6 5046
1		0.000109	0.00276	o.50 8 75	3.334	79.07 82.39	50	0.0004	0.0103	6.5946
Clay		0.000091 0.000077	0.00232 0.00195 0.00164	8.75 9.00 9.25	3.053	85.45 88.20	70	0.0002	0.0043	7.8701
Ciay		0.000065	0.00164	9.25	2.752	88.20		0.0004	0.0004	0.0400
		0.000054 0.000046	0.00138 0.00116	9.50 9.75 10.00	2.452 2.171	90.65 92.82	75	0.0001	0.0034	8.2106
		0.000038	0.00098	10.00	1.897	94.72	84	0.0001	0.0021	8.8762
		0.000032	0.00098 0.00082 0.00069	10.25 10.50	1.635	92.82 94.72 96.35 97.71				
		0.000027 0.000023	0.00069	10.50 10.75	1.355	97.71 98.77	90	0.0001	0.0015	9.4294
		0.000023	0.00058 0.00049 0.00041	11.00	0.741	99.51	95	0.0000	0.0009	10.0400
		0.000016	0.00041	11.00 11.25	1.897 1.635 1.355 1.058 0.741 0.396	99.51 99.90				
		0.000015	0.00038	11.50	0.097	100.00	**All Grain Sizes Classed Usin	g Wentworth Scal	e	
l					l		l	-		



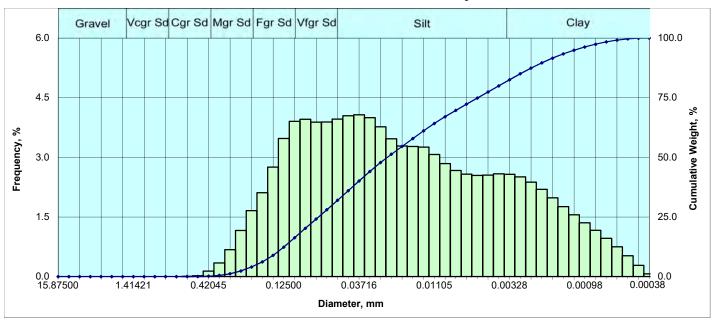
CL File No.: 1901575 Depth (ft): Nert 3.60 S1-86.0-86.3



		Particl	e Size Distrib	ution			Sor	ting Statistics	s (Folk)	
	7110 M 1-3		neter			ht %	Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[•]	[Incl.]	[Cum.]				
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9 50000	-3.25 -2.25	0.000	0.00				
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0005	0.0005	0.0005
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0120	0.0120	0.0120
	10	0.092913	2.00000	-1.00	0.000	0.00	(''''')	0.0120	0.0120	0.0120
	12	0.066212	1.68179	-0.75	0.000	0.00	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.000	0.00				
Sand	16	0.046819 0.039370	1.18921	-0.25	0.000	0.00	(in)	0.0007	0.0004	0.0004
	1 <u>8</u> 20	0.039370	1.00000 0.84090	0.00 0.25	0.000 0.000	0.00 0.00	(mm)	0.0186	0.0098	0.0105
Coarse	25 25	0.033100	0.70711	0.25	0.000	0.00	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0.0100	0.0096	0.0103
Sand	30	0.023410	0.59460	0.75	0.000	0.00	Sorting		Very poor	
	35 40	0.019685	0.70711 0.59460 0.50000 0.42045	1.00 1.25	0.000 0.000	0.00 0.00				
Medium	40 45	0.016553 0.013919	0.42045 0.35355	1.25 1.50	0.000	0.00		3.261	2.356	2.197
Sand	50	0.013919	0.33333	1.75	0.000	0.00	Skewness		Finely skewed	
Gana	60 70	0.009843	0.25000	2.00 2.25	0.000 0.001	0.00 0.00			T IIIOIY OROWOO	
	70	0.008277	0.21022	2.25	0.001	0.00		0.867	0.197	0.133
Fine	80	0.006960	0.17678	2.50	0.040	0.04	Vtaala		Di-t-lt'-	
Sand	100 120	0.005852 0.004921	0.14865	2.75 3.00	0.420	0.46	Kurtosis		Platykurtic	
	140	0.004321	0.12500 0.10511	3.25	1.054 1.538	1.51 3.05	1 1	0.234	0.426	0.808
V. Fine	170	0.003480	0.08839	3.50	2.072	5.12		0.20	020	0.000
Sand	200	0.002926	0.07433	3.75	2.775	7.90		mponent Perce		
	230	0.002461	0.06250	4.00	3.354	11.25	Gravel Sand	Silt	Clay	Silt + Clay
	270 325	0.002069 0.001740	0.05256	4.25 4.50	3.603	14.86 18.63	0.00 11.25	59.97	28.78	88.75
	325 400	0.001463	0.04419 0.03716	4.50 4.75	4.042	22.67	0.00	00.01	20.70	00.70
Silt	450	0.001230	0.03125	5.00	4.305	26.97		_		
O.I.C	500 635	0.001035 0.000870	0.03125 0.02628 0.02210	5.00 5.25 5.50	3.772 4.042 4.305 4.354 4.221	18.63 22.67 26.97 31.33 35.55	Percentile [Weight, %]	[in.]	article Diamet	er [phi]
	000	0.000732	0.01858	5.75 6.00	4.130 4.150	39.68 43.83				
		0.000615	0.01562	6.00	4.150	43.83	5	0.0035	0.0894	3.4837
		0.000517	0.01314	6.25	4.105	47.93 51.77	10	0.0026	0.0669	3.9015
		0.000435 0.000366	0.00929	6.50 6.75	3.840 3.519	51.77 55.29	10	0.0020	0.0009	3.9013
		0.000308	0.00781	7.00 7.25	3.286 3.163	58.58 61.74	16	0.0020	0.0500	4.3214
		0.000259 0.000217	0.01105 0.00929 0.00781 0.00657 0.00552	7.25 7.50	3.163 3.127	61.74 64.87	25	0.0013	0.0340	4.8799
		0.000183	0.00332	7.75	3.127	68.02	25	0.0013	0.0340	4.0799
		0.000154	0.00465 0.00391	8.00	3.147 3.205	71.22	40	0.0007	0.0184	5.7679
		0.000129 0.000109	0.00328 0.00276	8.25 8.50	3.224 3.180	74.44 77.62	50	0.0005	0.0120	6.3791
		0.000109	0.00276	8.75	3.160	80.69	50	0.0005	0.0120	0.3791
Clay		0.000091 0.000077	0.00232 0.00195 0.00164	8.75 9.00 9.25	3.068 2.906 2.715	83.60 86.31	70	0.0002	0.0042	7.8996
Olay		0.000065	0.00164	9.25	2.715	86.31	75	0.0004	0.0000	0.0000
		0.000054 0.000046	0.00138 0.00116	9.50 9.75 10.00	2.529 2.359	88.84 91.20 93.37 95.33 97.02	75	0.0001	0.0032	8.2906
		0.000038	0.00098	10.00	2.171	93.37	84	0.0001	0.0019	9.0343
		0.000032	0.00098 0.00082 0.00069	10.25 10.50	1.961 1.688	95.33		0.0004		0.0476
		0.000027 0.000023	0.00069	10.50 10.75	1.688	97.02	90	0.0001	0.0013	9.6172
		0.000023	0.00058 0.00049 0.00041	11.00	1.357 0.970 0.524	98.38 99.35	95	0.0000	0.0008	10.2043
		0.000016	0.00041	11.00 11.25	0.524	99.87				
		0.000015	0.00038	11.50	0.128	100.00	**All Grain Sizes Classed Usin	g Wentworth Scale	е	
					1					



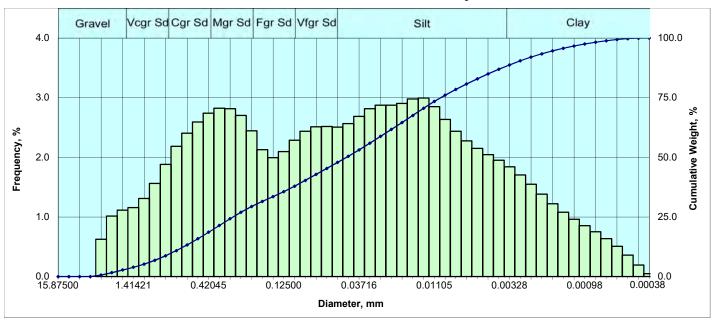
CL File No.: 1901575 Depth (ft): Nert 3.58 S1-60.0-60.3



		Particl	e Size Distrib	ution			Sor	ting Statistics	s (Folk)	
	7110 March 3		neter			tht %	Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[•]	[Incl.]	[Cum.]				
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9.50000 4.75000	-3.25 -2.25	0.000	0.00				
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0009	0.0009	0.0009
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0237	0.0237	0.0237
	10	0.092913	2.00000	-1.00	0.000	0.00	(111111)	0.0237	0.0237	0.0237
	12	0.066212	1.68179	-0.75	0.000	0.00	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.000	0.00				
Sand	16	0.046819 0.039370	1.18921	-0.25	0.000	0.00	(in)	0.0015	0.0007	0.0008
	1 <u>8</u> 20	0.039370	1.00000 0.84090	0.00 0.25	0.000 0.000	0.00 0.00	(mm)	0.0385	0.0178	0.0196
Coarse	25	0.027839	0.70711	0.50	0.000	0.00	(111111)	0.0303	0.0170	0.0190
Sand	30	0.023410 0.019685	0.59460	0.75	0 000	0.00	Sorting		Very poor	
	35 40	0.019685	0.70711 0.59460 0.50000 0.42045	1.00 1.25	0.022 0.137	0.02 0.16				
Medium	40 45	0.016553 0.013919	0.42045 0.35355	1.25 1.50	0.137 0.344	0.16 0.50		3.620	2.580	2.412
Sand	50	0.013919	0.33333	1.75	0.677	1 18	Skewness		Finely skewed	
Guna	60 70	0.009843	0.25000	2.00 2.25	1.161	2.34 4.00	<u> </u>		T IIIOIY OROWOO	
	70	0.008277	0.21022	2.25	1.659	4.00		0.836	0.257	0.169
Fine	80	0.006960	0.17678	2.50	2.112	6.11	Kontoolo			
Sand	100 120	0.005852 0.004921	0.14865	2.75 3.00	2.755	8.87 12.34	Kurtosis		Platykurtic	
	140	0.004321	0.12500 0.10511	3.25	3.475 3.907	12.34 16.25		0.238	0.435	0.818
V. Fine	170	0.003480	0.08839	3.50	3.957	20.20		0.200	000	0.0.0
Sand	200	0.002926	0.07433	3.75	3.884	24.09		mponent Perce		
	230	0.002461	0.06250	4.00	3.891	27.98	Gravel Sand	Silt	Clay	Silt + Clay
	270 325	0.002069 0.001740	0.05256	4.25 4.50	3.961 4.047	31.94 35.99	0.00 27.98	51.97	20.05	72.02
	325 400	0.001463	0.04419 0.03716	4.50 4.75	4.070	40.06	0.00 27.00	01.01	20.00	72.02
Silt	450	0.001230	0.03125	5.00	3.997	44.06		_		
J. C.II.	500 635	0.001035 0.000870	0.03125 0.02628 0.02210	5.00 5.25 5.50	4.047 4.070 3.997 3.768 3.466	35.99 40.06 44.06 47.82 51.29	Percentile [Weight, %]	[in.]	article Diamet	er [phi]
	000	0.000732	0.01858	5.75	3.285 3.273	54.58		1	,,,,,,	į pini
		0.000615	0.01858 0.01562	5.75 6.00	3.273	54.58 57.85	5	0.0077	0.1944	2.3630
		0.000517	0.01314	6.25	3.258	61.11	10	0.0055	0.1409	2.8269
		0.000435 0.000366	0.01103	6.50 6.75	3.074 2.841 2.670 2.576	64.18 67.02	10	0.0055	0.1409	2.0209
		0.000308	0.00781	7.00 7.25	2.670	69.69 72.27	16	0.0042	0.1064	3.2328
		0.000259	0.01105 0.00929 0.00781 0.00657 0.00552	7.25	2.576	72.27	25	0.0000	0.0740	3.8048
		0.000217 0.000183	0.00552	7.50 7.75	2.545 2.553	74.81 77.36	25	0.0028	0.0716	3.8048
		0.000154	0.00465 0.00391	8.00	2.545 2.553 2.583	77.36 79.95	40	0.0015	0.0373	4.7461
		0.000129	0.00328 0.00276	8.25 8.50	2.574 2.507	82.52 85.03	50	0.0000	0.0007	E 4010
		0.000109	0.00276	8.50 8.75	2.507	85.03 87.40	50	0.0009	0.0237	5.4018
Clay		0.000091 0.000077	0.00232 0.00195 0.00164	8.75 9.00 9.25	2.193 1.979	87.40 89.60 91.58	70	0.0003	0.0077	7.0278
Ciay		0.000065	0.00164	9.25	1.979	91.58		0.0000	0.0055	7 - 1 - 1
		0.000054 0.000046	0.00138 0.00116	9.50 9.75 10.00	1.762 1.555	93.34 94.89 96.25	75	0.0002	0.0055	7.5171
		0.000038	0.00098	10.00	1.355	96.25	84	0.0001	0.0030	8.3921
		0.000032	0.00098 0.00082 0.00069	10.25 10.50	1.555 1.355 1.164 0.963	97 41				
1		0.000027 0.000023	0.00069	10.50 10.75	0.963	98.37	90	0.0001	0.0019	9.0475
		0.000023	0.00049	11.00	0.751 0.525 0.280	99.13 99.65	95	0.0000	0.0011	9.7682
		0.000016	0.00058 0.00049 0.00041	11.00 11.25	0.280	99.93				
		0.000015	0.00038	11.50	0.069	100.00	**All Grain Sizes Classed Usin	g Wentworth Scal	e	
					1			-		



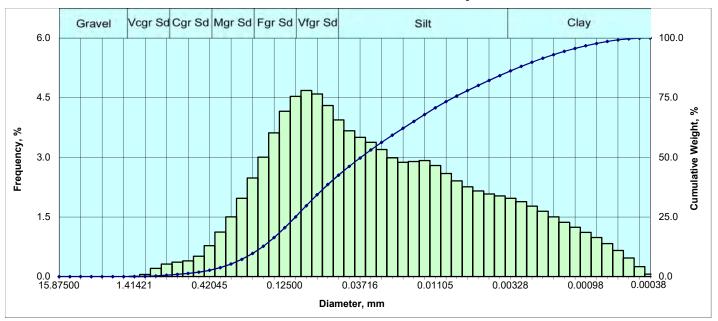
CL File No.: 1901575 Depth (ft): Nert 4.71S2-29.7-30.0



		Particle	e Size Distrib	ution			Sor	ting Statistics	s (Folk)	
			neter			aht %	Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[6]	[Incl.]	[Cum.]				
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9.50000 4.75000	-3.25 -2.25	0.000	0.00				
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0018	0.0018	0.0018
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.625	0.00 0.62	(mm)	0.0456	0.0456	0.0456
	10	0.092913	2.00000	-1.00	1.015	1.64	(111111)	0.0430	0.0430	0.0430
	12	0.066212	1.68179	-0.75	1.113	2.75	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	1.156	3.91				
Sand	16	0.046819 0.039370	1.18921	-0.25	1.309	5.22	(in)	0.0058	0.0020	0.0019
	1 <u>8</u> 20	0.039370	1.00000 0.84090	0.00 0.25	1.309 1.562 1.882	6.78 8.66	(mm)	0.1469	0.0500	0.0485
Coarse	25 25	0.027839	0.70711	0.50	2 185	10.85	(11111)	0.1409	0.0300	0.0465
Sand	30	0.023410 0.019685	0.59460	0.75	2.404	13.25	Sorting		Very poor	
	35 40	0.019685	0.70711 0.59460 0.50000 0.42045	1.00 1.25	2.404 2.592 2.741 2.823	10.85 13.25 15.84 18.58				
Medium	40 45	0.016553 0.013919	0.42045 0.35355	1.25 1.50	2.741	18.58		5.330	3.307	3.113
Sand	50	0.011705	0.33333	1.75	2 8 1 6	21.41	Skewness	N	ear symmetric	al
Gana	60 70	0.009843	0.25000	2.00 2.25	2.702 2.445	21.41 24.22 26.93 29.37	<u> </u>		our cymmouric	,ui
	70	0.008277	0.21022	2.25	2.445	29.37		1.168	0.020	-0.014
Fine	80	0.006960	0.17678	2.50	2.130	31.50	Kontoolo			
Sand	100 120	0.005852 0.004921	0.14865	2.75 3.00	1.995	33.50	Kurtosis		Platykurtic	
	140	0.004321	0.12500 0.10511	3.25	2.097 2.286	35.59 37.88		0.181	0.456	0.817
V. Fine	170	0.003480	0.08839	3.50	2.438	40.32		0	000	0.011
Sand	200	0.002926	0.07433	3.75	2.513	42.83		mponent Perce		
	230	0.002461 0.002069	0.06250	4.00	2.518	45.35	Gravel Sand	Silt	Clay	Silt + Clay
	270 325	0.002069	0.05256	4.25 4.50	2.506 2.567	47.86 50.42	1.64 43.71	41.56	13.09	54.65
	325 400	0.001463	0.04419 0.03716	4.50 4.75	2.567 2.688	50.42 53.11	1.04	41.00	10.00	01.00
Silt	450	0.001230	0.03125	5.00	2.816	55.93		_		
O.I.C	500 635	0.001035 0.000870	0.03125 0.02628 0.02210	5.00 5.25 5.50	2.816 2.875 2.875	55.93 58.80 61.68	Percentile [Weight, %]	[in.]	article Diamet	er [phi]
	000	0.000732	0.01858 0.01562	5.75 6.00	2.905 2.980	64.58				
		0.000615	0.01562	6.00	2.980	64.58 67.56 70.56	5	0.0483	1.2267	-0.2947
		0.000517	0.01314	6.25	2.996	70.56 72.41	10	0.0299	0.7590	0.3978
		0.000435 0.000366	0.00929	6.50 6.75	2.850 2.636	73.41 76.04	10	0.0299	0.7590	0.5970
		0.000308	0.00781	7.00 7.25	2.438 2.277	78.48 80.76	16	0.0195	0.4955	1.0132
		0.000259 0.000217	0.01105 0.00929 0.00781 0.00657 0.00552	7.25 7.50	2.277 2.150	80.76	25	0.0112	0.2837	1.8175
		0.000183	0.00332	7.75	2.045	82.91 84.95	23	0.0112	0.2037	1.0175
		0.000154	0.00465 0.00391	8.00	2.045 1.953	86.91	40	0.0036	0.0906	3.4648
		0.000129 0.000109	0.00328 0.00276	8.25 8.50	1.841 1.706	88.75 90.45	50	0.0018	0.0456	4.4558
		0.000109	0.00276	8.75	1.700	90.45	50	0.0016	0.0456	4.4556
Clay		0.000091 0.000077	0.00232 0.00195 0.00164	8.75 9.00 9.25	1.549 1.383 1.222	92.00 93.38 94.61	70	0.0005	0.0136	6.2002
Olay		0.000065	0.00164	9.25	1.222	94.61	7.5	0.0004	0.0400	0.0450
		0.000054 0.000046	0.00138 0.00116	9.50 9.75 10.00 10.25 10.50	1.080 0.961 0.853 0.751 0.637	94.61 95.69 96.65 97.50 98.25 98.89 99.40 99.76	75	0.0004	0.0100	6.6459
		0.000038	0.00098 0.00082 0.00069	10.00	0.853	97.50	84	0.0002	0.0051	7.6281
		0.000032	0.00082	10.25	0.751	98.25		0.0004		
		0.000027 0.000023	0.00069	10.50 10.75	0.637	98.89	90	0.0001	0.0029	8.4293
		0.000019	0.00058 0.00049 0.00041	10.75 11.00 11.25	0.507 0.361 0.194	99.76	95	0.0001	0.0015	9.3360
		0.000016	0.00041	11.25	0.194	99.95				
		0.000015	0.00038	11.50	0.048	100.00	**All Grain Sizes Classed Usin	g Wentworth Scale	е	
					L					



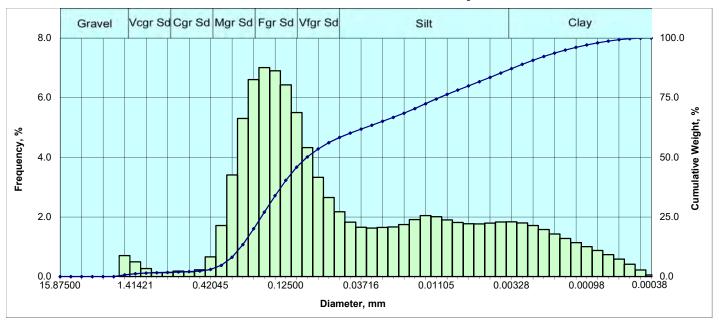
CL File No.: 1901575 Depth (ft): Nert3.98S1-9.7-10.0



		Particle	Size Distrib	ution			Sor	ting Statistics	s (Folk)	
		Diam			Weig		Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[•]	[Incl.]	[Cum.]	T unumotor	Truon	u	1 0.11
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9.50000	-3.25	0.000	0.00		•		
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0014	0.0014	0.0014
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0366	0.0366	0.0366
	10	0.092913	2.00000	-1.25	0.000	0.00	(''''')	0.0300	0.0366	0.0300
	12	0.066212	1.68179	-0.75	0.000	0.00	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.001	0.00				
Sand	16	0.046819	1.18921	-0.25	0.051	0.05	(in)	0.0022	0.0010	0.0011
	18 20	0.039370 0.033106	1.00000 0.84090	0.00 0.25	0.206 0.314	0.26 0.57	(mm)	0.0567	0.0246	0.0281
Coarse	25	0.027839	0.70711	0.50	0.364	0.94	(11111)	0.0307	0.0240	0.0201
Sand	30	0.023410	0.59460	0.75	0.394	1.33	Sorting		Very poor	
	35 40	0.019685	0.50000	1.00	0.511	1.84		0.500	0.040	0.500
Medium	40 45	0.016553 0.013919	0.42045 0.35355	1.25 1.50	0.779 1.119	2.62 3.74		3.566	2.619	2.508
Sand	50	0.013919	0.29730	1.75	1.504	5.24	Skewness		Finely skewed	1
	60 70	0.009843	0.25000	2.00 2.25	1.968 2.480	7.21 9.69			· ···o··y owowo	
	70	0.008277	0.21022		2.480			0.805	0.340	0.222
Fine	80	0.006960	0.17678	2.50	3.006	12.70	I/taala	_	Di-t-iti-	
Sand	100 120	0.005852 0.004921	0.14865 0.12500	2.75 3.00	3.617 4.160	16.31 20.47	Kurtosis		Platykurtic	
	140	0.004321	0.10511	3.25	4.532	25.01	1 1	0.237	0.510	0.884
V. Fine	170	0.003480	0.08839	3.50	4.684	29.69				
Sand	200	0.002926	0.07433	3.75	4.596	34.29		mponent Perce		
	230	0.002461	0.06250	4.00	4.305	38.59	Gravel Sand	Silt	Clay	Silt + Clay
	270 325	0.002069 0.001740	0.05256 0.04419	4.25 4.50	3.940 3.666	42.53 46.20	0.00 38.59	45.67	15.74	61.41
	400	0.001463	0.03716	4.50 4.75	3.504	49.70	0.00	10.01	10.7 1	01.41
Silt	450	0.001230	0.03125	5.00	3.377	53.08				
J. C.II.	500 635	0.001035 0.000870	0.02628 0.02210	5.25 5.50	3.196	56.27 59.26	Percentile [Weight, %]	[in.]	article Diamet	er [phi]
	000	0.000732	0.01858	5.75	2.987 2.875	62.14				
		0.000615	0.01562	6.00	2.894	65.03	5	0.0121	0.3064	1.7064
		0.000517 0.000435	0.01314 0.01105	6.25 6.50	2.918 2.794	67.95 70.74	10	0.0081	0.2068	2.2738
		0.000455	0.00929	6.75	2.595	73.34	10	0.0001	0.2000	2.2730
		0.000308	0.00781	6.75 7.00	2.408	75.74	16	0.0059	0.1511	2.7265
		0.000259 0.000217	0.00657 0.00552	7.25 7.50	2.260 2.153	78.00 80.16	25	0.0041	0.1051	3.2496
		0.000217	0.00332	7.75	2.133	82.23	25	0.0041	0.1051	3.2490
		0.000154	0.00465 0.00391	8.00	2.028	84.26	40	0.0023	0.0589	4.0845
		0.000129 0.000109	0.00328 0.00276	8.25 8.50	1.968 1.884	86.23 88.11	50	0.0014	0.0366	4.7704
		0.000091	0.00276	8.75	1.774	89.89	30	0.0014	0.0300	4.7704
Clay		0.000077	0.00195	9.00	1.643	91.53	70	0.0005	0.0116	6.4293
Giay		0.000065	0.00164	9.25	1.502	93.03	75	0.0000	0.0000	0.0400
		0.000054 0.000046	0.00138 0.00116	9.50 9.75	1.366 1.241	94.40 95.64	75	0.0003	0.0083	6.9180
		0.000038	0.00098	10.00	1.113	96.75	84	0.0002	0.0040	7.9652
		0.000032	0.00082	10.25 10.50	0.982	97.73		0.0004	0.0000	0.7050
1		0.000027 0.000023	0.00069	10.50 10.75	0.830 0.658	98.56 99.22	90	0.0001	0.0023	8.7659
		0.000023	0.00058 0.00049	10.75 11.00	0.466	99.69	95	0.0001	0.0013	9.6159
		0.000016	0.00041	11.25 11.50	0.250	99.94				
		0.000015	0.00038	11.50	0.061	100.00	**All Grain Sizes Classed Usir	ng Wentworth Scal	е	
L					1					



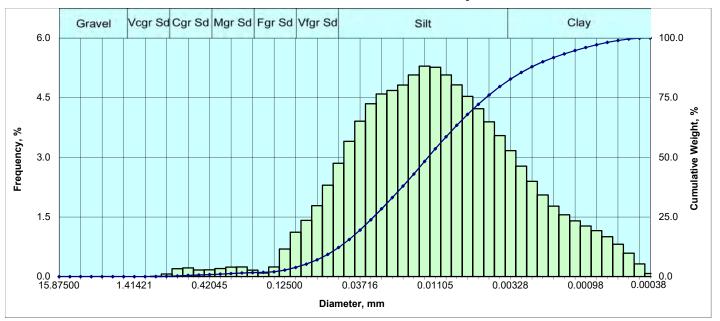
CL File No.: 1901575 Depth (ft): Nert3.98S1-17.0-17.3



		Particl	e Size Distrib	ution			Sor	ting Statistics	s (Folk)	
	7110 March 3		neter			tht %	Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[6]	[Incl.]	[Cum.]				
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median	Ve	ry fine sand si	zed
	3/8 in.	0.375000	9 50000	-3.25 -2.25	0.000	0.00				
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0035	0.0035	0.0035
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0891	0.0891	0.0891
	10	0.092913	2.00000	-1.00	0.000	0.00	(111111)	0.0091	0.0091	0.0091
	12	0.066212	1.68179	-0.75	0.702	0.70	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.492	1.19				
Sand	16	0.046819 0.039370	1.18921	-0.25	0.269	1.46	(in)	0.0039	0.0013	0.0018
	1 <u>8</u> 20	0.039370	1.00000 0.84090	0.00 0.25	0.135 0.135	1.60 1.73	(mm)	0.0985	0.0323	0.0453
Coarse	25 25	0.027839	0.70711	0.50	0.133	1.73	(11111)	0.0965	0.0323	0.0455
Sand	30	0.023410 0.019685	0.59460	0.75	0 163	1.91 2.08	Sorting		Very poor	
	35 40	0.019685	0.70711 0.59460 0.50000 0.42045	1.00 1.25	0.226 0.659	2.30 2.96				
Medium	40 45	0.016553 0.013919	0.42045 0.35355	1.25 1.50	0.659 1.711	2.96 4.67		4.203	2.860	2.640
Sand	50	0.013919	0.33333	1.75	3.410	8.08	Skewness	Str	ongly fine ske	wed
Guna	60 70	0.009843	0.25000	2.00 2.25	5.304 6.610	13.39 20.00	<u> </u>	<u> </u>	ongry mic one	
	70	0.008277	0.21022	2.25	6.610	20.00		0.498	0.708	0.510
Fine	80	0.006960	0.17678	2.50	7.013	27.01	V.mtaala		Di-t-lt'-	
Sand	100 120	0.005852 0.004921	0.14865	2.75 3.00	6.904	33.91 40.34	Kurtosis		Platykurtic	
	140	0.004321	0.12500 0.10511	3.25	6.429 5.503	45.85		0.317	0.396	0.790
V. Fine	170	0.003480	0.08839	3.50	4.329	50.18		0.011	0.000	000
Sand	200	0.002926	0.07433	3.75	3.327	53.50		mponent Perce		
	230	0.002461	0.06250	4.00	2.651	56.15	Gravel Sand	Silt	Clay	Silt + Clay
	270 325	0.002069 0.001740	0.05256	4.25 4.50	2.177 1.827	58.33 60.16	0.00 56.15	29.18	14.67	43.85
	325 400	0.001463	0.04419 0.03716	4.50 4.75	1.827 1.652	60.16 61.81	0.00 30.13	25.10	14.07	40.00
Silt	450	0.001230	0.03125	5.00	1.629	63.44		_		
Ont	500 635	0.001035 0.000870	0.03125 0.02628 0.02210	5.00 5.25 5.50	1.647 1.663	63.44 65.08 66.75	Percentile [Weight, %]	[in.]	article Diamet	er [phi]
	000	0.000732	0.01858	5.75	1.744	68.49		1	,,,,,,	i joini
		0.000615	0.01858 0.01562	5.75 6.00	1.744 1.913	68.49 70.40	5	0.0137	0.3482	1.5222
		0.000517	0.01314	6.25	2.047	72.45	10	0.0110	0.2802	1.8354
		0.000435 0.000366	0.01103	6.50 6.75	2.047 2.010 1.899	74.46 76.36	10	0.0110	0.2002	1.0354
		0.000308	0.00781	7.00 7.25	1.812 1.772	78.17 79.94	16	0.0092	0.2343	2.0937
		0.000259	0.01105 0.00929 0.00781 0.00657 0.00552	7.25	1.772	79.94	25	0.0070	0.4004	2.4238
		0.000217 0.000183	0.00552	7.50 7.75	1.769 1.791	81.71 83.50	25	0.0073	0.1864	2.4238
		0.000154	0.00465 0.00391	8.00	1.791 1.830	85.33	40	0.0050	0.1263	2.9855
		0.000129	0.00328 0.00276	8.25 8.50	1.838 1.800	87.17 88.97	50	0.0035	0.0904	2.4900
		0.000109	0.00276	8.50 8.75	1.800	90.68	50	0.0035	0.0891	3.4890
Clay		0.000091 0.000077	0.00232 0.00195 0.00164	8.75 9.00 9.25	1.581 1.429	92.26 93.69	70	0.0006	0.0163	5.9434
Ciay		0.000065	0.00164	9.25	1.429	93.69		0.0004	0.0405	0.5007
		0.000054 0.000046	0.00138 0.00116	9.50 9.75 10.00	1.277 1.138	94.97 96.11	75	0.0004	0.0105	6.5667
		0.000038	0.00098	10.00	1.005	97.11	84	0.0002	0.0044	7.8136
1		0.000032	0.00098 0.00082 0.00069	10.25 10.50	1.005 0.878 0.738	97.99 98.73				
1		0.000027 0.000023	0.00069	10.50 10.75	0.738	98.73	90	0.0001	0.0025	8.6449
1		0.000023	0.00036	11.00	0.304	99.31 99.72 99.95	95	0.0001	0.0014	9.5061
		0.000016	0.00058 0.00049 0.00041	11.00 11.25	0.584 0.413 0.222	99.95				
		0.000015	0.00038	11.50	0.054	100.00	**All Grain Sizes Classed Usin	g Wentworth Scal	e	
L					l .			-		



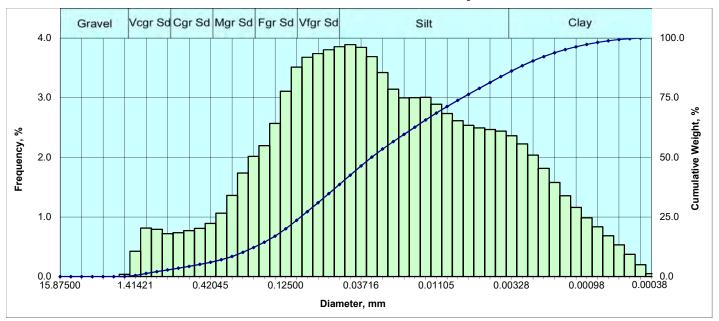
CL File No.: 1901575 Depth (ft): Nert4.64N1-37.0-37.3



		Particle	Size Distrib	ution			Sort	ing Statistics	s (Folk)	
		Diam				ght %	Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[•]	[Incl.]	[Cum.]				
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9.50000	-3.25	0.000	0.00				
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0005	0.0005	0.0005
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0125	0.0125	0.0125
	10	0.092913	2.00000	-1.25 -1.00	0.000	0.00	(11111)	0.0125	0.0125	0.0125
	12	0.066212	1.68179	-0.75	0.000	0.00	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.000	0.00				
Sand	16	0.046819	1.18921	-0.25	0.000	0.00	(in)	0.0007	0.0005	0.0005
	18 20	0.039370 0.033106	1.00000 0.84090	0.00 0.25	0.004 0.066	0.00 0.07	(mm)	0.0174	0.0115	0.0118
Coarse	25 25	0.033106	0.70711	0.25	0.066	0.07	(mm)	0.0174	0.0115	0.0116
Sand	30	0.023410	0.59460	0.75	0.219	0.49	Sorting		Poor	
L	35 40	0.019685	0.59460 0.50000	1.00 1.25	0.168 0.168	0.65				
		0.016553	0.42045	1.25	0.168	0.82		2.475	1.912	1.916
Medium Sand	45 50	0.013919 0.011705	0.35355 0.29730	1.50 1.75	0.202 0.237	1.02 1.26	Skewness	I N	ear symmetric	nal
Sanu	60	0.011703	0.25000	2.00	0.237	1.50	Skewiless	I IN	ear symmetric	cai
	60 70	0.008277	0.21022	2.25	0.242 0.162	1.66		0.972	0.156	0.076
Fine	80	0.006960	0.17678	2.50	0.089	1.75				
Sand	100	0.005852	0.14865	2.75	0.243	1.99	Kurtosis		Mesokurtic	
	120 140	0.004921 0.004138	0.12500 0.10511	3.00 3.25	0.694 1.115	2.69 3.80		0.216	0.656	0.993
V. Fine	170	0.003480	0.08839	3.50	1.414	5.22		0.210	0.030	0.993
Sand	200	0.002926	0.07433	3.75	1.783	7.00	Cor	nponent Perce	ntages	
	230	0.002461	0.06250	4.00	2.299	9.30	Gravel Sand	Silt	Clay	Silt + Clay
	270	0.002069	0.05256	4.25	2.851	12.15	0.00	70.05	20.25	00.70
	325 400	0.001740 0.001463	0.04419 0.03716	4.50 4.75	3.403 3.912	15.55 19.46	0.00 9.30	70.35	20.35	90.70
0:14	450	0.001230	0.03125	5.00	4.348	23.81				
Silt	500 635	0.001035	0.02628 0.02210	5.25 5.50	4.595	28.41	Percentile [Weight, %]	P	article Diamet	er
	635	0.000870 0.000732	0.02210	5.50 5.75	4.685	33.09 37.91	[weight, %]	[in.]	[mm]	[phi]
		0.000615	0.01562	5.75 6.00	4.819 5.073	37.91 42.98	5	0.0036	0.0909	3.4588
		0.000517	0.01314	6.25	5.297	48.28				
		0.000435 0.000366	0.01105 0.00929	6.50 6.75	5.265 5.075	53.55 58.62	10	0.0024	0.0601	4.0576
		0.000308	0.00929	7.00	4.822	63.44	16	0.0017	0.0434	4.5265
		0.000308 0.000259	0.00781 0.00657	7.00 7.25	4.822 4.534	63.44 67.98				
		0.000217 0.000183	0.00552	7.50 7.75	4.225	72.20 76.10	25	0.0012	0.0300	5.0606
		0.000183	0.00465 0.00391	7.75 8.00	3.896 3.548	76.10 79.65	40	0.0007	0.0174	5.8478
		0.000129	0.00328	8.25 8.50	3.168	82.81				
		0.000109	0.00276	8.50	2.777	85.59	50	0.0005	0.0125	6.3270
<u> </u>		0.000091 0.000077	0.00232 0.00195	8.75 9.00	2.396 2.055	87.99 90.04	70	0.0002	0.0061	7.3643
Clay		0.000065	0.00164	9.25	1.770	91.81		0.0002	0.0001	7.00-10
		0.000054	0.00138	9.50	1.553	93.37	75	0.0002	0.0049	7.6750
		0.000046 0.000038	0.00116	9.75 10.00	1.400 1.273	94.77 96.04	84	0.0001	0.0031	8.3514
		0.000038	0.00098 0.00082	10.25	1.154	96.04 97.19	04	0.0001	0.0031	0.0014
		0.000027	0.00069	10.25 10.50	1.154 1.004	98.20	90	0.0001	0.0020	8.9944
		0.000023	0.00058	10.75	0.815	99.01 99.60	95	0.0000	0.0011	0.7029
		0.000019 0.000016	0.00049 0.00041	11.00 11.25	0.589 0.320	99.60 99.92	95	0.0000	0.0011	9.7928
		0.000015	0.00038	11.50	0.078	100.00	**All Grain Sizes Classed Usin	a Wentworth Scal	•	
							, Grain Gizes Glassed Usin	g ***Siltworth Stall	•	



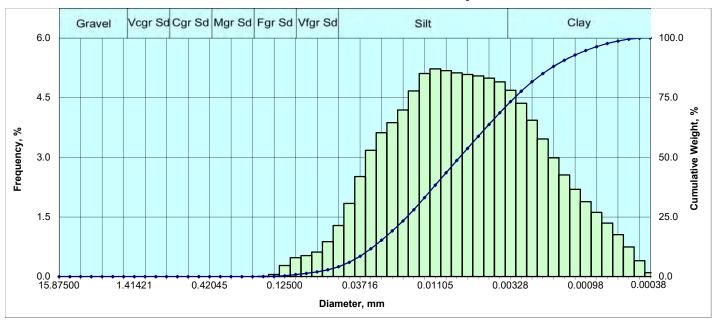
CL File No.: 1901575 Depth (ft): Nert4.64N1-68.0-68.3



		Particl	e Size Distrib	ution			Sor	ing Statistics	s (Folk)	
			neter			ht %	Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[•]	[Incl.]	[Cum.]				
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9.50000	-3.25	0.000	0.00				
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0012	0.0012	0.0012
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0313	0.0313	0.0313
	10	0.092913	2.00000	-1.00	0.000	0.00	(11111)	0.0313	0.0313	0.0313
	12	0.066212	1.68179	-0.75	0.039	0.04	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.425	0.46				
Sand	16	0.046819	1.18921	-0.25	0.813	1.28	(in)	0.0021	0.0010	0.0011
	18 20	0.039370 0.033106	1.00000 0.84090	0.00 0.25	0.791 0.719	2.07 2.79	(mm)	0.0529	0.0248	0.0268
Coarse	25	0.027839	0.70711	0.50	0.736	3.52	(11111)	0.0329	0.0240	0.0200
Sand	30	0.023410	0.59460 0.50000 0.42045	0.75	0.771	3.52 4.29	Sorting		Very poor	
	35 40	0.019685 0.016553	0.50000	1.00 1.25	0.807 0.891	5.10 5.99				
Madium	40 45	0.016553 0.013919	0.42045	1.25 1.50	0.891 1.063			3.685	2.682	2.629
Medium Sand	50	0.013919	0.35355 0.29730	1.75	1.362	7.06 8.42	Skewness	N	lear symmetric	al
Guna	60	0.009843	0.25000	2.00	1.737	10.15 12.17	<u> </u>		our cymmound	,
	60 70	0.008277	0.21022	2.00 2.25	2.016	12.17		0.853	0.082	0.089
Fine	80	0.006960	0.17678	2.50	2.196	14.37	Konto-la			
Sand	100	0.005852 0.004921	0.14865 0.12500	2.75	2.570	16.94	Kurtosis		Mesokurtic	
	120 140	0.004321	0.10511	3.00 3.25	3.109 3.514	20.04 23.56		0.181	0.584	0.925
V. Fine	170	0.003480	0.08839	3.50	3.678	27.24		0.101	0.00.	0.020
Sand	200	0.002926	0.07433	3.75	3.741	30.98		nponent Perce		_
	230	0.002461	0.06250	4.00	3.803	34.78	Gravel Sand	Silt	Clay	Silt + Clay
	270 325	0.002069 0.001740	0.05256	4.25 4.50	3.854	38.63 42.52	0.00 34.78	49.03	16.19	65.22
	325 400	0.001463	0.04419 0.03716	4.50 4.75	3.890 3.843 3.690	42.52 46.37	0.00	10.00	10.10	00.22
Silt	450	0.001230	0.03125	5.00	3.690	50.06 53.48				
O	500 635	0.001035 0.000870	0.02628 0.02210	5.00 5.25 5.50	3.422 3.143	53.48 56.62	Percentile [Weight, %]	[in.]	Particle Diamet	er [phi]
	000	0.000732	0.01858	5.75	2.999	59.62		1111.1	,,,,,,	i joini
		0.000615	0.01858 0.01562	5.75 6.00	2.999 3.000	59.62 62.62	5	0.0202	0.5119	0.9662
		0.000517	0.01314	6.25	3.007	65.63	10	0.0100	0.2542	1.9760
		0.000435 0.000366	0.01105 0.00929	6.50 6.75	2.892 2.736	68.52 71.26	10	0.0100	0.2542	1.9700
		0.000308 0.000259	0.00781 0.00657	7.00 7.25	2.614 2.538	73.87 76.41	16	0.0063	0.1589	2.6539
		0.000259	0.00657 0.00552	7.25 7.50	2.538 2.495	76.41 78.90	25	0.0039	0.0986	3.3429
		0.000217 0.000183	0.00552	7.50 7.75	2.467	81.37	25	0.0039	0.0960	3.3429
		0.000154	0.00465 0.00391	8.00	2.439	83.81	40	0.0020	0.0496	4.3330
		0.000129 0.000109	0.00328 0.00276	8.25 8.50	2.362 2.227	86.17 88.40	50	0.0012	0.0212	4.9958
		0.000109	0.00276	8.75	2.038	90.40 90.43	50	0.0012	0.0313	4.9956
Clay		0.000091 0.000077	0.00195 0.00164	9.00 9.25	1.814 1.578	90.43 92.25	70	0.0004	0.0101	6.6299
Ciay		0.000065	0.00164	9.25	1.578	93.83		0.0000	0.0070	7 4004
		0.000054 0.000046	0.00138 0.00116	9.50 9.75	1.355 1.159	95.18 96.34	75	0.0003	0.0073	7.1061
		0.000038	0.00098	9.75 10.00	0.986	96.34 97.33	84	0.0002	0.0039	8.0188
		0.000032	0.00082	10.25 10.50	0.834	98.16				
		0.000027	0.00069 0.00058	10.50 10.75	0.685	98.85	90	0.0001	0.0024	8.6930
		0.000023 0.000019	0.00049	11.00	0.533 0.373 0.199	99.38 99.75	95	0.0001	0.0014	9.4639
		0.000016	0.00041	11.00 11.25	0.199	99.95				
		0.000015	0.00038	11.50	0.049	100.00	**All Grain Sizes Classed Usin	g Wentworth Scale	e	
<u> </u>					L			-		



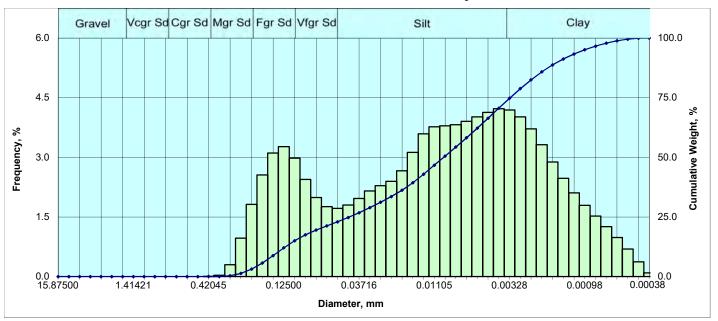
CL File No.: 1901575 Depth (ft): Nert4.71N1-58.5-59.0



				ution			001	ting Statistics	3 (I OIK)	
	[US Mesh] [in.] [mm] [nt %	Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[6]	[Incl.]	[Cum.]	T di dinoto:	Huok	u	1 OIIX
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9.50000	-3.25	0.000	0.00	Modium	1	Ont oizou	
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0003	0.0003	0.0003
	6	0.131890	3.35000	-1.75	0.000	0.00				
	8	0.092913	2.36000	-1.25	0.000	0.00	(mm)	0.0075	0.0075	0.0075
	10 12	0.078740 0.066212	2.00000 1.68179	-1.00 -0.75	0.000	0.00	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.000	0.00	Mean		Ont Sizeu	
Sand	16	0.046819	1.18921	-0.25	0.000	0.00	(in)	0.0004	0.0003	0.0003
	18 20	0.039370	1.00000	0.00 0.25	0.000 0.000	0.00				
	20	0.033106	0.84090	0.25	0.000	0.00	(mm)	0.0103	0.0073	0.0073
Coarse Sand	25 30	0.027839 0.023410	0.70711 0.59460	0.50 0.75	0.000 0.000	0.00 0.00	Sorting		Poor	
Janu	35 35	0.019685	0.50000	1.00	0.000	0.00	Sorting		FOOI	
	40	0.016553	0.42045	1.25	0.000	0.00		2.382	1.810	1.764
Medium	45	0.013919	0.35355	1.50	0.000	0.00				
Sand	50	0.011705	0.29730	1.75	0.000	0.00	Skewness	N	ear symmetric	al
	60 70	0.009843 0.008277	0.25000 0.21022	2.00 2.25	0.000 0.000	0.00		0.983	0.077	0.036
Fine	80	0.006277	0.21022	2.50	0.000	0.00		0.963	0.077	0.030
Sand	100	0.005852	0.14865	2.75	0.053	0.05	Kurtosis		Mesokurtic	
	120	0.004921	0.12500	3.00	0.278	0.33				
	140	0.004138	0.10511	3.25	0.474	0.81		0.220	0.567	0.928
V. Fine	170 200	0.003480 0.002926	0.08839 0.07433	3.50 3.75	0.526 0.616	1.33 1.95	6-1			
Sand	230	0.002926	0.07433	3.75 4.00	0.879	1.95 2.83	Gravel Sand	mponent Perce Silt	Clay	Silt + Clay
	270	0.002461	0.05256	4.25	1.284	4.11	Graver Caria	<u> </u>	Olay	Oilt · Olay
	325	0.001740	0.04419	4.50	1.842	5.95	0.00 2.83	65.85	31.33	97.17
	400	0.001463	0.03716	4.75	2.515	8.47				
Silt	450 500	0.001230 0.001035	0.03125 0.02628	5.00 5.25	3.177 3.620	11.64 15.26	Percentile		article Diamet	or
	635	0.000870	0.02210	5.25 5.50	3.873	19 14	Percentile [Weight, %]	[in.]	[mm]	[phi]
		0.000732	0.01858	5.75	4.192	23.33				
		0.000615 0.000517	0.01562 0.01314	6.00 6.25	4.671 5.109	28.00 33.11	5	0.0019	0.0485	4.3653
		0.000317	0.01314	6.50	5.109	38.34	10	0.0014	0.0343	4.8652
		0.000366	0.00929	6.75 7.00	5.183 5.126	43.52		0.0014		
		0.000308	0.00781	7.00	5.126	48.65	16	0.0010	0.0255	5.2942
		0.000259 0.000217	0.00657 0.00552	7.25 7.50	5.085 5.050	53.73 58.78	25	0.0007	0.0175	5.8345
		0.000117	0.00332 0.00465 0.00391	7.75	4.994	63.77	25	0.0007	0.0173	3.0343
		0.000154	0.00391	8.00	4.900	68.67	40	0.0004	0.0105	6.5756
		0.000129	0.00328	8.25	4.688	73.36	50	0.0000	0.0075	7.0625
		0.000109 0.000091	0.00276 0.00232	8.50 8.75	4.359 3.935	77.72 81.66	50	0.0003	0.0075	7.0625
Clay		0.000077	0.00195	9.00	3.461	85.12	70	0.0001	0.0037	8.0664
Clay		0.000065	0.00164	9.25	2.986	88.10				
		0.000054 0.000046	0.00138 0.00116	9.50 9.75	2.557 2.194	90.66 92.86	75	0.0001	0.0031	8.3389
		0.000038	0.000110	10.00	1.884	94.74	84	0.0001	0.0021	8.9144
		0.000032	0.00082	10.25	1.615	96.35				
		0.000027	0.00069	10.50	1.343	97.70	90	0.0001	0.0014	9.4311
		0.000023 0.000019	0.00058 0.00049	10.75 11.00	1.057 0.746	98.75 99.50	95	0.0000	0.0010	10.0375
		0.000019	0.00049	11.25 11.50	0.401	99.90		0.0000	0.0010	10.0073
		0.000015	0.00038	11.50	0.098	100.00	**All Grain Sizes Classed Usin	g Wentworth Scale	e	
							5.4 5.255 5.45564 6611	3 s	-	



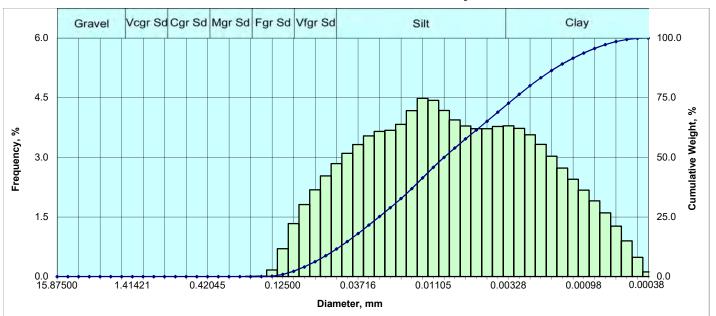
CL File No.: 1901575 Depth (ft): Nert3.60N1-26.0-26.4



		Particl	e Size Distrib	ution			Sor	ting Statistic	s (Folk)	
			neter			tht %	Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[•]	[Incl.]	[Cum.]				
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9.50000 4.75000	-3.25 -2.25	0.000	0.00				
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0004	0.0004	0.0004
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0095	0.0095	0.0095
	10	0.092913	2.00000	-1.00	0.000	0.00	(''''')	0.0093	0.0093	0.0093
	12	0.066212	1.68179	-0.75	0.000	0.00	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.000	0.00				
Sand	16	0.046819 0.039370	1.18921	-0.25	0.000	0.00	(in)	0.0009	0.0006	0.0005
	1 <u>8</u> 20	0.039370	1.00000 0.84090	0.00 0.25	0.000 0.000	0.00	(mm)	0.0233	0.0146	0.0126
Coarse	25 25	0.027839	0.70711	0.50	0.000	0.00	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0.0233	0.0140	0.0120
Sand	30	0.023410 0.019685	0.59460	0.75	0.000	0.00	Sorting		Very poor	
	35 40	0.019685	0.70711 0.59460 0.50000 0.42045	1.00 1.25	0.000 0.000	0.00				
Medium	40 45	0.016553 0.013919	0.42045 0.35355	1.25 1.50	0.000 0.032	0.00 0.03		3.646	2.757	2.523
Sand	50	0.013919	0.33333	1.75	0 299	0.03	Skewness		Coarse skewe	1
Gana	60	0.009843	0.25000	2.00	0.966 1.815	1.30			ocaroc oncure	-
	60 70	0.008277	0.21022	2.00 2.25	1.815	3.11		1.247	-0.184	-0.179
Fine	80	0.006960	0.17678	2.50	2.558	5.67	Ktaala			
Sand	100 120	0.005852 0.004921	0.14865	2.75 3.00	3.109	8.78 12.05	Kurtosis		Platykurtic	
	140	0.004321	0.12500 0.10511	3.25	3.2 <u>69</u> 2.979	12.0 <u>5</u> 15.03	1	0.145	0.371	0.830
V. Fine	170	0.003480	0.08839	3.50	2.444	17.47		00	0.01	0.000
Sand	200	0.002926	0.07433	3.75	1.990	19.46		mponent Perce		
	230	0.002461	0.06250	4.00	1.762	21.22	Gravel Sand	Silt	Clay	Silt + Clay
	270 325	0.002069 0.001740	0.05256	4.25 4.50	1.715 1.800	22.94 24.74	0.00 21.22	49.35	29.42	78.78
	325 400	0.001463	0.04419 0.03716	4.50 4.75	1.966	24.74 26.70	0.00	10.00	20.12	70.70
Silt	450	0.001230	0.03125	5.00	2.156	28.86	l	_		
O.I.C	500 635	0.001035 0.000870	0.03125 0.02628 0.02210	5.00 5.25 5.50	1.800 1.966 2.156 2.286 2.396	28.86 31.15 33.54	Percentile [Weight, %]	[in.]	article Diamet	er [phi]
	000	0.000732	0.01858	5.75	2.661	36.20 39.33		1,,,,	,,,,,,	i joini
		0.000615	0.01858 0.01562	5.75 6.00	2.661 3.126	39.33	5	0.0073	0.1855	2.4301
		0.000517	0.01314	6.25	3.590	42.92 46.69 50.48	10	0.0055	0.1398	2.8384
		0.000435 0.000366	0.01103	6.50 6.75	3.791	50.48	10	0.0055	0.1396	2.0304
		0.000308	0.00781	7.00 7.25	3.769 3.791 3.822 3.904	54.30 58.21	16	0.0039	0.0985	3.3443
		0.000259	0.01105 0.00929 0.00781 0.00657 0.00552	7.25	3.904	58.21	25	0.0047	0.0422	4.5309
		0.000217 0.000183	0.00552	7.50 7.75	4.017 4.130	62.22 66.35	25	0.0017	0.0433	4.5309
		0.000154	0.00465 0.00391	8.00	4.223	70.58	40	0.0006	0.0152	6.0435
		0.000129	0.00328 0.00276	8.25 8.50	4.192 4.019	74.77 78.79	50	0.0004	0.0005	0.7450
		0.000109	0.00276	8.50 8.75	3.715	78.79 82.50	50	0.0004	0.0095	6.7158
Clay		0.000091 0.000077	0.00232 0.00195 0.00164	8.75 9.00 9.25	3.319 2.885	85.82 88.71	70	0.0002	0.0040	7.9631
Clay		0.000065	0.00164	9.25	2.885	88.71				
		0.000054 0.000046	0.00138 0.00116	9.50	2.471	91.18	75	0.0001	0.0033	8.2632
		0.000038	0.00098	9.50 9.75 10.00	2.107 1.793 1.524 1.258	91.18 93.29 95.08	84	0.0001	0.0022	8.8574
		0.000032	0.00098 0.00082 0.00069	10.25 10.50	1.524	96.60 97.86				
		0.000027	0.00069	10.50 10.75	1.258	97.86	90	0.0001	0.0015	9.3754
		0.000023 0.000019	0.00038	11.00	0.903	98.84 99.54	95	0.0000	0.0010	9.9881
		0.000016	0.00058 0.00049 0.00041	11.00 11.25	0.985 0.692 0.372	99.91	<u> </u>			
		0.000015	0.00038	11.50	0.091	100.00	**All Grain Sizes Classed Usin	g Wentworth Scal	e	
					1					



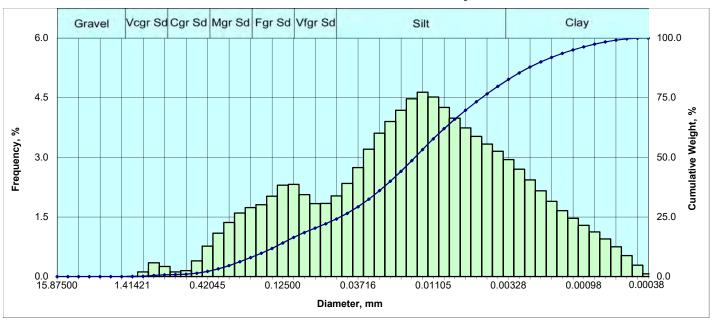
CL File No.: 1901575 Depth (ft): Nert3.60N1-42.3-42.5



	Particle Size Distribution						Sor	Sorting Statistics (Folk)			
	Diameter		Weig		Parameter	Trask	Inman	Folk			
	[US Mesh]	[in.]	[mm]	[•]	[Incl.]	[Cum.]					
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized		
	3/8 in.	0.375000	9.50000	-3.25	0.000	0.00					
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0004	0.0004	0.0004	
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0093	0.0093	0.0093	
	10	0.092913	2.00000	-1.23	0.000	0.00	(11111)	0.0093	0.0093	0.0093	
	12	0.066212	1.68179	-0.75	0.000	0.00	Mean		Silt sized		
V Crse	14	0.055678	1.41421	-0.50	0.000	0.00					
Sand	16	0.046819	1.18921	-0.25	0.000	0.00	(in)	0.0006	0.0003	0.0004	
	18 20	0.039370 0.033106	1.00000 0.84090	0.00 0.25	0.000 0.000	0.00 0.00	(mm)	0.0148	0.0088	0.0090	
Coarse	25 25	0.033100	0.70711	0.50	0.000	0.00	(11111)	0.0146	0.0066	0.0090	
Sand	30	0.023410	0.59460	0.75	0.000	0.00	Sorting		Very poor		
	35 40	0.019685	0.50000	1.00	0.000	0.00					
Ma dina		0.016553	0.42045	1.25	0.000	0.00		2.992	2.228	2.107	
Medium Sand	45 50	0.013919 0.011705	0.35355 0.29730	1.50 1.75	0.000 0.000	0.00 0.00	Skewness		lear symmetric	·al	
Julia	60	0.009843	0.25000	2.00	0.000	0.00	CROWNESS		icai symmetric	,ui	
	<u>60</u> 70	0.008277	0.21022	2.00 2.25	0.000 0.000	0.00	1	0.956	0.060	0.036	
Fine	80	0.006960	0.17678	2.50	0.007	0.01	l 				
Sand	100	0.005852 0.004921	0.14865	2.75	0.166	0.17	Kurtosis		Platykurtic		
	120 140	0.004921	0.12500 0.10511	3.00 3.25	0.700 1.332	0.87 2.21	1 1	0.208	0.471	0.850	
V. Fine	170	0.003480	0.08839	3.50	1.813	4.02		0.200	0.471	0.030	
Sand	200	0.002926	0.07433	3.75	2.182	6.20	Co	mponent Perce	ntages		
	230	0.002461	0.06250	4.00	2.534	8.73	Gravel Sand	Silt	Clay	Silt + Clay	
	270	0.002069	0.05256	4.25	2.843	11.58	0.00 0.70	CO 40	24.00	04.07	
	325 400	0.001740 0.001463	0.04419 0.03716	4.50 4.75	3.102 3.324	14.68 18.00	0.00 8.73	60.19	31.08	91.27	
0:14	450	0.001230	0.03125	5.00	3.538	21.54					
Silt	500	0.001035	0.02628	5.25 5.50	3.651	25.19	Percentile [Weight, %]	F	article Diamet	er	
	635	0.000870 0.000732	0.02210 0.01858	5.50 5.75	3.680 3.829	28.87 32.70	[Weight, %]	[in.]	[mm]	[phi]	
		0.000732	0.01562	6.00	4.175	36.88	5	0.0032	0.0821	3.6071	
		0.000517	0.01314	6.25	4.484	41.36					
		0.000435	0.01105	6.50	4.433	45.79	10	0.0023	0.0581	4.1059	
		0.000366 0.000308	0.00929 0.00781	6.75 7.00	4.180 3.940	49.97 53.91	16	0.0016	0.0414	4.5942	
		0.000259	0.00657 0.00552	7.25 7.50	3.940 3.788	57.70		0.0010	0.0414	1.0012	
		0.000217	0.00552	7.50	3.721	61.42	25	0.0010	0.0265	5.2356	
		0.000183 0.000154	0.00465 0.00391	7.75 8.00	3.721 3.778	65.14 68.92	40	0.0005	0.0139	6.1694	
		0.000134	0.00391	8.25	3.795	72.72	40	0.0003	0.0139	0.1094	
		0.000109	0.00276	8.50	3.730	76.45	50	0.0004	0.0093	6.7515	
		0.000091	0.00232	8.75	3.569	80.02	70	0.0004	0.0027	0.0007	
Clay		0.000077 0.000065	0.00195 0.00164	9.00 9.25	3.324 3.029	83.34 86.37	70	0.0001	0.0037	8.0667	
		0.000054	0.00138	9.50	2.730	89.10	75	0.0001	0.0030	8.3978	
		0.000046	0.00116	9.75	2.449	91.55					
		0.000038 0.000032	0.00098 0.00082	10.00	2.174 1.905	93.72 95.63	84	0.0001	0.0019	9.0509	
		0.000032	0.00069	10.25 10.50	1.604	95.63 97.23	90	0.0001	0.0013	9.5870	
		0.000023	0.00058 0.00049	10.75 11.00	1.270	98.50					
		0.000019	0.00049	11.00	0.898	99.40	95	0.0000	0.0009	10.1628	
		0.000016 0.000015	0.00041 0.00038	11.25 11.50	0.483 0.118	99.88 100.00	<u> </u>	1	<u> </u>		
		0.000015	0.00036	11.50	0.110	100.00	**All Grain Sizes Classed Usir	ng Wentworth Scal	e		
					•		-				



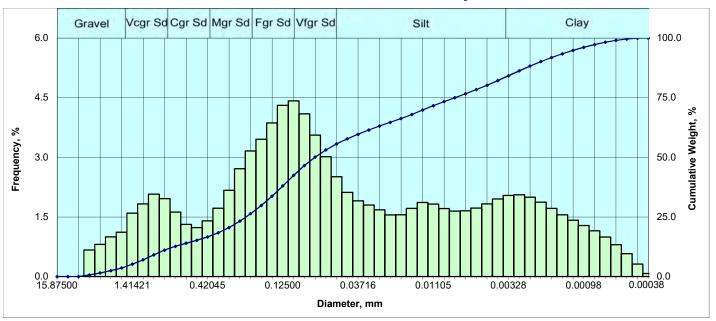
CL File No.: 1901575 Depth (ft): Nert4.65N1-53.0-53.3



		Particle	Size Distrib	ution	Sorting Statistics (Folk)					
		Diameter		Weig		Parameter	Trask Inman		Folk	
	[US Mesh]	[in.]	[mm]	[•]	[Incl.]	[Cum.]				
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9.50000	-3.25	0.000	0.00		•		
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0006	0.0006	0.0006
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0149	0.0149	0.0149
	10	0.092913	2.00000	-1.25 -1.00	0.000	0.00	(''''')	0.0149	0.0149	0.0149
	12	0.066212	1.68179	-0.75	0.000	0.00	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.003	0.00				
Sand	16	0.046819	1.18921	-0.25	0.117	0.12	(in)	0.0011	0.0007	0.0007
	18 20	0.039370 0.033106	1.00000 0.84090	0.00 0.25	0.348 0.254	0.47 0.72	(mm)	0.0273	0.0181	0.0170
Coarse	25	0.027839	0.70711	0.50	0.234	0.84	(11111)	0.0273	0.0101	0.0170
Sand	30	0.023410	0.59460	0.75	0.150	0.99	Sorting		Very poor	
	35 40	0.019685	0.50000	1.00	0.396 0.765	1.38				
Medium	40 45	0.016553 0.013919	0.42045 0.35355	1.25 1.50	0.765 1.092	2.15 3.24		3.126	2.580	2.493
Sand	50	0.013919	0.33333	1.75	1.362	4.60	Skewness	N	lear symmetric	al
Guna	60 70	0.009843	0.25000	2.00 2.25	1.598	6.20			our cymmound	,ui
	70	0.008277	0.21022		1. <u>598</u> 1.738	6.20 7.94		1.065	-0.113	-0.092
Fine	80	0.006960	0.17678	2.50	1.807	9.74	Vtaala	_		
Sand	100 120	0.005852 0.004921	0.14865 0.12500	2.75 3.00	2.022 2.300	11.77 14.07	Kurtosis		Mesokurtic	
	140	0.004321	0.10511	3.25	2.320	16.39	1 1	0.130	0.539	0.989
V. Fine	170	0.003480	0.08839	3.50	2.063	18.45				
Sand	200	0.002926	0.07433	3.75	1.836	20.29		mponent Perce		
	230	0.002461	0.06250	4.00	1.839	22.12	Gravel Sand	Silt	Clay	Silt + Clay
	270 325	0.002069 0.001740	0.05256 0.04419	4.25 4.50	2.028 2.343	24.15 26.50	0.00 22.12	57.63	20.24	77.88
	400	0.001463	0.03716	4.50 4.75	2.742	26.50 29.24	0.00 22.12	07.00	20.21	77.00
Silt	450	0.001230	0.03125	5.00	3.205	32.44				
J. C.II.	500 635	0.001035 0.000870	0.02628 0.02210	5.25 5.50	3.609	36.05	Percentile [Weight, %]	[in.]	Particle Diamet	er [phi]
	000	0.000732	0.01858	5.75	3.903 4.182	39.95 44.14				
		0.000615	0.01562	6.00	4.472	48.61	5	0.0112	0.2855	1.8082
		0.000517 0.000435	0.01314 0.01105	6.25 6.50	4.637 4.516	53.25 57.76	10	0.0068	0.1732	2.5292
		0.000366	0.00929	6.75	4.256	62.02	10	0.0008	0.1732	2.5292
		0.000308	0.00781	6.75 7.00	3.985	66.00	16	0.0043	0.1084	3.2052
		0.000259 0.000217	0.00657 0.00552	7.25 7.50	3.741 3.528	69.75 73.27	25	0.0020	0.0495	4.3355
		0.000217	0.00352	7.50 7.75	3.334	76.61	25	0.0020	0.0495	4.3355
		0.000154	0.00391	8.00	3.334 3.153	79.76	40	0.0009	0.0221	5.5025
		0.000129 0.000109	0.00328 0.00276	8.25 8.50	2.942 2.700	82.70	50	0.0006	0.0149	6.0705
		0.000109	0.00276	8.75	2.432	85.40 87.83	50	0.0006	0.0149	6.0705
Clay		0.000077	0.00195	9.00	2.157	89.99	70	0.0003	0.0065	7.2667
Ciay		0.000065	0.00164	9.25	1.894	91.89	75	0.0000	0.0054	7.0044
		0.000054 0.000046	0.00138 0.00116	9.50 9.75	1.661 1.464	93.55 95.01	75	0.0002	0.0051	7.6241
		0.000038	0.00098	10.00	1.288	96.30	84	0.0001	0.0030	8.3648
		0.000032	0.00082	10.25 10.50	1.124	97.42		0.0004	0.0000	0.0046
1		0.000027 0.000023	0.00069	10.50 10.75	0.945 0.748	98.37 99.12	90	0.0001	0.0020	9.0010
		0.000023	0.00058 0.00049	10.75 11.00	0.530	99.65	95	0.0000	0.0012	9.7480
		0.000016	0.00041	11.25 11.50	0.285	99.93				
		0.000015	0.00038	11.50	0.070	100.00	**All Grain Sizes Classed Usir	ng Wentworth Scal	е	
					L		1			



CL File No.: 1901575 Depth (ft): Nert3.40S1-47.0-47.3



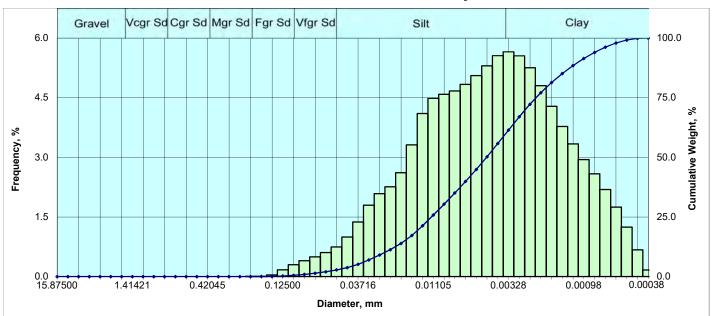
US Mesh In. Imm Is Incl. Cum.		Particle Size Distribution						Sol	Sorting Statistics (Folk)				
Si8 in. 0.625000 15.87500 -4.00 0.000 0.00 0		IIIC Machi					Parameter	Trask	Inman	Folk			
Gravel 4 0.187080 9.50000 -3.25 0.0000 0.00		[US Mesn]	[in.j	<u>[mmj</u>	101	[inci.]	[Cum.j						
Gravel 4					-4.00		0.00	Median	Very fine sand sized				
6					-3.25								
8	Gravel			4.75000	-2.25		0.00	(in)	0.0029	0.0029	0.0029		
10		8	0.131890	2.35000	-1.75 -1.25	0.667	0.67 1.48	[(mm)	0.0747	0.0747	0.0747		
V Crse								(,	0.07-17	0.07-17	0.0747		
Sand 16			0.066212	1.68179	-0.75	1.118		Mean		Silt sized			
18								11 "、	0.0040	0.0045	0.0040		
Coarse 20	Sand			1.18921	-0.25	1.827	7.02	(in)	0.0046	0.0015	0.0019		
Coarse Sand 25 (0) 27839 (0) 0.7711 (0.50) (0.50) (0.50) 1.622 (1.267 (1.339		20		0.84090	0.00	1 960	11 05	1 (mm)	0 1177	0.0390	0.0484		
Medium	Coarse	25	0.027839	0.70711	0.50	1.622	12.67		0.1177	0.0000	0.0101		
Medium	Sand	30				1.312	13.99	Sorting		Very poor			
Medium		35				1.233		4 1	F 400	2.545	2 220		
Sand 50	Medium							11	5.402	3.545	3.336		
60				0.29730	1.75		20.51	Skewness		Finely skewed	d		
Fine 80			0.009843	0.25000	2.00	2.713	23.22]	•				
Sand 100	F1					3.159	26.38	11	0.564	0.249	0.218		
120								Kurtosis		Diatykurtic			
V. Fine	Janu		0.003032	0.12500	3.00	4.309	38.01	Kurtosis		Flatykultic			
Sand 200					3.25	4.422	42.43	11	0.119	0.455	0.869		
230							46.53						
Silt	Sand										Silt + Clay		
Silt 325 0.001740 0.04419 4.50 1.906 59.64 4.50 0.001463 0.03716 4.75 1.906 59.64 450 0.001230 0.03125 5.00 1.801 61.44 5.00 0.000330 0.02628 5.25 1.679 63.12 63.5 0.000870 0.02210 5.50 1.551 64.67 0.000732 0.01858 5.75 1.555 66.23 0.000615 0.016562 6.00 1.716 67.94 0.000517 0.01314 6.25 1.864 69.81 0.000366 0.00929 6.75 1.710 73.34 0.000366 0.00929 6.75 1.710 73.34 0.000380 0.00781 7.00 1.646 74.98 0.000217 0.000517 0.000517 7.25 1.657 76.64 0.000217 0.000525 7.75 1.827 80.19 0.000154 0.000328 8.25 2.041 84.19 0.000109 0.00232 8.75 1.997 88.24 0.000077 0.00098 0.00077 0.00098 0.000077 0.00098 0.000077 0.00098 0.000077 0.00098 0.000077 0.00098 0.000078 0.000098 0.000064 0.000164 0.00018 0.000098 0.000098 0.000018 0.000032 0.000082 0.000098 0.000018 0.000032 0.000089 0.000089 0.000089 0.000089 0.000098 0.000018 0.00018 0.000018 0.000018 0.000018 0.000018 0.000018 0.00018 0.000018								Gravei Sand	Siit	Clay	Slit + Clay		
Silt		325	0.001740	0.04419	4.50	2.120	57.73	2.48 50.62	29.05	17.85	46.90		
Silt					4.75	1.906	59.64	11					
635	Silt			0.03125	5.00	1.801	61.44 63.12	Porcontilo		Particle Diamet	or		
0.000732		635		0.02210	5 50	1.551	64.67	[Weight, %]			[phi]		
Clay 0.000517 0.01314 6.25 1.864 69.81 0.000435 0.01105 6.50 1.823 71.63 10 0.0365 0.9262 0.000366 0.00929 6.75 1.710 73.34 0.000308 0.00781 7.00 1.646 74.98 16 0.0179 0.4556 0.000259 0.00657 7.25 1.657 76.64 0.000217 0.00552 7.50 1.724 78.37 25 0.0090 0.2277 2.000183 0.00465 7.75 1.827 80.19 0.000129 0.00328 8.25 2.041 84.19 0.000129 0.00328 8.25 2.041 84.19 0.000129 0.00276 8.50 2.058 86.25 50 0.0029 0.0747 3.000091 0.00232 8.75 1.997 88.24 0.000097 0.00195 9.00 1.873 90.12 70 0.0005 0.0129 0.00005 0.000054 0.00164 9.25 1.714 91.83 0.000054 0.00164 9.25 1.714 91.83 0.000054 0.00164 9.25 1.714 91.83 0.000054 0.0016 9.75 1.416 94.80 0.000032 0.00082 10.25 1.153 97.24 0.000032 0.00082 10.25 1.153 97.24 0.000032 0.00082 10.25 1.153 97.24 0.000027 0.00069 10.50 0.993 98.23 90 0.0001 0.0020 8.000016 0.00041 11.25 0.313 99.92 0.000016 0.00031 1.556 93.39 9.50 0.00001 0.000001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00000			0.000732	0.01858	5.75	1.555	66.23		0.0500	4 4404	0.5000		
Clay 0.000435							67.94 60.81	5	0.0569	1.4461	-0.5322		
Clay Clay O.000366				0.01314	6.50	1.823	71.63	10	0.0365	0.9262	0.1106		
Clay 0.000259 0.00657 7.25 1.667 76.64 0.000217 0.00552 7.50 1.724 78.37 0.000183 0.00465 7.75 1.827 80.19 0.000154 0.00391 8.00 1.955 82.15 0.000109 0.00276 8.50 2.058 86.25 0.000091 0.00232 8.75 1.997 88.24 0.0000077 0.00195 9.00 1.873 90.12 0.000065 0.00164 9.25 1.714 91.83 0.000054 0.00138 9.50 1.556 93.39 0.000046 0.00116 9.75 1.416 94.80 0.000032 0.00082 10.00 1.284 96.09 0.000032 0.00082 10.05 1.153 97.24 0.000027 0.00069 10.50 0.993 98.23 0.000027 0.00069 10.50 0.993 98.23 0.000016 0.00049 11.00 0.576 99.61 0.000016 0.00041 11.25 0.313 99.92			0.000366	0.00929	6.75	1.710	73.34						
0.000184			0.000308	0.00781	7.00	1.646	74.98 76.64	16	0.0179	0.4556	1.1341		
0.000184				0.00552	7.50	1.724	78.37	25	0.0090	0.2277	2.1351		
Clay 0.000129 0.00328 8.25 2.041 84.19 0.000109 0.00276 8.50 2.058 86.25 0.000091 0.00232 8.75 1.997 88.24 0.000077 0.00195 9.00 1.873 90.12 0.000065 0.00164 9.25 1.714 91.83 0.000054 0.00138 9.50 1.556 93.39 0.000046 0.00116 9.75 1.416 94.80 0.000032 0.00082 10.00 1.284 96.09 0.000032 0.00082 10.25 1.153 97.24 0.000027 0.00069 10.50 0.993 98.23 0.000027 0.00069 10.50 0.993 98.23 0.000023 0.00058 10.75 0.802 99.03 0.000019 0.00049 11.00 0.576 99.61 0.000016 0.00041 11.25 0.313 99.92			0.000183	0.00465	7.75	1.827	80.19						
Clay 0.000109 0.00276 8.50 2.058 86.25 0.000091 0.00232 8.75 1.997 88.24 0.0000077 0.00195 9.00 1.873 90.12 0.000065 0.00164 9.25 1.714 91.83 0.000064 0.00116 9.75 1.416 94.80 0.000032 0.00082 10.00 1.284 96.09 0.000032 0.00082 10.25 1.153 97.24 0.000027 0.00069 10.50 0.993 98.23 0.000027 0.00069 10.50 0.993 98.23 0.000019 0.00049 11.00 0.576 99.61 0.000016 0.00041 11.25 0.313 99.92					8.00			40	0.0046	0.1161	3.1071		
Clay 0.000077 0.00195 9.00 1.873 90.12 0.000065 0.00164 9.25 1.714 91.83 0.000054 0.00138 9.50 1.556 93.39 0.000046 0.00116 9.75 1.416 94.80 0.000032 0.00082 10.25 1.153 97.24 0.000027 0.00069 10.50 0.993 98.23 0.000027 0.00069 10.50 0.993 98.23 0.000023 0.00058 10.75 0.802 99.03 0.000019 0.00049 11.50 0.576 99.61 0.000016 0.00041 11.25 0.313 99.92				0.00328	8.25 8.50	2.041	84.19 86.25	50	0.0029	0.0747	3.7434		
Clay 0.000077 0.00195 9.00 1.873 90.12 0.000065 0.00164 9.25 1.714 91.83 0.000054 0.00138 9.50 1.556 93.39 0.000046 0.00116 9.75 1.416 94.80 0.000032 0.00082 10.00 1.284 96.09 0.000032 0.00082 10.25 1.153 97.24 0.000027 0.00069 10.50 0.993 98.23 0.000027 0.00069 10.50 0.993 98.23 0.000023 0.00058 10.75 0.802 99.03 0.000019 0.00049 11.00 0.576 99.61 0.000016 0.00041 11.25 0.313 99.92			0.000091	0.00232	8.75	1.997	88.24						
0.000054 0.00138 9.50 1.756 93.39 75 0.0003 0.0078 0.00038 0.00038 0.00038 0.00038 0.00038 0.00038 0.00038 0.00038 0.00038 0.00088 0.000032 0.00082 0.284 96.09 0.000032 0.00082 0.284 96.09 0.000032 0.00089 10.50 0.993 98.23 90.000032 0.00058 10.75 0.802 99.03 0.000033 0.00058 10.75 0.802 99.03 0.000019 0.00049 11.00 0.576 99.61 95 0.0000 0.0011 9.000016 0.00041 11.25 0.313 99.92	Clay				9.00		90.12	70	0.0005	0.0129	6.2747		
0.000046 0.00116 9.75 1.416 94.80 0.000038 0.00098 10.00 1.284 96.09 0.000032 0.00082 10.25 1.153 97.24 0.000027 0.00069 10.50 0.993 98.23 0.000023 0.00058 10.75 0.802 99.03 0.000019 0.00049 11.00 0.576 99.61 0.000016 0.00041 11.25 0.313 99.92				0.00164	9.25	1./14	91.83	75	0.0003	0.0078	7.0021		
0.000038 0.00098 10.00 1.284 96.09 0.000032 0.00082 10.25 1.153 97.24 0.000027 0.00069 10.50 0.993 98.23 0.000023 0.00058 10.75 0.802 99.03 0.000019 0.00049 11.00 0.576 99.61 0.000016 0.00041 11.25 0.313 99.92 0.000015 0.00028 11.50 0.0027 11.50 0.0027 11.00		1	0.000046	0.00116	9.75	1.416	94.80		0.0003				
0.000027 0.00069 10.50 0.993 98.23 0.000023 0.00058 10.75 0.802 99.03 0.000019 0.00049 11.00 0.576 99.61 0.000016 0.00041 11.25 0.313 99.92				0.00098	10.00	1.284	96.09	84	0.0001	0.0033	8.2250		
0.000023				0.00082	10.25		97.24	00	0.0001	0.0020	8.9831		
0.000019 0.00049 11.00 0.576 99.61 0.000016 0.00041 11.25 0.313 99.92		1		0.00058	10.75	0.802	99.03		0.0001	0.0020	0.3031		
1 0 000015 0 00020 11 50 1 0 077 100 00 1		1	0.000019	0.00049	11.00	0.576	99.61	95	0.0000	0.0011	9.7857		
			0.000016	0.00041	11.25	0.313	99.92				1		
**All Grain Sizes Classed Using Wentworth Scale		1	0.000015	0.00030	11.50	0.077	100.00	**All Grain Sizes Classed Usi	ng Wentworth Scal	e			



Company: Ramboll US Corporation Project Name: NERT Phase 3 MOD 6 Project Number: 1690011200-050

CL File No.: 1901575 Depth (ft): Nert3.63S1-49.0-49.4

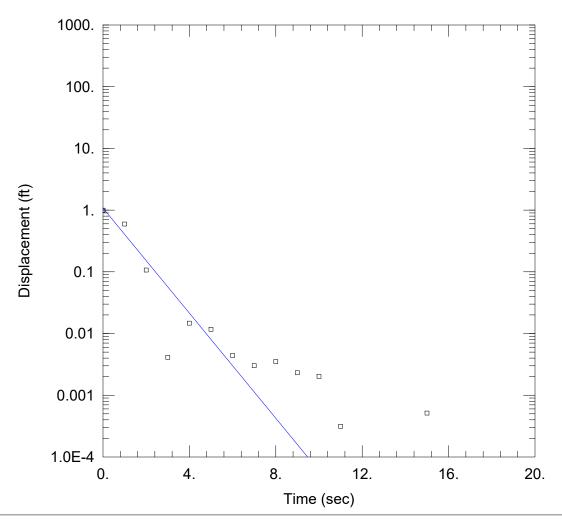
Sieve and Laser Particle Size Analysis



		Particle	Size Distrib	ution	Sorting Statistics (Folk)					
		Diam			Weig		Parameter	Trask	Inman	Folk
	[US Mesh]	[in.]	[mm]	[•]	[Incl.]	[Cum.]	1 0.0			
	5/8 in.	0.625000	15.87500	-4.00	0.000	0.00	Median		Silt sized	
	3/8 in.	0.375000	9.50000	-3.25	0.000	0.00		•		
Gravel	4	0.187008	4.75000	-2.25	0.000	0.00	(in)	0.0002	0.0002	0.0002
	6 8	0.131890 0.092913	3.35000 2.36000	-1.75 -1.25	0.000 0.000	0.00 0.00	(mm)	0.0047	0.0047	0.0047
	10	0.092913	2.00000	-1.25 -1.00	0.000	0.00	(''''')	0.0047	0.0047	0.0047
	12	0.066212	1.68179	-0.75	0.000	0.00	Mean		Silt sized	
V Crse	14	0.055678	1.41421	-0.50	0.000	0.00				
Sand	16	0.046819	1.18921	-0.25	0.000	0.00	(in)	0.0003	0.0002	0.0002
	18 20	0.039370 0.033106	1.00000 0.84090	0.00 0.25	0.000 0.000	0.00	(mm)	0.0068	0.0049	0.0048
Coarse	25	0.033100	0.70711	0.50	0.000	0.00	(11111)	0.0000	0.0043	0.0040
Sand	30	0.023410	0.59460	0.75	0.000	0.00	Sorting		Poor	
	35	0.019685	0.50000	1.00	0.000	0.00		0.005	4.750	4 700
Medium	40 45	0.016553 0.013919	0.42045 0.35355	1.25 1.50	0.000 0.000	0.00 0.00		2.325	1.758	1.733
Sand	50	0.013919	0.33333	1.75	0.000	0.00	Skewness		lear symmetric	al
Guna	60 70	0.009843	0.25000	2.00 2.25	0.000 0.000	0.00			our cymmound	,ui
	70	0.008277	0.21022		0.000	0.00		1.048	-0.111	-0.056
Fine	80	0.006960	0.17678	2.50	0.002	0.00	I/taala	_		
Sand	100 120	0.005852 0.004921	0.14865 0.12500	2.75 3.00	0.042	0.04 0.21	Kurtosis		Mesokurtic	
	140	0.004321	0.10511	3.25	0.169 0.299	0.51	1 1	0.199	0.603	0.949
V. Fine	170	0.003480	0.08839	3.50	0.400	0.91				
Sand	200	0.002926	0.07433	3.75	0.496	1.41		mponent Perce		
	230	0.002461	0.06250	4.00	0.604	2.01	Gravel Sand	Silt	Clay	Silt + Clay
	270 325	0.002069 0.001740	0.05256 0.04419	4.25 4.50	0.745 0.994	2.76 3.75	0.00 2.01	53.78	44.21	97.99
	400	0.001463	0.03716	4.75	1.374	3.75 5.12	0.00	00.70	77.21	07.00
Silt	450	0.001230	0.03125	5.00	1.797 2.085	6.92 9.00				
J. C.II.	500 635	0.001035 0.000870	0.02628 0.02210	5.25 5.50	2.085	9.00 11.26	Percentile [Weight, %]	Particle Diamet		er [phi]
	000	0.000732	0.01858	5.75	2.259 2.614	11.26 13.88				
		0.000615	0.01562	6.00	3.313	17.19	5	0.0015	0.0378	4.7258
		0.000517 0.000435	0.01314 0.01105	6.25 6.50	4.103 4.486	21.29 25.78	10	0.0010	0.0244	5.3549
		0.000433	0.00929	6.75	4.585	30.36	10	0.0010	0.0244	3.3349
		0.000308	0.00781	7.00	4.671	35.04	16	0.0007	0.0167	5.9051
		0.000259 0.000217	0.00657 0.00552	7.25 7.50	4.835 5.059	39.87 44.93	25	0.0004	0.0114	6.4534
		0.000217	0.00332	7.75	5.304	50.23	25	0.0004	0.0114	0.4334
		0.000154	0.00391	8.00	5.555	55.79	40	0.0003	0.0065	7.2559
		0.000129 0.000109	0.00328 0.00276	8.25 8.50	5.652 5.553	61.44	50	0.0002	0.0047	7.7380
		0.000091	0.00276	8.75	5.254	66.99 72.25	30	0.0002	0.0047	7.7300
Clay		0.000077	0.00195	9.00	4.805 4.283	77.05	70	0.0001	0.0025	8.6377
Ciay		0.000065	0.00164	9.25	4.283	81.34	75	0.0004	0.0004	0.0070
		0.000054 0.000046	0.00138 0.00116	9.50 9.75	3.779 3.337	85.11 88.45	75	0.0001	0.0021	8.8879
		0.000038	0.00098	10.00	2.943	91.39	84	0.0001	0.0015	9.4217
		0.000032	0.00082	10.25 10.50	2.583	93.98		0.0000	0.0044	0.0700
1		0.000027 0.000023	0.00069	10.50 10.75	2.189 1.748	96.17 97.91	90	0.0000	0.0011	9.8762
		0.000023	0.00058 0.00049	10.75 11.00	1.246	99.16	95	0.0000	0.0008	10.3615
		0.000016	0.00041	11.25 11.50	0.674	99.83				
		0.000015	0.00038	11.50	0.166	100.00	**All Grain Sizes Classed Usir	ng Wentworth Scal	е	

Appendix G

AQTESOLV Analysis



NERT3.58S1 FALLING HEAD TEST

Data Set: C:\...\NERT3.58S1 Falling Head Test.aqt

Date: 05/02/19 Time: 15:53:39

PROJECT INFORMATION

Company: <u>AECOM</u> Client: <u>NDEP</u> Project: 60477365

Location: Las Vegas Wash, Henderson NV

Test Well: <u>NERT3.58S1</u> Test Date: <u>4/19/2019</u>

AQUIFER DATA

Saturated Thickness: 20.54 ft Anisotropy Ratio (Kz/Kr): 0.3

WELL DATA (NERT3.58S1)

Initial Displacement: <u>0.996</u> ft Static Water Column Height: <u>20.54</u> ft

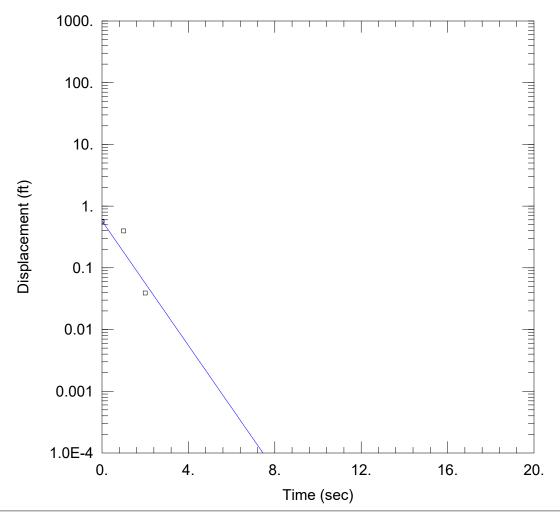
Total Well Penetration Depth: 55. ft Screen Length: 20. ft Well Radius: 0.3333 ft Gravel Pack Porosity: 0.3

Gravel Pack Porosity: <u>0.3</u>

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 413.8 ft/day y0 = 1.078 ft



NERT3.58S1 RISING HEAD TEST

Data Set: C:\...\NERT3.58S1 Rising Head Test.aqt

Date: 05/03/19 Time: 13:45:38

PROJECT INFORMATION

Company: <u>AECOM</u> Client: <u>NDEP</u> Project: 60477365

Location: Las Vegas Wash, Henderson NV

Test Well: <u>NERT3.58S1</u> Test Date: <u>4/19/2019</u>

AQUIFER DATA

Saturated Thickness: 20.54 ft Anisotropy Ratio (Kz/Kr): 0.3

WELL DATA (NERT3.58S1)

Initial Displacement: 0.5663 ft

Static Water Column Height: 20.54 ft

Total Well Penetration Depth: <u>55.</u> ft

Screen Length: 20. ft Well Radius: 0.3333 ft Gravel Pack Porosity: 0.3

Casing Radius: 0.167 ft

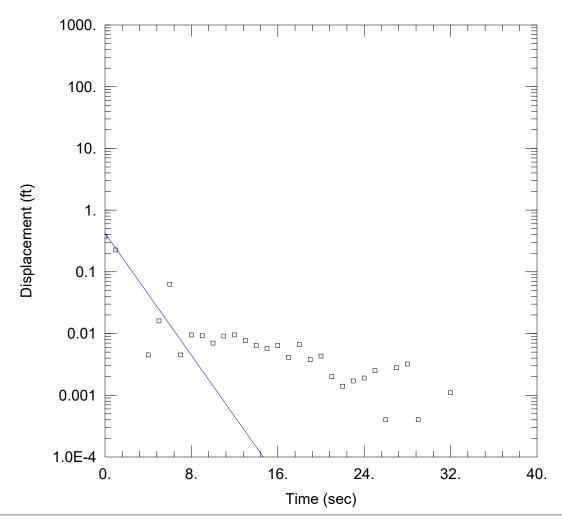
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 490.3 ft/day

y0 = 0.5745 ft



NERT3.60S1 FALLING HEAD TEST

Data Set: C:\...\NERT3.60S1 Falling Head Test.aqt

Date: 05/02/19 Time: 15:56:22

PROJECT INFORMATION

Company: <u>AECOM</u> Client: <u>NDEP</u> Project: 60477365

Location: Las Vegas Wash, Henderson NV

Test Well: <u>NERT3.60S1</u> Test Date: <u>4/19/2019</u>

AQUIFER DATA

Saturated Thickness: 26.48 ft Anisotropy Ratio (Kz/Kr): 0.3

WELL DATA (NERT3.60S1)

Initial Displacement: 0.3764 ft

Static Water Column Height: 16.48 ft

Total Well Penetration Depth: 55. ft

Screen Length: 20. ft Well Radius: 0.3333 ft Gravel Pack Porosity: 0.3

Casing Radius: <u>0.167</u> ft

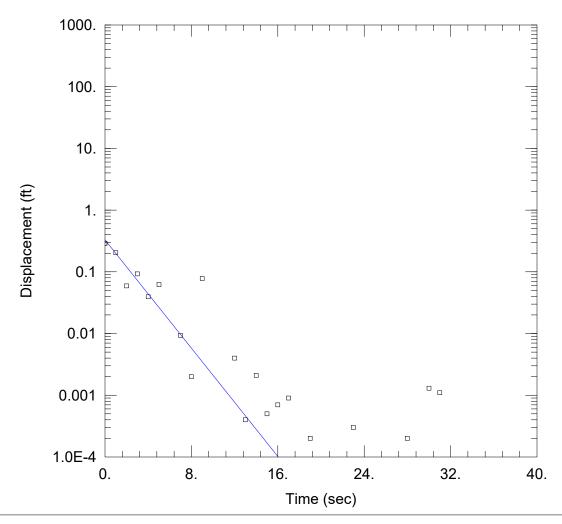
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 240.6 ft/day

y0 = 0.4246 ft



NERT3.60S1 RISING HEAD TEST

Data Set: C:\...\NERT3.60S1 Rising Head Test.aqt

Date: 05/03/19 Time: 09:55:26

PROJECT INFORMATION

Company: <u>AECOM</u> Client: <u>NDEP</u> Project: 60477365

Location: Las Vegas Wash, Henderson NV

Test Well: <u>NERT3.60S1</u> Test Date: <u>4/19/2019</u>

AQUIFER DATA

Saturated Thickness: <u>26.48</u> ft Anisotropy Ratio (Kz/Kr): <u>0.3</u>

WELL DATA (NERT3.60S1)

Initial Displacement: 0.2894 ft

Static Water Column Height: 16.48 ft

Total Well Penetration Depth: 55. ft

Screen Length: 20. ft Well Radius: 0.3333 ft

Casing Radius: 0.167 ft

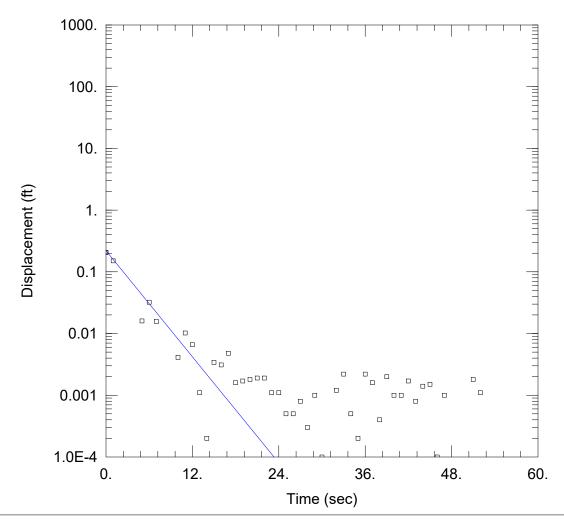
Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 213.2 ft/day y0 = 0.3297 ft



NERT4.64S1 FALLING HEAD TEST

Data Set: C:\...\NERT4.64S1 Falling Head Test 2.aqt

Date: 05/03/19 Time: 09:56:40

PROJECT INFORMATION

Company: <u>AECOM</u> Client: <u>NDEP</u> Project: 60477365

Location: Las Vegas Wash, Henderson NV

Test Well: <u>NERT4.64S1</u> Test Date: <u>4/19/2019</u>

AQUIFER DATA

Saturated Thickness: 20.54 ft Anisotropy Ratio (Kz/Kr): 0.3

WELL DATA (NERT4.64S1)

Initial Displacement: 0.2064 ft

Static Water Column Height: 20.54 ft

Total Well Penetration Depth: 55. ft

Screen Length: 20. ft Well Radius: 0.3333 ft Gravel Pack Porosity: 0.3

Casing Radius: 0.167 ft

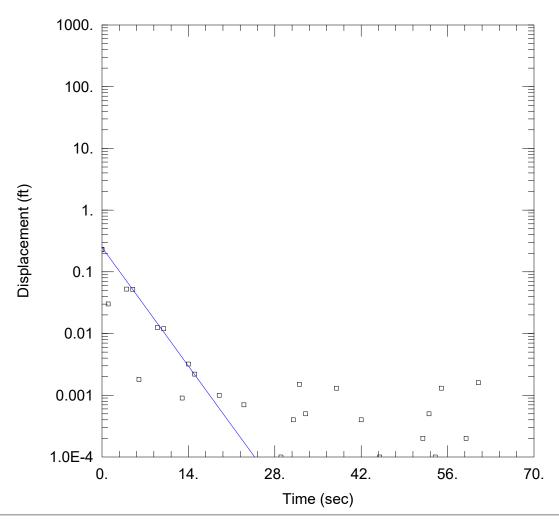
SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 139.2 ft/day

y0 = 0.2201 ft



NERT4.64S1 RISING HEAD TEST

Data Set: C:\...\NERT4.64S1 Rising Head Test 2.aqt

Date: 05/03/19 Time: 09:58:04

PROJECT INFORMATION

Company: <u>AECOM</u> Client: <u>NDEP</u> Project: 60477365

Location: Las Vegas Wash, Henderson NV

Test Well: <u>NERT4.64S1</u> Test Date: <u>4/19/2019</u>

AQUIFER DATA

Saturated Thickness: 20.54 ft Anisotropy Ratio (Kz/Kr): 0.3

WELL DATA (NERT4.64S1)

Initial Displacement: <u>0.23</u> ft Static Water Column Height: <u>20.54</u> ft

Total Well Penetration Depth: 55. ft Screen Length: 20. ft Well Radius: 0.3333 ft Gravel Pack Porosity: 0.3

SOLUTION

Aguifer Model: Unconfined Solution Method: Bouwer-Rice

K = 133.4 ft/day y0 = 0.2492 ft

Appendix H

Nuclear Magnetic Resonance Logs

NDEP Phase II Groundwater Investigation – Javelin Nuclear Magnetic Resonance Logging NERT Downgradient Study Area

Final NMR Logging Results Provide by Ramboll

NMR Logging Method Overview

The Nuclear Magnetic Resonance (NMR) logging method uses the physics of nuclear magnetic resonance to directly measure fluid hydrogen in groundwater. The downhole NMR probe contains magnets components being associated with smaller pores and longer T2 that polarize the fluid hydrogen, creating a net nuclear magnetization, present. Radio-frequency coils within the probe transmit EM pulses to excite this hydrogen magnetization and measure its response. The measured NMR signal has a detected amplitude and decays over time. The signal amplitude and decay rate provides useful information about the hydrogeologic properties of the investigated material.

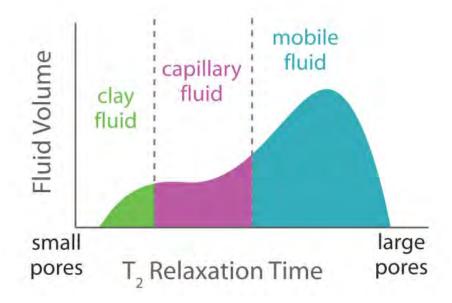
(e.g. a sand). In heterogeneous materials, the T2 distribution provides an indication of the relative pore-size distribution with shorter T2 components being associated with larger pores. Given the sensitivity to the magnitude of which is proportional to the number of fluid hydrogen water content and pore size, the NMR data may also be used to estimate permeability or hydraulic conductivity. Equations used to estimate hydraulic conductivity are explained later.

The initial amplitude of the NMR signal directly reflects the quantity of hydrogen in the formation or the volumetric water content (porosity if saturated). The decay time of the signal T2 indicates whether the water is in "bound" small pores (e.g. as in a silt) or is mobile in large pores

"Mobile" and "Bound" Water

The T2 distribution indicates a relative pore size distribution and can be subdivided to estimate the fraction of water that is more bound and more mobile. The total integral (total area under) the T2 distribution is the total water content. The area under any subdivided range of the distribution represents the total amount of water having T2 within that range.

Using standard cutoff times derived from oil reservoir sandstones, water with T2 longer than 33ms is estimated as "mobile" water; water with T2 less than 33ms is estimated as "bound" water. Because these standard cutoff times are based on reservoir sandstones, in other rock/sediment types, the cutoffs and definitions of "bound" and "mobile" should not be considered in a definite sense but rather a way to distinguish "more bound" water from "more mobile" water.



Hydraulic Conductivity Estimation

Hydraulic conductivity (K) estimation from NMR is based on the fact that the NMR The equation for KSDR is known as the Schlumberger Doll Research Equation, measurement is sensitive to both porosity (via the signal amplitude) and pore size (via the decay time T2). These are the two most important parameters determining hydraulic conductivity in sedimentary rocks and unconsolidated sediments. The Kozeny-Carmen equation is an analytical equation that predicts K based on the pore signal amplitude squared, thereby incorporating both signal amplitude and decay diameter (dpore), porosity (φ) , and tortuosity (τ) of the system. The NMR K estimators used here, essentially can be understood as substituting NMR measured parameters into the well-known analytically derived Kozeny-Carmen equation KKC. These equations are shown below:

$$K_{KC} = \frac{\phi d_{pore}^2}{\tau}$$
 $S_0 \propto \phi$ $T_2 \sim d_{pore}$ $K_{SDR} = b_{SDR} T_{2ml}^2 S_0^N$ $K_{SOE} = b_{SOE} \overline{S(t)}^2$

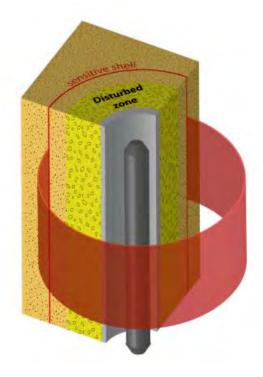
and estimates K using NMR estimated porosity (from the initial amplitude S0) and the mean-log T2 decay time in the T2 distribution. The equation for KSOE is known as the squared mean-of-echoes equation and estimates K as a function of the mean time. Both equations include a calibration coefficient b. For this data, we have used calibration coefficients that have been derived from NMR logs and pump tests from several unconsolidated sediment aquifer sites through the US.

The K values estimated from these two equations will differ to some extent because they are based on different models. In practice has shown the SOE estimator to be more stable in high noise environments. Because the SOE is strongly weighted by the longest relaxation time, it is not strongly influenced by the presence of clay fractions. The SDR, which is weighted by the log-mean relaxation time, tends to be more strongly influenced by the mean pore size and presence of clay fractions. These equations have primarily been calibrated and validated in materials ranging from <10-3 m/d to 102 m/d.

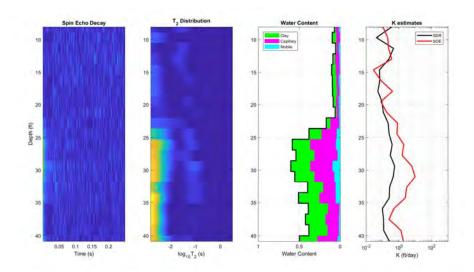
Javelin NMR Instrumentation

The configuration of the Vista Clara Javelin NMR logging tools allows data to be acquired within a sensitive zone shaped as a thin cylindrical shell that avoids sensitivity to formation disturbance and well construction nearby the tool. Javelin probes are available in different diameters with larger diameter tools providing a larger diameter sensitive zone. For the tools used in this work, the JP175 has a sensitive diameter of approximately 10 inches and the JP350 has a sensitive diameter of approximately 15 inches. In both cases, the sensitive zone has a vertical length of 50cm, which defines the vertical resolution of the measurements.

Data are acquired using a dual-frequency mode allowing independent measurements of two discrete sensitive shells located within ~0.5 inches of the nominal sensitive shell diameter. A lower frequency measurement is used to detect water in the deeper sensitive shell and a higher frequency is used to measure water in the shallower sensitive shell. In most cases, the formation is sufficiently homogeneous radially that data at these different radial distances are identical. As such, these two datasets are typically combined by averaging to generate a combined dual-frequency log. Significant differences between data for the two shells can indicate the measurements are influenced by well disturbance or construction artifacts.



Example Log



An example NMR log is shown here with four panels. In all panels, depth below the well head is on the y-axis. The panel at the far left shows the NMR signal decaying in time. The second panel shows the T2 distribution at every depth level. Water signals are shown in warm colors (dark blue is not signal) and the position of the signal along the horizontal axis indicates the T2 decay time of the signal on a logarithmic scale [e.g. log10(-2) s = 10-2 s = 10 ms]. Water constricted in smaller pores will plot towards the left of the distribution (short T2) and water in large spaces will plot to the right of the distribution (long T2). The third panel shows the total water content, mobile fraction, capillary fraction, and clay fraction at every depth level. The fourth panel shows the estimated K, based on the SDR (black) and SOE (red) equations. The fourth panel shows the noise level for each depth measurement. The noise level reflects the reliability of the data. The red and blue curves indicate the noise level in each of the two frequency datasets; the green curve shows the noise level of the combined frequency data. In areas where the combined (green) noise is very low (<7%), the data are most reliable; in areas where the noise is moderate to high 7%-10% the data are of reduced reliability but can still be quantitatively interpreted; in areas where the noise is 10-20%, the data should be interpreted qualitatively; data should not be interpreted in area where the noise is >20%. In general, the noise level is good at this site when the tool is below the water table and can become poor when the tool is above the water table. Therefore results in the vadose zone should be interpreted with caution.

Data Processing

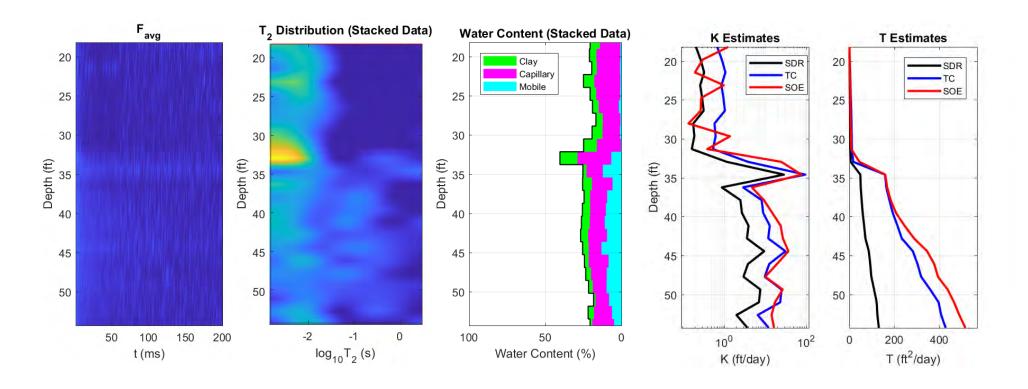
- Data were processed with the following parameters (selectable as options in Vista Clara's Javelin NMR processing software):
- Multi (2 or 4) frequency data were combined in final processing.
 Uncombined individual frequency data were visualized in preprocessing to assess variability between the frequency shells.
- A regularization value of 30 was used in all cases.
- The following hydraulic conductivity estimation coefficients were used: bSDR=8900; bSOE=4200.

NMR Logs

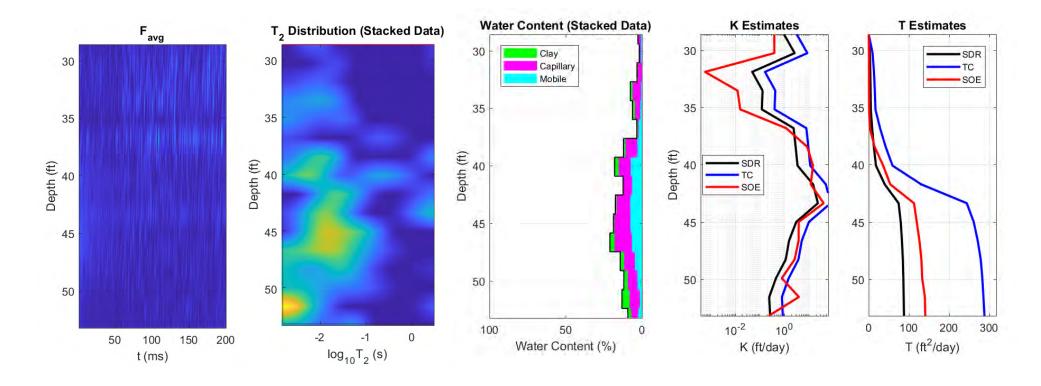
On the following pages, the NMR log composites for each hole are plotted.

6/11/2019

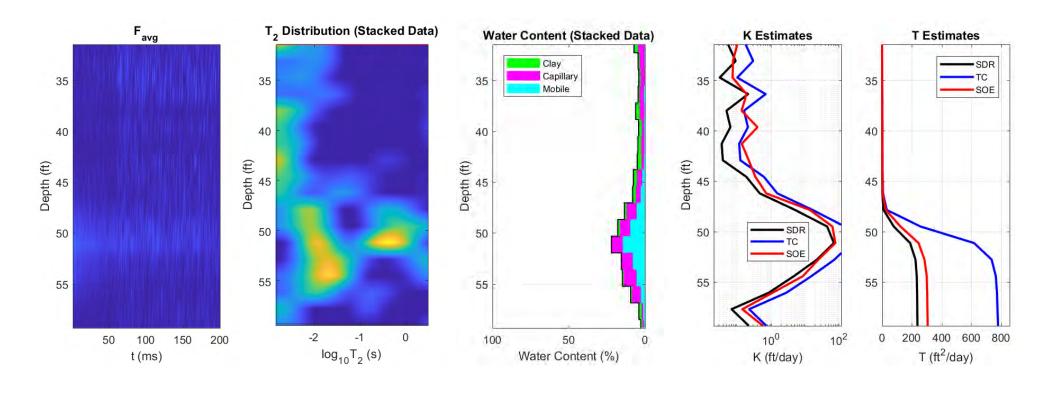
NERT3.35S1 – Phase II Groundwater Well



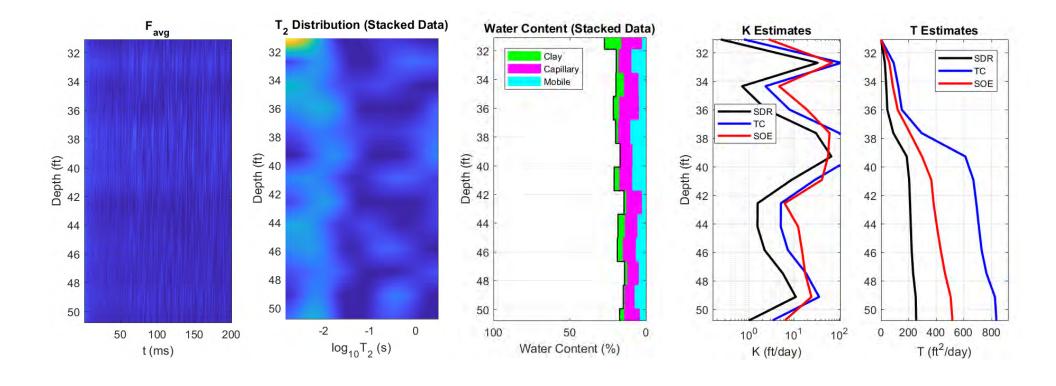
NERT3.40S1 – Phase II Groundwater Well



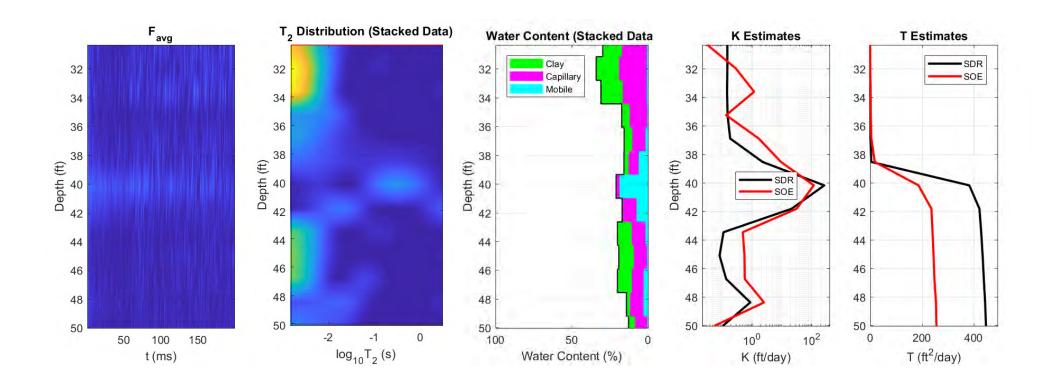
NERT3.58N1 – Phase II Groundwater Well



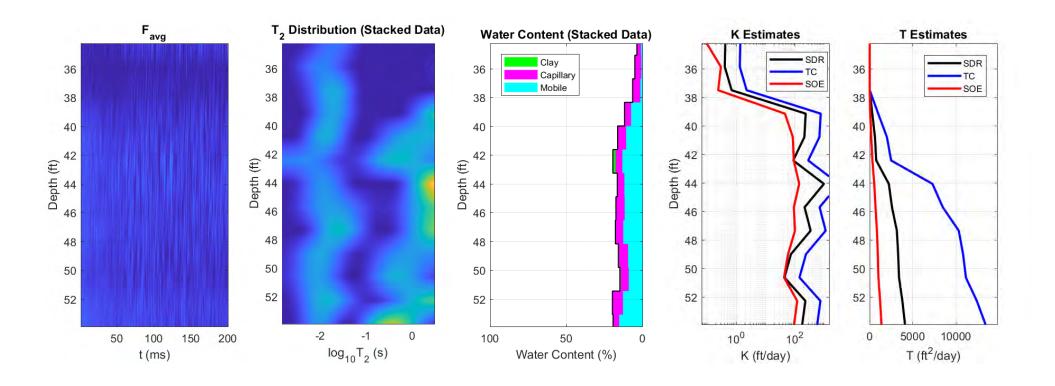
NERT3.58S1 - Phase II Groundwater Well



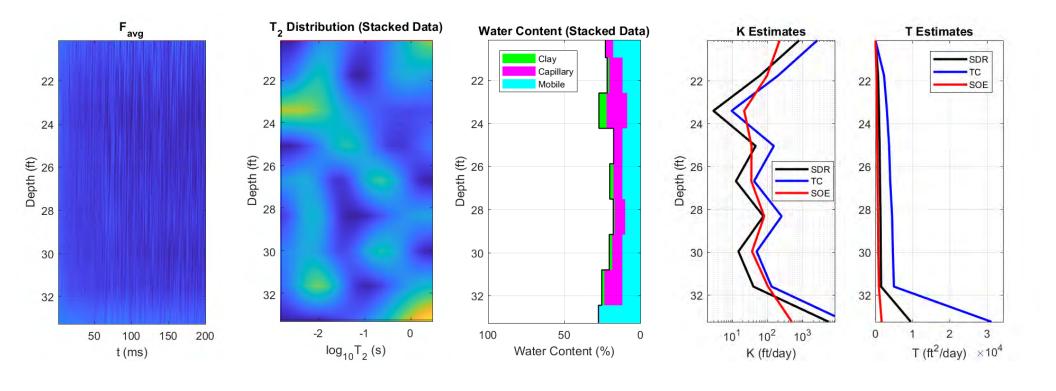
NERT3.60N1 – Phase II Groundwater Well



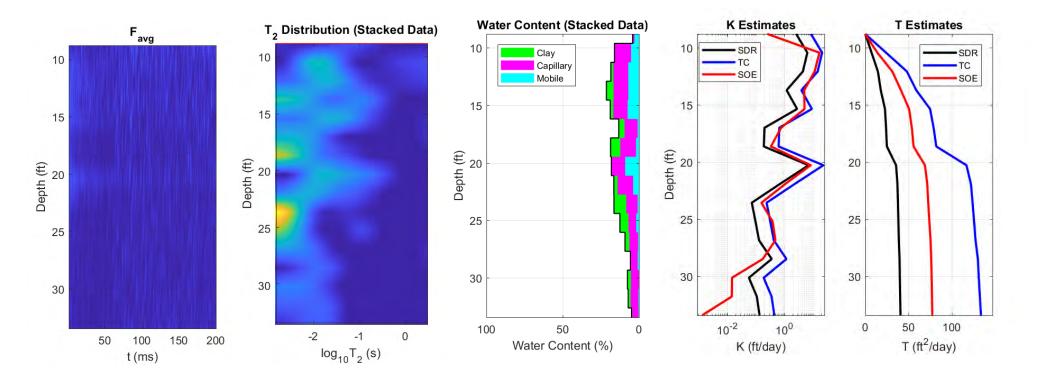
NERT3.60S1 – Phase II Groundwater Well



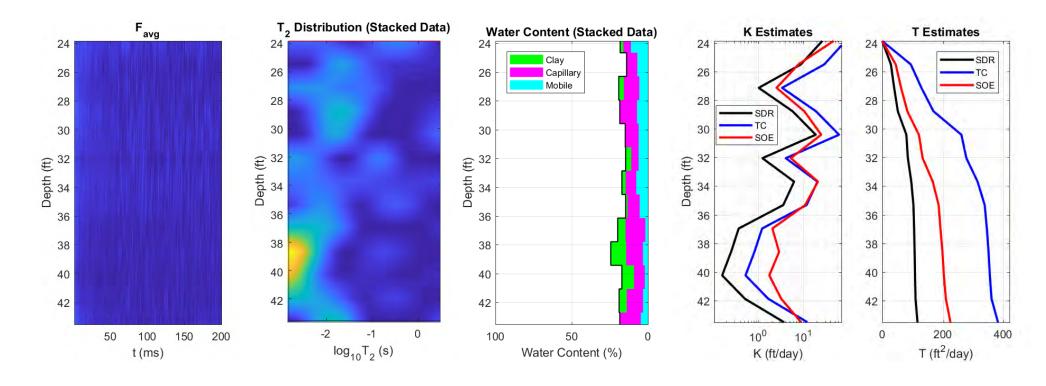
NERT3.63S1 – Phase II Groundwater Well



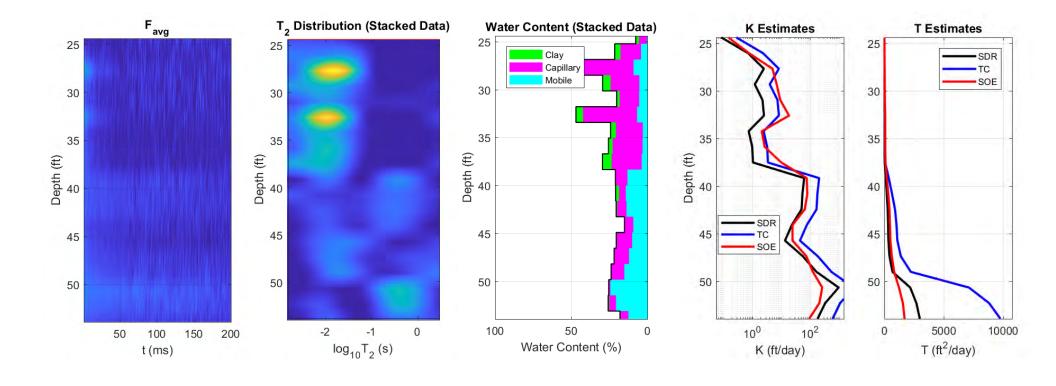
NERT3.98S1 - Phase II Groundwater Well



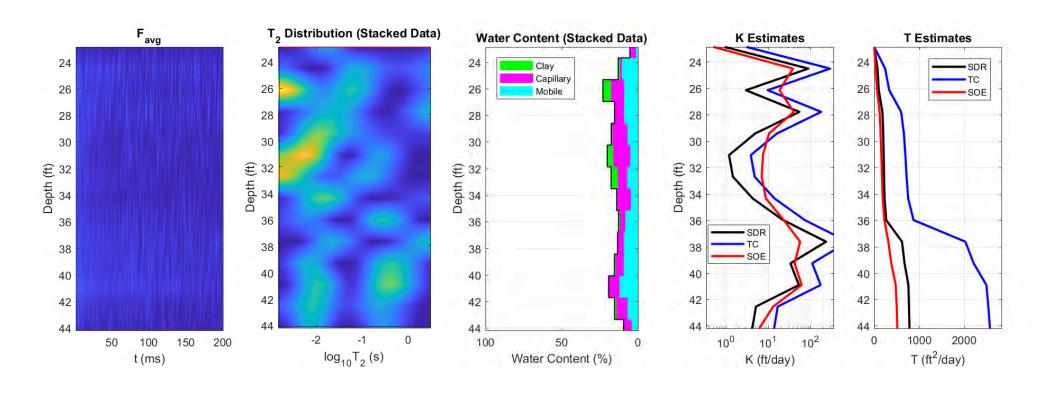
NERT4.64N1 – Phase II Groundwater Well



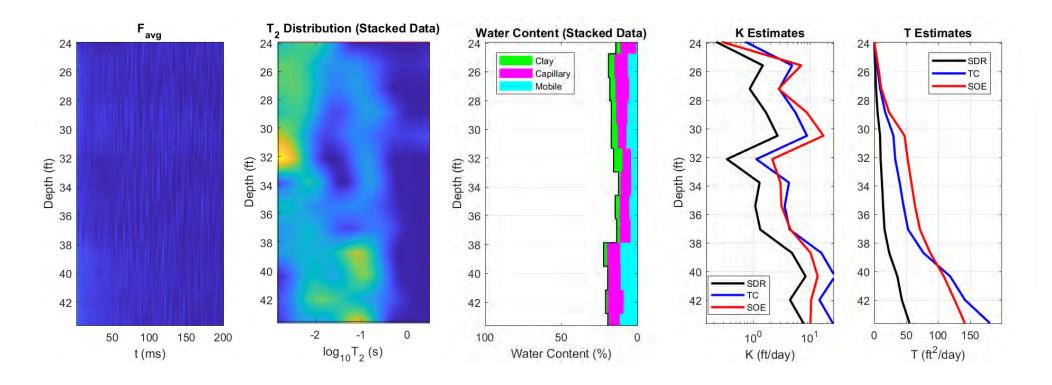
NERT4.64S1 – Phase II Groundwater Well



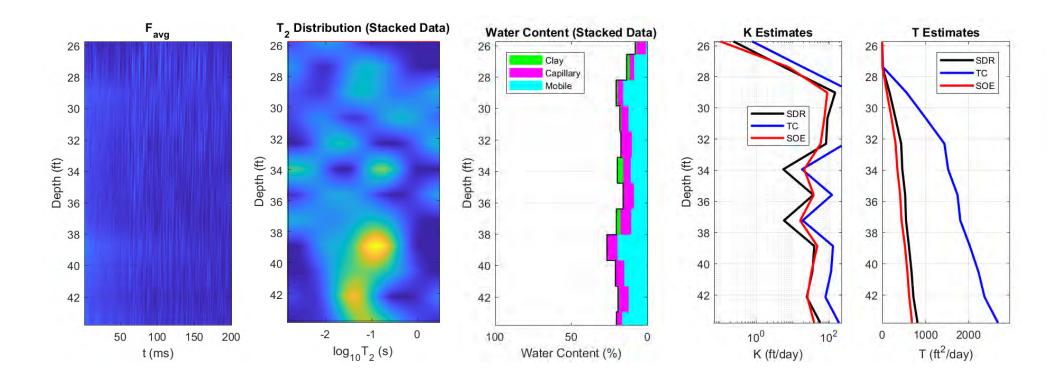
NERT4.65N1 – Phase II Groundwater Well



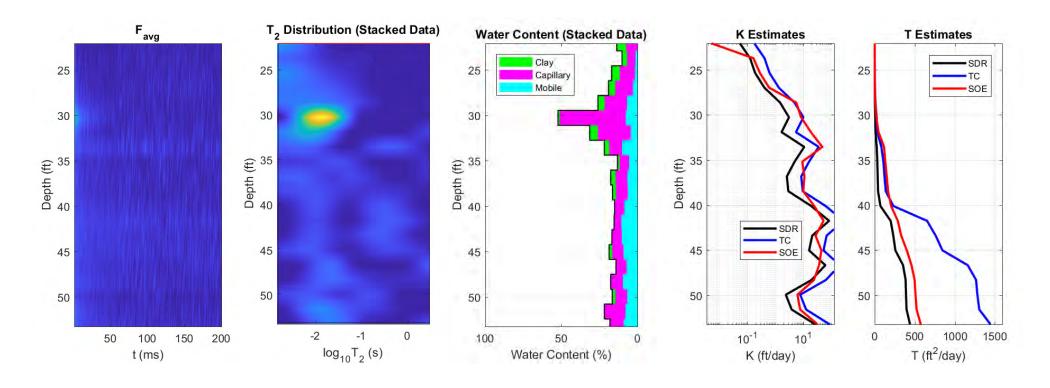
NERT4.70N1 – Phase II Groundwater Well



NERT4.71N1 – Phase II Groundwater Well



NERT4.71S2 - Phase II Groundwater Well



Appendix I

Groundwater Sampling Records

Well ID: PA-30

Client:	NE	<u>ер</u>)ate:	JER/19	Tin	ne: Start <u>O</u>	255 am/pm
Project N		60477	365						Finish /	ໄບບ am/pm
Site Loca			T LV	W						
Weather	Conds:		_	1. Het 9	O°	Collector(s)	: J CAR	TRIOCAE	com) & WA	MG(GES)
1 WATE	RIEVEL	DATA.	(measi	red from To	of Casin	a)				
				•		-	n /= h\		Casing Diam	eter/Material
a. roti	ai vveii Le	ngtn_3	710	c. Length of	vvater Col	umn <u>/3,0</u>	<u>C</u> (a-b)		4"	
b. Wa	ter Table I	Depth _	904	d. Calculate	d System \	/olume (see	back) 9	8		
	. PURGE I		Los	· Phr !	ladlor	Rump				
b. Acc	eptance C	riteria d		see workplan		,				
	perature	+2		-D.O.	, 0.3 m	q/l				
- pH	•	_	.1 unit	Turbidity		f NTU read	ing is > 10	NTUs		
- Sp. (Cond.	±3	%	ORP		milivolts	Ū			
c. Fiel	d Testing	Equipm	ent use		ake		Model		Serial	Number
				LuMoth	Surbia	Meter	2000	4	71-32	2/8
				45	I		556		152100	26.7
Time	Volume	LTomp		Spec. Cond.	DO	OPP	Tuelsielite	Flow Bata	Drawdowa	C-1/O-1
Time (24hr)	Removed (Liters)	(°C)	<u>pH</u>	<u>spec, Cond.</u> (μ\$/cm)	DO (mg/L)	ORP (mV)	(NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
1005	0.5	26,45	7.31	10720	5.42	650	21,1	150	19.08	Clear I None
1011	1.6	24.78	7.27	11404	5.11	65.8	17.3	180	19,08	li .
1017	2.7	24.18		9916	3.00	72-1	141.3	180	1928	"
1023	3.8	24.55		8144	2.44	72.5	15.1	KU	19.68	
1029	4.9	24.67		7365	1.82	72.9	11.3	180	19.08	11
1025	6.0	24.82		6991	1.42	72.9	9.27	180	19.09	1
1041	7./	24.79		6858	1-53	74.3	8.96	190	19.08	<i>JI</i>
1047	9.2	24.70		6897	1.50	72.4	9.04	180	19.08	11
d. Ace	ceptance o	criteria p	ass/fail		Yes N	o N//	4			(continued on back)
Ha	ve parame	eters sta	bilized							
	16 N	/A E.	deie bel							
	If no or N	/A - Ext	nam bei	ow.						
2 CAMD	LE COLL	ECTION	1•		Lon fi	1.11				
J. OAMI	LE GOLL	LOTION	4.	wethou.	conti	CW TAS	ng			_
Sample II		ontainer	Туре	No. of Cont	ainers	Prese	rvation	Analysi	s Req.	Time
AA 3	30-2019	070F					1984-19			
		250 W	12 Pos	4	/	Non	P.	Puchl	net	1000
		25 m		, , ,	/	80		chler	te	1050
0		7								
Commen		mp E	- 30	~						
	140	cone	-10	11	_					
Signature			2	1/	100			Date	7/4/19	,
ga				2					11111	

Well	ID:	COHZB	1
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Client:	NE	EP			D	ate: _ 7 /	3/19	Tin	ne: Start 🙆	9.55 am/pm
Project No	o: <u></u>	0477	365						Finish_/	106am/pm
Site Local	tion:	NE	et L	VW						
Weather (Conds: <u>&</u>				5	Collector(s)	JCAR	trio cae	com) E WA	NG (GES)
				red from Top	-				O : D:	
a. Tota	ai Well Ler	ngth_64	138	c. Length of	Water Colu	ımn <u>47,4</u>	<u>~</u> (a-b)		Z"	neter/Material
b. Wat	ter Table (Depth <u>//</u>	6.73	d. Calculated	l System V	olume (see	back)	7.78		
	PURGE D ge Method	DATA	low-	Flow bla	Mor 1	Pung				_
b. Acc	eptance C	riteria d	efined	(see workplan)						
- Tem	perature	<u>+</u> 2	°C	-D.O.	0.3 mg	g/l				
- pH		± 0.	.1 unit	Turbidity	10% if	NTU read	ing is > 10	NTUs		
- Sp. C	Cond.	± 3'	%	ORP	<u>+</u> 10 n	nilivolts				
c. Field	d Testing I	Equipmo	ent use		ake		Model		Serial	Number
				La Motte		Motor	wet			3218
	Malana			45	I		556		17210	0967
Time	Volume	Tomo	- LI	Saca Cond	DO	OPP	Tuebielitu	Elevi Boto	Drowdown	Colon/Odon
<u>Time</u> (24hr)	(Liters)	(°C)	рH	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	(NTU)	Flow Rate (ml/min)	Drawdown (feet)	Color/Odor
1005	0.6	26.45	7.44	36 19	2.41	529	625	150	14.70	Contara ne
1011	1.7	24.84	7.20	3376	1.05	46.6	262	180	16.71	Chudy non
1017	2.8	24.57		3237	1,00	49.4	106.5	180	14.71	11
1023	3.8	24.63		32413	1.00	48.4	37.4	180	16.71	Clear I Work
1029	5.0	24.57		3216	1.49	49.6	12.4	140	16.71	11
1035	7.2	24.55		3215	1.45	490	9.82	140	16.71	"
IOUK		de	, , , , ,	DE 2/1/14		1,12	71.0			
	ceptance o		ass/fail	4 11114	Yes No	N/A	1			(continued on back)
	•				4					
Hav	ve parame	eters sta	bilized							
	If no or N	/A - Exp	ilain be	ow.	In					
	_	_		NA						_
3. SAMP	LE COLLI	ECTION	l :	Method:	Con flo	in tubis	14			
							0			- 1A Co
Sample II		ontainer		No. of Conta	ainers	Prese	rvation	Analysi	s Req.	Time
COH	1281-	20190	1743							
		200 4	2 /	7/	/	11.			11 6	1045
		125 m		20.6	,	Not ED+		- l	1-4	1045
			- 00	1				661		1011
Commont	0		1	21	(
Comment	15	mp	16	00	1				-	
	ve	em C			1				,	,
Signature	_		1	1				Date	7/3/3	5
5					- 1					

Well ID: LNDMW !

Client:	ND		-		D	ate: 6	124/19	Tir		<u>930</u> am/pm
Project N		604	7734	-					Finish	<u> </u>
Site Loca	_	NEE	JT-L	VW						
Weather	Conds: _	mnny,	calm	, www.	<u>~ 91" (</u>	Collector(s)	JCARO	Pho CAEQ	m) & WANG	DGMKe CGE
1. WATE	R LEVEL	DATA:	(meası	red from To	p of Casing	g)				
a. Tot	al Well Le	ength_6	1.43	c. Length o	f Water Col	umn 24.	(a-b)		Casing Diam	neter/Material
b. Wa	ter Table	Depth 3	481	d. Calculate	ed System V	olume (see	back)	4.00		
2. WELL a. Pur	PURGE ge Metho	DATA d:	Lun	- Flow	bladde	Pen	P			
				see workplaı			'			
	perature	<u>+</u> 2°		-D.O.	0.3 mg	-				
- pH			.1 unit	Turbidity		NTU read	ing is > 10	NTUs		
- Sp. (Cond.	± 3°	%	ORP	<u>±</u> 10 n	nilivolts				
c. Fiel	d Testing	Equipme	ent use	d: N	/lake		Model		Serial	Number
			_		the Turb	1 c/ mobe	20	ret	71-3	218
			_	У	5I		556	2000	15710	06963
Time	Volume		-64	Cara Cara	DO.	ODD	Tueleidite	- Flave Bata	Demoderne	61.61
Time (24hr)	Remove (Liters)	(°C)	pН	Spec. Cond (µS/cm)	l. <u>DO</u> (mg/L)	ORP (mV)	(NTU)	Flow Rate (ml/min)	Drawdown (feet)	Color/Odor
1944	0.9	26.70	6.99	5277	3.25	79.5	E	1/1/10	36.80	Sun / shore
1950	7.0	25.43		5286	3.01	77.4	E	140	36,40	Cherchy / Non
0956	3./	24.4		53/0	2.85	74.1	E	180	36,50	ii
1003	4.2	24.84		5326	2.79	77.9	E	140	36100	11
1008	5-3	24.78		5325	2.77	77.7	F E	180	36.50)/ U
1014 1014	6.4	24.43		5322	N	77.6	=	140	36.40	4
,	562	77			4/2/19					
d. Acc	ceptance	criteria p	ass/fail		Yes No	N/A	E	= cur Cal	Range	(continued on back)
		N/A - Exp	lain bel	et turb u		rence	,	ment - 1	est of lave	mudu steb
3. SAMP	LE COLL	ECTION	!: i	Method:	Low fi	ken to	bing			_
Sample II	NOME	ontainer		No. of Con	tainers	Prese	rvation	Analys	is Req.	Time
		250 m				1	be	Perc	hernte	1015
		25 m		1-1			.00	ch	ferate	KUS
Comment	s _ //	amp e	2 ~	18'						
Signature				1/1	1			Date	6/28	119

Well ID: LNDMUZ
DISTINUC

Client:	<u> </u>	DEP				Date:	15/19	Ti	me: Start <u>/</u> c	
Project No	o:	604	7736	5			,		Finish_/	<u> </u>
Site Locat			ORT 1							
Weather	<u>ک</u>	sht Br	rez 1	Gen Clouds.	950	Collector(s	: JCA	PUTRIC CA	EWI & (MUDE	<u>ang</u> (Gec
1. WATE	R LEVEL	DATA:	(meası	ured from Top	of Casi	ng)				
a. Tota	al Well Le	ngth 55	10	c. Length of	Water Co	olumn <u>20.7</u>	<u>9</u> (a-b)		Casing Diam	neter/Material
b. Wa	ter Table l	Depth_3	4.31	d. Calculated	l System	Volume (see	back) 3	39		
2. WELL a. Pur	PURGE I	DATA	Low	flew b	ladde	r Pun	4			
- Tem	eptance C perature	<u>+</u> 2	°C	(see workplan) -D.O.	0.3 n	ng/I if NTU read	ling is > 10	NTUe		
- pH - Sp. (Cond.	±3		Turbidity ORP		milivolts	iling is > 10	NIUS		
c. Fiel	d Testing	Equipm	ent use	d: Mathe	ake	Inches	Model	*	Serial フル3	Number
			- 5	45\$		710777	556			00 163
<u>Time</u> (24hr)	Volume Removed (Liters)	<u>Temp.</u>	pH	Spec. Cond. (μS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	<u>Drawdown</u> (teet)	Color/Odor
1100	0.7	25.3%	7.10	3007	2.68	46.4	1244	200	34.3/	Fen / None
1105	1.7	2358		3040	1.38	58.3	524	200	34.31	41
11.10	2.7	2353		3094	1.37	52.1	499	200	34.31	11
11.15	3.7	23.20		3,36	1.56	59.4	490	200	34.31	- 04
1120	4.7	23.31	7.05	3145	1.53	60.1	487	200	34.31	el
1025	Sanny	lec/				2				
	L		75.11			2/17				
d. Ac	ceptance (criteria p	oass/fail		Yes 1	No N/	A			(continued on back)
На	ve parame	eters sta	abilized]			
	If no or N	I/A - Exp	olain be	low.	!					
	-			ווטו						_
3. SAMP	LE COLL	ECTION	N:	Method:	on flo	w tus	ns			_
Sample II	OMWZ	ontainer		No. of Conta	ainers	Prese	ervation	Analys	sis Req.	Time
			0 1			41			11 6	110-
		me	EDA		440	Non		ch	locate	1125
Commen	ts Pur	up e		3'						
01				111				D-1-	-1.1.	
Signature		-	7	Me 1				Date	2/5/19	

Well ID: MWOZ

	NOF		- 1 1		Da	ate:	3/19	Tir		226 am/pm
Project No Site Locat			7365		_				rinish /	345 am/pm
Weather (Conds:	nely	Pent C	buly 1 bet	102° C	ollector(s)	J CAPU	TRIU CAE	com) ERIC	WANG (GES)
1. WATE	R LEVEL	DATA:	(meası	red from Top	of Casing)				
a. Tota	al Well Ler	ngth <u>4/</u>	3,47	c. Length of	Water Colu	mn_3.84	5(a-b)		Casing Diam	neter/Material
b. Wat	er Table D	Depth _	39.52	d. Calculated	l System Vo	olume (see	back) 💆	.63		
2. WELL a. Purç	PURGE C ge Method		Lor	flow	bladder	and				
b Acc	eptance C	riteria c		see workplan)		1 1				
	perature	<u>+</u> 2		-D.O.	0.3 mg	/I				
- pH		_		Turbidity			ing is > 10	NTUs		
- Sp. C	ond.	<u>+</u> 3	%	ORP	<u>+</u> 10 m	ilivolts				
c. Field	d Testing (Equipm	ent use		ake		Model		Serial	Number
				La Motte	tubida	eder	7020 F		71-3	815
			-	VISI			556		175100°	963
Time	Volume Removed	Tomo	~H -	Spec. Cond.	DO	ORP	Turbidity	Flow Rate	Drawdown	Color/Odor
Time (24hr)	(Liters)	(°C)	<u>pH</u>	(μS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	(teet)	
101304	0.9		7:19	3496	649	63.4	1034	180	39.60	Cloudy None
1309	7.0		7.08	3470	6.19	63.6	543	190	39.61	n
13/4	Z.1		7.06	3429	6.26	70.1	15.6	180	39.61	Clear / Nov.
1319	5.7	2727		3433 3435	6.27	68-6	13.9	180	39.62 39.62	12
1325	Same	led		3 733	90		7,72			
	,				7/3/					
						<u> </u>				
d. Acc	ceptance o	criteria p	pass/fail		Yes No	N/A	4			(continued on back)
Har	ve parame	tere et:	ahilized				i			
110	ve parame		30111200		ت مر					
	If no or N	/A - Exp	olain bel	ow.						
	2			NA						
	. = 00111	-07101	M.	N. di Alla alla	/. M	11				
J. SAIVIP	LE COLL	ECTIO	N.	Method:	on Thi	w 7461	ne		_	_
Sample II		ontaine		No. of Conta		Prese	rvation	Analys	is Req.	Time
										- 9 %
	- 7		W Pa			Non	ر	Perel	linete	1325
	1	251	W El	A Poly	1	EPA	7	chile	reste	1325
	- 1								4	9 41
Comment	s Pin	mg &	43'				Tu bing	in heel	123 1346	ex had to
	Dece	me	133	5	_		"tish":	tout		
Signature			7	1	111	>		Date	7/31	9
Jigilatule		-		7						



Well ID: MW-3

Client: NDEP		Date:	15/19	Tin	ne: Start <u>/</u>	ク25 am/pm
Project No: 60477364					Finish_/	<u>ዛዛ</u> ታ am/pm
Site Location: NEAR LVV	1		_	- 0	.	•
Weather Conds: Light Sugar, Fr	mobul - 100	Collector(s):	5 CAR	OTRIO CH	Econ) En	iang (GES
1. WATER LEVEL DATA: (measure	ed from Top of Cas	ing)				
a. Total Well Length 14.45	. Length of Water C	olumn 83	3 (a-b)		Casing Diam	eter/Material
b. Water Table Depth 6.12 o	l. Calculated System	Volume (see	back)	44	,	
WELL PURGE DATA a. Purge Method:	Barles					
- pH <u>±</u> 0.1 unit	-D.O. 0.3 a Turbidity 10%		ng is > 10	NTUs		
c. Field Testing Equipment used:	Make		Model		Serial	Number
Volume Time Removed Temp. pH 5	Spec. Cond. DO	OPP	Turbiditu	Elou Boto	Droudous	Caladodan
Time Removed Temp. pH (24hr) (Liters) (°C)	Spec. Cond. DO (mg/L)	ORP (mV)	(NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
1430 - 24.53 7.48	4081 4.34	55.2	433			clam/ross
1435 Sampled						51
- 	7/5/					
		7				
		_				
					-	
d. Acceptance criteria pass/fail	Yes	No N/A				(continued on back)
Have parameters stabilized If no or N/A - Explain below	n. NA					
-	7017					
3. SAMPLE COLLECTION: Me	ethod: Ban	ln				_
Sample ID Container Type	No. of Containers	Preser	vation	Analysi	s Req.	Time
200.00	,	41.4	2	0 11	1	11.25
125 ml EDA Poly	1	Non		Chile	*	1435
ter me con rang	-	- CUI	*	Cara	-10	7.731
Comments Deco 1440						
Signature	tw			Date	7/8/19	

Well ID: MW-4

Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Analysis Req. Time Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-W- JURGOOS 750 ML Fuly None Purpled 125 ML EDA My EDA My EDA Chloride	Client:	NDE				Da	ate:	3/19	Tirr		20 am/pm
Weather Conds: Light Bury for class for the Put Collector(s): S CAPOTRIO (April) & Warf (485) 1. WATER LEVEL DATA: (measured from Top of Casing) a. Total Well Length 13. 23 c. Length of Water Column 10.27 (a-b) b. Water Table Depth 296 d. Calculated System Volume (see back) b. Water Table Depth 296 d. Calculated System Volume (see back) c. Put 10.1 unit Turbicity 10% if NTU reading is > 10 NTUs - Sp. Cond. ± 3% ORP ± 10 milivolts c. Field Testing Equipment used: Make Model Serial Number 15. Sec. Cond. Make 15. Sec. Cond. DO ORP 15. Sec. Cond. Sec. Cond. DO ORP 15. Sec. Cond. Make 15. Sec. Sec. Cond. Make 15. Sec.	Project No	o: <u>6</u>	6477	365						Finish_ <i>_/<u>L</u></i>	am/pm
Weather Conds: Light Bury for class for the Put Collector(s): S CAPOTRIO (April) & Warf (485) 1. WATER LEVEL DATA: (measured from Top of Casing) a. Total Well Length 13. 23 c. Length of Water Column 10.27 (a-b) b. Water Table Depth 296 d. Calculated System Volume (see back) b. Water Table Depth 296 d. Calculated System Volume (see back) c. Put 10.1 unit Turbicity 10% if NTU reading is > 10 NTUs - Sp. Cond. ± 3% ORP ± 10 milivolts c. Field Testing Equipment used: Make Model Serial Number 15. Sec. Cond. Make 15. Sec. Cond. DO ORP 15. Sec. Cond. Sec. Cond. DO ORP 15. Sec. Cond. Make 15. Sec. Sec. Cond. Make 15. Sec.			NEI	21 1	VW						
a. Total Well Length 13 23 c. Length of Water Column 10/27 (a-b) b. Water Table Depth 296 d. Calculated System Volume (see back) b. Water Table Depth 296 d. Calculated System Volume (see back) b. Acceptance Criteria defined (see workplan) - Temperature ±2°C -D.O. 0.3 mg/l - PH ±0.1 unit Turbicity 10% if NTU reading is > 10 NTUs - Sp. Cond. ±3% ORP ± 10 millivolts c. Field Testing Equipment used: Make Volume Time Removed Temp. pH Spec. Cond. DO ORP (Liters) CO (see back) Water Table Depth 296 (see back) Gastron Model Serial Number To 372 (2-b) Social Number Time Removed Temp. pH Spec. Cond. DO ORP Turbicity Flow Rate Drawdown (seet) (Liters) CO (seet) Gastron Model Time Removed Temp. pH Spec. Cond. DO ORP Turbicity Flow Rate (myll) Model Time Removed Temp. pH Spec. Cond. DO ORP Turbicity Flow Rate (seet) Gastron Model Turbicity Flow Rate (myll) Model Turbici	Weather (رکے :Conds	tht Be	en,	ben character 1	Fet-120 C	ollector(s)	: J CAL	POTRIC G	<u> AECOM) E h</u>	ANG (GES
b. Water Table Depth 296 d. Calculated System Volume (see back) 6.7 2. WELL PURGE DATA a. Purge Method: b. Acceptance Criteria defined (see workplan) - Temperature ± 2°C -D.O pH ± 0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ± 3% ORP ± 10 milivolts c. Field Testing Equipment used: Make Model Serial Number 71-73-14 Volume Time Removed Temp. pH (Liters) CD (Liters	1. WATE	R LEVEL I	DATA:	(meası	red from Top	of Casing	;)				
2. WELL PURGE DATA a. Purge Method: b. Acceptance Criteria defined (see workplan) - Temperature ± 2°C -D.O. 0.3 mg/l - pH ± 0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ± 3% ORP ± 10 milivolts c. Field Testing Equipment used: Make Model Serial Number 7/- 72 cc 7/-	a. Tota	al Well Len	gth <u>/3</u>	23	c. Length of	Water Colu	ımn <i>10.</i> Z	<u>7</u> (a-b)		Casing Diam	eter/Material
a. Purge Method: b. Acceptance Criteria defined (see workplan) - Temperature ± 2°C -D.O. 0.3 mg/l - pH ± 0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ± 3% ORP ± 10 milivolts c. Field Testing Equipment used: Make Model Serial Number Turbidity Flow Rate Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown (mg/L) (m/V) (mTU) (mI/min) (teet) d. Acceptance criteria pass/fail Have parameters stabilized If no or N/A - Explain below. Method: Meth	b. Wat	er Table D	epth Z	96	d. Calculated	d System V	olume (see	back)	7		
- Temperature				R	mater	1 Pm	P Ba	ile			
- pH		-									
C. Field Testing Equipment used: Make Model C. Field Testing Equipment used: Make Model Serial Number 71-32/4 75.7 S56 77-32/4 75.7 S56 75.2100.96.7 Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/Odor (myl.) (Illers) (C) (Issue) GC. 7 G.2/ (Inv.) G. 7.7 G.2/ Make Model Serial Number 71-32/4 75.7 S56 75.2100.96.7 Color/Odor (Inv.)	perature						40	AITI I.			
Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/Odor (NTU) (INTU)		Cond.	_					ing is > 10	NIUS		
Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown (Get) (Lilers) (C)	c. Field	d Testing E	quipme	ent use			4			Serial	Number
Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/Odor (24hr) (Liters) (*C) (Lite				_			Ar		2		
Time Removed Temp. pH Spec. Cond. DO (RP) Turbidity Flow Rate (ml/min) (Liters) (°C) (17.1		- 2	45	I		556		15210	20967
(24h) (Liters) (°C) (µS/cm) (mg/L) (mW) (NTU) (ml/min) (feet) // CO	Time		Tomn	ъH -	Spec Cond	DO	OPP	Turbidity	Flow Pate	Drawdown	Color/Odor
Acceptance criteria pass/fail Yes No N/A (continued on back Have parameters stabilized				<u>DI I</u>							COIOI/Odoi
d. Acceptance criteria pass/fail Wes No N/A (continued on back Have parameters stabilized If no or N/A - Explain below. Wh 3. SAMPLE COLLECTION: Method: Acceptance Preservation Analysis Req. Time Many - Jungaros Time Puly None Puly To me Food My Comments Decome 1415	14/00			7.68	1	1		7		-	clus
Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Foundation Lubrage NKB Builds Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-U-20190705 250 ml Poly None Parallelelelelelelelelelelelelelelelelele	14pt	Som	de	1	-			<u> </u>			
Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Foundation Lubrage NKB Builds Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-U-20190705 250 ml Poly None Parallelelelelelelelelelelelelelelelelele	. ,		<u> </u>								_/
Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Foundation Lubrage NKB Builds Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-U-20190705 250 ml Poly None Parallelelelelelelelelelelelelelelelelele							ze_				
Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Foundation Lubrage NKB Builds Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-U-20190705 250 ml Poly None Parallelelelelelelelelelelelelelelelelele							7/9				
Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Foundation Lubrage NKB Builds Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-U-20190705 250 ml Poly None Parallelelelelelelelelelelelelelelelelele							/				
Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Foundation Lubrage NKB Builds Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-U-20190705 250 ml Poly None Parallelelelelelelelelelelelelelelelelele					 						
Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Foundation Lubrage NKB Builds Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-U-20190705 250 ml Poly None Parallelelelelelelelelelelelelelelelelele	d. Acc	eptance c	riteria p	ass/fail		Yes No	N/A	1			(continued on back)
If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Analysis Req. Time Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-W-ZURGOROS Comments Decomp 1415											•
3. SAMPLE COLLECTION: Method: Account to the Mark Reids Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-41- 20190705 750 ml. For bly 1 For Laborate Comments Decomp 1415	1101	ve parame	1013 318	DIIIZEG							
Sample ID Container Type No. of Containers Preservation Analysis Req. Time MW-41- 70190705 250 ml. Poly None Published 125 ml. EDA Poly EDA Comments Duon & 1415		If no or N/	A - Exp	lain bel	ow. NH),					
750 ml Pely None Puelfusty 125 ml EDA Pely EDA characte Comments Duon & 1415	3. SAMP	LE COLLE	CTION	l: 1	Method:	2 11	- Lu	lange.	11/15 1	Briles	
250 ml Pely Nove Perchade 125 ml EDA Pely EDA chloride Comments Decon & 1415					No. of Cont	ainers	Prese	rvation	Analysi	s Req.	Time
Comments Decon & 1415	7.700		7.0								
Comments Duon & 1415		255	ml	Pel		/	N	lone	Perso	Just	
		125	ml	EDA	Poly	/	ε	07A	chi	mote	
Signature Date 7/3/19	Comment	s	uon	0	415	-17					
	Signature			2/	hell	711	>		Date	7/2/1	9

Well ID: MW/3

Client:		NOE	۲		Da	ate:	124/19	Tir	ne: Start <i>_</i> /	<u> </u>
Project No	o:	low	7736	5					Finish	/335 am/pm
Site Locat	tion:	NER	5 LVV	/			EWANG	+ b Gense	(CES)	
Weather (Conds:	Zww	y been	HA I	<i>∞</i> ° C	ollector(s)	42 7	POTRES CI	Accom)	
			•	red from Top	_				Coolea Diem	eter/Meterial
				c. Length of				001	4"	eter/Material
			8.24	d. Calculated	d System Vo	olume (see	back)	9.24		
2. WELL a. Pur	PURGE I ge Method		4	in Flor	blade	for Pen	1			
				see workplan						
-	perature	<u>+</u> 2		-D.O.	0.3 mg		: :- > 40	NITI I.		
- pH - Sp. C	Cond.	±0 ±3		Turbidity ORP	± 10 m		ing is > 10	NTUS		
c. Field	d Testing	Eauipm	ent use	d: M	ake .		Model		Serial	Number
	Ū	• •	5	Ly Motto		noter	202	ot	71-30	
	Valuma		-	Y	I		556	11	152100	1963
Time (24hr)	Volume Removed (Liters)	Temp.	pH -	Spec. Cond.	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
1310	1.0	27.11	6.99	5942	4.10	73.9	15.1	200	35.26	Clan / None
1315	2.0		7.00	5940	4.56	73.6	14.9	200	35,26	11
1320	3,0	25.70		5937	4.77	74.0	15-1	200	35.26	"/
1325	4.0	2564	7,03	5941	4.75	74.5	14.6	700	35.26	41
1530	Sen	111				1				
		╅	_			Charl				
		-				Chal	7			,
d. Acc	ceptance	criteria p	ass/fail		Yes No	N/A	1			(continued on back)
			. 1. 111		4 -					
на	ve parame	eters sta	abilized							
	If no or N	I/A - Ext	olain bel	ow.						
				NA						
3. SAMP	LECOLL	ECTIO	u. ı	Method:	1. C	1 6	Lund	1		
o. OAIIII			•	victiou.	COW #1	OW 44	omb			
Sample II		ontaine		No. of Cont	ainers	Prese	rvation	Analysi	is Req.	Time
M	W/3-	2017	28/9					_		
		250	mel	Och 1		n	ine	Par	chbrute	1330
	18	er m		1, 80A	7	Ę	DA	ch	krate	1330
Comment	e A	2		W.						
		Deen	the.	0 1340						
0.			1	11					111	_
Signature	-	-	1	1/1/	2			Date	6/0/1	7

Well ID: MW-20

L		-		Ground V					1	altilla.
Client:		DEP		-		Date:	124/19	Tim	_	<u>多11代</u> am/pm
Project N			7736							250 am/pm
Site Loca			25-1		20		EWAM	4 + U GRUS	E (425)	
Weather	Conds: 5	inthy .	Leens	Hot 9	90	Collector(s)	JCA	AUPRIU (A	Fcom)	_
a. To	tal Well Le	ngth_6;	7.23	red from Top c. Length of \ d. Calculated	Water Col	umn_34/4		5.64	Casing Diam	neter/Material
	_ PURGE I		lan	flow -	Blace	Un lu	mf			
- Ten - pH	ceptance Coperature	<u>+</u> 2°	C 1 unit	see workplan) -D.O. Turbidity ORP	0.3 m 10% i	g/l f NTU read milivolts	ing is > 10	NTUs		
c. Fie	ld Testing	Equipme			ake	, ,	Model			Number
			_	a Mette		morer	Zuro	t.		3218
				Y 5 1			556		152	100963
-	Volume	1.77	-	0 0 1		000	77 1. 1. 17.	F1 D-1-	5	0.1.10.1
Time (24hr)	Removed (Liters)	(°C)	<u>рН</u>	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	(NTU)	Flow Rate (ml/min)	Drawdown (feet)	Color/Odor
1202	0.3	28.47	7.27	6166	4.21	640	E	2600	32.43	Brown / New
1208	1.8	25,79	737	6141	4.00	69.1	F.	760	29.19	11
1214	2.5	26.33	7.42	6152	6:03	72.1	E	150	29.92	1/
17.20	3.7	26.26	7.42	6165	6.01	72.4	E	180	29.98	11
1226	4.8	262,	7.43	6157	6,09	722	E	180	29.98	N/
5851	San	sh				10				
					-66	19				
						W/7				
	eceptance ave parame If no or N	eters sta I/A - Exp	bilized Iain bel	ow.		els b. An	- rouge	ed Englume 1 bretten R		(continued on back)
3. SAMI	PLE COLL	ECTION	l: I	Method:	sw f	low by	bonz			_
Sample I	D C	ontainer 20190		No. of Conta	ainers	Prese	rvation	Analysi	s Req.	Time
-	-	cro m	L Peh	, /	-	W	ve	Perl	lake	1230
		Cm2	EAR	Ish 1		EA		al.	to	1230
				0						
Commer	nts	Penen	0-	1240						
0: 1			-	1	7				16	1

A=COM

Well ID: mw25

				~						
Client:		DEP			Da	ate: 7	/3/19	Tin	ne: Start _//	
Project N o	o:	604	77364	5					Finish	2 <i>1</i> (am/pm
Site Locat	tion:	NE	RT L	.VW						
Weather (Conds: F			Rugg, Het	100° C	ollector(s)	JCA	POTRIU CI	4Eccom) E h	MUGCGES)
1. WATE	R LEVEL	DATA:	(meası	red from Top	of Casing	1)				
a. Tota	al Well Le	ngth 54	1.78	c. Length of	Water Colu	mn_ <i>_15.3</i>	1 (a-b)		Casing Diam	eter/Material
b. Wa	ter Table [Depth 3	9.40	d. Calculated	System V	olume (see	back) _/	04		
	PURGE D	DATA	Lon	Flow	Blade	for Per	me			
	•	riteria d	lefined (see workplan)			•			
,	perature	<u>+</u> 2		-D.O.	0.3 mg					
- pH		_	.1 unit	Turbidity			ing is > 10	NTUs		
- Sp. 0	Cond.	<u>+</u> 3	%	ORP	<u>+</u> 10 m	ilivolts				
c. Fiel	d Testing l	Equipm	ent use		ake	,	Model			Number
				La Motte 7	Turbickm	oter	20000	5	71-3	218
			-	45			556		15210	0943
	Volume									
<u>Time</u> (24hr)	Removed (Liters)	(°C)	<u>pH</u>	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	(NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
1137	0.7	30,12	7,19	3994	5.86	59.3	75.9	180	39.4/	Charle / Non
1143	1.8		7.06	3943	5.17	63.6	71:5	180	39,40	11
1150	2.9		7.06	3948	5.12	71.5	63.4	180	39.40	<i>N</i>
1156	4.0	28.10	706	3979	5.15	69.9	69.8	180	39.40	11 .
1200	Scory	4				2				
		-					-			
				-						-
d Ac	l ceptance d	ritorio s	acc/fail		Yes No	N/A				for all and an heart's
u. Acc	septance t	interia t	ass/iaii		165 140	1977	`			(continued on back)
Ha	ve parame	ters sta	hilized							
110	ro parame		DIIILCG		- L					
	If no or N	/A - Exc	lain bel	ow.						
				NA	9					
3. SAMP	LE COLLI	ECTION	4: I	Method:	on flo	w tubi	N			
Sample II		ontainer		No. of Conta	ainers	Prese	rvation	Analysi	s Req.	Time
mu	25-20	1907	03							
				, ,	1		i de la companya de l		1	19
	- 1		met				Are	ruch	broth	1200
	/	25 100	E EDA	Tuhy 1		0	04	chie	rote	ROU
C	.	0	,501	es!						
Commen		ump		52						
	-	un	2	1205	1					
Signature			-	1/1				Date	7/3/	19
orginature			-	1				Date	11011	



Well ID: NERT 3.3591

Client:	NDE				D	ate: <u>67</u>	26/19	Tin	ne: Start/	
Project No		0477	365						Finish_/2	45 am/pm
Site Local		NFR	I LV	W						1
Weather (Conds:	Sunny	WIN	chy -950		collector(s)	JCAM	RIO CAEC	om); DGR	ISE LGES)
				red from Top	-		(Casing Diam	eter/Material
				c. Length of		•			4"	
b. Wai	ter I able L	epth_	16-05	d. Calculated	System V	olume (see	back) /	25.56		
	PURGE D	ATA	blad	der pury.	Lon -	Flow				
b. Acc	eptance C			see workplan)						
	perature	<u>+</u> 2		-D.O.	0.3 mg	p/I				
- pH		_	.1 unit	Turbidity		NTU readi	ing is > 10	NTUs		
- Sp. C	Cond.	<u>+</u> 3	%	ORP	<u>+</u> 10 m	nilivolts				
c. Field	d Testing I	Equipm	ent use	d: Ma	ake		Model		Serial	Number
			_	La Motte		Meter	20201	4	71-32	
	Maluma		-	151			556		157/00	963
<u>Time</u>	Volume Removed	Temn	<u>рН</u> -	Spec. Cond.	DO	ORP	Turbidity	Flow Rate	Drawdown	Color/Odor
(24hr)	(Liters)	(°C)	<u> </u>	(µS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	(teet)	COIOI/OUOI
1205	0.250	28.12	7.15	9869	2.39	<i>35. 3</i>	10.9	6.140	0-01	Clear None
1212	1.250	27.70		9885	1.42	16.7	3.52	0-140	0.01	- 11
1219	2.250	27.40	7.4/	9912	1.14	-50.6	0.90	0.140	0.01	- 11
1226	3.256	27.32	7.43	99/3	1.06	- 52-3	0.92	0.140	0.01	11
1233	4.250	27.36	7.43	9908	1.09	-51.6	1.08	0-140	0.01	11
1235	Sarry	مسدا				9C 6/24/R				
					-	DIZE/IT				
d. Acc	ceptance c	riteria p	ass/fail		Yes No	N/A				(continued on back)
-					-					,
Ha	ve parame	ters sta	bilized							
	15 61	=								
	If no or N	A - Exp	olain bei	ow. NA						
	-			10171						_
3. SAMP	LE COLLE	ECTION	N: 1	Method:	line fre	m blad	for near	w		
					0		/	1		-
Sample II) Co	ntainer	Туре	No. of Conta			rvation	Analysi	s Req.	Time
NER	T-3.35									
			46 101		1FD		tric	Disc	hrone	1235
		260	m/ Pa	,	+FO	No		1 here	Chrone	1235
		250	nt lo	7 4 1	LFD I	No	-	Ferch	farate 17	05 1235
		125	42 64	A Poly	+ F()	te	011	Ch	form to	12.35
Comment	ts	Pur	PE	-25	-1					
		1240	- Dec	an edmon	und					,
Signature				111	17			Date	6/211	4
orginature				2000					-,,	

Well ID: NERT3.4081
Well ID: NERT3.4081

Client:	NDEP			Da	ate: 4/2	16/19	Tin	ne: Start _/4	100 am	1/20
Project No:	6047	1365						Finish		n/pmg
Site Location:	NERT	LVM						-		<u> </u>
Weather Con	ds: <u>Sunn</u>	, win	dy , - 99°	c	ollector(s)	5 CAPE	TRIO CAEC	lom); D GA	USE CG	ES)
		•	red from Top	_	-					
a. Total W	ell Length_5	431	c. Length of	Water Colu	mn <u>16.03</u>	(a-b)		Casing Diam	eter/Mater	ial
b. Water T	able Depth 3	8.25	d. Calculated	System V	olume (see	back)	0,48			
2. WELL PU		,, ,,	Name of the last							
a. Purge N	letnod:	bladde	v pump -	Low +10	W				_	
b. Accepta	nce Criteria	defined (see workplan)							
- Tempera		2°C	-D.O.	0.3 mg	/I					
- pH	_).1 unit	Turbidity			ing is > 10	NTUs			
- Sp. Cond	l. <u>+</u> 3	3%	ORP	<u>+</u> 10 m	ilivolts					
c. Field Te	sting Equipm	ent used	t: Ma	ake		Model		Serial	Number	
0. 1 1010 10	omig Edupii	ioni acci	La Motte		Mater	20200	4		3215	
		3	751			554			100967	
Vo	lume							7-00-00		
	noved Temp iters) (°C)	Hq .	Spec. Cond. (µS/cm)	<u>DO</u> (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/O	dor
1920 0.4	00 29.91	7.27	13/09	1.49	626	35. Z	0.170	38.28	Clouch for	n/4/2
	29.44	7.27	13041	1.07	53.8	47.7	0.170	88.28	51,4 Ch	
		7.26	13178	0.97	48.0	49.0	0.170	34.28	111	100
		7.29	13151	1.17	46.0	47.3	6.170	34.28	11	11
	27.56	7.29	13165	1.19	45.3	47,1	0.170	34.28	11	H
14/4/5	Sony Le				n					—
	_			6/	26/0					\rightarrow
		12 - 11	L	, , , , , , , , , , , , , , , , , , ,	77/F					
d. Accept	ance criteria	pass/fail		Yes No	N/A	1		39.28	(continued on	back)
Have a		_6:1:	1	4 0						
Have p	arameters st	abilized								
If —	N/A Ev	alaia bal								
ır n	o or N/A - Ex	piain be	w. wh							
			WHI	_		_			_	
3. SAMPLE	COLLECTION	N· I	Method:	4.1		'ladder	Mars 0			
o. OAMI EL V	JOELLO 110	1	vietriod.	in THE	113 - 3	innan	puny)		_	
Sample ID	Containe	r Type	No. of Conta	ainers	Prese	rvation	Analysi	s Rea.	Time	
The second second	4091-20196		+ MST	,			·	o : .oq.	44	-
10 61613.			YUML VON	1+M7	Non	,	110.41	Chaman	LILL	_
	The second second	L lok		+ ANS	Nit		17-11	hromi	NAMA	,
	250			EMS61	Nort		Parel	te-705	Lich	
	125 m		L	* ME &	E.D.		chhy	4	1200	~
	1	0	-11							
Comments _	Penny	0-	3/		1					_
	Mum	E 14	יווס	,	-					
Cianatura			///	6			Date	6/26	15	
Signature		-	and the		-1			VIV.		

Well ID: NERT 3:45/

Client:					Da	ate: <i>/_</i>	27/19	Tir	ne: Start 🕜	895 (and/pm
Project N	lo:	047	7367						Finish	am/pm
Site Loca	ation:	NER	7-21	<i>w</i>						
Weather	Conds:	Larm	bres	ezy, 86°	c	ollector(s)	: J. CANOTR	KL45COM)	ERIC WALL	& Dames 16
1. WATE	ER LEVEL	DATA:	(meas	ured from Top	of Casing	1)				
a. Tol	tal Well Le	ngth_5	30	c. Length of	Water Colu	mn 22	(a-b)		Casing Diam	eter/Material
b. Wa	ater Table I	Depth 🤰	4.94	d. Calculated	i System V	olume (see	back) /x	1325		
2. WELL a. Pui	- PURGE I	ATA	low	Flow- b	Indla	Pump				
	-			(see workplan)						
	nperature	_	.°C	-D.O.	0.3 mg					
- pH	01	_).1 unit	Turbidity			ing is > 10	NTUs		
- Sp.	Cond.	±3	70	ORP	<u>+</u> 10 m	IIIIVOITS				
c. Fie	ld Testing	Equipm	ent use		ake		Model			Number
					e Two bida	netor	ZUZU T		71-321	
	Volume			45£			556		12510	0963
Time	Removed		рН	Spec. Cond.	DO	ORP	Turbidity	Flow Rate	Drawdown	Color/Odor
(24hr)	(Liters)	(°C)	<u> </u>	(µS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	(teet)	COIOTOGOI
0915	0.300		6.88	4285	1.43	72.2	73.3	8.RO	34.96	Pink I None
15 10	1.4	24.56		41264	1.47	70.9	29.8	0.190	34.95	Pink / None
0927	2.5	24.24		4263	1.61	7/./	22.9	0.180	34.90	Park / None
0939	3.6	24.35		4265	1.49	69.7	18.9	0.140	34,95	Pink / War
0940	San	2931	6177	4260	/ · - / 7	64.1	1 / 9 / /	G.AO	37.98	Piak Mene
<u></u>	1				61	SE				
						7/19				
d. Ac	ceptance	criteria i	pass/fai	i	Yes No		4		34.96	(continued on back)
Ha	ave parame	eters sta	abilized				l			
	If no or N	I/A - Ex	plain be							
	-			w A						
3. SAMF	PLE COLL	ECTIO	N:	Method:	w flow	tubing	,			
Sample I		ontaine		No. of Conta	ainers	Prese	rvation	Analys	is Req.	Time
/VEN	1.785		me Ve		+M5	No	ne.	Ver C	here	0940
					ILMS		tole	Dir C	heart	0940
		230		Paly	1+Ms		ne	Ruch	water & Dr	0940
		125	m 2	End lely	1+MS	EL	A	chlos	t	0940
Commer	nts	Pump		151'						
		Dena	0	0910	,					
Signature	9		2	161	1			Date	6/27	/19
g=		-		7				-		

Well ID: NELT3.59N

Client: NDEP	Date:	/2/19 T	ime: Start O	
Project No: 6647736				STC @/pm
Site Location: NERT LVW		EWANG (GE	5) D GRUSE	- (GET)
Weather Conds: Warm, Calm, Clear - 90	Collector(s)): 5 CAPOTRIC	(AECOM)	
1. WATER LEVEL DATA: (measured from Top of	of Casing)			
a. Total Well Length 6. Length of W	/ater Column 20.9	97 (a-b)	Casing Diame	eter/Material
b. Water Table Depth <u>3ๆะเง</u> d. Calculated	System Volume (see	e back) 13.69		
2. WELL PURGE DATA a. Purge Method: Long flow	Ladda Pa	my		
b. Acceptance Criteria defined (see workplan)		•		
- Temperature ± 2°C -D.O.	0.3 mg/l			
- pH ± 0.1 unit Turbidity	_	ling is > 10 NTUs		
- Sp. Cond. ±3% ORP	± 10 milivolts	•		
-	_			
c. Field Testing Equipment used: Make		Model		Number
La Mote	Inibicimeter	Zuzut	71-32	
Volume		556	172100	163
Time Removed Temp. pH Spec. Cond.	DO ORP	Turbidity Flow Rate		Color/Odor
(24hr) (Liters) (°C) (μS/cm)	(mg/L) (mV) 2.42 4/2.4	(NTU) (ml/min)	(feet) 39.5/	Clear Inter
0816 2.0 27.79 6.46 6923	1.88 58.0	33.8 140	39,52	1 Jean Inco
6822 3.1 24.84 6.85 6951	1.88 61.5	23.4 180	37.52	
6828 4.2 24.82 6.85 6954	1.87 620	22.1 /50	39.42	. 4
0834 5.3 2484683 6956	1193 625	19.8 180	39.52	4
G835 Samuel -				
	7			
	12/19			
d. Acceptance criteria pass/fail Y	es No N/	A		(continued on back)
Have parameters stabilized	3 \square \square			
If no or N/A - Explain below.	n			
WH	7			_
2 CAMPLE COLLECTION. Mother.	6/ 1	ubine		
3. SAMPLE COLLECTION: Method:	14 TION 1	Roller		_
Sample ID Container Type No. of Contain	nore Proce	ervation Analys	sis Req.	Time
NERTS.58 NH 20190702	1100	avadori Analy-	313 1 CCq.	Title
250 ml lady 2	41	ne Peres	LL. L STAT	0935
25 w/ left /		Intere Di	- Chame	0935
125 ml FAA Poly 1		DA CA	hate	0835
yo me val 1		Jone F	1)4	0838
Co			70 51/	2 1 1
Comments Pump 6 - 57	3945	Tre Hola	12/ 3/K//2	
Durin C 0848	Tre	wolness safe	Tea	850
Cignoture ///		Deta	2/1	1-
Signature	2/	Date	11611	7

Well ID:

Client:	N	DEP			D;	ate:/	12/19	'''		am/pm
Project No	o:	6047	7365	-					Finish_/	000_am/pm
Site Local	tion:			LVW			E. WI	NUG IGES	DGRUSE	(GET)
Weather (clear -	<i>90</i> 0	collector(s)	: <u>JC</u>	ARUTRIO	CAECUM)	<u> </u>
1. WATE	R LEVEL	DATA: (measu	red from To	of Casing	3)				
a. Tota	al Well Le	ength_5/	37	c. Length of	Water Colu	_{imn} 13.2	<u> </u>		Casing Diam	eter/Material
				d. Calculate				860	4"	
			607	u. Calculate	a System v	oldine (see		0-07	•	
a. Pur	ge Metho	d:	Les	2 flow	blad	dr Pi	nung			
	•			see workplan		_				
	perature	<u>+</u> 2°		-D.O.	0.3 mg					
- pH	Cond.	± 0.1 ± 3%	1 unit	Turbidity ORP		NTU read nilivolts	ing is > 10	NTUs		
•		_			_	illivoits			0 11	
C. FIEI	a i esting	Equipme	ent used	La Moth	ake Turb.	water	Model Zuzu	£	7/-3	Number 2/x
				45			556		15210	
	Volume)								
Time (24hr)	Remove (Liters)	d Temp. (°C)	pΗ	Spec. Cond. (μS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
0915	0.6	25.89	7.39	6739	1188	57.2	59.5	180	38.08	Clear/Non
0921	1.7	24.68	6.93	6829	1.28	56.8	41.6	180	3828	11
0127	2.8	24.04	6.90	6831	1,02	55.9	28.3	180	3848	pl.
0733	3.9	24.59		6437	1.07	56.9	29,0	180	38.08	,
0941	5.0	24.57	6.84	6835	1.11	57.3	27:7	180	3828	/
09415		any	us		- A	<u>+ </u>				
		1 -			73/				_	
	<u></u>			<u> </u>	915					
d. Acc	ceptance	criteria p	ass/fail		Yes No	N/A	4			(continued on back)
Ha	ve param	eters stal	bilized							
	·									
	If no or I	V/A - Exp	lain bel	ow.						
				WHA						
3. SAMP	LE COLI	ECTION	: 1	Method:	en fl	In the	house			
					7.13	1				_
Sample II		ontainer		No. of Cont	ainers	Prese	rvation	Analys	is Req.	Time
NI				190707		-		0 /	1 4/-0-	del -
		TO ML	-			Non		-	arab (TDS	0945
		TO ML					tric	Dis	Chame	0845
_		5 ml					24	- Color	· Alma	and the same
	-	le mi	Vep			No		- 140	0	077)
Commen		pe	~4/4	-1		Pre h	50= 3	809		4=38.09
	Ru	me	095	- /		Transale	un e	15 0	0900	,
Signature		1		111	?			Date	- /	//9
oignatule			-					Date	-//0	



Well ID: NEQT3.609]

Client:	ND	EP_			D	ate:	1/1/19	Tir	ne: Start /	USS am/pm
Project No	0:	1047	7.365						Finish	12./c am/pm
Site Locat		NER	TU	M			E WAL	16 (GES)	DGRUSE	(455)
Weather	Conds:	rege	Sun	my Hot "	790 0	Collector(s)	: JCA	POTRIVI	(AEcom)	
			-	red from Top			112		0.1.51	
a. Tota	al Well Lei	ngth 5	SAMO.	c. Length of	Water Col	umn_ <i>161</i>	43 (a-b)		Casing Dian	neter/Material
		-	8,67	d. Calculated	i System V	olume (see	back) /	0.77	•	
	PURGE I		Luw	flow 1	lador	Pump				
b. Acc	eptance C	riteria d	efined (see workplan)						
	perature	<u>+</u> 2		-D.O.	0.3 mg	_				
- pH	Cond	_	.1 unit	Turbidity ORP		NTU read	ing is > 10	NTUs		
- Sp. C	Cond.	10	70	UKP	<u> </u>	HillyOltS				
c. Fiel	d Testing	Equipm	ent use	d: Ma	ake	1 1	Model			Number
			3	La Mobbe		MUTER	20201	art -	7/-3	Market Committee of the
	Volume		-	1/3-2			556		120	00963
Time (24hr)	Removed (Liters)	Temp.	pН	Spec. Cond.	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (mt/min)	Drawdown (teet)	Color/Odor
1125	1.1	27.82	7.04	4245	1.98	74.7	20.3	150	34.67	Exfinic/Nos
1131	2.2	26.27		4214	1.61	69.2	10,43	140	39,67	P. No / None
1137	3.3	2576		4210	1.49	49.9	7.16	180	34.67	n
1143	44	78.32		4/99	1.53	63./	3.99	180	39.67	
1149	5.5	25.52	7.01	4202	1.54	69.7	4.72	180	34.67	//
1250						Sang				
						7//	/19	- 113 Mar	1	
d. Ac	ceptance o	riteria p	ass/fail		Yes No	N/A	1			(continued on back)
						_				
Ha	ve parame	eters sta	bilized] 🗆				
	16 61	/A ====								
	lf no or N	/A - Exp	naın bei	ow.						
	_			NA						
3. SAMP	LE COLL	ECTION	l: I	Method:/	in fka	y from	tubing			
Sample II			Type	No. of Conta	ainers	Prese	rvation	Analysi	is Req.	Time
			mf P.		2 MKD	N	ine	luchk	note +TAS	1100
		ZIC			LAMAD	1	ntvic		Lyane	2311
			L.COA	Poly &	1 +msp		DA	chlan		1150
		40 m	12 VC	A I	1 MID		me	Horac	home	11.00
Commen	ts	Rimo	0 -	52.5	(e	mail 7	1/24/2	019)		
		Que		1700						
			-	1/	4				_ //	1
Signature			1	hil	10			Date	7/1/1	2

Well ID: NERT3.63

Site Location: NERT LIVE Collector(s): TeachTile (AECOM) E WANG D Grant TeachTile (AECOM) Teac	Client: Project No		47	1365		D	ate: <u>6</u> /	27/19	Tim	ne: Start 1	010 am/pm /055 am/pm
a. Total Well Length 34, 37 c. Length of Water Column 16.15 (a-b) b. Water Table Depth 15.65 d. Calculated System Volume (see back) b. Water Table Depth 15.65 d. Calculated System Volume (see back) 2. WELL PURGE DATA a. Purge Method: c. Figure Method:							Collector(s)	JCAR	TRO (AE	COM) E INCA	NG & D Gruse 16
b. Water Table Depth 18.68 d. Calculated System Volume (see back) 2. WELL PURGE DATA a. Purge Method:	1. WATEI	R LEVEL	DATA:	(measu	red from To	p of Casing	J)				
2. WELL PURGE DATA a. Purge Method: Low Flow	a. Tota	l Well Ler	ngth 3	7.83	c. Length of	Water Colu	ımn <u>/6./</u>	(a-b)			eter/Material
a. Purge Method: Low Flow haddle fump b. Acceptance Criteria defined (see workplan) - Temperature ±2°C -D.O. 0.3 mg/l - pH ±0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ±3% ORP ±10 millivolts c. Field Testing Equipment used: Make Model Serial Number Volume b. Wat	er Table [Depth_	18.68	d. Calculate	ed System V	olume (see	back)	0.54			
- Temperature	2. WELL a. Purç	PURGE D	DATA	Low	Flen-	bladdy	Pung				
Volume	- Temp - pH	erature	<u>+</u> 2 <u>+</u> 0	2°C).1 unit	-D.O. Turbidity	0.3 mg 10% if	NTU readi	ng is > 10	NTUs		
Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/Odor (Liters) (*C) (L	c. Field	l Testing l	Equipm	ent used	d: N	Make	Imoker		t		
Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown (teet)				1							
1025		Removed		- <u>Ha</u> .							Color/Odor
103C 3.0 23.5 6.95 39.79 1.12 71.3 6.97 720 73.67 71 72.0 7.05 720 73.67 71 72.0 7.05 720 73.67 71 72.0 7.05 720 73.67 71 72.0 7.05 720 73.67 71 72.0 7.05 720 73.67 71 72.0 7.05 720 73.67 71 71 72.0 7.05 720 73.67 71 71 72.0 7.05 720 73.67 71 71 71 71 71 71 71			24:45		4000			809	200		Clear / NAME
d. Acceptance criteria pass/fail Wes No N/A (continued on back) Have parameters stabilized If no or N/A - Explain below. Method: Low flow Indiana Sample ID Container Type No. of Containers West 3:4351-20130627 West No N/A Next Chart 1005 Next No N/A (continued on back) No N/A (continued on back) No N/A No N/A (continued on back) N/A No N/A (continued on back)	1030										
d. Acceptance criteria pass/fail Yes No N/A (continued on back) Have parameters stabilized If no or N/A - Explain below. N/A Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 3.6361-20130627 Your Note August Heat Character (Curtific News) News Heat Character (Curtific News)	1030.	_								•	
d. Acceptance criteria pass/fail Yes No N/A (continued on back) Have parameters stabilized If no or N/A - Explain below. All Sample ID Container Type No. of Containers Yes No N/A (continued on back) All If no or N/A - Explain below. All All Analysis Req. Time WERT 3.6351-20120622					3978	1.14	72.0		200	18.67	 "
d. Acceptance criteria pass/fail Yes No N/A (continued on back) Have parameters stabilized If no or N/A - Explain below. N/A 3. SAMPLE COLLECTION: Method: Low flow hubin 4 Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 3.0351-20130627 How was Have Change 1000	1091	50	117		•			19			
d. Acceptance criteria pass/fail Yes No N/A (continued on back) Have parameters stabilized If no or N/A - Explain below. N/A 3. SAMPLE COLLECTION: Method: Low flow hubin 4 Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 3.C351-20130627 Your wat help Next Dis Charge No. 257 ml fely Next Dis Charge Next						-	6/	2-7/2			
Have parameters stabilized If no or N/A - Explain below. Sample ID Container Type No. of Containers Preservation Analysis Req. Time WERT 3.6351 - 20120627 Your ward Name Have Change 1045					İ			11/			
If no or N/A - Explain below. N/A 3. SAMPLE COLLECTION: Method: Low flow hubin y Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 3.6351-20120627 Your ward None Hear Charge 1045 252 ml Pary Nert Dis Charge New New New New New New New New New Ne	d. Acc	eptance o	riteria į	pass/fail		Yes No	N/A				(continued on back)
Sample ID Container Type No. of Containers Preservation Analysis Req. Time WERT 3.6351-2019062.7 Your North North North North Dis Charge North		If no or N	/A - Exj	plain bel	NIA				an.		_
NERT 3.6351-20190627 40 ml vat None Hex Chrome 1045 255 ml Pary Nore Dis Chrome Next									Analysi	s Rea	—— Time
Zer and Pary 1 Nexic Die Chromy rest						i					
			-			1	Nane	1	Her	Chrome	1045
						1	N. Eri		Dir	Ch rever	
250 miles None Reachter ats +105 west			_	-	100	-			Recoble	tate of TOS	
125 ml Puby EDA 1 EDA Chlarate 12th			S M	Laby	A		EDA		Chlore	10	1 0 1
Comments Pumple - Thoughton & The Die 19.68 the les	Comment	s	enon	0 10	Turk 31	Tha	neducar	e 3			& the list
Signature Date 6/27/19	Signature			26	1211				Date		4

Well ID: NERT3.80\$ |

Client: NDEP	Date:_	6/27/19	Tim		//4 am/pm
Project No:				Finish/	205 am/pm
Site Location: NERT LVW	<u> </u>				
Weather Conds: Hot Lundy910	Collec	tor(s): JcAfor	TE10 CAERO	m) E waned	D GRUSE CGES)
1. WATER LEVEL DATA: (measured from T					
a. Total Well Length /9.37 c. Length			_	Casing Diam	eter/Material
b. Water Table Depth <u>/ು.੫<</u> d. Calcula	ted System Volum	e (see back)	5.80		6
2. WELL PURGE DATA a. Purge Method: Low-flow	Bladder Pu	nf			
b. Acceptance Criteria defined (see workpla	an)				
- Temperature ± 2°C -D.O.	0.3 mg/l				
- pH ± 0.1 unit Turbidity	10% if NTU	reading is > 10	NTUs		
- Sp. Cond. ±3% ORP	± 10 milivol	_			
	Make	Model		Serial	Number
	the Tuxhidmek	~ ZUZUE			3218
	SI	354		1251	00763
Volume Time Removed Temp. pH Spec. Con	4 00 0	DD Turkidiko	Flour Data	Drowdows	Calar/Odar
Time Removed Temp. pH Spec. Con (24hr) (Liters) (°C) (μS/cm)	(mg/L) (n	RP <u>Turbidity</u> nV) (NTU)	Flow Rate (ml/min)	<u>Drawdown</u> (teet)	Color/Odor
1/30 1.25 25.50 6.72 3994	1.87 72	3 49.8	6,200	10.44	clear / None
1135 725 24.46 6.68 3986	1.78 67.		200	10.50	Clar I Ware
11414 3.25 24.36 6.67 3976	1.61 67		200	16.50	11
1144 424 24.2 6.64 3971	1.57 66		200	10.00	//
1150 4.25 24.34 6.69 3972 Samples	1.57 66	9 5.52	200	10.50	,,
Samples -					
	6,57	29			
d. Acceptance criteria pass/fail	Yes No	N/A			(continued on back)
Have parameters stabilized	d				
If no or N/A - Explain below.					
If no of two - Explain below.	149				
3. SAMPLE COLLECTION: Method:	len flor fue	l na &			_
Sample ID Container Type No. of Co		Preservation	Analysi	s Req.	Time
<u>NERT 3.9051 - 20190627 + NERT 3.90;</u> 40 mL VOI	1+FD	Nore	1hou	Chume	1150
Ackaly executions	1+ 50	WHOIC	Bire	hione	
Zec ml Poly	14 FD	Nove	Porch	ent + FOT	1120
125 ml EDA loly	1460	E I)A	Chl	rate	1100
Comments Rupe - 17'					
Deum P. 1206	-	•		(6)	
Signature		>	Date	6/27	/19

Well ID: NERT 3.999

Client:	NOF	P			D:	ate: 6	127/18	Tin	ne: Start _/	226_am/pm
Project No	0:	1047	7365	ī					Finish /	am/pm
Site Local	tion:	NEK	ET L	VW			SINCA	nd + DG	RUSE CG	
Weather	Conds: _/	ht, v	und	4. 970	c	collector(s)	5 CAR	TRIVE	AECOM)	
1. WATE	R LEVEL	DATA:	(meas	red from Top	of Casing	1)				
a. Tota	al Well Lei	ngth_34	193	c. Length of	Water Colu	ımn <u>242</u>	(a-b)		Casing Diam	eter/Material
b. Wa	ter Table [Depth_	10.67	d. Calculated	l System V	olume (see	back)	5.84		
2. WELL a. Pur	PURGE D	DATA	Low	Flow Bla	der	Pump				
				(see workplan)						
	perature	±2		-D.O.	0.3 mg	ı/l				
- pH	pordiare		.1 unit	Turbidity	_		ing is > 10	NTUs		
•	Cond.	± 3		ORP	± 10 m		g			
c. Field	d Testing l	Equipm	ent use	d: Ma	ake		Model		Serial	Number
				La Mette	Turbu	duster	202	75	71-3	218
				4/3	I		556		1521	00 963
70	Volume	Т	-11	0	DO.	ODB	Tla tatta .	Flore Data	December	0.1.101
Time (24hr)	Removed (Liters)	(°C)	<u>pH</u>	Spec. Cond. (µ\$/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
1245	0.4	25.75	7.01	5933	1.36	-19.3	50.2	/40	10.75	Clear / None
1251	1.5	24.40	6.96	6061	0.78	-45.1	43.9	180	10.75	11
1257	2.6	23.98		6100	0.62	- 55.0	43.1	1500	10.75	ď
1303	3.7	24.18		6099	0.71	-63.2	38.7	140	16.75	ıl
1309	4.8	74.41	6.99	6100	0.75	-63.5	39.3	180	10-75	11
1310	Som	-	//		6	4/6			 	
				-	6/	7/19				
d Acc	ceptance c	ritoria r	l nace/fail		Yes No					(continued on book)
u. Au	rehrance c	interia i	Jassilali		162 140	1977	`			(continued on back)
Ha	ve parame	eters sta	bilized	4	M D					
	•									
	If no or N	/A - Exp	olain be	ow. n/4						
				NITE						
3. SAMP	LE COLLI	ECTION	N:	Method:	eu fb	w tu	line	-	- Andrews	
Sample II	73.98\$1	ontainer	• •	No. of Conta	ainers	Prese	rvation	Analysi	s Req.	Time
		40 M	LVOT	7	/	No	ne	Hoso C	house	1310
		260	ms Po	1 2	2	11	and a	Perchlos	4 + TOS	1310
		250	me la	he 1	,	Nit	ric	Pis C	hrom	1310
		125	al El	4 long 1		ED	A	Chles	ate	1310
Comment	s Runs	0-	32'				Ho	Pre 10.	66 the	Port 10 4
	aun	e /	300			Truck	here e	30'€		
				11					1	1
Signature				mil	10			Date	6/271	19



Well ID: NERTYZINI

Client:	ND	EP			D.	ate:	7/2/19	Ti	me: Start <u>/</u>	coo_am/pm
Project N		6047	7365						Finish/	/or am/pm
Site Loca			RTL		-		EWI	ang & D G	PUSE CGE	(
Weather	Conds:	ulm,	Clear	Hat - C	350 0	ollector(s)	: JCH	POTRIO	(AECOM)	
				red from To					Casina Diam	neter/Material
				c. Length of					4"	ierei (iniarei iai
			25.38	d. Calculated	d System V	olume (see	back)	2.58		
	PURGE I		lon	fku bi	undaler ,	ormy				
b. Acc	eptance C	Criteria d	lefined (see workplan)					
- Tem	perature	<u>+</u> 2	°C	-D.O.	0.3 mg					
- pH		_	.1 unit	Turbidity			ing is > 10	NTUs		
- Sp. (Cond.	<u>+</u> 3	%	ORP	<u>+</u> 10 m	nilivolts				
c. Fiel	d Testing	Equipm	ent used	d: M	ake	1 1	Model			Number
			_	14 Mett	e Turbe	moter	2000	5	7/-3	
			_	Y5.I			556		152100	967
Time	Volume		,,L1 -	Cana Cana	DO	OPD	Translation	Flow Date	Descridares	Calad O.1
Time (24hr)	Removed (Liters)	(°C)		Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	(feet)	Color/Odor
1020	0.4	26.19		3701	4.64	43.2	115	200	35.40	Clar / None
1024	1.4	24.74		3935	4.29	61.1	170	200	35.39	Cloudy / Mere
1630	2.4	24.67		3919	4.19	67.5	25.0	200	35.39	Char Mars
1235	3.4	24.71		3919	4.14	7/1	3.22	216	35.39	1/
1040	4.4	24.61	7.08	3930 3933	4.21	72.7	3.03	7.00	35-39	//
1000	5000	124.01	7.00	-/33	7.01	16.1	2.00	Zee	38-39	
	,,,,,,,,	9			1/2/19					
d. Acc	ceptance o	criteria p	ass/fail		Yes No	N//	4			(continued on back)
		·			_					1000
Ha	ve parame	eters sta	bilized		Z -					
	If no or M	I/Δ Εν-	dain hal	5144						
	If no or N	ı⁄A - ⊏XI	лат век	ow. WAD						
	_			10110		-	1.			
3. SAMP	LE COLL	ECTION	N: 1	Method:	an flo	a tu	Line			
							0			
Sample II		ontainer		No. of Cont	_ 20	_	rvation	Analys	is Req.	Time
NER	T4.21 M	11-20	9070	5 F80	Palu FB					
	7	tci w	- Puly		1+63		line	Rec	11.1	1050
	4 -	C m	/	//	1 4 ER		E O A	chi	shorts	1050
	-	i m	1		IFFR		None	Ites	chrome	1050
Comment	ls .	0	16-	421						W-19-11
Commen	-	2 my		1100 1			1440	- 1141		
	-			//	//_				,	,
Signature			11	Ans	1/1			Date	2/2/	17
							, , , , , , ,			

Well ID:

Client:		DEP)		D	ate: 7	52/19	Tir	ne: Start	//o am/pm
Project N	o:		7736	~		-	-		Finish_	/250 am/pm
Site Loca				LVW						
Weather	Conds: 🔏	une	c, Cles	a Host 10	C	ollector(s)	1	APUTRI	O CAGCOM	E WANG CA
1. WATE	R LEVEL	DATA:	(measu	ared from Top	of Casing	1)				
a. Tot	al Well Le	ngth_3	9.47	c. Length of	Water Colu	ımn <u> 4.4</u>	(a-b)		Casing Diam	eter/Material
b. Wa	ter Table I	Depth 3	2.61	d. Calculated	d System V	olume (see	back)	1.57		
	PURGE I		lus	Den	blade	les Pe	mp			_
- Tem - pH	eptance C perature Cond.	<u>+</u> 2	2°C).1 unit	see workplan -D.O. Turbidity ORP	0.3 mg	NTU read	ing is > 10	NTUs		
c. Fiel	d Testing	Equipm	ent use	d: Methe	ake	huch	Model 7070	1		Number
			-	VII	Thibio	nmoser	556	76	15210	
<u>Time</u>	Volume Removed	i Temn	_ <u>pH</u> _	Spec. Cond.	DO	ORP	Turbidity	Flow Rate	Drawdown	CalariOdan
(24hr)	(Liters)	(°C)	<u>. pri</u>	(μS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	(teet)	Color/Odor
1215	1.0	2885	1	35.99	5.20	54.5	23,0	200	32.65	Chear / None
1220	2.0	25.50	4	3568	5.11	57.0	25.4	200	32-65	11
1225	3.0	2547	6.91	3566	5.02	61.1	27,7	200	32.65	11
1230	40		6.91	3567	5.12	62.8	26.3	200	32.67	2/
1284	Hong	10				-				
		+			Thin				1	
	^				777					
d. Acc	ceptance o	criteria p	pass/fail		Yes No	N/A				(continued on back)
Ha	ve parame If no or N				z í 🗆					_
3. SAMP	LE COLL	ECTIO	N: 1	Method:	en fle	in ky	bing			_
Sample II			Type	No. of Conta		Prese	rvation	Analys	is Req.	Time
		200	me l	14	1 + E8	n	18	Peral	lesset	1235
		125 -	12 CO	9 Poly	1 + E8	E	24	chi	ent	1235
-	- 4	de m	20	ua 1	+EB	n	boro	Hoy	Chrone	1235
Comment	s	lines	2-	381						
	4	recon	e 12	245	, ,					
Signature	_		2		11	7		Date	7/2/	19

Well ID: NERT 4.5/3/

147cc 2.3 29.12 6.97 5505 4,10 64.6 4.69 200 26.16 Chex/Nor 142cc 2.3 29.01 6.96 5506 3.99 66.0 1.56 200 26.16 " 1425 3.3 28.98 6.96 5508 4.05 66.4 1.22 200 26.16 "	Client:	NUE	<u> </u>			Da	ate: <u>///</u>	27/19	Tin	ne: Start <u>/ /</u>	250_am/pm
Size Location: Weather Conds: Steams, Hetz Livinshy, 100" Collector(s): CAROTRIO (RECON) 1. WATER LEVEL DATA: (measured from Top of Casing) a. Total Well Length 50.00 c. Length of Water Column 2383 (a-b) Casing Diameter/Material Ly" D. Water Table Depth 26.17 d. Calculated System Volume (see back) D. Water Table Depth 26.17 d. Calculated System Volume (see back) D. Acceptance Criteria defined (see workplan) - Temperature ±2°C - D.O. 0.3 mg/l - pH ±0.1 unit Turbidity - Sp. Cond. - pH ±0.1 unit Turbidity - Sp. Cond. - pH - to 1 unit Turbidity - Sp. Cond. - to 10 milliolts c. Field Testing Equipment used: Make Carother Turbidity Make Volume Time Removed Temp. Time Removed Temp. - pH - (Lilers) Collector(s): - Collector(s): - Collector(s): - Casing Diameter/Material Ly" D. Secundary - D. O. 3 mg/l - 10 milliolts - Secundary - D. O. 3 mg/l - PH - to 10 milliolts - Secundary - Volume Time Removed Temp. - (Lilers) - (Clary Collector) - (Lilers) -	Project No	o: <u>6</u>	0477	725					_	Finish 12	am/pm
Weather Conds: Standard More Collector(s): Sentence (Methor)		tion:	NER	TLVI	w			E WALL	410 Gm	· (GES)	. —
a. Total Well Length 50.00 c. Length of Water Column 23 93 (a-b) b. Water Table Depth 26.77 d. Calculated System Volume (see back) b. Water Table Depth 26.77 d. Calculated System Volume (see back) 2. WELL PURGE DATA a. Purge Method: Low flow bladder grumf b. Acceptance Criteria defined (see workplan) - Temperature ±2°C -0.0. 0.3 mg/l - pH ±0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ±3% ORP ±10 millivolts c. Field Testing Equipment used: Make Model Serial Number 7: 321 8 Cample 1	Weather	Conds:	Sunn	y, Har	t. Winchy-	1000 C	ollector(s)	: JCAR	TRIO CA	Elom)	
b. Water Table Depth 26.17 d. Calculated System Volume (see back) 2. WELL PURGE DATA a. Purge Method: Lew flow bladler grund b. Acceptance Criteria defined (see workplan) - Temperature ±2°C -D.O. 0.3 mg/l - pH ± 0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ±3% ORP ± 10 milivolts c. Field Testing Equipment used: Make Model Serial Number 7.1 7218 Volume Time Removed Temp. pH - (Lilers) CD - (Lilers) CD - (Lilers) CD - (Lilers) CD - (Lilers) CD - (Lilers) CD - (Lilers) CD - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93) - (Lilers) CD - (My Sy93)	1. WATE	R LEVEL	DATA:	(measu	red from Top	of Casing	ı)				
2. WELL PURGE DATA a. Purge Method: Low flow bladder grund b. Acceptance Criteria defined (see workplan) - Temperature	a. Tota	al Well Lei	ngth_ <i>5</i>	0.00	c. Length of	Water Colu	ımn <u>239</u>	<u>3</u> (a-b)		Casing Diam	eter/Material
a. Purge Method:	b. Wa	ter Table [Depth 2	6.17	d. Calculated	System V	olume (see	back) /	15.56		· · · · · · · · · · · · · · · · · · ·
b. Acceptance Criteria defined (see workplan) - Temperature ±2°C -D.O. 0.3 mg/l - pH ±0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ±3% ORP ± 10 millivolts c. Field Testing Equipment used: Make Model Serial Number Computer	2. WELL a. Pur	PURGE D	DATA I:	Low +	Elew blade	der pun	nf				
- pH	b. Acc	eptance C	riteria c	defined (see workplan)	•					
C. Field Testing Equipment used: Make Model Serial Number 71-3218 C. Field Testing Equipment used: Make Model Serial Number 71-3218 Volume 757 556 725160967 Volume Time Removed Temp. pH Spec. Cond. DO (myl.) (perature	_			_		ina in 5 40	NITI Is		
Comments	•	Cond.	_					ing is > 10	NIUS		
Comments	c. Field	d Testina l	Eguipm	ent used	d: Ma	ake		Model		Serial	Number
Volume YST SS6		3					neter		<u>:</u>		
Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/Odor (Liflers) (**C) (Liflers) (_							
(24hr) (Liters) (°C)											
141											Color/Odor
142cr 2.3 29.01 1.96 55.06 3.99 66.0 1.56 200 26.16 11 11 11 12 12 12 12	1410								200		Clear / Socks
1425 3.3 29.98 6.96 5.508 4.05 66.4 1.22 200 26.16 1.430											Clear / Nove
d. Acceptance criteria pass/fail WHA 3. SAMPLE COLLECTION: Method: Low flow fubing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 4.5/5!-20/90627 40 m/L von None Hurchmane 14/30 250 m/L fely None None None None None None 250 m/L fely None None None None None 250 m/L fely None None None None 250 m/L fely None None None None 250 m/L fely None None None 250 m/L fely None None None 250 m/L fely No											
d. Acceptance criteria pass/fail Yes No N/A (continued on back Have parameters stabilized If no or N/A - Explain below. NAA 3. SAMPLE COLLECTION: Method: Low flow fubin x Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 4.5/5/- 20/90627 40 m/c VOA Nore Har Chrome 14/30 750 m/c FOA loly Nore Low flow fubin x 175 m/c FOA loly EOA Clairett 14/30 Comments Angle -47' Duan 9 1440		5.3		6.76	3308	4.05	66,4	1.22	200	2616	
d. Acceptance criteria pass/fail Have parameters stabilized If no or N/A - Explain below. NHH 3. SAMPLE COLLECTION: Method: Lew flow fubin z Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 4.5/5/- Zo/90627 48 m/c NOA None Her Chrome 1430 250 m/c felly None Hubbant 1430 17.5 m/c 50A felly EOA Chlerett 1430 Comments Aug 447' Rush 9 1440	1450	761	777				20				105
d. Acceptance criteria pass/fail Have parameters stabilized If no or N/A - Explain below. NHH 3. SAMPLE COLLECTION: Method: Lew flow fubin z Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 4.5/5/- Zo/90627 48 m/c NOA None Her Chrome 1430 250 m/c felly None Hubbant 1430 17.5 m/c 50A felly EOA Chlerett 1430 Comments Aug 447' Rush 9 1440				_	#16		-127/1	,			V
Have parameters stabilized If no or N/A - Explain below. N/A 3. SAMPLE COLLECTION: Method: Low flow fusing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 4.5/5/- Z0/90627 40 m/L VOA None Hor Chrome 1430 250 m/L foly now fusilized 125 m/L 50A foly EOA Chlorett 1430 Comments Ample -477' Duan 9 1440											
If no or N/A - Explain below. N/A 3. SAMPLE COLLECTION: Method: Low flow fusing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 4.5/5/- 20/90627 40 m/L VOA None Law Chrome 14/30 250 m/L felv None Luchlande 14/30 17.5 m/L 500 felv E0A Chlerate 14/30 Comments Angle -477' Duan 9 1440	d. Acc	ceptance c	riteria p	oass/fail		Yes No	N/A	\			(continued on back)
If no or N/A - Explain below. N/A 3. SAMPLE COLLECTION: Method: Low flow fusing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 4.5/5/- 20/90627 40 m/L VOA None Law Chrome 14/30 250 m/L felv None Luchlande 14/30 17.5 m/L 500 felv E0A Chlerate 14/30 Comments Angle -477' Duan 9 1440											104
3. SAMPLE COLLECTION: Method: Low flow Juling Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 4.5/5/- 20190627 40 m/c VOA None Item Chrome 14130 250 m/c Polly None Inchlerte 1430 175 m/c 500 Poly EOA Chlerte 1430 Comments Our 1440	Ha	ve parame	eters sta	abilized		e ca					
3. SAMPLE COLLECTION: Method: Low flow Juling Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 4.5/5/- 20190627 40 m/c VOA None Item Chrome 14130 250 m/c Polly None Inchlerte 1430 175 m/c 500 Poly EOA Chlerte 1430 Comments Our 1440		If no call	/A E	alaia bet	014						
Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERT 4.5/S1-20/90627 4/6 m/c VoA None Hur Chrome 14/30 250 m/c Poly None Publicate 14/30 175 m/c 500 loly E009 Chluste 14/30 Comments Aug e 447' Duan 9 1440		II NO OF N	ıA - EX	Jiain Del	ow.	7					
NERTY.5/51-20190627 40 m/L VOA Nove Her Chrome 1430 250 m/L felv Now Puchlente 1430 175 m/L FAR loly EDA Chirate 1430 Comments Ange ~477' Duan 9 1440	3. SAMP	LE COLLI	ECTION	N: 1	Method:	en flour	- Jusin	ح ا			
40 ml va None Her Chrome 1430 250 ml foly None fuchcate 1430 125 ml 500 loly EDA Chkrote 1430 Comments Ours & 1440	•				No. of Conta	ainers	Prese	rvation	Analysi	is Req.	Time
250 ml Poly 1 non Publish 1430 175 ml 500 Poly 1 EDA Chkrote 1430 Comments Dung 2 447' Dung 9 1440	,,,,,	. <u> /-)/-) </u>			VOA	1	Nor	~2	There 10	nome	14130
Comments Amp @ ~47' Duan @ 1440						1			Puebler	£	
Duan 9 1440				17. cm	L FOR Poly		EO	9	Claker	te	1430
	Comment	ts									
Carrier Contract Cont	Signature			2	1	1	>		Date	A/27	15

Well ID: NERTY.UN

Client:	1/	VDEF	>		D:	ate: フ	12/19	Ti	me: Start _	13cm am/pm
Project No	0:	600	7736	5					Finish	1400 am/pm
Site Local	tion:	NE	RT 1	UNI			21	NANG	C GES)	
Weather (Conds:	Sunny	Bee	no the	1020 0	ollector(s)	20	APOTR	10 CAE	com)
1. WATE	R LEVEL	DATA:	(meası	red from Top	of Casing	1)				
a. Tota	al Well Le	ngth 4	(.25	c. Length of	Water Colu	ımn <u>22.0</u>	<u>/</u> (a-b)		Casing Diar	meter/Material
b. Wa	ter Table I	Depth Z	3.20	d. Calculated	d System V	olume (see	back) 1	1.39	-	
	PURGE I		La	w flow	blade	der Pe	mp			
b. Acc	eptance C	Criteria d		see workplan						
	perature	<u>+</u> 2		-D.O.	0.3 mg	/I				
- pH	•	±0	.1 unit	Turbidity	10% if	NTU read	ing is > 10	NTUs		
- Sp. 0	Cond.	<u>+</u> 3	%	ORP	± 10 m	ilivolts				
c. Fiel	d Testing	Equipm	ent use		ake	, .	Model		Seria	al Number
			_	La Mette		more	2000	t		3218
	Values		- 4	1/	SI		556		15ZK	00963
Time	Volume Removed		pH -	Spec. Cond.	DO	ORP	Turbidity	Flow Rate	Drawdown	Color/Odor
(24hr)	(Liters)	(°C)	DIT	(µS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	(teet)	<u>Coloi/Oddi</u>
1320	0.5	27.28	7.22	2445	2.72	52.6	674	200	23.20	class / reor
1325	1.5	25.03	7.14	2411	1.35	461	1.95	200	23.70	В
1330	7.0	25.23	2.12	2412	1.26	463	2.03	zue	23.70	И
1335	2-5	25.18		2410	1.30	46.8	1.09	Zce	13.70	41
13cm	50	ng	us			- R	7			
		+		 		22	/-			
	 	\vdash		 		111	7			
d. Acc	ceptance (criteria r	pass/fail		Yes No	N/A			_	(continued on back
0. 7.0			,400.141			, , , , , , , , , , , , , , , , , , , ,	`			(OCHORIZED OF DECK
Ha	ve parame	eters sta	bilized		X D					
	If no or N	I/A - Exp	olain bel	low.	n					
				NH	7					
2 CAMD	LE COLL	ECTION		Method:	Cen fi	1 1	1			
S. SAIMP	LE COLL	ECHO	4.	wethou.	en fl	car su	Sins			_
Sample II		ontainer		No. of Cont	ainers	Prese	rvation	Analys	sis Req.	Time
NER	T4.64				1)	4.1			11 1110	11 13/10
			mL	al.	I + FD	No	ne tric	O'	beste + 11	1340
		250		20 01	I + FD		04	-0	- Arouse	1340
		40		WA Puly	1 + 50			11.	Character of the same	1340
_	/	,		12/	TRU		one o	144	Chione	0
Commen	ts	my 6	2 24	8			PL	ethe si	3.24	Rest 1231
	0	une	13	re .	grus.	due e	40, G	1350		-
Signature		-	/	11	~			Date	7/3	15
orginature	-			2011				Date	110	
				the state of the s						



Well ID: NEDT 4.6481

Client:	NUE				Da	ate:	1/19	Tir		<u> 23(</u>
Project No		0477							Finish 👩	am/pm
Site Local			<u>27 </u>	m, hum			Eum	9 20 GRM	selles)	
Weather (Conds:	Simny	1 Cal	m, hem	√¢ç• C	ollector(s)	JCAR	RIOLAE	Com)	
1. WATE	R LEVEL	DATA:	(measu	red from Top	of Casing	1)				
a. Tota	al Well Le	ngth_55	20	c. Length of	Water Colu	mn_24.	10 (a-b)		Casing Diam	eter/Material
b. Wa	ter Table I	Depth Z	7.10	d. Calculated	d System V	olume (see	back)	8.34		
2. WELL a. Pur	PURGE I	DATA	love	flow blo	idler la	my				
b. Acc			lefined ((see workplan) -D.O.						
- pH - Sp. 0		_	.1 unit	Turbidity ORP		NTU read	ing is > 10	NTUs	~	
c. Fiel	d Testing	Equipm		d: Ma	ake	-	Model	4	Serial	Number
			- 5	457	-	LOW	556			10967
	Volume		7				100		Alexander	
Time (24hr)	Removed (Liters)	Temp.	Hq	Spec. Cond. (µS/cm)	<u>DO</u> (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
800	1.0	24.73	7.15	5737	4.37	77.7	8.34	150	27.05	Char I None
806	2.1	24.22	7.12	5641	4.68	79.4	2.67	140	27.05	12
502	3.2	23.60	7112	5655	4,28	93.3	2.20	140	27.08	"
858	4.3	23.60	2111	5644	3.99	836	1.88	190	17.08	4
820	4.8	23.59	7.11	5648	4.06	83.7	1.90	180	22.08	4
Sa	mode-	1				<u> </u>				
	,				71119		-			
d Ac	L ceptance o	critoria r	ace/fail		Yes No	N/A	<u> </u>			(analisued on book)
u. Acc	ceptance t	criteria p	Ja55/1611		162 140	18/7	`			(continued on back)
Har	ve parame	eters sta	abilized	,						
	If no or N	I/A - Exp	olain bel	ow.						
		·		NA						
3. SAMP	LE COLL	ECTION	V :	Method:	Luc fi	low to	1.			
							0			
Sample II	T4648	ontainer		No. of Conta	ainers	Prese	rvation	Analys	is Req.	Time
	Z	60 ml	Poly	2		Non		Porch	brato +TDS	
	Z	CC ms/	luh	1		Note		Diec	Arome	820
	17	25 m	L. EDA	Ruhy 1		EUA		Chlar	te	820
	4	10 ml	Vot	9 /		Non	4	1tex C	home	820
Comment	ts	mp	Bus	12'						
	D	eum	0	840	,					
Signature			2	4	1			Date	7/11	19
				1						,

Well ID: NERTY.LSNI

Client:	IOD	<u> </u>			Di	ate:	118117	Tim	ne: Start <u>/</u>	<i>[45</i> am/pm
Project No) :	1047	7365						Finish_/	2 <i>45</i> _am/pm
Site Locat	ion:		ゴム	/W						
				unds, Heit C	27° C	ollector(s)	: J CAR	OTRIO (A	Ecom) Eh	angliges)
1. WATE	R LEVEL	DATA:	(meası	red from Top	of Casing	1)				
a. Tota	al Well Lei	ngth 49	57.7	c. Length of	Water Colu	mn_2/.	(a-b)		Casing Diam	eter/Material
b. Wat	er Table (Depth Z	4,19	d. Calculated	System V	olume (see	back)	3.91	7	
2. WELL	PURGE (DATA	/	flow b	1.11.	0				
						range				
	•			see workplan)		п				
	perature	<u>+</u> 2	.1 unit	-D.O.	0.3 mg		ina in > 10	MTHe		
- pH - Sp. C	ond.	± 3		Turbidity ORP	± 10 m		ing is > 10	NIOS		
c. Field	d Testing	Equipm	ent use	d: Ma	ake	à	Model		Serial	Number
				La Motte	Turbida	neter	70201	t	71-3	218
	Volume			452			556		157.100	1963
Time	Removed	Temn	pH -	Spec. Cond.	DO	ORP	Turbidity	Flow Rate	Drawdown	Color/Odor
(24hr)	(Liters)	(°C)		(µS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	(teet)	COIOI/OUOI
1205	0.7	26.41	7.70	2332	7.78	340	15.4	180	24.19	clean / Nook
1211	1.8	26.28	7.13	2316	1.29	36.2	4,63	180	24.19	11
1217	2.9	25.66	7.12	2306	0.96	38.2	5.98	140	24.18	V
1223	4.0	25.26	7.13	2306	1.05	40.1	3.48	KO	24,19	<i>y</i> /
1230	5	del								
						4				
					1/3	/2				
d. Acc	eptance o	criteria p	ass/fail		Yes No	N/A	4			(continued on back)
Hav	ve parame	eters sta	bilized	•	\$ \(\Bar{\Pi} \)					
	If no or N	//Δ _ Evr	alain hel	OW						
			JIAITI DEI	WAA						
3. SAMPI	LE COLL	ECTION	N:		on flor	Tul.	us			
							0	A - ab:	- D	
Sample ID	4-65NI	ontainer		No. of Conta		Prese	rvation	Analysi	s req.	Time
		ZSON	m2 Pol			No	20	Perchlor	to + 705	1236
		250 M	AL Po	6 1+	FB	NI	110	Dir CA	nouse	Rite
		125 M	W EBF	Po4 1+	FB	E47	7	chlor	4	230
		40 m	110	19 118	3	Non	-	Horas	your	1234
Comment	s Pun	ne	-21.5			Trem	selmer.	12-sate	40'€	
	Rus	ne	1235	-	0	pu the	level =	K	at the law	_/=
Signature		_	2/	///	110			Date	7/8/1	•
oignature,					1				11811	

Well ID: NERT4.70NI

Client:	,	UDEP			D	ate: <u>7</u>	19/19	Tim	ne: Start <u>/</u>	//Oam/pm
Project N			7365						Finish /:	2/0 am/pm
Site Local	tion:		I LV							
Neather (Conds: R	MAG	Jim	y Hot 9	7" (Collector(s)	JCAR	TROCAE	com) E WI	MG (GES)
I. WATE	R LEVEL	DATA:	(measu	red from Top	of Casin	g)				
a. Tota	al Well Le	ngth_4	C.03	c. Length of	Water Col	umn <u>/9.9</u>	(a-b)		Casing Diam	eter/Material
b. Wa	ter Table I	Depth Z	5.08	d. Calculated	d System V	olume (see	back) /3	202		
	PURGE I		lon	flow	blades	ler Pu	mp			
- Tem - pH	eptance C perature Cond.	<u>+</u> 2	°C .1 unit	see workplan) -D.O. Turbidity ORP	0.3 mg 10% il	g/I f NTU read nilivolts	ing is > 10	NTUs		
c. Fiel	d Testing	Equipm	ent used	d: Ma	ake		Model		Serial	Number
			4	La Mette	Kurbid	meter	Zuro	d	71-3	218
				45	I	***	556		152100	2963
Time (24hr)	Volume Removed (Liters)	Temp.	- <u>Hq</u>	Spec. Cond.	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
1127	1.1	25.52	7.31	1904	2.11	824	30.2	-60250	25.08	Clear INcrea
1127	2.1	24.02	7.22	1895	1,67	1185	25.6	Z00	25.01	11
1132	3./	24.15	7.7	1899	1.23	1248	11.4	200	25.08	, A
1137	4.1	23.92	7.18	1910	1.04	154.2	9.63	eve	25.08	1
1142	5.1	23.98	7.18	1907	1.12	156.2	7,65	Zee	SUCT	p)
1147	6,1	23.93	7.1%	1908	1.14	161.1	7.34	200	Trut	1
150	Sung	land			90					
al A a.	ceptance o	nitaria n	ooo/foil		7/9/m Yes No					(continued on back)
	ve parame	eters sta	abilized		1 2					(continues on secur)
. SAMP	LE COLL	ECTION	N: 1	Method:	n ffer	- tub	inz			
Sample II		ontainer		No. of Conta		Prese	rvation	Analysi	s Req.	Time
	ZTC m		,	2+2		No	ic.	Ruchle	rate + TDS	1150
	250 M	1 Po	1	1+1	EB	Nite	ic	Pirce	erome	1150
	125 M	LED	A Pak	1 1 + 6	8	ED.	4	chla	rate	1150
	4cm	12 V	OA	1 + E	B	No	10	Here	Lione	1150
Commen	ts Rom	200	425	,		Trues	oluen	Reget	40' €	1200
	Per	ne.	12.00				Prest	be level	25.04 /	t the land = 2
Signature		-3	2	Chil	11/2	>		Date	7/9/	19

Well ID: NERTY.71NI

Low-Flow Ground Water Sample Collection Record Date: 7/9//9 Time: Start 1/3

Client:	<i>i</i> /	レンド	<u> </u>			ate:/	/9//1	IIn		am/pm
Project N	o:	6047	17345						Finish_/	<u>₹/</u> 6 am/pm
Site Loca		NER	IL	vW						
Weather	Conds: 🔏	uers	Jus	my . Hot 1	1000	Collector(s)	: JCA	RTRIO C	AECOM) &	wang 148
			_	ared from Top						
						-75-67	0 (- 1-)		Casing Diam	eter/Material
a. I ot	ai Weii Ler	igth 4	7.50	c. Length of	vvater Con	umn <u> / // 3</u>	<u>7</u> (a-b)		4"	
h Wa	ter Table [enth 2	7.91	d. Calculated	l System \	/olume (see	hack) /	1.32		
			71.5.	d. Galobiato	o o you o i ii	0141110 (000	Jaon,			
	. PURGE D		1	n flew	111	1 0	0			
a. Pui	ge Method		u	n +an	2/411	y in	7	_		
b. Acc	ceptance C			(see workplan)						
	perature	<u>+</u> 2'		-D.O.	0.3 m					
- pH		<u>+</u> 0.	.1 unit	Turbidity		NTU read	ing is > 10	NTUs		
- Sp. (Cond.	± 3'	%	ORP	<u>±</u> 10 r	nilivolts				
c Fie	ld Testing I	Fauinm	ent lise	d· Ma	ake	-	Model		Serial	Number
0. 1 10		-4-1-1-11	9	La Mette	dirk.	of meder	zuz	20	71.3	
				VISI			556		15210	
	Volume		1							
<u>Time</u>	Removed		pН	Spec. Cond.	DO	ORP		Flow Rate		Color/Odor
(24hr)	(Liters)	(°C)	- 22	(μS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	(feet)	10/ /1
1233	1.0	25.73	7.32	1999	2.20	75.2	9.71	200	27.91	Clean / Nia
1238 1243	2.0	23.94 23.63		1950	0.91	134.2	12-6	200 200	27.91	11 .
1248	3.0	23.4		1944	0.25	138 6	13.2	200	27.81	£2
1253	7.0	23.67		1947	0.97	140.9	12.9	200	27.91	u
125	Sem	1	/ -	74-77			1 2 7		27.	3
		P				70				
						119				
d. Ad	ceptance o	riteria p	oass/fai		Yes N	D N//	+			(continued on back)
			اد م دالا باد		N					
Ha	ive parame	eters sta	abilizea		A C	J []				
	If no or N	/Δ - Evr	olain he	low . /	1					
	11 110 01 11	,,, ,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	iow. Ny	9					
							.)			
3. SAMF	LE COLL	ECTION	1 :	Method:	en £	ku Tu	Sinz			
		_	_			_ '	0		_	_
Sample I		ontainer		No. of Conta	ainers	Prese	rvation	Analysi	is Req.	Time
NER	54.7/N							0 11	1	
	75.00	ne	-			None		Perchier	16+TD5	1255
			Con	0 / 1		Auto		2/1	L	1200
	125		EDA I	1		Litte		Hun	-	1200
_	. 0		701			100	-	17-50		, - , -
Commer	its	mp e	-43							-
-	Desco	ne	1.30	0	1				,	,
Signature	a		1	11-11	1			Date	7/9/	19
J.g. Idian		-	- KI	1						-

Well ID: NERT 4.7/S/

100 2 0 25.67 7.01 \$887 3.18 69.1 822.9 880 28.85 11 1007 7 25.49 703 \$873 322 70.6 21.0 180 28.85 11 1013 4.2 25.48 704 53.74 3.26 71.2 26.1 140 28.85 11 1015 5007 1015	Client:	NDE				D:	ate:	1/19	Tin		<i>99ර</i> ණ/pm
Weather Conds: State Level DATA: (measured from Top of Casing) a. Total Well Length 46.75 c. Length of Water Column 77.92 (a-b) b. Water Table Depth 29.93 d. Calculated System Volume (see back) // 70 2. WELL PURGE DATA a. Purge Method:	_										<u>ル35</u> am/pm
1. WATER LEVEL DATA: (measured from Top of Casing) a. Total Well Length \$\frac{\(\text{MC} \) \(\text{C} \) \(\text{Casing Diameter/Material } \) b. Water Table Depth \$\frac{\(\text{C} \) \(\text{C} \) \(\text{Casing Diameter/Material } \) b. Water Table Depth \$\frac{\(\text{C} \) \(\text{C} \) \(\text{Casing Diameter/Material } \) b. WELL PURGE DATA a. Purge Method: b. Acceptance Criteria defined (see workplan) - Temperature \$\frac{\(\text{2} \) \(\text{C} \) \(\text{D.O.} \) - 0.3 mg/l - pH \$ \(\text{cond.} \) \$\frac{\(\text{10} \) \(\text{In Initiality} \) - 0.3 mg/l - pH \$ \(\text{cond.} \) \$ \(\text{10} \) \(\text{millivolts} \) c. Field Testing Equipment used: Make Model Serial Number \(\text{7-1-32-1k} \) \(10-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	Site Locat	ion:	NER	rZV	W	~ d					
a. Total Well Length 4/2.7 c. Length of Water Column 77.92 (a-b) b. Water Table Depth 24.93 d. Calculated System Volume (see back) b. Water Table Depth 24.93 d. Calculated System Volume (see back) 2. WELL PURGE DATA a. Purge Method: b. Acceptance Criteria defined (see workplan) - Temperature ±2°C -D.O. 0.3 mg/l - pH ±0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ±3% ORP ±10 millivolts c. Field Testing Equipment used: Make Model Serial Number 71- 32/8 15210012 3 Volume Time Removed Temp. pH Spec. Cond. DO ORP (Libers) (Colling) (Coll	Weather (ارک Conds:	my,	heen	14t, -7	<u> </u>	collector(s)	: <u>TCA</u>	RTRIO (AERUM)	
b. Water Table Depth 23:33 d. Calculated System Volume (see back) 2. WELL PURGE DATA a. Purge Method: b. Acceptance Criteria defined (see workplan) - Temperature ±2°C -D.O. 0.3 mg/l - pH ±0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ±3% ORP ±10 millivolts c. Field Testing Equipment used: Make Model Serial Number Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown (Justice) (my) (mV) (mV) (mI/min) (teet) Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown (Justice) (my) (mV) (mV) (mI/min) (teet) PSS 0.90 26.06 20.0 \$52.2 4.89 7.3 2.1.1 / Sio 25.85 (Justice) (model) PSS 0.90 26.06 20.0 \$53.3 3.19 6.9.1 62.29 \$50.0 25.85 // PSS 0.90 26.06 20.0 \$53.3 3.22 76.6 27.0 150 25.85 // PSS 0.90 26.06 20.0 \$53.3 3.22 76.6 27.0 150 25.85 // PSS 0.90 26.06 20.0 \$53.3 3.22 76.6 27.0 150 25.85 // PSS 0.90 26.06 20.0 \$53.3 3.22 76.6 27.0 150 25.85 // PSS 0.90 26.00 26.00 50 50 50 50 50 50 50 50 50 50 50 50 5				•	•			lm , , ,		Casino Diam	eter/Material
2. WELL PURGE DATA a. Purge Method:									92		
a. Purge Method: b. Acceptance Criteria defined (see workplan) - Temperature				7.753	d. Calculated	ı System v	olume (see	back)/	7. 10		
- Temperature	a. Pur	ge Method	l:	lon	flow	Blada	In Pin	nf	*		
- pH		-			• •		_				
C. Field Testing Equipment used: Make	•	perature	_						APTI I		
Volume Time Removed Temp. pH Spec. Cond. DO (u.liers) ("C") C") (u.liers) ("C") ("C") ("C") (u.liers) ("C") ("C") ("C")		Cond.	_					ing is > 10	NIUS		
Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/Odor (24hr) (c. Field	d Testina l	Equipmo	ent used	i: Ma	ake		Model		Serial	Number
Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/Odor (24hr) (Liters) (°C) (Liters			• •		La Mette	Turbie	lunter	2020	t	フト 3	2/8
Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown (teet) Color/Odor (my/L) (_	Ust		•	556		15210	0983
(24hr) (Liters) (*C) (μS/cm) (mg/L) (mV) (NTU) (ml/min) (Teet) (14hr) (Liters) (*C) (μS/cm) (mg/L) (mV) (NTU) (ml/min) (Teet) (14hr) (14hr) (14hr) (14hr) (14hr) (14hr) (14hr) (14hr) (14	T :				Cara Card		000	To a de l'Attent	Flam Data	Describerra	G-1- /O.I
100 2 0 25.67 7.01 \$887 3.18 69.1 622.9 686 28.85 11 1007 7 25.49 703 \$873 322 70.6 21.0 180 28.85 11 1013 4.2 25.48 704 54.74 3.26 71.2 26.1 140 28.85 11 1017 5.000 1018 101			•	pm							Color/Udor
1	1955	0.90	2646	7.07	5922	4.89	7/.3		180	24.45	Clear I None
Color Continued on back Continued on bac	1001	2.0	25.67	7.01			69.1	022.9	180		
d. Acceptance criteria pass/fail Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Lin flow fubing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NENTY: 7/81-7/819 676/	1007		_				1				
d. Acceptance criteria pass/fail Yes No N/A Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Low flow fusing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NENTY.7/S/1-18/19 070/				7.04	5474	3.26	71.2	20.1	140	24.85	//
d. Acceptance criteria pass/fail Yes No N/A Have parameters stabilized If no or N/A - Explain below. **MA** 3. SAMPLE COLLECTION: Method: Land flow fubing Sample ID Container Type No. of Containers Preservation Analysis Req. Time **NERTY:7 SI-18 9670 TEO m2 Puly **Nere** **No N/A (continued on back of Container of Decision of De	JOK	Scary	m				- //				
d. Acceptance criteria pass/fail Yes No N/A Have parameters stabilized If no or N/A - Explain below. **MA** 3. SAMPLE COLLECTION: Method: Land flow fubing Sample ID Container Type No. of Containers Preservation Analysis Req. Time **NERTY:7 SI-18 9670 TEO m2 Puly **Nere** **No N/A (continued on back of Container of Decision of De						7/	,				
Have parameters stabilized If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Land flow fubing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NENTY: 7/81-18/19 070/		- 1				47	.119	-			
If no or N/A - Explain below. WHA 3. SAMPLE COLLECTION: Method: Law flow tubing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NENTY: 7/51-7/8/19 670/	d. Acc	ceptance o	criteria p	ass/fail		Yes No	N/A	À		-	(continued on back)
3. SAMPLE COLLECTION: Method: Lan flow fubing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERTY, 7/51-7/8/19 6701 The Management of Mana	Ha	ve parame	eters sta	bilized		8					
3. SAMPLE COLLECTION: Method: Lan flow fubing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERTY, 7/51-7/8/19 6701 The Management of Mana		If no or N	/Δ - Evr	dain hel	nw.						
3. SAMPLE COLLECTION: Method: Lon flow tubing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NERTY, 7/81-7/8196701 Z60 m2 Puly 1 Neve Puchlante 1017		11 110 01 14	,,,	nam ber							
Sample ID Container Type No. of Containers Preservation Analysis Req. Time NENTY.7/S/-78/9676/ Z60 m2 Paly / Neve Vuchlente ///						/ (, ,	/			
NERTY. 7/81-7/8190701 ZEO mil Palij I were Kuchlerte 1017	3. SAMP	LE COLL	FCHON	4: P	vietnod:	en the	ou to	15144			
260 ml Poly 1 were Puchlante 1018						ainers	Prese	rvation	Analysi	s Req.	Time
CONTRE TOTAL	70 0 10	. ,,,,,	7,39	,,,,,							
		Z£	Oml				Н	Vere	Pere	herate	1015
		12.	T m2		FDA /			500	<u> </u>	leveto	NIC.
41 M 40 1 Nove Here Phrome KIS			10 ml	40				Vore	144	1 Chromo	1211
Comments Pump e ~ 4/4/	Comment	s /	limp	10	- 4/2/						
Desen 9 125			deen	, 0	1025						
Signature	Signature			2/	And the second	11	<u>z_</u>		Date	7/1/	3

Well ID: NERTY.7132

Project No:	Client:	N	DEP			D	ate:	11/19	Tin	ne: Start 🕜	₹ 4 € am/pm
Site Location: Weather Conds: Colom Standy Wa.m- Qu" Collector(s): E VANG+ B GAMSE CGES) T CHRTHLO (AFCEN) 1. WATER LEVEL DATA: (measured from Top of Casing) a. Total Well Length 57 4% c. Length of Water Column 27.1 (a-b) Water Table Depth 27.3c d. Calculated System Volume (see back) b. Water Table Depth 27.3c d. Calculated System Volume (see back) D. Acceptance Criteria defined (see workplan) - Temperature ± 2°C -D.D. 0.3 mg/l - PH ± 0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ± 3% ORP ± 10 millivolts c. Field Testing Equipment used: Make Model Serial Number 1	Project No	0:	12417	7365							
Weather Conds: Colon Scany, War — 90° Collector(s): Scany Calcum. 1. WATER LEVEL DATA: (measured from Top of Casing) a. Total Well Length 57 46 c. Length of Water Column 27.1 (a-b) Casing Diameter/Mate b. Water Table Depth 27.3c d. Calculated System Volume (see back) 17149 2. WELL PURGE DATA a. Purge Method: Low flow Industry Industry b. Acceptance Criteria defined (see workplan) - Temperature ±2°C -D.O. 0.3 mg/l - pH ±0.1 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. ±3% ORP ±10 milivolts c. Field Testing Equipment used: Make Model Serial Number Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/C (uSlem) (mg/L) (mf/l) (mf/l) (mf/lmn) (reet) OTJO 0.4 25.37 7.04 492.4 2.18 75.2 E 180 22.31 (harder) 92°C 2.6 2.34 7.01 496.2 1.16 73.4 E 180 22.31 (harder) 92°C 2.6 2.34 7.01 496.2 1.16 73.4 E 180 22.31 (harder) 92°C 2.6 2.34 7.01 496.2 1.16 73.4 E 180 22.31 (harder) 93°C 2.6 2.7 2.40 7.01 496.2 1.15 73.4 E 180 22.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.40 7.01 497.0 1.59 7.16 163 750 27.31 (harder) 93°C 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7	Site Locat							5 14/0	U/- 4 A /- D		
1. WATER LEVEL DATA: (measured from Top of Casing) a. Total Well Length \$7.45 c. Length of Water Column \$27.1 (a-b)\$ b. Water Table Depth \$7.35 d. Calculated System Volume (see back) b. Water Table Depth \$7.35 d. Calculated System Volume (see back) c. WELL PURGE DATA a. Purge Method: b. Acceptance Criteria defined (see workplan) - Temperature \$2.00 - 0.0 0.3 mg/l - pH \$1.01 unit Turbidity 10% if NTU reading is > 10 NTUs - Sp. Cond. \$2.36 ORP \$1.01 millivolts c. Field Testing Equipment used: Wake Model Serial Number Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate (u.Stem) (mg/L) (m/V) (m	Weather (Conds: 📆				ر ماران الماران Collector(s)	J cA	WILLO CA	(Ecom)		
b. Water Table Depth 27.3c d. Calculated System Volume (see back) 17/49 2. WELL PURGE DATA a. Purge Method: Low flow bladder fund b. Acceptance Criteria defined (see workplan) - Temperature ±2°C -D.O D.O	1. WATE	R LEVEL	DATA: (measu)	red from Top	of Casing	9)				
2. WELL PURGE DATA a. Purge Method: b. Acceptance Criteria defined (see workplan) - Temperature ± 2°C -D.O. 0.3 mg/l - pH	a. Tota	ai Weli Ler	ngth <u>57</u>	46	c. Length of	Water Colu	ımn <u>27.</u>	/_(a-b)		Casing Diam	eter/Material
a. Purge Method: b. Acceptance Criteria defined (see workplan) - Temperature	b. Wat	ter Table [Depth Z	7.30	d. Calculated	l System V	'olume (see	back) /	7,49		
b. Acceptance Criteria defined (see workplan) - Temperature				lan	flew	blade	for Pun	ud			
- Temperature	h Acc	entance C	riteria de					,			
- pH		•					ı/l				
C. Field Testing Equipment used: Make		p 0. 0.0. 0	_			-		ina is > 10	NTUs		
Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/O (24hr) (Liters) (°C) (µS/cm) (mg/L) (mV) (NTU) (ml/min) (teet) Color/O (24hr) (Liters) (°C) (µS/cm) (mg/L) (mV) (NTU) (ml/min) (teet) Color/O (24hr) (µS/cm) (mg/L) (mV) (NTU) (ml/min) (teet) Color/O (24hr) (µS/cm) (µS/cm) (mg/L) (mV) (NTU) (ml/min) (teet) Color/O (14hr) (14	•	Cond.	_		•						
Volume Time Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/O (24hr) (Liters) (°C) (Liters) (c. Field	d Testing I	Equipme	ent used	i: Ma	ake	, ,		6		
Volume Removed Temp. pH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/C (24hr) (Liters) (*C) (Liters)				4			MART		t		
Time Removed Temp. PH Spec. Cond. DO ORP Turbidity Flow Rate Drawdown Color/O (uslorm)		Volume		-	1/5	I		556		1521	00963
1		Removed		Hq							Color/Odor
1	0750	0.4	25.38	7.04			78.7	E	180	27.31	Churchy Interes
16 73.4 16 73.4 16 73.4 16 73.4 16 73.3 7 7.0	0856	1.5	1		4949	1.66	74.7		180	27.3/	
1.56 72.4 154 160 27.31 1992 1.56 72.4 154 160 27.31 19920 5.9 24.09 7.01 49.70 1.59 71.6 163 180 77.81 " d. Acceptance criteria pass/fail Yes No N/A E-Exceds Informents (continued or Calibration Ronge) Have parameters stabilized B		7.6			41962		73.4	E	140		11
d. Acceptance criteria pass/fail Yes No N/A E=Excest Instruments Calibration Ronge Have parameters stabilized If no or N/A - Explain below. Alt Sample ID Container Type No. of Containers NERTY: 71.52-20191101 The None Pershabitation of the North Ronge Nort	0908	3.7	7403	7.01	4962	1.54	72.1	168	186	22.31	11
d. Acceptance criteria pass/fail Yes No N/A E seeds Induments (continued or Californium Renge) Have parameters stabilized If no or N/A - Explain below. Method: Can flow labing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NFRT4.7152-3040001 The Method Rely 7 None Publicate The Otto	0914	4.8				1.56	72.4	154	140	27.31	1
d. Acceptance criteria pass/fail Yes No N/A E Executs Informatis (continued or Call brat won Renge) Have parameters stabilized If no or N/A - Explain below. 3. SAMPLE COLLECTION: Method: Low flow kubing Sample ID Container Type No. of Containers Preservation Analysis Req. Time WERTY, 71.52-200000000000000000000000000000000000	3920		24.09	7.01	4970	1.59	71.6	163	180	77.81	"
d. Acceptance criteria pass/fail Yes No N/A E=Secols Indivended (continued or Calibration Rouge) Have parameters stabilized If no or N/A - Explain below. 3. SAMPLE COLLECTION: Method: Con flow fusing Sample ID Container Type No. of Containers Preservation Analysis Req. Time NFRT4.71.52-2019.0031 Sound foly The None Pershinder Office of Containers Preservation Chloride of Chlori	692×	Same	41			7,5					
If no or N/A - Explain below. If no or N/A - Explain below. 3. SAMPLE COLLECTION: Method: Low flow habing Sample ID Container Type No. of Containers Preservation Analysis Req. Time WERTY, 7/52-2019/00/1 250 ml foly 7 None furtherte/TOS 0705 250 ml foly 7 None furtherte/TOS 0705 250 ml foly 1 None for one one						///					
If no or N/A - Explain below. If no or N/A - Explain below. 3. SAMPLE COLLECTION: Method: Low flow habing Sample ID Container Type No. of Containers Preservation Analysis Req. Time WERTY, 7/52-2019/00/1 250 ml foly 7 None furtherte/TOS 0705 250 ml foly 7 None furtherte/TOS 0705 250 ml foly 1 None for one one	d. Acc	ceptance c	criteria pa	ass/fail		Yes No	N/A	E-EL	coeds Ind	runents	(continued on back)
3. SAMPLE COLLECTION: Method: <u>Low flow tubing</u> Sample ID Container Type No. of Containers Preservation Analysis Req. Time WERTY, 7152-3090001 ZEV ML Poly 7 None Purple of the Containers OF Conta	Hav	ve parame	eters stal	bilized		B		Ca	1. Sweet Kos	Ronge	
3. SAMPLE COLLECTION: Method: <u>Low flow tubing</u> Sample ID Container Type No. of Containers Preservation Analysis Req. Time WERT 4.7152-201901011 ZEV mil foly 7 None furtherte/TO 0715 ZEV mil foly 1 None for Change 0715 ZEV mil foly 1 None for Change 0715		If no or N	/A - Evol	lain hek	714/						
Sample ID Container Type No. of Containers Preservation Analysis Req. Time NFRT4.71.52-20190701 ZEC mil Poly 7 None Purchasta TD 0725 ZEC mil Poly 1 None Pis Channes 0725 185 mil Polysoft 1 None ENA Chilosoft 0725			/A - EXPI	iaiii bek	NIA	2.					
NFRTY.71.52-20195131 ZEC ML POLY 7 None Purchaste/TD 0725 ZEC ML POLY 1 Note Pis Chromes 0726 125 ML PolyEDA 1 NONE END Chlorate 0726	3. SAMPI	LE COLLI	ECTION	: 1	/lethod:	ou fi	len 1	Lubina			
NFRTY.71.52-20195131 ZEC ML POLY 7 None Purchaste/TD 0725 ZEC ML POLY 1 Note Pis Chromes 0726 125 ML PolyEDA 1 None ENA Chlorate 0726	0	0.			N= -601-		Dunne		Amaluai	- D	Time
The mil Poly ? None Perchante TD ones The mil Poly i Note Pis Change one The mil PolyEDA I None ENA Chlorate one						ainers	Presei	rvation	Analysi	s Req.	Time
THE ML PulyEDA I Note ENA Chilorate OFTE	101.1					2	No	me	Perch	brote/TOS	0925
		75	e me	Poli	1	i	N	trie	Pis	Chrone	0525
		12	C ml	Pul	EBA	1	-11	EN	2 C	Worte	0928
		y	ml	10	A	1			the	u chrone	0925
Comments Rung @ - 52' Re 1he = 27.30 Rest 1he 27.30	Comment	s	Pemp	0-	-52'		are	-			27.30
Decem e - 0935 Transferer Reset e 50' e 09,50			eun	0-	0935		Truster	er Reset	ere'	0 09.30	,
SignatureDateDateDate	Signature			1	M	20			Date	7/1/1	9



Well ID: NEET 4.433/

Client:		<u>e₽ </u>				Date:	11/19	Tir	ne: Start	<u>/ℨ/ひ</u> am/pm
Project N		6047	7365					_	Finish	/4/0 am/pm
Site Loca	_		RT				E 4	JANG (CA	5) DGRUKE	(KEC)
Weather	Conds:				105	Collector(s):	ARTRIO	(AF Com)
1. WATE	R LEVEL	DATA:	(measu	red from Top	of Casin	g)				
a. Tot	al Well Le	ngth 54	1.03	c. Length of	Water Co	lumn <u>Z.6.4</u>	13 (a-b)		Casing Diam	ieter/Material
b. Wa	iter Table	Depth _	227.40	d. Calculated	i System \	Volume (see	back) 🖊	7.25		
	. PURGE i		Cour	flow blo	Mar	Rung				
				see workplan)		,				
	perature	<u>+</u> 2		-D.O.	0.3 m	_				
- pH	Cond	_	.1 unit	Turbidity		f NTU read	ing is > 10	NTUs		
- Sp. (conu.	<u>+</u> 3	70	ORP	± 101	milivolts				
c. Fiel	ld Testing	Equipm	ent used	/ / /	ake /	1.1.	Model			Number
			-	Ca Mutte		MOTOR	556		7/-32	
	Volume		-				3,00		700,000	10.)
Time (24hr)	Removed (Liters)	(°C)		Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
1350	0.5		7,02	4024	2.21	77.8	30.4	150	27.58	Char Non
1336	1.6	26.63		4000	1.81	74.0	22.2	140	27.58	11
1342	2.7	26.74		3984	1.82	72.9	14.4	150	27.58	1/
1348	3.8	26.58	7.00	3948	1.85	70.3	12.8	190	27.58) / I
1355	50		100	3988	1.85	70.7	·/	140	2.7.58	
- H - Y - T		0				7/17				
	F					1 777				
d. Ac	ceptance	criteria p	ass/fail		Yes N	o N//	A			(continued on back)
На	ve parame	eters sta	bilized			1 🗆				
	,									
	If no or N	I/A - Exp	lain bel							
				NA				0.00		_
3. SAMP	LE COLL	ECTION	l: 1	Method:	en flo	in Fus	uz			_
Sample II	D C	ontainer		No. of Conta	ainers	Prese	rvation	Analysi	s Req.	Time
NE		SOME		,		No	10	0	Charte	1355
		es me		Pak 1		13		che	,	1355
		W ml		1			re	Hara	hore	1355
Comment	ts 4	Zumo	0 4	51'						
		accom.	e /	405						48.0
			1	11	1	,			-/	/
Signature	-		1	Mall	11			Date	7/11	19
				0						



Well ID: NERTS. 1151

Client:	NO	EP				Date:	1/1/19	Tin	ne: Start <u>I</u>	225 am/pm
Project No	0:	604	7776	5					Finish /	320 am/pm
Site Loca			7 L	VW.				JG (GFS)	O, GRUSE ((€5)
Weather	Conds:	انعيد	y, Hut.	Sunny 10	Z°	Collector(s)	: <u>Јс</u> А	NTRIO	(AEcom	
				red from Top			1		Casina Diam	eter/Material
				c. Length of		1	-		4"	reter/iviaterial
b. Wa	ter Table [Depth Z	180	d. Calculated	d System \	/olume (see	back)	5.60		
	PURGE D		Low	Flow !	ladder	puny	2			
b. Acc	eptance C	riteria d	lefined ((see workplan)						
	perature	<u>+</u> 2		-D.O.	0.3 m					
- pH		_	.1 unit	Turbidity		f NTU read	ing is > 10	NTUs		
- Sp. (Cond.	<u>+</u> 3	%	ORP	<u>+</u> 10 ı	milivolts				
c. Fiel	d Testing l	Equipm	ent use		ake		Model		Serial	Number
			_		Turbiel	meter	Sasa	t	71-	3218
			_	VISI			556		1521	00 963
Time	Volume	Tomo	- III -	Case Cond	DO	OPP	Tambidita	Elevi Dete	Deguadavas	C-1/O-1
<u>Time</u> (24hr)	Removed (Liters)	(°C)	<u>Hq</u>	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	(NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
1240	0.75	76.99	207	4032	1.33	76.7	15.1	250	20.41	Clear 1 stop
1245	2.0		7.04	4029	1:01	66.9	14.9	250	20.81	11
1240	20832			4056	0.70	70.2	14.7	750	20.81	11
1255	9500	2511		4056	0.74	68.8	15.7	260	20.81	11
1300	6.25 Som	25.11	7,07	9037	0.77	2.7	13.7	250	20.81	
7,50		7				7/1				
						1	7			
d. Ac	ceptance c	riteria p	ass/fail		Yes N	o N/A	4			(continued on back)
				_	-					
Ha	ve parame	ters sta	abilized] []				
	If no or N	Δ - Evr	olain hel	OW						
	11 110 01 147	- EV	naiii bei	NA	_					
	-			77 111		7.5		-100		_
3. SAMP	LE COLLE	ECTION	√i: i	Method:	on flo	w thhis	ng			_
			_			_				1
Sample II		ntainer		No. of Conta	ainers	Prese	rvation	Analysi	s Req.	Time
NER	75.1181	SU M		,		Nor	.0	1	11-1	13ot
		- my	A 11	COA 1		8.0		chi	and a	BOX
		40 m				No		Horse	chrone	1805
Comment	s Ki	mpe	- 4	11.5'						
	De	un		1815	1					
Signature			2	1	11	>		Date	2/1/1	9

Well ID: NERTS: Y131

Client:	N	DEP			D	ate:	4/19	Tir	me: Start 💍	900 am/pm
Project No	o:	6047	7365							gco am/pm
Site Locat	tion:	AJE	RTL	VW						
Weather (Conds:	colm, s	Emmy	, Warm &	8	Collector(s)	: JCAPE	STRIO CAL	com) E WA	WGLGES)
1. WATE	R LEVEL	DATA:	(measi	ured from Top	of Casing	9)				
a. Tota	al Well Le	ngth	9.73	c. Length of	Water Colu	ımn <u>/3</u> 2	2(a-b)		Casing Diam	eter/Material
b. Wat	ter Table I	Depth Z	6.71	d. Calculated	d System V	'olume (see	back) 8	-49		
2. WELL a. Pur	PURGE I	DATA	lon	flow b	ladder	Pun	P			
b. Acc	eptance C	Criteria d	defined	(see workplan)						
	perature	<u>+</u> 2		-D.O.	0.3 mg	J/ I				
- pH		<u>±</u> 0).1 unit	Turbidity	10% if	NTU read	ing is > 10	NTUs		
- Sp. C	Cond.	<u>+</u> 3	1%	ORP	<u>+</u> 10 n	nilivolts				
c. Field	d Testing	Equipm	ent use		ake		Model		Serial	Number
				La Matk		noter	Sisse	ν έ	71.3	218
	Maluma		-	45	#		554		152100	963
Time	Volume Removed	Tomp	pH -	Spec. Cond.	DO	ORP	Tuebiditu	Elou Doto	Droudown	CalariOda
(24hr)	(Liters)	(°C)	<u> </u>	(µS/cm)	(mg/L)	(mV)	(NTU)	Flow Rate (ml/min)	Drawdown (feet)	Color/Odor
0910	0.8	2637	7.50	1672	2.73	32.9	36.8	200	26.71	alear Inua
0915	1.8	25.12	7,42	1657	1-23	30.8	18.4	200	26.71	11
0920	2.8		7.42	1651	0.93	34.7	8.44	200	2671	1
0925	3.8	24.91		1650	6.97	38.2	5.33	200	76.71	11
0230	4.8		7.43	1648	0.99	39.8	6.73	200	76.71	11
39.35	Scene	plan				77				
				 		7/19				
d. Acc	ceptance o	riteria p	bass/fail		Yes No	N//				(continued on back)
	•									,
Hav	ve parame	eters sta	abilized							
	If no or N	/A - Exp	olain bel	ow. NA						
						, 4	26, 1	/		
3. SAMP	LE COLL	ECTION	V :	Method:	en flo	w 1/3	in Ins	ing		_
Sample ID) C	ontainer	Type	No. of Conta	inere	Drese	rvation	Analys	is Req.	Time
1.15	F5.4951			No. or Come	3111613	FICSC	I ValiOII	Allalys	is ried.	Tille
~ ~ ~	2.5.7.631	2011	701							
	250	me 1	Poly		/	Non	<	Per	blocate	0934
	125	ML	EDA	lohy	/	EDI		ch	brute	0935
	40	ml	Vot	/		No	4	Here	Chrone	0935
Comment	s R	mp	0 - 3	77'						
	Q	um	00	940						
Signature			71	11	1			Date	7/4/	10
ngi iatu e	_			110/11				Date	1/7/1	/



Well ID: NEW 5.9/5/

Client:—	_AIDE	<u> </u>		<u> </u>	Di	ate:	11/19			<u>4//0</u> am/pm
Project No		64	7736	5						<u>roo</u> am/pm
Site Locat				VW			EWA	MG (GES)	DGRUSE U AECom)	ies)
Weather (Conds:	unny	Wine	by 1 tot ~10		collector(s)	JCA	RYRIGE	AECom)	
1. WATE	R LEVEL	DATA:	(measi	ured from Top	of Casing	J)				
a. Tota	al Well Ler	ngth_4	19.61	c. Length of	Water Colu	ımn <u>36</u>	9_(a-b)		Casing Diam	eter/Material
b. Wat	ter Table D	Depth /	3.32	d. Calculated	l System V	olume (see	back)	19.77		
	PURGE D		6	w flow.	6 Judder	Punn	,			
b. Acc	eptance C	riteria d		(see workplan)		,				
- Tem	perature	<u>+</u> 2	°C	-D.O.	0.3 mg	j/l				
- pH		<u>+</u> 0.	.1 unit	Turbidity	10% if	NTU readi	ing is > 10	NTUs		
- Sp. C	Cond.	<u>+</u> 3'	%	ORP	<u>+</u> 10 m	nilivolts				
c. Field	d Testing l	Equipm	ent use		ake	1	Model	4		Number
			-	La Motte	14 Mila	1016/	2000		7/-3	
	Volume			45.7			556		15210	2963
Time (24hr)	Removed (Liters)	Temp.	<u>pH</u>	Spec. Cond.	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
1425	12.5	27.61	7.03	4021	2.13	68.1	46.4	ZZO	13.44	Chen Inore
14/30	1.6	27.64	7.03	4082	1.48	61.6	34.9	230	13.49	coleunluber
1435	2.7	26.35	7.02	4069	0.94	63.9	364	220	13.49	11
14 40	3.8	26.38	7.02	4074	0.93	62.3	34.3	270	13.42	. 11
معجم للإسال	Sen	der	1 -			70				
	- 0	1								
				-		2/1//	9			
d Acc	eptance c	ritoria n	acc/foil		<u>I</u> Yes No	N/A	<u> </u>		-	(
u. Acc	eptance c	лиспа р	ass/Iali		162 140	19//-	,			(continued on back)
Hav	ve parame	ters sta	bilized							
	If no or N	/A - Exp	lain bel	low.	In					
				N	4					
3. SAMP	LE COLLE	ECTION	l:	Method:	low fr	on the	line			_
Sample IE) (c	ontainer	Type	No. of Conta	ninore	Proco	rvation	Analysi	c Dog	Time
	5.9/5/-			140. Of Conta	111615	FIESE	valion	Allalysi	s ney.	Tillie
70601	3.7.3	0.10	-							-
	250	UML	Poly	1		None		Ruch	brate	1445
	121	CEDA	Poly	- /		E.04		Chlor	ate	MIK
	40	MIL	NOA	-		Non	ne _	17ems	chrome	1445
Comment	s	ing	e -	-471						
	De	con	0	1455					1	
Signature	_		2	1/1	7			Date	7/1/19	,
			-	and the					1	



Well ID: wmw 3.5∾

Client:	NDE					Date:	15/19	Tin	ne: Start <u>O</u>	
Project No		2047					•		Finish <u>//</u>	40 am/pm
Site Locat			r ZVL							
Weather (Conds: <u>4</u> 4	ht Brue	ze, for	chuck, warm	90°	Collector(s)	JCARN	PUU CAECU	om) EWALL	4 (4ES)
a. Tota	al Well Ler	ngth <u>55</u>	.06	c. Length of	Water Co	olumn <u>19.7</u> <			Casing Diam フル	eter/Material
b. Wat	er Table [Depth 3	531	d. Calculated	d System	Volume (see	back)	22		
2. WELL a. Purg	PURGE D	DATA	Lon	fkw	blade	les Pern	de			
	perature	<u>+</u> 2	°C .1 unit	(see workplan) -D.O. Turbidity ORP	0.3 г 10%	ng/l if NTU readi milivolts	ing is > 10	NTUs		
c. Field	d Testing I	Equipm	ent use	d: Matte	ake	her to	Model ている	.		Number
			2	45	+	Amerer	556	· C	1520	
	Volume Removed		- - <u>Ha</u>	Spec. Cond.	DO	ORP	Turbidity	Flow Rate	Drawdown	Color/Odor
(24hr)	(Liters)	(°C)	101	(μS/cm)	(mg/L)		(NTU)	(ml/min)	(teet) 35-3 /	2 /4/20
0955	2.1	25.05	6.96	6102	416	71.1	E	180	30.31	Brewn None
1001 1007	3.2	24.64		6178	5.99	40.9	E	180	35.31	Borney/Rhose
10/3	4.3	24.63		6133	6.08	82.2	E	180	35.31	11
1019	5.4	24.62		6123	6.05	84.4	E	180	35.31	7
1020	Scon	len	<u> </u>			71				
		1			7/5	19				
٦ ٨-		-141	<i>!</i> -: !							
	eptance over e parame	eters sta	abilized olain be	ow.		No N/A	t	ndrumen	at a	(continued on back)
	Tui	bidu	orle	net clear	ng to	below May	y inst.	ment		
3. SAMP						You to	1			_
Sample II	Co	ontainer I- ZOI		No. of Conta	ainers	Prese	rvation	Analysi	is Req.	Time
	-	2	er no	2 864	/	No	~/	Peroll.	+	1020
				COA Paly	1	EU	_	chlen	to	1020
Comment	s	Comp	e -s							
	- W	um	2 /4	0.30	1				_ , ,	/,
Signature			1	holas	1/1	1		Date	7/5/1	7

Well ID: WMW 3.55

Client:	ND	KP_			Da	ate: <u>し/</u> 3	28/19	Tin	ne: Start 🕜	<u>%3℃</u> am/pm
Project No			17365						Finish (29,70 am/pm
Site Local		NE	21 61	// A /						
Weather (Conds:	6 lars	n, LK	+ Breeze Sun	my -850 C	ollector(s)	J.C.A.RCA	NW (AECO	on) E WANG	LDGRUSE (G
1. WATE	R LEVEL	DATA:	(meası	red from Top	of Casing)				
a. Tota	al Well Ler	ngth_5	3,90	c. Length of	Water Colu	mn 16.3	<u>て</u> (a-b)		Casing Diam	eter/Material
								211		
			3.58	d. Calculated	i System vi	olume (see	back)	2.56	•	
2. WELL a. Pur	PURGE De Method	DATA I: <u> </u>	on t	flow blace	Her Pu	nnf				
b. Acc	eptance C	riteria d	lefined ((see workplan)		•				
- Tem	perature	<u>+</u> 2		-D.O.	0.3 mg					
- pH		_	.1 unit	Turbidity		NTU readi	ng is > 10	NTUs		
- Sp. 0	Cond.	<u>+</u> 3	%	ORP	<u>+</u> 10 m	ilivolts				
c. Field	d Testing I	Equipm	ent use	d: Ma	ake	,	Model			Number
			_	1, a Motte	Inibidin	ylor	Zuzut		71-3	
	Volume		-	Y51	.		556		15210	0963
Time	Removed	l Temp	<u>pH</u>	Spec. Cond.	DO	ORP	Turbidity	Flow Rate	Drawdown	Color/Odor
(24hr)	(Liters)	(°C)	<u> 511</u>	(μS/cm)	(mg/L)	(mV)	(NTU)	(ml/min)	(teet)	<u>COIOI/ COO</u>
0845	0.4	24.98	6.98	4047	2.64	73.7	43.8	150	4334	Tan / None
0851	1.5	24.17		4036	1.59	71.2	24.4	146	43.54	Cloudy / NOUC
0857	7.6	23.56		4042	1.37	71,7	155	/40	43.54	Char/ No
1903	7.7	23.47		4047	1.29	71.1	11.68	140	43.54	11
0909 0910	4.8 San	1348	6.98	4046	1.23	71,3	16.54	140	43.54	
0-110	Sant	7				- P				
	1				6/	28/17				
d. Acc	ceptance o	criteria p	pass/fail		Yes No	N/A			43.54	(continued on back)
Ha	ve parame	atere ets	hilized		A \square				•	
110	•				€ □					
	If no or N	/A - Exp	olain bel	ow.WH						
					-					
3. SAMP	LE COLLI	ECTION	N:	Method:	in floor	, tubi	ny			
Sample I	o Co	ontainer	Type	No. of Conta	ainers	A Preser	vation	Analysi	is Rea	Time
•			**	7 + FD W		100		, ,,,,,,,,		1
		_	me A		FJ)	100	love	Pero	hkrote	0910
		12× n			+FD	۶	"NA	chl	erate	090
Comment	ts	my c		57'			19			
		run	0 0	1920		7 -7	-	8.		
Signature			3	1/2	111			Date	6/26	119
				/	~					



WMW4.9N

Client:	NI	<u>ed</u>			^D	ate:7	15/19		me: Start <u>/</u>	<u>/46</u> am/pm
Project No	p:	60477	365						Finish	12.45 am/pm
Site Locati		VERT	LVh	/						
Weather 0	Conds: B	reezy	fend	unds. Hot	100°	Collector(s)	: Zche	oteio (A	Ecom) EWA	<u>ng (GET)</u>
1. WATE	R LEVEL	DATA:	(measu	red from Top	of Casing	3)				
a. Tota	al Well Le	ngth 52	2.62	c. Length of	Water Colu	ımn 20.4	2 (a-b)		Casing Diam	eter/Material
b. Wat	er Table [Depth 3	1,80	d. Calculated	d System V	'olume (see	back)	140	-	
2. WELL a. Purg	PURGE [ge Method	DATA I:	Lou	flow &	bladel	- Pem	q			
b. Acce - Temp - pH		riteria c <u>+</u> 2	lefined (°C .1 unit	see workplan) -D.O. Turbidity ORP	0.3 mg 10% if	g/l	ing is > 10	NTUs		
•	d Testing	_		d: Ma	ake	, ,	Model			Number
			_	La Motte		dmoter	2020	6	71-3	
			-	y:	I		516		172100	967
<u>Time</u> (24hr)	Volume Removed (Liters)	Temp.	<u>рН</u> -	Spec. Cond.	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	<u>Drawdown</u> (teet)	Color/Odor
/200	(2.5	27.52	2.12	2646	2.81	57.6	922	200	31 79	Tem / None
7205	1.5	25.24		2608	1.61	54.6	508	200	31.80	11
1210	2.5	25.09		2612	1,69	53.0	533	200	31.80	17
1215	3.1	24/19		2630	1.67	53-3	298	Zuc	31.40	Clottch / Wo
1220	4.5	_	7.03	2642	1.62	53.7	690	200	31.80	Chelchy / NO
1225	6.5	24.72	7.03	2643	1.64	53.6	287	240	21.40	1)
1230	Sam	1-			- 2/					,
- A	eptance o				Yes No		Δ.			
Hav	ve parame	eters sta	abilized			ı ====================================				(continued on back)
3. SAMPI	LE COLL	ECTION	N:	Method:	cu flo	w his	ins			
Sample ID	14.9 N	ontainer		No. of Conta	ainers	Prese	rvation	Analy	sis Req.	Time
			77	,			,	7)	11 /-	
	125		DA Po	hy 1			COA	el	prate 24	47725-1230
Comment	s Pur	on c	123	1'						
Signature			2	Ship!	10			Date	7/5/19	<u> </u>



Well ID:	C
WMW7-7.	<u> </u>

Client:		NDEI	þ		D	ate:	/4/19	Tir	ne: Start <u>Oʻ</u>	<u>۱۲۵</u> am/pm
Project N	o:	604	77365						Finish /	015 am/pm
Site Loca	tion:		REL							
Weather	Conds:/	alm	Clean	- wem	900	Collector(s)	: J CAR	UTRIU (A	Ecom) E. L	ANG (655)
1. WATE	R LEVEL	DATA:	(meası	red from Top	of Casing	g)			a : n:	
a. Tota	al Well Ler	igth 4	6.66	c. Length of	Water Colu	<u>20.2</u> mm	<u>./</u> (a-b)			eter/Material
								- 10	411	
b. Wa	ter Table D	epth 2	6.45	d. Calculated	l System V	olume (see	back)	3.19		
2. WELL	PURGE D	ATA		7.		0				
	ge Method		lone	flow !	bladde	+ Ken	no			
							0			
				see workplan)						
	perature	<u>+</u> 2		-D.O.	0.3 mg	-	ina in > 40	NITUO		
- pH - Sp. (Cond	±3).1 unit	Turbidity ORP		NTU read	ing is > 10	NIUS		
- Sp. (Junu.	13	70	ORF	<u>+</u> 1011	IIIIAOIT2				
c. Fiel	d Testing l	Equipm			ake	1 5	Model		Serial	Number
			4	la Moth		More	2000	t	71-3	2/8
			-	YS	I		556		15210	2963
	Volume	_								- 4 /- 1
<u>Time</u> (24hr)	Removed (Liters)	(°C)	<u>pH</u>	Spec. Cond. (µS/cm)	DO (mg/L)	ORP (mV)	(NTU)	Flow Rate (ml/min)	Drawdown (feet)	Color/Odor
0135	0.9		7.09	2444	4,63	54.1	27.9	200	26.45	Clear Iwon
0940	1,9	T	7.03	2457	3.77	770	30.5	200	26.46	11
0945	2.9	1	7.43	2456	3.68	101.1	13,4	Zoc	26.45	//
0950	3.9	24.35		2454	3.28	127-2	6.11	240	26.45	1
0955	4.9	24.37		2453	3.37	131.6	5.65	Zee	26.45	11
1000	5.9	24.29	7.04	2453	3.38	132.4	5.41	200	26.45	
1005	Sany	len			- 9	<u> </u>				
1 0	1	11 - 1 -	(F - 2)		7/9,					
d. Ac	ceptance c	riteria	oass/taii		Yes No	o N/A	4			(continued on back)
Ha	ve parame	ters sta	ahilized			1 🗆				
110	ve parame	1013 311	abilited .							
	If no or N	A - Ex	olain bel	ow.						
				NA						
						, /	,			
3. SAMP	LE COLLE	ECTIO	N: 1	Method:	ou f	low tu	bing			
0		-1-1	. T	No. of Courts		D		A b	:- B	T:
Sample II		ntaine		No. of Conta	ainers	Prese	rvation	Analys	is Req.	Time
WN	14.9	5- 20	0190	707		_				
	200	me	41			Non	0	Pian	llate	1005
	17.0		EDA	lule 1		EDY		CLL	1	1005
	701	77.150								
Commen	te D		42	-						
Commen	0	my c	2 11	NO NO						
	7.16	arin 6	70	~	1				i	,
Signature			7	120	1			Date	7/91	119
		_								



Well ID:

Client:		NDE	P		Di	ate: <i>C</i> ,	124119	Tin	ne:Start _/	095 am/pm	
Project No	0:	604	17736	5					Finish /	146 am/pm	
Site Location: NERT LI/W						EWANG + D GRUSE (GES)					
Weather	Conds: 🔏				ر ٥	collector(s)	JCAL	CX DIE (A	Ecom)		
a. Tota	al Well Lei	ngth_3	4.27	red from To					Casing Diam	eter/Material	
	ter Table [d. Calculate	d System V	olume (see	back)	5.26			
2. WELL a. Pur	PURGE I	DATA	lan	flow t	ladder	Purm	_				
	perature	<u>+</u> 2	°C .1 unit	see workplan -D.O. Turbidity ORP	0.3 mg 10% if	ı/l NTU read iilivolts	ing is > 10	NTUs			
c. Fiel	d Testing I	Equipm	ent use	d: M	lake	, ,	Model			Number	
			-	La Mott	Turboc	Imater	Zve	૨	71-3		
	Volume		-	45	I		556		15210	10863	
Time (24hr)	Removed (Liters)	Temp.	<u>pH</u>	Spec. Cond.	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (feet)	Color/Odor	
1055	0.3	27.91	7.22	3094	3.26	59.1	4.16	180	13.92	Charlakore	
1101	1.4	24.62		307/	2.98	59.9	9163	150	13.92	n	
1107	2.5		7.16	3056	2.93	615	9.59	180	13.92	"	
1143	3.6		7.17	3061	2.93	63.1	¥.36	16/6	13.52	4/	
1199	4.7	7.3.1.2	. フィハ	3058	2,90	63.0	7.42	140	13.97	-	
1,20	Semol					R					
					7	12841					
d. Acc	ceptance o	riteria p	pass/fail		Yes No					(continued on back)	
Ha	ve parame			ow.	Q D						
3. SAMP	LE COLLI	ECTION	N: 1	Method:	Cen fx	lew tu	bing				
Sample II	V 5.59	ontainer		No. of Cont	ainers	Prese	rvation	Analysi	s Req.	Time 45	
		o me		1		No	re	Reach	brate	1/20	
			va Put	4 1		ED.	A	chi	eneste	1120	
Comment	0	up	e 1	35'	1			Dete	6/28/1	19	
Signature			1	my			***	Date	7-1011	/	



Well ID:

Client:	ND	EP			D	ate: 7/	3/19	Tin	ne: Start 🕜	120 am/pm
Project No	0:	M loc	477.	365					Finish_0	956_ am/pm
Site Local				LUW						
		1-4+ R	each,	Summy for	chuch 880	Collector(s)	: J CAPE	STRIO CA	Ecom) & h	ANG (655)
		•		ured from To	-					
				c. Length of			7 (a-b)		Casing Diam	eter/Material
b Ma	tor Table	Donth 1	/ 67	d. Calculate	d System V	folume (see	hack) S	7.7	7"	
2. WELL			/	u. Calculate	u Oystein v	Oldine (see	back)			
a. Pur	ge Metho	d:	low	flow 5	ladder	pump)			
	•			(see workplan	•					
	perature	<u>+</u> 2		-D.O.	0.3 mg	-	inn in > 40	AITLIA		
- pH - Sp. (Cond.	±0 ±3		Turbidity ORP		NTU read	ing is > 10	NIUS		
c. Fiel	d Testing	Equipm	ent use	d: M	ake		Model		Serial	Number
				La Moto	k Turb	ductor	2020	t	71-3	2/8
				4	SI		556		15210	0963
T :	Volume			C C		ODD	To a de Californi	Elevi Dete	Danielaum	6.1.701
Time (24hr)	Remove (Liters)	(°C)		Spec. Cond. (µS/cm)	(mg/L)	ORP (mV)	(NTU)	Flow Rate (ml/min)	(teet)	Color/Odor
0450	0.6	25.23		4430	4.69	10.4	E	150	17,10	Brown Work
0456	1.2	24.21		4505	1,49	-24.6	782	100	17.12	Brunn / Wine
0404	2.0	2423		4483	1.28	-63.3	2114	100	12:12	A)
0912	2.8	24.40		4423	1,05	-67.6	237	100	17.12	
0920	3.4	24.35		4429	1.07	-68.4	22/	100	17.12	Tan/None
0928	4.7	24.39	7.23	4426	1.09	-69.1	219	700	17.12	
0930	Sem	les				18/19		-		
d. Acc	ceptance	criteria i	oass/fail		Yes No		F	- Cuencha	() Junt	(continued on back)
							-	Cul. bu	Influent du Rosque	,
Ha	ve param	eters sta	abilized						•	
	If no or N	I/A - Exp	olain be	low.	49					
				70	17 17					
3. SAMP	LE COLL	ECTIOI	٧:	Method:	len f	en to	sting			_
Sample II	о с	ontainer	Type	No. of Cont	ainers	Prese	rvation	Analys	is Rea.	Time
•				190703						
	-	co n	2 /	24 1	-	No	240	Perchlow	4	09.30
1.4.		zt m			- Han	ED	227	Ch knot	ž.	0234
Comment	_	Emp	en							
	7.1	un	-	940	1				200	1
Signature		_	1/2/	Mill	11			Date	7/3/	17



Well ID: www.5.7 N

Client:		DEL			Da	ate:	19/19	Tim	ne: Start //	
Project N	_		1736						Finish	4//5 am/pm
Site Loca			Rt 1							
Veather	Conds: 🔼	ww	1.5my	my Hot 1	00 0	ollector(s)	JCAR	OTRIO CA	Econ) Cil	JANG (GES)
				red from Top c. Length of	_		5 <u>4</u> (a-b)		Casing Diam	eter/Material
b. Wa	iter Table D	epth <u></u>	8.42	d. Calculated	l System V	olume (see	back)	1.21		
	PURGE C		Lon	Flow	blandele	- Pin	-0			
- Tem - pH	ceptance C perature Cond.	<u>+</u> 2	°C .1 unit	(see workplan) -D.O. Turbidity ORP	0.3 mg	NTU read	ing is > 10	NTUs		
c. Fiel	ld Testing E	Equipm	ent use		ake		Model		Serial	Number
				La Moble	Turbida	meter	Zurut	,	71-37	
				ISF		-	556		152100	963
Time (24hr)	Volume Removed (Liters)	Temp.	<u>рН</u>	Spec. Cond.	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (teet)	Color/Odor
1.335	0.5		7.28	1769	236	1091	5.34	Zec	8.40	Clen/NER
1340	1.5	22.07		1763	1.34	93.7	4.85	200	8.40	N
1345	2.5	27.64	7.20	1754	1.12	14.2	4.51	200	841	"
1350	3.6	29.75		1755	0.94	85.7	4,16	200	4.41	"
1355	4.5	29.69	7.21	1751	0.95	71.3	4.09	200	841	ıt.
1400	Serre	Kent			9		1			
	<u> </u>	-		<u> </u>	19/12					
d Ac	ceptance o	riteria r	nace/fail		Yes No	N//	Δ			(continued on back
На	if no or N			low.						
s. SAMF	PLE COLLI	ECTIOI	N:	Method:	en fles	a tub	har			_
Sample I	D Co	ontainer		No. of Conta	ainers	Prese	ervation	Analysi	is Req.	Time
			01		,			, ,	1	1. 1.
-	250	me	Por	01	/	1/me		Kerch	brute	1400
_	125	ML	EDA	roly		EDA	-	Chkr	uls	1400
Commen	nts	Emy	0-1	cr'	./	ank 1	Entish	- flate	if it mas	bor
		um	21	1//					271	1_
Signature	e		1	MA				Date	//9/1	9

Appendix J

Laboratory Reports

Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-244812-1

Laboratory Sample Delivery Group: LVW Client Project/Site: NDEP Phase II

For: AECOM 1220 Avenida Acaso Camarillo, California 93012

Attn: Carmen Caceres-Schnell

anea Roberdo

Authorized for release by: 7/10/2019 3:50:26 PM

Danielle Roberts, Senior Project Manager (949)260-3249

danielle.roberts@testamericainc.com

..... LINKS

Review your project results through

Total Access

Have a Question?



Visit us at: www.testamericainc.com The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: AECOM Project/Site: NDEP Phase II Laboratory Job ID: 440-244812-1 SDG: LVW

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Method Summary	10
Lab Chronicle	11
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QC Association Summary	20
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-

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a

Sample Summary

Client: AECOM

Project/Site: NDEP Phase II

Job ID: 440-244812-1 SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asse
440-244812-1	NERT3.35S1-20190626	Water	06/26/19 12:35	06/28/19 10:00	
440-244812-2	NERT3.35S1-20190626-FD	Water	06/26/19 12:35	06/28/19 10:00	
440-244812-3	NERT3.40S1-20190626	Water	06/26/19 14:45	06/28/19 10:00	
440-244812-4	NERT3.58S1-20190627	Water	06/27/19 09:40	06/28/19 10:00	
440-244812-5	NERT3.63S1-20190627	Water	06/27/19 10:45	06/28/19 10:00	
440-244812-6	NERT3.80S1-20190627	Water	06/27/19 11:50	06/28/19 10:00	
440-244812-7	NERT3.80S1-20190627-FD	Water	06/27/19 11:50	06/28/19 10:00	
440-244812-8	NERT4.51S1-20190627	Water	06/27/19 14:30	06/28/19 10:00	
440-244812-9	NERT3.98S1-20190627	Water	06/27/19 13:10	06/28/19 10:00	

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Case Narrative

Client: AECOM

Job ID: 440-244812-1 Project/Site: NDEP Phase II

SDG: LVW

Job ID: 440-244812-1

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-244812-1

Comments

No additional comments.

Receipt

The samples were received on 6/28/2019 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.6° C.

HPLC/IC

Method(s) 300.1B: The following sample was diluted for the chlorate analyte due to the nature of the sample matrix: NERT3.35S1-20190626 (440-244812-1). Elevated reporting limits (RLs) are provided.

Method(s) 300.1B: The following samples were diluted for the chlorate analyte due to the nature of the sample matrix: NERT3.35S1-20190626-FD (440-244812-2), NERT3.40S1-20190626 (440-244812-3) and NERT3.98S1-20190627 (440-244812-9). Elevated reporting limits (RLs) are provided.

Method(s) 300.1B: The following samples were diluted for the chlorate analyte due to the nature of the sample matrix: NERT3.35S1-20190626 (440-244812-1) and NERT3.40S1-20190626 (440-244812-3). Elevated reporting limits (RLs) are provided.

Method(s) 314.0: The following samples were diluted due to the nature of the sample matrix: NERT3.35S1-20190626 (440-244812-1), NERT3.35S1-20190626-FD (440-244812-2), NERT3.40S1-20190626 (440-244812-3) and NERT3.98S1-20190627 (440-244812-9). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Job ID: 440-244812-1

Client: AECOM Project/Site: NDEP Phase II SDG: LVW

1 Toject/Oile. NDET 1 Hase II									SDO. LVV
Client Sample ID: NER	T3.35S1-2019	90626				Lab Sa	am	ple ID: 44	0-244812-1
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	6900		100	50	mg/L		_	SM 2540C	Total/NA
- Client Sample ID: NER	T3 35S1-2019	00626-FD				l ah S	am	nle ID: 44	0-244812-2
	10.0001-201	70020-1 D				Lab O	uII	ipic ib. 44	10-2-1-012-2
Analyte		Qualifier	RL		Unit			Method	Prep Type
Total Dissolved Solids	6900		100	50	mg/L	1		SM 2540C	Total/NA
Client Sample ID: NER	T3.40S1-2019	90626				Lab Sa	am	ple ID: 44	0-244812-3
_ Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	9000	<u> </u>	100	50	mg/L		_	SM 2540C	Total/NA
- Client Comple ID: NED	T2 E864 2040	00607				l ah C	0 100	nolo ID: 44	0 244942 4
Client Sample ID: NER	13.5051-2018	00021				Lab Sa	all	ipie ib. 44	0-244812-4
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorate	2700		200	20	ug/L	10	_	300.1B	Total/NA
Perchlorate	1000		200	48	ug/L	50		314.0	Total/NA
Total Dissolved Solids	3400		20	10	mg/L	1		SM 2540C	Total/NA
Client Sample ID: NER	T3.63S1-2019	90627				Lab Sa	am	ple ID: 44	0-244812-5
_ Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorate	3900		400	40	ug/L		_	300.1B	Total/NA
Perchlorate	1200		80	19	ug/L	20		314.0	Total/NA
Total Dissolved Solids	3100		20	10	mg/L	1		SM 2540C	Total/NA
Client Sample ID: NER	T3.80S1-2019	90627				Lab Sa	am	ple ID: 44	0-244812-6
 Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorate	1400		100		ug/L			300.1B	Total/NA
Perchlorate	820		80		ug/L	20		314.0	Total/NA
Client Sample ID: NER	T3.80S1-2019	90627-FD				Lab Sa	am	ple ID: 44	0-244812-7
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorate	1400		100		ug/L		_	300.1B	Total/NA
Perchlorate	820		80		ug/L	20		314.0	Total/NA
Client Sample ID: NER	T4.51S1-2019	90627				Lab Sa	am	ple ID: 44	0-244812-8
- - Analysis	Daniil.	Ouglifie:	Di	MO	l lmit	D!! F	_	Mathad	Duan Torre
Analyte Chlorate		Qualifier	RL	MDL		Dil Fac 50	ח	Method 300.1B	Prep Type
	8200		1000		ug/L				Total/NA
Perchlorate 	2400		400	95	ug/L	100		314.0	Total/NA
Client Sample ID: NER	T3.98S1-2019	90627				Lab Sa	am	ple ID: 44	0-244812-9
- Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
							_		

5100

Total Dissolved Solids

Total/NA

7/10/2019

SM 2540C

100

50 mg/L

Client: AECOM

Project/Site: NDEP Phase II

Date Received: 06/28/19 10:00

SDG: LVW

Client Sample ID: NERT3.35S1-20190626 Lab Sample ID: 440-244812-1 Date Collected: 06/26/19 12:35

Matrix: Water

Job ID: 440-244812-1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	ND		100	10	ug/L			07/02/19 09:51	- 5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	98		90 - 115					07/02/19 09:51	
Method: 314.0 - Perchlora	Result	Qualifier	RL			D	Prepared	Analyzed	
	• •	Qualifier			Unit ug/L	<u>D</u> .	Prepared	Analyzed 07/08/19 13:59	Dil Fac
Analyte Perchlorate	Result	Qualifier				<u>D</u> .	Prepared		
Analyte	Result ND	Qualifier Qualifier			ug/L	D .	Prepared Prepared		

Date Collected: 06/26/19 12:35

Date Received: 06/28/19 10:00

Matrix: Water

Method: 300.1B - Disinfectio	n By-Products, (IC)						
Analyte Chlorate	Result Qualifier ND	RL 100	10 Unit ug/L	D	Prepared	Analyzed 07/02/19 09:09	Dil Fac
Surrogate Dichloroacetic acid(Surr)	%Recovery Qualifier 95	Limits 90 - 115			Prepared	Analyzed 07/02/19 09:09	Dil Fac
Method: 314.0 - Perchlorate	(IC)	DI.	MDI II	Б	Duamanad	Amahasad	Dilfor

Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac Perchlorate $\overline{\mathsf{ND}}$ 20 4.8 ug/L 07/08/19 14:20 **General Chemistry**

Analyte Result Qualifier RL **MDL** Unit Analyzed Dil Fac D Prepared **Total Dissolved Solids** 100 50 mg/L 07/01/19 09:09 6900

Client Sample ID: NERT3.40S1-20190626 Lab Sample ID: 440-244812-3 Date Collected: 06/26/19 14:45 **Matrix: Water**

Date Received: 06/28/19 10:00

Analyte

Total Dissolved Solids

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	ND		200	20	ug/L			07/02/19 15:49	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	102		90 - 115			=		07/02/19 15:49	10
- Method: 314.0 - Perchlor	ate (IC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	ND			4.8	ug/L			07/08/19 14:40	5

RL

100

MDL Unit

50 mg/L

Analyzed

07/01/19 09:09

Prepared

Result Qualifier

9000

Dil Fac

Client: AECOM

Project/Site: NDEP Phase II

Client Sample ID: NERT3.58S1-20190627

Lab Sample ID: 440-244812-4

Lab Sample ID: 440-244812-5

Lab Sample ID: 440-244812-6

Matrix: Water

Matrix: Water

Matrix: Water

SDG: LVW

Job ID: 440-244812-1

Date Collected: 06/27/19 09:40	
Date Received: 06/28/19 10:00	

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	2700		200	20	ug/L			07/05/19 11:25	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	104		90 - 115					07/05/19 11:25	10
Method: 314.0 - Perchlora Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Method: 314 0 - Perchlor:	ate (IC)								
Method: 314.0 - Perchlora Analyte Perchlorate		Qualifier	RL	MDL 48	Unit ug/L	<u>D</u> .	Prepared	Analyzed 07/08/19 11:21	Dil Fac
Analyte Perchlorate	Result	Qualifier				<u>D</u> .	Prepared		
Analyte	Result 1000	Qualifier			ug/L	<u>D</u> .	Prepared Prepared		

Client Sample ID: NERT3.63S1-20190627

Date Collected: 06/27/19 10:45

Date Received: 06/28/19 10:00

Method: 300.1B - Disinfection Analyte	n By-Products, (IC) Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	3900	400	40	ug/L			07/07/19 22:53	20
Surrogate	%Recovery Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	106	90 - 115					07/07/19 22:53	20

Dichioroacetic acid(Surr)	700		90 - 113					01/01/19 22.55	20
Method: 314.0 - Perchlorate (IC) Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	1200		80	19	ug/L			07/08/19 15:41	20
General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3100		20	10	mg/L			07/03/19 11:00	1

Client Sample ID: NERT3.80S1-20190627

Date Collected: 06/27/19 11:50

Date Received: 06/28/19 10	0:00								
Method: 300.1B - Disinfed Analyte	•	ts, (IC) Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	1400		100	10	ug/L			07/05/19 14:24	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	112		90 - 115			-		07/05/19 14:24	5
- Method: 314.0 - Perchlora	ate (IC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	820		80	19	ug/L			07/08/19 16:02	20

7/10/2019

Client Sample Results

Client: AECOM Job ID: 440-244812-1 Project/Site: NDEP Phase II

SDG: LVW

Lab Sample ID: 440-244812-7 Client Sample ID: NERT3.80S1-20190627-FD Date Collected: 06/27/19 11:50 **Matrix: Water** Date Received: 06/28/19 10:00 Method: 300.1B - Disinfection By-Products, (IC) Analyte Result Qualifier RL**MDL** Unit Dil Fac D Prepared Analyzed 100 07/05/19 14:54 Chlorate 1400 10 ug/L Dil Fac Surrogate %Recovery Qualifier Limits Prepared Analyzed Dichloroacetic acid(Surr) 109 90 - 115 07/05/19 14:54 Method: 314.0 - Perchlorate (IC) **MDL** Unit RLAnalyte Result Qualifier D Prepared Analyzed Dil Fac Perchlorate 820 80 19 ug/L 07/08/19 16:22 20 Lab Sample ID: 440-244812-8 Client Sample ID: NERT4.51S1-20190627 Date Collected: 06/27/19 14:30 **Matrix: Water** Date Received: 06/28/19 10:00 Method: 300.1B - Disinfection By-Products, (IC) Result Qualifier Analyte RL MDL Unit D Prepared Analyzed Dil Fac Chlorate 8200 1000 100 ug/L 07/07/19 21:05 Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 105 90 - 115 07/07/19 21:05 50 Method: 314.0 - Perchlorate (IC) Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 400 07/08/19 12:22 **Perchlorate** 2400 95 ug/L 100 Client Sample ID: NERT3.98S1-20190627 Lab Sample ID: 440-244812-9 Date Collected: 06/27/19 13:10

Matrix: Water

Method: 300.1B - Disinfection By-Products, (IC) Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Chlorate $\overline{\mathsf{ND}}$ 200 07/02/19 10:21 20 ug/L 10 Surrogate %Recovery Qualifier Limits Analyzed Dil Fac Prepared Dichloroacetic acid(Surr) 96 90 - 115 07/02/19 10:21 10 Method: 314.0 - Perchlorate (IC) Result Qualifier Analyte RL **MDL** Unit D Dil Fac Prepared Analyzed Perchlorate ND 20 4.8 ug/L 07/08/19 15:00 5 **General Chemistry** Analyte Result Qualifier Unit RL MDL D Prepared Analyzed Dil Fac 100 **Total Dissolved Solids** 50 mg/L 07/02/19 08:12 5100

Date Received: 06/28/19 10:00

Surrogate Summary

Client: AECOM Job ID: 440-244812-1 Project/Site: NDEP Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Matrix: Water Prep Type: Total/NA

	2011	Percent Surrogate Recovery (Acceptance Limits)
Olivet Overelle ID	DCAA	
Gample ID Client Sample ID 44812-1 NERT3.35S1-20190626	(90-115) 98	
	100	
44812-1 MS NERT3.35S1-20190626	99	
44812-1 MSD NERT3.35S1-20190626		
44812-2 NERT3.35S1-20190626-FI		
44812-2 MS NERT3.35S1-20190626-FI		
44812-2 MSD NERT3.35S1-20190626-FI		
44812-3 NERT3.40S1-20190626	102	
44812-3 MS NERT3.40S1-20190626	103	
44812-3 MSD NERT3.40S1-20190626	102	
44812-4 NERT3.58S1-20190627	104	
44812-4 MS NERT3.58S1-20190627	108	
44812-4 MSD NERT3.58S1-20190627	106	
44812-5 NERT3.63S1-20190627	106	
44812-6 NERT3.80S1-20190627	112	
44812-7 NERT3.80S1-20190627-FI	D 109	
44812-8 NERT4.51S1-20190627	105	
44812-9 NERT3.98S1-20190627	96	
45143-A-2 MS Matrix Spike	105	
45143-A-2 MSD Matrix Spike Duplicate	106	
140-555700/4 Lab Control Sample	100	
140-555709/4 Lab Control Sample	104	
140-556143/4 Lab Control Sample	109	
140-556356/4 Lab Control Sample	107	
40-555700/5 Method Blank	98	
40-555709/5 Method Blank	105	
40-556143/5 Method Blank	109	
40-556356/5 Method Blank	106	
440-555700/3 Lab Control Sample	99	
440-555709/3 Lab Control Sample	104	
440-556143/3 Lab Control Sample	109	
440-556356/3 Lab Control Sample	107	
ırrogate Legend		

Eurofins TestAmerica, Irvine

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7/10/2019

Method Summary

Client: AECOM

Job ID: 440-244812-1 Project/Site: NDEP Phase II SDG: LVW

Method	Method Description	Protocol	Laboratory
300.1B	Disinfection By-Products, (IC)	EPA	TAL IRV
314.0	Perchlorate (IC)	EPA	TAL IRV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Job ID: 440-244812-1

Lab Sample ID: 440-244812-2

Lab Sample ID: 440-244812-3

Lab Sample ID: 440-244812-4

Lab Sample ID: 440-244812-5

SDG: LVW

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Client: AECOM Project/Site: NDEP Phase II

Client Sample ID: NERT3.35S1-20190626 Lab Sample ID: 440-244812-1 Date Collected: 06/26/19 12:35 **Matrix: Water**

Date Received: 06/28/19 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			555709	07/02/19 09:51	YZ	TAL IRV
Total/NA	Analysis	314.0		5			556406	07/08/19 13:59	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	555543	07/01/19 09:09	XL	TAL IRV

Client Sample ID: NERT3.35S1-20190626-FD

Date Collected: 06/26/19 12:35

Date Received: 06/28/19 10:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			555700	07/02/19 09:09	YZ	TAL IRV
Total/NA	Analysis	314.0		5			556406	07/08/19 14:20	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	555543	07/01/19 09:09	XL	TAL IRV

Client Sample ID: NERT3.40S1-20190626

Date Collected: 06/26/19 14:45

Date Received: 06/28/19 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		10			555709	07/02/19 15:49	YZ	TAL IRV
Total/NA	Analysis	314.0		5			556406	07/08/19 14:40	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	555543	07/01/19 09:09	XL	TAL IRV

Client Sample ID: NERT3.58S1-20190627

Date Collected: 06/27/19 09:40

Date Received: 06/28/19 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		10			556143	07/05/19 11:25	YZ	TAL IRV
Total/NA	Analysis	314.0		50			556406	07/08/19 11:21	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	555746	07/02/19 08:12	XL	TAL IRV

Client Sample ID: NERT3.63S1-20190627

Date Collected: 06/27/19 10:45

Date Received: 06/28/19 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		20			556356	07/07/19 22:53	YZ	TAL IRV
Total/NA	Analysis	314.0		20			556406	07/08/19 15:41	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	555972	07/03/19 11:00	XL	TAL IRV

Eurofins TestAmerica, Irvine

Lab Chronicle

Client: AECOM

Job ID: 440-244812-1 Project/Site: NDEP Phase II SDG: LVW

Lab Sample ID: 440-244812-6

Lab Sample ID: 440-244812-7

Lab Sample ID: 440-244812-8

Lab Sample ID: 440-244812-9

07/05/19 14:54 YZ

07/08/19 16:22 CTH

556143

556406

Client Sample ID: NERT3.80S1-20190627

Date Collected: 06/27/19 11:50 Date Received: 06/28/19 10:00

	Batch	Batch	_	Dil	Initial	Final	Batch	Prepared		
Prep Type Total/NA	Type Analysis	Method 300.1B	Run	Factor 5	Amount	Amount	Number 556143	or Analyzed 07/05/19 14:24	Analyst YZ	Lab TAL IRV
Total/NA	Analysis	314.0		20			556406	07/08/19 16:02	CTH	TAL IRV

Client Sample ID: NERT3.80S1-20190627-FD

300.1B

314.0

Date Collected: 06/27/19 11:50 **Date Rec**

Date Received	ate Received: 06/28/19 10:00												
	Batch	Batch		Dil	Initial	Final	Batch	Dronorod					
	Daten	Daten		ווט	IIIIIIai	FIIIdi	Datell	Prepared					
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab			

Client Sample ID: NERT4.51S1-20190627

Analysis

Analysis

Date Collected: 06/27/19 14:30

Date Received: 06/28/19 10:00

Total/NA

Total/NA

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			556356	07/07/19 21:05	YZ	TAL IRV
Total/NA	Analysis	314.0		100			556406	07/08/19 12:22	CTH	TAL IRV

20

Client Sample ID: NERT3.98S1-20190627

Date Collected: 06/27/19 13:10

Date Received: 06/28/19 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		10			555700	07/02/19 10:21	YZ	TAL IRV
Total/NA	Analysis	314.0		5			556406	07/08/19 15:00	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	555746	07/02/19 08:12	XL	TAL IRV

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Matrix: Water

Matrix: Water

TAL IRV

TAL IRV

Matrix: Water

Matrix: Water

Eurofins TestAmerica, Irvine

Client: AECOM

Job ID: 440-244812-1 Project/Site: NDEP Phase II

SDG: LVW

Prep Type: Total/NA

Method: 300.1B - Disinfection By-Products, (IC)

Lab Sample ID: MB 440-555700/5 **Client Sample ID: Method Blank**

Matrix: Water Prep Type: Total/NA

Analysis Batch: 555700 MB MB

Analyte Qualifier RL **MDL** Unit Analyzed Dil Fac Result Prepared Chlorate 20 2.0 ug/L 07/02/19 07:56 $\overline{\mathsf{ND}}$

MB MB

Qualifier Surrogate %Recovery Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 98 90 - 115 07/02/19 07:56

Lab Sample ID: LCS 440-555700/4 **Client Sample ID: Lab Control Sample**

Matrix: Water

Analysis Batch: 555700

%Rec. Spike LCS LCS Analyte Added Result Qualifier Unit D %Rec Limits Chlorate 100 104 104 ug/L 75 - 125

LCS LCS Surrogate %Recovery Qualifier

Limits Dichloroacetic acid(Surr) 100 90 - 115

Lab Sample ID: MRL 440-555700/3 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555700

Spike MRL MRL %Rec. Analyte Added Result Qualifier Limits Unit D %Rec Chlorate 20.0 19.9 J ug/L 99 50 - 150

MRL MRL Surrogate %Recovery Qualifier Limits

90 - 115 Dichloroacetic acid(Surr) 99

Lab Sample ID: 440-244812-2 MS Client Sample ID: NERT3.35S1-20190626-FD Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555700

Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Unit Limits D %Rec 200 Chlorate 169 84 ND ug/L 75 - 125

MS MS

Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 92 90 - 115

Lab Sample ID: 440-244812-2 MSD Client Sample ID: NERT3.35S1-20190626-FD

Matrix: Water Analysis Batch: 555700

RPD Sample Sample Spike MSD MSD %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Chlorate ND 200 172 86 ug/L 75 - 125 25

MSD MSD

Surrogate %Recovery Qualifier Limits 92 90 - 115 Dichloroacetic acid(Surr)

Eurofins TestAmerica, Irvine

Job ID: 440-244812-1 SDG: LVW

10

Client: AECOM

Project/Site: NDEP Phase II

Client Sample ID: Method Blank

Lab Sample ID: MB 440-555709/5

Matrix: Water

Analysis Batch: 555709

Prep Type: Total/NA

MB MB Analyte Qualifier RL **MDL** Unit Analyzed Dil Fac Result Prepared Chlorate 20 2.0 ug/L 07/02/19 07:52 $\overline{\mathsf{ND}}$

MB MB

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

Qualifier Surrogate %Recovery Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 105 90 - 115 07/02/19 07:52

Lab Sample ID: LCS 440-555709/4 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555709

%Rec. Spike LCS LCS Analyte Added Result Qualifier Unit D %Rec Limits Chlorate 100 103 103 ug/L 75 - 125

LCS LCS Surrogate %Recovery Qualifier Limits

Dichloroacetic acid(Surr) 104 90 - 115

Lab Sample ID: MRL 440-555709/3 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555709

MRL MRL Spike %Rec. Analyte Added Limits Result Qualifier Unit D %Rec Chlorate 20.0 20.8 ug/L 104 50 - 150

MRL MRL Surrogate %Recovery Qualifier Limits 90 - 115 Dichloroacetic acid(Surr) 104

Lab Sample ID: 440-244812-1 MS

Matrix: Water

Analysis Batch: 555709

Sample Sample MS MS Spike %Rec. **Result Qualifier** Added Analyte Result Qualifier Unit Limits D %Rec 200 Chlorate 201 101 75 - 125 ND ug/L

MS MS Qualifier Limits Surrogate %Recovery Dichloroacetic acid(Surr) 100 90 - 115

Lab Sample ID: 440-244812-1 MSD **Matrix: Water**

Analysis Batch: 555709

RPD Sample Sample Spike MSD MSD %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Chlorate ND 200 201 ug/L 100 75 - 125 25

MSD MSD

Surrogate %Recovery Qualifier Limits 90 - 115 Dichloroacetic acid(Surr) 99

Eurofins TestAmerica, Irvine

Client Sample ID: NERT3.35S1-20190626

Client Sample ID: NERT3.35S1-20190626

Prep Type: Total/NA

Client: AECOM

Project/Site: NDEP Phase II

Job ID: 440-244812-1

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

Lab Sample ID: 440-244812-3 MS Client Sample ID: NERT3.40S1-20190626 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555709

-	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	ND		200	179	J	ug/L		90	75 - 125	

MS MS

Surrogate Limits %Recovery Qualifier Dichloroacetic acid(Surr) 103 90 - 115

Lab Sample ID: 440-244812-3 MSD Client Sample ID: NERT3.40S1-20190626 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555709

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Chlorate	ND		200	180	J	ug/L		90	75 - 125	0	25
	4400	MOD									

MSD MSD

Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 102 90 - 115

Lab Sample ID: MB 440-556143/5 **Client Sample ID: Method Blank** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556143

MB MB

109

Analyte Chlorate	Result ND	Qualifier	RL 20	MDL 2.0	Unit ug/L	<u>D</u> _	Prepared	Analyzed 07/05/19 06:27	Dil Fac
_	МВ								
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac

90 - 115

Lab Sample ID: LCS 440-556143/4

Matrix: Water

Dichloroacetic acid(Surr)

Analysis Batch: 556143

Client Sample ID:	Lab Control Sample
	Prep Type: Total/NA

Client Sample ID: Lab Control Sample

07/05/19 06:27

Spike LCS LCS %Rec.

Added Result Qualifier Analyte Unit Limits D %Rec Chlorate 100 102 102 75 - 125 ug/L

LCS LCS

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 109 90 - 115

Lab Sample ID: MRL 440-556143/3

Matrix: Water

Analysis Batch: 556143

	Spike	MRL	MRL					%Rec.	
Analyte	Added	Result	Qualifier	Unit	ı) (%Rec	Limits	
Chlorate	 20.0	21.2		ug/L			106	50 - 150	

MRL MRL

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 109 90 - 115

Eurofins TestAmerica, Irvine

Client: AECOM

Project/Site: NDEP Phase II

Job ID: 440-244812-1

Prep Type: Total/NA

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

Lab Sample ID: 440-244812-4 MS Client Sample ID: NERT3.58S1-20190627 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556143

Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits Chlorate 200 81 75 - 125 2700 2860 4 ug/L

MS MS

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 108 90 - 115

Lab Sample ID: 440-244812-4 MSD Client Sample ID: NERT3.58S1-20190627

Matrix: Water

Analysis Batch: 556143

Sample Sample Spike MSD MSD %Rec. **RPD** Result Qualifier Analyte Added Result Qualifier Unit D %Rec Limits **RPD** Limit Chlorate 2700 200 2800 4 51 ug/L 75 - 125 2

MSD MSD

Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 106 90 - 115

Lab Sample ID: MB 440-556356/5 **Client Sample ID: Method Blank** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

MB MB

Analyte RL **MDL** Unit Result Qualifier D Prepared Analyzed Dil Fac Chlorate ND 20 2.0 ug/L 07/07/19 09:36

MB MB

Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 106 90 - 115 07/07/19 09:36

Lab Sample ID: LCS 440-556356/4

Matrix: Water

Analysis Batch: 556356

Spike LCS LCS %Rec. Added Analyte Result Qualifier Unit Limits D %Rec Chlorate 100 101 101 75 - 125 ug/L

LCS LCS

%Recovery Qualifier Limits Surrogate Dichloroacetic acid(Surr) 107 90 - 115

Lab Sample ID: MRL 440-556356/3

Matrix: Water

Analysis Batch: 556356

Spike MRL MRL %Rec. Analyte Added Result Qualifier Unit %Rec Limits Chlorate 20.0 19.8 J ug/L 99 50 - 150

MRL MRL

Surrogate %Recovery Qualifier Limits 107 90 - 115 Dichloroacetic acid(Surr)

Eurofins TestAmerica, Irvine

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Client: AECOM

Job ID: 440-244812-1 Project/Site: NDEP Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

Lab Sample ID: 440-245143-A-2 MS Client Sample ID: Matrix Spike **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 556356

Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier %Rec Limits Unit Chlorate 200 110 75 - 125 160 381 ug/L

MS MS Surrogate %Recovery

Qualifier Limits Dichloroacetic acid(Surr) 105 90 - 115

Client Sample ID: Matrix Spike Duplicate Lab Sample ID: 440-245143-A-2 MSD Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

Sample Sample Spike MSD MSD %Rec. **RPD** Result Qualifier Analyte Added Result Qualifier Unit D %Rec Limits RPD Limit Chlorate 160 200 376 108 ug/L 75 - 125

MSD MSD

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 106 90 - 115

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 440-556406/6 **Client Sample ID: Method Blank** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556406

MB MB

Result Qualifier RL **MDL** Unit Analyzed Analyte D Prepared Dil Fac 4.0 Perchlorate $\overline{\mathsf{ND}}$ 0.95 ug/L 07/08/19 09:17

Lab Sample ID: LCS 440-556406/5 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556406

LCS LCS Spike %Rec. Added **Analyte** Result Qualifier Unit %Rec Limits Perchlorate 25.0 23.4 ug/L 94 85 - 115

Lab Sample ID: MRL 440-556406/8

Matrix: Water

Analysis Batch: 556406

Spike MRL MRL %Rec. Analyte Added Result Qualifier Unit %Rec Limits Perchlorate 4.00 3.72 J ug/L 93 75 - 125

Lab Sample ID: 440-244812-4 MS Client Sample ID: NERT3.58S1-20190627

Matrix: Water

Analysis Batch: 556406

Spike MS MS %Rec. Sample Sample Result Qualifier Analyte Result Qualifier Added Unit %Rec Limits Perchlorate 1000 1250 2320 ug/L 104 80 - 120

Eurofins TestAmerica, Irvine

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Client: AECOM

Job ID: 440-244812-1 Project/Site: NDEP Phase II SDG: LVW

Method: 314.0 - Perchlorate (IC) (Continued)

Lab Sample ID: 440-244812-4 MSD Client Sample ID: NERT3.58S1-20190627 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556406

randigolo Zatom coc ico	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD	
Analyte	•	Qualifier	Added	_	Qualifier	Unit	D	%Rec	Limits	RPD	Limit	
Perchlorate	1000		1250	2310		ug/L		103	80 - 120		15	

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 440-555543/1 **Client Sample ID: Method Blank** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555543

мв мв Result Qualifier RL MDL Unit Prepared Analyzed 10 Total Dissolved Solids ND 5.0 mg/L 07/01/19 09:09

Lab Sample ID: LCS 440-555543/2 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 555543

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Total Dissolved Solids 1000 1010 mg/L 101 90 - 110

Lab Sample ID: 440-244541-D-11 DU **Client Sample ID: Duplicate Matrix: Water** Prep Type: Total/NA

Analysis Batch: 555543

DU DU Sample Sample **RPD** Analyte Result Qualifier Result Qualifier Unit RPD Limit Total Dissolved Solids 940 959 mg/L

Lab Sample ID: MB 440-555746/1 **Client Sample ID: Method Blank Matrix: Water** Prep Type: Total/NA

Analysis Batch: 555746

MB MB Analyte Result Qualifier RI **MDL** Unit Prepared Analyzed Dil Fac Total Dissolved Solids $\overline{\mathsf{ND}}$ 10 5.0 mg/L 07/02/19 08:12

Lab Sample ID: LCS 440-555746/2 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555746

Spike LCS LCS %Rec. Added Analyte Result Qualifier Unit %Rec Limits Total Dissolved Solids 1000 996 mg/L 100 90 - 110

Lab Sample ID: 440-244812-4 DU Client Sample ID: NERT3.58S1-20190627 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555746

DU DU RPD Sample Sample Result Qualifier Result Qualifier Unit RPD Limit **Total Dissolved Solids** 3400 3380 mg/L 0.1

Eurofins TestAmerica, Irvine

QC Sample Results

Client: AECOM Job ID: 440-244812-1 Project/Site: NDEP Phase II

SDG: LVW

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: MB 440-555972/1 **Client Sample ID: Method Blank Matrix: Water** Prep Type: Total/NA

Analysis Batch: 555972

MB MB Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Total Dissolved Solids 10 07/03/19 11:00 5.0 mg/L ND

Lab Sample ID: LCS 440-555972/2 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 555972

LCS LCS Spike %Rec.

Added Result Qualifier Unit D %Rec Limits 1000 1000 **Total Dissolved Solids** mg/L 100 90 - 110

Client Sample ID: Duplicate Lab Sample ID: 440-245091-I-1 DU Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555972

Sample Sample DU DU **RPD** Analyte Result Qualifier Result Qualifier Unit D RPD Limit **Total Dissolved Solids** 860 887 3 5 mg/L

Client: AECOM

Project/Site: NDEP Phase II

SDG: LVW

HPLC/IC

Analysis Batch: 555700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244812-2	NERT3.35S1-20190626-FD	Total/NA	Water	300.1B	
440-244812-9	NERT3.98S1-20190627	Total/NA	Water	300.1B	
MB 440-555700/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-555700/4	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-555700/3	Lab Control Sample	Total/NA	Water	300.1B	
440-244812-2 MS	NERT3.35S1-20190626-FD	Total/NA	Water	300.1B	
440-244812-2 MSD	NERT3.35S1-20190626-FD	Total/NA	Water	300.1B	

Analysis Batch: 555709

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244812-1	NERT3.35S1-20190626	Total/NA	Water	300.1B	_
440-244812-3	NERT3.40S1-20190626	Total/NA	Water	300.1B	
MB 440-555709/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-555709/4	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-555709/3	Lab Control Sample	Total/NA	Water	300.1B	
440-244812-1 MS	NERT3.35S1-20190626	Total/NA	Water	300.1B	
440-244812-1 MSD	NERT3.35S1-20190626	Total/NA	Water	300.1B	
440-244812-3 MS	NERT3.40S1-20190626	Total/NA	Water	300.1B	
440-244812-3 MSD	NERT3.40S1-20190626	Total/NA	Water	300.1B	

Analysis Batch: 556143

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244812-4	NERT3.58S1-20190627	Total/NA	Water	300.1B	_
440-244812-6	NERT3.80S1-20190627	Total/NA	Water	300.1B	
440-244812-7	NERT3.80S1-20190627-FD	Total/NA	Water	300.1B	
MB 440-556143/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-556143/4	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556143/3	Lab Control Sample	Total/NA	Water	300.1B	
440-244812-4 MS	NERT3.58S1-20190627	Total/NA	Water	300.1B	
440-244812-4 MSD	NERT3.58S1-20190627	Total/NA	Water	300.1B	

Analysis Batch: 556356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244812-5	NERT3.63S1-20190627	Total/NA	Water	300.1B	_
440-244812-8	NERT4.51S1-20190627	Total/NA	Water	300.1B	
MB 440-556356/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-556356/4	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556356/3	Lab Control Sample	Total/NA	Water	300.1B	
440-245143-A-2 MS	Matrix Spike	Total/NA	Water	300.1B	
440-245143-A-2 MSD	Matrix Spike Duplicate	Total/NA	Water	300.1B	

Analysis Batch: 556406

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244812-1	NERT3.35S1-20190626	Total/NA	Water	314.0	_
440-244812-2	NERT3.35S1-20190626-FD	Total/NA	Water	314.0	
440-244812-3	NERT3.40S1-20190626	Total/NA	Water	314.0	
440-244812-4	NERT3.58S1-20190627	Total/NA	Water	314.0	
440-244812-5	NERT3.63S1-20190627	Total/NA	Water	314.0	
440-244812-6	NERT3.80S1-20190627	Total/NA	Water	314.0	
440-244812-7	NERT3.80S1-20190627-FD	Total/NA	Water	314.0	
440-244812-8	NERT4.51S1-20190627	Total/NA	Water	314.0	

Eurofins TestAmerica, Irvine

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QC Association Summary

Client: AECOM Job ID: 440-244812-1 Project/Site: NDEP Phase II SDG: LVW

HPLC/IC (Continued)

Analysis Batch: 556406 (Continued)

Client Sample ID	Prep Type	Matrix	Method	Prep Batch
NERT3.98S1-20190627	Total/NA	Water	314.0	
Method Blank	Total/NA	Water	314.0	
Lab Control Sample	Total/NA	Water	314.0	
Lab Control Sample	Total/NA	Water	314.0	
NERT3.58S1-20190627	Total/NA	Water	314.0	
NERT3.58S1-20190627	Total/NA	Water	314.0	
	NERT3.98S1-20190627 Method Blank Lab Control Sample Lab Control Sample NERT3.58S1-20190627	NERT3.98S1-20190627 Method Blank Lab Control Sample Lab Control Sample Total/NA NERT3.58S1-20190627 Total/NA	NERT3.98S1-20190627 Total/NA Water Method Blank Total/NA Water Lab Control Sample Total/NA Water Lab Control Sample Total/NA Water NERT3.58S1-20190627 Total/NA Water	NERT3.98S1-20190627 Total/NA Water 314.0 Method Blank Total/NA Water 314.0 Lab Control Sample Total/NA Water 314.0 Lab Control Sample Total/NA Water 314.0 NERT3.58S1-20190627 Total/NA Water 314.0

General Chemistry

Analysis Batch: 555543

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244812-1	NERT3.35S1-20190626	Total/NA	Water	SM 2540C	- -
440-244812-2	NERT3.35S1-20190626-FD	Total/NA	Water	SM 2540C	
440-244812-3	NERT3.40S1-20190626	Total/NA	Water	SM 2540C	
MB 440-555543/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 440-555543/2	Lab Control Sample	Total/NA	Water	SM 2540C	
440-244541-D-11 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 555746

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244812-4	NERT3.58S1-20190627	Total/NA	Water	SM 2540C	
440-244812-9	NERT3.98S1-20190627	Total/NA	Water	SM 2540C	
MB 440-555746/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 440-555746/2	Lab Control Sample	Total/NA	Water	SM 2540C	
440-244812-4 DU	NERT3.58S1-20190627	Total/NA	Water	SM 2540C	

Analysis Batch: 555972

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244812-5	NERT3.63S1-20190627	Total/NA	Water	SM 2540C	<u> </u>
MB 440-555972/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 440-555972/2	Lab Control Sample	Total/NA	Water	SM 2540C	
440-245091-I-1 DU	Duplicate	Total/NA	Water	SM 2540C	

Definitions/Glossary

Client: AECOM Job ID: 440-244812-1

Project/Site: NDEP Phase II SDG: LVW

Qualifiers

RPD

TEF

TEQ

HPLC/IC Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not
	applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

Toxicity Equivalent Factor (Dioxin)
Toxicity Equivalent Quotient (Dioxin)

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Accreditation/Certification Summary

Client: AECOM Job ID: 440-244812-1 Project/Site: NDEP Phase II

Laboratory: Eurofins TestAmerica, Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Nevada	State Program	9	CA015312019-5	07-31-19 *

SDG: LVW

^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

Job Number: 440-244812-1 SDG Number: LVW

List Source: Eurofins TestAmerica, Irvine

Login Number: 244812 List Number: 1

Client: AECOM

Creator: Escalante, Maria I

Creator: Escalante, Maria I		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins TestAmerica, Irvine

Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-244812-2

Laboratory Sample Delivery Group: LVW Client Project/Site: NDEP Phase II

For: AECOM 1220 Avenida Acaso Camarillo, California 93012

Attn: Carmen Caceres-Schnell

anea Roberdo

Authorized for release by: 7/10/2019 4:05:26 PM

Danielle Roberts, Senior Project Manager (949)260-3249

danielle.roberts@testamericainc.com

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The Expert

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: AECOM Project/Site: NDEP Phase II Laboratory Job ID: 440-244812-2 SDG: LVW

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Sample Summary

Client: AECOM

Project/Site: NDEP Phase II

Job ID: 440-244812-2

SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-244812-1	NERT3.35S1-20190626	Water	06/26/19 12:35	06/28/19 10:00
440-244812-2	NERT3.35S1-20190626-FD	Water	06/26/19 12:35	06/28/19 10:00
440-244812-3	NERT3.40S1-20190626	Water	06/26/19 14:45	06/28/19 10:00
440-244812-4	NERT3.58S1-20190627	Water	06/27/19 09:40	06/28/19 10:00
440-244812-5	NERT3.63S1-20190627	Water	06/27/19 10:45	06/28/19 10:00
440-244812-9	NERT3.98S1-20190627	Water	06/27/19 13:10	06/28/19 10:00

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Case Narrative

Client: AECOM

Job ID: 440-244812-2 Project/Site: NDEP Phase II

SDG: LVW

Job ID: 440-244812-2

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-244812-2

Comments

No additional comments.

Receipt

The samples were received on 6/28/2019 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.6° C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: AECOM

Job ID: 440-244812-2 Project/Site: NDEP Phase II

٠٠.	110 211012 2	
	SDG: LVW	

Client Sample ID: N	IERT3.35S1-20190626				Lab San	nple ID: 4	40-244812-1
Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Chromium	0.57 J	2.0	0.50	ug/L		200.8	Dissolved
Client Sample ID: N	IERT3.35S1-20190626-FD				Lab San	nple ID: 4	40-244812-2
Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Chromium	0.64 J	2.0	0.50	ug/L		200.8	Dissolved
Client Sample ID: N	IERT3.40S1-20190626				Lab San	nple ID: 4	40-244812-3
Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Chromium	0.71 J	2.0	0.50	ug/L		200.8	Dissolved
Client Sample ID: N	IERT3.58S1-20190627				Lab San	nple ID: 4	40-244812-4
Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Chromium	5.5	2.0	0.50	ug/L		200.8	Dissolved
Client Sample ID: N	IERT3.63S1-20190627				Lab San	nple ID: 4	40-244812-5
Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Chromium	8.6	2.0	0.50	ug/L		200.8	Dissolved
Client Sample ID: N	IERT3.98S1-20190627				Lab San	nple ID: 4	40-244812-9
Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Chromium	0.79 J	2.0	0.50	ug/L		200.8	Dissolved

7/10/2019

Client Sample Results

Client: AECOM Job ID: 440-244812-2 Project/Site: NDEP Phase II SDG: LVW Lab Sample ID: 440-244812-1 Client Sample ID: NERT3.35S1-20190626 Date Collected: 06/26/19 12:35 **Matrix: Water** Date Received: 06/28/19 10:00 Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RLMDL Unit D Prepared Analyzed Dil Fac 2.0 0.50 ug/L 07/02/19 12:05 07/02/19 14:56 Chromium 0.57 J Lab Sample ID: 440-244812-2 Client Sample ID: NERT3.35S1-20190626-FD Date Collected: 06/26/19 12:35 **Matrix: Water** Date Received: 06/28/19 10:00 Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 07/02/19 12:05 07/02/19 15:02 Chromium 0.64 J 2.0 0.50 ua/L Client Sample ID: NERT3.40S1-20190626 Lab Sample ID: 440-244812-3 Date Collected: 06/26/19 14:45 **Matrix: Water** Date Received: 06/28/19 10:00 Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 2.0 07/02/19 12:05 07/02/19 15:05 Chromium 0.71 J 0.50 ug/L Lab Sample ID: 440-244812-4 Client Sample ID: NERT3.58S1-20190627 Date Collected: 06/27/19 09:40 **Matrix: Water** Date Received: 06/28/19 10:00 Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac Chromium 5.5 2.0 0.50 ug/L 07/02/19 12:05 07/02/19 14:50 Client Sample ID: NERT3.63S1-20190627 Lab Sample ID: 440-244812-5 Date Collected: 06/27/19 10:45 **Matrix: Water** Date Received: 06/28/19 10:00 Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac

Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Chromium 2.0 0.50 ug/L 07/02/19 12:05 07/02/19 15:09 0.79 J

2.0

8.6

Client Sample ID: NERT3.98S1-20190627

Date Collected: 06/27/19 13:10

Date Received: 06/28/19 10:00

0.50 ug/L

Chromium

07/02/19 12:05 07/02/19 15:07

Lab Sample ID: 440-244812-9

Matrix: Water

Method Summary

Client: AECOM

Project/Site: NDEP Phase II

Job ID: 440-244812-2

SDG: LVW

Method Method Description 200.8 Metals (ICP/MS) Preparation Total Recoverable Metals		Protocol	Laboratory
200.8	Metals (ICP/MS)	EPA	TAL IRV
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

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Client: AECOM

Job ID: 440-244812-2 Project/Site: NDEP Phase II SDG: LVW

Client Sample ID: NERT3.35S1-20190626 Lab Sample ID: 440-244812-1

Matrix: Water

Date Collected: 06/26/19 12:35 Date Received: 06/28/19 10:00

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	555821	07/02/19 12:05	BV	TAL IRV
Dissolved	Analysis	200.8		1			555868	07/02/19 14:56	EMS	TAL IRV

Client Sample ID: NERT3.35S1-20190626-FD Lab Sample ID: 440-244812-2

Date Collected: 06/26/19 12:35 Date Received: 06/28/19 10:00

Matrix: Water

Batch Batch Dil Initial Final **Batch** Prepared **Prep Type** Type Method **Factor** Amount Amount Number or Analyzed Run Analyst Lab Dissolved Prep 200.2 555821 BV 25 mL 25 mL 07/02/19 12:05 TAL IRV Dissolved 200.8 555868 Analysis 07/02/19 15:02 EMS TAL IRV 1

Client Sample ID: NERT3.40S1-20190626 Lab Sample ID: 440-244812-3 Date Collected: 06/26/19 14:45 **Matrix: Water**

Date Received: 06/28/19 10:00

Batch Batch Dil Initial Final Batch Prepared **Prep Type** Туре Method Factor Amount Amount Number or Analyzed Run Analyst Lab 555821 TAL IRV Dissolved 200.2 25 mL 25 mL 07/02/19 12:05 BV Prep Dissolved Analysis 200.8 1 555868 07/02/19 15:05 EMS TAL IRV

Client Sample ID: NERT3.58S1-20190627 Lab Sample ID: 440-244812-4 **Matrix: Water**

Date Collected: 06/27/19 09:40 Date Received: 06/28/19 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	555821	07/02/19 12:05	BV	TAL IRV
Dissolved	Analysis	200.8		1			555868	07/02/19 14:50	EMS	TAL IRV

Lab Sample ID: 440-244812-5 Client Sample ID: NERT3.63S1-20190627

Date Collected: 06/27/19 10:45 Date Received: 06/28/19 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	555821	07/02/19 12:05	BV	TAL IRV
Dissolved	Analysis	200.8		1			555868	07/02/19 15:07	EMS	TAL IRV

Client Sample ID: NERT3.98S1-20190627 Lab Sample ID: 440-244812-9

Date Collected: 06/27/19 13:10 Date Received: 06/28/19 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	555821	07/02/19 12:05		TAL IRV
Dissolved	Analysis	200.8		1			555868	07/02/19 15:09	EMS	TAL IRV

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Matrix: Water

7/10/2019

Matrix: Water

QC Sample Results

Client: AECOM Job ID: 440-244812-2 Project/Site: NDEP Phase II

SDG: LVW

Method: 200.8 - Metals (ICP/MS)

Chromium

Lab Sample ID: MB 440-555821/1-A Client Sample ID: Method Blank **Matrix: Water Prep Type: Total Recoverable** Analysis Batch: 555868 **Prep Batch: 555821**

MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 2.0 Chromium 0.50 ug/L 07/02/19 12:05 07/02/19 14:42 $\overline{\mathsf{ND}}$

Lab Sample ID: LCS 440-555821/2-A **Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total Recoverable Analysis Batch: 555868 Prep Batch: 555821** LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits 80.0

78.9

ug/L

99

85 - 115

Lab Sample ID: LCSD 440-555821/3-A Client Sample ID: Lab Control Sample Dup **Matrix: Water Prep Type: Total Recoverable Analysis Batch: 555868 Prep Batch: 555821** Spike LCSD LCSD %Rec. **RPD** Analyte Added Result Qualifier Unit Limits RPD Limit %Rec Chromium 80.0 85 - 115 78.1 ug/L 98

Lab Sample ID: 440-244812-4 MS Client Sample ID: NERT3.58S1-20190627 **Matrix: Water Prep Type: Dissolved Analysis Batch: 555868 Prep Batch: 555821** Sample Sample Spike MS MS %Rec. Added Analyte Result Qualifier Result Qualifier Limits Unit D %Rec ug/L Chromium 5.5 80.0 81.5 95 70 - 130

Lab Sample ID: 440-244812-4 MSD Client Sample ID: NERT3.58S1-20190627 **Matrix: Water Prep Type: Dissolved** Analysis Batch: 555868 **Prep Batch: 555821** Sample Sample Spike MSD MSD %Rec. **RPD** Result Qualifier Added Analyte Result Qualifier Unit %Rec Limits **RPD** Limit 5.5 80.0 82.0 96 70 - 130 20 Chromium ug/L

7/10/2019

QC Association Summary

Client: AECOM Job ID: 440-244812-2
Project/Site: NDEP Phase II SDG: LVW

Metals

Prep Batch: 555821

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244812-1	NERT3.35S1-20190626	Dissolved	Water	200.2	
440-244812-2	NERT3.35S1-20190626-FD	Dissolved	Water	200.2	
440-244812-3	NERT3.40S1-20190626	Dissolved	Water	200.2	
440-244812-4	NERT3.58S1-20190627	Dissolved	Water	200.2	
440-244812-5	NERT3.63S1-20190627	Dissolved	Water	200.2	
440-244812-9	NERT3.98S1-20190627	Dissolved	Water	200.2	
MB 440-555821/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-555821/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
LCSD 440-555821/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.2	
440-244812-4 MS	NERT3.58S1-20190627	Dissolved	Water	200.2	
440-244812-4 MSD	NERT3.58S1-20190627	Dissolved	Water	200.2	

Analysis Batch: 555868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244812-1	NERT3.35S1-20190626	Dissolved	Water	200.8	555821
440-244812-2	NERT3.35S1-20190626-FD	Dissolved	Water	200.8	555821
440-244812-3	NERT3.40S1-20190626	Dissolved	Water	200.8	555821
440-244812-4	NERT3.58S1-20190627	Dissolved	Water	200.8	555821
440-244812-5	NERT3.63S1-20190627	Dissolved	Water	200.8	555821
440-244812-9	NERT3.98S1-20190627	Dissolved	Water	200.8	555821
MB 440-555821/1-A	Method Blank	Total Recoverable	Water	200.8	555821
LCS 440-555821/2-A	Lab Control Sample	Total Recoverable	Water	200.8	555821
LCSD 440-555821/3-A	Lab Control Sample Dup	Total Recoverable	Water	200.8	555821
440-244812-4 MS	NERT3.58S1-20190627	Dissolved	Water	200.8	555821
440-244812-4 MSD	NERT3.58S1-20190627	Dissolved	Water	200.8	555821

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Definitions/Glossary

Client: AECOM Job ID: 440-244812-2

Project/Site: NDEP Phase II SDG: LVW

Qualifiers

Metals

Qualifier Qualifier Description

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation These commonly used abbreviations may or may not be present in this report.

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Accreditation/Certification Summary

Client: AECOM Job ID: 440-244812-2 Project/Site: NDEP Phase II

Laboratory: Eurofins TestAmerica, Irvine

The accreditations/certifications listed below are applicable to this report.

	Authority	Program	EPA Region	Identification Number	Expiration Date
ı	Nevada	State Program	9	CA015312019-5	07-31-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

SDG: LVW

THE LEADER IN ENVIRONMENTAL TESTING.

TestAmerica Laboratories, Inc.

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Preservation Used: 1= ice, 2= HCl; 3= H2SO4; 4=HNO3;	5=NaOH; (6= Other _	***************************************											118
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Pleas	مانماممید[-DA Masto	Cadaa far	tha anmr	alo (n. tha	Sa				ay be asses	sed if sam	ples are retain	ed longer than 1 mon	th)
Are any samples from a listed EPA Hazardous Waste? Pleas Comments Section if the lab is to dispose of the sample.	e List any E	EPA vvaste	Codes lor	trie samp	ole in the	1		len	WO					1
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Job Number: 440-244812-2

SDG Number: LVW

Login Number: 244812 List Source: Eurofins TestAmerica, Irvine

List Number: 1

Creator: Escalante, Maria I

Creator: Escalante, Maria I		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-244905-1

Laboratory Sample Delivery Group: LVW Client Project/Site: NDEP NERT Phase II

Revision: 1

For:

AECOM 1220 Avenida Acaso Camarillo, California 93012

Attn: Andrea Christian

Authorized for release by: 7/15/2019 12:58:45 PM

Danielle Roberts, Senior Project Manager (949)260-3249

danielle.roberts@testamericainc.com

RENER ROberts

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: AECOM Project/Site: NDEP NERT Phase II Laboratory Job ID: 440-244905-1

SDG: LVW

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Sample Summary

Client: AECOM

Project/Site: NDEP NERT Phase II

Job ID: 440-244905-1

SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
440-244905-1	WMW3.5S-20190628	Water	06/28/19 09:10	06/29/19 10:45	
440-244905-2	WMW3.5S-20190628-FD	Water	06/28/19 09:10	06/29/19 10:45	
440-244905-3	LNDMW1-20190628	Water	06/28/19 10:15	06/29/19 10:45	
440-244905-4	WMW5.5S-20190628	Water	06/28/19 11:20	06/29/19 10:45	
440-244905-5	MW20-20190628	Water	06/28/19 12:30	06/29/19 10:45	
440-244905-6	MW13-20190628	Water	06/28/19 13:30	06/29/19 10:45	

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Case Narrative

Client: AECOM

Job ID: 440-244905-1 Project/Site: NDEP NERT Phase II

SDG: LVW

Job ID: 440-244905-1

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-244905-1

Comments

Revised sample Id's: (440-244905-1) WMW3.53-20190628 to WMW3.5S-20190628. (440-244905-4) WMW5.6S-20190628 to WMW5.5S-20190628, 7/15/2019.

No additional comments.

Receipt

The samples were received on 6/29/2019 10:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.0° C.

HPLC/IC

Method(s) 300.1B: The following samples were diluted for the chlorate analyte due to the nature of the sample matrix: MW20-20190628 (440-244905-5) and (440-244812-A-2). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: AECOM

Perchlorate

Job ID: 440-244905-1 Project/Site: NDEP NERT Phase II

SDG: LVW

Total/NA

Client Sample ID: V	VMW3.5S-201906	28				Lab Sample ID: 440-244905					
_ Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type			
Chlorate	3500		1000	100	ug/L		300.1B	Total/NA			
Perchlorate	1300		400	95	ug/L	100	314.0	Total/NA			
Client Sample ID: V	VMW3.5S-201906	28-FD				Lab San	ple ID: 4	40-244905-2			
- Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type			
Chlorate	3400		1000	100	ug/L	50	300.1B	Total/NA			
Perchlorate	1300		400	95	ug/L	100	314.0	Total/NA			
Client Sample ID: L	.NDMW1-2019062	28				Lab San	nple ID: 4	40-244905-3			
- Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type			
Chlorate	3700		1000	100	ug/L		300.1B	Total/NA			

Client Sample ID: WMW5.5S-20190628	Lab Sample ID: 440-244905-4
------------------------------------	-----------------------------

400

95 ug/L

100

314.0

1400

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorate	3500		1000	100	ug/L	50	_	300.1B	Total/NA
Perchlorate	1000		400	95	ug/L	100		314.0	Total/NA

Lab Sample ID: 440-244905-5 Client Sample ID: MW20-20190628

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorate	46	J	100	10	ug/L	5	_	300.1B	Total/NA
Perchlorate	57		20	4.8	ug/L	5		314.0	Total/NA

Client Sample ID: MW13-20190628 Lab Sample ID: 440-244905-6

Analyte	Result Q	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorate	9400		1000	100	ug/L	50	_	300.1B	 Total/NA
Perchlorate	3100		400	95	ug/L	100		314.0	Total/NA

This Detection Summary does not include radiochemical test results.

7/15/2019 (Rev. 1)

Project/Site: NDEP NERT Phase II

Date Collected: 06/28/19 09:10

Client Sample ID: WMW3.5S-20190628

Method: 300.1B - Disinfection By-Products, (IC)

Lab Sample ID: 440-244905-1

Lab Sample ID: 440-244905-2

Lab Sample ID: 440-244905-3

Matrix: Water

Matrix: Water

Matrix: Water

100

100

SDG: LVW

Job ID: 440-244905-1

Date Received:	06/29/19	10:45	

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	3500		1000	100	ug/L			06/30/19 21:37	50
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	100		90 - 115			-		06/30/19 21:37	50
Method: 314.0 - Perchlorate (IC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	1300		400	95	ug/L			07/09/19 14:29	100

Client Sample ID: WMW3.5S-20190628-FD

Date Collected: 06/28/19 09:10

Date Received: 06/29/19 10:45

Method: 300.1B - Disinfe	ction By-Products, (IC)							
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	3400	1000	100	ug/L			06/30/19 22:13	50
Surrogate	%Recovery Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	101	90 - 115			•		06/30/19 22:13	50

Method: 314.0 - Perchlorate (IC)						_			
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	1300		400	95	ug/L			07/09/19 15:40	100

Client Sample ID: LNDMW1-20190628

1400

1000

Date Collected: 06/28/19 10:15 Date Received: 06/29/19 10:45

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	3700		1000	100	ug/L			06/30/19 22:49	50
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	101		90 - 115			-		06/30/19 22:49	50

Client	Camarala	ID.	VALBANALE EC COACOCCO
Client 3	Sample	וט:	WMW5.5S-20190628

Perchlorate

Perchlorate

Client Sample ID: WMW5.5S-20190628	Lab Sample ID: 440-244905-4
Date Collected: 06/28/19 11:20	Matrix: Water
Date Received: 06/29/19 10:45	

400

95 ug/L

95 ug/L

Analyte	Result Qu	ualifier	RL	MDL U	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	3500		1000	100 u	ug/L			06/30/19 23:26	50
Surrogate	%Recovery Qu	ualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	102		90 - 115			-		06/30/19 23:26	50

400

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07/09/19 16:17

07/09/19 15:59

Client Sample Results

Client: AECOM Job ID: 440-244905-1 Project/Site: NDEP NERT Phase II SDG: LVW

Client Sample ID: MW20-20190628 Lab Sample ID: 440-244905-5 Date Collected: 06/28/19 12:30

Matrix: Water

Date Received: 06/29/19 10:45

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	46	J	100	10	ug/L			07/02/19 18:12	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	98		90 - 115					07/02/19 18:12	5

Method: 314.0 - Perchlorate (IC	;)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	57		20	4.8	ug/L			07/10/19 11:37	5

Client Sample ID: MW13-20190628 Lab Sample ID: 440-244905-6

Date Collected: 06/28/19 13:30 **Matrix: Water**

Date Received: 06/29/19 10:45

Analyte	Result (Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	9400		1000	100	ug/L			07/01/19 00:38	50
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	103		90 - 115			-		07/01/19 00:38	50

Method: 314.0 - Perchlorate (IC)	Daguill	O1161	DI	MDI	1114	ь.	D	A a la a d	Dil Faa
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	3100		400	95	ug/L			07/09/19 16:53	100

Surrogate Summary

Client: AECOM Job ID: 440-244905-1
Project/Site: NDEP NERT Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Matrix: Water Prep Type: Total/NA

			Percent Surrogate Recovery (Acceptance Limits)
		DCAA	
Lab Sample ID	Client Sample ID	(90-115)	
440-244905-1	WMW3.5S-20190628	100	
440-244905-2	WMW3.5S-20190628-FD	101	
440-244905-3	LNDMW1-20190628	101	
440-244905-4	WMW5.5S-20190628	102	
440-244905-5	MW20-20190628	98	
440-244905-5 MS	MW20-20190628	100	
440-244905-5 MSD	MW20-20190628	98	
440-244905-6	MW13-20190628	103	
550-124988-A-1 MS	Matrix Spike	99	
550-124988-A-1 MSD	Matrix Spike Duplicate	101	
LCS 440-555427/4	Lab Control Sample	100	
LCS 440-555700/4	Lab Control Sample	100	
MB 440-555427/5	Method Blank	102	
MB 440-555700/5	Method Blank	98	
MRL 440-555427/3	Lab Control Sample	101	
MRL 440-555700/3	Lab Control Sample	99	

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Method Summary

Client: AECOM

Project/Site: NDEP NERT Phase II

Job ID: 440-244905-1

SDG: LVW

Method	Method Description	Protocol	Laboratory
300.1B	Disinfection By-Products, (IC)	EPA	TAL IRV
314.0	Perchlorate (IC)	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

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Job ID: 440-244905-1 SDG: LVW

Client Sample ID: WMW3.5S-20190628

Date Collected: 06/28/19 09:10 Date Received: 06/29/19 10:45 Lab Sample ID: 440-244905-1

Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			555427	06/30/19 21:37	YZ	TAL IRV
Total/NA	Analysis	314.0		100			556610	07/09/19 14:29	CTH	TAL IRV

Client Sample ID: WMW3.5S-20190628-FD

Date Collected: 06/28/19 09:10 Date Received: 06/29/19 10:45 Lab Sample ID: 440-244905-2

Lab Sample ID: 440-244905-3

Lab Sample ID: 440-244905-4

Lab Sample ID: 440-244905-5

Lab Sample ID: 440-244905-6

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			555427	06/30/19 22:13	YZ	TAL IRV
Total/NA	Analysis	314.0		100			556610	07/09/19 15:40	CTH	TAL IRV

Client Sample ID: LNDMW1-20190628

Date Collected: 06/28/19 10:15

Date Received: 06/29/19 10:45

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type Total/NA	Type Analysis	Method 300.1B	Run	Factor 50	Amount	Amount	Number 555427	or Analyzed 06/30/19 22:49	Analyst YZ	Lab TAL IRV
Total/NA	Analysis	314.0		100			556610	07/09/19 15:59	-	TAL IRV

Client Sample ID: WMW5.5S-20190628

Date Collected: 06/28/19 11:20

Date Received: 06/29/19 10:45

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			555427	06/30/19 23:26	YZ	TAL IRV
Total/NA	Analysis	314.0		100			556610	07/09/19 16:17	CTH	TAL IRV

Client Sample ID: MW20-20190628

Date Collected: 06/28/19 12:30

Date Received: 06/29/19 10:45

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			555700	07/02/19 18:12	YZ	TAL IRV
Total/NA	Analysis	314.0		5			556815	07/10/19 11:37	CTH	TAL IRV

Client Sample ID: MW13-20190628

Date Collected: 06/28/19 13:30

Date Received: 06/29/19 10:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			555427	07/01/19 00:38	YZ	TAL IRV
Total/NA	Analysis	314.0		100			556610	07/09/19 16:53	CTH	TAL IRV

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Eurofins TestAmerica, Irvine

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Client: AECOM

Project/Site: NDEP NERT Phase II

Job ID: 440-244905-1

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Lab Sample ID: MB 440-555427/5

Matrix: Water

Analysis Batch: 555427

Client Sample ID: Method Blank Prep Type: Total/NA

MR MR Analyte RL **MDL** Unit Analyzed Dil Fac Result Qualifier Prepared Chlorate 20 2.0 ug/L 06/30/19 08:20 $\overline{\mathsf{ND}}$

MB MB

Qualifier Surrogate %Recovery Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 102 90 - 115 06/30/19 08:20

Lab Sample ID: LCS 440-555427/4 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555427

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Chlorate 100 105 105 ug/L 75 - 125

LCS LCS

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 100 90 - 115

Client Sample ID: Lab Control Sample Lab Sample ID: MRL 440-555427/3 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555427

Spike MRL MRL %Rec. Analyte Added Limits Result Qualifier Unit D %Rec Chlorate 20.0 20.9 ug/L 104 50 - 150

MRL MRL

Surrogate %Recovery Qualifier Limits 90 - 115 Dichloroacetic acid(Surr) 101

Lab Sample ID: 550-124988-A-1 MS

Matrix: Water

Analysis Batch: 555427

Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Unit Limits D %Rec Chlorate 200 386 75 - 125 180 ug/L 101

MS MS

Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 90 - 115 99

Lab Sample ID: 550-124988-A-1 MSD

Matrix: Water

Analysis Batch: 555427

RPD Sample Sample Spike MSD MSD %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Chlorate 180 200 377 ug/L 97 75 - 125 25

MSD MSD

Surrogate %Recovery Qualifier Limits 90 - 115 101 Dichloroacetic acid(Surr)

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Client Sample ID: Matrix Spike

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Type: Total/NA

10

Client: AECOM

Job ID: 440-244905-1 Project/Site: NDEP NERT Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

Lab Sample ID: MB 440-555700/5 **Client Sample ID: Method Blank Matrix: Water** Prep Type: Total/NA

Analysis Batch: 555700

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	ND		20	2.0	ug/L			07/02/19 07:56	1
	MB	MB							

Surrogate	%Recovery	Qualifier	Limits	Prepared Analyzed	Dil Fac
Dichloroacetic acid(Surr)	98		90 - 115	07/02/19 07:5	5 <u>1</u>

Lab Sample ID: LCS 440-555700/4 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555700

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	 100	104		ug/L		104	75 - 125	

LCS LCS

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 100 90 - 115

Lab Sample ID: MRL 440-555700/3 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555700

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-	Spike	MRL	MRL				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	20.0	19.9	J	ug/L		99	50 - 150	

MRL MRL Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 90 - 115 99

Lab Sample ID: 440-244905-5 MS Client Sample ID: MW20-20190628 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555700

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	46	J	200	239		ug/L		97	75 - 125	

MS MS Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 100 90 - 115

Client Sample ID: MW20-20190628 Lab Sample ID: 440-244905-5 MSD Prep Type: Total/NA

Matrix: Water

Analysis Batch: 555700

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Chlorate	46	J	200	233		ug/L		94	75 - 125	3	25

MSD MSD

Surrogate	%Recovery Qualifier	Limits
Dichloroacetic acid(Surr)	98	90 - 115

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Project/Site: NDEP NERT Phase II

Job ID: 440-244905-1

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample

Client Sample ID: Matrix Spike Duplicate

Client Sample ID: Matrix Spike

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample

SDG: LVW

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 440-556610/6

Matrix: Water

Analysis Batch: 556610

			MB	МВ

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 4.0 Perchlorate ND 0.95 ug/L 07/09/19 09:12

Lab Sample ID: LCS 440-556610/5

Matrix: Water

Analysis Batch: 556610

, , , , , , , , , , , , , , , , , , , ,	Spike	LCS	LCS			%Rec.	
Analyte	Added	Result	Qualifier Uni	t D	%Rec	Limits	
Perchlorate	25.0	24.1	ug/l		96	85 - 115	

Lab Sample ID: MRL 440-556610/8

Matrix: Water

Analysis Batch: 556610

Lab Sample ID: 440-245124-D-2 MS

Matrix: Water

Analysis Batch: 556610

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Perchlorate	17		25.0	42.2		ug/L		102	80 - 120	

Lab Sample ID: 440-245124-D-2 MSD

Matrix: Water

Analysis Batch: 556610

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit	
Perchlorate	17		25.0	42.1		ug/L		101	80 - 120	0	15	

Lab Sample ID: MB 440-556815/6

Matrix: Water

Analysis Batch: 556815

	MB	MB					
Analyte	Result	Qualifier	RL	MDL	Unit	D	F

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	ND	4.0	0.95 ug/L			07/10/19 10:36	1

Lab Sample ID: LCS 440-556815/5

Matrix: Water

Analysis Batch: 556815

	Spike	LCS	LCS		%Rec.
Analyte	Added	Result	Qualifier Unit	D %Rec	Limits
Perchlorate	25.0	25.8	ua/l	103	85 115

Lab Sample ID: MRL 440-556815/8

Matrix: Water

Analysis Batch: 556815								
	Spike	MRL	MRL				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Perchlorate	4.00	4.08		ug/L		102	75 - 125	

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QC Sample Results

Client: AECOM Job ID: 440-244905-1 Project/Site: NDEP NERT Phase II

SDG: LVW

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: 440-245219-D-1 MS Client Sample ID: Matrix Spike **Matrix: Water Prep Type: Total/NA**

Analysis Batch: 556815

	Sample	Sample	Spike	MS	MS				%Rec.		
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits		
Perchlorate	4.2		25.0	30.8		ug/L		107	80 - 120		_

Lab Sample ID: 440-245219-D-1 MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water** Prep Type: Total/NA

Analysis Batch: 556815

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perchlorate	4.2		25.0	30.7		ug/L		106	80 - 120	0	15

QC Association Summary

Client: AECOM

Project/Site: NDEP NERT Phase II

SDG: LVW

HPLC/IC

Analysis Batch: 555427

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244905-1	WMW3.5S-20190628	Total/NA	Water	300.1B	
440-244905-2	WMW3.5S-20190628-FD	Total/NA	Water	300.1B	
440-244905-3	LNDMW1-20190628	Total/NA	Water	300.1B	
440-244905-4	WMW5.5S-20190628	Total/NA	Water	300.1B	
440-244905-6	MW13-20190628	Total/NA	Water	300.1B	
MB 440-555427/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-555427/4	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-555427/3	Lab Control Sample	Total/NA	Water	300.1B	
550-124988-A-1 MS	Matrix Spike	Total/NA	Water	300.1B	
550-124988-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.1B	

Analysis Batch: 555700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244905-5	MW20-20190628	Total/NA	Water	300.1B	-
MB 440-555700/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-555700/4	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-555700/3	Lab Control Sample	Total/NA	Water	300.1B	
440-244905-5 MS	MW20-20190628	Total/NA	Water	300.1B	
440-244905-5 MSD	MW20-20190628	Total/NA	Water	300.1B	

Analysis Batch: 556610

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244905-1	WMW3.5S-20190628	Total/NA	Water	314.0	
440-244905-2	WMW3.5S-20190628-FD	Total/NA	Water	314.0	
440-244905-3	LNDMW1-20190628	Total/NA	Water	314.0	
440-244905-4	WMW5.5S-20190628	Total/NA	Water	314.0	
440-244905-6	MW13-20190628	Total/NA	Water	314.0	
MB 440-556610/6	Method Blank	Total/NA	Water	314.0	
LCS 440-556610/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-556610/8	Lab Control Sample	Total/NA	Water	314.0	
440-245124-D-2 MS	Matrix Spike	Total/NA	Water	314.0	
440-245124-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

Analysis Batch: 556815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-244905-5	MW20-20190628	Total/NA	Water	314.0	
MB 440-556815/6	Method Blank	Total/NA	Water	314.0	
LCS 440-556815/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-556815/8	Lab Control Sample	Total/NA	Water	314.0	
440-245219-D-1 MS	Matrix Spike	Total/NA	Water	314.0	
440-245219-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

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Definitions/Glossary

Client: AECOM Job ID: 440-244905-1

Project/Site: NDEP NERT Phase II SDG: LVW

Qualifiers

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п	М	L	<u>ل</u>	/	U

Qualifier Qualifier Description

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery

CFL Contains Free Liquid
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Accreditation/Certification Summary

Client: AECOM Job ID: 440-244905-1

Project/Site: NDEP NERT Phase II

Laboratory: Eurofins TestAmerica, Irvine

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	CA01531	06-30-20
Arizona	State Program	9	AZ0671	10-14-19
California	LA Cty Sanitation Districts	9	10256	06-30-20
California	State Program	9	CA ELAP 2706	06-30-19 *
Guam	State Program	9	Cert. No. 19-005R	01-23-20
Hawaii	State Program	9	N/A	01-29-20
Kansas	NELAP	7	E-10420	07-31-19 *
Nevada	State Program	9	CA015312019-5	07-31-19 *
New Mexico	State Program	6	N/A	01-29-20
Oregon	NELAP	10	4028	01-29-20
US Fish & Wildlife	Federal		058448	07-31-19 *
USDA	Federal		P330-18-00214	07-09-21
Washington	State Program	10	C900	09-03-19

SDG: LVW

^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Irvine

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7/15/2019 (Rev. 1)

Job Number: 440-244905-1 SDG Number: LVW

List Source: Eurofins TestAmerica, Irvine

Login Number: 244905

List Number: 1 Creator: Skinner. Alma D

Answer	Comment
True	
N/A	Not present
N/A	Not Present
True	
N/A	
True	
True	
True	
True	
N/A	
	True N/A N/A True True True True True True True True

Eurofins TestAmerica, Irvine

Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-245201-1

Laboratory Sample Delivery Group: LVW Client Project/Site: NDEP Phase II

For: AECOM 1220 Avenida Acaso Camarillo, California 93012

Attn: Carmen Caceres-Schnell

anea Roberdo

Authorized for release by: 7/15/2019 3:20:25 PM

Danielle Roberts, Senior Project Manager (949)260-3249

danielle.roberts@testamericainc.com

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Have a Question?



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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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14

Client: AECOM Project/Site: NDEP Phase II Laboratory Job ID: 440-245201-1 SDG: LVW

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A

Sample Summary

Client: AECOM

Job ID: 440-245201-1 Project/Site: NDEP Phase II

SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-245201-1	NERT4.64S1-20190701	Water	07/01/19 08:20	07/03/19 10:20
440-245201-2	NERT4.71S2-20190701	Water	07/01/19 09:25	07/03/19 10:20
440-245201-3	NERT4.71S1-20190701	Water	07/01/19 10:15	07/03/19 10:20
440-245201-4	NERT3.60S1-20190701	Water	07/01/19 11:50	07/03/19 10:20
440-245201-5	NERT5.11S1-20190701	Water	07/01/19 13:05	07/03/19 10:20
440-245201-6	NERT4.93S1-20190701	Water	07/01/19 13:55	07/03/19 10:20
440-245201-7	NERT5.91S1-20190701	Water	07/01/19 14:45	07/03/19 10:20
440-245201-8	NERT3.58N1-20190702	Water	07/02/19 08:35	07/03/19 10:20
440-245201-9	NERT3.60N1-20190702	Water	07/02/19 09:45	07/03/19 10:20
440-245201-10	NERT4.21N1-20190702	Water	07/02/19 10:50	07/03/19 10:20
440-245201-11	NERT4.21N1-20190702-FB	Water	07/02/19 10:15	07/03/19 10:20
440-245201-12	NERT4.38N1-20190702-EB	Water	07/02/19 11:15	07/03/19 10:20
440-245201-13	NERT4.38N1-20190702	Water	07/02/19 12:35	07/03/19 10:20
440-245201-14	NERT4.64N1-20190702	Water	07/02/19 13:40	07/03/19 10:20
440-245201-15	NERT4.64N1-20190702-FD	Water	07/02/19 13:40	07/03/19 10:20

Case Narrative

Client: AECOM

Job ID: 440-245201-1 Project/Site: NDEP Phase II SDG: LVW

Job ID: 440-245201-1

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-245201-1

Comments

No additional comments.

Receipt

The samples were received on 7/3/2019 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3° C.

HPLC/IC

Method(s) 300.1B: The following samples were diluted for the chlorate analyte due to the nature of the sample matrix: NERT3.58N1-20190702 (440-245201-8), NERT3.60N1-20190702 (440-245201-9), NERT4.64N1-20190702 (440-245201-14) and NERT4.64N1-20190702-FD (440-245201-15). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Client: AECOM Job ID: 440-245201-1 Project/Site: NDEP Phase II SDG: LVW Client Sample ID: NERT4.64S1-20190701 Lab Sample ID: 440-245201-1 Result Qualifier RL **MDL** Unit Dil Fac D Method Prep Type Chlorate 8900 1000 100 ug/L 50 300.1B Total/NA Perchlorate 3200 800 190 ug/L 200 314.0 Total/NA Total Dissolved Solids 4900 100 SM 2540C Total/NA 50 mg/L Client Sample ID: NERT4.71S2-20190701 Lab Sample ID: 440-245201-2 Analyte Result Qualifier RL MDL Unit Dil Fac D Method Prep Type Chlorate 14000 1000 100 50 300.1B Total/NA ug/L Perchlorate 2900 800 190 ug/L 200 314.0 Total/NA

Client Sample ID: NERT4.71S1-20190701

4100

Total Dissolved Solids

Analyte Result Qualifier RL MDL Unit Dil Fac D Method Prep Type Chlorate 10000 1000 ug/L 50 300.1B Total/NA 100 Perchlorate 3400 800 190 ug/L 200 314.0 Total/NA

100

50 mg/L

Client Sample ID: NERT3.60S1-20190701

Analyte Result Qualifier RL MDL Unit Dil Fac D Method **Prep Type** Chlorate 4900 1000 100 ug/L 50 300.1B Total/NA Perchlorate 1600 400 100 Total/NA 314 0 95 ug/L **Total Dissolved Solids** 3300 50 25 mg/L SM 2540C Total/NA

Client Sample ID: NERT5.11S1-20190701

RL Analyte Result Qualifier **MDL** Unit Dil Fac D Method **Prep Type** Chlorate 10000 1000 100 ug/L 50 300.1B Total/NA Perchlorate 2300 800 200 314.0 Total/NA 190 ug/L

Client Sample ID: NERT4.93S1-20190701

Dil Fac D Method Analyte Result Qualifier RL MDL Unit Prep Type Chlorate 8600 1000 50 300 1B Total/NA 100 ug/L Perchlorate 1800 800 190 ug/L 200 314.0 Total/NA

Client Sample ID: NERT5.91S1-20190701

Analyte Result Qualifier RL **MDL** Unit Dil Fac D Method Prep Type Chlorate 450 100 10 ug/L 5 300.1B Total/NA 2800 Perchlorate 800 200 314.0 Total/NA 190 ug/L

Client Sample ID: NERT3.58N1-20190702

Analyte Result Qualifier RL MDL Unit Dil Fac D Method **Prep Type** Chlorate 100 10 5 300.1B 24 J ug/L Total/NA Perchlorate 88 20 5 314.0 Total/NA 4.8 ug/L **Total Dissolved Solids** 6600 100 SM 2540C mg/L Total/NA

Client Sample ID: NERT3.60N1-20190702

Unit Analyte Result Qualifier RL MDL Dil Fac D Method Prep Type Chlorate 100 5 300.1B Total/NA 27 ī 10 ug/L Perchlorate 57 20 4.8 ug/L 5 314.0 Total/NA **Total Dissolved Solids** 6400 100 SM 2540C Total/NA 50 mg/L

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Irvine

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Total/NA

SM 2540C

Lab Sample ID: 440-245201-3

Lab Sample ID: 440-245201-4

Lab Sample ID: 440-245201-5

Lab Sample ID: 440-245201-6

Lab Sample ID: 440-245201-7

Lab Sample ID: 440-245201-8

Lab Sample ID: 440-245201-9

7/15/2019

Detection Summary

Client: AECOM Job ID: 440-245201-1 Project/Site: NDEP Phase II

SDG: LVW

Dil Fac	D	Method	Prep Type	
	_			
	_	200 40	T-4-1/NIA	_

Lab Sample ID: 440-245201-10

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Chlorate	5500	1000	100 ug/L	50	300.1B	Total/NA
Perchlorate	1800	400	95 ug/L	100	314.0	Total/NA

Lab Sample ID: 440-245201-11 Client Sample ID: NERT4.21N1-20190702-FB

No Detections.

Client Sample ID: NERT4.38N1-20190702-EB Lab Sample ID: 440-245201-12

No Detections.

Client Sample ID: NERT4.38N1-20190702 Lab Sample ID: 440-245201-13

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Chlorate	340	100	10	ug/L		300.1B	Total/NA
Perchlorate	1500	200	48	ug/L	50	314.0	Total/NA

Client Sample ID: NERT4.64N1-20190702 Lab Sample ID: 440-245201-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorate	28		20	2.0	ug/L		_	300.1B	Total/NA
Perchlorate	500		80	19	ug/L	20		314.0	Total/NA
Total Dissolved Solids	2000		20	10	mg/L	1		SM 2540C	Total/NA

Client Sample ID: NERT4.64N1-20190702-FD Lab Sample ID: 440-245201-15

Analyte	Result Qualifier	RL	MDL U	Jnit	Dil Fac	D	Method	Prep Type
Chlorate	28	20	2.0 u	ıg/L		_	300.1B	Total/NA
Perchlorate	500	80	19 u	ıg/L	20		314.0	Total/NA
Total Dissolved Solids	2000	20	10 m	ng/L	1		SM 2540C	Total/NA

7/15/2019

Project/Site: NDEP Phase II

SDG: LVW

Client Sample ID: NERT4.64S1-20190701

Date Collected: 07/01/19 08:20 Date Received: 07/03/19 10:20

Lab Sample ID: 440-245201-1

Lab Sample ID: 440-245201-2

Lab Sample ID: 440-245201-3

Matrix: Water

Matrix: Water

Matrix: Water

Job ID: 440-245201-1

Method: 300.1B - Disinfed Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	8900		1000	100	ug/L			07/08/19 20:48	50
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	104		90 - 115					07/08/19 20:48	50
Method: 314.0 - Perchlora		Qualifier	РI	MDI	Unit	n	Propared	Analyzod	Dil Ea
Analyte	Result	Qualifier	RL	MDL		D	Prepared	Analyzed	Dil Fac
Analyte Perchlorate		Qualifier	RL 800		Unit ug/L	<u>D</u> .	Prepared	Analyzed 07/12/19 15:02	
Analyte Perchlorate General Chemistry	Result 3200		800	190	ug/L		·	07/12/19 15:02	200
Analyte Perchlorate	Result 3200	Qualifier Qualifier			ug/L	D .	Prepared Prepared	.	

Client Sample ID: NERT4.71S2-20190701

Date Collected: 07/01/19 09:25 Date Received: 07/03/19 10:20

Method: 300.1B - Disinfection By-Products, (IC) Analyte Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac Chlorate 14000 1000 100 ug/L 07/08/19 21:25 Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 105 07/08/19 21:25 90 - 115

Method: 314.0 - Perchlorate (IC) Analyte Dil Fac Result Qualifier RL MDL Unit D Prepared Analyzed 800 **Perchlorate** 2900 190 ug/L 07/12/19 15:20 200 **General Chemistry** Analyte Result Qualifier RL **MDL** Unit Analyzed Dil Fac D **Prepared Total Dissolved Solids** 100 50 mg/L 07/05/19 15:41 4100

Client Sample ID: NERT4.71S1-20190701

3400

Date Collected: 07/01/19 10:15

Date Received: 07/03/19 10:20

Perchlorate

Method: 300.1B - Disinfe Analyte	ction By-Products, (I Result Qua	•	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	10000	1000	100	ug/L			07/08/19 15:40	50
Surrogate	%Recovery Qua	lifier Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	108	90 - 115			-		07/08/19 15:40	50
- Method: 314.0 - Perchlor	ate (IC)							
Analyte	Result Qua	lifier RI	MDI	Unit	D	Prepared	Analyzed	Dil Fac

800

190 ug/L

07/12/19 15:38

Project/Site: NDEP Phase II

Date Collected: 07/01/19 11:50

Date Received: 07/03/19 10:20

Client Sample ID: NERT3.60S1-20190701

Job ID: 440-245201-1

SDG: LVW

Lab Sample ID: 440-245201-4

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	4900		1000	100	ug/L			07/08/19 10:32	50
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	104		90 - 115					07/08/19 10:32	50
Method: 314.0 - Perchlora						_			
Method: 314.0 - Perchlora Analyte Perchlorate		Qualifier	RL	MDL 95	Unit ug/L	D	Prepared	Analyzed 07/12/19 19:01	Dil Fac
Analyte Perchlorate	Result	Qualifier				<u>D</u> .	Prepared		
Analyte	Result 1600	Qualifier			ug/L	<u>D</u> .	Prepared Prepared		

Client Sample ID: NERT5.11S1-20190701 Lab Sample ID: 440-245201-5 Date Collected: 07/01/19 13:05 **Matrix: Water**

Date Received: 07/03/19 10:20

Analyte	Result Qualif	ier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	10000	1000	100	ug/L			07/08/19 13:33	50
Surrogate	%Recovery Qualif	ier Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	105	90 - 115					07/08/19 13:33	50

Method: 314.0 - Perchlorate (IC) Analyte RL Result Qualifier MDL Unit Prepared Analyzed Dil Fac 800 190 ug/L 07/12/19 15:57 **Perchlorate** 2300 200

Lab Sample ID: 440-245201-6 Client Sample ID: NERT4.93S1-20190701 **Matrix: Water**

Date Collected: 07/01/19 13:55 Date Received: 07/03/19 10:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	8600		1000	100	ug/L			07/08/19 14:10	50
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	106		90 - 115					07/08/19 14:10	50

Method: 314.0 - Perchlorate (IC)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	1800		800	190	ug/L			07/12/19 16:15	200

Lab Sample ID: 440-245201-7 Client Sample ID: NERT5.91S1-20190701 Date Collected: 07/01/19 14:45 **Matrix: Water**

Date Received: 07/03/19 10:20

Method: 300.1B - Disinfed	tion By-Product	ts, (IC)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	450		100	10	ug/L			07/07/19 19:36	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	113		90 - 115			-		07/07/19 19:36	5

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7/15/2019

Project/Site: NDEP Phase II

SDG: LVW

Client Sample	ID: NERT5.919	31-20190701
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Date Collected: 07/01/19 14:45 Date Received: 07/03/19 10:20

Lab Sample ID: 440-245201-7

Matrix: Water

Job ID: 440-245201-1

Method: 314.0 - Perchiorate	(IC)	
A I4		

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	2800	800	190 ug/L			07/12/19 16:34	200

Client Sample ID: NERT3.58N1-20190702 Lab Sample ID: 440-245201-8

Date Collected: 07/02/19 08:35 Date Received: 07/03/19 10:20

Matrix: Water

Method: 300.1B - Disinfection By-Products, (IC)

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	24 J	100	10 ug/L			07/07/19 21:35	5

Limits Analyzed Surrogate %Recovery Qualifier Prepared Dichloroacetic acid(Surr) 106 90 - 115 07/07/19 21:35

Method: 314.0 - Perchlorate (IC)

Analyte	Result C	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	88		20	4.8	ug/L		-	07/11/19 18:45	5

General Chemistry

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	6600	100	50 mg/L			07/05/19 15:41	1

Client Sample ID: NERT3.60N1-20190702

Date Collected: 07/02/19 09:45 Date Received: 07/03/19 10:20

Lab Sample ID: 440-245201-9

Matrix: Water

Method: 300.1B - Disinfection By-Products. (IC)

nalyte	Result Qua	•	MDL	Unit	D Prepared	Analyzed	Dil Fac
hlorate	27 J	100	10	ug/L		07/07/19 22:05	5

Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 107 90 - 115 07/07/19 22:05

Method: 314.0 - Perchlorate (IC)

Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	57	20	4.8	ug/L			07/11/19 19:04	5

General Chemistry

Dichloroacetic acid(Surr)

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	6400	100	50 mg/L			07/05/19 15:41	1

Client Sample ID: NERT4.21N1-20190702

Date Collected: 07/02/19 10:50

Date Received: 07/03/19 10:20

Matrix: Water

Method: 300.1B - Disin	fection By-Products, (IC)						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	5500	1000	100 ug/L			07/08/19 15:58	50
Surrogate	%Recovery Qualifier	Limits			Prepared	Analyzed	Dil Fac

90 - 115

106

Eurofins TestAmerica, Irvine

07/08/19 15:58

Job ID: 440-245201-1

SDG: LVW

Date Collected: 07/02/19 10:50 Date Received: 07/03/19 10:20

Lab Sample ID: 440-245201-10

Matrix: Water

Method: 314.0 - Perchlorate (IC	C)
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RL **MDL** Unit **Analyte** Result Qualifier D Prepared Analyzed Dil Fac 400 07/12/19 14:25 Perchlorate 1800 95 ug/L 100

Client Sample ID: NERT4.21N1-20190702-FB

Date Collected: 07/02/19 10:15 Date Received: 07/03/19 10:20

Lab Sample ID: 440-245201-11

Matrix: Water

Method: 300.1B - Disinfection By-Products, (IC)

Analyte Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac Chlorate $\overline{\mathsf{ND}}$ 20 2.0 ug/L 07/07/19 20:05

Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 108 90 - 115 07/07/19 20:05

Method: 314.0 - Perchlorate (IC)

Analyte Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac Perchlorate $\overline{\mathsf{ND}}$ 4.0 0.95 ug/L 07/11/19 15:23

Client Sample ID: NERT4.38N1-20190702-EB

Date Collected: 07/02/19 11:15

Date Received: 07/03/19 10:20

Lab Sample ID: 440-245201-12

Matrix: Water

Method: 300.1B - Disinfection By-Products, (IC)

MDL Unit Analyte Result Qualifier RL D Prepared Analyzed Dil Fac Chlorate ND 20 2.0 ug/L 07/05/19 15:54

Qualifier Surrogate %Recovery Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 107 90 - 115 07/05/19 15:54

Method: 314.0 - Perchlorate (IC)

Result Qualifier Analyte RL **MDL** Unit D Prepared Analyzed Dil Fac Perchlorate 4.0 0.95 ug/L 07/11/19 15:42 $\overline{\mathsf{ND}}$

Client Sample ID: NERT4.38N1-20190702

Date Collected: 07/02/19 12:35

Date Received: 07/03/19 10:20

Lab Sample ID: 440-245201-13

Matrix: Water

Method: 300.1B - Disinfection By-Products, (IC)

Result Qualifier **MDL** Unit Analyte RL D Prepared Analyzed Dil Fac Chlorate 340 100 10 ug/L 07/07/19 23:34

%Recovery Surrogate Qualifier Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 108 90 - 115 07/07/19 23:34 5

Method: 314.0 - Perchlorate (IC)

Analyte RL **MDL** Unit Result Qualifier D Prepared Analyzed Dil Fac **Perchlorate** 1500 200 48 ug/L 07/12/19 14:07

Client Sample Results

Client: AECOM

Date Collected: 07/02/19 13:40

Date Received: 07/03/19 10:20

Client Sample ID: NERT4.64N1-20190702

Project/Site: NDEP Phase II

Job ID: 440-245201-1

SDG: LVW

Lab Sample ID: 440-245201-14

Matrix: Water

Method: 300.1B - Disinfer Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	28		20	2.0	ug/L			07/09/19 20:32	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	99		90 - 115					07/09/19 20:32	1
Method: 314.0 - Perchlor	ate (IC)								
Method: 314.0 - Perchlora Analyte	• •	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	• •	Qualifier	RL 80	MDL 19		<u>D</u> .	Prepared	Analyzed 07/12/19 13:11	Dil Fac
Analyte Perchlorate	Result	Qualifier				<u>D</u> .	Prepared		
Analyte	Result 500	Qualifier Qualifier			ug/L	D .	Prepared Prepared		

Client Sample ID: NERT4.64N1-20190702-FD Lab Sample ID: 440-245201-15 Date Collected: 07/02/19 13:40 **Matrix: Water**

Date Received: 07/03/19 10:20

Method: 314.0 - Perchlorate (IC)

Analyte

Method: 300.1B - Disinfection	on By-Produc	ts, (IC)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	28		20	2.0	ug/L			07/09/19 21:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	103		90 - 115			-		07/09/19 21:08	1

, many to	itoouit	Q uuo.			•	_	opu.ou	7 tiluly 20 a	D a0
Perchlorate	500		80	19	ug/L			07/12/19 13:30	20
General Chemistry Analyte Total Dissolved Solids	Result 2000	Qualifier	RL 20	MDL 10	Unit mg/L	<u>D</u>	Prepared	Analyzed 07/05/19 15:41	Dil Fac

RI

MDI Unit

Prepared

Result Qualifier

Eurofins TestAmerica, Irvine

Dil Fac

Analyzed

Surrogate Summary

Client: AECOM Job ID: 440-245201-1 Project/Site: NDEP Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Matrix: Water Prep Type: Total/NA

		DCAA	Percent Surrogate Recovery (Acceptance Limits)
l ah Cammia ID	Client Semale ID	(90-115)	
Lab Sample ID 440-244812-A-4 MS	Client Sample ID Matrix Spike	108	
440-244812-A-4 MSD	Matrix Spike Duplicate	106	
440-245201-1	NERT4.64S1-20190701	104	
440-245201-2	NERT4.71S2-20190701	105	
440-245201-3	NERT4.71S1-20190701	108	
440-245201-3 MS	NERT4.71S1-20190701	109	
440-245201-4	NERT3.60S1-20190701	104	
440-245201-4 MS	NERT3.60S1-20190701	106	
440-245201-4 MSD	NERT3.60S1-20190701	106	
440-245201-5	NERT5.11S1-20190701	105	
440-245201-6	NERT4.93S1-20190701	106	
440-245201-6 440-245201-7	NERT4.9351-20190701 NERT5.91S1-20190701	113	
440-245201-7 440-245201-8	NERT3.58N1-20190701	106	
440-245201-8 440-245201-9	NERT3.56N1-20190702 NERT3.60N1-20190702	107	
440-245201-9 440-245201-10	NERT4.21N1-20190702	106	
440-245201-10 MS	NERT4.21N1-20190702	105	
440-245201-10 MSD		105	
440-245201-10 MSD 440-245201-11	NERT4.21N1-20190702 NERT4.21N1-20190702-FB		
		108	
440-245201-12	NERT4.38N1-20190702-EB	107	
440-245201-13	NERT4.38N1-20190702	108	
440-245201-14	NERT4.64N1-20190702	99	
440-245201-15	NERT4.64N1-20190702-FD	103	
440-245263-A-2 MS	Matrix Spike	103	
440-245263-A-2 MSD	Matrix Spike Duplicate	103	
LCS 440-556143/4	Lab Control Sample	109	
LCS 440-556356/44	Lab Control Sample	109	
LCS 440-556360/4	Lab Control Sample	112	
LCS 440-556360/40	Lab Control Sample	111	
LCS 440-556577/4	Lab Control Sample	102	
MB 440-556143/5	Method Blank	109	
MB 440-556356/45	Method Blank	107	
MB 440-556360/41	Method Blank	111	
MB 440-556360/5	Method Blank	110	
MB 440-556577/5	Method Blank	105	
MRL 440-556143/3	Lab Control Sample	109	
MRL 440-556356/43	Lab Control Sample	106	
MRL 440-556360/3	Lab Control Sample	109	
MRL 440-556360/39	Lab Control Sample	110	
MRL 440-556577/3	Lab Control Sample	103	

Method Summary

Client: AECOM

Job ID: 440-245201-1 Project/Site: NDEP Phase II SDG: LVW

Method	Method Description	Protocol	Laboratory
300.1B	Disinfection By-Products, (IC)	EPA	TAL IRV
314.0	Perchlorate (IC)	EPA	TAL IRV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Client: AECOM Project/Site: NDEP Phase II

Client Sample ID: NERT4.64S1-20190701

Lab Sample ID: 440-245201-1

Date Collected: 07/01/19 08:20 Date Received: 07/03/19 10:20

Matrix: Water

Job ID: 440-245201-1

SDG: LVW

Batch Batch Dil Initial Final Batch Prepared Method Number or Analyzed **Prep Type** Type Run **Factor** Amount Amount Analyst Lab Total/NA 556356 \overline{YZ} Analysis 300.1B 50 07/08/19 20:48 TAL IRV Total/NA 200 557216 07/12/19 15:02 CTH TAL IRV Analysis 314.0 07/05/19 15:41 HTL Total/NA Analysis SM 2540C 1 10 mL 100 mL 556281 TAL IRV

Client Sample ID: NERT4.71S2-20190701

Lab Sample ID: 440-245201-2

Matrix: Water

Date Collected: 07/01/19 09:25 Date Received: 07/03/19 10:20

Batch Batch Dil Initial Final Batch Prepared **Prep Type** Method Factor Amount Amount Number or Analyzed Type Run **Analyst** Lab Total/NA 300.1B 556356 07/08/19 21:25 YZ TAL IRV Analysis 50 Analysis 314.0 200 557216 07/12/19 15:20 CTH TAL IRV

Total/NA 07/05/19 15:41 HTL Total/NA Analysis 1 556281 TAL IRV SM 2540C 10 mL 100 mL

Client Sample ID: NERT4.71S1-20190701

Lab Sample ID: 440-245201-3

Matrix: Water

Date Collected: 07/01/19 10:15 Date Received: 07/03/19 10:20

Batch Batch Dil Initial Final Batch Prepared Method **Factor** Number or Analyzed Prep Type Type **Amount** Amount Analyst Run Lab 300.1B 556360 07/08/19 15:40 YZ Total/NA Analysis 50 TAL IRV Total/NA Analysis 314.0 200 557216 07/12/19 15:38 CTH TAL IRV

Client Sample ID: NERT3.60S1-20190701

Lab Sample ID: 440-245201-4

Matrix: Water

Date Collected: 07/01/19 11:50 Date Received: 07/03/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			556356	07/08/19 10:32	YZ	TAL IRV
Total/NA	Analysis	314.0		100			557216	07/12/19 19:01	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	20 mL	100 mL	556281	07/05/19 15:41	HTL	TAL IRV

Client Sample ID: NERT5.11S1-20190701

Lab Sample ID: 440-245201-5

Matrix: Water

Date Collected: 07/01/19 13:05 Date Received: 07/03/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			556356	07/08/19 13:33	YZ	TAL IRV
Total/NA	Analysis	314.0		200			557216	07/12/19 15:57	CTH	TAL IRV

Client Sample ID: NERT4.93S1-20190701

Lab Sample ID: 440-245201-6

Matrix: Water

Date Collected: 07/01/19 13:55 Date Received: 07/03/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			556356	07/08/19 14:10	YZ	TAL IRV
Total/NA	Analysis	314.0		200			557216	07/12/19 16:15	CTH	TAL IRV

Eurofins TestAmerica, Irvine

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7/15/2019

Project/Site: NDEP Phase II

Lab Sample ID: 440-245201-7

Job ID: 440-245201-1

SDG: LVW

Client Sample ID: NERT5.91S1-20190701 Date Collected: 07/01/19 14:45

Date Received: 07/03/19 10:20

watrix: water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			556360	07/07/19 19:36	YZ	TAL IRV
Total/NA	Analysis	314.0		200			557216	07/12/19 16:34	CTH	TAL IRV

Lab Sample ID: 440-245201-8 **Client Sample ID: NERT3.58N1-20190702**

Date Collected: 07/02/19 08:35 Date Received: 07/03/19 10:20

Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			556360	07/07/19 21:35	YZ	TAL IRV
Total/NA	Analysis	314.0		5			557008	07/11/19 18:45	СТН	TAL IRV
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	556281	07/05/19 15:41	HTL	TAL IRV

Client Sample ID: NERT3.60N1-20190702 Lab Sample ID: 440-245201-9

Date Collected: 07/02/19 09:45 Date Received: 07/03/19 10:20

Matrix: Water

Batch Batch Dil Initial Final Batch Prepared **Prep Type** Type Method Factor Amount Amount Number or Analyzed Analyst Lab Run Total/NA Analysis 300.1B 556360 07/07/19 22:05 YZ TAL IRV Total/NA Analysis 314.0 5 557008 07/11/19 19:04 CTH TAL IRV Total/NA Analysis SM 2540C 1 10 mL 100 mL 556281 07/05/19 15:41 HTL TAL IRV

Client Sample ID: NERT4.21N1-20190702

Date Collected: 07/02/19 10:50

Date Received: 07/03/19 10:20

Lab Sample	ID: 440-245201-10
_	Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			556356	07/08/19 15:58	YZ	TAL IRV
Total/NA	Analysis	314.0		100			557216	07/12/19 14:25	CTH	TAL IRV

Client Sample ID: NERT4.21N1-20190702-FB Lab Sample ID: 440-245201-11 **Matrix: Water**

Date Collected: 07/02/19 10:15 Date Received: 07/03/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		1			556360	07/07/19 20:05	YZ	TAL IRV
Total/NA	Analysis	314.0		1			557008	07/11/19 15:23	CTH	TAL IRV

Client Sample ID: NERT4.38N1-20190702-EB Lab Sample ID: 440-245201-12

Date Collected: 07/02/19 11:15 Date Received: 07/03/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type Total/NA	Type Analysis	Method 300.1B	Run	Factor 1	Amount	Amount	Number 556143	or Analyzed 07/05/19 15:54	$\frac{\textbf{Analyst}}{\text{YZ}}$	Lab TAL IRV
Total/NA	Analysis	314.0		1			557008	07/11/19 15:42	СТН	TAL IRV

Eurofins TestAmerica, Irvine

Matrix: Water

Lab Chronicle

Client: AECOM Job ID: 440-245201-1
Project/Site: NDEP Phase II SDG: LVW

Client Sample ID: NERT4.38N1-20190702 Lab Sample ID: 440-245201-13

Date Collected: 07/02/19 12:35 Matrix: Water Date Received: 07/03/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			556360	07/07/19 23:34	YZ	TAL IRV
Total/NA	Analysis	314.0		50			557216	07/12/19 14:07	CTH	TAL IRV

Client Sample ID: NERT4.64N1-20190702 Lab Sample ID: 440-245201-14

Date Collected: 07/02/19 13:40 Matrix: Water Date Received: 07/03/19 10:20

_	Batch	Batch	_	Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		1			556577	07/09/19 20:32	YZ	TAL IRV
Total/NA	Analysis	314.0		20			557216	07/12/19 13:11	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	556281	07/05/19 15:41	HTL	TAL IRV

Client Sample ID: NERT4.64N1-20190702-FD

Lab Sample ID: 440-245201-15

Date Collected: 07/02/19 13:40

Matrix: Water

Date Collected: 07/02/19 13:40 Matrix: Water Date Received: 07/03/19 10:20

Batch **Batch** Dil Initial Final Batch Prepared **Prep Type** Type Method Run **Factor** Amount **Amount** Number or Analyzed Analyst Lab Total/NA Analysis 300.1B 556577 07/09/19 21:08 YZ TAL IRV Total/NA Analysis 314.0 20 557216 07/12/19 13:30 CTH TAL IRV Total/NA Analysis SM 2540C 50 mL 556281 07/05/19 15:41 HTL TAL IRV 1 100 mL

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

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Client: AECOM

Job ID: 440-245201-1 Project/Site: NDEP Phase II

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Lab Sample ID: MB 440-556143/5 **Client Sample ID: Method Blank** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556143

	IVID IVID							
Analyte	Result Qualifie	er RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	ND	20	2.0	ug/L			07/05/19 06:27	1

MB MB

Limits Dil Fac Surrogate %Recovery Qualifier Prepared Analyzed Dichloroacetic acid(Surr) 109 90 - 115 07/05/19 06:27

Lab Sample ID: LCS 440-556143/4 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556143

%Rec. Spike LCS LCS Added Analyte Result Qualifier Unit D %Rec Limits

Chlorate 100 102 102 ug/L 75 - 125

LCS LCS

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 109 90 - 115

Lab Sample ID: MRL 440-556143/3 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556143

Spike MRL MRL %Rec. Analyte Added Limits Result Qualifier Unit D %Rec Chlorate 20.0 21.2 ug/L 106 50 - 150

MRL MRL Surrogate %Recovery Qualifier Limits

90 - 115 Dichloroacetic acid(Surr) 109

Lab Sample ID: 440-244812-A-4 MS

Matrix: Water

Analysis Batch: 556143 Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Unit Limits %Rec

200 Chlorate 2700 2860 4 MS MS

Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 108 90 - 115

Lab Sample ID: 440-244812-A-4 MSD **Matrix: Water**

Analysis Batch: 556143

RPD Sample Sample Spike MSD MSD %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Chlorate 2700 200 2800 4 ug/L 51 75 - 125 25

MSD MSD

Surrogate %Recovery Qualifier Limits 106 90 - 115 Dichloroacetic acid(Surr)

Eurofins TestAmerica, Irvine

Client Sample ID: Matrix Spike

75 - 125

81

Client Sample ID: Matrix Spike Duplicate

ug/L

Prep Type: Total/NA

Prep Type: Total/NA

Job ID: 440-245201-1 Project/Site: NDEP Phase II

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

Lab Sample ID: MB 440-556356/45 **Client Sample ID: Method Blank Matrix: Water Prep Type: Total/NA**

Analysis Batch: 556356

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	ND		20	2.0	ug/L			07/08/19 09:56	1
	MD	MR							

MB MB

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac	
Dichloroacetic acid(Surr)	107		90 - 115		07/08/19 09:56	1	ì

Lab Sample ID: LCS 440-556356/44 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

			Spike	LCS	LCS				%Rec.		
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits		
Chlorate			100	104		ug/L		104	75 - 125		_
	1.00	1.00									
	LCS	LUS									
Surrogato	%Recovery	Qualifier	l imite								

Dichloroacetic acid(Surr) 109 90 - 115

Lab Sample ID: MRL 440-556356/43 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

Tillary Clo Batom Cocco								
_	Spike	MRL	MRL				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	20.0	20.3		ug/L		101	50 - 150	

MRL MRL Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 106 90 - 115

Lab Sample ID: 440-245201-4 MS Client Sample ID: NERT3.60S1-20190701 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	4900		200	4820	4	ug/L		-60	75 - 125	

MS MS Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 90 - 115 106

Client Sample ID: NERT3.60S1-20190701 Lab Sample ID: 440-245201-4 MSD Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

Analysis Balch: 556556	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Chlorate	4900		200	4880	4	ug/L		-29	75 - 125	1	25
	MSD	MSD									

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 106 90 - 115

Eurofins TestAmerica, Irvine

Matrix: Water

Lab Sample ID: 440-245201-10 MS

Job ID: 440-245201-1 Project/Site: NDEP Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

Client Sample ID: NERT4.21N1-20190702

Prep Type: Total/NA

Analysis Batch: 556356

Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits Chlorate 5500 200 -30 75 - 125 5450 4 ug/L

MS MS

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 105 90 - 115

Lab Sample ID: 440-245201-10 MSD Client Sample ID: NERT4.21N1-20190702 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

Sample Sample Spike MSD MSD %Rec. **RPD** Result Qualifier Analyte Added Result Qualifier Unit D %Rec Limits **RPD** Limit Chlorate 5500 200 5420 4 -45 ug/L 75 - 125

MSD MSD

Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 107 90 - 115

Lab Sample ID: MB 440-556360/41 **Client Sample ID: Method Blank** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556360

MB MB

Analyte Result Qualifier RL **MDL** Unit Dil Fac D Prepared Analyzed Chlorate ND 20 2.0 ug/L 07/08/19 07:42

MB MB

Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 90 - 115 07/08/19 07:42 111

Lab Sample ID: MB 440-556360/5

Matrix: Water

Analysis Batch: 556360

MB MB

RL Analyte Result Qualifier **MDL** Unit D Analyzed Dil Fac Prepared 20 Chlorate 07/07/19 10:38 $\overline{\mathsf{ND}}$ 2.0 ug/L

MR MR

Qualifier Limits Dil Fac Surrogate %Recovery Prepared Analyzed Dichloroacetic acid(Surr) 110 90 - 115 07/07/19 10:38

Lab Sample ID: LCS 440-556360/4

Matrix: Water

Analysis Batch: 556360

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit %Rec Limits Chlorate 100 99.4 ug/L 99 75 - 125

LCS LCS

Surrogate %Recovery Qualifier Limits 90 - 115 Dichloroacetic acid(Surr) 112

Eurofins TestAmerica, Irvine

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Type: Total/NA

Job ID: 440-245201-1 Project/Site: NDEP Phase II

SDG: LVW

Prep Type: Total/NA

Prep Type: Total/NA

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

Client Sample ID: Lab Control Sample Lab Sample ID: LCS 440-556360/40 **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 556360

Spike LCS LCS %Rec. Analyte Added Result Qualifier %Rec Limits Unit Chlorate 100 102 75 - 125 102 ug/L

LCS LCS

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 90 - 115 111

Lab Sample ID: MRL 440-556360/3 Client Sample ID: Lab Control Sample

Matrix: Water

Analysis Batch: 556360

Spike MRL MRL %Rec. Analyte Added Result Qualifier Unit D %Rec Limits

Chlorate 20.0 20.3 101 ug/L 50 - 150

MRL MRL

%Recovery Qualifier Surrogate Limits Dichloroacetic acid(Surr) 109 90 - 115

Lab Sample ID: MRL 440-556360/39 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556360

MRL MRL Spike %Rec. Analyte Added Limits Result Qualifier Unit D %Rec

Chlorate 20.0 20.3 ug/L 102 50 - 150

MRL MRL

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 90 - 115 110

Lab Sample ID: 440-245201-3 MS Client Sample ID: NERT4.71S1-20190701

Matrix: Water

Analysis Batch: 556360

Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Unit Limits D %Rec 200 Chlorate 10000 9890 4 -170 75 - 125 ug/L

MS MS

Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 109 90 - 115

Lab Sample ID: 440-245201-3 MSD Client Sample ID: NERT4.71S1-20190701 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556360

Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit 10000 200 9940 4 -143 Chlorate ug/L 75 - 125

Lab Sample ID: MB 440-556577/5 **Client Sample ID: Method Blank**

Matrix: Water

Analysis Batch: 556577

MB MB RL Analyte Result Qualifier **MDL** Unit D Prepared Analyzed Dil Fac Chlorate $\overline{\mathsf{ND}}$ 20 2.0 ug/L 07/09/19 06:38

Eurofins TestAmerica, Irvine

Prep Type: Total/NA

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Project/Site: NDEP Phase II

Job ID: 440-245201-1

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

	MB	MB				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	105		90 - 115		07/09/19 06:38	1
-						

Lab Sample ID: LCS 440-556577/4 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 556577

Spike LCS LCS %Rec. Limits Analyte Added Result Qualifier Unit D %Rec Chlorate 100 104 104 75 - 125 ua/L

LCS LCS Surrogate %Recovery Qualifier I imits Dichloroacetic acid(Surr) 90 - 115 102

Lab Sample ID: MRL 440-556577/3 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556577

Spike MRL MRL %Rec. Added Result Qualifier Analyte Limits Unit %Rec Chlorate 20.0 20.3 ug/L 101 50 - 150

MRL MRL Surrogate %Recovery Qualifier Limits 90 - 115 Dichloroacetic acid(Surr) 103

Lab Sample ID: 440-245263-A-2 MS

Matrix: Water

Analysis Batch: 556577

Sample Sample Spike MS MS %Rec. Result Qualifier Added Result Qualifier Analyte Unit %Rec Limits Chlorate 200 4600 4570 4 ug/L -19 75 - 125

MS MS Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 103 90 - 115

Lab Sample ID: 440-245263-A-2 MSD **Matrix: Water**

Analysis Batch: 556577

MSD MSD %Rec. **RPD** Sample Sample Spike Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit 200 Chlorate 4600 4610 4 ug/L 75 - 125 25 MSD MSD

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 103 90 - 115

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 440-557008/6 **Client Sample ID: Method Blank** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557008

MB MB **Analyte** Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac 07/11/19 10:45 Perchlorate $\overline{\mathsf{ND}}$ 4.0 0.95 ug/L

Eurofins TestAmerica, Irvine

Client Sample ID: Matrix Spike

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Type: Total/NA

10

Client: AECOM

Job ID: 440-245201-1 Project/Site: NDEP Phase II SDG: LVW

Method: 314.0 - Perchlorate (IC) (Continued)

Lab Sample ID: LCS 440-557008/5 Client Sample ID: Lab Control Sample Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557008 Spike LCS LCS %Rec. Added Result Qualifier %Rec Limits Analyte Unit

Perchlorate 25.0 26.5 106 85 - 115 ug/L

Lab Sample ID: MRL 440-557008/8 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557008

Spike MRL MRL %Rec. Analyte Added Result Qualifier Unit D %Rec Limits 4.00 75 - 125 Perchlorate 4.37 ug/L 109

Lab Sample ID: 320-51755-D-2 MS Client Sample ID: Matrix Spike **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557008

Sample Sample Spike MS MS %Rec. Result Qualifier babb∆ Result Qualifier Unit Limits Analyte %Rec Perchlorate 25.0 80 - 120 ND 26.5 ug/L 106

Lab Sample ID: 320-51755-D-2 MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557008

Spike MSD MSD %Rec. **RPD** Sample Sample Added Analyte Result Qualifier Result Qualifier Limits RPD Limit Unit D %Rec Perchlorate ND 25.0 27.4 110 80 - 120 ug/L

Lab Sample ID: MB 440-557216/6 Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557216

MB MB **MDL** Unit Analyte Result Qualifier RL Prepared Analyzed Dil Fac Perchlorate 4.0 0.95 ug/L 07/12/19 09:57 ND

Lab Sample ID: LCS 440-557216/5 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557216

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit %Rec Limits Perchlorate 25.0 26.0 ug/L 104 85 - 115

Client Sample ID: Lab Control Sample Lab Sample ID: MRL 440-557216/8 **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557216

Spike MRL MRL %Rec. Analyte Added Result Qualifier Unit %Rec Limits Perchlorate 4.00 4.53 113 75 - 125 ug/L

Lab Sample ID: 440-245201-4 MS Client Sample ID: NERT3.60S1-20190701 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557216

Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Unit %Rec Limits Perchlorate 1600 2500 4340 ug/L 108 80 - 120

Eurofins TestAmerica, Irvine

QC Sample Results

Client: AECOM Job ID: 440-245201-1 Project/Site: NDEP Phase II SDG: LVW

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: 440-245201-4 MSD Client Sample ID: NERT3.60S1-20190701

Matrix: Water

Analysis Batch: 55/216												
-	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit	
Perchlorate	1600		2500	4260		ug/L		105	80 - 120	2	15	

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 440-556281/1 Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556281

MB MB Result Qualifier RL MDL Unit **Prepared** Analyzed 10 07/05/19 15:41 Total Dissolved Solids ND 5.0 mg/L

Lab Sample ID: LCS 440-556281/2 **Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total/NA** Analysis Batch: 556281

Spike LCS LCS %Rec. Added Analyte Result Qualifier Unit D %Rec Limits 1000 **Total Dissolved Solids** 962 mg/L 96 90 - 110

Lab Sample ID: 440-245201-4 DU Client Sample ID: NERT3.60S1-20190701 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556281

DU DU RPD Sample Sample Result Qualifier Analyte Result Qualifier Unit RPD Limit **Total Dissolved Solids** 3300 3210 mg/L

Prep Type: Total/NA

QC Association Summary

Job ID: 440-245201-1 Client: AECOM Project/Site: NDEP Phase II SDG: LVW

HPLC/IC

Analysis Batch: 556143

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245201-12	NERT4.38N1-20190702-EB	Total/NA	Water	300.1B	
MB 440-556143/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-556143/4	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556143/3	Lab Control Sample	Total/NA	Water	300.1B	
440-244812-A-4 MS	Matrix Spike	Total/NA	Water	300.1B	
440-244812-A-4 MSD	Matrix Spike Duplicate	Total/NA	Water	300.1B	

Analysis Batch: 556356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245201-1	NERT4.64S1-20190701	Total/NA	Water	300.1B	
440-245201-2	NERT4.71S2-20190701	Total/NA	Water	300.1B	
440-245201-4	NERT3.60S1-20190701	Total/NA	Water	300.1B	
440-245201-5	NERT5.11S1-20190701	Total/NA	Water	300.1B	
440-245201-6	NERT4.93S1-20190701	Total/NA	Water	300.1B	
440-245201-10	NERT4.21N1-20190702	Total/NA	Water	300.1B	
MB 440-556356/45	Method Blank	Total/NA	Water	300.1B	
LCS 440-556356/44	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556356/43	Lab Control Sample	Total/NA	Water	300.1B	
440-245201-4 MS	NERT3.60S1-20190701	Total/NA	Water	300.1B	
440-245201-4 MSD	NERT3.60S1-20190701	Total/NA	Water	300.1B	
440-245201-10 MS	NERT4.21N1-20190702	Total/NA	Water	300.1B	
440-245201-10 MSD	NERT4.21N1-20190702	Total/NA	Water	300.1B	

Analysis Batch: 556360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245201-3	NERT4.71S1-20190701	Total/NA	Water	300.1B	_
440-245201-7	NERT5.91S1-20190701	Total/NA	Water	300.1B	
440-245201-8	NERT3.58N1-20190702	Total/NA	Water	300.1B	
440-245201-9	NERT3.60N1-20190702	Total/NA	Water	300.1B	
440-245201-11	NERT4.21N1-20190702-FB	Total/NA	Water	300.1B	
440-245201-13	NERT4.38N1-20190702	Total/NA	Water	300.1B	
MB 440-556360/41	Method Blank	Total/NA	Water	300.1B	
MB 440-556360/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-556360/4	Lab Control Sample	Total/NA	Water	300.1B	
LCS 440-556360/40	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556360/3	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556360/39	Lab Control Sample	Total/NA	Water	300.1B	
440-245201-3 MS	NERT4.71S1-20190701	Total/NA	Water	300.1B	
440-245201-3 MSD	NERT4.71S1-20190701	Total/NA	Water	300.1B	

Analysis Batch: 556577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245201-14	NERT4.64N1-20190702	Total/NA	Water	300.1B	_
440-245201-15	NERT4.64N1-20190702-FD	Total/NA	Water	300.1B	
MB 440-556577/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-556577/4	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556577/3	Lab Control Sample	Total/NA	Water	300.1B	
440-245263-A-2 MS	Matrix Spike	Total/NA	Water	300.1B	
440-245263-A-2 MSD	Matrix Spike Duplicate	Total/NA	Water	300.1B	

Page 24 of 30

QC Association Summary

Job ID: 440-245201-1 Client: AECOM Project/Site: NDEP Phase II SDG: LVW

HPLC/IC

Analysis Batch: 557008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245201-8	NERT3.58N1-20190702	Total/NA	Water	314.0	
440-245201-9	NERT3.60N1-20190702	Total/NA	Water	314.0	
440-245201-11	NERT4.21N1-20190702-FB	Total/NA	Water	314.0	
440-245201-12	NERT4.38N1-20190702-EB	Total/NA	Water	314.0	
MB 440-557008/6	Method Blank	Total/NA	Water	314.0	
LCS 440-557008/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557008/8	Lab Control Sample	Total/NA	Water	314.0	
320-51755-D-2 MS	Matrix Spike	Total/NA	Water	314.0	
320-51755-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

Analysis Batch: 557216

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245201-1	NERT4.64S1-20190701	Total/NA	Water	314.0	
440-245201-2	NERT4.71S2-20190701	Total/NA	Water	314.0	
440-245201-3	NERT4.71S1-20190701	Total/NA	Water	314.0	
440-245201-4	NERT3.60S1-20190701	Total/NA	Water	314.0	
440-245201-5	NERT5.11S1-20190701	Total/NA	Water	314.0	
440-245201-6	NERT4.93S1-20190701	Total/NA	Water	314.0	
440-245201-7	NERT5.91S1-20190701	Total/NA	Water	314.0	
440-245201-10	NERT4.21N1-20190702	Total/NA	Water	314.0	
440-245201-13	NERT4.38N1-20190702	Total/NA	Water	314.0	
440-245201-14	NERT4.64N1-20190702	Total/NA	Water	314.0	
440-245201-15	NERT4.64N1-20190702-FD	Total/NA	Water	314.0	
MB 440-557216/6	Method Blank	Total/NA	Water	314.0	
LCS 440-557216/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557216/8	Lab Control Sample	Total/NA	Water	314.0	
440-245201-4 MS	NERT3.60S1-20190701	Total/NA	Water	314.0	
440-245201-4 MSD	NERT3.60S1-20190701	Total/NA	Water	314.0	

General Chemistry

Analysis Batch: 556281

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245201-1	NERT4.64S1-20190701	Total/NA	Water	SM 2540C	
440-245201-2	NERT4.71S2-20190701	Total/NA	Water	SM 2540C	
440-245201-4	NERT3.60S1-20190701	Total/NA	Water	SM 2540C	
440-245201-8	NERT3.58N1-20190702	Total/NA	Water	SM 2540C	
440-245201-9	NERT3.60N1-20190702	Total/NA	Water	SM 2540C	
440-245201-14	NERT4.64N1-20190702	Total/NA	Water	SM 2540C	
440-245201-15	NERT4.64N1-20190702-FD	Total/NA	Water	SM 2540C	
MB 440-556281/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 440-556281/2	Lab Control Sample	Total/NA	Water	SM 2540C	
440-245201-4 DU	NERT3.60S1-20190701	Total/NA	Water	SM 2540C	

Definitions/Glossary

Client: AECOM Job ID: 440-245201-1

Project/Site: NDEP Phase II SDG: LVW

Qualifiers

RPD

TEF

TEQ

HPLC/IC Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not
	applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

Toxicity Equivalent Factor (Dioxin) Toxicity Equivalent Quotient (Dioxin)

7/15/2019

Accreditation/Certification Summary

Client: AECOM Job ID: 440-245201-1 Project/Site: NDEP Phase II

Laboratory: Eurofins TestAmerica, Irvine

The accreditations/certifications listed below are applicable to this report.

	Authority	Program	EPA Region	Identification Number	Expiration Date
1	Nevada	State Program	9	CA015312019-5	07-31-19 *

SDG: LVW

^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Las Vəgas 219

Chain of Custody Record

323024

THE LEADER IN ENVIRONMENTAL TESTING TestAmerica Laboratories, Inc.

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TestAmerica Las Vegas 219

Chain of Custody Record

323023

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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Job Number: 440-245201-1

SDG Number: LVW

Login Number: 245201 List Source: Eurofins TestAmerica, Irvine

List Number: 1

Creator: Skinner, Alma D

Creator: Skinner, Alma D		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins TestAmerica, Irvine

Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-245201-2

Laboratory Sample Delivery Group: LVW

Client Project/Site: NDEP Phase II

For: **AECOM** 1220 Avenida Acaso Camarillo, California 93012

Attn: Carmen Caceres-Schnell

anea Roberdo Authorized for release by: 7/12/2019 9:27:36 AM

Danielle Roberts, Senior Project Manager (949)260-3249

danielle.roberts@testamericainc.com

.....LINKS

Review your project results through Total Access

Have a Question?



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: AECOM Project/Site: NDEP Phase II Laboratory Job ID: 440-245201-2 SDG: LVW

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Sample Summary

Client: AECOM

Job ID: 440-245201-2 Project/Site: NDEP Phase II

SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
440-245201-1	NERT4.64S1-20190701	Water	07/01/19 08:20	07/03/19 10:20	
440-245201-2	NERT4.71S2-20190701	Water	07/01/19 09:25	07/03/19 10:20	
440-245201-4	NERT3.60S1-20190701	Water	07/01/19 11:50	07/03/19 10:20	
440-245201-8	NERT3.58N1-20190702	Water	07/02/19 08:35	07/03/19 10:20	
440-245201-9	NERT3.60N1-20190702	Water	07/02/19 09:45	07/03/19 10:20	
440-245201-14	NERT4.64N1-20190702	Water	07/02/19 13:40	07/03/19 10:20	
440-245201-15	NERT4.64N1-20190702-FD	Water	07/02/19 13:40	07/03/19 10:20	

Case Narrative

Client: AECOM

Job ID: 440-245201-2 Project/Site: NDEP Phase II

SDG: LVW

Job ID: 440-245201-2

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-245201-2

Comments

No additional comments.

Receipt

The samples were received on 7/3/2019 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3° C.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: AECOM

Job ID: 440-245201-2 Project/Site: NDEP Phase II SDG: LVW

Client Sample ID: N	IERT4.64S1-20190701				Lab Sa	mple ID: 4	40-245201-1
Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac I	O Method	Prep Type
Chromium	20	2.0	0.50	ug/L	1	200.8	Dissolved
Client Sample ID: N	IERT4.71S2-20190701				Lab Sa	mple ID: 4	40-245201-2
Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac I	O Method	Prep Type
Chromium	19	2.0	0.50	ug/L	1	200.8	Dissolved
Client Sample ID: N	IERT3.60S1-20190701				Lab Sa	mple ID: 4	40-245201-4
_ Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac I	D Method	Prep Type
Chromium	9.9	2.0	0.50	ug/L		200.8	Dissolved
Client Sample ID: N	IERT3.58N1-20190702				Lab Sa	mple ID: 4	40-245201-8
_ Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac I	O Method	Prep Type
Chromium	1.3 J	2.0	0.50	ug/L	1	200.8	Dissolved
Client Sample ID: N	IERT3.60N1-20190702				Lab Sa	mple ID: 4	40-245201-9
No Detections.							
Client Sample ID: N	IERT4.64N1-20190702				Lab Sam	ple ID: 44	0-245201-14
Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac I	D Method	Prep Type
Chromium	0.55 J	2.0	0.50	ug/L	1	200.8	Dissolved
Client Sample ID: N	IERT4.64N1-20190702-FD				Lab Sam	ple ID: 44	0-245201-15
_ Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	O Method	Prep Type
Chromium	0.72 J	2.0	0.50	ua/I		200.8	Dissolved

Project/Site: NDEP Phase II

Client Sample ID: NERT4.64S1-20190701

Date Collected: 07/01/19 08:20 Date Received: 07/03/19 10:20

Lab Sample ID: 440-245201-1

Matrix: Water

Job ID: 440-245201-2

SDG: LVW

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Method: 200.8 - Metals (ICP/MS) - Dissolved

Result Qualifier Analyte RLMDL Unit D Prepared Analyzed Dil Fac 2.0 0.50 ug/L 07/09/19 11:27 07/09/19 13:29 Chromium 20

Lab Sample ID: 440-245201-2 Client Sample ID: NERT4.71S2-20190701 **Matrix: Water**

Date Collected: 07/01/19 09:25 Date Received: 07/03/19 10:20

Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Chromium 19 2.0 0.50 ua/L 07/09/19 11:27 07/09/19 13:31

Client Sample ID: NERT3.60S1-20190701 Lab Sample ID: 440-245201-4

Date Collected: 07/01/19 11:50 Date Received: 07/03/19 10:20

Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac 20 07/09/19 11:27 07/09/19 13:23 Chromium 0.50 ug/L 9.9

Lab Sample ID: 440-245201-8 Client Sample ID: NERT3.58N1-20190702 **Matrix: Water**

Date Collected: 07/02/19 08:35 Date Received: 07/03/19 10:20

Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac Chromium 1.3 J 2.0 0.50 ug/L 07/09/19 11:27 07/09/19 13:33

Client Sample ID: NERT3.60N1-20190702 Lab Sample ID: 440-245201-9

Date Collected: 07/02/19 09:45 Date Received: 07/03/19 10:20

Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 07/09/19 11:27 07/09/19 13:36 Chromium $\overline{\mathsf{ND}}$ 2.0 0.50 ug/L

Client Sample ID: NERT4.64N1-20190702 Lab Sample ID: 440-245201-14

Date Collected: 07/02/19 13:40

Date Received: 07/03/19 10:20

Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte Result Qualifier RI **MDL** Unit Prepared Analyzed Dil Fac Chromium 0.55 J 2.0 0.50 ug/L 07/09/19 11:27 07/09/19 13:42

Client Sample ID: NERT4.64N1-20190702-FD Lab Sample ID: 440-245201-15

Date Collected: 07/02/19 13:40 Date Received: 07/03/19 10:20

Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte **Result Qualifier** RL **MDL** Unit Prepared Analyzed Dil Fac 2.0 07/09/19 11:27 07/09/19 13:44 Chromium 0.72 J 0.50 ug/L

Method Summary

Client: AECOM

Project/Site: NDEP Phase II SDG: LVW

Job ID: 440-245201-2

Method	Method Description	Protocol	Laboratory
200.8	Metals (ICP/MS)	EPA	TAL IRV
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Job ID: 440-245201-2 Project/Site: NDEP Phase II SDG: LVW

Client Sample ID: NERT4.64S1-20190701 Lab Sample ID: 440-245201-1

Date Collected: 07/01/19 08:20 Date Received: 07/03/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	556670	07/09/19 11:27	EP	TAL IRV
Dissolved	Analysis	200.8		1			556701	07/09/19 13:29	MQP	TAL IRV

Client Sample ID: NERT4.71S2-20190701

Date Collected: 07/01/19 09:25 Date Received: 07/03/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	556670	07/09/19 11:27	EP	TAL IRV
Dissolved	Analysis	200.8		1			556701	07/09/19 13:31	MQP	TAL IRV

Client Sample ID: NERT3.60S1-20190701

Date Collected: 07/01/19 11:50

Date Received: 07/03/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	556670	07/09/19 11:27	EP	TAL IRV
Dissolved	Analysis	200.8		1			556701	07/09/19 13:23	MQP	TAL IRV

Client Sample ID: NERT3.58N1-20190702

Date Collected: 07/02/19 08:35 Date Received: 07/03/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	556670	07/09/19 11:27	EP	TAL IRV
Dissolved	Analysis	200.8		1			556701	07/09/19 13:33	MQP	TAL IRV

Client Sample ID: NERT3.60N1-20190702

Date Collected: 07/02/19 09:45 Date Received: 07/03/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	556670	07/09/19 11:27	EP	TAL IRV
Dissolved	Analysis	200.8		1			556701	07/09/19 13:36	MQP	TAL IRV

Client Sample ID: NERT4.64N1-20190702

Date Collected: 07/02/19 13:40 Date Received: 07/03/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	556670	07/09/19 11:27	EP	TAL IRV
Dissolved	Analysis	200.8		1			556701	07/09/19 13:42	MQP	TAL IRV

Eurofins TestAmerica, Irvine

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Lab Sample ID: 440-245201-2

Lab Sample ID: 440-245201-4

Lab Sample ID: 440-245201-8

Lab Sample ID: 440-245201-9

Matrix: Water

7/12/2019

Lab Chronicle

Client: AECOM Job ID: 440-245201-2
Project/Site: NDEP Phase II SDG: LVW

Client Sample ID: NERT4.64N1-20190702-FD Lab Sample ID: 440-245201-15

Date Collected: 07/02/19 13:40 Matrix: Water Date Received: 07/03/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	556670	07/09/19 11:27	EP	TAL IRV
Dissolved	Analysis	200.8		1			556701	07/09/19 13:44	MQP	TAL IRV

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

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QC Sample Results

Client: AECOM Job ID: 440-245201-2 Project/Site: NDEP Phase II

SDG: LVW

Method: 200.8 - Metals (ICP/MS)

Chromium

Chromium

Lab Sample ID: MB 440-556670/1-A **Client Sample ID: Method Blank Matrix: Water Prep Type: Total Recoverable** Analysis Batch: 556701 **Prep Batch: 556670**

MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 2.0 0.50 ug/L Chromium 07/09/19 11:27 07/09/19 13:19 $\overline{\mathsf{ND}}$

Lab Sample ID: LCS 440-556670/2-A **Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total Recoverable Analysis Batch: 556701 Prep Batch: 556670** LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits

79.5

83.8

ug/L

ug/L

99

92

85 - 115

70 - 130

80.0

80.0

9.9

Lab Sample ID: 440-245201-4 MS Client Sample ID: NERT3.60S1-20190701 **Matrix: Water Prep Type: Dissolved Analysis Batch: 556701 Prep Batch: 556670** Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier Unit Limits %Rec

Lab Sample ID: 440-245201-4 MSD Client Sample ID: NERT3.60S1-20190701

Matrix: Water Prep Type: Dissolved

Analysis Batch: 556701 **Prep Batch: 556670** Sample Sample Spike MSD MSD %Rec. **RPD** Result Qualifier Added Limits Analyte Result Qualifier D %Rec RPD Limit Unit Chromium 9.9 80.0 84.3 ug/L 93 70 - 130 20

Eurofins TestAmerica, Irvine

7/12/2019

QC Association Summary

Client: AECOM Job ID: 440-245201-2 Project/Site: NDEP Phase II SDG: LVW

Metals

Prep Batch: 556670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245201-1	NERT4.64S1-20190701	Dissolved	Water	200.2	
440-245201-2	NERT4.71S2-20190701	Dissolved	Water	200.2	
440-245201-4	NERT3.60S1-20190701	Dissolved	Water	200.2	
440-245201-8	NERT3.58N1-20190702	Dissolved	Water	200.2	
440-245201-9	NERT3.60N1-20190702	Dissolved	Water	200.2	
440-245201-14	NERT4.64N1-20190702	Dissolved	Water	200.2	
440-245201-15	NERT4.64N1-20190702-FD	Dissolved	Water	200.2	
MB 440-556670/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-556670/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-245201-4 MS	NERT3.60S1-20190701	Dissolved	Water	200.2	
440-245201-4 MSD	NERT3.60S1-20190701	Dissolved	Water	200.2	

Analysis Batch: 556701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245201-1	NERT4.64S1-20190701	Dissolved	Water	200.8	556670
440-245201-2	NERT4.71S2-20190701	Dissolved	Water	200.8	556670
440-245201-4	NERT3.60S1-20190701	Dissolved	Water	200.8	556670
440-245201-8	NERT3.58N1-20190702	Dissolved	Water	200.8	556670
440-245201-9	NERT3.60N1-20190702	Dissolved	Water	200.8	556670
440-245201-14	NERT4.64N1-20190702	Dissolved	Water	200.8	556670
440-245201-15	NERT4.64N1-20190702-FD	Dissolved	Water	200.8	556670
MB 440-556670/1-A	Method Blank	Total Recoverable	Water	200.8	556670
LCS 440-556670/2-A	Lab Control Sample	Total Recoverable	Water	200.8	556670
440-245201-4 MS	NERT3.60S1-20190701	Dissolved	Water	200.8	556670
440-245201-4 MSD	NERT3.60S1-20190701	Dissolved	Water	200.8	556670

Definitions/Glossary

Client: AECOM Job ID: 440-245201-2

Project/Site: NDEP Phase II SDG: LVW

Qualifiers

M	ota	le
IVI	Cla	IJ

Qualifier Qualifier Description

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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A A

Accreditation/Certification Summary

Client: AECOM Job ID: 440-245201-2

Project/Site: NDEP Phase II SDG: LVW

Laboratory: Eurofins TestAmerica, Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Nevada	State Program	9	CA015312019-5	07-31-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Irvine

TestAmerica Las Vəgas 219

Chain of Custody Record

323024

THE LEADER IN ENVIRONMENTAL TESTING TestAmerica Laboratories, Inc.

		ory Program: L			RCRA	Other:					TAL-8210 (0713)
Client Contact	Project Mana	ager: C. CsCyngs	-Schnell	Site	Contac	" J CAPUT	1210 [ate:		COC No	
Company Name: AEcom	Tel/Fax: %O	5-764-40	37		Contac			arrier:		of	COCs
Address. 1220 monida Acosa		alysis Turnaround		П						Sampler:	
City/State/Zip: Campasilla 93on	CALENDAR		RKING DAYS		3,40					For Lab Use Only:	
Phone: ५ ७५ ७८५ ५७७७	TAT if o	different from Below			3,40					Walk-in Client	
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NERT 3.60 Ni- 20196767	1 1	945 1	14	П	درور	الالايا					
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NERT438 NI- 20194707- EB		115 1	4 2	H	<u> </u>	7				I	
Preservation Used: 1= ice, 2= HCl; 3= H2SO4; 4=HNO3;			1 - 1 - 2 -	╁┼							
Possible Hazard Identification:					ample	Disposal (A fee	may be a	ssessed if	samples are retaine	d longer than 1 mont	h) .
Are any samples from a listed EPA Hazardous Waste? Pleas	se List any EPA	A Waste Codes for	the sample in th	е		Rund					
Comments Section if the lab is to dispose of the sample.	-			_		•					
Non-Hazard Flammable Skin Irritant	Poison B	Unkno	own		Reti	ım to Client	Disp	osal by Lab	Archive for	Months	
Special Instructions/QC Requirements & Comments:											1
											1
Custody Seals Intact Yes No	Custody Seal	No :				Cooler Temp (°C) Obs'd	j	Corr'd	Therm ID No	
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TestAmerica Las Vegas 219

Chain of Custody Record

323023

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: DW NPDES RCRA TAL-8210 (0718) COC No: Project Manager: & Lawyer Schmell Site Contact: T CARARIO Date: **Client Contact** COCs Carrier: Tel/Fax: 805-764-4031 Lab Contact: Company Name 1220 Avenida Acaso Camarilla CA 93612 **Analysis Turnaround Time** 234CC For Lab Use Only: WORKING DAYS CALENDAR DAYS City/State/Zip Walk-in Client Phone 805-764-4027 TAT if different from Below Lab Sampling Fax: 2 weeks Project Name. Site: Job / SDG No 2 days PO# 604177365 1 day Sample Type Sample Sample (C=Comp, Date Time G=Grab) Matrix Cont. Sample Identification Sample Specific Notes: 1235 NERT 4.39NI-20190707 6w 1340 ŗ NERT4,64N1-20196702 NERT 4.64/NI-20190722-FD Preservation Used: 1= lce, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Possible Hazard Identification: Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample Skin Irritant Poison B Unknown Return to Client Archive for___ Non-Hazard Flammable Disposal by Lab Special Instructions/QC Requirements & Comments: Cooler Temp. ("C): Obs'd. Therm ID No Custody Seals Intact Custody Seal No : Relinguished by Company Date/Time: 7-2-19 1620 Date/Times













Job Number: 440-245201-2 SDG Number: LVW

List Source: Eurofins TestAmerica, Irvine

Login Number: 245201

List Number: 1

Creator: Skinner, Alma D

Creator: Skinner, Alma D		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-245262-1

Laboratory Sample Delivery Group: LVW

Client Project/Site: NDEP Phase II

For: AECOM

1220 Avenida Acaso Camarillo, California 93012

Attn: Carmen Caceres-Schnell

Authorized for release hy:

Authorized for release by: 7/17/2019 1:08:23 PM

Danielle Roberts, Senior Project Manager (949)260-3249

danielle.roberts@testamericainc.com

LINKS

Review your project results through

Total Access

Have a Question?



Visit us at: www.testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: AECOM Project/Site: NDEP Phase II Laboratory Job ID: 440-245262-1 SDG: LVW

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Sample Summary

Client: AECOM

Project/Site: NDEP Phase II

Job ID: 440-245262-1

SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
440-245262-1	WMW5.58S-20190703	Water	07/03/19 09:30	07/06/19 10:40	
440-245262-2	COH2B1-20190703	Water	07/03/19 10:45	07/06/19 10:40	
440-245262-3	MW-25-20190703	Water	07/03/19 12:00	07/06/19 10:40	
440-245262-4	MW-02-20190703	Water	07/03/19 13:25	07/06/19 10:40	

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Case Narrative

Client: AECOM

Project/Site: NDEP Phase II

Job ID: 440-245262-1

SDG: LVW

Job ID: 440-245262-1

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-245262-1

Comments

No additional comments.

Receipt

The samples were received on 7/6/2019 10:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.2° C.

HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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Detection Summary

Client: AECOM Job ID: 440-245262-1 Project/Site: NDEP Phase II

SDG: LVW

Client Sample ID: WMW5.58S-20190703	Lab Sample ID: 440-245262-

Analyte	Result Qualifier	r RL	MDL	Unit	Dil F	ac D	Method	Prep Type
Chlorate	8000	1000	100	ug/L		50	300.1B	Total/NA
Perchlorate	4000	400	95	ug/L	1	00	314.0	Total/NA

Lab Sample ID: 440-245262-2 Client Sample ID: COH2B1-20190703

Analyte	Result Qu	alifier RL	MDL	Unit	Dil Fac [Method	Prep Type
Chlorate	790	100	10	ug/L	5	300.1B	Total/NA
Perchlorate	1800	400	95	ug/L	100	314.0	Total/NA

Client Sample ID: MW-25-20190703 Lab Sample ID: 440-245262-3

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Chlorate		100	10 ug/L		Total/NA
Perchlorate	13	4.0	0.95 ug/L	1 314.0	Total/NA

Client Sample ID: MW-02-20190703 Lab Sample ID: 440-245262-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fa	c D	Method	Prep Type
Chlorate	2400		200	20	ug/L	1	<u> </u>	300.1B	Total/NA
Perchlorate	1700		400	95	ug/L	10)	314.0	Total/NA

7/17/2019

Client Sample Results Client: AECOM Job ID: 440-245262-1 Project/Site: NDEP Phase II SDG: LVW Client Sample ID: WMW5.58S-20190703 Lab Sample ID: 440-245262-1 Date Collected: 07/03/19 09:30 **Matrix: Water** Date Received: 07/06/19 10:40 Method: 300.1B - Disinfection By-Products, (IC) **MDL** Unit Result Qualifier RLAnalyte D Prepared Analyzed Dil Fac 1000 07/09/19 12:41 Chlorate 8000 100 ug/L 50 Dil Fac Surrogate %Recovery Qualifier Limits Prepared Analyzed Dichloroacetic acid(Surr) 103 90 - 115 07/09/19 12:41 50 Method: 314.0 - Perchlorate (IC) MDL Unit Analyte Result Qualifier RL D Prepared Analyzed Dil Fac Perchlorate 4000 400 95 ug/L 07/16/19 19:28 100 Client Sample ID: COH2B1-20190703 Lab Sample ID: 440-245262-2 Date Collected: 07/03/19 10:45 **Matrix: Water** Date Received: 07/06/19 10:40 Method: 300.1B - Disinfection By-Products, (IC) Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Chlorate 100 10 ug/L 07/08/19 19:00 790 Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 106 90 - 115 07/08/19 19:00 Method: 314.0 - Perchlorate (IC) Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 400 07/15/19 17:32 **Perchlorate** 1800 95 ug/L 100 Client Sample ID: MW-25-20190703 Lab Sample ID: 440-245262-3 Date Collected: 07/03/19 12:00 **Matrix: Water** Date Received: 07/06/19 10:40 Method: 300.1B - Disinfection By-Products, (IC) Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Chlorate 100 07/08/19 19:36 56 J 10 ug/L Surrogate %Recovery Qualifier Analyzed Dil Fac Limits Prepared Dichloroacetic acid(Surr) 105 90 - 115 07/08/19 19:36 5 Method: 314.0 - Perchlorate (IC) Result Qualifier Analyte RL **MDL** Unit Analyzed D Prepared Dil Fac **Perchlorate** 13 4.0 0.95 ug/L 07/16/19 18:51 Client Sample ID: MW-02-20190703 Lab Sample ID: 440-245262-4 **Matrix: Water** Date Collected: 07/03/19 13:25 Date Received: 07/06/19 10:40 Method: 300.1B - Disinfection By-Products, (IC) Result Qualifier Analyte RL **MDL** Unit D Prepared Analyzed Dil Fac Chlorate 2400 200 20 ug/L 07/09/19 09:39

Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 101 90 - 115 07/09/19 09:39 10 Method: 314.0 - Perchlorate (IC) RL **MDL** Unit D Analyte Result Qualifier Prepared Analyzed Dil Fac 400 07/15/19 18:08 **Perchlorate** 1700 95 ug/L 100

Eurofins TestAmerica, Irvine

7/17/2019

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Surrogate Summary

Client: AECOM Job ID: 440-245262-1

Project/Site: NDEP Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Prep Type: Total/NA **Matrix: Water**

		DCAA	
Lab Sample ID	Client Sample ID	(90-115)	
440-245201-A-10 MS	Matrix Spike	105	
440-245201-A-10 MSD	Matrix Spike Duplicate	107	
440-245262-1	WMW5.58S-20190703	103	
440-245262-2	COH2B1-20190703	106	
440-245262-3	MW-25-20190703	105	
440-245262-4	MW-02-20190703	101	
440-245262-4 MS	MW-02-20190703	104	
440-245262-4 MSD	MW-02-20190703	104	
LCS 440-556356/44	Lab Control Sample	109	
LCS 440-556577/4	Lab Control Sample	102	
MB 440-556356/45	Method Blank	107	
MB 440-556577/5	Method Blank	105	
MRL 440-556356/43	Lab Control Sample	106	
	Lab Control Sample	103	

7/17/2019

Method Summary

Client: AECOM

Method 300.1B 314.0

Project/Site: NDEP Phase II

Job ID: 440-245262-1 SDG: LVW

Method Description	Protocol	Laboratory
Disinfection By-Products, (IC)	EPA	TAL IRV
Perchlorate (IC)	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

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Lab Chronicle

Client: AECOM

Job ID: 440-245262-1 Project/Site: NDEP Phase II SDG: LVW

Lab Sample ID: 440-245262-1

Client Sample ID: WMW5.58S-20190703

Date Collected: 07/03/19 09:30 **Matrix: Water** Date Received: 07/06/19 10:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			556577	07/09/19 12:41	YZ	TAL IRV
Total/NA	Analysis	314.0		100			557816	07/16/19 19:28	CTH	TAL IRV

Client Sample ID: COH2B1-20190703

Lab Sample ID: 440-245262-2 Date Collected: 07/03/19 10:45 **Matrix: Water** Date Received: 07/06/19 10:40

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			556356	07/08/19 19:00	YZ	TAL IRV
Total/NA	Analysis	314.0		100			557511	07/15/19 17:32	CTH	TAL IRV

Client Sample ID: MW-25-20190703

Lab Sample ID: 440-245262-3 Date Collected: 07/03/19 12:00 **Matrix: Water**

Date Received: 07/06/19 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5	Amount		556356	07/08/19 19:36		TAL IRV
Total/NA	Analysis	314.0		1			557816	07/16/19 18:51	CTH	TAL IRV

Client Sample ID: MW-02-20190703 Lab Sample ID: 440-245262-4 Date Collected: 07/03/19 13:25 **Matrix: Water**

Date Received: 07/06/19 10:40

	Batch	Batch	_	Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		10			556577	07/09/19 09:39		TAL IRV
Total/NA	Analysis	314.0		100			557511	07/15/19 18:08	CTH	TAL IRV

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Client: AECOM

Job ID: 440-245262-1 Project/Site: NDEP Phase II

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Lab Sample ID: MB 440-556356/45 Client Sample ID: Method Blank Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

MB MB Analyte RL **MDL** Unit Analyzed Dil Fac Result Qualifier Prepared Chlorate 20 2.0 ug/L 07/08/19 09:56 $\overline{\mathsf{ND}}$

MB MB

Qualifier Surrogate %Recovery Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 107 90 - 115 07/08/19 09:56

Lab Sample ID: LCS 440-556356/44 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

Spike %Rec. LCS LCS Analyte Added Result Qualifier Unit D %Rec Limits

Chlorate 100 104 104 ug/L 75 - 125

LCS LCS

Surrogate %Recovery Qualifier Limits

Dichloroacetic acid(Surr) 109 90 - 115

Lab Sample ID: MRL 440-556356/43 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

MRL MRL Spike %Rec. Analyte Added Limits Result Qualifier Unit D %Rec

Chlorate 20.0 20.3 ug/L 101 50 - 150

MRL MRL

Surrogate %Recovery Qualifier Limits

90 - 115 Dichloroacetic acid(Surr) 106

Lab Sample ID: 440-245201-A-10 MS Client Sample ID: Matrix Spike Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556356

MS MS Sample Sample Spike %Rec. Result Qualifier Added Analyte Result Qualifier Unit D Limits %Rec 200 Chlorate 5500 5450 4 -30 75 - 125 ug/L

MS MS

Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 105 90 - 115

Lab Sample ID: 440-245201-A-10 MSD

Matrix: Water

Analysis Batch: 556356

RPD Sample Sample Spike MSD MSD %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Chlorate 5500 200 5420 4 -45 ug/L 75 - 125 25

MSD MSD

Surrogate %Recovery Qualifier Limits 90 - 115 107 Dichloroacetic acid(Surr)

Eurofins TestAmerica, Irvine

Prep Type: Total/NA

Client Sample ID: Matrix Spike Duplicate

Client: AECOM

Job ID: 440-245262-1 Project/Site: NDEP Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

Lab Sample ID: MB 440-556577/5 **Client Sample ID: Method Blank Matrix: Water Prep Type: Total/NA**

Analysis Batch: 556577

	MR M	IR							
Analyte	Result Q	ualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	ND		20	2.0	ug/L			07/09/19 06:38	1

MB MB

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	105		90 - 115		07/09/19 06:38	1

Lab Sample ID: LCS 440-556577/4 **Client Sample ID: Lab Control Sample Prep Type: Total/NA**

Matrix: Water

Analysis Batch: 556577

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	100	104		ug/L		104	75 - 125	

LCS LCS

Surrogate	%Recovery Qualifier	Limits
Dichloroacetic acid(Surr)	102	90 - 115

Lab Sample ID: MRL 440-556577/3 Client Sample ID: Lab Control Sample Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556577

-	Spike	MRL	MRL				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	20.0	20.3		ug/L	_	101	50 - 150	

MRL MRL Surrogate %Recovery Qualifier

Limits Dichloroacetic acid(Surr) 103 90 - 115

Lab Sample ID: 440-245262-4 MS Client Sample ID: MW-02-20190703 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556577

	Sample	Sample	Бріке	IVIS	M2				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	2400		200	2640	4	ug/L		112	75 - 125	

MS MS

Surrogate	%Recovery	Qualifier	Limits		
Dichloroacetic acid(Surr)	104		00 115		

Lab Sample ID: 440-245262-4 MSD Client Sample ID: MW-02-20190703

Matrix: Water

Analysis Batch: 556577

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Chlorate	2400		200	2380	4	ug/L		-19	75 - 125	10	25

MSD MSD

Surrogate	%Recovery Qualific	er Limits
Dichloroacetic acid(Surr)	104	90 - 115

Eurofins TestAmerica, Irvine

Prep Type: Total/NA

Client: AECOM

Job ID: 440-245262-1 Project/Site: NDEP Phase II

MB MB

SDG: LVW

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 440-557511/6

Matrix: Water

Analysis Batch: 557511

Client Sample ID: Method Blank Prep Type: Total/NA

Analyte Result Qualifier RL **MDL** Unit Analyzed Dil Fac Prepared Perchlorate 4.0 0.95 ug/L 07/15/19 09:25 ND

Lab Sample ID: LCS 440-557511/5 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557511

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits 10.0 Perchlorate 10.4 ug/L 104 85 - 115

Lab Sample ID: MRL 440-557511/8 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557511

Spike MRL MRL %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Perchlorate 4.00 100 75 - 125 4.00 ug/L

Lab Sample ID: 440-245452-D-3 MS **Client Sample ID: Matrix Spike Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557511

Spike MS MS %Rec. Sample Sample Added Analyte Result Qualifier Result Qualifier %Rec Limits Unit D ug/L Perchlorate $\overline{\mathsf{ND}}$ 10.0 9.50 95 80 - 120

Lab Sample ID: 440-245452-D-3 MSD

Matrix: Water

Analysis Batch: 557511

Sample Sample Spike MSD MSD %Rec **RPD** Added Analyte Result Qualifier Result Qualifier Unit %Rec Limits **RPD** Limit Perchlorate ND 10.0 9.64 96 80 - 120 ug/L

Lab Sample ID: MB 440-557816/6

Matrix: Water

Analysis Batch: 557816

MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Perchlorate $\overline{\mathsf{ND}}$ 4.0 0.95 ug/L 07/16/19 14:49

Lab Sample ID: LCS 440-557816/5 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557816

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit %Rec Limits Perchlorate 25.0 24.2 ug/L 97 85 - 115

Lab Sample ID: MRL 440-557816/8 **Client Sample ID: Lab Control Sample**

Matrix: Water

Analysis Batch: 557816

Spike MRL MRL %Rec. Added Result Qualifier Analyte Unit %Rec Limits Perchlorate 4.00 4.12 ug/L 103 75 - 125

Eurofins TestAmerica, Irvine

Prep Type: Total/NA

Client Sample ID: Matrix Spike Duplicate

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Type: Total/NA

QC Sample Results

Client: AECOM Job ID: 440-245262-1 Project/Site: NDEP Phase II

SDG: LVW

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: 440-245693-B-5 MS **Client Sample ID: Matrix Spike** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557816 MS MS

Sample Sample Spike %Rec. Analyte **Result Qualifier** Added Result Qualifier Unit D %Rec Limits Perchlorate 12 25.0 37.8 104 80 - 120 ug/L

Lab Sample ID: 440-245693-B-5 MSD Client Sample ID: Matrix Spike Duplicate **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557816

RPD Sample Sample Spike MSD MSD %Rec. Result Qualifier Added Result Qualifier RPD Analyte Unit D %Rec Limits Limit Perchlorate 12 25.0 37.7 103 ug/L 80 - 120 0

QC Association Summary

Job ID: 440-245262-1 Client: AECOM Project/Site: NDEP Phase II SDG: LVW

HPLC/IC

Analysis Batch: 556356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245262-2	COH2B1-20190703	Total/NA	Water	300.1B	
440-245262-3	MW-25-20190703	Total/NA	Water	300.1B	
MB 440-556356/45	Method Blank	Total/NA	Water	300.1B	
LCS 440-556356/44	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556356/43	Lab Control Sample	Total/NA	Water	300.1B	
440-245201-A-10 MS	Matrix Spike	Total/NA	Water	300.1B	
440-245201-A-10 MSD	Matrix Spike Duplicate	Total/NA	Water	300.1B	

Analysis Batch: 556577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245262-1	WMW5.58S-20190703	Total/NA	Water	300.1B	
440-245262-4	MW-02-20190703	Total/NA	Water	300.1B	
MB 440-556577/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-556577/4	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556577/3	Lab Control Sample	Total/NA	Water	300.1B	
440-245262-4 MS	MW-02-20190703	Total/NA	Water	300.1B	
440-245262-4 MSD	MW-02-20190703	Total/NA	Water	300.1B	

Analysis Batch: 557511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245262-2	COH2B1-20190703	Total/NA	Water	314.0	
440-245262-4	MW-02-20190703	Total/NA	Water	314.0	
MB 440-557511/6	Method Blank	Total/NA	Water	314.0	
LCS 440-557511/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557511/8	Lab Control Sample	Total/NA	Water	314.0	
440-245452-D-3 MS	Matrix Spike	Total/NA	Water	314.0	
440-245452-D-3 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

Analysis Batch: 557816

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245262-1	WMW5.58S-20190703	Total/NA	Water	314.0	
440-245262-3	MW-25-20190703	Total/NA	Water	314.0	
MB 440-557816/6	Method Blank	Total/NA	Water	314.0	
LCS 440-557816/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557816/8	Lab Control Sample	Total/NA	Water	314.0	
440-245693-B-5 MS	Matrix Spike	Total/NA	Water	314.0	
440-245693-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

Definitions/Glossary

Client: AECOM Job ID: 440-245262-1

Project/Site: NDEP Phase II SDG: LVW

Qualifiers

HPLC/IC Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not
	applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

RPD

TEF

TEQ

Glossary	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: AECOM Job ID: 440-245262-1 Project/Site: NDEP Phase II

Laboratory: Eurofins TestAmerica, Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Nevada	State Program	9	CA015312019-5	07-31-19 *

SDG: LVW

^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Phoenix

4625 E. Cotton Center Blud. Suite 189

Phone: 602.437.3340 Fax:

Phoenix, AZ 85040

TestAmerica Las Vegas 219

Regulatory Program: DW NPDES

Chain of Custody Record

RCRA

17978**7**

TestAmerica

TestAmerica Laboratories, Inc.

TAL-8210 (0713)

COC No: Project Manager: C Garage schnell Site Contact: TCAPCTRIC Date: **Client Contact** COCs Lab Contact: Carrier: Company Name AFCOM 405-746- 4031 Sampler: **Analysis Turnaround Time** Address: 1220 Avenida Aces For Lab Use Only: Campatillo Cu 93012 CALENDAR DAYS WORKING DAYS City/State/Zip: 1 Sample (Y/N) n MS/MSD (Y/N) Lunte 314,0 Walk-in Client 805 764 4027 TAT if different from Below Phone: Lab Sampling: ax 2 weeks Project Name: NOEP Phose II 1 week Job / SDG No : Site 4000 2 days 60477368 PO# 1 day Sample Type Sample Sample (C=Comp, Matrix Date Time Cont. Sample Specific Notes: Sample Identification G=Grab) 7/3/19 WMW 5.585-20190703 6930 66 COH281-20190703 1045 MW-25-20190763 * 1700 MW-02-20196703 1325 Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Runo Comments Section if the lab is to dispose of the sample Poison B Unknown Return to Client Archive for Skin Irritant Disposal by Lab Months Non-Hazard Flammable Special Instructions/QC Requirements & Comments: Cooler Temp (°C): Obs'd. Custody Seals Intact. Custody Seal No. Company: Date/Time Date/Time: Received by Relinguished by Company 7-3-19 1420 73/19 KHZO J CAROTRIO AEcom Relinquished by Received by 7/5/19 1000 Relinquished by Received in Laboratory by: 1040

















Client: AECOM

Job Number: 440-245262-1

SDG Number: LVW

Login Number: 245262 List Source: Eurofins TestAmerica, Irvine

List Number: 1

Creator: Escalante, Maria

Creator: Escalante, Maria I		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins TestAmerica, Irvine

Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-245263-1

Laboratory Sample Delivery Group: LVW Client Project/Site: NERT NDEP Phase II

For: AECOM 1220 Avenida Acaso Camarillo, California 93012

Attn: Carmen Caceres-Schnell

anea Roberdo

Authorized for release by: 7/17/2019 9:05:03 AM

Danielle Roberts, Senior Project Manager (949)260-3249

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: AECOM Project/Site: NERT NDEP Phase II Laboratory Job ID: 440-245263-1 SDG: LVW

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Sample Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245263-1

SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
440-245263-1	WMW3.5N-20190705	Water	07/05/19 10:20	07/06/19 10:40	
440-245263-2	LNDMW2-20190705	Water	07/05/19 11:25	07/06/19 10:40	
440-245263-3	WMW4.9N-20190705	Water	07/05/19 12:30	07/06/19 10:40	
440-245263-4	MW-4-20190705	Water	07/05/19 14:05	07/06/19 10:40	
440-245263-5	MW-3-20190705	Water	07/05/19 14:35	07/06/19 10:40	

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Case Narrative

Client: AECOM

Job ID: 440-245263-1 Project/Site: NERT NDEP Phase II

SDG: LVW

Job ID: 440-245263-1

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-245263-1

Comments

No additional comments.

Receipt

The samples were received on 7/6/2019 10:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.4° C.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245263-1 SDG: LVW

Lab Sample ID: 440-245263-1

Lab Sample ID: 440-245263-2

Lab Sample ID: 440-245263-3

Lab Sample ID: 440-245263-4

Lab Sample ID: 440-245263-5

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Chlorate	300	100	10 ug/L	5 300.1B	Total/NA
Perchlorate	260	40	9.5 ug/L	10 314.0	Total/NA

Client Sample ID: LNDMW2-20190705

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Meth	od Prep Type
Chlorate	4600	400	40 ug/L	20 300.	1B Total/NA
Perchlorate	1500	400	95 ug/L	100 314.0) Total/NA

Client Sample ID: WMW4.9N-20190705

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Chlorate	16 J	100	10 ug/L	5 300.1B	Total/NA
Perchlorate	660	400	95 ug/L	100 314.0	Total/NA

Client Sample ID: MW-4-20190705

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorate	5900	400	40	ug/L	20	_	300.1B	Total/NA
Perchlorate	2700	400	95	ug/L	100		314.0	Total/NA

Client Sample ID: MW-3-20190705

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type	е
Chlorate	6000		400	40	ug/L	20		300.1B	Total/NA	
Perchlorate	2900		400	95	ug/L	100		314.0	Total/NA	

This Detection Summary does not include radiochemical test results.

7/17/2019

Job ID: 440-245263-1 SDG: LVW

Client: AECOM

Project/Site: NERT NDEP Phase II

Lab Sample ID: 440-245263-1

Lab Sample ID: 440-245263-2

Matrix: Water

Matrix: Water

Date Collected:	07/05/19 10:20
Date Received:	07/06/19 10:40

Client Sample ID: WMW3.5N-20190705

Duto	oonootoa.	01/00/10 10:20	
Date	Received:	07/06/19 10:40	

Method: 300.1B - Disinfed	ction By-Produc	ts, (IC)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	300		100	10	ug/L			07/08/19 13:11	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	107		90 - 115					07/08/19 13:11	5
Method: 314.0 - Perchlora	ate (IC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	260		40	9.5	ug/L			07/16/19 17:37	10

Client Sample ID: LNDMW2-20190705

Date Collected: 07/05/19 11:25

Date Received: 07/06/19 10:	40						
Method: 300.1B - Disinfect Analyte	ion By-Products, (IC) Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac

Chlorate	4600		400	40	ug/L	_		07/09/19 13:17	20
Surrogate Dichloroacetic acid(Surr)	%Recovery 103	Qualifier	Limits 90 - 115				Prepared	Analyzed 07/09/19 13:17	Dil Fac

Method: 314.0 - Perchlorate (IC) Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	1500	400	95	ug/L		<u> </u>	07/16/19 03:40	100

Client Sample ID: WMW4.9N-20190705	Lab Sample ID: 440-245263-3
Date Collected: 07/05/19 12:30	Matrix: Water

Date Collected: 07/05/19 12:30 Date Received: 07/06/19 10:40

Analyte	ction By-Product Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	16	J	100	10	ug/L			07/08/19 14:10	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	107		90 - 115			-		07/08/19 14:10	5

Method: 314.0 - Perchlorate (IC) Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	660		400	95	ug/L			07/16/19 04:00	100

Lab Sample ID: 440-245263-4 **Client Sample ID: MW-4-20190705** Date Collected: 07/05/19 14:05 **Matrix: Water**

Date Received: 07/06/19 10:40

Method: 300.1B - Disinfe Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	5900		400	40	ug/L			07/08/19 22:08	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
Dichloroacetic acid(Surr)	115		90 - 115					07/08/19 22:08	20
Method: 314.0 - Perchlor	ate (IC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fa
Perchlorate	2700		400	95	ug/L			07/16/19 04:20	100

Eurofins TestAmerica, Irvine

Client Sample Results

Client: AECOM Job ID: 440-245263-1 Project/Site: NERT NDEP Phase II SDG: LVW

Client Sample ID: MW-3-20190705 Lab Sample ID: 440-245263-5

Date Collected: 07/05/19 14:35 **Matrix: Water** Date Received: 07/06/19 10:40

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	6000		400	40	ug/L			07/08/19 22:38	20
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	114		90 - 115					07/08/19 22:38	20

Dil Fac Analyte Result Qualifier RL MDL Unit Prepared Analyzed 07/16/19 04:41 400 100 Perchlorate 2900 95 ug/L

Surrogate Summary

Client: AECOM Job ID: 440-245263-1 Project/Site: NERT NDEP Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Prep Type: Total/NA **Matrix: Water**

			Percent Surrogate Recovery (Acceptance Limits)
		DCAA	
₋ab Sample ID	Client Sample ID	(90-115)	
140-245201-A-3 MS	Matrix Spike	109	
140-245263-1	WMW3.5N-20190705	107	
140-245263-2	LNDMW2-20190705	103	
140-245263-2 MS	LNDMW2-20190705	103	
140-245263-2 MSD	LNDMW2-20190705	103	
140-245263-3	WMW4.9N-20190705	107	
140-245263-4	MW-4-20190705	115	
140-245263-5	MW-3-20190705	114	
_CS 440-556360/40	Lab Control Sample	111	
CS 440-556577/4	Lab Control Sample	102	
MB 440-556360/41	Method Blank	111	
MB 440-556577/5	Method Blank	105	
ADL 440 EE6360/30	Lab Control Sample	110	
MRL 440-556360/39		103	

Method Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245263-1

SDG: LVW

Method	Method Description	Protocol	Laboratory
300.1B	Disinfection By-Products, (IC)	EPA	TAL IRV
314.0	Perchlorate (IC)	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

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SDG: LVW

Client Sample ID: WMW3.5N-20190705

Date Collected: 07/05/19 10:20 Date Received: 07/06/19 10:40 Lab Sample ID: 440-245263-1

Matrix: Water

Job ID: 440-245263-1

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			556360	07/08/19 13:11	YZ	TAL IRV
Total/NA	Analysis	314.0		10			557815	07/16/19 17:37	CTH	TAL IRV

Client Sample ID: LNDMW2-20190705

Date Collected: 07/05/19 11:25 Date Received: 07/06/19 10:40 Lab Sample ID: 440-245263-2

Lab Sample ID: 440-245263-3

Lab Sample ID: 440-245263-4

Lab Sample ID: 440-245263-5

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		20			556577	07/09/19 13:17	YZ	TAL IRV
Total/NA	Analysis	314.0		100			557509	07/16/19 03:40	CTH	TAL IRV

Client Sample ID: WMW4.9N-20190705

Date Collected: 07/05/19 12:30

Date Received: 07/06/19 10:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			556360	07/08/19 14:10	YZ	TAL IRV
Total/NA	Analysis	314.0		100			557509	07/16/19 04:00	CTH	TAL IRV

Client Sample ID: MW-4-20190705

Date Collected: 07/05/19 14:05

Date Received: 07/06/19 10:40

_										
	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		20			556360	07/08/19 22:08	YZ	TAL IRV
Total/NA	Analysis	314.0		100			557509	07/16/19 04:20	CTH	TAI IRV

Client Sample ID: MW-3-20190705

Date Collected: 07/05/19 14:35

Date Received: 07/06/19 10:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		20			556360	07/08/19 22:38	YZ	TAL IRV
Total/NA	Analysis	314.0		100			557509	07/16/19 04:41	CTH	TAL IRV

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245263-1

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC	;))
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Lab Sample ID: MB 440-556360/41

Matrix: Water

Analyte

Chlorate

Analysis Batch: 556360

Client Sample ID: Method Blank

Prep Type: Total/NA

MB MB RL **MDL** Unit Analyzed Dil Fac Result Qualifier Prepared 20 2.0 ug/L 07/08/19 07:42 $\overline{\mathsf{ND}}$

MB MB

Qualifier Surrogate %Recovery Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 111 90 - 115 07/08/19 07:42

Lab Sample ID: LCS 440-556360/40 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556360

Spike LCS LCS %Rec. Added Analyte Result Qualifier Unit D %Rec Limits Chlorate 100 102 102 ug/L 75 - 125

LCS LCS

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 111 90 - 115

Lab Sample ID: MRL 440-556360/39 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556360

Spike MRL MRL %Rec. Analyte Added Limits Result Qualifier Unit D %Rec Chlorate 20.0 20.3 ug/L 102 50 - 150

MRL MRL Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 90 - 115 110

Lab Sample ID: 440-245201-A-3 MS

Matrix: Water

Prep Type: Total/NA **Analysis Batch: 556360** Sample Sample MS MS Spike %Rec.

Result Qualifier Added Analyte Result Qualifier Unit D Limits %Rec 200 Chlorate 10000 9890 4 -170 75 - 125 ug/L

MS MS

Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 109 90 - 115

Lab Sample ID: 440-245201-A-3 MSD

Matrix: Water

Analysis Batch: 556360

RPD Sample Sample Spike MSD MSD %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit 10000 200 9940 4 -143 Chlorate ug/L 75 - 125

Lab Sample ID: MB 440-556577/5

Matrix: Water

Analysis Batch: 556577

MB MB

RL Analyte Result Qualifier **MDL** Unit D Prepared Analyzed Dil Fac Chlorate $\overline{\mathsf{ND}}$ 20 2.0 ug/L 07/09/19 06:38

Eurofins TestAmerica, Irvine

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Matrix Spike

Client Sample ID: Matrix Spike Duplicate

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245263-1

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

	MB	MB				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	105		90 - 115		07/09/19 06:38	1

Lab Sample ID: LCS 440-556577/4 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

100 100

Analysis Batch: 556577

	Spike	LUS	LUS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	100	104		ug/L		104	75 - 125	

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LCS LCS Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 90 - 115 102

Lab Sample ID: MRL 440-556577/3 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 556577

	Spike	MRL	MRL				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	20.0	20.3		ug/L		101	50 - 150	

MRL MRL Surrogate %Recovery Qualifier Limits 90 - 115 Dichloroacetic acid(Surr) 103

Client Sample ID: LNDMW2-20190705 Lab Sample ID: 440-245263-2 MS **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 556577

	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chlorate	4600		200	4570	4	ug/L		-19	75 - 125	
	MS	MS								
Commo moto	0/ 5		I imaida							

Surrogate Limits %Recovery Qualifier Dichloroacetic acid(Surr) 103 90 - 115

Lab Sample ID: 440-245263-2 MSD Client Sample ID: LNDMW2-20190705 **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 556577

Alialysis Datell. 330311											
	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Chlorate	4600		200	4610	4	ug/L		2	75 - 125	1	25
	MSD	MSD									
		Analyte Sample Chlorate Result 4600	Analyte Sample Sample Result Qualifier	AnalyteResult ChlorateQualifier 4600Added 200	AnalyteResult 4600Qualifier 4600Added 200Result 4610	AnalyteResult 4600Qualifier 200Added 200Result 4610Qualifier 4610	AnalyteResult ChlorateQualifier 4600Added 200Result 4610Qualifier 4Unit 4	Sample Sample Spike MSD MSD Analyte Result 4600 Qualifier Added Result Qualifier Unit Ug/L	Sample Sample Spike MSD MSD Analyte Result 4600 Qualifier Added Result 4600 Qualifier 200 4610 4 Unit ug/L 2	AnalyteResult ChlorateQualifier 4600Added 200Result 4610Qualifier 4Qualifier 4Qualifier 4Qualifier 4Unit 4D ug/L%Rec. D 20	Sample Sample Spike MSD MSD %Rec. Analyte Result Qualifier Added Result Qualifier Unit Ug/L D NRec Limits RPD Chlorate 4600 200 4610 4 ug/L 2 75 - 125 1

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 103 90 - 115

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 440-557509/46 Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557509									
	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	ND		4.0	0.95	ug/L			07/15/19 23:15	1

Eurofins TestAmerica, Irvine

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245263-1

SDG: LVW

Lab Sample ID: LCS 440-557509/47			Client Sample ID: Lab Control Sample
Matrix: Water			Prep Type: Total/NA
Analysis Batch: 557509			
	Spike	LCS LCS	%Rec.

Analyte Added Result Qualifier %Rec Unit Limits Perchlorate 25.0 24.5 98 85 - 115 ug/L

Lab Sample ID: MRL 440-557509/8 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA **Analysis Batch: 557509**

Spike MRL MRL %Rec. Limits

Analyte Added Result Qualifier Unit D %Rec 4.00 75 - 125 Perchlorate 4.12 ug/L 103

Lab Sample ID: 440-245046-A-3 MS Client Sample ID: Matrix Spike **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557509 Sample Sample Spike MS MS %Rec.

Result Qualifier Added Result Qualifier Unit Limits Analyte %Rec Perchlorate 2500 80 - 120 1500 4080 ug/L 104

Lab Sample ID: 440-245046-A-3 MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557509

Spike MSD MSD %Rec. **RPD** Sample Sample Added Analyte Result Qualifier Result Qualifier Limits RPD Limit Unit D %Rec

Perchlorate 1500 2500 4120 105 80 - 120 ug/L

Lab Sample ID: MB 440-557815/6 Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557815

MB MB

MDL Unit Analyte Result Qualifier RL Prepared Analyzed Dil Fac Perchlorate 4.0 0.95 ug/L 07/16/19 15:37 ND

Lab Sample ID: LCS 440-557815/5 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557815

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit %Rec Limits Perchlorate 25.0 25.2 ug/L 101 85 - 115

Lab Sample ID: MRL 440-557815/8 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557815

Spike MRL MRL %Rec. Analyte Added Result Qualifier Unit %Rec Limits Perchlorate 4.00 4.18 105 75 - 125 ug/L

Lab Sample ID: 440-245263-1 MS Client Sample ID: WMW3.5N-20190705

Matrix: Water Prep Type: Total/NA

Analysis Batch: 557815 Sample Sample Spike MS MS %Rec. Result Qualifier Added Result Qualifier Analyte Unit %Rec Limits Perchlorate 260 250 523 ug/L 105 80 - 120

Eurofins TestAmerica, Irvine

QC Sample Results

Client: AECOM Job ID: 440-245263-1 Project/Site: NERT NDEP Phase II

SDG: LVW

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: 440-245263-1 MSD Client Sample ID: WMW3.5N-20190705

Matrix: Water F										Prep Ty	Prep Type: Total/NA			
	Analysis Batch: 557815													
		Sample	Sample	Spike	MSD	MSD				%Rec.		RPD		
	Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit		
	Perchlorate	260		250	525		ug/L		106	80 - 120	0	15		

QC Association Summary

Job ID: 440-245263-1 Client: AECOM Project/Site: NERT NDEP Phase II SDG: LVW

HPLC/IC

Analysis Batch: 556360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245263-1	WMW3.5N-20190705	Total/NA	Water	300.1B	
440-245263-3	WMW4.9N-20190705	Total/NA	Water	300.1B	
440-245263-4	MW-4-20190705	Total/NA	Water	300.1B	
440-245263-5	MW-3-20190705	Total/NA	Water	300.1B	
MB 440-556360/41	Method Blank	Total/NA	Water	300.1B	
LCS 440-556360/40	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556360/39	Lab Control Sample	Total/NA	Water	300.1B	
440-245201-A-3 MS	Matrix Spike	Total/NA	Water	300.1B	
440-245201-A-3 MSD	Matrix Spike Duplicate	Total/NA	Water	300.1B	

Analysis Batch: 556577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245263-2	LNDMW2-20190705	Total/NA	Water	300.1B	
MB 440-556577/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-556577/4	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556577/3	Lab Control Sample	Total/NA	Water	300.1B	
440-245263-2 MS	LNDMW2-20190705	Total/NA	Water	300.1B	
440-245263-2 MSD	LNDMW2-20190705	Total/NA	Water	300.1B	

Analysis Batch: 557509

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245263-2	LNDMW2-20190705	Total/NA	Water	314.0	
440-245263-3	WMW4.9N-20190705	Total/NA	Water	314.0	
440-245263-4	MW-4-20190705	Total/NA	Water	314.0	
440-245263-5	MW-3-20190705	Total/NA	Water	314.0	
MB 440-557509/46	Method Blank	Total/NA	Water	314.0	
LCS 440-557509/47	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557509/8	Lab Control Sample	Total/NA	Water	314.0	
440-245046-A-3 MS	Matrix Spike	Total/NA	Water	314.0	
440-245046-A-3 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

Analysis Batch: 557815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245263-1	WMW3.5N-20190705	Total/NA	Water	314.0	
MB 440-557815/6	Method Blank	Total/NA	Water	314.0	
LCS 440-557815/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557815/8	Lab Control Sample	Total/NA	Water	314.0	
440-245263-1 MS	WMW3.5N-20190705	Total/NA	Water	314.0	
440-245263-1 MSD	WMW3.5N-20190705	Total/NA	Water	314.0	

Definitions/Glossary

Client: AECOM Job ID: 440-245263-1

Project/Site: NERT NDEP Phase II SDG: LVW

Qualifiers

RPD

TEF

TEQ

HPLC/IC Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not
	applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Abbreviation	These commonly used abbreviations may or may not be present in this report.
Appreviation	
n	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

Toxicity Equivalent Factor (Dioxin) Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: AECOM Job ID: 440-245263-1
Project/Site: NERT NDEP Phase II SDG: LVW

Laboratory: Eurofins TestAmerica, Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Nevada	State Program	9	CA015312019-5	07-31-19 *

G. LVVV

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^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Phoenix

4625 E. Catton Center Blvd. Suite 189

Phoenix, AZ 85040 Phone: 602.437.3340 Fax:

Chain of Custody Record

179792

TestAmerica Las Vegas

THE LEADER IN ENVIRONMENTAL TESTING TestAmerica Laboratories, Inc.

rnone: 602.437.334V Fax:	Regul	atory Pro	gram: 🛚] bw [NPDE5		RCRA	A [Other:				2	10	_			TAL-82	210 (0713)
Client Contact	Project Ma	anager: (Caceres	s-Sch	ne// 8	Site	Cont	act: -	TCARO	TR16	D:	ate:					COC No:		
Company Name: AE COM	Tel/Fax:		5/2-3				Cont				C	arrier:					of	COCs	
Address 1220 Avenida Acaso	,		urnaround				ПП										Sampler:		
City/State/Zip Camerillo CA 930/2	CALENI	DAR DAYS	☐ WOF	KING DAY	S		اما								1		For Lab Use Only	<i>/</i> :	
Phone 805 388 3775	TA ⁻	T if different fr	om Below			ź	10	300.1									Walk-in Client		
Fax:		2	weeks	n			3/4,	8									Lab Sampling		
Project Name: NERT NOEP Phase II		1	Lweek 🖊) n		Sample (Y/N	- 1												
Site: LVW		2	2 days	w.O.		MSD (Y	13										Job / SDG No.:		
PO# 60977365		1	l day	,		<u> </u>		+3											
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix		Filtered Sam Perform MS /	Perchlorate	Chlor									Sample Sp	oecific Note	es:
WMW3.5N-ZU190705	7/5/19	1020	6	GW	2		X	1											
LNDMW/2-20190765	1	1125	(1	1		¥	1											
WMW4.9N-20190705		/2 <i>3</i> 0					Y	_						Ш					
		1405					7	x				g	1	,	,		, , , ,		
BMW-4-20190705 BMW-3-20190705	1	1435	1	<u> </u>			y	ץ				13							
18												1							
<u> </u>						+		_		TTT	1	† †							
1				2							-	44	440-	24526	3 Cha	ain of C	ustody		
			>	X.															
			1	5/19		Ţ													
									<i>//</i>										
															_				
Preservation Used: 1= lce, 2= HCl; 3= H2SO4; 4=HNO3;	5=NaOH;	6= Other_									<u> </u>					ــلِــلــ			
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Pleas Comments Section if the lab is to dispose of the sample					ple in the		R	u c	~ O,	tee ma	•			·			d longer than 1 mo	ontn)	
Non-Hazard	Poisor	n B	Unkn	own			F	Return	to Client		Dispo	sal by La	ıb		Arcr	rive for	Months		
Special Instructions/QC Requirements & Comments:												1.	9/	1 L			IR89	0	<u>'/S^</u>
Custody Seals Intact: YesNo	Custody S	Seal No .						C	Cooler Te	mp. (°C)	. Obs'd			Corr'd			Therm ID No		
Relinquished by SEARCTRIC SAMON	Company		-	Date/Te	me <i>142</i> 4		eceiv	/ed by	ml				0mpa	any: LV	2		Date/Time:	142	20
Relinquished by	Company.		7.	Date/Ti	me: 600		ecei	ed by	2	0		ď	ompa	any:			Date/Time		
Relinquished by: 1045 63/76839	Company			Date/Ti			leceiv	red in	Laborato	ry by			Compa	any,			Date/Time: 1/9	104	10
0 1043 631/683°	1		···					4	AZV				<u>//</u>	1//			1/2//	, - /	~
υ								//	けんり	١ ٧٤ ١	50	6	9.	9/	7	7.7			













Client: AECOM

Job Number: 440-245263-1

SDG Number: LVW

Login Number: 245263 List Source: Eurofins TestAmerica, Irvine

List Number: 1

Creator: Escalante, Maria I

Creator: Escalante, Maria I		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-245430-1

Laboratory Sample Delivery Group: LVW Client Project/Site: NERT NDEP Phase II

For: AECOM 1220 Avenida Acaso Camarillo, California 93012

Attn: Carmen Caceres-Schnell

Authorized for release by: 7/17/2019 1:15:33 PM

Danielle Roberts, Senior Project Manager (949)260-3249

danielle.roberts@testamericainc.com

anea Roberdo

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: AECOM Project/Site: NERT NDEP Phase II Laboratory Job ID: 440-245430-1 SDG: LVW

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Sample Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245430-1

SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset I
440-245430-1	NERT5.49S1-20190708	Water	07/08/19 09:35	07/09/19 10:20	
440-245430-2	AA-30-20190708	Water	07/08/19 10:50	07/09/19 10:20	
440-245430-3	NERT4.65N1-20190708	Water	07/08/19 12:30	07/09/19 10:20	
440-245430-4	NERT4.65N1-20190708-EB	Water	07/08/19 12:15	07/09/19 10:20	

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Case Narrative

Client: AECOM

Job ID: 440-245430-1 Project/Site: NERT NDEP Phase II

SDG: LVW

Job ID: 440-245430-1

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-245430-1

Comments

No additional comments.

Receipt

The samples were received on 7/9/2019 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

Method(s) 300.1B: The following samples were diluted for the chlorate analyte due to the nature of the sample matrix: NERT5.49S1-20190708 (440-245430-1), NERT4.65N1-20190708 (440-245430-3) and (440-245417-B-5). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: AECOM

Job ID: 440-245430-1 Project/Site: NERT NDEP Phase II

SDG: LVW

440-245430-1

Client Sample ID: NERT5.49S1-20190708	Lab Sample ID:

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Perchlorate		4.0	0.95 ug/L	<u> </u>	Total/NA

Client Sample ID: AA-30-20190708 Lab Sample ID: 440-245430-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chlorate	9500		1000	100	ug/L	50	_	300.1B	Total/NA
Perchlorate	3300		400	95	ug/L	100		314.0	Total/NA

Lab Sample ID: 440-245430-3 **Client Sample ID: NERT4.65N1-20190708**

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D Method	Prep Type
Chlorate	13 J	100	10	ug/L	5	300.1B	Total/NA
Perchlorate	470	400	95	ug/L	100	314.0	Total/NA
Total Dissolved Solids	2400	20	10	mg/L	1	SM 2540C	Total/NA

Client Sample ID: NERT4.65N1-20190708-EB Lab Sample ID: 440-245430-4

No Detections.

This Detection Summary does not include radiochemical test results.

Job ID: 440-245430-1 SDG: LVW

Client: AECOM

Project/Site: NERT NDEP Phase II

Client Sample ID: NERT5.49S1-20190708

Lab Sample ID: 440-245430-1

Matrix: Water

Date Collected: 07/08/19 09:35 Date Received: 07/09/19 10:20

Method: 300.1B - Disinfection	By-Product	ts, (IC)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	ND		100	10	ug/L			07/12/19 00:09	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
						_			

Dichloroacetic acid(Surr) 108 90 - 115 07/12/19 00:09

Method: 314.0 - Perchlorate (IC) Analyte Result Qualifier RL **MDL** Unit D **Prepared** Analyzed Dil Fac Perchlorate 13 4.0 0.95 ug/L 07/16/19 16:57

Client Sample ID: AA-30-20190708 Lab Sample ID: 440-245430-2 Date Collected: 07/08/19 10:50 **Matrix: Water**

Date Received: 07/09/19 10:20

Method: 300.1B - Disinfection Analyte	n By-Products, (IC) Result Qualifie		MDL Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	9500	1000	100 ug/L			07/11/19 03:02	50
Surrogate	%Recovery Qualifie	er Limits			Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	107	90 - 115		•		07/11/19 03:02	50

Method: 314.0 - Perchlorate (IC) Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 400 07/16/19 01:37 **Perchlorate** 3300 95 ug/L 100

Client Sample ID: NERT4.65N1-20190708 Lab Sample ID: 440-245430-3 Date Collected: 07/08/19 12:30 **Matrix: Water**

Date Received: 07/09/19 10:20

Method: 300.1B - Disinfect	tion By-Produc	ts, (IC)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	13	J	100	10	ug/L			07/11/19 01:13	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	107		90 - 115					07/11/19 01:13	5
Method: 314.0 - Perchlorat	te (IC)								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac

Perchlorate 470 400 95 ug/L 07/16/19 01:58 100 **General Chemistry** Analyte Result Qualifier RL **MDL** Unit **Prepared** Analyzed Dil Fac

Total Dissolved Solids 2400 Lab Sample ID: 440-245430-4 Client Sample ID: NERT4.65N1-20190708-EB

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10 mg/L

Date Collected: 07/08/19 12:15 Date Received: 07/09/19 10:20

Method: 300.1B - Disinfect	ion By-Products, (IC)						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	ND		2.0 ug/L			07/10/19 13:08	1
Surrogate	%Recovery Qualifier	Limits			Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)		90 - 115				07/10/19 13:08	

Eurofins TestAmerica, Irvine

07/15/19 09:17

Matrix: Water

Client Sample Results

Client: AECOM Job ID: 440-245430-1

Project/Site: NERT NDEP Phase II SDG: LVW

Client Sample ID: NERT4.65N1-20190708-EB Lab Sample ID: 440-245430-4

Date Collected: 07/08/19 12:15 **Matrix: Water** Date Received: 07/09/19 10:20

Method: 314.0 - Perchlorate (IC) Analyte Perchlorate	Result ND	Qualifier	RL 4.0	MDL 0.95		D	Prepared	Analyzed 07/15/19 16:21	Dil Fac
General Chemistry Analyte Total Dissolved Solids	Result ND	Qualifier	RL 10	MDL 5.0	Unit mg/L	D	Prepared	Analyzed 07/15/19 09:17	Dil Fac

Surrogate Summary

Client: AECOM Job ID: 440-245430-1

Project/Site: NERT NDEP Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Prep Type: Total/NA **Matrix: Water**

			Percent Surrogate Recovery (Acceptance Limits)
		DCAA	
₋ab Sample ID	Client Sample ID	(90-115)	
140-245417-B-5 MS	Matrix Spike	107	
40-245417-B-5 MSD	Matrix Spike Duplicate	105	
40-245430-1	NERT5.49S1-20190708	108	
140-245430-2	AA-30-20190708	107	
140-245430-3	NERT4.65N1-20190708	107	
140-245430-4	NERT4.65N1-20190708-EB	106	
140-245519-A-1 MS	Matrix Spike	111	
140-245519-A-1 MSD	Matrix Spike Duplicate	112	
CS 440-556774/4	Lab Control Sample	107	
CS 440-556774/40	Lab Control Sample	110	
MB 440-556774/41	Method Blank	109	
MB 440-556774/5	Method Blank	109	
MRL 440-556774/3	Lab Control Sample	107	
MRL 440-556774/39	Lab Control Sample	108	

7/17/2019

Method Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245430-1

SDG: LVW

Method	Method Description	Protocol	Laboratory
300.1B	Disinfection By-Products, (IC)	EPA	TAL IRV
314.0	Perchlorate (IC)	EPA	TAL IRV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Eurofins TestAmerica, Irvine

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Lab Chronicle

Client: AECOM

Project/Site: NERT NDEP Phase II

SDG: LVW

Client Sample ID: NERT5.49S1-20190708

Date Collected: 07/08/19 09:35 Date Received: 07/09/19 10:20 Lab Sample ID: 440-245430-1

Matrix: Water

Job ID: 440-245430-1

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			556774	07/12/19 00:09	YZ	TAL IRV
Total/NA	Analysis	314.0		1			557815	07/16/19 16:57	CTH	TAL IRV

Client Sample ID: AA-30-20190708

Date Collected: 07/08/19 10:50 Date Received: 07/09/19 10:20 Lab Sample ID: 440-245430-2

Matrix: Water

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		50			556774	07/11/19 03:02	YZ	TAL IRV
Total/NA	Analysis	314.0		100			557509	07/16/19 01:37	CTH	TAL IRV

Client Sample ID: NERT4.65N1-20190708

Date Collected: 07/08/19 12:30 Date Received: 07/09/19 10:20 Lab Sample ID: 440-245430-3

Matrix: Water

Batch Batch Dil Initial Final Batch Prepared **Prep Type** Method Amount Amount Number or Analyzed Analyst Type **Factor** Lab Run 300.1B Total/NA Analysis 5 556774 07/11/19 01:13 YZ TAL IRV Total/NA Analysis 314.0 100 557509 07/16/19 01:58 CTH TAL IRV Total/NA Analysis SM 2540C 07/15/19 09:17 XL TAL IRV 50 mL 100 mL 557514

Client Sample ID: NERT4.65N1-20190708-EB

Date Collected: 07/08/19 12:15

Date Received: 07/09/19 10:20

Lab Sample ID: 440-245430-4

Matrix: Water

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		1			556774	07/10/19 13:08	YZ	TAL IRV
Total/NA	Analysis	314.0		1			557511	07/15/19 16:21	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	557514	07/15/19 09:17	XL	TAL IRV

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Eurofins TestAmerica, Irvine

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Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245430-1

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Method Blank

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample

SDG: LVW

Dil Fac

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Method: 300.1B - Disinfection By-Products, (IC)

Lab Sample ID: MB 440-556774/41

Matrix: Water

Analysis Batch: 556774

MB MB

MB MB

Surrogate%Recovery
Dichloroacetic acid(Surr)Qualifier
109Limits
90 - 115Prepared
90 - 115Analyzed
07/11/19 06:39Dil Fac
07/11/19 06:39

Lab Sample ID: MB 440-556774/5

Matrix: Water

Analysis Batch: 556774

MB MB

AnalyteResult
ChlorateQualifierRLMDLUnitDPreparedAnalyzedDil FacChlorateND202.0ug/L07/10/19 08:541

MB MB

Surrogate%Recovery
Dichloroacetic acid(Surr)Qualifier
109Limits
90 - 115Prepared
90 - 115Analyzed
07/10/19 08:54Dil Fac
07/10/19 08:54

Lab Sample ID: LCS 440-556774/4

Matrix: Water

Analysis Batch: 556774

Spike LCS LCS %Rec.

Analyte Added Result Qualifier Unit D %Rec Limits

Chlorate 100 101 ug/L 101 75 - 125

LCS LCS

Surrogate %Recovery Qualifier Limits

Dichloroacetic acid(Surr) 107 90 - 115

Lab Sample ID: LCS 440-556774/40

Matrix: Water

Analysis Batch: 556774

 Analyte
 Added Chlorate
 Result Qualifier Unit
 Unit Ug/L
 D VRec Umits

 100
 106
 ug/L
 106
 75 - 125

LCS LCS

Surrogate%RecoveryQualifierLimitsDichloroacetic acid(Surr)11090 - 115

Lab Sample ID: MRL 440-556774/3

Matrix: Water

Analysis Batch: 556774

 Analyte
 Added Chlorate
 Result 20.0
 Unit 10.2
 Unit 20.0
 Unit 20.0
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MRL MRL

 Surrogate
 %Recovery
 Qualifier
 Limits

 Dichloroacetic acid(Surr)
 107
 90 - 115

Eurofins TestAmerica, Irvine

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Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245430-1

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC) (Continued)

Client Sample ID: Lab Control Sample Lab Sample ID: MRL 440-556774/39 **Matrix: Water** Prep Type: Total/NA Analysis Batch: 556774

Spike MRL MRL %Rec. Analyte Added Result Qualifier %Rec Limits Unit Chlorate 20.0 101 50 - 150 20.1 ug/L

MRL MRL Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 108 90 - 115

Lab Sample ID: 440-245417-B-5 MS **Client Sample ID: Matrix Spike Matrix: Water** Prep Type: Total/NA

Analysis Batch: 556774

%Rec. Sample Sample Spike MS MS Result Qualifier Analyte Added Result Qualifier Unit D %Rec Limits Chlorate 20 J 200 103 226 ug/L 75 - 125

MS MS Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 107 90 - 115

Lab Sample ID: 440-245417-B-5 MSD Client Sample ID: Matrix Spike Duplicate **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 556774

Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Limits RPD Limit Result Qualifier Unit D %Rec

224

ug/L

102

75 - 125

Client Sample ID: Matrix Spike Duplicate

200

MSD MSD Surrogate %Recovery Qualifier Limits 90 - 115 Dichloroacetic acid(Surr) 105

20 J

Lab Sample ID: 440-245519-A-1 MS Client Sample ID: Matrix Spike Prep Type: Total/NA

Matrix: Water

Chlorate

Analysis Batch: 556774

MS MS Sample Sample Spike %Rec. Result Qualifier Added Analyte Result Qualifier Unit Limits D %Rec 200 Chlorate 180 397 108 75 - 125 ug/L

MS MS Limits Surrogate %Recovery Qualifier Dichloroacetic acid(Surr) 90 - 115 111

Lab Sample ID: 440-245519-A-1 MSD

Matrix: Water

Analysis Batch: 556774

MSD MSD **RPD** Sample Sample Spike %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Chlorate 180 200 396 ug/L 107 75 - 125 25

MSD MSD Surrogate %Recovery Qualifier Limits 90 - 115 Dichloroacetic acid(Surr) 112

Eurofins TestAmerica, Irvine

Prep Type: Total/NA

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245430-1 SDG: LVW

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample

Client Sample ID: Matrix Spike Duplicate

Client Sample ID: Matrix Spike

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 440-557509/46

Matrix: Water

Analysis Batch: 557509

MB MB Analyte Result Qualifier RL **MDL** Unit Analyzed Dil Fac Prepared Perchlorate 4.0 0.95 ug/L 07/15/19 23:15 ND

Lab Sample ID: LCS 440-557509/47

Matrix: Water

Analysis Batch: 557509

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits 25.0 Perchlorate 24.5 ug/L 98 85 - 115

Lab Sample ID: MRL 440-557509/8

Matrix: Water

Analysis Batch: 557509

Spike MRL MRL %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Perchlorate 4.00 75 - 125 4.12 ug/L 103

Lab Sample ID: 440-245046-A-3 MS

Matrix: Water

Analysis Batch: 557509

Spike MS MS %Rec. Sample Sample Added Analyte Result Qualifier Result Qualifier Limits Unit D %Rec ug/L Perchlorate 1500 2500 4080 104 80 - 120

Lab Sample ID: 440-245046-A-3 MSD

Matrix: Water

Analysis Batch: 557509

Sample Sample Spike MSD MSD %Rec **RPD** Added Analyte Result Qualifier Result Qualifier Unit %Rec Limits **RPD** Limit Perchlorate 2500 4120 105 80 - 120 1500 ug/L

Lab Sample ID: MB 440-557511/6

Matrix: Water

Analysis Batch: 557511

MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Perchlorate $\overline{\mathsf{ND}}$ 4.0 0.95 ug/L 07/15/19 09:25

Lab Sample ID: LCS 440-557511/5

Matrix: Water

Analysis Batch: 557511

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit %Rec Limits Perchlorate 10 0 10.4 ug/L 104 85 - 115

Lab Sample ID: MRL 440-557511/8

Matrix: Water

Analysis Batch: 557511

Spike MRL MRL %Rec. Result Qualifier Added Analyte Unit %Rec Limits Perchlorate 4.00 4.00 ug/L 100 75 - 125

Eurofins TestAmerica, Irvine

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10

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245430-1

SDG: LVW

V	letho	d: 3'	14.0	- F	erc	hlor	ate ((IC)	
---	-------	-------	------	-----	-----	------	-------	------	--

Lab Sample ID: 440-245452-D-3 MS Client Sample ID: Matrix Spike Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557511

Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier %Rec Limits Unit Perchlorate ND 10.0 ug/L 95 80 - 120 9.50

Lab Sample ID: 440-245452-D-3 MSD Client Sample ID: Matrix Spike Duplicate **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557511

RPD Spike MSD MSD %Rec. Sample Sample Analyte Result Qualifier Added Result Qualifier Unit D %Rec Limits RPD Limit ND 10.0 Perchlorate 9.64 ug/L 96 80 - 120

Lab Sample ID: MB 440-557815/6 **Client Sample ID: Method Blank Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557815

MB MB

Analyte Result Qualifier RL **MDL** Unit Analyzed Dil Fac Prepared Perchlorate 4.0 0.95 ug/L 07/16/19 15:37 $\overline{\mathsf{ND}}$

Lab Sample ID: LCS 440-557815/5 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557815

Spike LCS LCS %Rec. Added Analyte Result Qualifier D %Rec Limits Unit Perchlorate 25.0 25.2 ug/L 101 85 - 115

Lab Sample ID: MRL 440-557815/8

Matrix: Water

Analysis Batch: 557815

Spike MRL MRL %Rec Added Analyte Result Qualifier Unit %Rec Limits Perchlorate 4.18 105 ug/L 75 - 125

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 440-557514/1 Client Sample ID: Method Blank **Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557514

MB MB **MDL** Unit Analyte Result Qualifier RL Prepared Analyzed Dil Fac 10 5.0 mg/L 07/15/19 09:17 Total Dissolved Solids $\overline{\mathsf{ND}}$

Lab Sample ID: LCS 440-557514/2 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557514

Spike LCS LCS %Rec. Added Result Qualifier Unit Limits 90 - 110 **Total Dissolved Solids** 1000 994 mg/L

Eurofins TestAmerica, Irvine

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

QC Sample Results

Client: AECOM Job ID: 440-245430-1

Project/Site: NERT NDEP Phase II SDG: LVW

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: 440-245380-G-6 DU **Client Sample ID: Duplicate** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557514

DU DU RPD Sample Sample Analyte Result Qualifier Result Qualifier Unit RPD Limit Total Dissolved Solids 1100 5 1130 mg/L

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245430-1 SDG: LVW

HPLC/IC

Analysis Batch: 556774

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245430-1	NERT5.49S1-20190708	Total/NA	Water	300.1B	
440-245430-2	AA-30-20190708	Total/NA	Water	300.1B	
440-245430-3	NERT4.65N1-20190708	Total/NA	Water	300.1B	
440-245430-4	NERT4.65N1-20190708-EB	Total/NA	Water	300.1B	
MB 440-556774/41	Method Blank	Total/NA	Water	300.1B	
MB 440-556774/5	Method Blank	Total/NA	Water	300.1B	
LCS 440-556774/4	Lab Control Sample	Total/NA	Water	300.1B	
LCS 440-556774/40	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556774/3	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-556774/39	Lab Control Sample	Total/NA	Water	300.1B	
440-245417-B-5 MS	Matrix Spike	Total/NA	Water	300.1B	
440-245417-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	300.1B	
440-245519-A-1 MS	Matrix Spike	Total/NA	Water	300.1B	
440-245519-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.1B	

Analysis Batch: 557509

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245430-2	AA-30-20190708	Total/NA	Water	314.0	
440-245430-3	NERT4.65N1-20190708	Total/NA	Water	314.0	
MB 440-557509/46	Method Blank	Total/NA	Water	314.0	
LCS 440-557509/47	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557509/8	Lab Control Sample	Total/NA	Water	314.0	
440-245046-A-3 MS	Matrix Spike	Total/NA	Water	314.0	
440-245046-A-3 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

Analysis Batch: 557511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245430-4	NERT4.65N1-20190708-EB	Total/NA	Water	314.0	
MB 440-557511/6	Method Blank	Total/NA	Water	314.0	
LCS 440-557511/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557511/8	Lab Control Sample	Total/NA	Water	314.0	
440-245452-D-3 MS	Matrix Spike	Total/NA	Water	314.0	
440-245452-D-3 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

Analysis Batch: 557815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245430-1	NERT5.49S1-20190708	Total/NA	Water	314.0	
MB 440-557815/6	Method Blank	Total/NA	Water	314.0	
LCS 440-557815/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557815/8	Lab Control Sample	Total/NA	Water	314.0	

General Chemistry

Analysis Batch: 557514

Lab Sample ID 440-245430-3	Client Sample ID NERT4.65N1-20190708	Prep Type Total/NA	Matrix Water	Method SM 2540C	Prep Batch
440-245430-4	NERT4.65N1-20190708 NERT4.65N1-20190708-EB	Total/NA	Water	SM 2540C	
MB 440-557514/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 440-557514/2	Lab Control Sample	Total/NA	Water	SM 2540C	
440-245380-G-6 DU	Duplicate	Total/NA	Water	SM 2540C	

Eurofins TestAmerica, Irvine

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Definitions/Glossary

Client: AECOM Job ID: 440-245430-1

Project/Site: NERT NDEP Phase II

SDG: LVW

Qualifiers

Qualifier Qualifier Description

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight hasis

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Accreditation/Certification Summary

Client: AECOM Job ID: 440-245430-1

Project/Site: NERT NDEP Phase II

Laboratory: Eurofins TestAmerica, Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Nevada	State Program	9	CA015312019-5	07-31-19 *

SDG: LVW

^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

INV Las Vegas 219

Chain of Custody Record

179788

THE LEADER IN ENVIRONMENTAL TESTING TestAmerica Laboratories, Inc.

Phoenix, AZ 85040 Phone: 602.437.3340 Fax:	_	19 latory Pro	ogram: [ا يسوا	Upper	_	RCR		7.04												orator	AL TESTING ries, Inc.
Client Contact									Other: 丁 <i>CA</i> A			Date						CO	C No		TAL-	8210 (0713)
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Preservation Used: 1= lce, 2= HCl; 3= H2SO4; 4=HNO3;	5≖NaOH;	6= Other_				\perp																
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Pleas Comments Section if the lab is to dispose of the sample.	se List any I	EPA Waste	Codes for t	he samp	ole in the	S	-) posal		may be	e asse	essed	if san	nple	s are	retaine	ed long	ger than 1	month)	
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Special Instructions/QC Requirements & Comments:	****						•							-	32	/ 3	ų.	1	'λ 8f			
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Client: AECOM

Job Number: 440-245430-1

SDG Number: LVW

Login Number: 245430 List Source: Eurofins TestAmerica, Irvine

List Number: 1

Creator: Escalante, Maria I

Creator: Escalante, Maria I		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins TestAmerica, Irvine

Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-245430-2

Laboratory Sample Delivery Group: LVW Client Project/Site: NERT NDEP Phase II

For: AECOM 1220 Avenida Acaso Camarillo, California 93012

Attn: Carmen Caceres-Schnell

Authorized for release by: 7/16/2019 4:24:27 PM

Danielle Roberts, Senior Project Manager (949)260-3249

danielle.roberts@testamericainc.com

anea Roberdo

Review your project results through

Have a Question?



Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: AECOM Project/Site: NERT NDEP Phase II Laboratory Job ID: 440-245430-2

SDG: LVW

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Sample Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245430-2

SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
440-245430-3	NERT4.65N1-20190708	Water	07/08/19 12:30	07/09/19 10:20	
440-245430-4	NERT4.65N1-20190708-EB	Water	07/08/19 12:15	07/09/19 10:20	

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Case Narrative

Client: AECOM

Job ID: 440-245430-2 Project/Site: NERT NDEP Phase II

SDG: LVW

Job ID: 440-245430-2

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-245430-2

Comments

No additional comments.

Receipt

The samples were received on 7/9/2019 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: AECOM Job ID: 440-245430-2

Project/Site: NERT NDEP Phase II SDG: LVW

Client Sample ID: NERT4.65N1-20190708 Lab Sample ID: 440-245430-3

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Chromium	0.59 J	2.0	0.50 ug/L	1 200.8	Dissolved

Client Sample ID: NERT4.65N1-20190708-EB	Lab Sample ID: 440-245430-4

No Detections.

Client Sample Results

Client: AECOM Job ID: 440-245430-2

Project/Site: NERT NDEP Phase II SDG: LVW

Client Sample ID: NERT4.65N1-20190708 Lab Sample ID: 440-245430-3 Date Collected: 07/08/19 12:30 **Matrix: Water** Date Received: 07/09/19 10:20

Method: 200.8 - Metals (ICP/MS) - Dissolved Dil Fac Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed D Chromium 2.0 0.50 ug/L 07/15/19 12:47 07/15/19 19:02 0.59 J

Client Sample ID: NERT4.65N1-20190708-EB Lab Sample ID: 440-245430-4 Date Collected: 07/08/19 12:15 **Matrix: Water**

Date Received: 07/09/19 10:20

Method: 200.8 - Metals (ICP/MS) - Dissolved Analyte RL MDL Unit Prepared Analyzed Dil Fac 07/15/19 12:47 07/15/19 19:05 Chromium ND 2.0 0.50 ug/L

Method Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245430-2

SDG: LVW

Method	Method Description	Protocol	Laboratory
200.8	Metals (ICP/MS)	EPA	TAL IRV
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

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4.0

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Lab Chronicle

Client: AECOM Job ID: 440-245430-2

SDG: LVW Project/Site: NERT NDEP Phase II

Client Sample ID: NERT4.65N1-20190708

Lab Sample ID: 440-245430-3 Date Collected: 07/08/19 12:30 **Matrix: Water** Date Received: 07/09/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	557574	07/15/19 12:47	EP	TAL IRV
Dissolved	Analysis	200.8		1			557666	07/15/19 19:02	P1R	TAL IRV

Lab Sample ID: 440-245430-4 Client Sample ID: NERT4.65N1-20190708-EB **Matrix: Water**

Date Collected: 07/08/19 12:15 Date Received: 07/09/19 10:20

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	557574	07/15/19 12:47	EP	TAL IRV
Dissolved	Analysis	200.8		1			557666	07/15/19 19:05	P1R	TAL IRV

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

QC Sample Results

Client: AECOM Job ID: 440-245430-2 Project/Site: NERT NDEP Phase II

SDG: LVW

Method: 200.8 - Metals (ICP/MS)

Chromium

Chromium

Lab Sample ID: MB 440-557574/1-A Client Sample ID: Method Blank **Matrix: Water Prep Type: Total Recoverable** Analysis Batch: 557666

Prep Batch: 557574

85 - 115

70 - 130

100

95

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 2.0 0.50 ug/L Chromium 07/15/19 12:47 07/15/19 18:11 $\overline{\mathsf{ND}}$

Lab Sample ID: LCS 440-557574/2-A **Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total Recoverable Analysis Batch: 557666 Prep Batch: 557574** LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits

80.0

81.7

ug/L

ug/L

Lab Sample ID: 720-93985-C-6-B MS **Client Sample ID: Matrix Spike Matrix: Water Prep Type: Dissolved Analysis Batch: 557666** Prep Batch: 557574 Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier Unit Limits %Rec

80.0

80.0

Lab Sample ID: 720-93985-C-6-C MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water Prep Type: Dissolved**

Analysis Batch: 557666

MB MB

5.3

Prep Batch: 557574 Sample Sample Spike MSD MSD %Rec. **RPD** Result Qualifier Added Limits Analyte Result Qualifier D %Rec RPD Limit Unit Chromium 5.3 80.0 82.3 ug/L 96 70 - 130 20

7/16/2019

QC Association Summary

Client: AECOM

Job ID: 440-245430-2 Project/Site: NERT NDEP Phase II

SDG: LVW

Metals

Prep Batch: 557574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245430-3	NERT4.65N1-20190708	Dissolved	Water	200.2	
440-245430-4	NERT4.65N1-20190708-EB	Dissolved	Water	200.2	
MB 440-557574/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-557574/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
720-93985-C-6-B MS	Matrix Spike	Dissolved	Water	200.2	
720-93985-C-6-C MSD	Matrix Spike Duplicate	Dissolved	Water	200.2	

Analysis Batch: 557666

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245430-3	NERT4.65N1-20190708	Dissolved	Water	200.8	557574
440-245430-4	NERT4.65N1-20190708-EB	Dissolved	Water	200.8	557574
MB 440-557574/1-A	Method Blank	Total Recoverable	Water	200.8	557574
LCS 440-557574/2-A	Lab Control Sample	Total Recoverable	Water	200.8	557574
720-93985-C-6-B MS	Matrix Spike	Dissolved	Water	200.8	557574
720-93985-C-6-C MSD	Matrix Spike Duplicate	Dissolved	Water	200.8	557574

Definitions/Glossary

Client: AECOM Job ID: 440-245430-2

Project/Site: NERT NDEP Phase II

SDG: LVW

Qualifiers

	-4-	
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Qualifier Qualifier Description

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery

CFL Contains Free Liquid
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Accreditation/Certification Summary

Client: AECOM Job ID: 440-245430-2 Project/Site: NERT NDEP Phase II

SDG: LVW

Laboratory: Eurofins TestAmerica, Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Nevada	State Program	9	CA015312019-5	07-31-19 *

^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica

| N Las Vegas
219

Chain of Custody Record

179788

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Phoenix, AZ 85040 Phone: 602.437.3340 Fax.	_	19	ogram: [¬ [NDDEC	Г-	RCR	.a. F	7 out										TestAme		borat	ories, I	nc.
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Job Number: 440-245430-2

SDG Number: LVW

Login Number: 245430 List Source: Eurofins TestAmerica, Irvine

List Number: 1

Client: AECOM

Creator: Escalante. Maria I

Creator: Escalante, Maria I		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-245693-1

Laboratory Sample Delivery Group: LVW Client Project/Site: NERT NDEP Phase II

For: AECOM 1220 Avenida Acaso Camarillo, California 93012

Attn: Carmen Caceres-Schnell

anea Roberdo

Authorized for release by: 7/18/2019 4:45:27 PM

Danielle Roberts, Senior Project Manager (949)260-3249

danielle.roberts@testamericainc.com

Review your project results through Total Access

Have a Question?

Ask

Visit us at: www.testamericainc.com

Expert

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Client: AECOM Project/Site: NERT NDEP Phase II Laboratory Job ID: 440-245693-1 SDG: LVW

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Sample Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245693-1

SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
440-245693-1	WMW4.9S-20190709	Water	07/09/19 10:05	07/11/19 10:20	
440-245693-2	NERT4.70N1-20190709	Water	07/09/19 11:50	07/11/19 10:20	
440-245693-3	NERT4.70N1-20190709-EB	Water	07/09/19 12:05	07/11/19 10:20	
440-245693-4	NERT4.71N1-20190709	Water	07/09/19 12:55	07/11/19 10:20	
440-245693-5	WMW5.7N-20190709	Water	07/09/19 14:00	07/11/19 10:20	

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Case Narrative

Client: AECOM

Job ID: 440-245693-1 Project/Site: NERT NDEP Phase II

SDG: LVW

Job ID: 440-245693-1

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-245693-1

Comments

No additional comments.

Receipt

The samples were received on 7/11/2019 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.0° C.

HPLC/IC

Method(s) 300.1B: The following samples were diluted for the chlorate analyte due to the nature of the sample matrix: NERT4.70N1-20190709 (440-245693-2), NERT4.71N1-20190709 (440-245693-4) and WMW5.7N-20190709 (440-245693-5). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: AECOM

Job ID: 440-245693-1 Project/Site: NERT NDEP Phase II SDG: LVW

Client Sample ID: WMV	V4.9S-201907	709				Lab San	iple ID: 44	0-245693-1
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Chlorate	3000		1000	100	ug/L		300.1B	Total/NA
Perchlorate	850		400	95	ug/L	100	314.0	Total/NA
Client Sample ID: NER	T4.70N1-2019	90709				Lab San	ple ID: 44	0-245693-2
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perchlorate	140		40	9.5	ug/L		314.0	Total/NA
Total Dissolved Solids	1800		20	10	mg/L	1	SM 2540C	Total/NA
Client Sample ID: NER	T4.70N1-2019	90709-EB				Lab San	ple ID: 44	0-245693-3
No Detections.								
Client Sample ID: NER	T4.71N1-2019	90709				Lab San	ple ID: 44	0-245693-4
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perchlorate	160		40	9.5	ug/L		314.0	Total/NA
Total Dissolved Solids	1800		20	10	mg/L	1	SM 2540C	Total/NA
Client Sample ID: WMV	V5.7N-201907	709				Lab San	ple ID: 44	0-245693-5
Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac D	Method	Prep Type
Perchlorate	12		4.0	0.95	ug/L		314.0	Total/NA

2

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Client: AECOM

General Chemistry

Total Dissolved Solids

Analyte

Project/Site: NERT NDEP Phase II

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SDG. LV

Job ID: 440-245693-1

SDG: LVW

Client Sample ID: WMW4.9S-20190709 Lab Sample ID: 440-245693-1 Date Collected: 07/09/19 10:05 **Matrix: Water** Date Received: 07/11/19 10:20 Method: 300.1B - Disinfection By-Products, (IC) Analyte Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac 1000 07/15/19 19:09 Chlorate 3000 100 ug/L 50 Dil Fac Surrogate %Recovery Qualifier Limits Prepared Analyzed Dichloroacetic acid(Surr) 103 90 - 115 07/15/19 19:09 50 Method: 314.0 - Perchlorate (IC) **MDL** Unit Analyte Result Qualifier RL D Prepared Analyzed Dil Fac Perchlorate 850 400 95 ug/L 07/16/19 05:01 100 Client Sample ID: NERT4.70N1-20190709 Lab Sample ID: 440-245693-2 Date Collected: 07/09/19 11:50 **Matrix: Water** Date Received: 07/11/19 10:20 Method: 300.1B - Disinfection By-Products, (IC) Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Chlorate $\overline{\mathsf{ND}}$ 100 10 ug/L 07/16/19 04:13 Surrogate %Recovery Qualifier Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 102 90 - 115 07/16/19 04:13 Method: 314.0 - Perchlorate (IC) Analyte Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac 40 07/16/19 16:13 **Perchlorate** 140 9.5 ug/L **General Chemistry** Result Qualifier Analyte RL MDL Unit D Prepared Analyzed Dil Fac **Total Dissolved Solids** 1800 20 10 mg/L 07/16/19 10:01 Lab Sample ID: 440-245693-3 Client Sample ID: NERT4.70N1-20190709-EB Date Collected: 07/09/19 12:05 **Matrix: Water** Date Received: 07/11/19 10:20 Method: 300.1B - Disinfection By-Products, (IC) Analyte Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac Chlorate $\overline{\mathsf{ND}}$ 20 2.0 ug/L 07/16/19 00:36 %Recovery Dil Fac Surrogate Qualifier Limits Prepared Analyzed Dichloroacetic acid(Surr) 103 90 - 115 07/16/19 00:36 Method: 314.0 - Perchlorate (IC) **MDL** Unit Analyte Result Qualifier RL D Prepared Analyzed Dil Fac Perchlorate ND 4.0 0.95 ug/L 07/15/19 16:03

Analyzed

07/16/19 10:01

RL

10

MDL Unit

5.0 mg/L

D

Prepared

Result Qualifier

ND

Dil Fac

Client Sample Results

Client: AECOM Job ID: 440-245693-1 Project/Site: NERT NDEP Phase II

SDG: LVW

Client Sample ID: NERT4.71N1-20190709

Date Collected: 07/09/19 12:55 Date Received: 07/11/19 10:20 Lab Sample ID: 440-245693-4

Matrix: Water

Method: 300.1B - Disinfed	•		D.	MDI	1114	_	B	A	D'I = -
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	ND		100	10	ug/L			07/16/19 04:49	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	105		90 - 115			-		07/16/19 04:49	5
- -			30 = 1,1 3					07770773 04.43	
Method: 314.0 - Perchlora	ate (IC)	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	
Method: 314.0 - Perchlora	ate (IC)	Qualifier				<u>D</u> .	Prepared		Dil Fac
Method: 314.0 - Perchlora Analyte Perchlorate	ate (IC)	Qualifier	RL			D .	Prepared	Analyzed	Dil Fac
Method: 314.0 - Perchlora Analyte	Result 160	Qualifier Qualifier	RL		ug/L	D .	Prepared Prepared	Analyzed	Dil Fac

Client Sample ID: WMW5.7N-20190709 Lab Sample ID: 440-245693-5 Date Collected: 07/09/19 14:00 **Matrix: Water**

Date Received: 07/11/19 10:20

Method: 300.1B - Disinfecti	on By-Product	s, (IC)							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlorate	ND		100	10	ug/L			07/16/19 05:25	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dichloroacetic acid(Surr)	103		90 - 115			-		07/16/19 05:25	5

Method: 314.0 - Perchlorate (IC) Analyte	Result Qu	ualifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perchlorate	12	4.0	0.95	ug/L			07/16/19 15:55	1

Surrogate Summary

Client: AECOM Job ID: 440-245693-1 Project/Site: NERT NDEP Phase II SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Prep Type: Total/NA **Matrix: Water**

			Percent Surrogate Recovery (Acceptance Limits)
		DCAA	
Lab Sample ID	Client Sample ID	(90-115)	
140-245693-1	WMW4.9S-20190709	103	
140-245693-2	NERT4.70N1-20190709	102	
440-245693-2 MS	NERT4.70N1-20190709	102	
440-245693-2 MSD	NERT4.70N1-20190709	103	
140-245693-3	NERT4.70N1-20190709-EB	103	
440-245693-4	NERT4.71N1-20190709	105	
440-245693-5	WMW5.7N-20190709	103	
LCS 440-557434/46	Lab Control Sample	103	
MB 440-557434/47	Method Blank	103	
MRL 440-557434/45	Lab Control Sample	104	
Surrogate Legend			
DCAA = Dichloroacetic	acid(Surr)		

Method Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245693-1

SDG: LVW

Method	Method Description	Protocol	Laboratory
300.1B	Disinfection By-Products, (IC)	EPA	TAL IRV
314.0	Perchlorate (IC)	EPA	TAL IRV
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Job ID: 440-245693-1 Project/Site: NERT NDEP Phase II SDG: LVW

Client Sample ID: WMW4.9S-20190709 Lab Sample ID: 440-245693-1

Date Collected: 07/09/19 10:05 Date Received: 07/11/19 10:20

Matrix: Water

Batch Batch Dil Initial Final Batch Prepared Method Factor Number or Analyzed **Prep Type** Type Run Amount Amount Analyst Lab Total/NA Analysis 300.1B 50 557434 07/15/19 19:09 YZ TAL IRV Total/NA Analysis 100 557509 07/16/19 05:01 CTH 314.0 TAL IRV

Client Sample ID: NERT4.70N1-20190709 Lab Sample ID: 440-245693-2

Date Collected: 07/09/19 11:50 Date Received: 07/11/19 10:20

Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			557434	07/16/19 04:13	YZ	TAL IRV
Total/NA	Analysis	314.0		10			557816	07/16/19 16:13	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	557739	07/16/19 10:01	XL	TAL IRV

Client Sample ID: NERT4.70N1-20190709-EB

Lab Sample ID: 440-245693-3

Date Collected: 07/09/19 12:05 **Matrix: Water** Date Received: 07/11/19 10:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		1			557434	07/16/19 00:36	YZ	TAL IRV
Total/NA	Analysis	314.0		1			557511	07/15/19 16:03	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	557739	07/16/19 10:01	XL	TAL IRV

Client Sample ID: NERT4.71N1-20190709

Lab Sample ID: 440-245693-4 Date Collected: 07/09/19 12:55 **Matrix: Water**

Date Received: 07/11/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5	-		557434	07/16/19 04:49	YZ	TAL IRV
Total/NA	Analysis	314.0		10			557816	07/16/19 16:31	CTH	TAL IRV
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	557739	07/16/19 10:01	XL	TAL IRV

Client Sample ID: WMW5.7N-20190709 Lab Sample ID: 440-245693-5

Date Collected: 07/09/19 14:00 **Matrix: Water** Date Received: 07/11/19 10:20

-	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	300.1B		5			557434	07/16/19 05:25	YZ	TAL IRV
Total/NA	Analysis	314.0		1			557816	07/16/19 15:55	CTH	TAL IRV

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

10

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245693-1

Prep Type: Total/NA

Client Sample ID: Method Blank

75 - 125

Prep Type: Total/NA

Client Sample ID: NERT4.70N1-20190709

SDG: LVW

Method: 300.1B - Disinfection By-Products, (IC)

Lab Sample ID: MB 440-557434/47

Matrix: Water

Analysis Batch: 557434

Prep Type: Total/NA MB MB

Analyte Result Qualifier RL **MDL** Unit Analyzed Dil Fac Prepared Chlorate 20 2.0 ug/L 07/15/19 13:07 $\overline{\mathsf{ND}}$

MB MB

Qualifier Surrogate %Recovery Limits Prepared Analyzed Dil Fac Dichloroacetic acid(Surr) 103 90 - 115 07/15/19 13:07

Lab Sample ID: LCS 440-557434/46 **Client Sample ID: Lab Control Sample**

Matrix: Water

Analysis Batch: 557434

%Rec. Spike LCS LCS Analyte Added Result Qualifier Unit D %Rec Limits

Chlorate 100 102 102 ug/L 75 - 125

LCS LCS

Surrogate %Recovery Qualifier Limits Dichloroacetic acid(Surr) 103 90 - 115

Lab Sample ID: MRL 440-557434/45 **Client Sample ID: Lab Control Sample** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557434

Spike MRL MRL %Rec. Analyte Added Result Qualifier Limits Unit D %Rec

Chlorate 20.0 19.2 J ug/L 96 50 - 150

MRL MRL

Surrogate %Recovery Qualifier Limits

90 - 115 Dichloroacetic acid(Surr) 104

Lab Sample ID: 440-245693-2 MS Client Sample ID: NERT4.70N1-20190709 Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557434

MS MS Sample Sample Spike %Rec. Result Qualifier Added Analyte Result Qualifier Unit Limits D %Rec 98

200 Chlorate ND 196 MS MS

%Recovery Qualifier Limits Surrogate Dichloroacetic acid(Surr) 102 90 - 115

Lab Sample ID: 440-245693-2 MSD

Matrix: Water Analysis Batch: 557434

MSD MSD **RPD** Sample Sample Spike %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Chlorate ND 200 199 ug/L 99 75 - 125 25

MSD MSD

Surrogate %Recovery Qualifier Limits 103 90 - 115 Dichloroacetic acid(Surr)

Eurofins TestAmerica, Irvine

ug/L

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245693-1

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample

Client Sample ID: Matrix Spike Duplicate

Client Sample ID: Matrix Spike

Client Sample ID: Method Blank

Client Sample ID: Lab Control Sample

Client Sample ID: Lab Control Sample

SDG: LVW

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: MB 440-557509/46

Matrix: Water

Analysis Batch: 557509

MB MB

Analyte Result Qualifier RL **MDL** Unit Analyzed Dil Fac Prepared Perchlorate 4.0 0.95 ug/L 07/15/19 23:15 ND

Lab Sample ID: LCS 440-557509/47

Matrix: Water

Analysis Batch: 557509

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits 25.0 Perchlorate 24.5 ug/L 98 85 - 115

Lab Sample ID: MRL 440-557509/8

Matrix: Water

Analysis Batch: 557509

Spike MRL MRL %Rec. Analyte Added Result Qualifier Unit D %Rec Limits Perchlorate 4.00 75 - 125 4.12 ug/L 103

Lab Sample ID: 440-245046-A-3 MS

Matrix: Water

Analysis Batch: 557509

Spike MS MS %Rec. Sample Sample Added Analyte Result Qualifier Result Qualifier Limits Unit D %Rec Perchlorate 1500 2500 4080 104 80 - 120 ug/L

Lab Sample ID: 440-245046-A-3 MSD

Matrix: Water

Analysis Batch: 557509

Sample Sample Spike MSD MSD %Rec **RPD** Added Analyte Result Qualifier Result Qualifier Unit %Rec Limits **RPD** Limit Perchlorate 2500 4120 105 80 - 120 1500 ug/L

Lab Sample ID: MB 440-557511/6

Matrix: Water

Analysis Batch: 557511

MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Perchlorate $\overline{\mathsf{ND}}$ 4.0 0.95 ug/L 07/15/19 09:25

Lab Sample ID: LCS 440-557511/5

Matrix: Water

Analysis Batch: 557511

Spike LCS LCS %Rec. Analyte Added Result Qualifier Unit %Rec Limits Perchlorate 10 0 10.4 ug/L 104 85 - 115

Lab Sample ID: MRL 440-557511/8

Matrix: Water

Analysis Batch: 557511 Spike MRL MRL %Rec. Result Qualifier Added Analyte Unit %Rec Limits Perchlorate 4.00 4.00 ug/L 100 75 - 125

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7/18/2019

10

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245693-1 SDG: LVW

Method: 314.0 - Perchlorate (IC)

Lab Sample ID: 440-245452-D-3 MS Client Sample ID: Matrix Spike Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557511

Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier %Rec Limits Unit Perchlorate ND 10.0 ug/L 95 80 - 120 9.50

Lab Sample ID: 440-245452-D-3 MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557511

RPD MSD MSD %Rec. Sample Sample Spike Analyte Result Qualifier Added Result Qualifier Unit D %Rec Limits RPD Limit ND 10.0 Perchlorate 9.64 ug/L 96 80 - 120

Lab Sample ID: MB 440-557816/6 **Client Sample ID: Method Blank Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557816

MB MB

Analyte Result Qualifier RL **MDL** Unit Analyzed Dil Fac Prepared Perchlorate 4.0 0.95 ug/L 07/16/19 14:49 $\overline{\mathsf{ND}}$

Lab Sample ID: LCS 440-557816/5 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557816

Spike LCS LCS %Rec. Added Analyte Result Qualifier D %Rec Limits Unit Perchlorate 25.0 24.2 ug/L 97 85 - 115

Lab Sample ID: MRL 440-557816/8

Matrix: Water

Analysis Batch: 557816

Spike MRL MRL %Rec Added Analyte Result Qualifier Unit %Rec Limits Perchlorate 4.00 103 75 ₋ 125 4.12 ug/L

Lab Sample ID: 440-245693-5 MS

Matrix: Water

Analysis Batch: 557816

Spike MS MS Sample Sample %Rec. Result Qualifier Analyte Result Qualifier Added Unit %Rec Limits Perchlorate 12 25.0 37.8 ug/L 104 80 - 120

Lab Sample ID: 440-245693-5 MSD

Matrix: Water

Analysis Batch: 557816

Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits RPD Limit Perchlorate 12 25.0 37.7 ug/L 103 80 - 120

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Client Sample ID: Lab Control Sample

Client Sample ID: WMW5.7N-20190709

Client Sample ID: WMW5.7N-20190709

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

QC Sample Results

Client: AECOM Job ID: 440-245693-1

Project/Site: NERT NDEP Phase II SDG: LVW

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 440-557739/1 **Client Sample ID: Method Blank**

Matrix: Water

Analysis Batch: 557739 MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Total Dissolved Solids 10 07/16/19 10:01 5.0 mg/L ND

Lab Sample ID: LCS 440-557739/2 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 557739

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits 1000 1060 **Total Dissolved Solids** mg/L 106 90 - 110

Client Sample ID: Duplicate Lab Sample ID: 440-245493-A-1 DU Prep Type: Total/NA

Matrix: Water

Analysis Batch: 557739

Sample Sample DU DU **RPD** Analyte Result Qualifier Result Qualifier Unit D RPD Limit **Total Dissolved Solids** 290 287 0.3 5 mg/L

Prep Type: Total/NA

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QC Association Summary

Job ID: 440-245693-1 Client: AECOM Project/Site: NERT NDEP Phase II SDG: LVW

HPLC/IC

Analysis Batch: 557434

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245693-1	WMW4.9S-20190709	Total/NA	Water	300.1B	
440-245693-2	NERT4.70N1-20190709	Total/NA	Water	300.1B	
440-245693-3	NERT4.70N1-20190709-EB	Total/NA	Water	300.1B	
440-245693-4	NERT4.71N1-20190709	Total/NA	Water	300.1B	
440-245693-5	WMW5.7N-20190709	Total/NA	Water	300.1B	
MB 440-557434/47	Method Blank	Total/NA	Water	300.1B	
LCS 440-557434/46	Lab Control Sample	Total/NA	Water	300.1B	
MRL 440-557434/45	Lab Control Sample	Total/NA	Water	300.1B	
440-245693-2 MS	NERT4.70N1-20190709	Total/NA	Water	300.1B	
440-245693-2 MSD	NERT4.70N1-20190709	Total/NA	Water	300.1B	

Analysis Batch: 557509

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245693-1	WMW4.9S-20190709	Total/NA	Water	314.0	
MB 440-557509/46	Method Blank	Total/NA	Water	314.0	
LCS 440-557509/47	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557509/8	Lab Control Sample	Total/NA	Water	314.0	
440-245046-A-3 MS	Matrix Spike	Total/NA	Water	314.0	
440-245046-A-3 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

Analysis Batch: 557511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245693-3	NERT4.70N1-20190709-EB	Total/NA	Water	314.0	
MB 440-557511/6	Method Blank	Total/NA	Water	314.0	
LCS 440-557511/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557511/8	Lab Control Sample	Total/NA	Water	314.0	
440-245452-D-3 MS	Matrix Spike	Total/NA	Water	314.0	
440-245452-D-3 MSD	Matrix Spike Duplicate	Total/NA	Water	314.0	

Analysis Batch: 557816

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245693-2	NERT4.70N1-20190709	Total/NA	Water	314.0	
440-245693-4	NERT4.71N1-20190709	Total/NA	Water	314.0	
440-245693-5	WMW5.7N-20190709	Total/NA	Water	314.0	
MB 440-557816/6	Method Blank	Total/NA	Water	314.0	
LCS 440-557816/5	Lab Control Sample	Total/NA	Water	314.0	
MRL 440-557816/8	Lab Control Sample	Total/NA	Water	314.0	
440-245693-5 MS	WMW5.7N-20190709	Total/NA	Water	314.0	
440-245693-5 MSD	WMW5.7N-20190709	Total/NA	Water	314.0	

General Chemistry

Analysis Batch: 557739

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245693-2	NERT4.70N1-20190709	Total/NA	Water	SM 2540C	
440-245693-3	NERT4.70N1-20190709-EB	Total/NA	Water	SM 2540C	
440-245693-4	NERT4.71N1-20190709	Total/NA	Water	SM 2540C	
MB 440-557739/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 440-557739/2	Lab Control Sample	Total/NA	Water	SM 2540C	
440-245493-A-1 DU	Duplicate	Total/NA	Water	SM 2540C	

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Definitions/Glossary

Client: AECOM Job ID: 440-245693-1

Project/Site: NERT NDEP Phase II SDG: LVW

Qualifiers

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Qualifier Qualifier Description

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)
LOD Limit of Detection (DoD/DOE)
LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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Accreditation/Certification Summary

Client: AECOM Job ID: 440-245693-1 Project/Site: NERT NDEP Phase II

Laboratory: Eurofins TestAmerica, Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Nevada	State Program	9	CA015312019-5	07-31-19 *

SDG: LVW

^{*} Accreditation/Certification renewal pending - accreditation/certification considered valid.

TestAmerica Phoenix

4625 E. Cotton Senter Blud. Suite 189

Phoenix: AZ 85046 Phone: 602.437.3340 Fax:

TestAmericaChain of Custody Record Las Vegas and Quite 219

179791

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc. TAL-8210 (0713)

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Client: AECOM

Job Number: 440-245693-1

SDG Number: LVW

Login Number: 245693 List Source: Eurofins TestAmerica, Irvine

List Number: 1

Creator: Skinner, Alma D

Creator: Skinner, Alma D		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins TestAmerica, Irvine

Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Irvine 17461 Derian Ave Suite 100 Irvine, CA 92614-5817

Tel: (949)261-1022

Laboratory Job ID: 440-245693-2

Laboratory Sample Delivery Group: LVW Client Project/Site: NERT NDEP Phase II

For: AECOM 1220 Avenida Acaso Camarillo, California 93012

Attn: Carmen Caceres-Schnell

anea Roberdo

Authorized for release by: 7/18/2019 4:54:49 PM

Danielle Roberts, Senior Project Manager (949)260-3249

danielle.roberts@testamericainc.com

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: AECOM Project/Site: NERT NDEP Phase II Laboratory Job ID: 440-245693-2

SDG: LVW

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Sample Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245693-2

SDG: LVW

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-245693-2	NERT4.70N1-20190709	Water	07/09/19 11:50	07/11/19 10:20
440-245693-3	NERT4.70N1-20190709-EB	Water	07/09/19 12:05	07/11/19 10:20
440-245693-4	NERT4.71N1-20190709	Water	07/09/19 12:55	07/11/19 10:20

Case Narrative

Client: AECOM

Job ID: 440-245693-2 Project/Site: NERT NDEP Phase II

SDG: LVW

Job ID: 440-245693-2

Laboratory: Eurofins TestAmerica, Irvine

Narrative

Job Narrative 440-245693-2

Comments

No additional comments.

Receipt

The samples were received on 7/11/2019 10:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.0° C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: AECOM Job ID: 440-245693-2 Project/Site: NERT NDEP Phase II

SDG: LVW

5

Client Sample ID: NERT4.70N1-20190709 Lab Sample ID: 440-245693-2

No Detections.

Client Sample ID: NERT4.70N1-20190709-EB Lab Sample ID: 440-245693-3

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Chromium	0.70 J	2.0	0.50 ug/L	1 200.8	Dissolved

Client Sample ID: NERT4.71N1-20190709 Lab Sample ID: 440-245693-4

	Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
ı	Chromium	0.69 J	2.0	0.50 ug/L	1 200.8	Dissolved

Client Sample Results

Client: AECOM Job ID: 440-245693-2
Project/Site: NERT NDEP Phase II SDG: LVW

Client Sample ID: NERT4.70N1-20190709 Lab Sample ID: 440-245693-2

Matrix: Water

Date Collected: 07/09/19 11:50 Date Received: 07/11/19 10:20

Method: 200.8 - Metals (ICP/MS) - Dissolved									
	Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Chromium	ND	2.0	0.50	ug/L		07/17/19 12:07	07/17/19 20:00	1

Client Sample ID: NERT4.70N1-20190709-EB

Date Collected: 07/09/19 12:05

Lab Sample ID: 440-245693-3

Matrix: Water

Date Received: 07/11/19 10:20

Method: 200.8 - Metals (ICP/MS										
Analyte	Result C	Qualifier	RL	MDL	Unit	D)	Prepared	Analyzed	Dil Fac
Chromium	0.70 J	j	2.0	0.50	ug/L			07/15/19 12:39	07/15/19 22:10	1

Client Sample ID: NERT4.71N1-20190709

Date Collected: 07/09/19 12:55

Lab Sample ID: 440-245693-4

Matrix: Water

Date Collected: 07/09/19 12:55 Date Received: 07/11/19 10:20

Method: 200.8 - Metals (ICP/M	S) - Dissolv	ed							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	0.69	J	2.0	0.50	ug/L		07/15/19 12:39	07/15/19 22:13	1

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Method Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245693-2

SDG: LVW

Method	Method Description	Protocol	Laboratory
200.8	Metals (ICP/MS)	EPA	TAL IRV
200.2	Preparation, Total Recoverable Metals	EPA	TAL IRV

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

J

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Lab Chronicle

Client: AECOM

Job ID: 440-245693-2 Project/Site: NERT NDEP Phase II

SDG: LVW

Client Sample ID: NERT4.70N1-20190709

Lab Sample ID: 440-245693-2 Date Collected: 07/09/19 11:50 **Matrix: Water** Date Received: 07/11/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	557997	07/17/19 12:07	EP	TAL IRV
Dissolved	Analysis	200.8		1			558111	07/17/19 20:00	P1R	TAL IRV

Client Sample ID: NERT4.70N1-20190709-EB Lab Sample ID: 440-245693-3

Date Collected: 07/09/19 12:05 **Matrix: Water**

Date Received: 07/11/19 10:20

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Dissolved	Prep	200.2			25 mL	25 mL	557573	07/15/19 12:39	EP	TAL IRV
Dissolved	Analysis	200.8		1			557670	07/15/19 22:10	P1R	TAL IRV

Client Sample ID: NERT4.71N1-20190709 Lab Sample ID: 440-245693-4 **Matrix: Water**

Date Collected: 07/09/19 12:55 Date Received: 07/11/19 10:20

Batch Batch Dil Initial Final Batch Prepared Method **Prep Type** Туре Run **Factor** Amount **Amount** Number or Analyzed Analyst Lab TAL IRV 200.2 557573 07/15/19 12:39 EP Dissolved Prep 25 mL 25 mL Dissolved Analysis 200.8 1 557670 07/15/19 22:13 P1R TAL IRV

Laboratory References:

TAL IRV = Eurofins TestAmerica, Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Eurofins TestAmerica, Irvine

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245693-2

SDG: LVW

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 440-557573/1-A Client Sample ID: Method Blank **Matrix: Water Prep Type: Total Recoverable Prep Batch: 557573**

Analysis Batch: 557670

	IVID	IVID									
Analyte	Result	Qualifier	RL	MDL	Unit	D)	Prepared	Analyzed	Dil Fac	
Chromium	ND		2.0	0.50	ug/L			07/15/19 12:39	07/15/19 21:20	1	

Lab Sample ID: LCS 440-557573/2-A **Client Sample ID: Lab Control Sample Matrix: Water Prep Type: Total Recoverable Prep Batch: 557573 Analysis Batch: 557670**

LCS LCS Spike %Rec. Analyte Added Result Qualifier Unit D %Rec Limits

80.0 Chromium 76.6 ug/L 96 85 - 115 Lab Sample ID: MB 440-557997/1-A Client Sample ID: Method Blank

Matrix: Water Prep Type: Total Recoverable Analysis Batch: 558111 Prep Batch: 557997

MB MB Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac

Chromium 2.0 0.50 ug/L 07/17/19 12:07 07/17/19 19:26 $\overline{\mathsf{ND}}$ Lab Sample ID: LCS 440-557997/2-A **Client Sample ID: Lab Control Sample**

Matrix: Water Prep Type: Total Recoverable Analysis Batch: 558111 Prep Batch: 557997

Spike LCS LCS %Rec.

Added Limits Analyte Result Qualifier D %Rec Unit Chromium 80.0 79.6 99 85 - 115 ug/L

Lab Sample ID: 440-245657-J-1-H MS **Matrix: Water**

Analysis Batch: 557670

Prep Batch: 557573 Sample Sample Spike MS MS %Rec. Result Qualifier Added Analyte Result Qualifier Unit %Rec Limits Chromium 80.0 92 70 - 130 85.6 ug/L

Lab Sample ID: 440-245657-J-1-I MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water Prep Type: Dissolved Analysis Batch: 557670 Prep Batch: 557573** Spike MSD MSD Sample Sample %Rec. **RPD**

Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits **RPD** Limit Chromium 12 80.0 84.9 ug/L 70 - 130

Lab Sample ID: 440-245802-J-1-H MS Client Sample ID: Matrix Spike **Matrix: Water Prep Type: Dissolved**

Analysis Batch: 558111 Prep Batch: 557997 Sample Sample Spike MS MS %Rec. Result Qualifier Added Result Qualifier Unit %Rec Limits

Analyte Chromium 2.0 80.0 78.9 96 70 - 130 ug/L

Lab Sample ID: 440-245802-J-1-I MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water Prep Type: Dissolved Analysis Batch: 558111 Prep Batch: 557997**

Sample Sample Spike MSD MSD %Rec. **RPD** Result Qualifier Added Result Qualifier RPD Limit Analyte Unit %Rec Limits Chromium 2.0 80.0 75.7 ug/L 92 70 - 130 20

Eurofins TestAmerica, Irvine

Client Sample ID: Matrix Spike

Prep Type: Dissolved

Page 9 of 14

7/18/2019

QC Association Summary

Client: AECOM

Project/Site: NERT NDEP Phase II

Job ID: 440-245693-2 SDG: LVW

.VW

Metals

Prep Batch: 557573

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245693-3	NERT4.70N1-20190709-EB	Dissolved	Water	200.2	
440-245693-4	NERT4.71N1-20190709	Dissolved	Water	200.2	
MB 440-557573/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-557573/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-245657-J-1-H MS	Matrix Spike	Dissolved	Water	200.2	
440-245657-J-1-I MSD	Matrix Spike Duplicate	Dissolved	Water	200.2	

Analysis Batch: 557670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245693-3	NERT4.70N1-20190709-EB	Dissolved	Water	200.8	557573
440-245693-4	NERT4.71N1-20190709	Dissolved	Water	200.8	557573
MB 440-557573/1-A	Method Blank	Total Recoverable	Water	200.8	557573
LCS 440-557573/2-A	Lab Control Sample	Total Recoverable	Water	200.8	557573
440-245657-J-1-H MS	Matrix Spike	Dissolved	Water	200.8	557573
440-245657-J-1-I MSD	Matrix Spike Duplicate	Dissolved	Water	200.8	557573

Prep Batch: 557997

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245693-2	NERT4.70N1-20190709	Dissolved	Water	200.2	
MB 440-557997/1-A	Method Blank	Total Recoverable	Water	200.2	
LCS 440-557997/2-A	Lab Control Sample	Total Recoverable	Water	200.2	
440-245802-J-1-H MS	Matrix Spike	Dissolved	Water	200.2	
440-245802-J-1-I MSD	Matrix Spike Duplicate	Dissolved	Water	200.2	

Analysis Batch: 558111

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-245693-2	NERT4.70N1-20190709	Dissolved	Water	200.8	557997
MB 440-557997/1-A	Method Blank	Total Recoverable	Water	200.8	557997
LCS 440-557997/2-A	Lab Control Sample	Total Recoverable	Water	200.8	557997
440-245802-J-1-H MS	Matrix Spike	Dissolved	Water	200.8	557997
440-245802-J-1-I MSD	Matrix Spike Duplicate	Dissolved	Water	200.8	557997

Eurofins TestAmerica, Irvine

Definitions/Glossary

Client: AECOM Job ID: 440-245693-2

Project/Site: NERT NDEP Phase II

SDG: LVW

Qualifiers

M	ota	le
IVI	Cla	IJ

Qualifier Qualifier Description

J Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery

CFL Contains Free Liquid
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MDA Minimum Detectable Activity (Radiochemistry)
MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

PQL Practical Quantitation Limit

QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

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12

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Accreditation/Certification Summary

Client: AECOM Job ID: 440-245693-2 Project/Site: NERT NDEP Phase II

Laboratory: Eurofins TestAmerica, Irvine

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Nevada	State Program	9	CA015312019-5	07-31-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

SDG: LVW

TestAmerica Phoenix

4625 E. Cotton Senter Blud. Suite 189

Phoenix: AZ 85046 Phone: 602.437.3340 Fax:

TestAmericaChain of Custody Record Las Vegas and Quite

219

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THE LEADER IN ENVIRONMENTAL TESTING TestAmerica Laboratories, Inc.

rnune: 002.937.3340 Fax:	Regu	latory Pro	ogram: [] bw	NPDES		RCF	ZA	Ot	her:											TAL-821	o (0713)
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Site: <u>LVW</u> PO# 60477345	┫		2 days	U		원통	1	3		5					1 1			Job /	SDG NO	-		4
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WMW4.95-20190709	7/4/19	1005	9	6W	2		1	¥														
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Preservation Used: 1= ice, 2= HCl; 3= H2SO4; 4=HNO3;		C Other				Щ	_		4		44	1		_	+1	4	-			:11:		: 111-
Possible Hazard Identification:	, o=NaUn;	o- Other_		-		-	amo	le Di	isnos	al / A fe	e may	he as	5000	d if s	ample	s are	retair	red longe	or than 1	month	7	<u></u>
Are any samples from a listed EPA Hazardous Waste? Plea Comments Section if the lab is to dispose of the sample	ise List any	EPA Waste	Codes for	the samp	ole in the	e		4	N									.ou tong	,		,	
Non-Hazard Flammable Skin Irritant	Poisoi	n B	Unkn	own				Retur	n to Cla	ent	Ξ	Dispos	al by L	ab		Arc	hive for		_ Months			
Special Instructions/QC Requirements & Comments:										, ,												
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Job Number: 440-245693-2

SDG Number: LVW

Login Number: 245693 List Source: Eurofins TestAmerica, Irvine

List Number: 1

Client: AECOM

Creator: Skinner, Alma D

Creator: Skinner, Alma D		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	Not Present
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	







July 11, 2019

Chad Roper
AECOM

1220 Avenida Acaso
Camarillo, CA 93012

Lab ID:

Las Vegas, NV (NV930, CA3029)

Reno, NV (NV015, CA2526)

Project: 60477365 Workorder No.: 19061527

Dear Chad Roper:

Silver State Labs-Las Vegas received 3 sample(s) on 6/26/2019 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative. Analytical results reported as non-detect (ND) in the result field are below the Practical Quantification Limit (PQL). Analytical results above the PQL are reported as the measured value in the results field.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

John Sloan

Laboratory Technical Director 3626 E. Sunset Road, Suite 100 Las Vegas, NV 89120



Silver State Labs-Las Vegas 3626 E. Sunset Road, Suite 100

www.ssalabs.com

ND

Analytical Report

WO#: 19061527

Date Reported: 7/11/2019

7/7/2019 9:09:00 PM

CLIENT: AECOM Collection Date: 6/26/2019 12:35:00 PM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19061527-01 Matrix:

Client Sample ID NERT-3.35S1-20190626

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.

Not Detected at the PQL. ND



Silver State Labs-Las Vegas 3626 E. Sunset Road, Suite 100

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ND

Analytical Report

WO#: 19061527

Date Reported: 7/11/2019

7/7/2019 9:23:00 PM

CLIENT: AECOM Collection Date: 6/26/2019 12:35:00 PM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19061527-02 Matrix:

Client Sample ID NERT-3.35S1-20190626-FD

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

Dilution Factor. DF

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.

Not Detected at the PQL. ND



Silver State Labs-Las Vegas 3626 E. Sunset Road, Suite 100

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ND

Analytical Report

WO#: 19061527

Date Reported: 7/11/2019

7/7/2019 9:38:00 PM

CLIENT: AECOM Collection Date: 6/26/2019 2:45:00 PM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19061527-03 Matrix:

Client Sample ID NERT-3.40S1-20190626

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.

ND Not Detected at the PQL.



H Holding times for preparation or analysis exceeded.

Qualifiers:

Silver State Labs-Las Vegas

QC SUMMARY REPORT

ND Not Detected at the PQL.

WO#:

19061527

11-Jul-19

Client: Project:	AECOM 60477365						TestCode: C	CR6-SDWA-218.7	
Sample ID:	ICV-R31012	SampType: ICV	TestCode: CR6-SDW	'A-2 Units: μg/L		Prep Date:	7/7/2019	RunNo: 31012	
Client ID:	ICV	Batch ID: R31012	TestNo: E218.7			Analysis Date:	7/7/2019	SeqNo: 713304	
Analyte		Result	PQL SPK value	SPK Ref Val	%REC	LowLimit Hig	ghLimit RPD Ref Val	%RPD RPDLimit	Qual
Chromium, F	Hexavalent	53.9	1.00 50.00	0	108	90	110		
Sample ID:	ICB-R31012	SampType: ICB	TestCode: CR6-SDW	'A-2 Units: μg/L		Prep Date:	7/7/2019	RunNo: 31012	
Client ID:	ICB	Batch ID: R31012	TestNo: E218.7			Analysis Date:	7/7/2019	SeqNo: 713305	
Analyte		Result	PQL SPK value	SPK Ref Val	%REC	LowLimit Hig	ghLimit RPD Ref Val	%RPD RPDLimit	Qual
Chromium, H	Hexavalent	ND	1.00						
Sample ID:	CCV-R31012	SampType: CCV	TestCode: CR6-SDW	'A-2 Units: μg/L		Prep Date:	7/8/2019	RunNo: 31012	
Client ID:	CCV	Batch ID: R31012	TestNo: E218.7			Analysis Date:	7/8/2019	SeqNo: 713306	
Analyte		Result	PQL SPK value	SPK Ref Val	%REC	LowLimit Hig	ghLimit RPD Ref Val	%RPD RPDLimit	Qual
Chromium, F	Hexavalent	52.2	1.00 50.00	0	104	90	110		
Sample ID:	CCB-R31012	SampType: CCB	TestCode: CR6-SDW	'A-2 Units: μg/L		Prep Date:	7/8/2019	RunNo: 31012	
Client ID:	ССВ	Batch ID: R31012	TestNo: E218.7			Analysis Date:	7/8/2019	SeqNo: 713307	
Analyte		Result	PQL SPK value	SPK Ref Val	%REC	LowLimit Hig	ghLimit RPD Ref Val	%RPD RPDLimit	Qual
Chromium, F	Hexavalent	ND	1.00						

MCL Maximum Contaminant Level.



Silver State Labs-Las Vegas

QC SUMMARY REPORT

WO#:

19061527

11-Jul-19

Client:	AECOM						
Project:	60477365					TestCode:	CR6-SDWA-218.7
Sample ID:	CCB-R31012	SampType: CCB	TestCode: CR6-SDWA-2	Units: µg/L	Prep Date:	7/8/2019	RunNo: 31012

o: **31012** Client ID: CCB Batch ID: R31012 Analysis Date: 7/8/2019 TestNo: **E218.7** SeqNo: 713307

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

Sample ID: MB-R31012 Client ID: PBW	SampType: MBLK Batch ID: R31012		de: CR6-SDW No: E218.7	A-2 Units: μg/L		Prep Da Analysis Da	te: 7/7/201		RunNo: 310 SeqNo: 713		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	1.00									

Sample ID: LCS-R31012 Client ID: LCSW	SampType: LCS Batch ID: R31012		de: CR6-SDW.	A-2 Units: µg/L		•	ite: 7/7/2019 ite: 7/7/2019		RunNo: 310 SeqNo: 713		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium. Hexavalent	20.7	1.00	20.00	0	104	90	110				

Sample ID: 19061403-04CMS Client ID: BatchQC	SampType: MS Batch ID: R31012		le: CR6-SDW/	A-2 Units: μg/L		Prep Dat Analysis Dat	te: 7/7/2019 te: 7/7/2019		RunNo: 310 SeqNo: 713		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	18.8	1.00	5.000	14.04	95.4	90	110				

H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL. Qualifiers:



Chromium, Hexavalent

Silver State Labs-Las Vegas

www.ssalabs.com

13.8

1.00

QC SUMMARY REPORT

WO#:

19061527

11-Jul-19

Client: Project:	AECOM 60477365						т	estCode:	CR6-SDWA-	219 7	
Troject.	00477303						1	estCode.	CKU-SDWA-	210./	
Sample ID:	19061403-04CMSD	SampType: MSD	TestCode: CR6-SDW	4-2 Units: μg/L		Prep Dat	te: 7/7/201	9	RunNo: 310)12	
Client ID:	BatchQC	Batch ID: R31012	TestNo: E218.7			Analysis Dat	te: 7/7/201	9	SeqNo: 713	3314	
Analyte		Result	PQL SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium,	Hexavalent	19.1	1.00 5.000	14.04	101	90	110	18.81	1.45	20	
Sample ID:	19061616-01AMS	SampType: MS	TestCode: CR6-SDW	A-2 Units: μg/L		Prep Dat	te: 7/7/201	9	RunNo: 310)12	
Client ID:	BatchQC	Batch ID: R31012	TestNo: E218.7			Analysis Dat	te: 7/7/201	9	SeqNo: 713	3322	
Client ID: Analyte	BatchQC	Batch ID: R31012 Result	TestNo: E218.7 PQL SPK value	SPK Ref Val	%REC	Analysis Dat		9 RPD Ref Val	SeqNo: 713 %RPD	RPDLimit	Qual
Analyte	BatchQC Hexavalent			SPK Ref Val	%REC 96.6	•					Qual
Analyte		Result	PQL SPK value			LowLimit	HighLimit				Qual
Analyte Chromium,		Result	PQL SPK value	9.093		LowLimit	HighLimit	RPD Ref Val		RPDLimit	Qual
Analyte Chromium,	Hexavalent	Result 13.9	PQL SPK value 1.00 5.000	9.093		LowLimit 90	HighLimit 110 te: 7/7/201	RPD Ref Val	%RPD	RPDLimit	Qual

9.093

90

110

13.92

0.662

20

94.7

H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL. Qualifiers:

5.000





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Com Maili City,	ng Address: /22 State, Zip:	Roper 60477365 Elom Co Avenida Acaso amarillo CA 930112 Email/Fax:		Con Mail	State,	JECOV Tress: 200	Son	HE Schwell Wh Gubec ST Village Co 8 Email/Fax:	Quote #	COMPLIANCE NEW ADDRESS NO Invoice: Applicable Program SDWA CWA RCRA Mining Other OC Level Report
ampled by	: J CA	2007 Ched. spect & a. Signature:	hope		80	5 764	1 46	ANALYSES REQU	res-schnelle accom	NOTE: Suicharges apply to Level II, III and IV reports Send Results Via: Mail: Email: Fax:
Stan Rush Same 1 Day 2 Day	dard: Day: Day: V: V: V: V: V: V: V:	Standard TAT 7-10 Business Days. Note that some tests vary. 3 Day: Other (specify): Per Werld 4 4 Day: 5 Day: Rush results will be issued after 4:00 p.m.	Other Pertinent In	formation /	Special	Instructions	mber / Type of Containers ***	Chromium 218.7		Send Invoice Via: Mail: Email: Fax: Fax: Field Measurements On-Site pH: Chlorine:
Date Sampled	Time Sampled	Sample Identification	SSAL - SEM Lab No	O. Comp	Matrix	Preservative**	N	Hex		Temperature: Other:
126/19	1235	NERT-3.3551-201906ZL	19061527-1	+ 6	Ew	Nove	V	×		Metals*
126/A	1235	NERT- 3.35SI-2090626- FD	-2	4 6	6W	Nume	V	4		THO-1000
16/19	1445	NERT- 3.40SI -20190626	-3	A 6	GW	nene	1	×		1
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			4	
Signature Relinquished By:	Print Name	Company	Date	Time
Received By:	5 CAPOTRIC	AECOM	6/26/19	1610
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uthorization is required to process samples. This obligates your organiza	ation for service fees. SSAL Standard T & C's or other written agreement applies. If collections or	Samples are discarded 30 days after results are reported un	less other arrangements are made a	and storage fees may apply

Authorization is required to process samples. This obligates your organization for service fees. SSAL Standard T & C's or other written agreement applies. If collections or legal services are required to process samples, your organization will be responsible for all fees and costs in addition to service fees.

Matrix* DW-Drinking Water, WW-Waste Water, GW-Ground Water, SW-Surface Water, SS-Soil, S-Soild, OT-Other Preservative** 1=H₂SO₄, 2=HNO₃, 3=HCl, 4=NaOH, 5=Na₂S₂O₃, 6=None, 7=Other

Samples are discarded 30 days after results are reported unless other arrangements are made and storage fees mad

Container*** P-Plastic, G-Glass, V-Voa Vial, OT-Other

COMMENTS:

448 West Fork Dr Arlington, TX 76012 http://www.riccachemical.com 1-888-GO-RICCA customerservice@riccachemical.com

Certificate of Analysis

Hexavalent Chromium Standard, 100 ppm Cr⁶

Lot Number: 1807D61 Product Number: 2095

Manufacture Date: JUL 11, 2018

Expiration Date: JAN 2020

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Potassium Dichromate	7778-50-9	ACS

Test	Specification	Result	NIST SRM#
Appearance	Orange liquid	Passed	
Assay (vs. Sodium Thiosulfate/Starch)	99.5-100.5 ppm Cr	100.5 ppm Cr	136

Specification	Reference
Cr(VI) stock solution, 100 mg/L Cr6+	APHA (3500-Cr C)

Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with ε thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
2095-4	120 mL natural poly	18 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)

Israel Alamudun (07/11/2018)

Quality Control Supervisor

This Certificate of Analysis is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."

This test report shall not be reproduced, except in full, without the written approval of Ricca Chemical Company.

Version: 1.3 Lot Number: 1807D61 Product Number: 2095 Page 1 of 1

Alfa Aesar

Certificate of analysis

Product No.: 42234

Hexavalent Chromium Standard

Concentration: $1000 \pm 5 \mu g/mL$ Starting Material: $((NH_4)_2Cr_2O_7)$

Lot No.: 8132650 Matrix: H₂O

Expiry Date: November 30, 2020

This solution is intended for use as a calibration standard for Hexavalent Chromium (Cr⁺⁶). The certified concentration is based upon gravimetric procedures, ie., weight per volume composition of high purity raw material dissolved and diluted with ASTM Type I water. The uncertainty associated with the certified concentration is approximated by summing the estimated errors due to the purity of the starting material, the gravimetric preparation of the solution, and transpiration of the solution through the container wall.

NIST Traceability: All balances and class A volumetrics are calibrated regularly in accordance with NIST recommended procedures. In order to verify the concentration, the final solution was checked by titration against NIST SRM 136f.

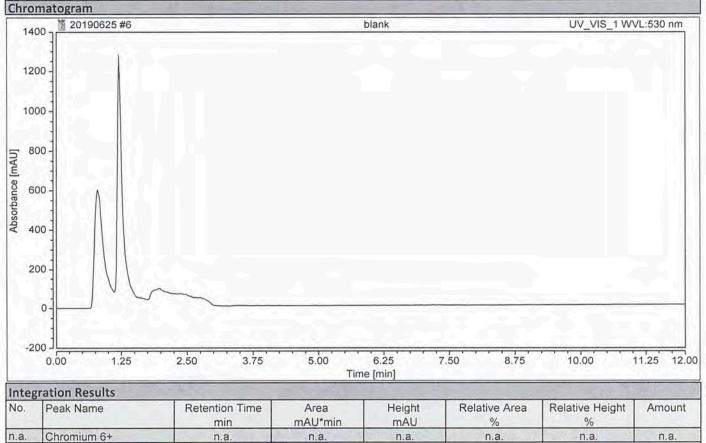
Shelf Life: Alfa Aesar guarantees the accuracy of this Specpure® solution until the expiry date shown above, provided it is kept tightly capped and stored under normal laboratory conditions. We recommend preparing fresh working solutions daily by diluting with the same matrix and using certified class A volumetrics.

5/14/2018

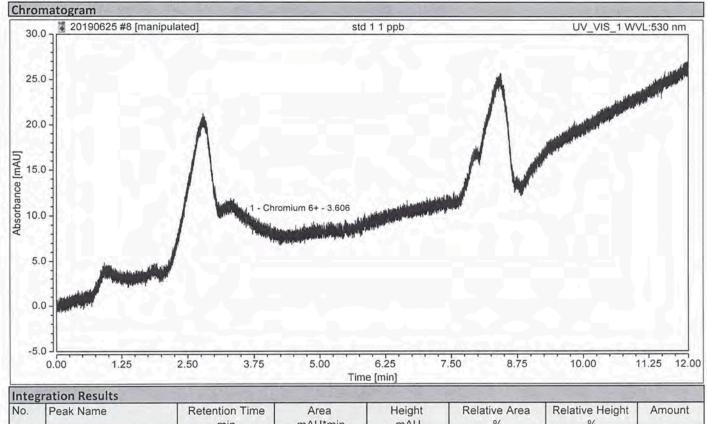
Certification Date

This document has been electronically generated and does not require a signature.

Chromatogram and Results Injection Details					
Vial Number:	4	Injection Volume:	5000.00		
Injection Type:	Unknown	Channel:	UV_VIS_1		
Calibration Level:		Wavelength:	530.0		
Instrument Method:	AS7 8min	Bandwidth:	n.a.		
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000		
Injection Date/Time:	7/7/2019 16:21	Sample Weight:	1.0000		

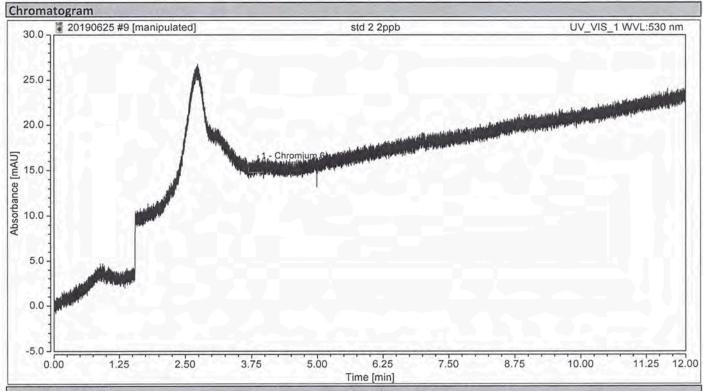


Chromatogram and Results Injection Details					
Vial Number:	4	Injection Volume:	5000.00		
Injection Type:	Calibration Standard	Channel:	UV VIS 1		
Calibration Level:	01	Wavelength:	530.0		
Instrument Method:	AS7_8min	Bandwidth:	n.a.		
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000		
Injection Date/Time:	7/7/2019 16:50	Sample Weight:	1.0000		



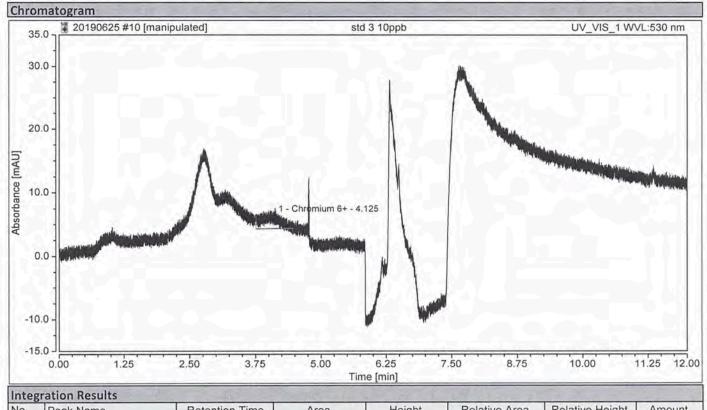
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	3.606	0.064	1.074	100.00	100.00	0.6698
Tota			0.064	1.074	100.00	100.00	

Chromatogram and Results Injection Details					
Vial Number:	4	Injection Volume:	5000.00		
Injection Type:	Calibration Standard	Channel:	UV_VIS_1		
Calibration Level:	02	Wavelength:	530.0		
Instrument Method:	AS7_8min	Bandwidth:	n.a.		
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000		
Injection Date/Time:	7/7/2019 17:04	Sample Weight:	1.0000		



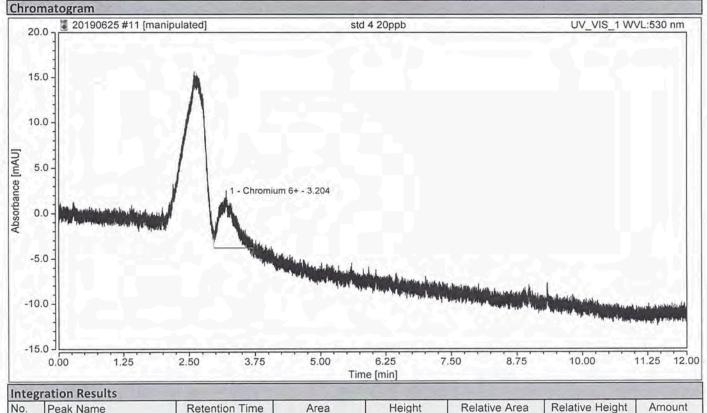
Integ	Integration Results						
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area	Relative Height %	Amount
1	Chromium 6+	3.873	0.143	1.199	100.00	100.00	1.4947
Total			0.143	1.199	100.00	100.00	

Chromatogram and Results Injection Details					
Vial Number:	4	Injection Volume:	5000.00		
Injection Type:	Calibration Standard	Channel:	UV_VIS_1		
Calibration Level:	03	Wavelength:	530.0		
Instrument Method:	AS7_8min	Bandwidth:	n.a.		
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000		
Injection Date/Time:	7/7/2019 17:19	Sample Weight:	1.0000		



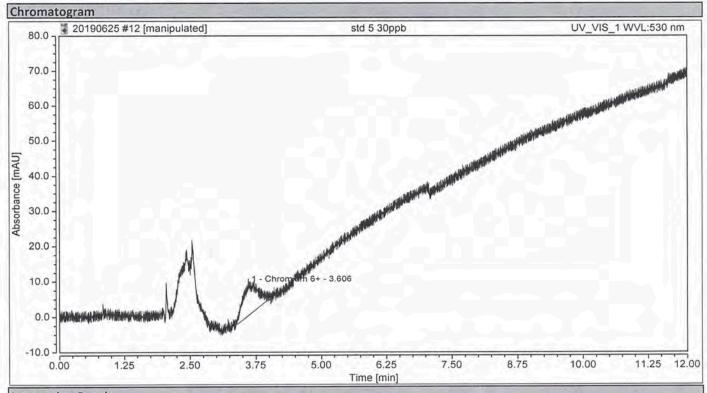
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	4.125	0.856	2.208	100.00	100.00	8.9432
Total	1:)		0.856	2.208	100.00	100.00	

Chromatogram and Results Injection Details					
Vial Number:	4	Injection Volume:	5000.00		
Injection Type:	Calibration Standard	Channel:	UV_VIS_1		
Calibration Level:	04	Wavelength:	530.0		
Instrument Method:	AS7 8min	Bandwidth:	n.a.		
Processing Method:	AS CR 8min 0409	Dilution Factor:	1.0000		
Injection Date/Time:	7/7/2019 17:33	Sample Weight:	1.0000		



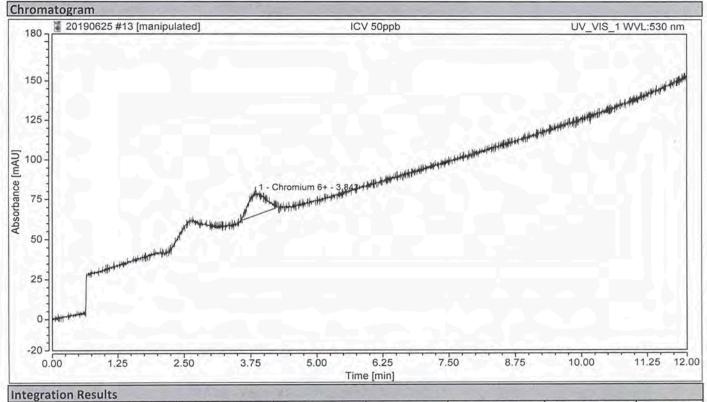
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	3.204	1.880	5.679	100.00	100.00	19.6387
Tota	l:		1.880	5.679	100.00	100.00	

Chromatogram and Results							
Injection Details							
Injection Name:	std 5 30ppb	Run Time (min):	12.00				
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Calibration Standard	Channel:	UV_VIS_1				
Calibration Level:	05	Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS CR 8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 17:47	Sample Weight:	1.0000				



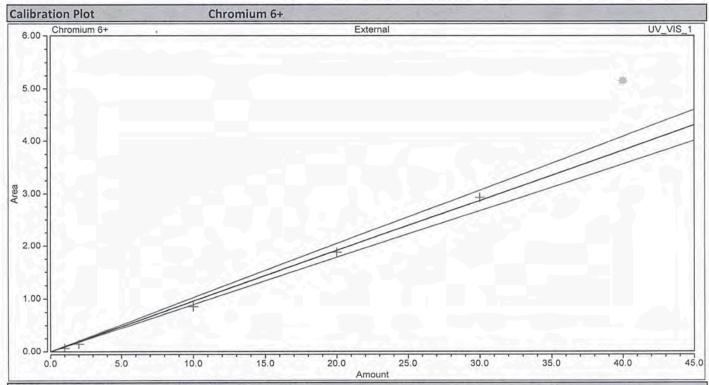
Integ	gration Results	The state of the same					
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	3.606	2.933	8.715	100.00	100.00	30.6378
Total	l:		2.933	8.715	100.00	100.00	

Chromatogram and Results						
Injection Details						
Injection Name:	ICV 50ppb	Run Time (min):	12.00			
Vial Number:	4	Injection Volume:	5000.00			
Injection Type:	Calibration Standard	Channel:	UV VIS 1			
Calibration Level:	06	Wavelength:	530.0			
Instrument Method:	AS7_8min	Bandwidth:	n.a.			
Processing Method:	AS CR 8min 0409	Dilution Factor:	1.0000			
Injection Date/Time:	7/7/2019 18:02	Sample Weight:	1.0000			



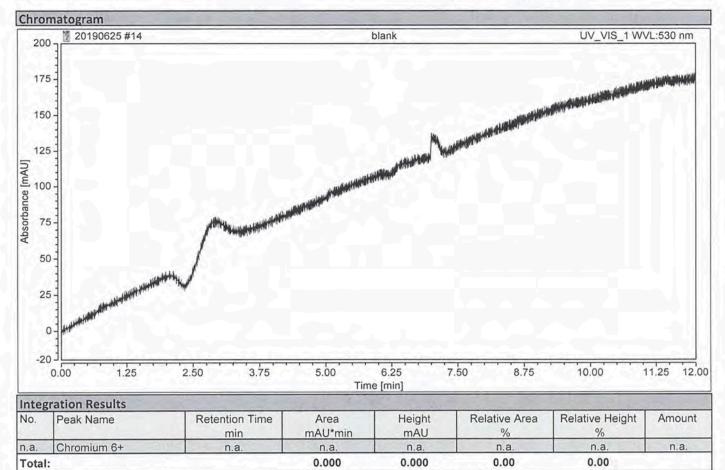
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	3.843	5.155	13.931	100.00	100.00	53.8569
Total:		5.155	13.931	100.00	100.00		

Calibration							
Calibration Details	Chromium 6+						
Calibration Type	Lin	Offset (C0)	0.0000				
Evaluation Type	Area	Slope (C1)	0.0957				
Number of Calibration Points	5	Curve (C2)	0.0000				
Number of disabled Calibration Points	1	R-Square	0.9969				

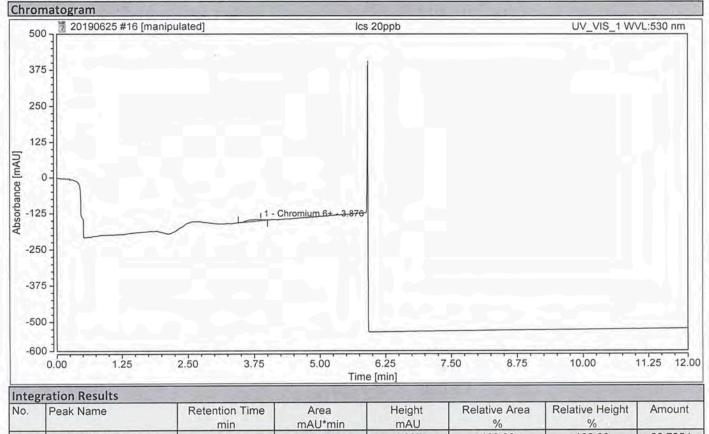


Calib	oration Results	Chromium 6+					
No.	Injection Name	Calibration Level	X Value Chromium 6+ UV VIS_1	Y Value Chromium 6+ UV_VIS_1	Y Value Chromium 6+ UV_VIS_1	Area mAU*min Chromium 6+ UV_VIS_1	Height mAU Chromium 6+ UV_VIS_1
8	std 1 1 ppb	01	1.0000	0.0641	0.0641	0.064	1.074
9	std 2 2ppb	02	2.0000	0.1431	0.1431	0.143	1.199
10	std 3 10ppb	03	10.0000	0.8560	0.8560	0.856	2.208
11	std 4 20ppb	04	20.0000	1.8797	1.8797	1.880	5.679
12	std 5 30ppb	05	30.0000	2.9325	2.9325	2.933	8.715
13	ICV 50ppb	06	40.0000	5.1549	5.1549	5.155	13.931

Chromatogram and Results						
Injection Details						
Injection Name:	blank	Run Time (min):	12.00			
Vial Number:	4	Injection Volume:	5000.00			
Injection Type:	Unknown	Channel:	UV_VIS_1			
Calibration Level:		Wavelength:	530.0			
Instrument Method:	AS7 8min	Bandwidth:	n.a.			
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000			
Injection Date/Time:	7/7/2019 18:16	Sample Weight:	1.0000			

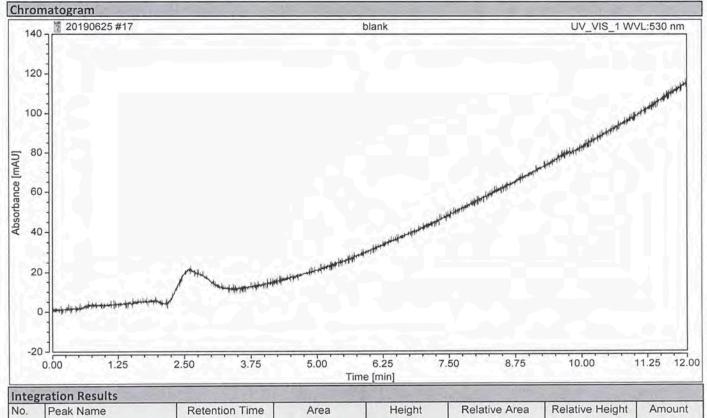


Chromatogram and Results						
Injection Details	and the second					
Injection Name:	lcs 20ppb	Run Time (min):	12.00			
Vial Number:	4	Injection Volume:	5000.00			
Injection Type:	Unknown	Channel:	UV_VIS_1			
Calibration Level:		Wavelength:	530.0			
Instrument Method:	AS7_8min	Bandwidth:	n.a.			
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000			
Injection Date/Time:	7/7/2019 18:45	Sample Weight:	1.0000			



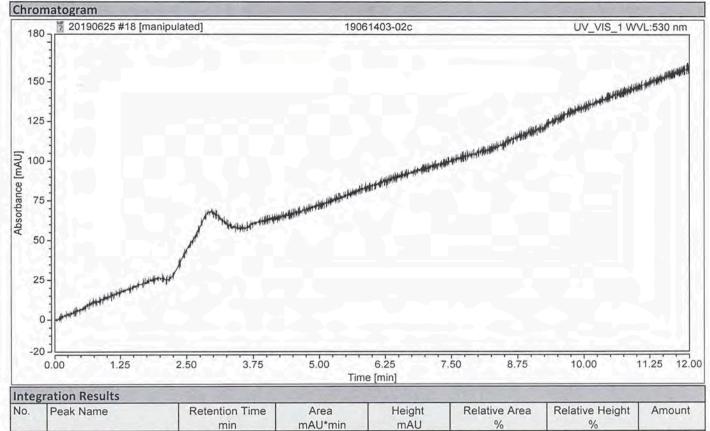
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	3.876	1.985	4.837	100.00	100.00	20.7354
Tota	l:		1.985	4.837	100.00	100.00	

Chromatogram and Results							
Injection Details							
Injection Name:	blank	Run Time (min):	12.00				
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV_VIS_1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 18:59	Sample Weight:	1.0000				



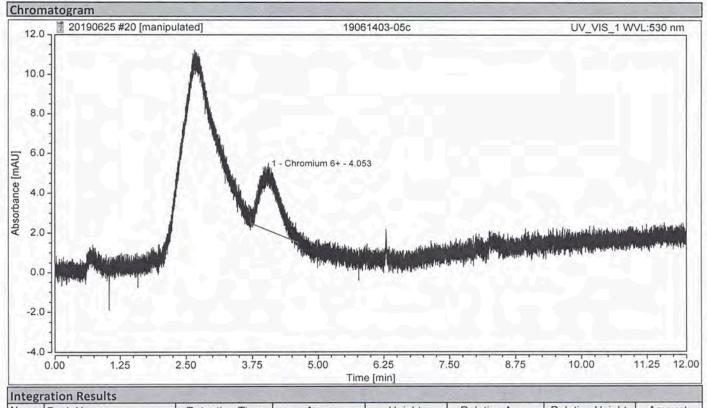
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
n.a.	Chromium 6+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total			0.000	0.000	0.00	0.00	

Chromatogram and Results Injection Details							
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV VIS 1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 19:14	Sample Weight:	1.0000				



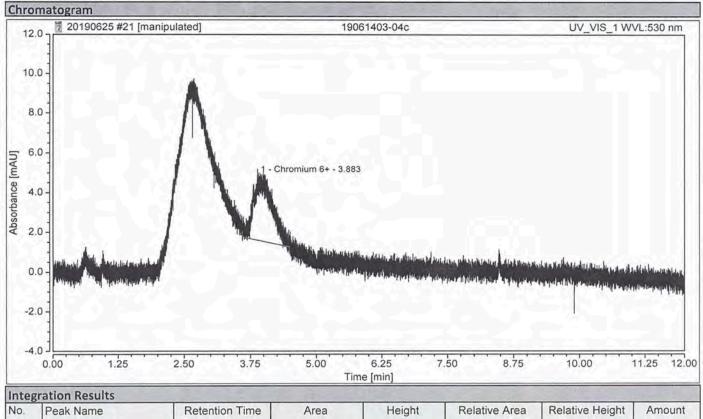
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
n.a.	Chromium 6+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:		0.000	0.000	0.00	0.00		

Chromatogram and Results Injection Details							
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV VIS 1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 19:43	Sample Weight:	1.0000				



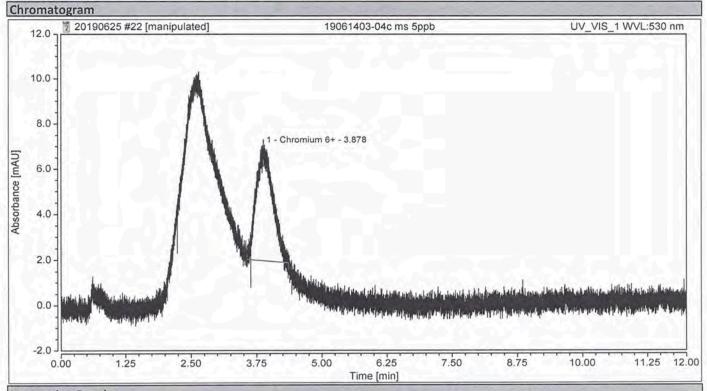
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	4.053	1.280	3.071	100.00	100.00	13.3700
Tota			1.280	3.071	100.00	100.00	

Chromatogram and Results Injection Details							
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV VIS 1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 19:57	Sample Weight:	1.0000				



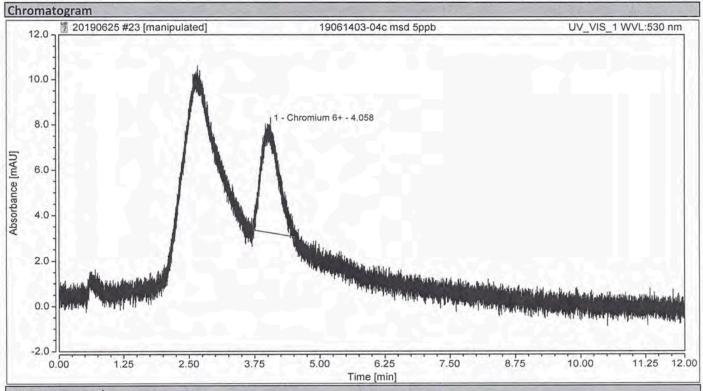
Integ	gration Results						
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	3.883	1.344	3.292	100.00	100.00	14.0419
Total:		1.344	3.292	100.00	100.00		

Chromatogram and Results Injection Details							
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV_VIS_1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7 8min	Bandwidth:	n.a.				
Processing Method:	AS CR 8min 0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 20:11	Sample Weight:	1.0000				



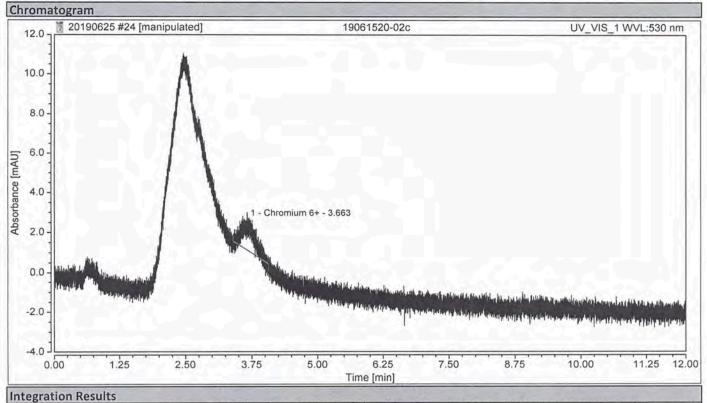
Integ	gration Results						
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	3.878	1.800	5.063	100.00	100.00	18.8107
Tota			1.800	5.063	100.00	100.00	

Chromatogram and Results Injection Details							
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV_VIS_1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 20:26	Sample Weight:	1.0000				



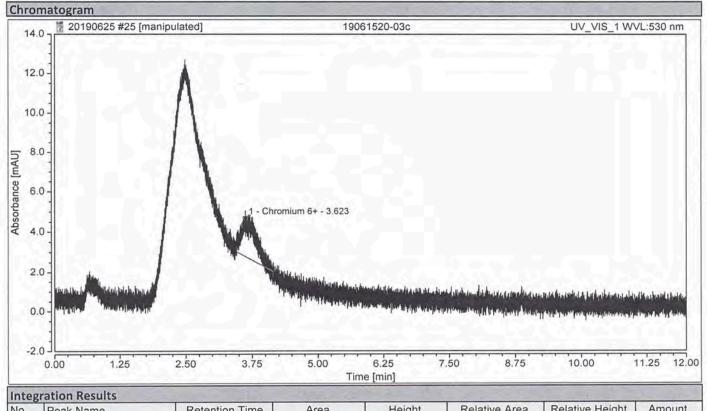
Integration Results							
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	4.058	1.827	4.813	100.00	100.00	19.0859
Total:		1.827	4.813	100.00	100.00		

Chromatogram and Results Injection Details							
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV VIS 1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 20:40	Sample Weight:	1.0000				



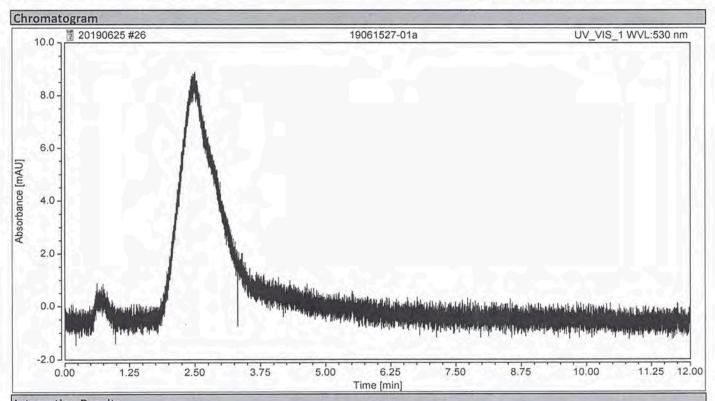
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	3.663	0.373	1.565	100.00	100.00	3.8924
Tota			0.373	1.565	100.00	100.00	

Chromatogram and Results						
Injection Details						
Injection Name:	19061520-03c	Run Time (min):	12.00			
Vial Number:	4	Injection Volume:	5000.00			
Injection Type:	Unknown	Channel:	UV VIS 1			
Calibration Level:		Wavelength:	530.0			
Instrument Method:	AS7 8min	Bandwidth:	n.a.			
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000			
Injection Date/Time:	7/7/2019 20:55	Sample Weight:	1.0000			



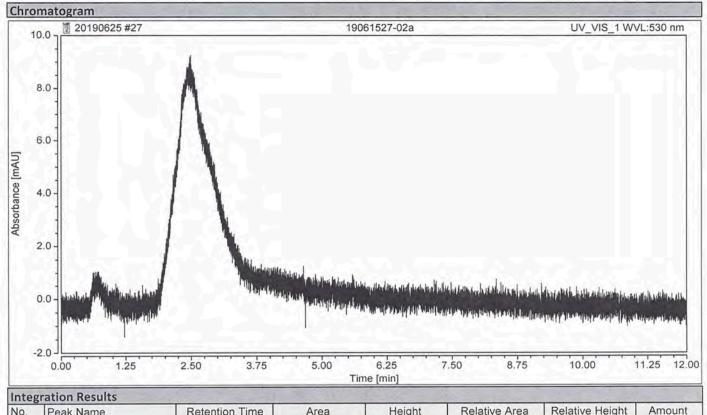
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	3.623	0.589	1.948	100.00	100.00	6.1567
Total:		0.589	1.948	100.00	100.00		

Chromatogram and Results						
Injection Details			100000000000000000000000000000000000000			
Injection Name:	19061527-01a	Run Time (min):	12.00			
Vial Number:	4	Injection Volume:	5000.00			
Injection Type:	Unknown	Channel:	UV_VIS_1			
Calibration Level:		Wavelength:	530.0			
Instrument Method:	AS7_8min	Bandwidth:	n.a.			
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000			
Injection Date/Time:	7/7/2019 21:09	Sample Weight:	1.0000			



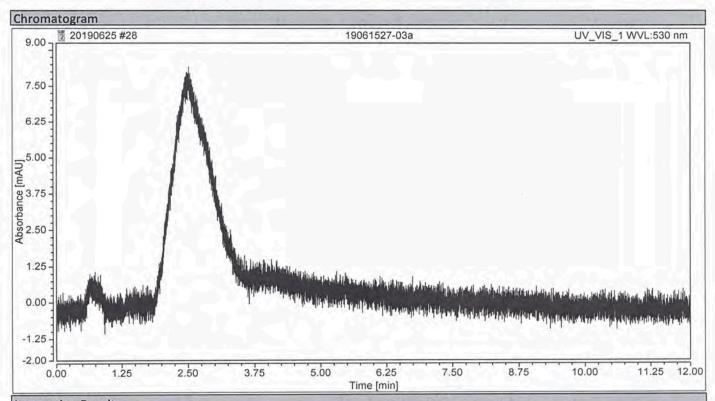
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
n.a.	Chromium 6+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Tota	: _ 1 =		0.000	0.000	0.00	0.00	

Chromatogram and Results							
Injection Details							
Injection Name:	19061527-02a	Run Time (min):	12.00				
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV_VIS_1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 21:23	Sample Weight:	1.0000				



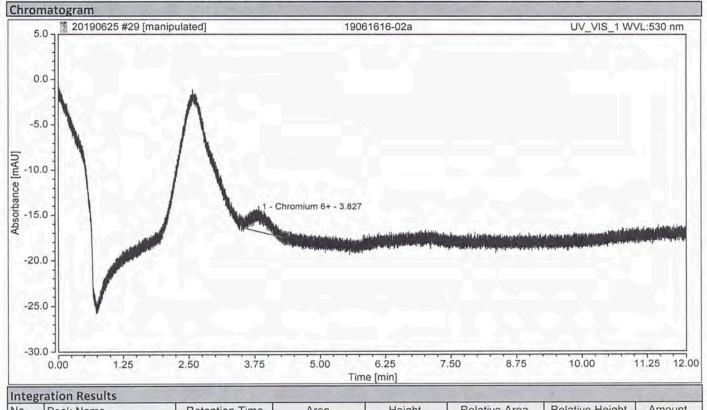
No.	Peak Name	Retention Time	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
n.a.	Chromium 6+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:		0.000	0.000	0.00	0.00		

Chromatogram and Results							
Injection Details							
Injection Name:	19061527-03a	Run Time (min):	12.00				
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV_VIS_1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 21:38	Sample Weight:	1.0000				



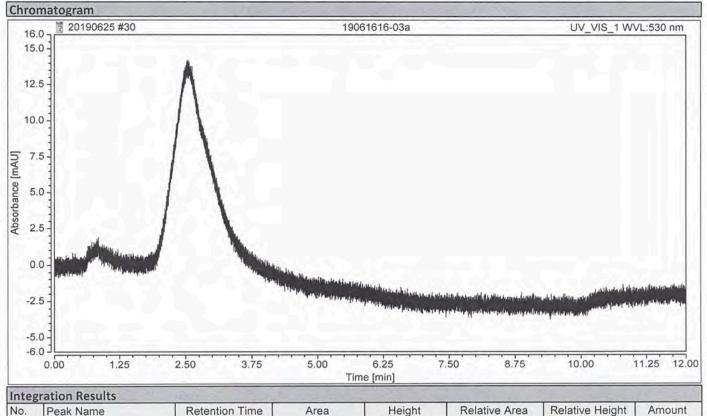
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
n.a.	Chromium 6+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:		0.000	0.000	0.00	0.00		

Chromatogram and Results						
Injection Details						
Injection Name:	19061616-02a	Run Time (min):	12.00			
Vial Number:	4	Injection Volume:	5000.00			
Injection Type:	Unknown	Channel:	UV_VIS_1			
Calibration Level:		Wavelength:	530.0			
Instrument Method:	AS7 8min	Bandwidth:	n.a.			
Processing Method:	AS CR_8min_0409	Dilution Factor:	1.0000			
Injection Date/Time:	7/7/2019 21:52	Sample Weight:	1.0000			



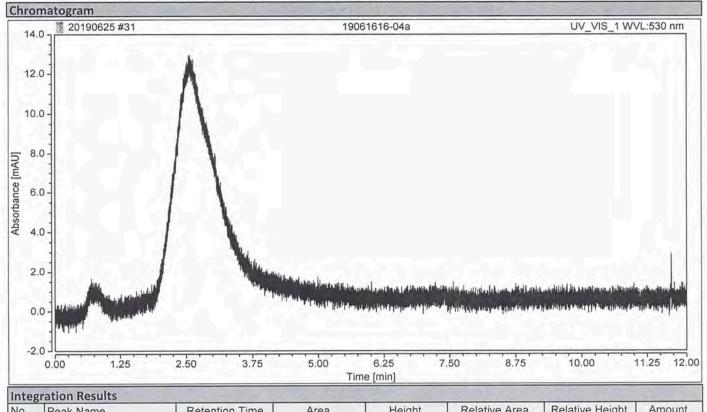
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	3.827	0.817	2.147	100.00	100.00	8.5382
Total:		0.817	2.147	100.00	100.00		

Chromatogram and Results						
Injection Details						
Injection Name:	19061616-03a	Run Time (min):	12.00			
Vial Number:	4	Injection Volume:	5000.00			
Injection Type:	Unknown	Channel:	UV VIS 1			
Calibration Level:		Wavelength:	530.0			
Instrument Method:	AS7_8min	Bandwidth:	n.a.			
Processing Method:	AS CR 8min 0409	Dilution Factor:	1.0000			
Injection Date/Time:	7/7/2019 22:07	Sample Weight:	1.0000			



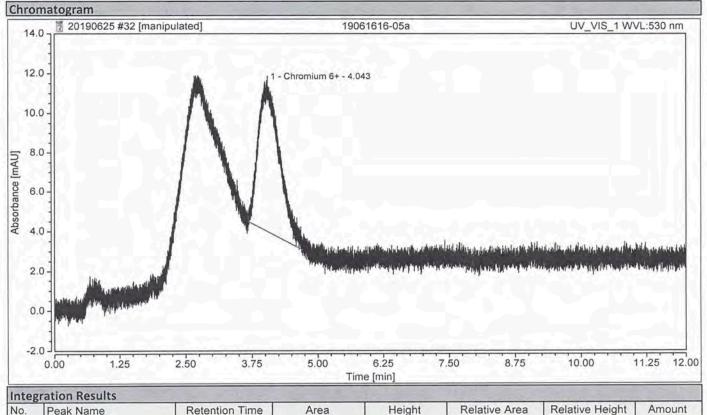
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
n.a.	Chromium 6+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total			0.000	0.000	0.00	0.00	

Chromatogram and Results							
Injection Details							
Injection Name:	19061616-04a	Run Time (min):	12.00				
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV_VIS_1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7 8min	Bandwidth:	n.a.				
Processing Method:	AS CR 8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 22:21	Sample Weight:	1.0000				



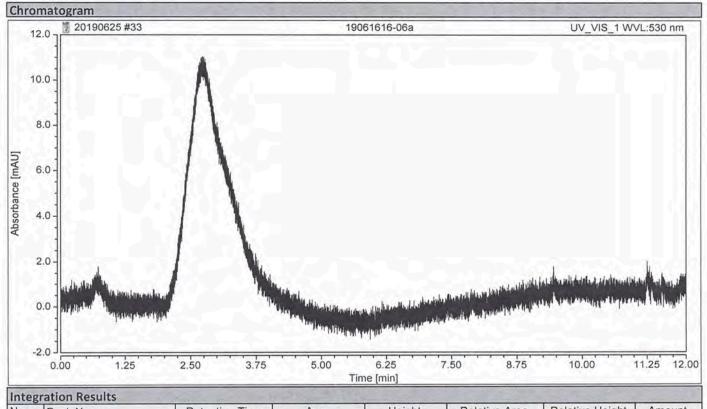
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area	Relative Height %	Amount
n.a.	Chromium 6+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total	l:		0.000	0.000	0.00	0.00	

Chromatogram and Results Injection Details							
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV_VIS_1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR 8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 22:35	Sample Weight:	1.0000				



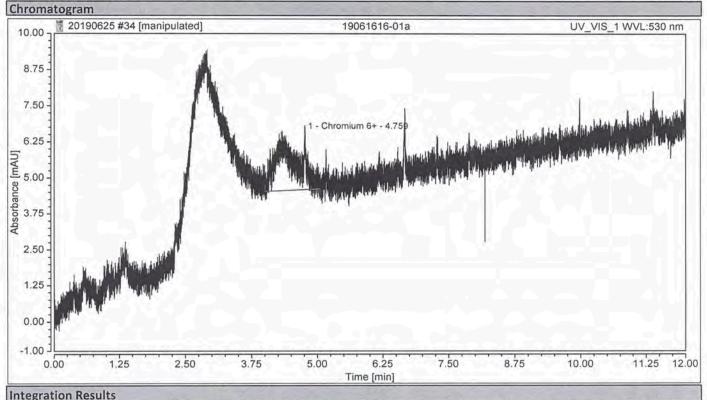
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	4.043	3.524	7.556	100.00	100.00	36.8206
Tota	:		3.524	7.556	100.00	100.00	

Chromatogram and Results Injection Details							
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV VIS 1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS CR 8min 0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 22:50	Sample Weight:	1.0000				



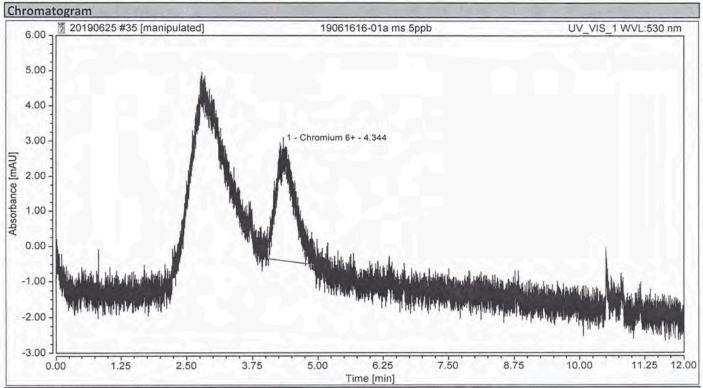
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
n.a.	Chromium 6+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:		0.000	0.000	0.00	0.00		

Chromatogram and Results							
Injection Details							
Injection Name:	19061616-01a	Run Time (min):	12.00				
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV VIS 1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 23:04	Sample Weight:	1.0000				



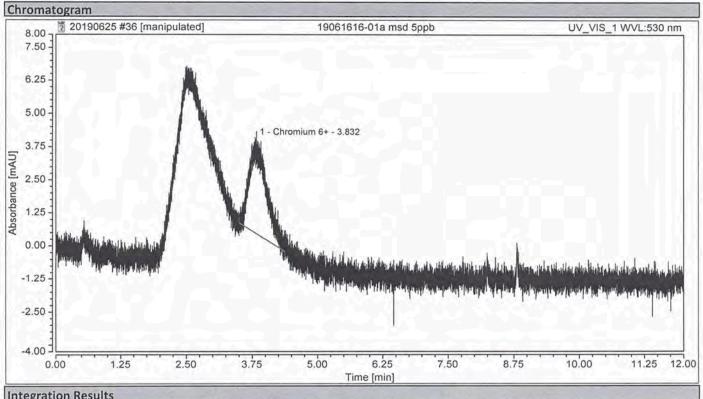
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	4.759	0.870	2.003	100.00	100.00	9.0932
Total	l: —		0.870	2.003	100.00	100.00	

Chromatogram and Results							
Injection Details							
Injection Name:	19061616-01a ms 5ppb	Run Time (min):	12.00				
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV VIS 1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7 8min	Bandwidth:	n.a.				
Processing Method:	AS CR 8min 0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 23:19	Sample Weight:	1.0000				



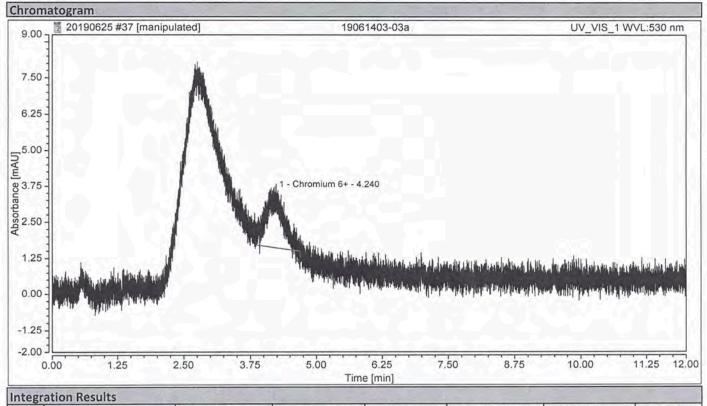
Integration Results								
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount	
1	Chromium 6+	4.344	1.332	3.336	100.00	100.00	13.9208	
Tota	1:		1.332	3.336	100.00	100.00		

Chromatogram and Results							
Injection Details							
Injection Name:	19061616-01a msd 5ppb	Run Time (min):	12.00				
Vial Number:	4	Injection Volume:	5000.00				
Injection Type:	Unknown	Channel:	UV VIS 1				
Calibration Level:		Wavelength:	530.0				
Instrument Method:	AS7_8min	Bandwidth:	n.a.				
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000				
Injection Date/Time:	7/7/2019 23:33	Sample Weight:	1.0000				



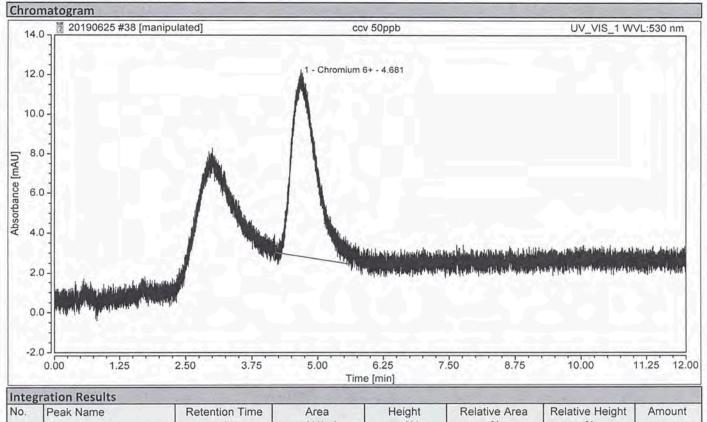
Inte	ntegration Results							
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount	
1	Chromium 6+	3.832	1.324	3.635	100.00	100.00	13.8290	
Tota	:		1.324	3.635	100.00	100.00		

Chromatogram and Results					
Injection Details					
Injection Name:	19061403-03a	Run Time (min):	12.00		
Vial Number:	4	Injection Volume:	5000.00		
Injection Type:	Unknown	Channel:	UV VIS 1		
Calibration Level:		Wavelength:	530.0		
Instrument Method:	AS7 8min	Bandwidth:	n.a.		
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000		
Injection Date/Time:	7/7/2019 23:47	Sample Weight:	1.0000		



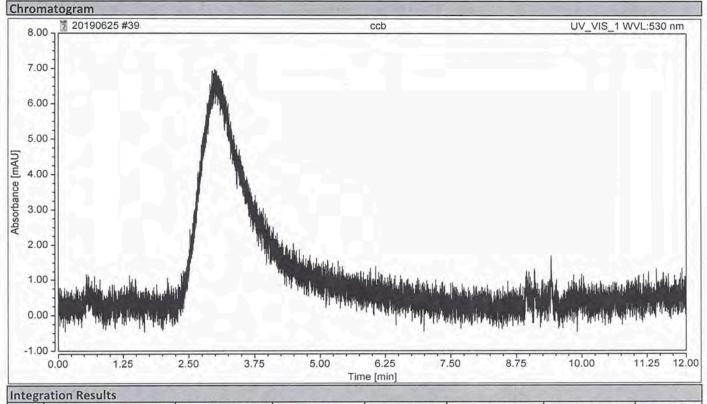
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	4.240	0.725	2.007	100.00	100.00	7.5793
Total:		0.725	2.007	100.00	100.00		

Chromatogram and Results					
Injection Details		West of the supple			
Injection Name:	ccv 50ppb	Run Time (min):	12.00		
Vial Number:	4	Injection Volume:	5000.00		
Injection Type:	Unknown	Channel:	UV VIS 1		
Calibration Level:		Wavelength:	530.0		
Instrument Method:	AS7_8min	Bandwidth:	n.a.		
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000		
Injection Date/Time:	7/8/2019 0:02	Sample Weight:	1.0000		



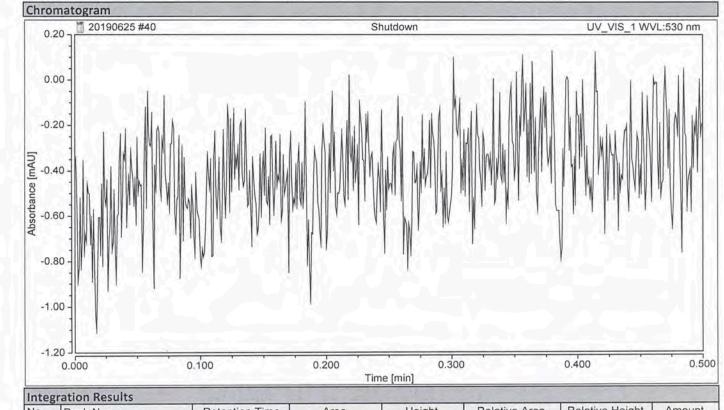
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
1	Chromium 6+	4.681	5.001	9.123	100.00	100.00	52.2457
Tota	l:		5.001	9.123	100.00	100.00	

Chromatogram and Results					
Injection Details		The state of the s			
Injection Name:	ccb	Run Time (min):	12.00		
Vial Number:	4	Injection Volume:	5000.00		
Injection Type:	Unknown	Channel:	UV_VIS_1		
Calibration Level:		Wavelength:	530.0		
Instrument Method:	AS7_8min	Bandwidth:	n.a.		
Processing Method:	AS CR 8min 0409	Dilution Factor:	1.0000		
Injection Date/Time:	7/8/2019 0:16	Sample Weight:	1.0000		



Integration Results							
No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
n.a.	Chromium 6+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:		0.000	0.000	0.00	0.00		

Chromatogram and Results					
Injection Details					
Injection Name:	Shutdown	Run Time (min):	0.50		
Vial Number:	19	Injection Volume:	5000.00		
Injection Type:	Blank	Channel:	UV_VIS_1		
Calibration Level:		Wavelength:	530.0		
Instrument Method:	Shutdown	Bandwidth:	n.a.		
Processing Method:	AS_CR_8min_0409	Dilution Factor:	1.0000		
Injection Date/Time:	7/8/2019 0:31	Sample Weight:	1.0000		



No.	Peak Name	Retention Time min	Area mAU*min	Height mAU	Relative Area %	Relative Height %	Amount
n.a.	Chromium 6+	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total:		0.000	0.000	0.00	0.00		







Workorder No.: 19061616

July 12, 2019

Chad Roper
AECOM

1220 Avenida Acaso
Camarillo, CA 93012

Lab ID:

Lab ID:

Lab ID:

Las Vegas, NV (NV930, CA3029)

Reno, NV (NV015, CA2526)

Dear Chad Roper:

Project: 60477365

Silver State Labs-Las Vegas received 6 sample(s) on 6/27/2019 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative. Analytical results reported as non-detect (ND) in the result field are below the Practical Quantification Limit (PQL). Analytical results above the PQL are reported as the measured value in the results field.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

John Sloan

Laboratory Technical Director 3626 E. Sunset Road, Suite 100 Las Vegas, NV 89120



www.ssalabs.com

Analytical Report

WO#: 19061616

Date Reported: 7/12/2019

CLIENT: AECOM Collection Date: 6/27/2019 9:40:00 AM

Project: 60477365

Lab ID: **GROUNDWATER** 19061616-01 Matrix:

Client Sample ID NERT3.58S1 - 20190627

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

Chromium, Hexavalent 9.09 1.00 μg/L 7/7/2019 11:04:00 PM

Qualifiers: (Qual)

Dilution Factor. DF

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



www.ssalabs.com

Analytical Report

WO#: 19061616

Date Reported: 7/12/2019

CLIENT: AECOM Collection Date: 6/27/2019 10:45:00 AM

Project: 60477365

Lab ID: **GROUNDWATER** 19061616-02 Matrix:

Client Sample ID NERT3.63S1 - 20190627

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

Chromium, Hexavalent 8.54 1.00 μg/L 7/7/2019 9:52:00 PM

Qualifiers: (Qual)

Dilution Factor. DF

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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Analytical Report

WO#: 19061616

Date Reported: 7/12/2019

CLIENT: AECOM Collection Date: 6/27/2019 11:50:00 AM

Project: 60477365

Lab ID: **GROUNDWATER** 19061616-03 Matrix:

Client Sample ID NERT3.80S1 - 20190627

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

Chromium, Hexavalent ND 1.00 μg/L 7/7/2019 10:07:00 PM

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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Analytical Report

WO#: 19061616

Date Reported: 7/12/2019

CLIENT: AECOM Collection Date: 6/27/2019 1:10:00 PM

Project: 60477365

Lab ID: **GROUNDWATER** 19061616-04 Matrix:

Client Sample ID NERT3.98S1 - 20190627

HEXAVALENT CHROMIUM-SDWA-LO LEVEL

Analyses Result **RL Qual Units** DF **Date Analyzed**

Chromium, Hexavalent

ND

1.00

μg/L

EPA 218.7

7/7/2019 10:21:00 PM

Analyst: JS

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level. PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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Analytical Report

WO#: 19061616

Date Reported: 7/12/2019

CLIENT: AECOM Collection Date: 6/27/2019 2:30:00 PM

Project: 60477365

Lab ID: **GROUNDWATER** 19061616-05 Matrix:

Client Sample ID NERT4.51S1 - 20190627

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

Chromium, Hexavalent 36.8 1.00 μg/L 7/7/2019 10:35:00 PM

Qualifiers: (Qual)

Dilution Factor. DF

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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Analytical Report

WO#: 19061616

Date Reported: 7/12/2019

CLIENT: AECOM Collection Date: 6/27/2019 11:50:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19061616-06 Matrix:

Client Sample ID NERT3.80S1 - 20190627-FD

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

ND

μg/L

7/7/2019 10:50:00 PM

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level. PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



H Holding times for preparation or analysis exceeded.

Qualifiers:

Silver State Labs-Las Vegas

QC SUMMARY REPORT

ND Not Detected at the PQL.

WO#:

19061616

12-Jul-19

Client: Project:	AECOM 60477365			TestCode: (CR6-SDWA-218.7
Sample ID:	ICV-R31012	SampType: ICV	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/7/2019	RunNo: 31012
Client ID:	ICV	Batch ID: R31012	TestNo: E218.7	Analysis Date: 7/7/2019	SeqNo: 713304
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	53.9	1.00 50.00 0	108 90 110	
Sample ID:	ICB-R31012	SampType: ICB	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/7/2019	RunNo: 31012
Client ID:	ICB-R31012	Batch ID: R31012	TestNo: E218.7	Analysis Date: 7/7/2019	SeqNo: 713305
Olichi ib.	ЮВ	Datem D. NSTOTE	1 CSUNO. L210. 7		Ocq140. 7 13303
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	ND	1.00		
Sample ID:	CCV-R31012	SampType: CCV	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/8/2019	RunNo: 31012
Client ID:	CCV	Batch ID: R31012	TestNo: E218.7	Analysis Date: 7/8/2019	SeqNo: 713306
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	52.2	1.00 50.00 0	104 90 110	
Sample ID:	CCB-R31012	SampType: CCB	TestCode: CR6-SDWA-2 Units: μα/L	Prep Date: 7/8/2019	RunNo: 31012
Client ID:	ССВ	Batch ID: R31012	TestNo: E218.7	Analysis Date: 7/8/2019	SeqNo: 713307
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	ND	1.00		

MCL Maximum Contaminant Level.



Sample ID: 19061403-04CMS

Chromium, Hexavalent

BatchQC

Client ID:

Analyte

Qualifiers:

SampType: MS

H Holding times for preparation or analysis exceeded.

Batch ID: R31012

Result

18.8

Silver State Labs-Las Vegas

QC SUMMARY REPORT

WO#:

RunNo: 31012

SeqNo: 713313

%RPD RPDLimit

19061616

12-Jul-19

Client: Project:	AECOM 60477365			TestCode: C	CR6-SDWA-218.7
Sample ID: CC		SampType: CCB	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/8/2019	RunNo: 31012
Client ID: CC	В	Batch ID: R31012	TestNo: E218.7	Analysis Date: 7/8/2019	SeqNo: 713307
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Sample ID: MB	-R31012	SampType: MBLK	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/7/2019	RunNo: 31012
Client ID: PB	W	Batch ID: R31012	TestNo: E218.7	Analysis Date: 7/7/2019	SeqNo: 713308
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium, Hexa	avalent	ND	1.00		
Sample ID: LC:	S-R31012	SampType: LCS	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/7/2019	RunNo: 31012
Client ID: LC:	sw	Batch ID: R31012	TestNo: E218.7	Analysis Date: 7/7/2019	SeqNo: 713309
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium, Hexa		20.7	1.00 20.00 0	104 90 110	

TestCode: CR6-SDWA-2 Units: µg/L

5.000

SPK value SPK Ref Val

MCL Maximum Contaminant Level.

14.04

TestNo: **E218.7**

PQL

1.00

Prep Date: 7/7/2019

HighLimit RPD Ref Val

ND Not Detected at the PQL.

110

Analysis Date: 7/7/2019

LowLimit

90

%REC

95.4

Original

Qual



QC SUMMARY REPORT

WO#:

19061616

12-Jul-19

Client: AECOM

Project: 60477365	5					To	estCode: (CR6-SDWA-	218.7	
Sample ID: 19061403-04CMSD Client ID: BatchQC	SampType: MSD Batch ID: R31012	TestCode: CR6-SDW TestNo: E218.7	/A-2 Units: μg/L		Prep Date: Analysis Date:			RunNo: 310 SeqNo: 713		
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit F	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	19.1	1.00 5.000	14.04	101	90	110	18.81	1.45	20	
Sample ID: 19061616-01AMS	SampType: MS	TestCode: CR6-SDW	/A-2 Units: μg/L		Prep Date:	7/7/2019)	RunNo: 310)12	
Client ID: NERT3.58S1 - 2019	90 Batch ID: R31012	TestNo: E218.7			Analysis Date:	7/7/2019)	SeqNo: 71 3	3322	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit F	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	13.9	1.00 5.000	9.093	96.6	90	110				
Sample ID: 19061616-01AMSD	SampType: MSD	TestCode: CR6-SDW	/A-2 Units: μg/L		Prep Date:	7/7/2019)	RunNo: 310)12	
Client ID: NERT3.58S1 - 2019	90 Batch ID: R31012	TestNo: E218.7			Analysis Date:	7/7/2019	9	SeqNo: 713	3323	
Analyte	Result	PQL SPK value	SPK Ref Val	%REC	LowLimit F	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	13.8	1.00 5.000	9.093	94.7	90	110	13.92	0.662	20	

H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL. Qualifiers:



Sierra Environmental Monitoring

3626 E. SUNSET ROAD, STE 100, LAS VEGAS, NV 89120 Phone (702) 873-4478 Fax: (702) 873-7967 (EPA#: NV00930, CA2885)

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sem-analytical.com envirotechonline.com ssalabs.com

1135 FINANCIAL BOULEVARD, RENO, NV 89502 Phone (775) 857-2400 Fax: (888) 398-7002 (EPA#: NV00015, CA2526)

Composed Mailing City, 3 City, 3 Phone Sampled by, 1 attest to the	g Address:	Project Number: d Roper Coup 17365 ECOM 20 Avenida Areaso Email/Fax: Chad, repere accommendationally mithor intentionally mithor	40	Com Mail City,	ing Addr	ECOT ress: OC 3	n 5. Q	Jilley Jilley	Email/Fax:	SON CGC+ POS-SE SES REQUES		ecom, con	SDWA Mining Root OC OC OC OC OC OC OC O		Page
Stand Rush Same 1 Day 2 Day	Day:	idered fraud and may be grounds for legal action.	Other Pertinent Info	ormation /	Special	Instruction	Number / Type of Containers ***	Chrome 21817					Mail: 🗆 R	d Invoice Via: Email: Fax: d Measurements Chlorine:	
Date Sampled	Time Sampled	Sample Identification	SSAL - SEM Lab No	Comp Grat	p. Matrix*	Preservative		Hey							
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Received B	Ву:														_
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Authorization i	required to pr are required to	ocess samples. This obligates your organization for service fees. SSAL Standard o recover said fees, yell organization will be responsible for all fees and co	T & Co or other written agreeme lists in addition to service lees.	ent applies.	If collection	ons own	Judg	The analyt	tical results associa	ays after results are lated with this COC a is limited to the amo	apply only to the	ese samples as		nd storage fees may apply. by the laboratory.	







July 16, 2019

Chad Roper
AECOM
1220 Avenida Acaso
Camarillo, CA 93012

Lab ID:

Las Vegas, NV (NV930, CA3029)

Reno, NV (NV015, CA2526)

Project: 60477365 Workorder No.: 19070063

Dear Chad Roper:

Silver State Labs-Las Vegas received 7 sample(s) on 7/1/2019 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative. Analytical results reported as non-detect (ND) in the result field are below the Practical Quantification Limit (PQL). Analytical results above the PQL are reported as the measured value in the results field.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

John Sloan

Laboratory Technical Director 3626 E. Sunset Road, Suite 100 Las Vegas, NV 89120



www.ssalabs.com

38.2

Analytical Report

WO#: 19070063

Date Reported: 7/16/2019

7/14/2019 10:52:00 PM

CLIENT: AECOM Collection Date: 7/1/2019 8:20:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19070063-01 Matrix:

Client Sample ID NERT4.64S1 - 20190701

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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26.6

Analytical Report

WO#: 19070063

Date Reported: 7/16/2019

7/14/2019 11:07:00 PM

CLIENT: AECOM Collection Date: 7/1/2019 9:25:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19070063-02 Matrix:

Client Sample ID NERT4.71S2 - 20190701

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

Dilution Factor. DF

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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37.4

Analytical Report

WO#: 19070063

Date Reported: 7/16/2019

7/14/2019 11:21:00 PM

CLIENT: AECOM Collection Date: 7/1/2019 10:15:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19070063-03 Matrix:

Client Sample ID NERT4.71S1 - 20190701

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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14.7

Analytical Report

WO#: 19070063

Date Reported: 7/16/2019

7/14/2019 11:35:00 PM

CLIENT: AECOM Collection Date: 7/1/2019 11:50:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: 19070063-04 **GROUNDWATER** Matrix:

Client Sample ID NERT3.60S1 - 20190701

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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14.2

Analytical Report

WO#: 19070063

Date Reported: 7/16/2019

7/15/2019 12:19:00 AM

CLIENT: AECOM Collection Date: 7/1/2019 1:05:00 PM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19070063-05 Matrix:

Client Sample ID NERT5.11S1 - 20190701

Analyses Result **RL Qual Units** DF **Date Analyzed HEXAVALENT CHROMIUM-SDWA-LO LEVEL** Analyst: JS **EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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16.8

Analytical Report

WO#: 19070063

Date Reported: 7/16/2019

7/15/2019 12:33:00 AM

CLIENT: AECOM Collection Date: 7/1/2019 1:55:00 PM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19070063-06 Matrix:

Client Sample ID NERT4.93S1 - 20190701

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



www.ssalabs.com

ND

Analytical Report

WO#: 19070063

Date Reported: 7/16/2019

7/15/2019 12:47:00 AM

CLIENT: AECOM Collection Date: 7/1/2019 2:45:00 PM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19070063-07 Matrix:

Client Sample ID NERT5.91S1 - 20190701

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

DF Dilution Factor. Qualifiers:

MCL Maximum Contaminant Level. (Qual)

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



H Holding times for preparation or analysis exceeded.

Qualifiers:

Silver State Labs-Las Vegas

QC SUMMARY REPORT

ND Not Detected at the PQL.

WO#:

19070063

16-Jul-19

Client: Project:	AECOM 60477365			TestCode: C	R6-SDWA-218.7
	ICV-R31286	SampType: ICV	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/14/2019	RunNo: 31286
Client ID:	ICV	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/14/2019	SeqNo: 719755
				•	·
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	25.8	1.00 25.00 0	103 90 110	
Sample ID:	ICB-R31286	SampType: ICB	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/14/2019	RunNo: 31286
Client ID:	ICB	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/14/2019	SeqNo: 719756
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	ND	1.00		
Sample ID:	CCV-R31286	SampType: CCV	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/15/2019	RunNo: 31286
Client ID:	ccv	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/15/2019	SeqNo: 719757
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	22.5	1.00 25.00 0	90.1 90 110	
Sample ID:	CCB-R31286	SampType: CCB	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/15/2019	RunNo: 31286
Client ID:	ССВ	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/15/2019	SeqNo: 719758
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	ND	1.00		

MCL Maximum Contaminant Level.



Silver State Labs-Las Vegas

QC SUMMARY REPORT

WO#:

19070063

16-Jul-19

Client: AECOM

60477365 TestCode: CR6-SDWA-218.7 **Project:**

Sample ID: CCB-R31286 SampType: CCB TestCode: CR6-SDWA-2 Units: µg/L Prep Date: 7/15/2019 RunNo: 31286 Client ID: CCB Batch ID: R31286 TestNo: **E218.7** Analysis Date: 7/15/2019 SeqNo: 719758

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

Sample ID: 19070063-04AMS	SampType: MS			A-2 Units: μg/L		•	te: 7/14/20		RunNo: 312		
Client ID: NERT3.60S1 - 20190	Batch ID: R31286		No: E218.7	CDI/ Dof Vol	%REC	Analysis Da		19 RPD Ref Val	SeqNo: 719 %RPD	763 RPDLimit	Ougl
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	nignLimit	RPD Rei Vai	%RPD	RPDLIMIL	Qual
Chromium, Hexavalent	19.7	1.00	5.000	14.70	101	90	110				

Sample ID: 19070063-04AMSD	SampType: MSD	TestCoo	le: CR6-SDW	A-2 Units: μg/L		Prep Da	te: 7/15/20	19	RunNo: 312	86	
Client ID: NERT3.60S1 - 20190	Batch ID: R31286	TestN	lo: E218.7			Analysis Da	te: 7/15/20	19	SeqNo: 719	764	
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	19.3	1.00	5.000	14.70	92.0	90	110	19.75	2.25	20	

Sample ID: MB-R31286	SampType: MBLK	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/14/2019	RunNo: 31286
Client ID: PBW	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/14/2019	SeqNo: 719779
Analyte	Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium, Hexavalent	ND	1.00		

MCL Maximum Contaminant Level. ND Not Detected at the PQL. Qualifiers: H Holding times for preparation or analysis exceeded.



Silver State Labs-Las Vegas

QC SUMMARY REPORT

WO#:

19070063

16-Jul-19

Client: AECOM

Project: 60477365 TestCode: CR6-SDWA-218.7

Sample ID: LCS-R31286 Client ID: LCSW	SampType: LCS Batch ID: R31286		de: CR6-SDW	A-2 Units: μg/L		•	te: 7/14/20		RunNo: 312 SegNo: 719		
Analyte	Result	PQL		SPK Ref Val	%REC	LowLimit		RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	10.6	1.00	10.00	0	106	90	110				

H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL. Qualifiers:





|X| 3626 E. SUNSET ROAD, STE 100, LAS VEGAS, NV 89120 Phone (702) 873-4478 Fax: (702) 873-7967 (EPA#: NV00930, CA2885)

CHAIN-OF-CUSTODY-RECORD

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1135 FINANCIAL BOULEVARD, RENO, NV 89502 Phone (775) 857-2400 Fax: (888) 398-7002 (EPA#: NV00015, CA2526)

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Received I	Ву:														
Relinquish	ed By:														
Received	Ву:	_													
Authorized By: 5 CARO				RIO AECOM Samples are discarded 30 days after results are reported unless other arrangements are n							1,10	1550			







July 16, 2019

Chad Roper
AECOM
1220 Avenida Acaso
Camarillo, CA 93012

Lab ID:

Las Vegas, NV (NV930, CA3029)

Reno, NV (NV015, CA2526)

Project: 60477365 Workorder No.: 19070163

Dear Chad Roper:

Silver State Labs-Las Vegas received 8 sample(s) on 7/2/2019 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative. Analytical results reported as non-detect (ND) in the result field are below the Practical Quantification Limit (PQL). Analytical results above the PQL are reported as the measured value in the results field.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

John Sloan

Laboratory Technical Director 3626 E. Sunset Road, Suite 100 Las Vegas, NV 89120



www.ssalabs.com

ND

Analytical Report

WO#: 19070163

Date Reported: 7/16/2019

7/15/2019 1:02:00 AM

CLIENT: AECOM Collection Date: 7/2/2019 8:35:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: 19070163-01 **GROUNDWATER** Matrix:

Client Sample ID NERT 3.58N1-20190702

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



www.ssalabs.com

ND

Analytical Report

WO#: 19070163

Date Reported: 7/16/2019

7/15/2019 1:16:00 AM

CLIENT: AECOM Collection Date: 7/2/2019 9:45:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: 19070163-02 **GROUNDWATER** Matrix:

Client Sample ID NERT 3.60N1-20190702

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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27.1

Analytical Report

WO#: 19070163

Date Reported: 7/16/2019

7/15/2019 1:31:00 AM

CLIENT: AECOM Collection Date: 7/2/2019 10:50:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: 19070163-03 **GROUNDWATER** Matrix:

Client Sample ID NERT 4.21N1-20190702

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



www.ssalabs.com

ND

Analytical Report

WO#: 19070163

Date Reported: 7/16/2019

7/15/2019 1:45:00 AM

CLIENT: AECOM Collection Date: 7/2/2019 10:15:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: 19070163-04 **GROUNDWATER** Matrix:

Client Sample ID NERT 4.21N1-20190702-FB

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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Analytical Report

WO#: 19070163

Date Reported: 7/16/2019

CLIENT: AECOM Collection Date: 7/2/2019 11:15:00 AM

Project: 60477365

Lab ID: 19070163-05 **GROUNDWATER** Matrix:

Client Sample ID NERT 4.38N1-20190702-EB

Analyses Result **RL Qual Units** DF **Date Analyzed**

Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

Chromium, Hexavalent ND 1.00 μg/L 7/15/2019 1:59:00 AM

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level. PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



www.ssalabs.com

ND

Analytical Report

WO#: 19070163

Date Reported: 7/16/2019

7/15/2019 2:14:00 AM

CLIENT: AECOM Collection Date: 7/2/2019 12:35:00 PM

Project: 60477365

Chromium, Hexavalent

DF

Dilution Factor.

Lab ID: 19070163-06 **GROUNDWATER** Matrix:

Client Sample ID NERT 4.38N1-20190702

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Н

Holding times for preparation or analysis exceeded.

Qualifiers: MCL Maximum Contaminant Level. ND Not Detected at the PQL. (Qual) PQL Practical Quantitation Limit.



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ND

Analytical Report

WO#: 19070163

Date Reported: 7/16/2019

7/15/2019 2:28:00 AM

CLIENT: AECOM Collection Date: 7/2/2019 1:40:00 PM

Project: 60477365

Chromium, Hexavalent

Lab ID: 19070163-07 **GROUNDWATER** Matrix:

Client Sample ID NERT 4.64N1-20190702

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



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Analytical Report

WO#: 19070163

Date Reported: 7/16/2019

CLIENT: AECOM Collection Date: 7/2/2019 1:40:00 PM

Project: 60477365

Lab ID: 19070163-08 **GROUNDWATER** Matrix:

Client Sample ID NERT 4.64N1-20190702-FD

Analyses Result **RL Qual Units** DF **Date Analyzed**

Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

Chromium, Hexavalent ND 1.00 μg/L 7/15/2019 2:43:00 AM

ND Not Detected at the PQL.



H Holding times for preparation or analysis exceeded.

Qualifiers:

Silver State Labs-Las Vegas

QC SUMMARY REPORT

ND Not Detected at the PQL.

WO#:

19070163

16-Jul-19

Client: Project:	AECOM 60477365			TestCode: C	R6-SDWA-218.7
Sample ID:	ICV-R31286	SampType: ICV	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/14/2019	RunNo: 31286
Client ID:	ICV	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/14/2019	SeqNo: 719755
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	25.8	1.00 25.00 0	103 90 110	
Sample ID:	ICB-R31286	SampType: ICB	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/14/2019	RunNo: 31286
Client ID:	ICB	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/14/2019	SeqNo: 719756
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	ND	1.00		
Sample ID:	CCV-R31286	SampType: CCV	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/15/2019	RunNo: 31286
Client ID:	CCV	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/15/2019	SeqNo: 719757
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	22.5	1.00 25.00 0	90.1 90 110	
Sample ID:	CCB-R31286	SampType: CCB	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/15/2019	RunNo: 31286
Client ID:	ССВ	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/15/2019	SeqNo: 719758
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	ND	1.00		

MCL Maximum Contaminant Level.



Silver State Labs-Las Vegas

QC SUMMARY REPORT

WO#:

19070163

16-Jul-19

AECOM

Project: 60477365 TestCode: CR6-SDWA-218.7

Sample ID: CCB-R31286	SampType: CCB	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/15/2019	RunNo: 31286
Client ID: CCB	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/15/2019	SeqNo: 719758
Analyte	Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual

Sample ID: 19070063-04AMS	SampType: MS	TestCode: CR6-SDWA-2 Units: µg/L				Prep Da	te: 7/14/20	19	RunNo: 31286		
Client ID: BatchQC	Batch ID: R31286	TestN	lo: E218.7		Analysis Date: 7/14/2019			SeqNo: 719763			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	19.7	1.00	5.000	14.70	101	90	110				

Sample ID: 19070063	-04AMSD SampType: MSD	TestC	TestCode: CR6-SDWA-2 Units: µg/L			Prep Date: 7/15/2019				RunNo: 31286		
Client ID: BatchQC	Batch ID: R31286	Tes	tNo: E218.7			Analysis Date: 7/15/2019			SeqNo: 719764			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Chromium, Hexavalen	19.3	1.00	5.000	14.70	92.0	90	110	19.75	2.25	20		

Sample ID: MB-R31286	SampType: MBLK	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/14/2019	RunNo: 31286
Client ID: PBW	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/14/2019	SeqNo: 719779
Analyte	Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium, Hexavalent	ND	1.00		

H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL. Qualifiers:



Silver State Labs-Las Vegas

www.ssalabs.com

QC SUMMARY REPORT

WO#:

19070163

16-Jul-19

Client: AECOM

Project: 60477365 TestCode: CR6-SDWA-218.7

Sample ID: LCS-R31286 Client ID: LCSW	SampType: LCS Batch ID: R31286		TestCode: CR6-SDWA-2 Units: μg/L TestNo: E218.7			·	te: 7/14/20	RunNo: 31286 SeqNo: 719780			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	10.6	1.00	10.00	0	106	90	110				

H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL. Qualifiers:



sem-analytical.com



Sierra Environmental Monitoring 3626 E. SUNSET ROAD, STE 100, LAS VEGAS, NV 89120
Phone (702) 873-4478 Fax: (702) 873-7967 (EPA#: NV00930, CA2885)

CHAIN-OF-CUSTODY-RECORD

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ssalabs.com

EnviroTech.

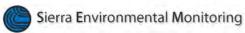
envirotechonline.com

1135 FINANCIAL BOULEVARD, RENO, NV 89502 Phone (775) 857-2400 Fax: (888) 398-7002 (EPA#: NV00015, CA2526)

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Page _	of
	13
	4

Report Attention: Project Number: Chad Report Company: AECOM Mailing Address: 1220 Avenide Alaso City, State, Zip: Phone: Sampled by: CAPOTRIO Signature: I attest to the validity and authenticity of the sample. I am aware that tampering with or intentio location, date or time is considered fraud and may be grounds for legal action.	2 2 gerom.com	Dio Com Maili City,		AECO ess.	5	Quebec J Vill	St leso mail y Fax:	Co	Scill Linelle C	TE COM I	SDWA Mining Mining NOTE: Surch	RING? Results: Description of the control of the co
Standard: Standard TAT 7-10 Business Days. Note that some tests vary. Rush Same Day: Other (specify): 1 Day: 4 Day: Rush results will be issued after 4:00 2 Day: 5 Day: NOTE: A Rush Surcharge is applied for rush samples	Other Pertinent In	nformation /	Special	Instructions	lumber / Type of Containers	Hexchrome 218.					Mail:	end Invoice Via: Email: Fax: Chlorine: Other:
Date Time Sampled Sample Identification	SSAL - SEM Lab N	lo. Comp	Matrix*	Preservative**	7	He						Suid.
7/2/9 0835 NERT 3.58 N+ 20196767	19070163.	46	CW	6	IV	X					Metals*	
(6945 NERT 3.66N1-ZU19070Z	-	2A 1	1	1	10	7,						
1050 NERTY-ZINI-ZUIGOTUZ	-	34	11		14	*						
1015 NERT 4.21N1-20190702-FL	7 -1	1A	1		lv	3						
1115 NERT4.38NI-ZOIGETEZ-E		1			iv	X	-1-1			+++		
1235 NERTY. 38NI - 20190707		Δ	1			4			-	++	COMMENTS:	
	7	A	H	-	11	4		1 +		++		
1340 NERTY. LYNI-20190702	+.	4	1	1	IV	X						
4 1340 NERTY 64NI- ZU19070Z-F		4 -	4		10	X						
Signature Relinquished By:		int Name				2-		npany		-	Date	Time
Received By:	J CARTRI	0				AEC	mo			7/	2/19	1600
Relinquished By:	Wishys						558	V		7-	2-19	1605
Received By:										-		
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Received By:												
Authorized By:	J CARSTRI	U				DE	e/nes			7/	19/10	11.1
Authorization is required to process samples. This obligates your organization for service fees. SSALS egal services are required to recover said fees, your organization will be responsible for all fees	4 -11	pent applies. If	yolleetion U	107/2	1/9	Samples are disc The analytical res The liability of the	sults associated	with this COC	apply only to th	nese samples a	gements are made a as they are received	and storage fees may apply. d by the laboratory.







July 16, 2019

Chad Roper
AECOM

1220 Avenida Acaso
Camarillo, CA 93012

Lab ID:

Las Vegas, NV (NV930, CA3029)

Reno, NV (NV015, CA2526)

Project: 60477365 Workorder No.: 19070339

Dear Chad Roper:

Silver State Labs-Las Vegas received 3 sample(s) on 7/8/2019 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative. Analytical results reported as non-detect (ND) in the result field are below the Practical Quantification Limit (PQL). Analytical results above the PQL are reported as the measured value in the results field.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

John Sloan

Laboratory Technical Director 3626 E. Sunset Road, Suite 100 Las Vegas, NV 89120



www.ssalabs.com

ND

Analytical Report

WO#: 19070339

Date Reported: 7/16/2019

7/15/2019 2:57:00 AM

CLIENT: AECOM Collection Date: 7/8/2019 9:35:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: 19070339-01 **GROUNDWATER** Matrix:

Client Sample ID NERT-5.49S1-201907081

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



www.ssalabs.com

ND

Analytical Report

WO#: 19070339

Date Reported: 7/16/2019

Analyst: JS

7/15/2019 3:11:00 AM

CLIENT: AECOM Collection Date: 7/8/2019 12:15:00 PM

Project: 60477365

Chromium, Hexavalent

Lab ID: 19070339-02 **GROUNDWATER** Matrix:

Client Sample ID NERT-4.65N1-201907082-FB

HEXAVALENT CHROMIUM-SDWA-LO LEVEL

Analyses Result **RL Qual Units** DF **Date Analyzed**

1.00

EPA 218.7

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



www.ssalabs.com

Analytical Report

WO#: 19070339

Date Reported: 7/16/2019

CLIENT: AECOM Collection Date: 7/8/2019 12:30:00 PM

Project: 60477365

Lab ID: 19070339-03 **GROUNDWATER** Matrix:

Client Sample ID NERT-4.65N1-20190708

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

Chromium, Hexavalent ND 1.00 μg/L 7/15/2019 3:26:00 AM

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



H Holding times for preparation or analysis exceeded.

Qualifiers:

Silver State Labs-Las Vegas

QC SUMMARY REPORT

ND Not Detected at the PQL.

WO#:

19070339

16-Jul-19

Client: Project:	AECOM 60477365			TestCode: C	CR6-SDWA-218.7		
Sample ID:	ICV-R31286	SampType: ICV	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/14/2019	RunNo: 31286		
Client ID:	ICV-K51266	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/14/2019	SeqNo: 719755		
Client ID.	icv	Dalcii ID. R31200	restivo. Ez16. 7	Analysis Date. 7/14/2019	Seq140. 719733		
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual		
Chromium,	Hexavalent	25.8	1.00 25.00 0	103 90 110			
Sample ID:	ICB-R31286	SampType: ICB	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/14/2019	RunNo: 31286		
Client ID:	ICB	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/14/2019	SeqNo: 719756		
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual		
Chromium,	Hexavalent	ND	1.00				
Sample ID:	CCV-R31286	SampType: CCV	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/15/2019	RunNo: 31286		
Client ID:	CCV	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/15/2019	SeqNo: 719757		
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual		
Chromium,	Hexavalent	22.5	1.00 25.00 0	90.1 90 110			
Sample ID:	CCB-R31286	SampType: CCB	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/15/2019	RunNo: 31286		
Client ID:	ССВ	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/15/2019	SeqNo: 719758		
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual		
Chromium,	Hexavalent	ND	1.00				

MCL Maximum Contaminant Level.



H Holding times for preparation or analysis exceeded.

Qualifiers:

Silver State Labs-Las Vegas

www.ssalabs.com

QC SUMMARY REPORT

ND Not Detected at the PQL.

WO#:

19070339

16-Jul-19

Client:	AECOM				
Project:	60477365			TestCode: (CR6-SDWA-218.7
Sample ID:	CCB-R31286	SampType: CCB	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/15/2019	RunNo: 31286
Client ID:	ССВ	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/15/2019	SeqNo: 719758
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Sample ID:	19070063-04AMS	SampType: MS	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/14/2019	RunNo: 31286
Client ID:	BatchQC	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/14/2019	SeqNo: 719763
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	19.7	1.00 5.000 14.70	101 90 110	
Sample ID:	19070063-04AMSD	SampType: MSD	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/15/2019	RunNo: 31286
Client ID:	BatchQC	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/15/2019	SeqNo: 719764
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	19.3	1.00 5.000 14.70	92.0 90 110 19.75	2.25 20
Sample ID:	MB-R31286	SampType: MBLK	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/14/2019	RunNo: 31286
Client ID:	PBW	Batch ID: R31286	TestNo: E218.7	Analysis Date: 7/14/2019	SeqNo: 719779
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual
Chromium,	Hexavalent	ND	1.00		

MCL Maximum Contaminant Level.



Silver State Labs-Las Vegas

QC SUMMARY REPORT

WO#:

19070339

16-Jul-19

Client: AECOM

Project: 60477365 TestCode: CR6-SDWA-218.7

Sample ID: LCS-R31286 SampType: LCS Client ID: LCSW Batch ID: R31286			de: CR6-SDW	A-2 Units: μg/L	Prep Date: 7/14/2019 Analysis Date: 7/14/2019				RunNo: 31286 SegNo: 719780		
Analyte	Result	PQL		SPK Ref Val	%REC	LowLimit		RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	10.6	1.00	10.00	0	106	90	110				

H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL. Qualifiers:





3626 E. SUNSET ROAD, STE 100, LAS VEGAS, NV 89120 Phone (702) 873-4478 Fax: (702) 873-7967 (EPA#: NV00930, CA2885)

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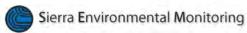
1135 FINANCIAL BOULEVARD, RENO, NV 89502

Phone (775) 857-2400 Fax: (888) 398-7002 (EPA#: NV00015, CA2526)

Page _	1	of]	
			of 8

Report Results	Report Attention: Chad Roper Company: AELOM Mailing Address: 1270 Avenida Acaso City, State, Zip: Camarillo CA 93012 Phone: Email/Fax: 805 764 4031 Chad-roper e gecom-com Sampled by: T CAPORNO Signature:						AE of Additional AE of A	com ress: 05 5.	Qu	Vil	ST lage Co 9 Email/Fax:		Quote #		SDWA Mining Co	plicable Proceedings of the CWA Other CLevel R	RCRA [
attest.	to the va	alidity and au	Signature: thenticity of the sample. I am aware that tampering with or intenti idered fraud and may be grounds for legal action.	nnally mislabeling the s	ample				1.		ANALYSE	S REQUES	STED		Mail:	end Result	
	Rush Same (1 Day: 2 Day:	Day:	Standard TAT 7-10 Business Days. Note that some tests vary. 3 Day: Other (specify): For W 4 Day: Day: Rush results will be issued after 4:0	0	er Pertinent Infor	mation / :	Special	Instructions	Number / Type of Containers **	Chrome 218,7					Mail: Fix On-Site pH:	eld Measure Chi	Fax: ements lorine:
Da		Time Sampled	Sample Identification	SSAL -	SEM Lab No.	Comp	. Matrix*	Preservative*	-	Her					Temperature:	Oth	ner:
7/8	1/9 0234 NERTS.4951-26196708 19070339				0339-14	6	GW		1.1	VX					Metals*		
(- /	1215 NERT4.65NI-20190708-FB					1	1	1	+			1.1				
7			NERT 4.65 NI- 20196708		34	- 4	1	7	7	x							
					7	200									COMMENTS:		
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Autho	rized	By:	De Note	JCAR							AECUM es are discarded 30 days a	fter results are	renorted unless	7/	4/19	1411	0
uthoriz egal ser	vices ar	equired to pro re required to	reess samples. This obligates your organization for service fees. SSAL recover said fees, your organization will be responsible for all fee	tandard T & C's or other and costs in addition	to service fees.	Rev 1	Collectio	ons or		The and	alytical results associated bility of the laboratory is lim	with this COC a	pply only to these	e samples as	they are received	by the labora	atory.







July 23, 2019

Chad Roper
AECOM

1220 Avenida Acaso
Camarillo, CA 93012

Lab ID:

Las Vegas, NV (NV930, CA3029)

Reno, NV (NV015, CA2526)

Project: 60477365 Workorder No.: 19070468

Dear Chad Roper:

Silver State Labs-Las Vegas received 3 sample(s) on 7/10/2019 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative. Analytical results reported as non-detect (ND) in the result field are below the Practical Quantification Limit (PQL). Analytical results above the PQL are reported as the measured value in the results field.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

John Sloan

Laboratory Technical Director 3626 E. Sunset Road, Suite 100 Las Vegas, NV 89120



www.ssalabs.com

ND

Analytical Report

WO#: 19070468

7/23/2019 Date Reported:

7/22/2019 4:32:00 PM

CLIENT: AECOM Collection Date: 7/9/2019 11:50:00 AM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19070468-01 Matrix:

Client Sample ID NERT4.70N1 - 20190709

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Dilution Factor. DF Qualifiers:

MCL Maximum Contaminant Level. (Qual) PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



www.ssalabs.com

Analytical Report

WO#: 19070468

Date Reported: 7/23/2019

CLIENT: AECOM Collection Date: 7/9/2019 12:05:00 PM

Project: 60477365

Lab ID: **GROUNDWATER** 19070468-02 Matrix:

Client Sample ID NERT4.70N1 - 20190709-EB

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

Chromium, Hexavalent ND 1.00 μg/L 7/22/2019 4:46:00 PM

Qualifiers: (Qual)

Dilution Factor. DF

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



www.ssalabs.com

ND

Analytical Report

WO#: 19070468

Date Reported: 7/23/2019

7/22/2019 5:01:00 PM

CLIENT: AECOM Collection Date: 7/9/2019 12:55:00 PM

Project: 60477365

Chromium, Hexavalent

Lab ID: **GROUNDWATER** 19070468-03 Matrix:

Client Sample ID NERT4.71N1 - 20190709

Analyses Result **RL Qual Units** DF **Date Analyzed** Analyst: JS **HEXAVALENT CHROMIUM-SDWA-LO LEVEL EPA 218.7**

1.00

μg/L

Qualifiers: (Qual)

DF Dilution Factor.

MCL Maximum Contaminant Level.

PQL Practical Quantitation Limit.

Н Holding times for preparation or analysis exceeded.



H Holding times for preparation or analysis exceeded.

Qualifiers:

Silver State Labs-Las Vegas

QC SUMMARY REPORT

ND Not Detected at the PQL.

WO#:

19070468

23-Jul-19

Client: Project:	AECOM 60477365			TestCode: C	R6-SDWA-218.7		
Sample ID:	ICV-R31496	SampType: ICV	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/22/2019	RunNo: 31496		
Client ID:	ICV	Batch ID: R31496	TestNo: E218.7	Analysis Date: 7/22/2019	SeqNo: 726457		
				•			
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual		
Chromium,	Hexavalent	47.6	1.00 50.00 0	95.3 90 110			
Sample ID:	ICB-R31496	SampType: ICB	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/22/2019	RunNo: 31496		
Client ID:	ICB	Batch ID: R31496	TestNo: E218.7	Analysis Date: 7/22/2019	SeqNo: 726458		
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual		
Chromium,	Hexavalent	ND	1.00				
Sample ID:	MB-R31496	SampType: MBLK	TestCode: CR6-SDWA-2 Units: μg/L	Prep Date: 7/22/2019	RunNo: 31496		
Client ID:	PBW	Batch ID: R31496	TestNo: E218.7	Analysis Date: 7/22/2019	SeqNo: 726459		
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual		
Chromium,	Hexavalent	ND	1.00				
Sample ID:	LCS-R31496	SampType: LCS	TestCode: CR6-SDWA-2 Units: µg/L	Prep Date: 7/22/2019	RunNo: 31496		
Client ID:	LCSW	Batch ID: R31496	TestNo: E218.7	Analysis Date: 7/22/2019	SeqNo: 726460		
Analyte		Result	PQL SPK value SPK Ref Val	%REC LowLimit HighLimit RPD Ref Val	%RPD RPDLimit Qual		
Chromium,	Hexavalent	49.6	1.00 50.00 0	99.1 90 110			

MCL Maximum Contaminant Level.



Silver State Labs-Las Vegas

QC SUMMARY REPORT

WO#:

19070468

23-Jul-19

Client: AECOM

60477365 TestCode: CR6-SDWA-218.7 **Project:**

Sample ID: LCS-R31496 SampType: LCS TestCode: CR6-SDWA-2 Units: µg/L Prep Date: 7/22/2019 RunNo: 31496 Analysis Date: 7/22/2019 Client ID: LCSW Batch ID: R31496 TestNo: **E218.7** SeqNo: 726460

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

Sample ID: 19070386-01BMS Client ID: BatchQC	SampType: MS Batch ID: R31496		TestCode: CR6-SDWA-2 Units: µg/L TestNo: E218.7		Prep Date: 7/22/2019 Analysis Date: 7/22/2019				RunNo: 31496 SeqNo: 726466		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	9.61	1.00	10.00	0	96.1	90	110				

Sample ID: 19070386-01BMSD	SampType: MSD	TestCoo	TestCode: CR6-SDWA-2 Units: µg/L		Prep Date: 7/22/2019				RunNo: 31496		
Client ID: BatchQC	Batch ID: R31496	TestN	lo: E218.7		Analysis Date: 7/22/2019			SeqNo: 726467			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	7.20	1.00	10.00	0	72.0	90	110	9.610	28.7	20	RS

Sample ID: CCV-R31496 Client ID: CCV	SampType: CCV Batch ID: R31496		TestCode: CR6-SDWA-2 Units: μg/L TestNo: E218.7			Prep Dat Analysis Dat	te: 7/22/20 °te: 7/22/20 °		RunNo: 31496 SeqNo: 726468		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	48.0	1.00	50.00	0	95.9	90	110				

H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL. Qualifiers:



Silver State Labs-Las Vegas

QC SUMMARY REPORT

WO#:

19070468

23-Jul-19

Client: AECOM

60477365 TestCode: CR6-SDWA-218.7 **Project:**

Sample ID: CCB-R31496 SampType: CCB TestCode: CR6-SDWA-2 Units: µg/L Prep Date: 7/22/2019 RunNo: 31496

Analysis Date: 7/22/2019 Client ID: CCB Batch ID: R31496 TestNo: **E218.7** SeqNo: 726469 PQL **RPDLimit** Analyte Result SPK value SPK Ref Val %REC LowLimit HighLimit RPD Ref Val %RPD Qual

Chromium, Hexavalent ND 1.00

H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL. Qualifiers:



CHAIN-OF-CUSTODY-RECORD

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Analytical Laboratories Analytical Laboratories sem-analytical.com envirotechonline.com	ch.	1135 FINANCIAI Phone (775) 857	L BOULEVAR 7-2400 Fax: (RD, RENO, N 888) 398-700	V 89502 2 (EPA#: NV0	0015, CA2526)		1 age	
Report Attention: Chad Ruper Company: AECOM Mailing Address: 1220 Avenida Acceso City, State, Zip: Phone: Sus 764 4631 Chad super experies Chad super experies Project Number: 664773 GOUTH ACCESO Project Number: 664773 GOUTH ACCESO CAMBRILLO AVENIDA Email / Fax: Chad super experies	City, State,	ELOM ress:		COMPLIANCE NEW ADDRESS MONITORING? Yes Results: Invoice: Applicable Program SDWA CWA RCRA Mining Other QC Level Report III IV NOTE: Surcharges apply to Level II, III and W report Send Results Via:					
ampled by: Signature: ttest to the validity and authenticity of the sample. I am aware that tampering with or intentionally	mislabeling the sample			2				Mail: Er	mail: Fax:
cation, date or time is considered fraud and may be grounds for legal action.		nformation / Specia	I Instructions	3					invoice via.
Standard: Standard TAT 7-10 Business Days. Note that some tests vary. Rush	1	•		Contair				Mail: E	mail: Fax:
Rush Same Day:	1.	I. I		Number / Type of Containers W. Chrome 21:				Field On-Site pH: Temperature:	Measurements Chlorine: Other:
Date Time Sampled Sampled Sample Identification	SSAL - SEM Lab			7					
1/9/19 /150 NERT 4.70NI-2019 0709	19076468		17	1/0 ×				Metals*	
(1205 NERT4.76NI-20194)Ug-EB		2A ()	1	1					
1 1255 NERT4.7/NI-20190709									
	5							COMMENTS:	
	19/19								
Signature	-	Print Name				mpany		ate	Time
Relinquished By:	J. CAROT.	RIO		/	FECUM	1	7/10		0900
Received By:	J. CAROT.	awlms-			55P	2	7-	10-19	0900
Relinquished By:									
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Authorized By:	J CARYL	210		/	4 Ecom		7/1	0/19	U908
Author Nicoland and International Computer This obligates your organization for service fees. SSAL St.			ections or	Sample The and	s are discarded 30 day alytical results associat	s after results are reported unle- led with this COC apply only to the	ss other arranger hese samples as	they are received	by the laboratory.

Certificate of Analysis

Date of certificate: March 18, 2019

Client: AECOM

8985 South Eastern Avenue, Suite 130

Las Vegas, NV 89123

Project name/location: Ph2 GW Invest, Henderson, NV / Las Vegas Wash

Contact people: Chad.Roper@aecom.com

Carmen.Caceres-Schnell@aecom.com Jessica.Budin-Caloroso@aecom.com Patty.Mata@testamericainc.com Samples collected by: Joseph Capotrio and Eric Wang

Date samples shipped: March 7, 2019

Date samples rec'd at OUL: March 8, 2019

Date analyzed by OUL: March 13 and 14, 2019

Included with certificate of analysis: Table of

results and copies of sample collection data sheets

Results for charcoal and water samples analyzed for the presence of fluorescein, eosine, rhodamine WT (RWT) and sulforhodamine B (SRB) dyes.

Peak wavelengths are reported in nanometers (nm); dye concentrations are reported in parts per billion (ppb).

All results are for charcoal unless otherwise indicated.

OUL	Station	Date/Time	Date/Time	Fluor	rescein	Eo	sine	RV	WT	S	RB
Number	Name	Placed	Collected	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)	Peak (nm)	Conc (ppb)
D5355	T4.60C	3/7/19 0755	3/7/19 1210	516.8 *	0.186	ND		ND		ND	
D5356	T4.61C	3/7/19 0800	3/7/19 1215	513.4 *	0.355	ND		ND		ND	
D5357	T4.62C	3/7/19 0805	3/7/19 1220	ND	197	ND		ND		ND	
D5358	T3.60C	3/7/19 0825	3/7/19 1240	516.0	0.585	ND		ND		ND	
D5359	T3.58C	3/7/19 0830	3/7/19 1245	516.2	0.728	ND		ND		ND	
D5360	Laboratory	control charcoal b	olank								
D5361	T3.57C	3/7/19 0845	3/7/19 1250	516.4	0.851	ND		ND		ND	
D5566	T4.60	Water	3/7/19 1210	ND		ND		ND		581.8	0.087
D5567	T4.61	Water	3/7/19 1215	ND	- 11	ND		ND		582.2	0.081
D5568	T3.60	Water	3/7/19 1240	ND		ND		ND		582.0	0.093
D5569	T3.58	Water	3/7/19 1245	ND		ND		ND		580.8	0.067
D5570	T3.57	Water	3/7/19 1250	ND		ND		ND		582.6	0.081

Note: Dye concentrations are based upon standards used at the OUL. The standard concentrations are based upon the as sold weight of the dye that the OUL use If the client is not using OUL dyes, the client should provide the OUL with a sample of the dye to compare to the OUL dyes.

Footnotes: ND = No dye detected

Thomas J. Aley, PHG and RG Clares Aley

1 of 1

^{* =} A fluorescence peak is present that does not meet all the criteria for a positive dye result. However, it has been calculated as though it was the tracer dye.

	OUL se only		[x] Eosine [x] Rhodamine WT [x] Other Sulforhodamine B Ship cooler to: Please indicate stations where dye was visible in for Field toolwining was a ship to be a simple of the ship in t					OUL use on
# CHAR REC'D	LAB NUMBER Charcogl	STATION NUMBER 1-4 Numbers	for field technician use - use black ink onl STATION NAME	PL	PLACED COLLECTI			# WATE
1	D5358	1-4 lyumbers	T3.60C	DATE	TIME	DATE	TIME	RECT
0	7700		T3.60C	3/7/19	0825	3/2/19		7
1	D5359		T 3.58 C		1240		1240	1
Ó	7				0830		1245	0
e	D5361		T 3.58		1244		1245	6
0	20001		T3.57C		0845		1250	0
U			13.57		1750		1250	/
						-		
-								
			Contacts: Carmen.Caceres-Schnell@aecom.com			r		
			Chad.Roper@aecom.com					
			Jessica.Budin-Caloroso@aecom.com Patty.Mata@testamericainc.com		1.	4		
			seals intact upon arrival (a) our out					

Analyze	out.	orescein	erica; Jessica Budin-Caloroso, AECOM Send Results to: All contacts (see be [x] Eosine [x] Rhodamine WT [x] Other Sulforhodamine B Ship cooler to:					
	se only		Please indicate stations where dye was visible in t for field technician use - use black ink only					OUL use only
# CHAR REC'D	NUMBER Charcoal	STATION NUMBER 1-4 Numbers	STATION NAME		ACED	COLL	ECTED	# WATER
1	D5355	1-4 Indinders	T4.60C	DATE	TIME	DATE	TIME	REC'D
6			T4.60	3/7/19		3/2/19		0
1	D5356		T4.61C		1210		1215	0
6			T4.61		1215		1214	1
	D5357		74.60 Cae 31/1 74.626 74620 T4.620		0805		1220	0
0	L 3		T462 74.62 T4.62 T4.62	1	1550	1	1220	1-
			AL.					
{								
			Contacts: Carmen.Caceres-Schnell@aecom.com					
-			Chad.Roper@aecom.com					
			Jessica.Budin-Caloroso@aecom.com Patty.Mata@testamericainc.com					
OMME	NTS CIL	stade	seals intactupon around a six					

anaiyze	for: [X] FI	uorescein	[x] Eosine [x] Rhodamine WT [x] Other Sulforhodamine B Ship cooler to:						
и	se only		<u>Please indicate stations where dye was visible in</u> for field technician use - use black ink only						OUL use onl
# CHAR REC'D	LAB NUMBER Waler	STATION NUMBER 1-4 Numbers	STATION NAME	PLACED		V		12.2	# WATE
1			T4.60C	DAT		755	DATE	TIME	O
6	D5566		T4.60	3///	_	210	3/3/19	1210	1
1			T4.61C			406		1215	0
6	D5567		T4.61			215		1214	
/			T4.600 9831/ T4628 74628 T4.676			805		1220	0
0	_		T462 T4.62 T4.62 C- T4.62			520	1	1220	1-
			Contacts: Carmen.Caceres-Schnell@aecom.com Chad.Roper@aecom.com Jessica.Budin-Caloroso@aecom.com Patty.Mata@testamericainc.com						
MME	NTS CU	stode	seals intactupa arrival a our						-

w	OUL se only		[x] Eosine [x] Rhodamine WT [x] Other Sulforhodamine B Ship cooler to: Please indicate stations where dye was visible in the for field technician use - use black ink only	e field	į.				OUL use on	
CHAR REC'D	LAB NUMBER	STATION NUMBER	STATION NAME	STATION NAME PLACED				PLACED COLLECTED	ECTED	# WATER
1	Water	1-4 Numbers	T3.60 C	3/7	/ATE	0825	3/2/14	TIME	REC'D	
0	D5568		T3.60	3/7	// <i>A</i> _	1240	3/7/19	1246	1	
1			T 3.5%.C			0830		1245	0	
0	D5569		T 3.5%	1	1.4	1244		1245	1	
P			T3.57C			0845		1250	6	
0	D5590		13.57			1250		1250	1	
				7			4			
	-									
		-		-						
-				_						
			Contacts: Carmen.Caceres-Schnell@aecom.com	+-						
-1			Chad.Roper@aecom.com Jessica.Budin-Caloroso@aecom.com	+						
			Patty.Mata@testamericainc.com							

Page L of Z ou

Appendix K

Licensed Well Survey

Project file data Coordinate System

Name: H:\Field_Services\dataproject\26871.01.00 Name: US State Plane 1983

NAD 1983 (Conus)

Nevada East 2701

GEOID12A (Conus)

AECOM-NDEP LV WASH\Wetlands Wells Datum:

\WETLAND WELLS .vce

Size: 784 KB

Modified: 6/17/2019 8:23:19 AM (UTC:-7)

Time zone: Pacific Standard Time Vertical datum: NAVD88

Reference number:

Description:
Comment 1:
Comment 2:

Comment 3:

Additional Coordinate System Details

Zone:

Geoid:

Calibrated site:

Local Site Settings						
Project latitude:	?	Ground scale factor:	1			
Project longitude:	?	False northing offset:	0.000			
Project height:	1465.355	False easting offset:	0.000			

Point List

ID	Latitude (Global)	Longitude (Global)	Height (Global) (US survey foot)	Feature Code
31244	N36°05'57.30725"	W114°56'34.04499"	1378.035	NERT3.35S1
31245	N36°05'57.31245"	W114°56'34.05240"	1378.410	CONC N SIDE
31246	N36°05'57.31107"	W114°56'34.05709"	1378.122	NG N SIDE
31247	N36°05'55.67540"	W114°56'36.41547"	1382.164	NERT3.40S1
31248	N36°05'55.68274"	W114°56'36.41971"	1382.706	CONC N SIDE
31249	N36°05'55.68399"	W114°56'36.41994"	1382.453	NG N SIDE
31250	N36°05'49.54716"	W114°56'42.59289"	1381.861	NERT3.58S1
31251	N36°05'49.55195"	W114°56'42.59890"	1382.254	CONC N SIDE
31252	N36°05'49.55050"	W114°56'42.60566"	1382.071	NG N SIDE
31253	N36°05'49.59217"	W114°56'42.65672"	1382.090	NERT3.58S1B
31254	N36°05'49.59748"	W114°56'42.66363"	1382.688	CONC N SIDE
31255	N36°05'49.59791"	W114°56'42.66781"	1382.547	NG N SIDE
31256	N36°05'49.64558"	W114°56'42.50155"	1381.506	NERT3.58S1C
31257	N36°05'49.65095"	W114°56'42.50856"	1381.993	CONC N SIDE
31258	N36°05'49.64958"	W114°56'42.51285"	1381.892	NG N SIDE
31259	N36°05'49.50998"	W114°56'42.53328"	1381.831	NERT3.60S1
31260	N36°05'49.51396"	W114°56'42.54132"	1382.317	CONC N SIDE
31261	N36°05'49.51637"	W114°56'42.54420"	1382.202	NG N SIDE

NERT3.60S1A	1385.787	W114°56'44.01719"	N36°05'47.83163"	31262
CONC N SIDE	1386.282	W 114°56'44.02447"	N36°05'47.83566"	31263
NG N SIDE	1386.038	W114°56'44.02895"	N36°05'47.83552"	31264
NERT3.60S1B	1386.056	W114°56'44.06157"	N36°05'47.85924"	31265
CONC N SIDE	1386.383	W114°56'44.06831"	N36°05'47.86372"	31266
NG N SIDE	1386.162	W114°56'44.07321"	N36°05'47.86485"	31267
NERT3.60S1D	1385.798	W114°56'43.93918"	N36°05'47.90052"	31268
CONC N SIDE	1386.248	W114°56'43.94499"	N36°05'47.90585"	31269
NG N SIDE	1386.055	W114°56'43.94774"	N36°05'47.90744"	31270
NERT3.60S1C	1385.865	W114°56'43.79552"	N36°05'48.05382"	31271
CONC N SIDE	1386.053	W114°56'43.80359"	N36°05'48.05862"	31272
NG N SIDE	1385.944	W114°56'43.80536"	N36°05'48.05967"	31273
NERT3.60S1C	1386.295	W114°56'43.80843"	N36°05'47.70201"	31274
CONC N SIDE	1386.832	W114°56'43.81536"	N36°05'47.70619"	31275
NG N SIDE	1386.718	W114°56'43.81924"	N36°05'47.70723"	31276
NERT3.63S1	1369.320	W 114°56'49.24651"	N36°05'44.51947"	31277
CONC N SIDE	1369.736	W 114°56'49.24832"	N36°05'44.52549"	31278
NG N SIDE	1369.500	W114°56'49.25376"	N36°05'44.52643"	31279
THREE KIDS WEIR	1360.993	W114°56'47.74325"	N36°05'46.05032"	31280
THREE KIDS WEIR CHECK	1361.000	W114°56'47.74385"	N36°05'46.05022"	31281
NERT3.98S1	1373.779	W114°57'09.14091"	N36°05'40.74189"	31282
CONC N SIDE	1374.162	W114°57'09.14227"	N36°05'40.74751"	31283
NG N SIDE	1373.998	W114°57'09.14487"	N36°05'40.75159"	31284
NERT4.64S1	1420.434	W114°57'45.94037"	N36°05'31.65540"	31285
CONC N SIDE	1420.838	W114°57'45.94577"	N36°05'31.66131"	31286
NG N SIDE	1420.635	W114°57'45.94979"	N36°05'31.66311"	31287
NERT4.64S1A	1420.163	W114°57'45.96711"	N36°05'31.71041"	31288
CONC N SIDE	1420.719	W114°57'45.96972"	N36°05'31.71676"	31289
NG N SIDE	1420.382	W114°57'45.97456"	N36°05'31.71878"	31290
NERT4.64S1B	1419.976	W 114°57'45.77046"	N36°05'31.71794"	31291
CONC N SIDE	1420.633	W 114°57'45.77154"	N36°05'31.72105"	31292
NG N SIDE	1420.474	W 114°57'45.77493"	N36°05'31.72738"	31293
NERT4.64S1C	1420.406	W 114°57'45.91581"	N36°05'31.60031"	31294
CONC N SIDE	1420.960	W114°57'45.91761"	N36°05'31.60715"	31295
NG N SIDE	1420.747	W114°57'45.92083"	N36°05'31.60811"	31296
NERT4.64S1D	1420.061	W114°57'45.49794"	N36°05'31.80695"	31297
CONC N SIDE	1420.451	W 114°57'45.50059"	N36°05'31.81386"	31298
NG N SIDE	1420.330	W114°57'45.50337"	N36°05'31.81640"	31299

NERT4.71S2	1425.633	W 114°57'54.95918"	N36°05'28.41404"	31300
CONC N SIDE	1426.003	W 114°57'54.96724"	N36°05'28.41679"	31301
NG N SIDE	1425.996	W 114°57'54.97136"	N36°05'28.42126"	31302
NG S SIDE CALICO RIDGE WEIR (INACCESSABLE)	1399.324	W114°57'51.15500"	N36°05'31.77197"	31303
NERT3.58N1	1384.065	W 114°56'48.73173"	N36°05'54.17929"	31304
NERT3.58N1	1384.059	W 114°56'48.73188"	N36°05'54.17929"	31305
CONC N SIDE	1384.279	W 114°56'48.73900"	N36°05'54.18473"	31306
NG N SIDE	1384.115	W 114°56'48.74133"	N36°05'54.18534"	31307
NERT3.60N1	1390.634	W 114°56'50.85065"	N36°05'52.00693"	31308
CONC N SIDE	1390.918	W 114°56'50.85684"	N36°05'52.01093"	31309
NG N SIDE	1390.697	W114°56'50.86229"	N36°05'52.01161"	31310
NERT4.64N1	1419.017	W 114°57'48.78426"	N36°05'36.89912"	31311
CONC N SIDE	1419.415	W 114°57'48.78792"	N36°05'36.90481"	31312
NG N SIDE	1419.319	W 114°57'48.79173"	N36°05'36.90542"	31313
NERT4.65N1	1420.439	W114°57'50.78201"	N36°05'36.66472"	31314
CONC N SIDE	1420.844	W 114°57'50.78835"	N36°05'36.66862"	31315
NG N SIDE	1420.775	W 114°57'50.79203"	N36°05'36.67058"	31316
NERT4.70N1	1422.333	W 114°57'53.66734"	N36°05'35.67994"	31317
CONC N SIDE	1422.803	W 114°57'53.67362"	N36°05'35.68577"	31318
CONC N SIDE	1422.795	W 114°57'53.67384"	N36°05'35.68614"	31319
NERT4.71N1	1426.143	W 114°57'56.97557"	N36°05'35.50150"	31322
CONC N SIDE	1426.545	W 114°57'56.97578"	N36°05'35.50442"	31323
NG N SIDE	1426.481	W114°57'56.98120"	N36°05'35.51305"	31324

6/17/2019 8:27:32 AM	H:\Field_Services\dataproject\26871.01.00 AECOM-NDEP LV WASH\Wetlands Wells	Trimble Business Center
	\WETLAND WELLS .vce	

Project file data Coordinate System

Name: H:\Field_Services\dataproject\26871.01.00 Name: US State Plane 1983

NAD 1983 (Conus)

Nevada East 2701

GEOID12A (Conus)

AECOM-NDEP LV WASH\Wetlands Wells Datum:

\WETLAND WELLS .vce

Size: 784 KB

Modified: 6/17/2019 8:23:19 AM (UTC:-7)

Time zone: Pacific Standard Time Vertical datum: NAVD88

Reference number:

Description:
Comment 1:
Comment 2:

Comment 2: Comment 3:

Additional Coordinate System Details

Zone:

Geoid:

Calibrated site:

Local Site Settings						
Project latitude:	?	Ground scale factor:	1			
Project longitude:	?	False northing offset:	0.000			
Project height:	1465.355	False easting offset:	0.000			

Point List

ID	Northing (US survey foot)	Easting (US survey foot)	Elevation (US survey foot)	Feature Code
31244	26738372.779	845391.591	1470.443	NERT3.35S1
31245	26738373.301	845390.979	1470.818	CONC N SIDE
31246	26738373.158	845390.595	1470.530	NG N SIDE
31247	26738206.492	845198.154	1474.579	NERT3.40S1
31248	26738207.233	845197.802	1475.120	CONC N SIDE
31249	26738207.360	845197.781	1474.868	NG N SIDE
31250	26737583.504	844695.297	1474.297	NERT3.58S1
31251	26737583.985	844694.801	1474.690	CONC N SIDE
31252	26737583.834	844694.247	1474.507	NG N SIDE
31253	26737588.020	844690.029	1474.526	NERT3.58S1B
31254	26737588.554	844689.458	1475.123	CONC N SIDE
31255	26737588.595	844689.115	1474.982	NG N SIDE
31256	26737593.505	844702.727	1473.941	NERT3.58S1C
31257	26737594.044	844702.148	1474.428	CONC N SIDE
31258	26737593.903	844701.798	1474.328	NG N SIDE
31259	26737579.776	844700.214	1474.267	NERT3.60S1
31260	26737580.175	844699.551	1474.752	CONC N SIDE
31261	26737580.417	844699.313	1474.638	NG N SIDE

NERT3.60S1A	1478.228	844579.552	26737409.271	31262
CONC N SIDE	1478.723	844578.953	26737409.674	31263
NG N SIDE	1478.479	844578.585	26737409.658	31264
NERT3.60S1B	1478.497	844575.892	26737412.039	31265
CONC N SIDE	1478.824	844575.336	26737412.489	31266
NG N SIDE	1478.604	844574.934	26737412.600	31267
NERT3.60S1D	1478.239	844585.909	26737416.279	31268
CONC N SIDE	1478.689	844585.428	26737416.815	31269
NG N SIDE	1478.496	844585.202	26737416.974	31270
NERT3.60S1C	1478.305	844597.596	26737431.857	31271
CONC N SIDE	1478.494	844596.931	26737432.338	31272
NG N SIDE	1478.384	844596.785	26737432.443	31273
NERT3.60S1C	1478.736	844596.771	26737396.276	31274
CONC N SIDE	1479.273	844596.199	26737396.696	31275
NG N SIDE	1479.159	844595.879	26737396.799	31276
NERT3.63S1	1461.775	844152.610	26737071.551	31277
CONC N SIDE	1462.191	844152.458	26737072.159	31278
NG N SIDE	1461.955	844152.011	26737072.250	31279
THREE KIDS WEIR	1453.443	844274.960	26737227.150	31280
THREE KIDS WEIR CHECK	1453.450	844274.911	26737227.139	31281
NERT3.98S1	1466.271	842522.475	26736678.945	31282
CONC N SIDE	1466.654	842522.360	26736679.512	31283
NG N SIDE	1466.490	842522.143	26736679.923	31284
NERT4.64S1	1513.004	839508.389	26735740.735	31285
CONC N SIDE	1513.408	839507.942	26735741.329	31286
NG N SIDE	1513.205	839507.611	26735741.510	31287
NERT4.64S1A	1512.733	839506.159	26735746.283	31288
CONC N SIDE	1513.290	839505.941	26735746.924	31289
NG N SIDE	1512.952	839505.542	26735747.126	31290
NERT4.64S1B	1512.546	839522.293	26735747.147	31291
CONC N SIDE	1513.202	839522.202	26735747.461	31292
NG N SIDE	1513.044	839521.920	26735748.100	31293
NERT4.64S1C	1512.976	839510.440	26735735.178	31294
CONC N SIDE	1513.531	839510.288	26735735.868	31295
NG N SIDE	1513.317	839510.023	26735735.963	31296
NERT4.64S1D	1512.630	839544.601	26735756.291	31297
CONC N SIDE	1513.020	839544.379	26735756.989	31298
NG N SIDE	1512.899	839544.149	26735757.244	31299

NERT4.71S2	1518.222	838770.320	26735408.272	31300
CONC N SIDE	1518.592	838769.656	26735408.546	31301
NG N SIDE	1518.585	838769.316	26735408.996	31302
NG S SIDE CALICO RIDGE WEIR (INACCESSABLE)	1491.901	839080.362	26735749.795	31303
NERT3.58N1	1476.499	844188.462	26738048.580	31304
NERT3.58N1	1476.493	844188.450	26738048.581	31305
CONC N SIDE	1476.713	844187.862	26738049.127	31306
NG N SIDE	1476.549	844187.671	26738049.187	31307
NERT3.60N1	1483.076	844016.018	26737827.785	31308
CONC N SIDE	1483.359	844015.507	26737828.186	31309
NG N SIDE	1483.139	844015.060	26737828.252	31310
NERT4.64N1	1511.580	839271.619	26736269.465	31311
CONC N SIDE	1511.978	839271.315	26736270.038	31312
NG N SIDE	1511.883	839271.002	26736270.098	31313
NERT4.65N1	1513.006	839107.823	26736244.720	31314
CONC N SIDE	1513.411	839107.299	26736245.111	31315
NG N SIDE	1513.342	839106.997	26736245.307	31316
NERT4.70N1	1514.906	838871.668	26736143.637	31317
CONC N SIDE	1515.376	838871.148	26736144.224	31318
CONC N SIDE	1515.368	838871.130	26736144.260	31319
NERT4.71N1	1518.722	838600.288	26736123.869	31322
CONC N SIDE	1519.124	838600.269	26736124.164	31323
NG N SIDE	1519.060	838599.819	26736125.034	31324

6/17/2019 8:28:59 AM	H:\Field_Services\dataproject\26871.01.00	Trimble Business Center
	AECOM-NDEP LV WASH\Wetlands Wells	
	\WETLAND WELLS .vce	

Project File Data

Name: H:\Field_Services\dataproject\26871.01.00

AECOM-NDEP LV WASH\Wetlands Wells\WETLAND WELLS .vce

784 KB

Modified: 5/10/2019 8:23:29 AM (UTC:-7)

Time zone: Pacific Standard Time

Reference number: Description: Comment 1: Comment 2: Comment 3:

Size:

Coordinate System

Name: US State Plane 1983
Datum: NAD 1983 (Conus)
Zone: Nevada East 2701
Geoid: GEOID12A (Conus)

Vertical datum: NAVD88

Calibrated site:

Additional Coordinate System Details

Local Site Settings			
Project latitude:	?	Ground scale factor:	1
Project longitude:	?	False northing offset:	0.000 ft
Project height:	1465.355 ft	False easting offset:	0.000 ft

Vector List

Precision Confidence Level: 95%				
Vector ID	From Point ID	To Point ID	Solution Type	Start Time
<u>V997</u>	Hen1	31244	Fixed	5/9/2019 8:12:24 AM
<u>V1001</u>	Hen1	31247	Fixed	5/9/2019 8:19:56 AM
V1005	Hen1	31250	Fixed	5/9/2019 8:27:56 AM
<u>V1009</u>	Hen1	31253	Fixed	5/9/2019 8:30:22 AM
<u>V1013</u>	Hen1	<u>31256</u>	Fixed	5/9/2019 8:33:27 AM
<u>V1017</u>	Hen1	31259	Fixed	5/9/2019 8:36:11 AM
<u>V1021</u>	Hen1	31262	Fixed	5/9/2019 8:41:01 AM
V1025	Hen1	31265	Fixed	5/9/2019 8:43:17 AM
V1029	Hen1	31268	Fixed	5/9/2019 8:46:02 AM
V1033	Hen1	31271	Fixed	5/9/2019 8:48:26 AM
<u>V1037</u>	Hen1	31274	Fixed	5/9/2019 8:50:43 AM
<u>V1041</u>	Hen1	31277	Fixed	5/9/2019 8:57:16 AM
V1047	Hen1	31282	Fixed	5/9/2019 9:11:11 AM
	<u> </u>	ĺ		

Vector ID	From Point ID	To Point ID	Solution Type	Start Time
<u>V1051</u>	Hen1	31285	Fixed	5/9/2019 9:24:47 AM
<u>V1055</u>	Hen1	31288	Fixed	5/9/2019 9:27:54 AM
<u>V1059</u>	Hen1	31291	Fixed	5/9/2019 9:29:53 AM
<u>V1063</u>	Hen1	31294	Fixed	5/9/2019 9:31:47 AM
<u>V1067</u>	Hen1	<u>31297</u>	Fixed	5/9/2019 9:33:53 AM
<u>V1071</u>	Hen1	31300	Fixed	5/9/2019 9:39:58 AM
<u>V1077</u>	Hen1	31304	Fixed	5/9/2019 10:18:46 AM
<u>V1082</u>	Hen1	31308	Fixed	5/9/2019 10:24:44 AM
<u>V1088</u>	Hen1	31312	Fixed	5/9/2019 10:37:50 AM
<u>V1090</u>	Hen1	31314	Fixed	5/9/2019 10:39:47 AM
<u>V1094</u>	Hen1	31317	Fixed	5/9/2019 10:45:33 AM
<u>V1100</u>	Hen1	31322	Fixed	5/9/2019 10:52:28 AM

	Project:	
Date: 5/15/2019 1:52:28 PM	H:\Field_Services\dataproject\26871.01.00 AECOM-NDEP LV WASH\Wetlands Wells\WETLAND WELLS .vce	Trimble Business Center

Appendix L

2019 Proposed Borehole Dilution Testing as an Alternative to Pump Testing for Hydraulic Conductivity Determination Memo



To:

Carlton Parker, PG Nevada Division of Environmental Protection 2030 E Flamingo Road, Suite 230 Las Vegas, NV 89119

CC:

Carmen Caceres-Schnell, CEM; Harry Vandenberg,

AECOM 1220 Avenida Acaso Camarillo CA, 93012 USA aecom.com

Project name:

NDEP Downgradient Study Area

Project ref:

60477365

rom:

Sally Bilodeau, CEM, Chad Roper, CEM

Date:

May 13, 2019

Memo

Subject: Proposed Borehole Dilution Testing as an Alternative to Pump Testing for Hydraulic Conductivity Determination

This memorandum documents AECOM's proposal to perform dilution testing as an alternative aquifer test in lieu of the Phase II pump tests proposed in the Data Gap Investigation Plan – Phase II Groundwater Quality Assessment work plan (Phase II work plan).¹ An alternative is needed due to the difficulty in storing and disposing the large quantities of water that can be expected during the proposed pump test as estimated based on slug testing performed in the target wells. In addition, pump testing is no longer deemed critical because the use of automated dye-measuring probes in the surface water allows for continual readings over an extended period of time without the need for personnel to continually travel to the Las Vegas Wash (LVW). This makes the estimate of travel time from the injection well to the LVW less important to cost-effective completion of the tracer test.

Three newly installed wells were identified in the Phase II work plan for slug, pump and tracer testing: NERT4.64S1, NERT3.60S1 and NERT3.58S1. The slug and pump tests were intended to determine hydraulic conductivity for use in the tracer test design and monitoring and to provide multiple lines of evidence supporting the hydraulic conductivity estimate. Slug tests performed in the wells NERT4.64S1, NERT3.60S1 and NERT3.58S1 indicate that a pump rate of around 30 gallons per minute (gpm) will be needed to sufficiently stress the aquifer. This rate is higher than what was assumed in the work plan (between 5 and 10 gpm).

The Phase II work plan proposed running a 12-hour pump test in each of the selected wells. If the pump tests were run at 30 gpm, each test would generate approximately 21,600 gallons of groundwater per test or a total of 64,800 gallons. This amount of water would require large capacity water storage and an efficient means to dispose of the generated water at the NERT Site. For reference, 10,000-gallon Baker tanks are approximately 9.5 feet high, 8.5 feet wide and 26.5 feet long and weigh between 10,500 and 12,700 pounds before filling. Storage, handling, and disposal of this volume of water would be problematic due to the following logistical constraints at the well locations:

- Well NERT4.64S1 near Calico Ridge Weir: The area is physically constrained by areas where vegetation has been restored.
- Wells NERT3.60S1 and NERT3.58S1 near Three Kids Weir: The area is physically constrained by a bike path, vegetation, and slopes to the north and south. An additional concern in this location is that the area is faulted which may affect the results and interpretation of the pump tests.

¹ AECOM 2019. Data Gap Investigation Plan – Phase II Groundwater Quality Assessment, NERT Remedial Investigation-Downgradient Study Area, Nevada Environmental Response Trust Site, Henderson, Nevada, Final January.

Since approval of the Phase II work plan, numerous wells have been installed, sampled, and tested near NERT4.64S1 for the LVW Bioremediation Pilot Study (Tetra Tech). The data available from the slug tests in NERT3.58S1, NERT 3.60S1, and NERT 4.64S1 and from nearby LVW Bioremediation Pilot Study wells is deemed sufficient to support tracer test design and monitoring.

In addition, because the proposed 12-hour pump test described faces significant hurdles due to the above constraints and the results of pump testing are not considered essential for dye tracer testing due to the use of automated probes, dilution testing and additional observation well monitoring concurrent with the dye tracer testing in the LVW are proposed to supplement existing hydraulic conductivity data. This testing will not generate waste water and therefore will not be subject to the constraints of pump testing.

Dilution Test

One reason for determining the hydraulic conductivity was to estimate the travel time from between the dye injection point to the LVW. A dye-dilution test could be performed concurrently with the dye tracer tests to estimate hydraulic conductivity. As stated by Pitrak et al. 2007, "Borehole dilution techniques use repeated fluid column profiling after establishment of an initial uniform condition to monitor the rate at which ambient ground water moves into a borehole. Application of the dilution technique in a monitoring well makes it possible to estimate the horizontal Darcy flow velocity of ground water in the aquifer surrounding the borehole." Although Pitrak and others incorporated vertical profiling into their studies, the proposed dilution test would homogenize the well contents to study the dilution across the entirety of the screened interval.

Injection well sampling would consist of collecting four sets of at least five samples at uniform time intervals in the injection well on the day the dye was introduced. Four sampling events at each injection location are proposed in order to adequately define the dilution of dye in the well due to groundwater movement and its appearance in the nearest observation wells. Samples would also be collected from each observation well. Each sample will be collected with dedicated or disposable sampling equipment.

Dye concentration would be quantified by visual comparison to prepared standards (this measurement is effective in the range from approximately 200,000 milligrams per liter (mg/L) [20%] to 1,000 mg/L [0.1%]). Since data from each sample will consist of a small aliquot compared to a known concentration, sampling will include homogenization (mixing within the water column of the well prior to sample collection) to ensure a uniform concentration within the well and to minimize any vertical stratification.

The trend (decline in dye concentration) observed in the initial sampling of the injection well will be used to determine the timing for the next sampling event. The next event would be scheduled for the time when a 50% reduction from the initial concentration would be predicted. The schedule for subsequent sampling events will be determined by field personnel based on similar data and criteria.

Once the dilution data is collected, the data are fit to a simple model (defined in Pitrak et al 2007) of logarithmic decay. The solution of this model includes parameters which correspond to aquifer properties including flow velocity. Flow velocity is then used to estimate hydraulic conductivity. This estimate will represent another line of evidence in aquifer characterization in addition to the slug testing, and dye testing from the injection well to its entry in the LVW.

Data collected from the observation wells is analyzed similarly to that collected in the LVW. The time to the initial detection of dye and the time to the peak observed dye concentration are used as boundaries of the time needed for the groundwater to travel from the injection well to the observation point. This data provides flow velocity. Additionally, the concentration at each observation well can be used to estimate the dispersivity of the aquifer materials along the flow path.

Data and discussion of the results of the dilution testing would be presented in the DGIP II Report as well as the rationale for not performing the 12-hour pump tests as discussed in this memorandum. Cost for the dilution test is estimated at less than 1/3 of the costs of the proposed pump tests (about \$120,000) described in the work plan and therefore would represent a considerable cost-savings. AECOM recommends proceeding with the dilution test as it would support achieving the objectives of the work plan and yield at least 67% cost savings compared to performing the pumping tests described in the work plan.

² Pitrak, Michal, Mares, S & Kobr, Miroslav. (2007). A Simple Borehole Dilution Technique in Measuring Horizontal Ground Water Flow. Ground water. 45. 89-92.

From: <u>James Carlton Parker</u>

To: <u>Bilodeau, Sally; Vandenberg, Harry</u>

Cc: Caceres-Schnell, Carmen; Roper, Chad; James Dotchin; "Fong, Alison"; Weiguan Dong; Alan Pineda; "Steve Clough"

Subject: Approval for OU3 Phase II Mod Tech Memo for Dilution Testing

Date: Thursday, May 16, 2019 3:01:07 PM

Attachments: image003.png

2019 05 13 NDEP Ph II Mod Tech Memo Dilution Testing.docx

Sally and Harry,

NDEP has reviewed the requested change from traditional well aquifer testing to dilution testing and approves of the requested change. Contact me if there are questions.

Thanks, Carlton



Carlton Parker, P.G.

Supervisor Bureau of Industrial Site Cleanup Environmental Scientist IV Nevada Division of Environmental Protection 2030 E. Flamingo Road, Suite 230 Las Vegas, NV 89119

p: 702.486.2850 Ext. 228 f: 702.486.2863 c: 702.659.3243

c: 702.659.3243 www.ndep.nv.gov

From: Bilodeau, Sally <Sally.Bilodeau@aecom.com>

Sent: Monday, May 13, 2019 4:49 PM

To: James Carlton Parker < jcarltonparker@ndep.nv.gov>

Cc: Vandenberg, Harry < Harry. Van Den Berg@aecom.com >; Caceres-Schnell, Carmen < Carmen. Caceres-

Schnell@aecom.com>; Roper, Chad <Chad.Roper@aecom.com> Subject: OU3 Phase II Mod Tech Memo for Dilution Testing

Carlton,

As discussed in our last conference call we have evaluated options for conducting aquifer tests for the OU3 Phase II study. Attached is a technical memorandum that describes AECOM's proposal to perform dilution testing as an alternative aquifer test in lieu of the 12 hour pump tests proposed in the Data Gap Investigation Plan – Phase II Groundwater Quality Assessment work plan. An alternative is needed due to the difficulty in storing and disposing the large quantities of water that can be expected during the proposed pump test as estimated based on slug testing performed in the target wells. In addition, pump testing is no longer deemed critical because the use of automated dye-measuring probes in the surface water allows for continual readings over an extended period of time without the need for personnel to continually travel to the Las Vegas Wash (LVW). AECOM recommends proceeding with the dilution test as it would support achieving the objectives of the work plan and yield at least 67% cost savings compared to performing the pumping tests described in the work plan.

Please do not hesitate to contact Harry, Carmen or me if you have any questions or require additional information.

Sally Bilodeau, PG, CEG, CHG, CEM
Senior Program Manager, Remediation, West
D +1-805-764-4006
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sally.bilodeau@aecom.com

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Imagine it. Delivered.

Appendix M

Dye Testing Photologs

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PHOTO LOG

Project: NERT Downgradient Study Area - Dye Tracer Study

Site Location: Henderson, NV near Three Kids Weir

Photographed By: AECOM **Date:** 6/21/19

Photo Number

Photo Direction: N/A

Samples collected from: Well NERT3.58S1

Samples collected on 6/3/19

At (time-from left to right): 1025

1120

1150

1225

1300



Photo Number

Direction Photo Taken:

N/A

Samples collected from: Well NERT3.58S1

Samples collected on 6/3/19

At (time-from left to right):

1300

1330

1400,

1430

1500



Photo Number

3

Direction Photo Taken:

N/A

Samples collected from: Well NERT3.58S1

Samples collected on 6/3/19

At (time-from left to right):

1500

1530

1555

And on 6/4/19

0855 0945



Photo Number

4

Direction Photo Taken:

N/A

Samples collected from: Well NERT3.58S1

Samples collected on 6/4/19

At (time-from left to right): 0945

1045

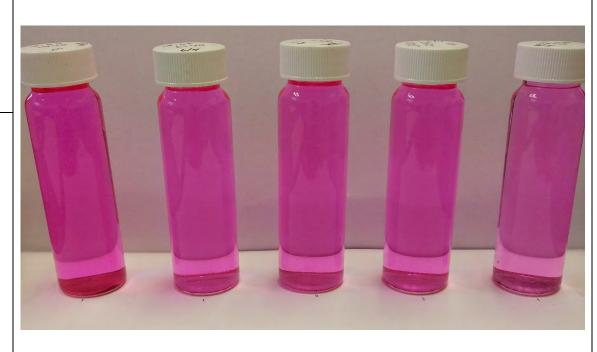
1145

1245

._ .0

And on 6/5/19

0945



Direction Photo Taken:

Samples collected from: Well NERT3.58S1

Samples collected on 6/4/19

At (time-from left to right):

0945

1045

1145

1245

And on 6/5/19

0840



Photo Number 6

Direction Photo Taken: NA

Samples collected from: **Well NERT3.58S1**

Samples collected on 6/5/19

At (time-from left to right):

0840

0945

1045

1145



7

Direction Photo Taken:

N/A

amples collected from: Well NERT3.58S1

Samples collected on: 6/5/19

At (time-from left to right): 1245 And on 6/7/19 0850 And on 6/10/19 0840 And on 6/13/19 1445

And on 6/18/19

1045

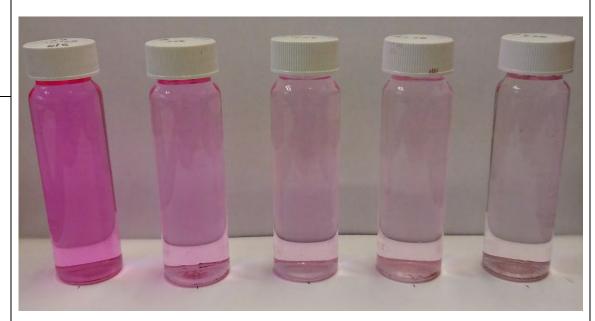


Photo Number 8

Direction Photo Taken:

N/A 0.064 standard, three samples, and "no dye" blank

Samples collected from: **Well NERT3.58S1A**

Samples collected on 6/3/19

At (time-from left to right): 1030 1105 1150



Direction Photo Taken:

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1A

Samples collected on 6/3/19

At (time-from left to right): 1230 1300 1335



Photo Number 10

Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

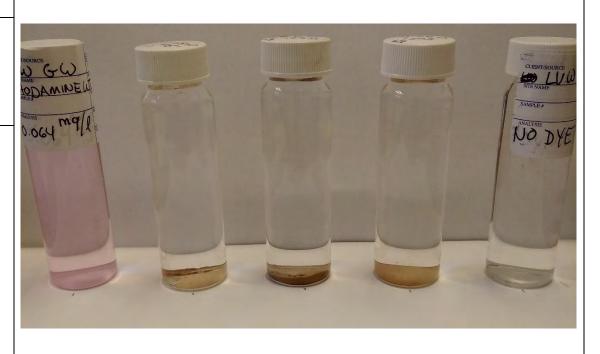
Samples collected from: **Well NERT3.58S1A**

Samples collected on 6/3/19

At (time-from left to right) Between Standards:

1405

1435



Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1A

Samples collected on 6/3/19

At (time-from left to right) Between Standards:

1535 1600

Well NERT3.58S1B 1040



Photo Number 12

Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1B

Samples collected on 6/3/19

At (time-from left to right) Between Standards:

1120

1155



Direction Photo Taken:

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1B

Samples collected on 6/3/19

At (time-from left to right) Between Standards: 1305

1335

1405



Photo Number 14

Direction Photo Taken:

N/A 0.064 standard, three samples, and "no dye" blank

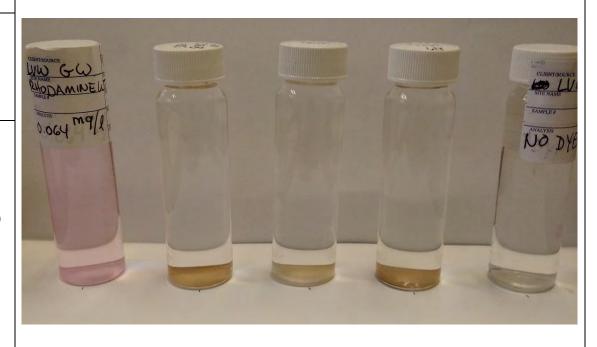
Samples collected from: Well NERT3.58S1B

Samples collected on 6/3/19

At (time-from left to right) Between Standards:

1435

1505



Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1B
Samples collected on 6/3/19

At (time-from left to right) Between Standards: 1600 And

Well NERT3.58S1C

Samples collected on

6/3/19

1045 1125

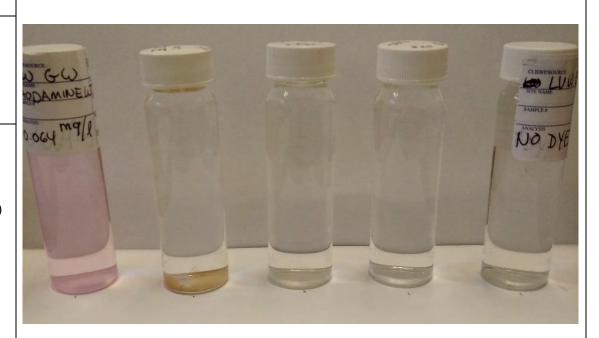


Photo Number 16

Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1C

Samples collected on 6/3/19

At (time-from left to right)
Between Standards:

1155

1245



Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1C

Samples collected on 6/3/19

At (time-from left to right) Between Standards:

1330

1400

1430



Photo Number 18

Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

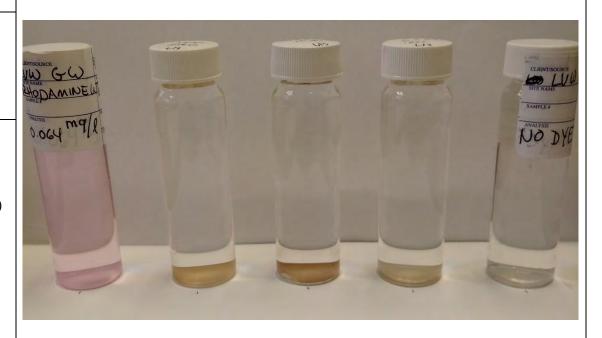
Samples collected from: Well NERT3.58S1C

Samples collected on 6/3/19

At (time-from left to right)
Between Standards:

1500

1530



Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1
Observation Wells

Samples collected on 6/18/19

At (time-from left to right) Between Standards: A1050

B1055 C1100



Photo Number 20

Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1
Observation Wells

Samples collected on 6/17/19

At (time-from left to right) Between Standards: A0855 B0900 C0905



Direction Photo Taken:

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1
Observation Wells

Samples collected on 6/10/19

At (time-from left to right) Between Standards: A0845 B0850 C0855



Photo Number 22

Direction Photo Taken:

N/A 0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1
Observation Wells

Samples collected on 6/13/19

At (time-from left to right)
Between Standards:

A1450 B1500



Direction Photo Taken: N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1 **Observation Wells**

Samples collected on 6/4/19

At (time-from left to right) Between Standards:

A0855 B0900 C0900



Photo Number 24

Direction Photo Taken:

N/A 0.064 standard, three samples, and "no dye" blank

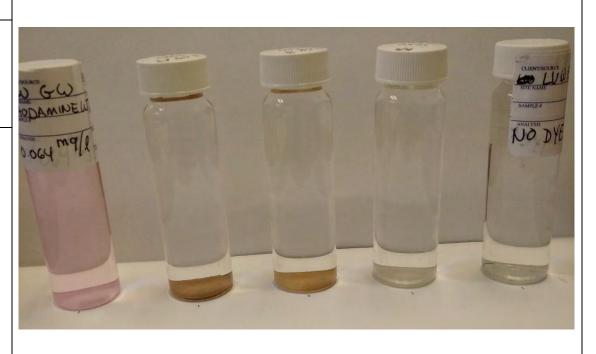
Samples collected from: **Well NERT3.58S1 Observation Wells**

Samples collected on 6/4/19

At (time-from left to right) Between Standards:

A1050

B1045 C1050



Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1
Observation Wells

Samples collected on 6/4/19

At (time-from left to right)
Between Standards:

A1150

B1150

C1145



Photo Number 26

Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well 3.58 Observation

Well 3.58 Observation Wells

Samples collected on 6/4/19

At (time-from left to right)
Between Standards:

A1250

B1250



Direction Photo Taken:

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1
Observation Wells

Samples collected on 6/5/19

At (time-from left to right) Between Standards:

A0845 B0840 C0845



Photo Number 28

Direction Photo Taken:

N/A 0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1
Observation Wells

Samples collected on 6/5/19

At (time-from left to right)
Between Standards:

A0950 B0950



Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1 Observation Wells

Samples collected on 6/5/19

At (time-from left to right) Between Standards: A1045 B1045

C1045



Photo Number 30

Direction Photo Taken:

N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1
Observation Wells

Samples collected on 6/5/19

At (time-from left to right) Between Standards:

A1150

B1145



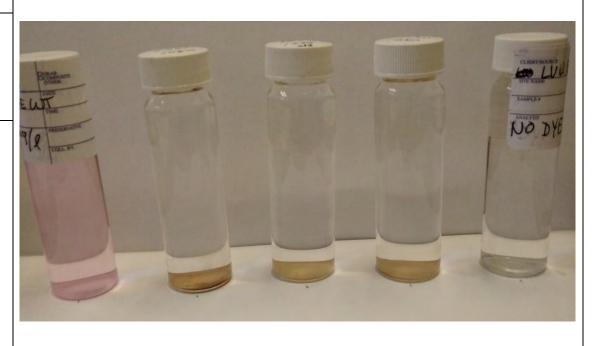
Direction Photo Taken: N/A

0.064 standard, three samples, and "no dye" blank

Samples collected from: Well NERT3.58S1 Observation Wells

Samples collected on 6/5/19

At (time-from left to right) Between Standards: A1250 B1245 C1250



A=COM

PHOTO LOG

Project: NERT Downgradient Study Area – Dye Tracer Study

Site Location: Henderson, NV near Three

Kids Weir

Photographed By: AECOM **Date:** 7/18/19

Photo Number

Photo Direction: N/A

Samples collected on 6/24/19

Location	Time
0 STD	NA
NERT3.60	1125
NERT3.60A	1130
NERT3.60B	1135
NERT3.60C	1145
NERT3.60D	1140
0.064 STD	NA



Photo Number

Direction Photo Taken: N/A

Injection at 12 noon.

Samples collected on: 6/24/19

Location	Time
NERT3.60	1215
NERT3.60	1245
NERT3.60	1315
NERT3.60	1345
NERT3.60	1415



Direction Photo Taken: N/A

Description:

Dilutions of NERT3.60S1 on 6/24/19 at 1215



Photo Number 4

Direction Photo Taken: N/A

Description:

Dilution of NERT3.60S1 on 6/24/19 at 1245



Direction Photo Taken: N/A

Description:

Dilution of NERT 3.60 1315 6/24/19



Photo Number

Direction Photo Taken:

N/A

Location	Time
NERT3.60	1445
NERT3.60	1515
NERT3.60	1545



Direction Photo Taken: N/A

Description:Samples collected on: 6/24/19

Location	Time
NERT3.60A	1220
NERT3.60B	1225
NERT3.60C	1235
NERT3.60D	1230



Photo Number

Direction Photo Taken: N/A

Location	Time
NERT3.60A	1250
NERT3.60B	1255
NERT3.60C	1300
NERT3.60D	1305



Direction Photo Taken: N/A

Description:Samples collected on: 6/24/19

Location	Time
NERT3.60A	1320
NERT3.60B	1325
NERT3.60C	1330
NERT3.60D	1335



Photo Number 10

Direction Photo Taken: N/A

Location	Time
NERT3.60A	1350
NERT3.60B	1355
NERT3.60C	1400
NERT3 60D	1405



Direction Photo Taken: N/A

Description:Samples collected on: 6/24/19

Location	Time
NERT3.60A	1420
NERT3.60B	1425
NERT3.60C	1430
NERT3.60D	1435



Photo Number 12

Direction Photo Taken: N/A

Location	Time
NERT3.60A	1450
NERT3.60B	1455
NERT3.60C	1500
NERT3.60D	1505



Direction Photo Taken: N/A

Description:Samples collected on: 6/24/19

Location	Time
NERT3.60A	1520
NERT3.60B	1525
NERT3.60C	1530
NERT3.60D	1535

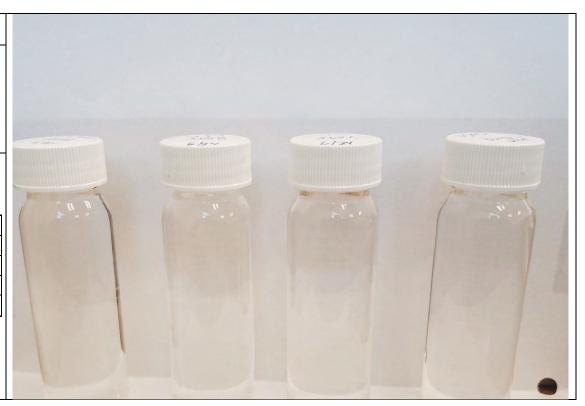


Photo Number 14

Direction Photo Taken: N/A

Location	Time
NERT3.60A	1550
NERT3.60B	1555
NERT3.60C	1600
NERT3 60D	1605



Direction Photo Taken: N/A

Description:Samples collected on: 6/25/19

Location	Time
NERT3.60	1030
NERT3.60	1130
NERT3.60	1230
NERT3.60	1330
NERT3.60	1430
NERT3.60	1530



Photo Number 16

Direction Photo Taken: N/A

Location	Time
NERT3.60A	1035
NERT3.60B	1040
NERT3.60C	1045
NERT3.60D	1050



Direction Photo Taken: N/A

Description:Samples collected on: 6/25/19

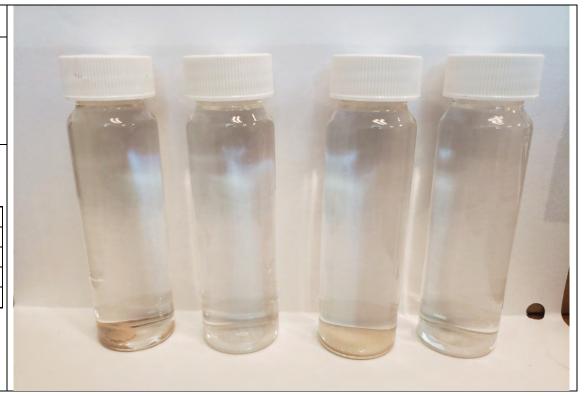
Location	Time
NERT3.60A	1135
NERT3.60B	1140
NERT3.60C	1145
NERT3.60D	1150



Photo Number 18

Direction Photo Taken: N/A

Location	Time
NERT3.60A	1235
NERT3.60B	1240
NERT3.60C	1245
NERT3.60D	1250



Direction Photo Taken: N/A

Description:Samples collected on: 6/25/19

Location	Time
NERT3.60A	1335
NERT3.60B	1340
NERT3.60C	1345
NERT3.60D	1350



Photo Number 20

Direction Photo Taken: N/A

Location	Time
NERT3.60A	1435
NERT3.60B	1440
NERT3.60C	1445
NERT3.60D	1450



Direction Photo Taken: N/A

Description:Samples collected on: 6/25/19

Location	Time
NERT3.60A	1535
NERT3.60B	1540
NERT3.60C	1545
NERT3.60D	1550

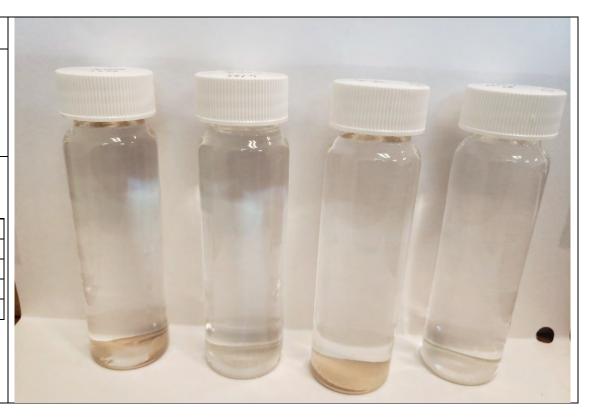


Photo Number 22

Direction Photo Taken: N/A

Location	Time
NERT3.60	1040
NERT3.60A	1045
NERT3.60B	1050
NERT3.60C	1055
NERT3 60D	1100



Direction Photo Taken: N/A

Description:Samples collected on: 6/26/19

Location	Time
NERT3.60	1515
NERT3.60A	1520
NERT3.60B	1525
NERT3.60C	1530
NERT3.60D	1535

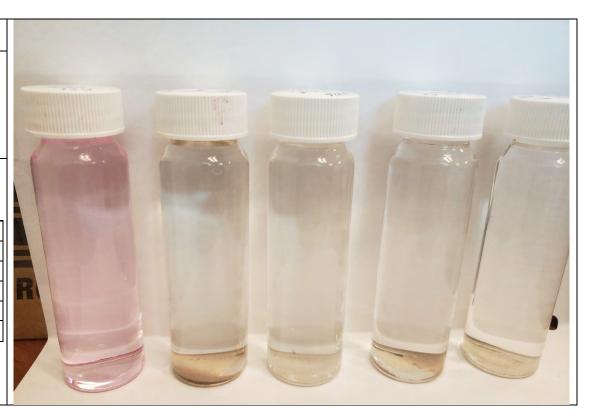


Photo Number 24

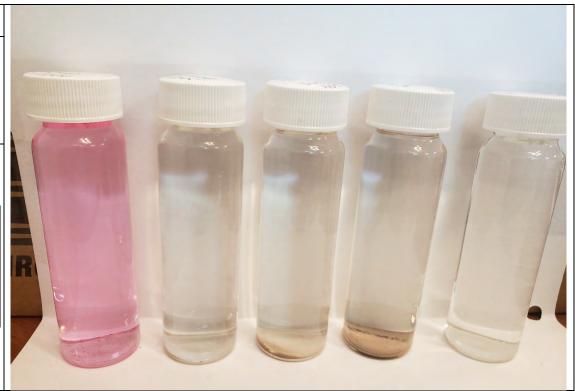
Direction Photo Taken: N/A

Location	Time
NERT3.60	1410
NERT3.60A	1410
NERT3.60B	1415
NERT3.60C	1405
NERT3.60D	1415



Photo Number 25
Direction Photo Taken:
N/A

Location	Time
NERT3.60	1100
NERT3.60A	1105
NERT3.60B	1105
NERT3.60C	1100
NERT3.60D	1110



A=COM

PHOTO LOG

Project: NERT Downgradient Study Area – Dye Tracer Study

Site Location: Henderson, NV near Calico Ridge Weir

Date: 8/6/2019

Photographed By: AECOM

Photo Number

Photo Direction: N/A

Samples collected on: 7/16/19

Location	Time
0 STD	NA
NERT4.64S1	835
NERT4.64S1	910
NERT4.64S1	940
NERT4.64S1	1010
NERT4.64S1	1040
1000 STD	NA



Photo Number

Direction Photo Taken: N/A

Samples collected on: 7/16/19

Location	Time
900 STD	NA
NERT4.64S1	1110
NERT4.64S1	1140
NERT4.64S1	1210
240 STD	NA



Direction Photo Taken: N/A

Samples collected on: 7/17/19

· · · ·	
Location	Time
40 STD	NA
NERT4.64S1	1050
NERT4.64S1	1150
NERT4.64S1	1250
NERT4.64S1	1350
28 STD	NA



Photo Number

Direction Photo Taken: N/A

Samples collected on: 7/18/19

.,	
Location	Time
10 STD	NA
NERT4.64S1	1015
NERT4.64S1	1115
NERT4.64S1	1215
NERT4.64S1	1315
4 STD	NA



Direction Photo Taken: N/A

Samples collected on: 7/19/19

Location	Time
4 STD	NA
NERT4.64S1	915
NERT4.64S1	1515
NERT4.64S1	1030
NERT4.64S1	1110
0.64 STD	NA



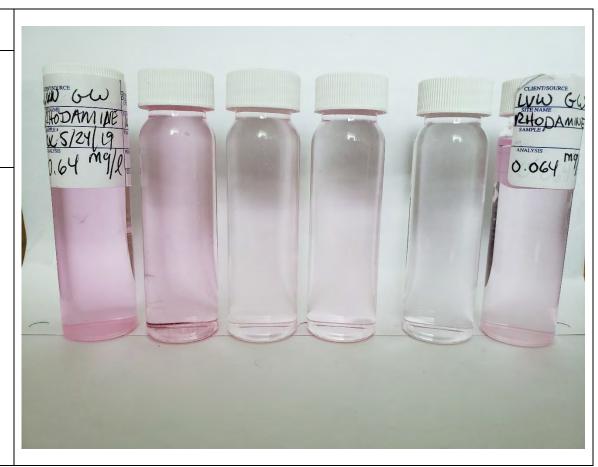
Photo Number 6

Direction Photo Taken:

N/A

Samples collected on: 7/29/19

Location	Time
0.64 STD	NA
NERT4.64S1	1250
NERT4.64S1	1600
NERT4.64S1	1520
NERT4.64S1	1535
0.064 STD	NA



Direction Photo Taken: N/A

Samples collected on: 7/16/19

Location	Time
0 STD	NA
NERT4.64S1A	840
NERT4.64S1A	910
NERT4.64S1A	940
NERT4.64S1A	1010

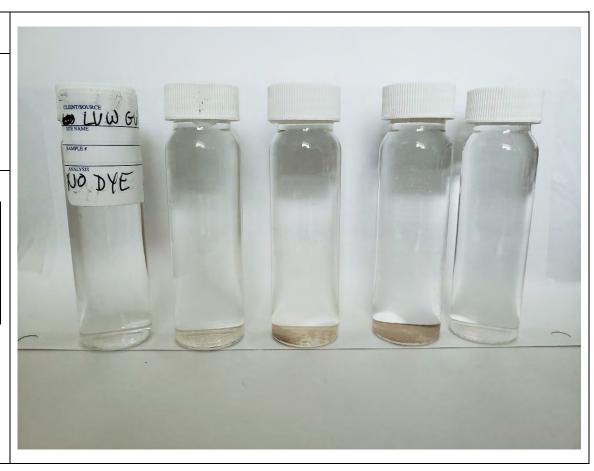


Photo Number

Direction Photo Taken: N/A

Samples collected on: 7/16/19

Location	Time
NERT4.64S1A	1040
NERT4.64S1A	1110
NERT4.64S1A	1140
NERT4.64S1A	1210



Direction Photo Taken: N/A

Samples collected on: 7/17/19

., , . •	
Location	Time
NERT4.64S1A	1050
NERT4.64S1A	1150
NERT4.64S1A	1250
NERT4.64S1A	1350



Photo Number 10

Direction Photo Taken: N/A

Samples collected on: 7/18/19

Location	Time
NERT4.64S1A	1015
NERT4.64S1A	1115
NERT4.64S1A	1215
NERT4.64S1A	1315



Photo Number 11 Direction Photo Taken:

N/A

Samples collected on: 7/19 thru 7/26/19

7/13 tillu 1/20/13	
Location	Time
NERT4.64S1A	915
NERT4.64S1A	1520
NERT4.64S1A	1035
NERT4.64S1A	1115



Photo Number 12

Direction Photo Taken: N/A

Samples collected on: 7/29-8/05 2019

Location	Time
NERT4.64S1A	1255
NERT4.64S1A	1605
NERT4.64S1A	1525
NERT4.64S1A	1540



Direction Photo Taken: N/A

Samples collected on: 7/16/19

Location	Time
0 STD	NA
NERT4.64S1B	845
NERT4.64S1B	915
NERT4.64S1B	945
NFRT4 64S1B	1015

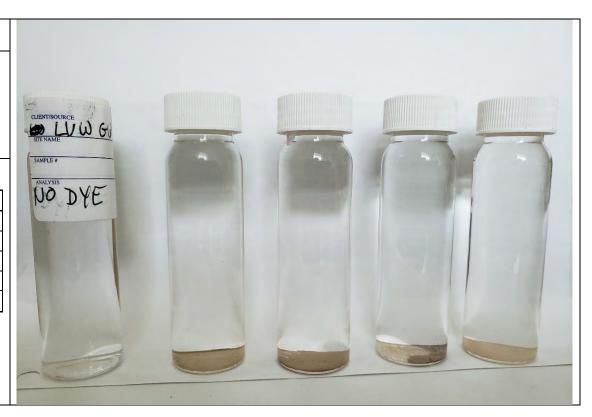


Photo Number 14

Direction Photo Taken: N/A

Samples collected on: 7/16/19

Location	Time
NERT4.64S1B	1040
NERT4.64S1B	1110
NERT4.64S1B	1140
NERT4.64S1B	1210



Direction Photo Taken: N/A

Samples collected on: 7/17/19

Location	Time
NERT4.64S1B	1055
NERT4.64S1B	1155
NERT4.64S1B	1255
NERT4.64S1B	1355



Photo Number 16

Direction Photo Taken: N/A

Samples collected on: 7/18/19

Location	Time
NERT4.64S1B	1020
NERT4.64S1B	1120
NERT4.64S1B	1220
NERT4.64S1B	1320



Direction Photo Taken: N/A

Samples collected on: 7/19-7/26 2019

Location	Time
NERT4.64S1B	920
NERT4.64S1B	1520
NERT4.64S1B	1035
NERT4 64S1B	1115



Photo Number 18

Direction Photo Taken: N/A

Samples collected on: 7/29-8/05 2019

Location	Time
NERT4.64S1B	1255
NERT4.64S1B	1605
NERT4.64S1B	1525
NERT4 64S1B	1540



Direction Photo Taken: N/A

Samples collected on: 7/16/19

.,,		
Location	Time	
0 STD	NA	
NERT4.64S1C	850	
NERT4.64S1C	915	
NERT4.64S1C	945	
NFRT4 64S1C	1015	

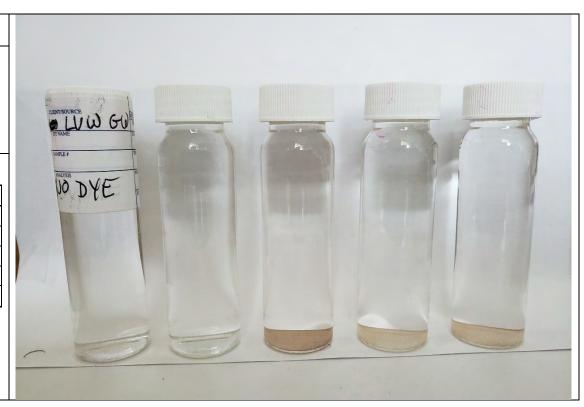


Photo Number 20

Direction Photo Taken: N/A

Samples collected on: 7/16/19

Location	Time
NERT4.64S1C	1045
NERT4.64S1C	1115
NERT4.64S1C	1145
NERT4.64S1C	1215



Direction Photo Taken: N/A

Samples collected on: 7/17/19

Location	Time	
NERT4.64S1C	1055	
NERT4.64S1C	1155	
NERT4.64S1C	1255	
NERTA 64S1C	1355	



Photo Number 22

Direction Photo Taken: N/A

Samples collected on: 7/18/19

Location	Time
NERT4.64S1C	1020
NERT4.64S1C	1120
NERT4.64S1C	1220
NERT4 64S1C	1320



Direction Photo Taken: N/A

Samples collected on: 7/19-7/26 2019

Location	Time	
NERT4.64S1C	920	
NERT4.64S1C	1520	
NERT4.64S1C	1035	
NERTA 64S1C	1115	



Photo Number 24

Direction Photo Taken: N/A

Samples collected on: 7/16/19

Location	Time	
0 STD	NA	
NERT4.64S1D	855	
NERT4.64S1D	920	
NERT4.64S1D	950	
NERT4.64S1D	1020	
0.64 STD	NA	



Direction Photo Taken: N/A

Samples collected on: 7/16/19

1/10/10		
Location	Time	
0.64 STD	NA	
NERT4.64S1D	1050	
NERT4.64S1D	1120	
NERT4.64S1D	1150	
NERT4.64S1D	1220	

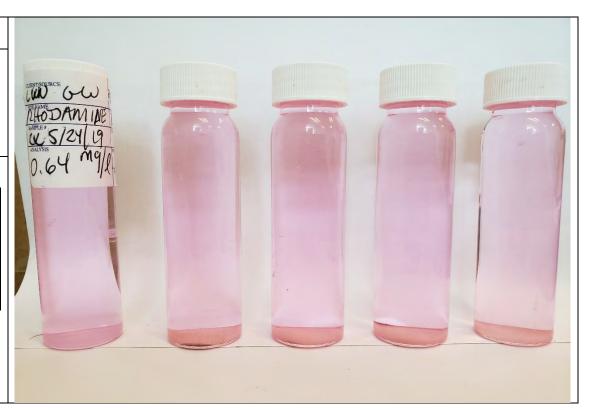


Photo Number 26

Direction Photo Taken: N/A

Samples collected on: 7/17/19

Location	Time	
NERT4.64S1D	1100	
NERT4.64S1D	1200	
NERT4.64S1D	1300	
NERT4.64S1D	1400	



Direction Photo Taken: N/A

Samples collected on: 7/18/19

Location	Time	
NERT4.64S1D	1025	
NERT4.64S1D	1125	
NERT4.64S1D	1225	
NERTA 64S1D	1325	



Photo Number 28

Direction Photo Taken: N/A

Samples collected on: 7/19-7/26 2019

Location	Time
NERT4.64S1D	925
NERT4.64S1D	1520
NERT4.64S1D	1035
NERT4 64S1D	1115



29
Direction Photo Taken:
N/A

Samples collected on: 7/29-8/05 2019

Location	Time
NERT4.64S1D	1255
NERT4.64S1D	1605
NERT4.64S1D	1525
NERT4.64S1D	1540



Appendix N

Data Validation Summary Report

Data Validation Summary ReportJune / July 2019 Groundwater Sampling

NERT Remedial Investigation – Downgradient Study Area Nevada Environmental Response Trust Site Henderson, Nevada

Environment

Final





Data Validation Summary ReportJune / July 2019 Groundwater Sampling

Prepared by Cathy Larson

Reviewed by Steve Szocik

Style I by

AECOM

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Attachment A Wet Chemistry Data Validation

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List of Acronyms

DQO data quality objectives

DUP duplicate

EB equipment blank

EPA United States Environmental Protection Agency

FB field blank
FD field duplicate
ID identification

LCS laboratory control sample

MS/MSD matrix spike / matrix spike duplicate

NDEP Nevada Division of Environmental Protection
NERT Nevada Environmental Response Trust

PARCCS precision, accuracy, representativeness, comparability, completeness, sensitivity

PQL practical quantitation limit

QA quality assurance

QAPP Quality Assurance Project Plan

QC quality control

RPD relative percent difference
SDG sample delivery group
SQL sample quantitation limit
TDS Total Dissolved Solids
%R percent recovery

1.0 Introduction

This Data Validation Summary Report has been prepared by AECOM to assess the validity and usability of laboratory analytical data from the June / July 2019 groundwater sampling conducted in the Downgradient Study Area of the Nevada Environmental Response Trust (NERT) site in Henderson, Nevada. The assessment was performed by AECOM under their May 2017 Quality Assurance Project Plan (QAPP) and included the collection and analyses of 48 environmental and quality control (QC) samples. The analyses were performed by the following methods:

- Chlorate by United States Environmental Protection Agency (EPA) Method 300.1B
- Perchlorate by EPA Method 314.0
- Total Dissolved Solids (TDS) by Standard Method 2540C
- Chromium by EPA Method 200.8
- Hexavalent Chromium by EPA Method 218.7

Laboratory analytical services for hexavalent chromium were provided by Silver State Analytical Laboratories (Las Vegas, Nevada). All other analytical testing was provided by Euorofins TestAmerica, Inc. (Irvine, California). The samples were grouped into sample delivery groups (SDGs). The water samples are associated with quality assurance (QA)/QC samples designed to document the data quality of the entire SDG or a sub-group of samples within an SDG. **Table 1** is a cross-reference table listing each sample identification (ID), analysis, SDG, sample date, laboratory sample ID, matrix, and validation level. **Table 2** is a reference table that identifies the QC elements reviewed.

The laboratory analytical data were validated in accordance with procedures described in:

- The Nevada Division of Environmental Protection (NDEP) Data Verification and Validation Requirements - Supplement established for the BMI Plant Sites and Common Areas Projects, Henderson, Nevada, dated July 13, 2018;
- AECOM's QAPP Downgradient Study Area, Henderson, Nevada, Revision, dated May 2017; and
- EPA's Contract Laboratory Program National Functional Guidelines for Inorganic Data Review dated January 2017.

In accordance with the project QAPP and NDEP requirements, 100 percent of the analytical data were validated according to Stage 2A data validation procedures.

This report summarizes the QA/QC evaluation of the data according to precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) relative to the project data quality objectives (DQOs). This report provides a quantitative and qualitative assessment of the data and identifies potential sources of error, uncertainty, and bias that may affect the overall usability.

The PARCCS summary report evaluates and summarizes the results of QA/QC data validation for the entire sampling program. Section 2.0 interprets specific QC deviations and their effects on both individual data points and the analyses as a whole. Section 4.0 presents a summary of the PARCCS criteria by comparing quantitative

parameters with acceptability criteria defined in the project DQOs. Qualitative PARCCS criteria are also summarized in this section.

1.1 Precision and Accuracy of Environmental Data

Environmental data quality depends on sample collection procedures, analytical methods and instrumentation, documentation, and sample matrix properties. Both sample collection procedures and laboratory analyses contain potential sources of uncertainty, error, and/or bias, which affect the overall quality of a measurement. Errors in sample data may result from incomplete equipment decontamination, inappropriate sampling techniques, sample heterogeneity, improper filtering, and improper preservation. The accuracy of analytical results is dependent on selecting appropriate analytical methods, maintaining equipment properly, and complying with QC requirements. The sample matrix (i.e. groundwater) is also an important factor in the ability to obtain precise and accurate results within a given media.

Environmental and laboratory QA/QC samples assess the effects of sampling procedures and evaluate laboratory contamination, laboratory performance, and matrix effects. QA/QC samples include equipment blanks (EBs), field blanks (FBs), field duplicates (FDs), method blanks, laboratory control samples (LCSs), and matrix spike/matrix spike duplicates (MS/MSDs).

Before conducting the PARCCS evaluation, the analytical data were validated according to the QAPP (AECOM 2017), Functional Guidelines (EPA 2017), and NDEP July 13, 2018 Data Validation Guidance (NDEP 2018). Samples not meeting the acceptance criteria were qualified with a flag, an abbreviation indicating a deficiency with the data. The following are flags used in data validation:

J-	Estimated - The associated numerical value is an estimated quantity with a negative bias. The
	analyte was detected but the reported value may not be accurate or precise.

J+ Estimated - The associated numerical value is an estimated quantity with a positive bias. The analyte was detected but the reported value may not be accurate or precise.

J Estimated - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. It is not possible to assess the direction of the potential bias. The analyte was detected but the reported value may not be accurate or precise.

R Rejected - The data is unusable (the compound or analyte may or may not be present). Use of the "R" qualifier indicates a significant variance from functional guideline acceptance criteria. Either resampling or reanalysis is necessary to determine the presence or absence of the rejected analyte.

U Nondetected - Analyses were performed for the compound or analyte, but it was not detected.

UJ Estimated/Nondetected - The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

DNR Do Not Report - A more appropriate result is reported from another analysis or dilution.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

The hierarchy of flags is listed below:

R > J The R flag will always take precedence over the J gualifier.

J+ The high bias (J+) flag is applied only to detected results.

J > J+ or J- A non-biased (J) flag will always supersede biased (J+ or J-) flags since it is not possible to

assess the direction of the potential bias.

J = J+ plus J- Adding biased (J+, J-) flags with opposite signs will result in a nonbiased flag (J).

UJ = U plus J The UJ flag is used when a non-detected (U) flag is added to J flag.

Table 3 lists the reason codes used. Reason codes explain why flags have been applied and identify possible limitations of data use. Reason codes are cumulative except when one of the flags is R then only the reason code associated to the R flag will be used.

Table 4 presents the overall qualified results after all the flags or validation qualifiers and associated reason codes have been applied.

Once the data are reviewed and qualified according to the QAPP, functional guidelines, and NDEP guidance the data set is then evaluated using PARCCS criteria. PARCCS criteria provide an evaluation of overall data usability. The following is a discussion of PARCCS criteria as related to the project DQOs.

Precision measures the reproducibility of repetitive measurements. It is defined as the degree of mutual agreement among independent measurements as the result of repeated application of the sample analytical process under similar conditions.

Components of precision include analytical precision and total precision. Analytical precision is a measurement of the variability associated with duplicate or replicate analyses of the same sample in the laboratory, and is determined by analysis of laboratory QC samples, such as duplicate control samples (MSD, or sample duplicates). If the recoveries of analytes in the specified control samples are comparable within established control limits, then precision is within limits.

Total precision is a measurement of the variability associated with the entire sampling and analytical process. It is determined by analysis of duplicate or replicate field samples, and measures variability introduced by both the laboratory and field operations. FD samples are analyzed to assess field and analytical precision.

Duplicate results are assessed using the relative percent difference (RPD) between duplicate measurements. If the RPD for laboratory QC samples exceeds the laboratory's statistically determined acceptance ranges, data will be qualified as described in the applicable validation procedure. If the RPD between primary and duplicate field samples exceeds 50 percent for groundwater, data will be qualified as described in the applicable validation procedure.

The RPD will be calculated as follows:

RPD =
$$\frac{|x_1-x_2|}{\left(\frac{(x_1+x_2)}{2}\right)} *100$$

where:

 x_1 = analyte concentration in the primary sample, and

 x_2 = analyte concentration in the duplicate sample

Possible causes of poor precision include improper sample collection or handling, inconsistent sample preparation, and poor instrument stability. In some duplicate pairs, results may be reported in either the primary or duplicate samples at levels below the practical quantitation limit (PQL) or non-detected. Since these values are considered to be estimates, RPD exceedances from these duplicate pairs do not suggest a significant impact on the data quality.

Accuracy is a measure of the agreement of an experimental determination and the true value of the parameter being measured. It is used to identify bias in a given measurement system. Recoveries outside acceptable QC limits may be caused by factors such as instrumentation, analyst error, or matrix interference. Accuracy is assessed through the analysis of surrogates, MSs, MSDs, and LCSs. In some cases, samples from multiple SDGs were within one QC batch and therefore are associated with the same laboratory QC samples.

Accuracy of inorganic analyses is determined using the percent recoveries of MS and LCS analyses. Surrogates were also used to assess accuracy for the chlorate test. Additionally, an "MRL" spike was reported by the laboratory for the chlorate and perchlorate tests. The laboratory did not define the acronym MRL however, the MRL spike was a blank spike at the concentration of the PQL

Percent recovery (%R) in a MS or MSD is calculated using the following equation:

 $%R = (A-B)/C \times 100$

where:

A = measured concentration in the spiked sample

B = measured concentration of the spike compound in the unspiked sample

C = concentration of the spike

%R for a surrogate or LCS is calculated using the following equation:

 $%R = A/B \times 100$

where:

A = measured concentration in the spiked sample

B = concentration of the spike

The %R for MS/MSD samples and LCSs is evaluated with the acceptance criteria specified by the previously noted documents. The MRL spike and surrogate recoveries were compared to limits included in the laboratory reports. Spike recoveries outside the acceptable QC accuracy limits provide an indication of bias, where the reported data may overestimate or underestimate the actual concentration of compounds detected or quantitation limits reported for environmental samples.

Representativeness is a qualitative parameter that expresses the degree to which the sample data are characteristic of a population. It is evaluated by reviewing the QC results of blanks, samples and holding times. Positive detects of compounds in the blank samples identify compounds that may have been introduced into the samples during sample collection, transport, preparation, or analysis. The QA/QC blanks collected and analyzed are method blanks, calibration blanks, EBs, and FBs.

A method blank is a laboratory-grade water or solid matrix that contains the method reagents and has undergone the same preparation and analysis as the environmental samples. The method blank provides a measure of the combined contamination derived from the laboratory-source water, glassware, instruments, reagents, and sample preparation steps. Method blanks are prepared for each sample of a similar matrix extracted by the same method at a similar concentration level.

EBs consist of analyte-free water poured over or through the sample collection equipment. The water is collected in a sample container for laboratory analysis. These blanks are collected after the sampling equipment is decontaminated and measure efficiency of the decontamination procedure. EBs were collected and analyzed for all target analytes.

FBs consist of analyte-free source water stored at the sample collection site. Water is collected from each source water used during each sampling event. FBs were collected and analyzed for all target analytes.

For inorganic analyses, contaminants found in both the environmental sample and the blank sample are assumed to be laboratory artifacts if both values are less than the PQL or if a sample result and blank contaminant value are greater than the PQL and the sample result is less than 10 times the blank contaminant value. The blanks and associated samples are evaluated according to the NDEP July 13, 2018 Data Validation Guidance (NDEP 2018).

Holding times are evaluated to assure that the sample integrity is intact for accurate sample preparation and analysis. Holding times will be specific for each method and matrix analyzed. Holding time exceedance can cause loss of sample constituents due to biodegradation, precipitation, volatilization, and chemical degradation. In accordance with NDEP Guidance (NDEP 2018) sample results for analyses that were performed after the method holding time but less than two times the method holding time would be qualified as estimated (J- or UJ). For analyses that were performed after two times the method holding time, detected sample results would be qualified as estimated (J-) and nondetect sample results would be qualified as rejected (R).

Comparability is a qualitative expression of the confidence with which one data set may be compared to another. It provides an assessment of the equivalence of the analytical results to data obtained from other analyses. It is important that data sets be comparable if they are used in conjunction with other data sets. The factors affecting comparability include the following: sample collection and handling techniques, matrix type, and analytical method. If these aspects of sampling and analysis are carried out according to standard analytical procedures, the data are considered comparable. Comparability is also dependent upon other PARCCS criteria, because only when precision, accuracy, and representativeness are known can data sets be compared with confidence.

Completeness is defined as the percentage of acceptable sample results compared to the total number of sample results. Completeness is evaluated to determine if an acceptable amount of usable data were obtained so that a valid scientific site assessment can be completed. Completeness equals the total number of sample results for each fraction minus the total number of rejected sample results divided by the total number of sample results multiplied by 100. As specified in the project DQOs, the goal for completeness for target analytes in each analytical fraction is 90 percent.

Percent completeness is calculated using the following equation:

 $%C = (T - R)/T \times 100$

where:

%C = percent completeness

T = total number of sample results

R = total number of rejected sample results

Completeness is also determined by comparing the planned number of samples per method and matrix as specified in the QAPP, with the number determined above.

Sensitivity is the ability of an analytical method or instrument to discriminate between measurement responses representing different concentrations. This capability is established during the planning phase to meet the DQOs. It is important that calibration requirements, detection limits, and PQLs presented in the QAPP are achieved and that target analytes can be detected at concentrations necessary to support the DQOs. The method detection

limits (MDLs) represent the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. Sample quantitation limits (SQLs) are adjusted MDL values that reflect sample-specific actions, such as dilutions or varying aliquot sizes. PQLs are the lowest level at which the entire analytical system gives a recognizable signal and acceptable calibration point for the analyte. The laboratory is required to report detected analytes down to the SQL for this project. The laboratory uses a format that reports estimated values down to the SQL. Target compounds detected below the PQLs but greater than or equal to the SQLs were flagged (J) by the laboratory and should be considered estimated. In addition, sample results are compared to method blank, EB, and FB results to identify potential effects of laboratory background and field procedures on sensitivity.

The following sections present a review of QC data for chlorate, perchlorate, TDS, chromium, and hexavalent chromium analyses.

AECOM 2-1

2.0 Analysis

A total of 40 primary water samples and 8 QC samples were collectively analyzed for one or more of the following tests: hexavalent chromium by EPA Method 218.7, chromium by EPA Method 200.8, chlorate by EPA Method 300.1B; perchlorate by EPA Method 314.0; and TDS by Standard Method 2540C. Samples analyzed for chromium were filtered in the field.

All analytical data were assessed to be valid. This section discusses the QA/QC supporting documentation as defined by the PARCCS criteria and evaluated based on the DQOs.

2.1 Precision and Accuracy

2.1.1 Surrogate

Surrogate (dichloroacetic acid) recoveries were evaluated for chlorate analysis by EPA Method 300.1B. All surrogate %Rs met the acceptance criteria as stated in the laboratory report of 90-115% recovery.

2.1.2 MS/MSD Samples

MS/MSD sample analysis was performed on associated project samples. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

MS/MSD recovery limits do not apply when the sample concentration is $\geq 4x$ the spike added. In such an event, the data would be reported unflagged (*USEPA National Functional Guidelines*). In addition, batch or non-project MS/MSD data were not evaluated.

The details regarding the qualification of results are presented in Attachment A, Section 5.

2.1.3 DUP Samples

Duplicate (DUP) samples were evaluated for TDS analysis by SM 2540C. All DUP RPDs met the acceptance criteria as stated in the QAPP.

2.1.4 LCS Samples

LCS samples were evaluated for all wet chemistry methods. All LCS %Rs met the acceptance criteria as stated in the QAPP.

2.1.5 MRL Samples

The MRL spikes were evaluated for the chlorate and perchlorate tests. All MRL %Rs met the acceptance criteria as stated in the laboratory reports.

2.1.6 FD Samples

The FD samples were evaluated for acceptable precision with RPDs. Acceptable field and analytical precision were demonstrated for all FD pairs.

The details regarding the FD RPDs are presented in Attachment A, Section 9.

AECOM 2-2

2.1.7 Analyte Quantitation and Target Identification

All SQLs are lower than the screening criteria presented in the QAPP. Target compounds detected below the PQLs were flagged (J) by the laboratory and should be considered estimated.

2.2 Representativeness

2.2.1 Sample Preservation and Holding Times

The evaluation of holding times to verify compliance with all analytical methods was conducted. All water samples met the 7-day analysis holding time criteria for TDS, the 14-day holding time for hexavalent chromium, the 28-day analysis holding time criteria for chlorate and perchlorate, and the 180-day holding analysis holding time for chromium.

The details regarding sample preservation and holding times are presented in Attachment A, Section 1.

2.2.2 Blanks

Method blanks, EBs, and FBs were analyzed to evaluate representativeness.

2.2.2.1 Method Blanks

No contaminants were found in the method blanks.

2.2.2.2 EBs and FBs

Three EBs (NERT4.38N1-20190702-EB_20190702, NERT4.65N1-20190708-EB_20190708 and NERT4.70N1-20190709-EB_20190709) and one FB (NERT4.21N1-20190702-FB_20190702 NERT4.21N1-20190702-FB_20190702) were submitted for analyses.

Due to low-level blank contamination in an associated EB, the result for chromium for sample NERT4.71N1-20190709_20190709 was qualified as estimated ("J+"). The details regarding the qualification of these results are presented in Attachment A, Section 3.

2.3 Comparability

The laboratory used standard analytical methods identified in the QAPP for all the analyses. The comparability of the data is regarded as acceptable.

2.4 Completeness

The completeness level attained for wet chemistry field samples was 100 percent. This percentage was calculated as the total number of accepted sample results divided by the total number of sample results multiplied by 100.

2.5 Sensitivity

All laboratory SQLs were below the screening criteria specified in the QAPP and meet the project DQOs.

AECOM 3-1

3.0 Variances in Analytical Performance

The laboratory used standard analytical methods for all of the analyses throughout the project. No systematic variances in analytical performance were noted in the laboratory case narratives.

AECOM 4-1

4.0 Summary of PARCCS Criteria

The validation reports present the PARCCS results for all SDGs. Each PARCCS criterion is discussed in detail in the following sections.

4.1 Precision and Accuracy

Precision and accuracy were evaluated using data quality indicators such as surrogates, MS/MSD, DUP, LCS, MRL spikes, and field duplicates. The precision and accuracy of the data set were considered acceptable after incorporation of validation-qualified results.

All surrogate, MS/MSD, RPDs, DUP, LCS, MRL spikes, and FD %Rs and RPDs met acceptance criteria.

4.2 Representativeness

All samples for each method and matrix were evaluated for holding time compliance. All samples were associated with a method blank in each individual SDG. Sampling frequency requirements were met in obtaining necessary EBs, FBs and FDs. The representativeness of the project data is considered acceptable after incorporation of validation-qualified results.

4.3 Comparability

The laboratory used standard analytical methods for the analyses. The analytical results were reported in correct standard units. Sample integrity criteria were met. Sample preservation and holding times were within QC criteria. The overall comparability is considered acceptable after incorporation of validation-qualified results.

4.4 Completeness

Of the 162 total analytes reported, including primary samples, field duplicates, and field blanks, , 0 sample results were rejected. The completeness for the SDGs is as follows:

Parameter	Total Analytes	No. of Rejects	% Completeness
Perchlorate	48	0	100
Chlorate	48	0	100
TDS	18	0	100
Hexavalent Chromium	30	0	100
Chromium	18	0	100
Total	162	0	100

The completeness percentage based on rejected data met the 90-percent DQO goal.

4.5 Sensitivity

Sensitivity was achieved by the laboratory to support the DQOs.

AECOM 5-1

5.0 Conclusions and Recommendations

The analytical data quality assessment for the water sample laboratory analytical results generated during the June / July 2019 groundwater sampling in the Downgradient Study Area of the NERT site in Henderson, Nevada, established that the overall project requirements and completeness levels were met. No results were rejected. Sample results that were found to be estimated ("J+") are usable for limited purposes only. Based upon the Stage 2A data validation, all other results are considered valid and usable for all purposes.

AECOM 6-1

6.0 References

AECOM, 2017. Quality Assurance Project Plan, Downgradient Study Area, Henderson, Nevada (QAPP), May (Rev 1).

EPA, 2017. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. January 2017.

EPA,1983. EPA Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Cincinnati, Ohio. March.

NDEP, 2018. NDEP Data Validation and Verification Requirements for the BMI Complex and Common Areas. July 13.

Tables

Table 1 Sample Cross Reference NERT Downgradient Study Area Henderson, Nevada

					QC	Validation	Chlorate	Perchlorate	Chromium	Total Dissolved Solids	Hexavalent Chromium
SDG	Client Sample ID	Lab Sample ID	Matrix	Sample Date	Type	Level	(E300.1B)	(E314.0)	(E200.8)a	(SM2540C)	(E218.7)b
4402454301	AA-30-20190708_20190708	440-245430-2	W	07/08/19	N	Stage 2A	X	X	,		,
4402452621	COH2B1-20190703_20190703	440-245262-2	W	07/03/19	N	Stage 2A	Х	Х			
4402449051	LNDMW1-20190628_20190628	440-244905-3	W	06/28/19	N	Stage 2A	Х	Х			
4402452631	LNDMW2-20190705_20190705	440-245263-2	W	07/05/19	N	Stage 2A	Χ	Х			
4402452621	MW-02-20190703_20190703	440-245262-4	W	07/03/19	N	Stage 2A	Χ	Х			
4402449051	MW13-20190628_20190628	440-244905-6	W	06/28/19	N	Stage 2A	Χ	Х			
4402449051	MW20-20190628_20190628	440-244905-5	W	06/28/19	N	Stage 2A	Χ	Х			
4402452621	MW-25-20190703_20190703	440-245262-3	W	07/03/19	N	Stage 2A	Χ	Х			
4402452631	MW-3-20190705_20190705	440-245263-5	W	07/05/19	N	Stage 2A	Χ	Х			
4402452631	MW-4-20190705_20190705	440-245263-4	W	07/05/19	N	Stage 2A	Χ	Х			
4402448121	NERT3.35S1-20190626_20190626	440-244812-1	W	06/26/19	N	Stage 2A	Χ	Х	Χ	Χ	19061527-01A
4402448121	NERT3.35S1-20190626-FD_20190626	440-244812-2	W	06/26/19	FD	Stage 2A	Χ	Χ	Χ	X	19061527-02A
4402448121	NERT3.40S1-20190626_20190626	440-244812-3	W	06/26/19	N	Stage 2A	Χ	Χ	Χ	X	19061527-03A
4402452011	NERT3.58N1-20190702_20190702	440-245201-8	W	07/02/19	N	Stage 2A	Χ	Χ	Χ	X	19070163-01A
4402448121	NERT3.58S1-20190627_20190627	440-244812-4	W	06/27/19	N	Stage 2A	Χ	Χ	Χ	X	19061616-01A
4402452011	NERT3.60N1-20190702_20190702	440-245201-9	W	07/02/19	N	Stage 2A	Χ	Χ	Χ	X	19070163-02A
4402452011	NERT3.60S1-20190701_20190701	440-245201-4	W	07/01/19	N	Stage 2A	Χ	Χ	Χ	X	19070063-04A
4402448121	NERT3.63S1-20190627_20190627	440-244812-5	W	06/27/19	N	Stage 2A	Х	Χ	Х	X	19061616-02A
4402448121	NERT3.80S1-20190627_20190627	440-244812-6	W	06/27/19	N	Stage 2A	Χ	Χ			19061616-03A
4402448121	NERT3.80S1-20190627-FD_20190627	440-244812-7	W	06/27/19	FD	Stage 2A	Χ	Χ			19061616-06A
4402448121	NERT3.98S1-20190627_20190627	440-244812-9	W	06/27/19	N	Stage 2A	Х	Χ	Х	X	19061616-04A
4402452011	NERT4.21N1-20190702_20190702	440-245201-10	W	07/02/19	N	Stage 2A	Χ	Χ			19070163-03A
4402452011	NERT4.21N1-20190702-FB_20190702	440-245201-11	W	07/02/19	FB	Stage 2A	Х	Х			19070163-04A
4402452011	NERT4.38N1-20190702_20190702	440-245201-13	W	07/02/19	N	Stage 2A	Х	Χ			19070163-05A
4402452011	NERT4.38N1-20190702-EB_20190702	440-245201-12	W	07/02/19	EB	Stage 2A	Х	Х			19070163-06A
4402448121	NERT4.51S1-20190627_20190627	440-244812-8	W	06/27/19	N	Stage 2A	X	Χ			19061616-05A

Table 1 Sample Cross Reference NERT Downgradient Study Area Henderson, Nevada

										Total Dissolved	Hexavalent
				Sample	QC	Validation	Chlorate	Perchlorate	Chromium	Solids	Chromium
SDG	Client Sample ID	Lab Sample ID	Matrix	Date	Type	Level	(E300.1B)	(E314.0)	(E200.8) ^a	(SM2540C)	(E218.7)b
4402452011	NERT4.64N1-20190702_20190702	440-245201-14	W	07/02/19	N	Stage 2A	Χ	X	Χ	X	19070163-07A
4402452011	NERT4.64N1-20190702-FD_20190702	440-245201-15	W	07/02/19	FD	Stage 2A	Х	X	Х	X	19070163-08A
4402452011	NERT4.64S1-20190701_20190701	440-245201-1	W	07/01/19	N	Stage 2A	Х	Χ	Х	Χ	19070063-01A
4402454301	NERT4.65N1-20190708_20190708	440-245430-3	W	07/08/19	N	Stage 2A	Χ	Χ	Χ	Χ	19070339-03A
4402454301	NERT4.65N1-20190708-EB_20190708	440-245430-4	W	07/08/19	EB	Stage 2A	Χ	Χ	Χ	Χ	19070339-02A
4402456931	NERT4.70N1-20190709_20190709	440-245693-2	W	07/09/19	N	Stage 2A	Χ	X	Χ	Χ	19070468-01A
4402456931	NERT4.70N1-20190709-EB_20190709	440-245693-3	W	07/09/19	EB	Stage 2A	Χ	X	Χ	Χ	19070468-02A
4402456931	NERT4.71N1-20190709_20190709	440-245693-4	W	07/09/19	N	Stage 2A	Χ	Х	Χ	Х	19070468-03A
4402452011	NERT4.71S1-20190701_20190701	440-245201-3	W	07/01/19	N	Stage 2A	Χ	Х			19070063-03A
4402452011	NERT4.71S2-20190701_20190701	440-245201-2	W	07/01/19	N	Stage 2A	Χ	Х	Х	Х	19070063-02A
4402452011	NERT4.93S1-20190701_20190701	440-245201-6	W	07/01/19	N	Stage 2A	Χ	Х			19070063-06A
4402452011	NERT5.11S1-20190701_20190701	440-245201-5	W	07/01/19	N	Stage 2A	Χ	Х			19070063-05A
4402454301	NERT5.49S1-20190708_20190708	440-245430-1	W	07/08/19	N	Stage 2A	Χ	Х			19070339-01A
4402452011	NERT5.91S1-20190701_20190701	440-245201-7	W	07/01/19	N	Stage 2A	Χ	Х			19070468-07A
4402452631	WMW3.5N-20190705_20190705	440-245263-1	W	07/05/19	N	Stage 2A	Χ	Х			
4402449051	WMW3.5S-20190628_20190628	440-244905-1	W	06/28/19	N	Stage 2A	Х	Х			
4402449051	WMW3.5S-20190628-FD_20190628	440-244905-2	W	06/28/19	FD	Stage 2A	Х	Х			
4402452631	WMW4.9N-20190705_20190705	440-245263-3	W	07/05/19	N	Stage 2A	Х	Х			
4402456931	WMW4.9S-20190709_20190709	440-245693-1	W	07/09/19	N	Stage 2A	Х	Х			
4402452621	WMW5.58S-20190703_20190703	440-245262-1	W	07/03/19	N	Stage 2A	Х	Х			
4402449051	WMW5.5S-20190628_20190628	440-244905-4	W	06/28/19	N	Stage 2A	Х	Х			
4402456931	WMW5.7N-20190709_20190709	440-245693-5	W	07/09/19	N	Stage 2A	Х	Х			

Notes

a - The SDG for chromium is that listed in the SDG column with the last digit changed from a "1" to a "2".

b - Samples for hexavalent chromium analysis were submitted to Silver State Analytical Laboratories. The laboratory ID is provided in this column.

SDG - Sample Delivery Group

FB - Field Blank

ID - Identifier

QC - Quality control

W – Water

EB - Equipment Blank

Table 2 Validation Elements NERT Downgradient Study Area Henderson, Nevada

Stage 2A	All Analyses
Sample Receipt & Technical Holding Time	$\sqrt{}$
Laboratory Blanks	V
Field Blanks	V
Surrogate Spikes	V
Matrix Spike (MS), Matrix Spike Duplicate (MSD)	V
Laboratory Duplicate (DUP)	V
Laboratory Control Sample (LCS)	V
Field Duplicate	V
Project Quantitation Limits (PQL)	V
Overall Data Usability Assessment	V

Notes:

 $\sqrt{}$ = Reviewed

Table 3 **Qualification Codes and Definitions**NERT Downgradient Study Area

Henderson,	Explanation
а	qualified due to low abundance (radiochemical activity)
be	qualified due to equipment blank contamination
bf	qualified due to field blank contamination
bl	qualified due to laboratory blank contamination
bt	qualified due to trip blank contamination
bp	qualified due to pump blank contamination (wells w/o dedicated pumps, when contamination is detected in the Pump Blk)
br	qualified due to filter blank contamination (aqueous Hexavalent Chromium and Dissolved sample fractions)
С	qualified due to calibration problems
ср	qualified due to insufficient ingrowth (radiochemical only)
dc	dual column confirmation %D exceeded
е	concentration exceeded the calibration range
fd	qualified due to field duplicate imprecision
h	qualified due to holding time exceedance
i	qualified due to internal standard areas
k	qualified as Estimated Maximum Possible Concentrations (dioxins and PCB congeners)
I	qualified due to LCS recoveries
ld	qualified due to laboratory duplicate imprecision (matrix duplicate, MSD, LCSD)
m	qualified due to matrix spike recoveries
nb	qualified due to negative laboratory blank contamination (nondetect results only)
nd	qualified due to non-detected target analyte
0	other
р	qualified as a false positive due to contamination during shipping
рН	sample preservation not within acceptance range
q	qualified due to quantitation problem
s	qualified due to surrogate recoveries
sd	serial dilution did not meet control criteria
sp	detected value reported >SQL <pql< td=""></pql<>
st	sample receipt temperature exceeded
t	qualified due to elevated helium tracer concentrations
vh	volatile headspace detected in aqueous sample containers submitted for VOC analysis
х	qualified due to low % solids
z	qualified due to ICS results

Table 4 **Qualified Results**NERT Downgradient Study Area, Henderson, Nevada

		Sample				Lab	Lab				Validator	Reason	Reason Code	Qualification
SDG	Client Sample ID	Date	Method	CAS No.	Analyte	Result	Qualifier	SQL	PQL	Units	Qualifier	Code	Definition	Finding
4402454301	AA-30-20190708_20190708	7/8/19	E300.1	14866-68-3	Chlorate	9500		100	1000	ug/L				
4402454301	AA-30-20190708_20190708	7/8/19	E314.0	14797-73-0	Perchlorate	3300		95	400	ug/L				
4402452621	COH2B1-20190703_20190703	7/3/19	E300.1	14866-68-3	Chlorate	790		10	100	ug/L				
4402452621	COH2B1-20190703_20190703	7/3/19	E314.0	14797-73-0	Perchlorate	1800		95	400	ug/L				
4402449051	LNDMW1-20190628_20190628	6/28/19	E300.1	14866-68-3	Chlorate	3700		100	1000	ug/L				
4402449051	LNDMW1-20190628_20190628	6/28/19	E314.0	14797-73-0	Perchlorate	1400		95	400	ug/L				
4402452631	LNDMW2-20190705_20190705	7/5/19	E300.1	14866-68-3	Chlorate	4600		40	400	ug/L				
4402452631	LNDMW2-20190705_20190705	7/5/19	E314.0	14797-73-0	Perchlorate	1500		95	400	ug/L				
4402452621	MW-02-20190703_20190703	7/3/19	E300.1	14866-68-3	Chlorate	2400		20	200	ug/L				
4402452621	MW-02-20190703_20190703	7/3/19	E314.0	14797-73-0	Perchlorate	1700		95	400	ug/L				
4402449051	MW13-20190628_20190628	6/28/19	E300.1	14866-68-3	Chlorate	9400		100	1000	ug/L				
4402449051	MW13-20190628_20190628	6/28/19	E314.0	14797-73-0	Perchlorate	3100		95	400	ug/L				
4402449051	MW20-20190628_20190628	6/28/19	E300.1	14866-68-3	Chlorate	46	J	10	100	ug/L	J	sp	Detect <pql< td=""><td></td></pql<>	
4402449051	MW20-20190628_20190628	6/28/19	E314.0	14797-73-0	Perchlorate	57		4.8	20	ug/L				
4402452621	MW-25-20190703_20190703	7/3/19	E300.1	14866-68-3	Chlorate	56	J	10	100	ug/L	J	sp	Detect <pql< td=""><td></td></pql<>	
4402452621	MW-25-20190703_20190703	7/3/19	E314.0	14797-73-0	Perchlorate	13		0.95	4.0	ug/L				
4402452631	MW-3-20190705_20190705	7/5/19	E300.1	14866-68-3	Chlorate	6000		40	400	ug/L				
4402452631	MW-3-20190705_20190705	7/5/19	E314.0	14797-73-0	Perchlorate	2900		95	400	ug/L				
4402452631	MW-4-20190705_20190705	7/5/19	E300.1	14866-68-3	Chlorate	5900		40	400	ug/L				
4402452631	MW-4-20190705_20190705	7/5/19	E314.0	14797-73-0	Perchlorate	2700		95	400	ug/L				
4402448121	NERT3.35S1-20190626_20190626	6/26/19	E300.1	14866-68-3	Chlorate	10	U	10	100	ug/L	U	nd	Not detected	
4402448122	NERT3.35S1-20190626_20190626	6/26/19	E200.8	7440-47-3	Chromium	0.57	J	0.50	2.0	ug/L	J	sp	Detect <pql< td=""><td></td></pql<>	
19061527	NERT3.35S1-20190626_20190626	6/26/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402448121	NERT3.35S1-20190626_20190626	6/26/19	SM2540C	TDS	Dissolved Solids (total)	6900		50	100	mg/L				
4402448121	NERT3.35S1-20190626_20190626	6/26/19	E314.0	14797-73-0	Perchlorate	4.8	U	4.8	20	ug/L	U	nd	Not detected	
4402448121	NERT3.35S1-20190626-FD_20190626	6/26/19	E300.1	14866-68-3	Chlorate	10	U	10	100	ug/L	U	nd	Not detected	
4402448122	NERT3.35S1-20190626-FD_20190626	6/26/19	E200.8	7440-47-3	Chromium	0.64	J	0.50	2.0	ug/L	J	sp	Detect <pql< td=""><td></td></pql<>	
19061527	NERT3.35S1-20190626_20190626-FD	6/26/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402448121	NERT3.35S1-20190626-FD_20190626	6/26/19	SM2540C	TDS	Dissolved Solids (total)	6900		50	100	mg/L				
4402448121	NERT3.35S1-20190626-FD_20190626	6/26/19	E314.0	14797-73-0	Perchlorate	4.8	U	4.8	20	ug/L	U	nd	Not detected	
4402448121	NERT3.40S1-20190626_20190626	6/26/19	E300.1	14866-68-3	Chlorate	20	U	20	200	ug/L	U	nd	Not detected	
4402448122	NERT3.40S1-20190626_20190626	6/26/19	E200.8	7440-47-3	Chromium	0.71	J	0.50	2.0	ug/L	J	sp	Detect <pql< td=""><td></td></pql<>	
19061527	NERT3.40S1-20190626_20190626	6/26/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402448121	NERT3.40S1-20190626_20190626	6/26/19	SM2540C	TDS	Dissolved Solids (total)	9000		50	100	mg/L				
4402448121	NERT3.40S1-20190626_20190626	6/26/19	E314.0	14797-73-0	Perchlorate	4.8	U	4.8	20	ug/L	U	nd	Not detected	

Table 4 **Qualified Results**NERT Downgradient Study Area, Henderson, Nevada

SDG	Client Sample ID	Sample Date	Method	CAS No.	Analyte	Lab Result	Lab Qualifier	SQL	PQL	Units	Validator Qualifier	Reason Code	Reason Code Definition	Qualification Finding
4402452011	NERT3.58N1-20190702_20190702	7/2/19	E300.1	14866-68-3	Chlorate	24	Qualifier	10	100	ug/L	Qualifier		Detect <pql< th=""><th>Filluling</th></pql<>	Filluling
4402452011	NERT3.58N1-20190702_20190702 NERT3.58N1-20190702 20190702	7/2/19	E200.8	7440-47-3	Chromium	1.3	J	0.50	2.0		J	sp	Detect < PQL	
	_	7/2/19	E200.6 E218.7			1.00	IJ	1.00		ug/L	U	sp		+
19070163	NERT3.58N1-20190702_20190702		-	18540-29-9	Chromium VI		U		1.00	ug/L	U	nd	Not detected	-
4402452011	NERT3.58N1-20190702_20190702	7/2/19	SM2540C	TDS	Dissolved Solids (total)	6600		50 4.8	100	mg/L				
4402452011	NERT3.58N1-20190702_20190702	7/2/19	E314.0	14797-73-0	Perchlorate	88			20	ug/L				
4402448121	NERT3.58S1-20190627_20190627	6/27/19	E300.1	14866-68-3	Chlorate	2700		20	200	ug/L				
4402448122	NERT3.58S1-20190627_20190627	6/27/19	E200.8	7440-47-3	Chromium	5.5		0.50	2.0	ug/L				
19061616	NERT3.58S1-20190627_20190627	6/27/19	E218.7	18540-29-9	Chromium VI	9.09		1.00	1.00	ug/L				1
4402448121	NERT3.58S1-20190627_20190627	6/27/19	SM2540C	TDS	Dissolved Solids (total)	3400		10	20	mg/L				
4402448121	NERT3.58S1-20190627_20190627	6/27/19	E314.0	14797-73-0	Perchlorate	1000		48	200	ug/L				
4402452011	NERT3.60N1-20190702_20190702	7/2/19	E300.1	14866-68-3	Chlorate	27	J	10	100	ug/L	J	sp	Detect <pql< td=""><td></td></pql<>	
4402452012	NERT3.60N1-20190702_20190702	7/2/19	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/L	U	nd	Not detected	
19070163	NERT3.60N1-20190702_20190702	7/2/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402452011	NERT3.60N1-20190702_20190702	7/2/19	SM2540C	TDS	Dissolved Solids (total)	6400		50	100	mg/L				
4402452011	NERT3.60N1-20190702_20190702	7/2/19	E314.0	14797-73-0	Perchlorate	57		4.8	20	ug/L				
4402452011	NERT3.60S1-20190701_20190701	7/1/19	E300.1	14866-68-3	Chlorate	4900		100	1000	ug/L				
4402452012	NERT3.60S1-20190701_20190701	7/1/19	E200.8	7440-47-3	Chromium	9.9		0.50	2.0	ug/L				
19070063	NERT3.60S1-20190701_20190701	7/1/19	E218.7	18540-29-9	Chromium VI	14.7		1.00	1.00	ug/L				
4402452011	NERT3.60S1-20190701_20190701	7/1/19	SM2540C	TDS	Dissolved Solids (total)	3300		25	50	mg/L				
4402452011	NERT3.60S1-20190701_20190701	7/1/19	E314.0	14797-73-0	Perchlorate	1600		95	400	ug/L				
4402448121	NERT3.63S1-20190627_20190627	6/27/19	E300.1	14866-68-3	Chlorate	3900		40	400	ug/L				
4402448122	NERT3.63S1-20190627_20190627	6/27/19	E200.8	7440-47-3	Chromium	8.6		0.50	2.0	ug/L				
19061616	NERT3.63S1-20190627_20190627	6/27/19	E218.7	18540-29-9	Chromium VI	8.54		1.00	1.00	ug/L				
4402448121	NERT3.63S1-20190627_20190627	6/27/19	SM2540C	TDS	Dissolved Solids (total)	3100		10	20	mg/L				
4402448121	NERT3.63S1-20190627_20190627	6/27/19	E314.0	14797-73-0	Perchlorate	1200		19	80	ug/L				
4402448121	NERT3.80S1-20190627_20190627	6/27/19	E300.1	14866-68-3	Chlorate	1400		10	100	ug/L				
19061616	NERT3.80S1-20190627 20190627	6/27/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402448121	NERT3.80S1-20190627 20190627	6/27/19	E314.0	14797-73-0	Perchlorate	820		19	80	ug/L				
4402448121	NERT3.80S1-20190627-FD 20190627	6/27/19	E300.1	14866-68-3	Chlorate	1400		10	100	ug/L				
19061616	NERT3.80S1-20190627 20190627-FD	6/27/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402448121	NERT3.80S1-20190627-FD 20190627	6/27/19	E314.0	14797-73-0	Perchlorate	820	-	19	80	ug/L	_			
4402448121	NERT3.98S1-20190627 20190627	6/27/19	E300.1	14866-68-3	Chlorate	20	U	20	200	ug/L	U	nd	Not detected	1
4402448122	NERT3.98S1-20190627 20190627	6/27/19	E200.8	7440-47-3	Chromium	0.79	J	0.50	2.0	ug/L	J	sp	Detect <pql< td=""><td>1</td></pql<>	1
19061616	NERT3.98S1-20190627 20190627	6/27/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	1

Table 4 **Qualified Results**NERT Downgradient Study Area, Henderson, Nevada

		Sample				Lab	Lab				Validator	Reason	Reason Code	Qualification
SDG	Client Sample ID	Date	Method	CAS No.	Analyte	Result	Qualifier	SQL	PQL	Units	Qualifier	Code	Definition	Finding
4402448121	NERT3.98S1-20190627_20190627	6/27/19	SM2540C	TDS	Dissolved Solids (total)	5100		50	100	mg/L				
4402448121	NERT3.98S1-20190627_20190627	6/27/19	E314.0	14797-73-0	Perchlorate	4.8	U	4.8	20	ug/L	U	nd	Not detected	
4402452011	NERT4.21N1-20190702_20190702	7/2/19	E300.1	14866-68-3	Chlorate	5500		100	1000	ug/L				
19070163	NERT4.21N1-20190702_20190702	7/2/19	E218.7	18540-29-9	Chromium VI	27.1		1.00	1.00	ug/L				
4402452011	NERT4.21N1-20190702_20190702	7/2/19	E314.0	14797-73-0	Perchlorate	1800		95	400	ug/L				
4402452011	NERT4.21N1-20190702-FB_20190702	7/2/19	E300.1	14866-68-3	Chlorate	2.0	U	2.0	20	ug/L	U	nd	Not detected	
19070163	NERT4.21N1-20190702_20190702-FB	7/2/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402452011	NERT4.21N1-20190702-FB_20190702	7/2/19	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/L	U	nd	Not detected	
4402452011	NERT4.38N1-20190702_20190702	7/2/19	E300.1	14866-68-3	Chlorate	340		10	100	ug/L				
19070163	NERT4.38N1-20190702_20190702	7/2/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402452011	NERT4.38N1-20190702_20190702	7/2/19	E314.0	14797-73-0	Perchlorate	1500		48	200	ug/L				
4402452011	NERT4.38N1-20190702-EB_20190702	7/2/19	E300.1	14866-68-3	Chlorate	2.0	U	2.0	20	ug/L	U	nd	Not detected	
19070163	NERT4.38N1-20190702_20190702-EB	7/2/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402452011	NERT4.38N1-20190702-EB_20190702	7/2/19	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/L	U	nd	Not detected	
4402448121	NERT4.51S1-20190627_20190627	6/27/19	E300.1	14866-68-3	Chlorate	8200		100	1000	ug/L				
19061616	NERT4.51S1-20190627_20190627	6/27/19	E218.7	18540-29-9	Chromium VI	36.8		1.00	1.00	ug/L				
4402448121	NERT4.51S1-20190627_20190627	6/27/19	E314.0	14797-73-0	Perchlorate	2400		95	400	ug/L				
4402452011	NERT4.64N1-20190702_20190702	7/2/19	E300.1	14866-68-3	Chlorate	28		2.0	20	ug/L				
4402452012	NERT4.64N1-20190702_20190702	7/2/19	E200.8	7440-47-3	Chromium	0.55	J	0.50	2.0	ug/L	J	sp	Detect <pql< td=""><td></td></pql<>	
19070163	NERT4.64N1-20190702_20190702	7/2/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402452011	NERT4.64N1-20190702_20190702	7/2/19	SM2540C	TDS	Dissolved Solids (total)	2000		10	20	mg/L				
4402452011	NERT4.64N1-20190702_20190702	7/2/19	E314.0	14797-73-0	Perchlorate	500		19	80	ug/L				
4402452011	NERT4.64N1-20190702-FD_20190702	7/2/19	E300.1	14866-68-3	Chlorate	28		2.0	20	ug/L				
4402452012	NERT4.64N1-20190702-FD_20190702	7/2/19	E200.8	7440-47-3	Chromium	0.72	J	0.50	2.0	ug/L	J	sp	Detect <pql< td=""><td></td></pql<>	
19070163	NERT4.64N1-20190702_20190702-FD	7/2/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402452011	NERT4.64N1-20190702-FD_20190702	7/2/19	SM2540C	TDS	Dissolved Solids (total)	2000		10	20	mg/L				
4402452011	NERT4.64N1-20190702-FD_20190702	7/2/19	E314.0	14797-73-0	Perchlorate	500		19	80	ug/L				
4402452011	NERT4.64S1-20190701 20190701	7/1/19	E300.1	14866-68-3	Chlorate	8900		100	1000	ug/L				
4402452012	NERT4.64S1-20190701_20190701	7/1/19	E200.8	7440-47-3	Chromium	20		0.50	2.0	ug/L				
19070063	NERT4.64S1-20190701_20190701	7/1/19	E218.7	18540-29-9	Chromium VI	38.2		1.00	1.00	ug/L				
4402452011	NERT4.64S1-20190701_20190701	7/1/19	SM2540C	TDS	Dissolved Solids (total)	4900		50	100	mg/L				
4402452011	NERT4.64S1-20190701 20190701	7/1/19	E314.0	14797-73-0	Perchlorate	3200		190	800	ug/L				
4402454301	NERT4.65N1-20190708 20190708	7/8/19	E300.1	14866-68-3	Chlorate	13	J	10	100	ug/L	J	sp	Detect <pql< td=""><td></td></pql<>	
4402454302	NERT4.65N1-20190708_20190708	7/8/19	E200.8	7440-47-3	Chromium	0.59	J	0.50	2.0	ug/L	J	sp	Detect <pql< td=""><td></td></pql<>	

Table 4 **Qualified Results**NERT Downgradient Study Area, Henderson, Nevada

		Sample				Lab	Lab				Validator	Reason	Reason Code	Qualif	fication
SDG	Client Sample ID	Date	Method	CAS No.	Analyte	Result	Qualifier	SQL	PQL	Units	Qualifier	Code	Definition	Fine	ding
19070339	NERT4.65N1-20190708_20190708	7/8/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected		
4402454301	NERT4.65N1-20190708_20190708	7/8/19	SM2540C	TDS	Dissolved Solids (total)	2400		10	20	mg/L					
4402454301	NERT4.65N1-20190708_20190708	7/8/19	E314.0	14797-73-0	Perchlorate	470		95	400	ug/L					
4402454301	NERT4.65N1-20190708-EB_20190708	7/8/19	E300.1	14866-68-3	Chlorate	2.0	U	2.0	20	ug/L	U	nd	Not detected		
4402454302	NERT4.65N1-20190708-EB_20190708	7/8/19	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/L	U	nd	Not detected		
4402454301	NERT4.65N1-20190708-EB_20190708	7/8/19	SM2540C	TDS	Dissolved Solids (total)	5.0	U	5.0	10	mg/L	U	nd	Not detected		
4402454301	NERT4.65N1-20190708-EB_20190708	7/8/19	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/L	U	nd	Not detected		
19070339	NERT-4.65N1-20190708-FB_20190708	7/8/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected		
4402456931	NERT4.70N1-20190709_20190709	7/9/19	E300.1	14866-68-3	Chlorate	10	U	10	100	ug/L	U	nd	Not detected		
4402456932	NERT4.70N1-20190709_20190709	7/9/19	E200.8	7440-47-3	Chromium	0.50	U	0.50	2.0	ug/L	U	nd	Not detected		
19070468	NERT4.70N1-20190709_20190709	7/9/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected		
4402456931	NERT4.70N1-20190709_20190709	7/9/19	SM2540C	TDS	Dissolved Solids (total)	1800		10	20	mg/L					
4402456931	NERT4.70N1-20190709_20190709	7/9/19	E314.0	14797-73-0	Perchlorate	140		9.5	40	ug/L					
4402456931	NERT4.70N1-20190709-EB_20190709	7/9/19	E300.1	14866-68-3	Chlorate	2.0	U	2.0	20	ug/L	U	nd	Not detected		
4402456932	NERT4.70N1-20190709-EB_20190709	7/9/19	E200.8	7440-47-3	Chromium	0.70	J	0.50	2.0	ug/L	J	sp	Detect <pql< td=""><td></td><td></td></pql<>		
19070468	NERT4.70N1-20190709-EB_20190709	7/9/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected		
4402456931	NERT4.70N1-20190709-EB_20190709	7/9/19	SM2540C	TDS	Dissolved Solids (total)	5.0	U	5.0	10	mg/L	U	nd	Not detected		
4402456931	NERT4.70N1-20190709-EB_20190709	7/9/19	E314.0	14797-73-0	Perchlorate	0.95	U	0.95	4.0	ug/L	U	nd	Not detected		
4402456931	NERT4.71N1-20190709_20190709	7/9/19	E300.1	14866-68-3	Chlorate	10	U	10	100	ug/L	U	nd	Not detected		
4402456932	NERT4.71N1-20190709_20190709	7/9/19	E200.8	7440-47-3	Chromium	0.69	J	0.50	2.0	ug/L	J+	be	Equipment Blank	0.7	ug/L
19070468	NERT4.71N1-20190709_20190709	7/9/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected		
4402456931	NERT4.71N1-20190709_20190709	7/9/19	SM2540C	TDS	Dissolved Solids (total)	1800		10	20	mg/L					
4402456931	NERT4.71N1-20190709_20190709	7/9/19	E314.0	14797-73-0	Perchlorate	160		9.5	40	ug/L					
4402452011	NERT4.71S1-20190701_20190701	7/1/19	E300.1	14866-68-3	Chlorate	10000		100	1000	ug/L					
19070063	NERT4.71S1-20190701_20190701	7/1/19	E218.7	18540-29-9	Chromium VI	37.4		1.00	1.00	ug/L					
4402452011	NERT4.71S1-20190701_20190701	7/1/19	E314.0	14797-73-0	Perchlorate	3400		190	800	ug/L					
4402452011	NERT4.71S2-20190701_20190701	7/1/19	E300.1	14866-68-3	Chlorate	14000		100	1000	ug/L					
4402452012	NERT4.71S2-20190701_20190701	7/1/19	E200.8	7440-47-3	Chromium	19		0.50	2.0	ug/L					
19070063	NERT4.71S2-20190701_20190701	7/1/19	E218.7	18540-29-9	Chromium VI	26.6		1.00	1.00	ug/L					
4402452011	NERT4.71S2-20190701_20190701	7/1/19	SM2540C	TDS	Dissolved Solids (total)	4100		50	100	mg/L					
4402452011	NERT4.71S2-20190701_20190701	7/1/19	E314.0	14797-73-0	Perchlorate	2900		190	800	ug/L					
4402452011	NERT4.93S1-20190701_20190701	7/1/19	E300.1	14866-68-3	Chlorate	8600		100	1000	ug/L					
19070063	NERT4.93S1-20190701_20190701	7/1/19	E218.7	18540-29-9	Chromium VI	16.8		1.00	1.00	ug/L					
4402452011	NERT4.93S1-20190701_20190701	7/1/19	E314.0	14797-73-0	Perchlorate	1800		190	800	ug/L					
4402452011	NERT5.11S1-20190701_20190701	7/1/19	E300.1	14866-68-3	Chlorate	10000		100	1000	ug/L					

Table 4

Qualified Results

NERT Downgradient Study Area, Henderson, Nevada

		Sample				Lab	Lab				Validator	Reason	Reason Code	Qualification
SDG	Client Sample ID	Date	Method	CAS No.	Analyte	Result	Qualifier	SQL	PQL	Units	Qualifier	Code	Definition	Finding
19070063	NERT5.11S1-20190701_20190701	7/1/19	E218.7	18540-29-9	Chromium VI	14.2		1.00	1.00	ug/L				
4402452011	NERT5.11S1-20190701_20190701	7/1/19	E314.0	14797-73-0	Perchlorate	2300		190	800	ug/L				
4402454301	NERT5.49S1-20190708_20190708	7/8/19	E300.1	14866-68-3	Chlorate	10	U	10	100	ug/L	U	nd	Not detected	
19070339	NERT5.49S1-20190708_20190708	7/8/19	E218.7	18540-29-9	Chromium VI	1.00	J	1.00	1.00	ug/L	U	nd	Not detected	
4402454301	NERT5.49S1-20190708_20190708	7/8/19	E314.0	14797-73-0	Perchlorate	13		0.95	4.0	ug/L				
4402452011	NERT5.91S1-20190701_20190701	7/1/19	E300.1	14866-68-3	Chlorate	450		10	100	ug/L				
19070063	NERT5.91S1-20190701_20190701	7/1/19	E218.7	18540-29-9	Chromium VI	1.00	U	1.00	1.00	ug/L	U	nd	Not detected	
4402452011	NERT5.91S1-20190701_20190701	7/1/19	E314.0	14797-73-0	Perchlorate	2800		190	800	ug/L				
4402452631	WMW3.5N-20190705_20190705	7/5/19	E300.1	14866-68-3	Chlorate	300		10	100	ug/L				
4402452631	WMW3.5N-20190705_20190705	7/5/19	E314.0	14797-73-0	Perchlorate	260		9.5	40	ug/L				
4402449051	WMW3.5S-20190628_20190628	6/28/19	E300.1	14866-68-3	Chlorate	3500		100	1000	ug/L				
4402449051	WMW3.5S-20190628_20190628	6/28/19	E314.0	14797-73-0	Perchlorate	1300		95	400	ug/L				
4402449051	WMW3.5S-20190628-FD_20190628	6/28/19	E300.1	14866-68-3	Chlorate	3400		100	1000	ug/L				
4402449051	WMW3.5S-20190628-FD_20190628	6/28/19	E314.0	14797-73-0	Perchlorate	1300		95	400	ug/L				
4402452631	WMW4.9N-20190705_20190705	7/5/19	E300.1	14866-68-3	Chlorate	16	J	10	100	ug/L	J	sp	Detect < PQL	
4402452631	WMW4.9N-20190705_20190705	7/5/19	E314.0	14797-73-0	Perchlorate	660		95	400	ug/L				
4402456931	WMW4.9S-20190709_20190709	7/9/19	E300.1	14866-68-3	Chlorate	3000		100	1000	ug/L				
4402456931	WMW4.9S-20190709_20190709	7/9/19	E314.0	14797-73-0	Perchlorate	850		95	400	ug/L				
4402452621	WMW5.58S-20190703_20190703	7/3/19	E300.1	14866-68-3	Chlorate	8000		100	1000	ug/L				
4402452621	WMW5.58S-20190703_20190703	7/3/19	E314.0	14797-73-0	Perchlorate	4000		95	400	ug/L				
4402449051	WMW5.5S-20190628_20190628	6/28/19	E300.1	14866-68-3	Chlorate	3500		100	1000	ug/L			-	
4402449051	WMW5.5S-20190628_20190628	6/28/19	E314.0	14797-73-0	Perchlorate	1000		95	400	ug/L			-	
4402456931	WMW5.7N-20190709_20190709	7/9/19	E300.1	14866-68-3	Chlorate	10	U	10	100	ug/L	U	nd	Not detected	
4402456931	WMW5.7N-20190709_20190709	7/9/19	E314.0	14797-73-0	Perchlorate	12		0.95	4.0	ug/L				

Notes

be = qualified due to equipment blank contamination

ID = identifier

J = Estimated. The associated numerical value is the approximate concentration of the analyte in the sample. It is not possible to assess the direction of the potential bias. The analyte was detected but the reported value may not be accurate or precise.

mg/L = milligrams per liter

nd = qualified due to non=detected target analyte

PQL = practical quantitation limit SDG = Sample Delivery Group

SQL = sample quantitation limits

sp = detected value reported >SQL<PQL

U = Nondetected. Analyses were performed for the compound or analyte, but it was not detected.

ug/L = micrograms per liter

< = less than

Attachment A

Wet Chemistry Data Validation

Chlorate by EPA Method 300.1B
Perchlorate by EPA Method 314.0
Total Dissolved Solids by Standard Method 2540C
Chromium by EPA Method 200.8
Hexavalent Chromium by EPA Method 218.7

1. Sample Receipt and Technical Holding Times

All samples were collected and preserved appropriately, and all analyses were performed within the method-specified holding times. Note, the method specified holding time for hexavalent chromium is 14 days while the QAPP specifies a holding time of 7 days (preserved). The method holding time was used for evaluation. The laboratory confirmed the samples for hexavalent chromium were preserved in accordance with the method.

All analyses were performed as requested on the chain of custodies. The laboratory reported all requested analyses and the deliverable data reports were complete.

2. Laboratory Blanks

Laboratory method blanks were analyzed at the proper frequency as required by each analytical method. No contaminants were found in the laboratory method blanks.

3. Field Blanks

Samples NERT4.38N1-20190702-EB_20190702, NERT4.65N1-20190708-EB_20190708 and NERT4.70N1-20190709-EB_20190709 were identified as equipment blanks. No contaminants were found in the equipment blanks with the following exception:

Method	Blank	Analyte	Concentration	Qualified Samples	Qualifier
EPA 200.8	NERT4.70N1-20190709- EB_20190709	Chromium	0.70 ug/L	NERT4.71N1- 20190709_20190709	J+

Sample NERT4.21N1-20190702-FB_20190702 was identified as a field blank. No contaminants were found in the field blank.

4. Surrogate

Surrogate (dichloroacetic acid) recoveries were evaluated for chlorate analysis by EPA Method 300.1B. All surrogate percent recoveries met the acceptance criteria.

5. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on associated project samples. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits. MS/MSD recovery limits do not apply when the sample concentration is ≥ 4x the spike added. In such an event, the data would be reported unflagged (*USEPA National Functional Guidelines*). In addition, batch or non-project MS/MSD data were not evaluated.

6. Duplicate Sample Analysis

Duplicate (DUP) analyses were performed for Total Dissolved Solids by Standard Method 2540C. All duplicate analyses met criteria and therefore no samples were qualified based on duplicate analysis results.

7. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

8. MRL Samples

The QC samples associated with the chlorate and perchlorate tests included an MRL sample for each analytical batch. The MRL sample was a laboratory blank spiked at the PQL. All recoveries were within the laboratory specified control criteria.

9. Field Duplicates

Samples NERT3.35S1-20190626_20190626, NERT3.80S1-20190627_20190627, NERT4.64N1-20190702_20190702, and WMW3.5S-20190628_20190628 were identified as field duplicates. The RPD was calculated for detected results. As shown below, acceptable field and analytical precision were demonstrated for all field duplicate pairs with the calculated RPDs being below the QAPP criteria of ≤30%.

	NERT3.35S1-	NERT3.35S1-20190626-	RPD
Analyte	20190626_20190626	FD_20190626	%
Chromium	0.57	0.64	12
Dissolved Solids (total)	6900	6900	0
	NERT3.80S1- 20190627_20190627	NERT3.80S1-20190627- FD_20190627	
Chlorate	1400	1400	0
Perchlorate	820	820	0
	NERT4.64N1- 20190702_20190702	NERT4.64N1-20190702- FD_20190702	
Chlorate	28	28	0
Chromium	0.55	0.72	27
Dissolved Solids (total)	2000	2000	0
Perchlorate	500	500	0
	WMW3.5S- 20190628_20190628	WMW3.5S-20190628- FD_20190628	
Chlorate	3500	3400	3
Perchlorate	1300	1300	0

RPD = Relative Percent Difference

10. Sample Result Verification

Raw data were not reviewed for Stage 2A validation.

11. Overall Assessment of Data

All samples were analyzed as requested and all holding times were met. Due to low-level blank contamination, the result for chromium in one sample was qualified as estimated ("J+"). No other data were qualified.

Overall, based on this data validation, the data as qualified, are useable for meeting project objectives. All results are considered to be valid; the analytical completeness defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%. Additionally, because all samples in each data set were collected and analyzed under similar prescribed conditions, the data are comparable.

Appendix O

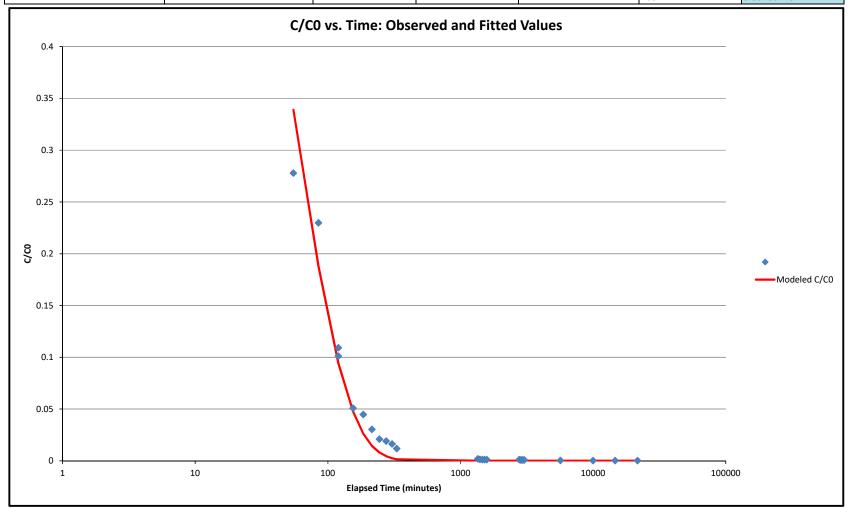
Dilution Testing Model Reports

Input Data Depth to water (ft) 34.91 Bottom of screen depth (ft) 55.00 Height of water column (ft) 20.09 Well radius (ft) 0.33 Cross sectional area (ft²) 13.33 Volume of water in well (ft³) 7.01

Results		
Apparent Velocity	0.010340779	ft/minute
	14.89072194	ft/day
Darcy Velocity	0.00517039	ft/day
porosity	0.33	
alpha	2	Well shape factor
Groundwater velocity	22.56169991	ft/day
Local Gradient	0.01	ft/ft
Gradient Direction	N/NW	

$\frac{C}{C0} = e^{-(v_a * A * t)/V}$	[$v_{-}a = \propto v_{d}$	$v = \frac{v_a}{\alpha * n}$	

Model Data	[a	1-1 1-1	. (2/22)		I	1
Elapsed Time (minutes)	Observed Concentation (mg/L)	Observed C/C0	Ln(C/C0)	Modeled C/C0	Residual	Squared Residual
0	2040	1	0	1	0	0
55	567	0.277941176	-1.280345783	0.338950492	0.061009315	0.003722137
85	469	0.229901961	-1.470102318	0.187865468	-0.042036492	0.001767067
120	223	0.109117647	-2.215328648	0.094371915	-0.014745732	0.000217437
120	206	0.101078431	-2.291858515	0.094371915	-0.006706517	4.49774E-05
155	104	0.050882353	-2.978239116	0.047406574	-0.003475779	1.2081E-05
185	91	0.044705882	-3.10765019	0.026275396	-0.018430487	0.000339683
215	62	0.030294118	-3.496801722	0.014563305	-0.015730812	0.000247458
245	43	0.020882353	-3.868850834	0.008071805	-0.012810548	0.00016411
275	39	0.019019608	-3.96228484	0.004473849	-0.014545759	0.000211579
305	33	0.01627451	-4.118155211	0.002479659	-0.01379485	0.000190298
330	24	0.011715686	-4.446826628	0.001516413	-0.010199273	0.000104025
1350	4	0.001862745	-6.28570402	2.93077E-12	-0.001862745	3.46982E-06
1400	3	0.001421569	-6.55599435	1.09605E-12	-0.001421569	2.02086E-06
1460	2	0.001127451	-6.787795964	3.36708E-13	-0.001127451	1.27115E-06
1520	2	0.001127451	-6.787795964	1.03437E-13	-0.001127451	1.27115E-06
1580	2	0.001078431	-6.832247726	3.17758E-14	-0.001078431	1.16301E-06
2775	2	0.001127451	-6.787795964	1.96444E-24	-0.001127451	1.27115E-06
2840	2	0.000833333	-7.090076836	5.46947E-25	-0.000833333	6.94444E-07
2900	2	0.000833333	-7.090076836	1.68022E-25	-0.000833333	6.94444E-07
2960	2	0.000784314	-7.150701458	5.16165E-26	-0.000784314	6.15148E-07
3020	2	0.000784314	-7.150701458	1.58566E-26	-0.000784314	6.15148E-07
5665	1	0.000392157	-7.843848638	4.01824E-49	-0.000392157	1.53787E-07
9975	1	0.000245098	-8.313852267	6.07862E-86	-0.000245098	6.0073E-08
14660	0	0.000196078	-8.536995819	5.7538E-126	-0.000196078	3.84468E-08
21620	0	0.000147059	-8.824677891	1.9991E-185	-0.000147059	2.16263E-08
					RSS	0.00703419



Input Data

3060

Depth to water (ft)	38.63
Bottom of screen depth (ft)	55
Height of water column (ft)	16.37
Well radius (ft)	0.33
Cross sectional area (ft ²)	13.33
Volume of water in well (ft ³)	5.71

$\frac{C}{C0} = e^{-(v_a * A * t)/V}$

 $v_a = \propto v_d$

Results

3.20853E-79

Apparent Velocity	0.025300326	ft/minute
	36.43246915	ft/day
Darcy Velocity	0.012650163	ft/day
porosity	0.33	
alpha	2	Well shape factor
Groundwater velocity	55.20071083	ft/day
Local Gradient	0.01	ft/ft
Gradient Direction	N/NE	

-0.000862069

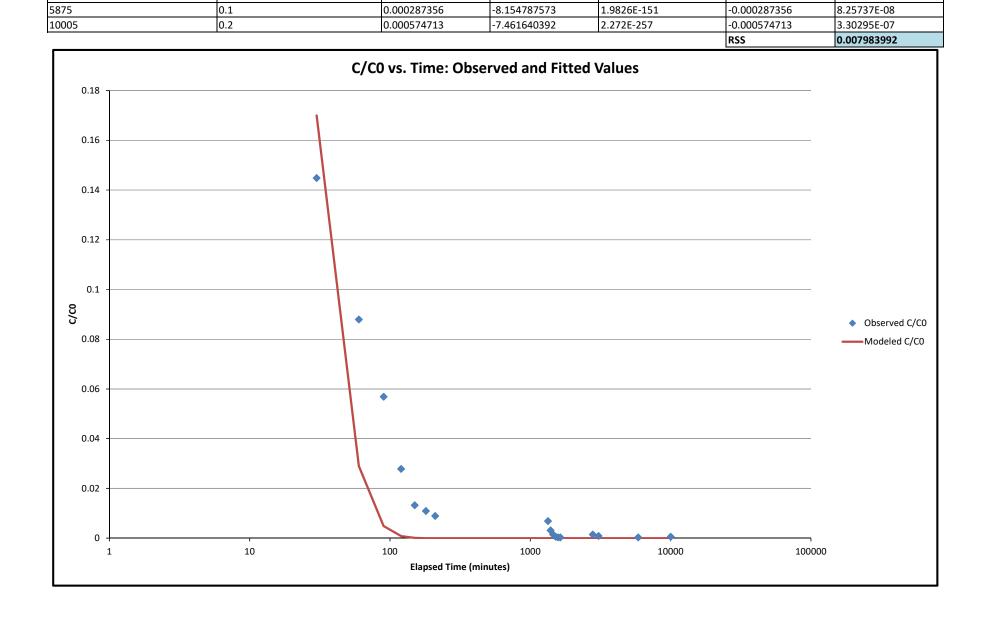
7.43163E-07

	v_a	
v =	$\propto * n$	

Model Data						
Elapsed Time (minutes)	Observed Concentration (mg/L)	Observed C/C0	Ln(C/C0)	Modeled C/C0	Residual	Squared Residual
0	348	1	0	1	0	0
30	50.4	0.144827586	-1.932211305	0.170001979	0.025174393	0.00063375
60.0000001	30.6	0.087931034	-2.431202471	0.028900673	-0.059030362	0.003484584
90	19.8	0.056896552	-2.866520542	0.004913172	-0.05198338	0.002702272
120	9.7	0.027873563	-3.580076594	0.000835249	-0.027038314	0.00073107
150	4.6	0.013218391	-4.326146176	0.000141994	-0.013076397	0.000170992
180	3.8	0.01091954	-4.517201413	2.41393E-05	-0.010895401	0.00011871
210	3.1	0.008908046	-4.720800368	4.10372E-06	-0.008903942	7.92802E-05
1335	2.4	0.006896552	-4.976733742	5.69118E-35	-0.006896552	4.75624E-05
1395	1.1	0.00316092	-5.7568923	1.64479E-36	-0.00316092	9.99141E-06
1455	0.5	0.001436782	-6.54534966	4.75355E-38	-0.001436782	2.06434E-06
1515	0.2	0.000574713	-7.461640392	1.37381E-39	-0.000574713	3.30295E-07
1575	0.1	0.000287356	-8.154787573	3.9704E-41	-0.000287356	8.25737E-08
1635	0.1	0.000287356	-8.154787573	1.14747E-42	-0.000287356	8.25737E-08
2785	0.5	0.001436782	-6.54534966	3.63477E-72	-0.001436782	2.06434E-06

-7.056175284

0.000862069



Input Data

Depth to water (ft)	27.1
Bottom of screen depth (ft)	55
Height of water column (ft)	27.9
Well radius (ft)	0.33
Cross sectional area (ft ²)	13.33
Volume of water in well (ft ³)	9.73

 $\frac{C}{C0} = e^{-(v_a*A*t)/V}$ $v_a = \propto v_d$

Results

Apparent Velocity	0.004401475	ft/minute
	6.338124627	ft/day
Darcy Velocity	0.002200738	ft/day
porosity	0.33	
alpha	2	Well shape factor
Groundwater velocity	9.603219131	ft/day
Local Gradient	0.009	ft/ft
Gradient Direction	N	

 $v = \frac{v_a}{\alpha * n}$

Elapsed Time (minutes)	Observed Concentration (mg/L)	Observed C/C0	Ln(C/C0)	Modeled C/C0	Residual	Squared Residual
0	653	1	0	1	0	0
30	526	0.805513017	-0.216275917	0.834543706	0.029030689	0.000842781
60	466	0.713629403	-0.337391495	0.696463197	-0.017166206	0.000294679
90	390	0.597243492	-0.51543039	0.581228977	-0.016014515	0.000256465
120	366	0.560490046	-0.578943796	0.485060984	-0.075429062	0.005689543
150	251	0.384379786	-0.95612419	0.404804591	0.020424806	0.000417173
180	177.7	0.272128637	-1.301480394	0.337827124	0.065698487	0.004316291
1540	32.2	0.049310873	-3.009610677	9.28367E-05	-0.049218036	0.002422415
1600	30.1	0.046094946	-3.077051958	6.46574E-05	-0.046030289	0.002118788
1660	19.3	0.029555896	-3.521472033	4.50315E-05	-0.029510864	0.000870891
1720	30.1	0.046094946	-3.077051958	3.13628E-05	-0.046063584	0.002121854
2945	8.8	0.013476263	-4.306825408	1.945E-08	-0.013476244	0.000181609
3005	7.1	0.010872894	-4.521482345	1.35462E-08	-0.010872881	0.00011822
3065	4.3	0.006584992	-5.022962107	9.43441E-09	-0.006584983	4.3362E-05
3125	4.6	0.00704441	-4.955520826	6.57072E-09	-0.007044404	4.96236E-05
4325	3.5	0.005359877	-5.228814161	4.7378E-12	-0.005359877	2.87283E-05
9005	0.5	0.000765697	-7.17472431	2.64018E-24	-0.000765697	5.86292E-07
11600	0.9	0.001378254	-6.586937645	4.23623E-31	-0.001378254	1.89958E-06
14520	0.5	0.000765697	-7.17472431	9.57983E-39	-0.000765697	5.86292E-07
18940	0.3	0.000459418	-7.685549934	2.5597E-50	-0.000459418	2.11065E-07
22010	0.2	0.000306279	-8.091015042	2.34322E-58	-0.000306279	9.38067E-08
24850	0.2	0.000306279	-8.091015042	8.5834E-66	-0.000306279	9.38067E-08
29185	0.2	0.000306279	-8.091015042	3.82871E-77	-0.000306279	9.38067E-08
				·	RSS	0.019774907

