Prepared for
Nevada Environmental Response Trust
Henderson, Nevada

Project Number
1690016062-017

Prepared by
Ramboll US Corporation
Emeryville, California

Date
March 4, 2020

REMEDIAL PERFORMANCE SAMPLING AND ANALYSIS PLAN, REVISION 1

NEVADA ENVIRONMENTAL RESPONSE TRUST SITE HENDERSON, NEVADA

RAMBOLL

Remedial Performance Sampling and Analysis Plan, Revision 1

Nevada Environmental Response Trust Site
(Former Tronox LLC Site)
Henderson, Nevada

Nevada Environmental Response Trust (NERT) Representative Certification

I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of NERT. Based on my own involvement and/or my inquiry of the person or persons who manage the system(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

Signature: [signature] Not Individually, but Solely as President of the Trustee

Name: Jay A. Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

Title: Solely as President and not individually

Company: Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

Date: 3/3/2020

Remedial Performance Sampling and Analysis Plan, Revision 1

Nevada Environmental Response Trust Site
(Former Tronox LLC Site)
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.

3/4/2020

John M. Pekala, PG **Date**
Principal

Certified Environmental Manager
Ramboll US Corporation
CEM Certificate Number: 2347
CEM Expiration Date: September 20, 2020

The following individuals provided input to this document:

John M. Pekala, PG
Allan J. DeLorme, PE
Christopher J. Ritchie, PE
David Heinze, PE
Scott Hayter
Kristin Drucquer
Craig Knox
Annika Deurlington
Jesse D. King, RG
Jonathan Hunt, PhD
Uma Patel, PE
Kate Logan, MPA
Thomas Winger
Janette Kiernan
Marcella Valentine
Daniel Hogan
Carol Tsai

RAMBOLL

Date	**March 4, 2020**
Prepared by	**Ramboll**
Description	**Remedial Performance Sampling and Analysis Plan, Revision 1**

Project No **1690016062-017**

Ramboll
2200 Powell Street
Suite 700
Emeryville, CA 94608
USA
T +1 510 655 7400
F +1 510 655 9517
www.ramboll.com

CONTENTS

TABLES

FIGURES

ELECTRONIC MAP

APPENDICES

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

AWF	Athens Road Well Field
CEM	Certified Environmental Manager
COC	chain of custody
DO	dissolved oxygen
DNAPL	dense non-aqueous phase liquid
DTW	depth to water
EB	equipment blank
EDD	electronic data deliverable
Envirogen	Envirogen Technologies, Inc.
FB	field blank
FD	field duplicate
FGD	field guidance document
FS	Feasibility Study
ft	feet
ft bgs	feet below ground surface
GW/SW	groundwater and surface water
GWETS	groundwater extraction and treatment system
GWMO Plan	Groundwater Monitoring Optimization Plan
IWF	Interceptor Well Field
L	liters
LDC	Laboratory Data Consultants, Inc.
mg/L	milligrams per liter
mL	milliliters
mL/min	milliliters per minute
mS/cm	milliSiemens per centimeter
mV	millivolts
NDEP	Nevada Division of Environmental Protection
NERT	Nevada Environmental Response Trust
NPDES	National Pollutant Discharge Elimination System
NTU	nephelometric turbidity units
ORP	oxidation reduction potential
OU	Operable Unit

PDF	portable document format
PM	project manager
psi	pounds per square inch
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
Ramboll	Ramboll US Corporation
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SDG	sample delivery group
SOP	standard operating procedure
Site	Nevada Environmental Response Trust Site
SWF	Seep Well Field
TAT	turnaround time
TestAmerica	Eurofins TestAmerica Laboratories, Inc.
Tetra Tech	Tetra Tech, Inc.
TB	trip blank
TDS	total dissolved solids
TOC	top of casing
Trust	Nevada Environmental Response Trust
UMCf	Upper Muddy Creek Formation
uS/cm	microSiemens per centimeter
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WBZ	water-bearing zone

1. INTRODUCTION

On behalf of the Nevada Environmental Response Trust (NERT or the Trust), Ramboll US Corporation (Ramboll) has prepared this *Remedial Performance Sampling and Analysis Plan, Revision 1* (the "2020 SAP") to provide guidance for implementing the remedial performance monitoring program for the NERT Site (the Site) located in Henderson, Nevada (Figure 1). This 2020 SAP is intended to supersede the *Remedial Performance Groundwater Sampling and Analysis Plan* (the "2017 SAP") (Ramboll Environ 2017a). The 2017 SAP was approved by the Nevada Division of Environmental Protection (NDEP) on April 7, 2017. The 2017 SAP implemented a revised groundwater monitoring program as initially proposed in the *2016 Groundwater Monitoring Optimization Plan* (the "2016 GWMO Plan"; Ramboll Environ 2016), which evaluated the groundwater monitoring program previously in place and provided specific recommendations to improve the program.

1.1 Purpose

This 2020 SAP updates the remedial performance monitoring program to ensure the dataset stays current with site characterization improvements made during the ongoing NERT Remedial Investigation (RI). More specifically, the 2020 SAP documents incremental changes to the monitoring program since the 2017 SAP was prepared, adds strategically-located monitoring wells installed as part of the ongoing RI, incorporates the existing surface water monitoring program, and integrates the transducer network installed throughout the RI into the monitoring program. The overall purpose of the SAP is to ensure remedial performance monitoring data collected throughout the RI, Feasibility Study (FS) and Remedial Design (RD) are timely, accurate and reliable for their intended use. As with the previous version, the scope of the 2020 SAP is limited to the remedial performance monitoring program and does not include treatment process sampling or extraction well transducer monitoring required for operation of the Groundwater Extraction and Treatment System (GWETS). Moreover, the scope of the 2020 SAP does not provide guidance for implementing sampling and analysis programs for the Remedial Investigation and Feasibility Study (RI/FS), which are documented elsewhere, most recently in the *Quality Assurance Project Plan, Revision 4* (QAPP) (Ramboll 2019a).

Data collected as part of the monitoring program are primarily used in the preparation of the Annual Remedial Performance Reports for Chromium and Perchlorate (the Annual Performance Reports, e.g., Ramboll 2018), and the Semi-Annual Remedial Performance Memoranda for Chromium and Perchlorate (the Semi-Annual Performance Memoranda, e.g., Ramboll 2019b), which are prepared by Ramboll, reviewed by the Trust, and submitted to NDEP at the end of October and the end of April, respectively. The Annual Performance Reports and the Semi-Annual Performance Memoranda are designed to meet reporting requirements described in the Interim Consent Agreement[1] between the Trust and NDEP, as modified through the approvals of the 2016 GWMO Plan and the Performance Metrics Technical Memorandum (Ramboll Environ 2017b).

In addition to performance reporting, monitoring data is used to support other tasks, including the following: estimating perchlorate mass removal from the environment and

1 Interim Consent Agreement, effective February 14, 2011 (NDEP 2011).

mass loading to the Las Vegas Wash; adjusting operation of the GWETS to improve remedial performance; informing the planning and implementation of the RI/FS tasks; and calibrating and refining the groundwater model.

The next revision of the SAP is anticipated after completion of the RI or at the direction of the Trust.

1.2 Objectives

The principal goal of the 2020 SAP is to provide a resource documenting the procedures for execution of the following tasks:

1. Implementing the monitoring program and assuring that activities are conducted as planned and are performed on schedule;
2. Supervising the monitoring events as they progress to confirm that the proper locations are sampled/measured or visited to download transducer data and that proper protocols are followed;
3. Reviewing field data as they are generated for accuracy and completeness;
4. Alerting field personnel of any missing and/or anomalous data and developing corrective actions as necessary; and
5. Delivering the appropriate data deliverables on time, free of omissions, reasonably free of errors, and approved by a Nevada Certified Environmental Manager (CEM).

1.3 Summary of Changes to the Monitoring Program

A revised SAP is necessary at this time in order to document changes that have been made to the 2017 SAP at the direction of the Trust and/or NDEP, as well as to present additional changes needed to align the monitoring program with current project data requirements. The changes presented in this 2020 SAP are as follows:

- Document incremental changes to the monitoring program since the 2017 SAP was prepared;
- Add strategically-located monitoring wells installed as part of the ongoing RI;
- Incorporate the existing surface water monitoring program; and
- Integrate the existing transducer network into the monitoring program and update the transducer network.

These changes result in an expanded monitoring program. The 2017 SAP included 303 monitoring wells with transducers planned to be installed in 20 monitoring wells. Surface water sampling was not included in the 2017 SAP. The 2020 SAP has a total of 524 monitoring locations, including 486 monitoring wells[2] and 38 surface water monitoring locations[3]. In addition, the 2020 SAP includes 121 transducer deployments at certain monitoring wells and surface water monitoring locations.

Table 1a provides a summary of changes that were previously made to the monitoring program at the direction of the Trust subsequent to NDEP's approval of the 2017 SAP.

[2] Of the 486 monitoring wells, there are 33 wells that are only monitored for water level using transducers.

[3] Of the 38 surface water monitoring locations, there are seven locations that are only monitored for water level using transducers.

These changes include the removal or replacement of wells at the direction of the Trust, the addition of surface water sample locations to improve understanding of perchlorate mass loading to the Las Vegas Wash (Ramboll Environ 2017c), the addition of transducers to wells at the request of NDEP (NDEP 2016), and other miscellaneous changes. Table 1b provides a list of existing monitoring wells and surface water sampling locations that are proposed to be added to the monitoring program in the 2020 SAP and have not yet been implemented. Appendix A presents the Surface Water Sampling and Analysis Plan, Las Vegas Wash, Revision 3, prepared by Tetra Tech on October 31, 2018, which describes the surface water sampling program being incorporated herein. Appendix B presents the 2020 Transducer Network Update, which provides an assessment of the existing transducer network and recommendations for updating the network for current project data requirements.

In addition, the 2020 SAP includes the following modifications to the existing remedial performance monitoring program:

- Updated sampling practices (i.e., frequency, responsible party for sampling, analytes) for ART-6 to make them consistent with practices used for other monitoring wells (see Tables 2 through 6);
- Updated quantities of field quality control samples such as trip blanks, field blanks, equipment blanks, and field duplicates to account for new samples (see Tables 3 through 6);
- Enumerated volatile organic compound (VOC) analytes (see Table 7);
- Updated timeline for June and December monthly field events and associated deliverables (see Sections 2.1.1 and 4.1); and
- Updated timeline for the May-July transducer data download and associated data submission to the first half of August (see Sections 2.2 and 3.3.1).

The remainder of this section provides the rationale for expansion of the monitoring network and a summary of proposed additions to the monitoring program, which include additional sampling of groundwater monitoring wells during the annual sampling event and placement of additional transducers in monitoring wells.

1.3.1 Rationale for Expansion of Monitoring Network

The expansion of the monitoring network presented in this 2020 SAP is primarily intended to address gaps in the current monitoring program due to the expansion of the NERT RI Study Area. The NERT RI Study Area has been divided into three OUs for the purposes of investigation and determination of future remedial action, as shown on Figure 1. Operable Unit 1 (OU-1) consists solely of the NERT Site. Operable Unit 2 (OU-2) comprises the southern portion of the NERT Off-Site Study Area and the Eastside Sub-Area. Operable Unit 3 (OU-3) encompasses the Downgradient Study Area, the Northeast Sub-Area and the northern portion of the NERT Off-Site Study Area. The 2017 SAP was not intended to monitor the expanded NERT RI Study Area and therefore included very few monitoring locations within the Eastside Sub-Area, the Northeast Sub-Area, and portions of the Downgradient Study Area. This 2020 SAP adds monitoring locations from within these areas. Additional monitoring locations were added focusing on OU boundaries to inform flux-related performance metrics and monitoring wells useful in defining the extent of key monitored constituents (chromium, perchlorate, chloroform, and total dissolved solids [TDS]) with priority given to wells expected to remain after the completion of the RI (e.g., wells located within Right-of-Ways in areas currently undergoing development). The rationale for adding individual locations is provided in Table 1b.

Transducer locations added in the 2020 SAP will be monitored/visited quarterly, as with existing transducer locations. Groundwater wells added for chemical analysis will only be sampled during the annual event. These monitoring frequencies will provide sufficient data to evaluate performance metrics in forthcoming Annual Remedial Performance reports. More frequent monitoring is not expected to substantively improve the effectiveness of the remedial performance monitoring.

1.3.2 Proposed Additions to the Monitoring Program

As presented in Table 1b, 153 existing monitoring wells are proposed to be added to the remedial performance monitoring program. A total of 27 well locations are proposed to be added to the transducer monitoring network. There are 136 monitoring wells proposed to be added for chemical analysis to the annual sampling event. No additional monitoring locations are proposed for addition to the monthly, quarterly, and semi-annual sampling events, as shown in Figures 2a-c, 3a-c, and 4a-c, respectively. Specific details regarding the additions to the annual sampling event and the transducer monitoring network are provided in the sub-sections below.

1.3.2.1 Annual Sampling Event Additions

As shown in Figures 5a-c, 136 existing monitoring wells are proposed to be added to the annual sampling event in the 2020 SAP. The additional wells will largely serve to address monitoring gaps within OU-2 and OU-3 as well as across the three NDEP-defined water-bearing zones (WBZs): the Shallow WBZ, defined by the first occurrence of groundwater to 90 feet below ground surface (ft bgs); the Middles WBZ, which extends from 90 to 300 ft bgs; and the Deep WBZ, defined as the contiguous WBZ that is generally encountered between 300 to 400 ft bgs (NDEP 2009).

Previous groundwater investigations and remedial performance monitoring within the NERT RI Study Area have historically focused on the Shallow WBZ, although recent investigations have included a number of Middle WBZ wells to improve vertical delineation of contaminant distribution and improve the understanding of hydrogeologic conditions. The 2020 SAP proposes adding 19 of these Middle WBZ wells, generally located near OU boundaries, to inform mass flux estimates across those boundaries. The information obtained from these wells will provide valuable information to inform the FS and remedial decision-making process and will provide greater resolution to the flux transects reported in the performance reporting. The other 117 proposed wells are either located along OU boundaries or the Las Vegas Wash to inform mass flux estimates, or they are distributed throughout OU-2 and OU-3 to address monitoring gaps and constrain contaminant plume contours. Specific rationale for each monitoring well addition is provided in Table 1b.

1.3.2.2 Transducer Monitoring Network Additions

As shown in Figure 6, 27 monitoring locations are proposed to be added to the transducer monitoring network in the 2020 SAP, all of which are at existing monitoring wells. These recommended updates are discussed further in Appendix B.

1.4 Organization

The 2020 SAP is organized as follows:

- Section 1 provides an introduction.
- Section 2 describes the monitoring program in detail.
- Section 3 describes the roles and responsibilities of various parties for accomplishing all components of the monitoring program.
- Section 4 explains the methods and procedures for completing the monitoring program data collection.
- Section 5 lists the requirements for quality control of field deliverables and laboratory data.
- Section 6 lists steps to correct errors.
- Section 7 provides a summary of the document.
- Section 8 lists citations for key documents referenced in this plan.

2. MONITORING PROGRAM SUMMARY

The monitoring program includes eight monthly events, two quarterly events (typically performed in February and August), one semi-annual event (typically performed in November), and one annual event (typically performed in May).

Table 2 summarizes the remedial performance monitoring program as modified by this SAP revision and lists the sampling frequencies of all analytes at each location. Tables 3, 4, 5, and 6 show sample locations and analytes that are to be sampled/analyzed during the monthly, quarterly, semi-annual, and annual sampling events, respectively. Figures 2a-c, 3a-c, 4a-c, and 5a-c show the locations that are sampled/measured in OU-1, OU-2, and OU-3 during the monthly, quarterly, semi-annual, and annual sampling events, respectively. Figure 6 shows the locations where transducer data are downloaded concurrent with the July monthly, February quarterly, semi-annual, and annual sampling events. All tables described in this document are available in electronic format in Attachment 1.

2.1 Monitoring Events

2.1.1 Monthly Monitoring

As described in Table 3, monthly sampling events include a total of 85 wells and 31 surface water locations (with 30 of the 85 wells measured for groundwater level only). Unless otherwise approved by the Trust, monthly events may begin as early as the first day of the month and shall conclude by the final day of the month except for in June and December when sampling shall conclude by the 15th of the month. Samples are collected from all extraction wells[4] in the Interceptor Well Field (IWF), Athens Road Well Field (AWF), Seep Well Field (SWF), and AP Area and analyzed for perchlorate, TDS, hexavalent chromium, total chromium, nitrate, and chlorate. Surface water samples are collected from 28 locations along Las Vegas Wash and three locations in the C1 Channel; these samples are analyzed for perchlorate, TDS, and chlorate. Wells and surface water locations monitored on a monthly basis are shown in Figures 2a-c.

2.1.2 Quarterly Monitoring

Expanded monitoring events are conducted in the first and third quarters (typically in February and August) of each year. Unless otherwise approved by the Trust, quarterly events may begin as early as the first day of the second month of the quarter (February 1 for first quarter and August 1 for third quarter) and shall conclude by the final day of the second month in the quarter. As shown in Table 4, a total of 129 wells and 31 surface water locations are included in the quarterly sampling events (with 61 of the 129 wells measured for groundwater level only). The quarterly event includes the same samples and analyses included in the monthly event, in addition to several wells sampled due to permitting and Resource Conservation and Recovery Act (RCRA) monitoring requirements, which require additional analyses. Wells and surface water locations associated with the quarterly monitoring event are shown in Figures 3a-c.

2.1.3 Semi-Annual Monitoring

The semi-annual monitoring event is conducted during the fourth quarter (typically in November) of each year. Unless otherwise approved by the Trust, the semi-annual

[4] Although ART-6 no longer operates as an extraction well, it is included in the monthly well sampling event for consistency with the enhanced operational metrics.

event may begin as early as November 1 and shall conclude by November 30. As detailed in Table 5, a total of 184 wells and 31 surface water locations are included in the semi-annual monitoring event (with 23 of the 184 wells measured for groundwater level only). All samples are analyzed for perchlorate, total chromium, TDS, nitrate, and chlorate, and extraction wells plus nine monitoring wells are additionally sampled for hexavalent chromium. Wells and surface water locations associated with the semi-annual monitoring event are shown in Figures 4a-c.

2.1.4 Annual Monitoring

A comprehensive monitoring event is conducted annually during the second quarter (typically in May) of each year. Unless otherwise approved by the Trust, the annual event may begin as early as April 1 and shall conclude by May 31. As shown in Table 6, a total of 453 wells and 31 surface water locations are included in the annual monitoring event (with 29 of the 453 wells measured for groundwater level only). Samples are analyzed for perchlorate, hexavalent chromium, total chromium, TDS, nitrate, chlorate, and VOCs[5] or for a subset of these analytes. Wells and surface water locations associated with the annual monitoring event are shown in Figures 5a-c.

2.2 Transducer Data Download Schedule and Locations

Appendix B presents the 2020 Transducer Network Update, which provides an assessment of the existing transducer network and recommendations for updating the network for current project data requirements. The recommended updates from the 2020 Transducer Network Update are reflected in the transducer program described in this section.

A summary of the Site's transducers and their data download schedule is presented in Table 8. Once expanded as proposed in Appendix B, the transducer network will consist of 113 transducers deployed in monitoring wells, two barometric devices deployed in monitoring wells[6], and seven transducers deployed at surface water monitoring locations. Location information for transducers installed in monitoring wells can be found in Table 9, and location information for surface water transducers can be found in Table 10. Transducers installed in extraction wells used for GWETS operations are not considered part of this transducer monitoring program. Data from the monitoring well transducer network are downloaded once per quarter:

- February through April data are downloaded concurrent with the annual monitoring event (typically in May).
- May through July data are downloaded in the first half of August, concurrent with the quarterly monitoring event in August if possible.
- July through October data are downloaded concurrent with the semi-annual monitoring event (typically in November).
- November through January data are downloaded concurrent with the quarterly monitoring event in February.

---

[5] Specific VOCs to be analyzed are listed in Table 7.
[6] WMW4.9S contains both a pressure transducer and a barometric device.

2.3 Well Location Information

Monitoring well locations are shown in Figures 2a-c through 5a-c, as discussed above. Table 9 includes coordinates, basic construction information, and ownership information for each well.

2.4 Surface Water Sampling Location Information

Surface water samples are collected in the C1 Channel and in nine localities along the Las Vegas Wash. Sampling locations are shown in Figures 2c, 3c, 4c, and 5c. Table 10 includes the target coordinates for each surface water sample.

3. ROLES AND RESPONSIBILITIES

The roles described in this section include those for the GWETS Operator, the Groundwater and Surface Water (GW/SW) Sampling Contractor, the Transducer Network Manager, the Data Manager, and the Analytical Laboratory. As of the date of this document, the companies assuming these roles are:

- Envirogen Technologies, Inc. (Envirogen) as the GWETS Operator,
- Tetra Tech, Inc. (Tetra Tech) as the GW/SW Sampling Contractor,
- Ramboll as the Transducer Network Manager,
- Ramboll as the Data Manager,
- Laboratory Data Consultants, Inc. (LDC), as the Data Validator, and
- Eurofins TestAmerica Laboratories, Inc. (TestAmerica) as the Analytical Laboratory.

Contact information for these parties is listed in Appendix C. Table 11 provides a summary of responsibilities associated with each role.

3.1 Sampling and Manual Water Level Measurements

3.1.1 Data Collection

The GWETS Operator and the GW/SW Sampling Contractor share responsibility for conducting the groundwater monitoring and sampling activities outlined in this document. The GWETS Operator will perform sampling of extraction wells and the GW/SW Sampling Contractor will perform sampling of monitoring wells. The GWETS Operator is also responsible for assisting the GW/SW Sampling Contractor with locating and accessing wells as needed. Data collection procedures for groundwater monitoring wells are included in the field guidance documents (FGDs) for Low-Flow Groundwater Sampling and Groundwater and Free Product Level Measurements included in Appendix D. Procedures for extraction well sampling are described in the Extraction Wells Standard Operating Procedure (SOP) developed by the GWETS Operator (Envirogen 2016).

The GW/SW Sampling Contractor is responsible for conducting the surface water sampling activities outlined in this document. The GW/SW Sampling Contractor will collect surface water samples, as described in Appendix A.

The Analytical Laboratory is responsible for providing sample containers and coolers for sampling events to the GWETS Operator and the GW/SW Sampling Contractor in addition to providing sample receiving, analytical testing, and data reporting services.

The GWETS Operator and the GW/SW Sampling Contractor are each responsible for handling and storage of the samples they collect until the samples and responsibility for sample custody are officially transferred to the laboratory or another party under chain of custody (COC) protocols as described in Section 4.14. The courier from the Analytical Laboratory will sign the COC when they take possession of the samples and will verify that all samples listed on the COC are present.

3.1.2 Data Deliverables

The GWETS Operator and the GW/SW Sampling Contractor will prepare documents summarizing their respective field data and field observations, as well as backup documentation for these activities, as described in Section 4.1. Both the GWETS Operator and the GW/SW Sampling Contractor will complete Depth to Water (DTW) Electronic Data Deliverables (EDDs) (example provided in Attachment 2) and Field Parameter EDDs (example provided in Attachment 3), which the GW/SW Sampling Contractor will review and correct, if necessary, prior to submittal to the Data Manager.

3.1.3 Data Verification

The GW/SW Sampling Contractor will provide oversight of all field sampling and monitoring activities to verify that they comply with this SAP. The GW/SW Sampling Contractor will verify that purge logs, water sampling field logs, DTW field logs, DTW EDDs, and groundwater sampling field parameter EDDs produced as part of the remedial performance monitoring program are complete, have undergone data verification and Quality Assurance/Quality Control (QA/QC) evaluations to verify that deliverables are free of omissions and are reasonably free of errors, and are approved by a Nevada CEM. The deliverables produced as part of each monitoring event are described in Section 4.1. The GW/SW Sampling Contractor will also review all documents for consistency between hand-written field logs and EDDs. During this review, the GW/SW Sampling Contractor will verify that all required DTW measurements were taken and all required samples were collected. In addition, the GWETS Operator and the GW/SW Sampling Contractor will review laboratory acknowledgements produced by the Analytical Laboratory as described in Section 5.3.

The GWETS Operator and the GW/SW Sampling Contractor will work together to communicate all anticipated and unanticipated deviations from the sampling program to the Trust and the Data Manager, as necessary. The Data Manager will contact the GW/SW Sampling Contractor or the GWETS Operator, as appropriate, with any questions regarding the monitoring program or data deliverables.

3.2 Laboratory Analyses

3.2.1 Sample Analysis

The Analytical Laboratory is responsible for courier sample pickup and laboratory analysis. Analytical results are reported via portable document format (PDF) report, project-specific EDDs, and the Analytical Laboratory's online data portal.

3.2.2 Data Verification

Data verification evaluates whether a data set is complete, correct, and consistent with program requirements. It is the responsibility of the Analytical Laboratory, under the direction of their own Quality Assurance (QA) Officer and the laboratory project manager (PM), to verify that all analyses are correctly performed and all laboratory data deliverables are consistent with each other, as described in Sections 5.4 and 5.5. The Data Manager will verify that the deliverables provided by the Analytical Laboratory are complete and have undergone data verification.

3.2.3 Data Validation

Data validation evaluates the analytical quality of a data set. The Data Manager will coordinate efforts for data validation, which will be performed by the Data Validator and be consistent with NDEP and United States Environmental Protection Agency (USEPA) guidance for data validation, as discussed in Section 5.7.

3.3 Transducer Water Level Data

3.3.1 Data Download

The GW/SW Sampling Contractor and the Transducer Network Manager share responsibility for conducting the transducer data downloads outlined in this document. The GW/SW Sampling Contractor will download data from locations visited during monitoring events and from locations with transducers deployed by AECOM as part of the RI's Downgradient Study Area Investigation. The Transducer Network Manager will download data from all other network transducers that the GW/SW Sampling Contractor is not visiting. As described in the FGD for Groundwater and Free Product Level Measurements included in Appendix D, manual water level measurement should be collected and recorded in a DTW field log whenever transducer data are downloaded. The party responsible for collecting data from each location during each transducer data download event is shown in Table 8.

Raw transducer data from all locations will be provided to the Transducer Network Manager, along with field daily logs and any additional DTW field logs that were used to record water levels manually during data collection.

3.3.2 Data Verification

The GW/SW Sampling Contractor and Transducer Network Manager will review downloaded data and hand-written field logs for consistency. During this review, both parties will verify that all transducers in the network were visited and appear to be recording accurate groundwater elevations. The Transducer Network Manager will apply any necessary corrections (barometric and level corrections) and submit the data to the Data Manager. The Data Manager will incorporate the data into the project database for evaluation and reporting.

If a transducer failure is noted during a download event, the Transducer Network Manager will be contacted and the failure will be addressed in a timely manner to reduce the amount of data loss.

3.4 Data Management

All analytical and elevation data will be entered into an EQuIS® database system maintained by the Data Manager. The database will be maintained on a secure, enterprise-level database server that is backed-up regularly. Analytical and groundwater elevation data are also directly available to the Trust and other Trust-approved parties through the cloud database, a database server that is updated at least once per week. Responsibilities of the Data Manager include the following tasks: 1) downloading and tracking data as it is generated to assess completeness; 2) coordinating with laboratory and field personnel on data generation and management issues including missing and incorrectly reported data; 3) inputting data into the database and maintaining it in an organized, transparent, and readily accessible manner and in accordance with NDEP requirements; 4) performing QA/QC on the database; 5) coordinating the performance of data validation; and 6) corresponding with the Trust as necessary on data management issues. The Data Manager will also be responsible for compiling and managing field data collected from implementation of low-flow groundwater sampling, which will be provided to the Data Manager by the GW/SW Sampling Contractor using the EDD format and definitions in Attachment 3.

3.5 Data Evaluation and Reporting

The Data Manager will use the data collected by the GWETS Operator and the GW/SW Sampling Contractor and verified by the GW/SW Sampling Contractor, as well as analytical laboratory results from the Analytical Laboratory, in the preparation of various reports and deliverables. Monitoring data will be compiled, reviewed, analyzed, presented, and interpreted by the Data Manager. The reviewed data will be used to comply with NDEP requirements for remedial performance monitoring and reporting, as well as support other tasks relying on groundwater monitoring data, including the following: estimating perchlorate mass removal from the environment; adjusting operation of the GWETS to optimize remedial performance; informing the planning and implementation of RI/FS tasks; and calibrating and refining the groundwater model. Annual Remedial Performance Reports and Semi-Annual Performance Memoranda presenting the conclusions of these evaluations will be prepared by the Data Manager and submitted to NDEP. The Data Manager will also provide updates to this SAP as necessary if there are changes to the monitoring program.

3.6 Monitoring Well Inspection and Maintenance

The GWETS Operator and the GW/SW Sampling Contractor will be responsible for notifying the Data Manager of any well-related maintenance issues with routinely sampled wells on an ongoing basis. The Data Manager will also follow-up with the GWETS Operator and the GW/SW Sampling Contractor if any potential well maintenance issues are identified during the course of data evaluation. The potential well maintenance issues will be reviewed by the Data Manager to determine the extent of repair needed. The Data Manager will then coordinate with the Trust to determine which party will implement the identified repairs. The party responsible for the repairs will communicate the nature and timing of the repairs to the GW/SW Sampling Contractor and the Data Manager, as appropriate.

4. DATA COLLECTION PROCEDURES

This data collection methods and procedures section provides a summary of the field protocols that will be followed as part of the remedial performance monitoring program to complement the FGDs provided in Appendix D. These procedures may be modified as necessary over time. NDEP will be notified if significant modifications are made to the procedures described below. Well maintenance and inspection procedures for the wells in this monitoring program are included in the 2016 GWMO Plan (Ramboll Environ 2016).

4.1 Documentation Procedures and Field Deliverables

Records that will be generated during field work include field logs and data sheets, sample COC records, equipment inspection/calibration records, and others as necessary. Units of measure for any field measurements and/or analyses will be clearly identified on the field forms and in notes and logs as necessary. Any deviations from field procedures described below, in addition to general notes on observed well condition, should be documented on field forms and communicated to the Data Manager. The GW/SW Sampling Contractor will review all field data to evaluate the completeness of the field records.

Field records to be completed for each sampling event include:

- **Field daily sign-in log**, to be completed by the GWETS Operator and GW/SW Sampling Contractor daily;
- **Daily maintenance and calibration records**, to be completed by the GWETS Operator and GW/SW Sampling Contractor daily;
- **COC**, to be completed by the GWETS Operator and GW/SW Sampling Contractor for each sample shipment (see Section 4.14);
- **Purge logs**, to be completed in the field by the GW/SW Sampling Contractor when performing low-flow sampling at monitoring wells;
- **Water sampling field logs**, to be completed in the field by the GWETS Operator when collecting samples at extraction wells;
- **DTW field logs**, to be completed in the field by the GWETS Operator and GW/SW Sampling Contractor for manual water level measurements taken at extraction and monitoring wells. A similar form can be used by the GW/SW Sampling Contractor and Transducer Network Manager for manual water level measurements taken while downloading transducer data;
- **DTW EDD**, to be prepared by the GWETS Operator for all extraction wells measured and by the GW/SW Sampling Contractor for all monitoring wells measured (see Section 4.2);
- **Groundwater sampling field parameters EDD**, to be prepared by the GWETS Operator for all extraction wells measured and by the GW/SW Sampling Contractor for all monitoring wells measured (see Section 4.3);
- **Surface water sampling field parameters EDD**, to be prepared by the GW/SW Sampling Contractor for all surface water locations measured (see Section 4.3);

- **CEM certification,** to be provided by the GW/SW Sampling Contractor for all data collected by the GW/SW Sampling Contractor and the GWETS Operator; and
- **Summary of sampling event**, including but not limited to explanations of any issues encountered during sampling and deviations from the established sampling program.

Submittals should include sampling logs or purge logs, alphabetized by well name, and DTW field logs for each well in the sampling event. If a location was not sampled or measured, the field forms for that well should indicate that an attempt was made to sample or measure the location and should explain why the sampling or measurement did not occur. Prior to submission to the Data Manager, the GW/SW Sampling Contractor should review all field deliverables produced by the GW/SW Sampling Contractor and by the GWETS Operator to confirm that all required measurements and samples were collected.

All of the documents listed above should be submitted to the Data Manager in a timely manner. Monthly documents should be submitted to the Data Manager by the 20th of each month (following the month when the data were collected) except for documents associated with the June and December monthly events; documents for these events should be submitted to the Data Manager by the 15th of the following month. Quarterly, semi-annual, and annual documents should be submitted to the Data Manager by the last day of each month (following the month when the data were collected). In addition to sending field deliverables and EDDs to the Data Manager, the DTW EDDs and the groundwater sampling field parameters EDDs should be emailed to EmeryvilleLabData@ramboll.com.

4.2 Depth to Water EDD

The table below provides more detailed information on the EDD requirements for DTW measurements mentioned above. A template for the EDD, included as an Excel file in Attachment 2, is directly compatible with the Site's existing database structure and is intended to eliminate multiple rounds of data entry.

For each sampling event, the fields listed in the table below should be populated by the GWETS Operator and the GW/SW Sampling Contractor and verified by the GW/SW Sampling Contractor prior to submittal to the Data Manager. Fields not listed in the table below should be left blank. Wells that could not be measured should also be included in this EDD, though only the well identification, measurement date and time, technician, remark, and task code fields should be completed for these wells.

Column Number	Column Title	Comments
Column A	#sys_loc_code	More commonly referred to as the well ID or well name. This field provides a unique and consistent identifier for each well.
Column B	measurement_date	The measurement date and time. Time is in 24-hour notation.

Column Number	Column Title	Comments
Column C	historical_reference_elev	The measuring point for water level measurements, typically identical to the top of casing elevation. This field should be left blank, as it will be populated by the Data Manager.
Column D	water_level_depth	The DTW in hundredths of feet. The field should be left blank if no DTW measurement was collected.
Column E	water_level_elev	The water level elevation at each well, calculated using historical_reference_elev and water_level_depth data. This field should be left blank, as it will be populated by the Data Manager.
Columns F and G	corrected_depth corrected_elevation	The corrected DTW and corrected groundwater elevation after any necessary corrections, e.g., if corrections were necessary because free product was encountered. These fields are hidden and should generally be left blank unless there is a specific need.
Column I	depth_unit	The unit for DTW measurements, which is generally listed as "ft" for feet below the measuring point. For artesian wells, pressure measurements should be converted from pounds per square inch (psi) to negative ft using the following formula: $ft = 2.307\ ft/psi * measured\ value\ in\ psi$
Column J	technician	The primary field technician responsible for groundwater measurement collection.
Column K	dry_indicator_yn	The dry indicator for a measurement. Insert a "Y" for yes (the well was dry) or an "N" for no (the well was not dry). This field should be left blank if no measurement was taken.
Column O	remark	Optional entry designed to provide information on wells that were not measured. Acceptable values are: "dry", "damaged", "obstructed", "destroyed" or "no access". Well access information should only be included here if field personnel were unable to access a well.
Column T	task_code	Describes the monitoring event for which the measurement was taken (e.g. "Monthly", "Quarterly", "Semi-Annual", "Annual").

Column Number	Column Title	Comments
Column V	reportable_yn	Determination if a result is reportable ("Y") or not ("N"). This field should be left blank as this determination will be made by the Data Manager if needed.

4.3 Groundwater and Surface Water Sampling Field Parameters EDD

The field parameters collected during low-flow sampling will be used in the interpretation of geochemical conditions in groundwater. Field parameters collected during surface water sampling will similarly inform the interpretation of geochemical conditions at sampled locations. A template for the field parameters EDD is included as an Excel file in Attachment 3. This template is directly compatible with the existing database structure. The EDD will contain one row per location sampled per sampling event. For each monitoring well sampled using the low-flow sampling technique, only the final stabilized field parameters (the final row listed on the low-flow sampling purge log) should be entered into the EDD. Locations that could not be sampled should also be included in this EDD, though only the unique location identifier, measurement date and time, technician, remark, and task code fields should be completed for these locations.

Note that the field parameters EDD should also be used to submit extraction well field data, even though the extraction wells will not be sampled using the low-flow technique. For extraction wells, only the well identification, measurement date and time, temperature, conductivity, pH, technician, remark, and task code sections of the field parameters EDD should be completed.

Column Number	Column Title	Comments
Column A	#sys_loc_code	More commonly referred to as the well ID or well name. This field provides a unique and consistent identifier for each well.
Column B	purge_start_time	The purge start date and time. Time is in 24-hour notation. Leave blank for extraction wells.
Column C	purge_stop_time	The purge end date and time. Time is in 24-hour notation. Leave blank for extraction wells.
Column D	sample_depth	The sample depth entered in hundredths of feet. Leave blank for extraction wells.
Column E	sample_depth_unit	The unit for sample depth measurements, generally listed as "ft" for feet below the measuring point. Leave blank for extraction wells.
Column F	final_purge_rate	The final purge rate used when stabilization of low-flow parameters was achieved. Leave blank for extraction wells.

Column Number	Column Title	Comments
Column G	purge_unit	The unit for the final purge rate, generally listed as "ml/min" for milliliters per minute. Leave blank for extraction wells.
Column H	volume_purged	The total volume purged, determined using the methodology outlined in the low-flow groundwater sampling FGD. Leave blank for extraction wells.
Column I	volume_unit	The unit for volume purged, generally listed as "ml" for milliliters or "L" for liters. Leave blank for extraction wells.
Column J	measurement_date	The date and time when stabilization of field parameters was achieved as it is written on the field sheet. For extraction wells, the time of sample collection should be entered. Time is in 24-hour notation. If sampling is attempted and unsuccessful, the date and time of the sampling attempt should be entered. If sampling is not attempted because a well is known to be dry or damaged, the date during the current sampling event when the well's dry or damaged status was confirmed should be entered.
Column K	temperature	The final stabilized temperature measurement as it is written on the field sheet.
Column L	temp_unit	The unit for temperature, generally listed as "celsius".
Column M	pH	The final stabilized pH measurement in standard pH units as it is written on the field sheet.
Column N	conductivity	The final stabilized conductivity measurement as it is written on the field sheet.
Column O	cond_unit	The unit for conductivity, generally listed as "uS/cm" for microSiemens per centimeter or "mS/cm" for milliSiemens per centimeter.
Column P	dissolved_oxygen	The final stabilized dissolved oxygen (DO) measurement as it is written on the field sheet. Leave blank for extraction wells.
Column Q	diss_oxy_unit	The unit for DO, generally listed as "mg/L" for milligrams per liter. Leave blank for extraction wells.

Column Number	Column Title	Comments
Column R	orp	The final stabilized oxidation reduction potential (ORP) measurement as it is written on the field sheet. Leave blank for extraction wells.
Column S	orp_unit	The unit for ORP, generally listed as "mV" for millivolts. Leave blank for extraction wells.
Column T	turbidity	The final stabilized turbidity measurement as it is written on the field sheet. Leave blank for extraction wells.
Column U	turb_unit	The unit for turbidity, generally listed as "NTU" for nephelometric turbidity units. Leave blank for extraction wells.
Column V	Color	The observed color of the purged water as it is written on the field sheet. For some wells, the color may be "Clear". Leave blank for extraction wells.
Column W	Odor_y_n	Odor indicator. Insert a "Y" for yes (the purged water had an odor) or an "N" for no (purged water did not have an odor). Leave blank for extraction wells.
Column X	technician	The primary field technician responsible for sample collection. If multiple technicians were present, enter the senior technician considered responsible for sample collection.
Column Y	remark	Optional entry designed to provide information on wells that were not sampled. Acceptable values are: "dry", "damaged", "obstructed", "destroyed" or "no access". This field can also be used to briefly note other anomalies in the sampling/purging procedure.
Column Z	task_code	Describes the monitoring event for which the measurements were taken (e.g. "Monthly", "Quarterly", "Semi-Annual", "Annual").

4.4 Instrument Calibration Procedures

Water quality meters measuring pH, DO, specific conductivity and turbidity meters will require calibration. Equipment that can be field calibrated will be calibrated at least once per day prior to beginning sampling activities, with calibration results documented on an Instrument Calibration Log. Equipment that must be calibrated in a laboratory setting should be used only if a current calibration certificate is available (for example, a calibration certificate is provided with a piece of rental monitoring equipment). Calibration procedures should be consistent with manufacturer instruction manuals for each instrument.

4.5 Decontamination Procedures

Equipment decontamination procedures are described in each of the FGDs included in Appendix D.

4.6 Groundwater Gauging Procedures

The FGD for Groundwater and Free Product Level Measurements included in Appendix D is applicable to all monitoring wells in the remedial performance monitoring program. Measurements of water levels in extraction wells should follow guidelines in the Extraction Wells SOP prepared by Envirogen (Envirogen 2016). Additional manual measurements of DTW in extraction wells equipped with transducers may be required at the direction of the Data Manager or as described in the Extraction Wells SOP (Envirogen 2016). During the second quarter annual event, or more frequently if requested by the Trust, total well depth will also be measured in all wells where DTW is measured following procedures outlined in the FGD for Groundwater and Free Product Level Measurements included in Appendix D.

It is preferable that all groundwater gauging required by a sampling event be performed prior to any sample collection in as short a timeframe as possible to capture a "snapshot" of groundwater conditions; if there is a single sampling team, they should perform all groundwater gauging before collecting any samples for laboratory analyses. At a minimum, adjacent wells should all be gauged prior to purging any of the wells to prevent inconsistencies in DTW measurements from localized well drawdown. At each well, DTW measurements should be compared to historical data and atypical conditions should be noted. Groundwater elevations in extraction wells tend to vary more than in monitoring wells. If the current measurement differs from the previous measurement by more than two feet, the DTW should be confirmed by additional measurements. Only the final measurement should be entered in the DTW EDD.

DTW measurements should be taken with respect to a consistent measuring point. The measuring point for monitoring wells in the remedial performance monitoring program is the top of casing (also referred to as "TOC") of the groundwater well. In some cases, surveyors have made a notch or mark to indicate the location on the casing that was surveyed; when it exists, this notch or mark should be used as the measuring point for DTW measurements. In cases where there is no notch or mark on the casing, the northern edge of the top of the casing should be used as the measuring point. The measuring point on extraction wells may be either the top of casing or a defined access point through which the water level meter may be lowered.

Groundwater samplers should be aware that dense non-aqueous phase liquid (DNAPL) has been detected in monitoring wells screened between 80 and 120 ft bgs near the former Montrose Chemical Corporation of California site, located to the west of the NERT property boundary (AECOM 2016). DNAPL has been encountered within the NERT property boundary at well MC-MW-18 (AECOM 2016); though this well is not included in the remedial performance monitoring program, it is located approximately 30 feet north-northwest from well M-123, which is sampled during the annual monitoring event. Table 12 lists all wells in the remedial performance monitoring program that are near the zone with identified DNAPL contamination in addition to wells with potential hazardous vapor concerns. If DNAPL is encountered during sampling, groundwater samplers should follow the procedures specific to wells with "free product" outlined in the FGD for Groundwater and Free Product Level Measurements included in Appendix D and should notify the Analytical Laboratory and the Data Manager.

4.7 Pressure Transducer Field Procedures

Once the transducer network is expanded as proposed in Appendix B, the Trust will have deployed 113 transducers and two barometric sensors in select monitoring wells in OU-1, OU-2, and OU-3 (this does not include the extraction well transducers located at the SWF, AWF, and IWF). The transducer locations have been chosen based on current project needs but may change in the future at the direction of the Trust or the Data Manager.

The GW/SW Sampling Contractor and Transducer Network Manager will typically visit the transducers according to the schedule discussed in Section 2.2 to collect data from the transducer data loggers. Locations they are responsible for visiting are discussed in Section 3.3.1. Contemporaneous with the data downloads, the GW/SW Sampling Contractor and Transducer Network Manager shall also collect manual DTW measurements at the wells equipped with transducers following the procedure outlined in the FGD for Groundwater and Free Product Level Measurements included in Appendix D.

If a transducer interferes with manual DTW measurements or the collection of samples for laboratory analysis during a remedial performance monitoring program sampling event, follow the procedure outlined in Section 4.9 for transducer removal during sampling. The GW/SW Sampling Contractor shall continue to take DTW measurements and collect samples at all monitoring wells equipped with transducers according to the schedule outlined in Table 2.

4.8 Surface Water Transducer Field Procedures

The Trust has transducers deployed at seven surface water monitoring points within the Las Vegas Wash. The same general procedures for downloading data from pressure transducers outlined in the FGD for Groundwater and Free Product Level Measurements included in Appendix D can be followed to download data from surface water transducers.

4.9 Low-Flow Groundwater Sampling Procedures

The low-flow sampling technique is used for all monitoring wells within the monitoring program. The FGD for Low-Flow Groundwater Sampling included in Appendix D describes procedures for performing low-flow sampling. As noted in this FGD, care should be taken to avoid cross-contamination of monitoring wells during sampling. Sampling teams using non-dedicated equipment should begin sampling at the wells generally located in regions with the lowest perchlorate concentrations and move systematically toward the wells generally located in regions with the highest perchlorate concentrations, as reasonably practicable. The sampling order should be determined by the GW/SW Sampling Contractor.

Samples collected for analysis of total chromium should not be filtered in the field or in the lab. Samples collected for analysis of hexavalent chromium should be filtered in the lab using 0.45-micron filters, according to EPA Method 218.6. Samples collected for other metals at the RCRA wells and for the National Pollutant Discharge Elimination System (NPDES) permit should not be filtered in the field or in the lab. Samples collected for perchlorate analysis also should not be filtered; instead, filled containers should contain headspace and should be agitated and immediately chilled to 4ºC. Preservation requirements are listed in Table 13.

Some monitoring wells are equipped with transducers to monitor and record their depth to water levels. There are two different types of transducers that may be encountered: data loggers coupled with telemetric tubes and standalone pressure transducers. If a transducer interferes with sampling, procedures outlined in the FGD for Groundwater and Free Product Level Measurements included in Appendix D should be used to remove the transducer carefully from the well and place it on plastic sheeting adjacent to the well while sampling occurs. If possible, the transducer data log should be stopped and downloaded when the transducer is removed from the well. Once sampling is complete, the transducer should have a new log started and be reinserted into the monitoring well. The transducer should be redeployed in the well at the same depth it was initially deployed with care taken to avoid uncoiling or kinking the transducer wires. The times when transducers are removed from wells and redeployed following sampling should be recorded on the low-flow sampling purge log.

4.10 Extraction Well Sampling Procedures

Extraction well sampling is carried out by the GWETS Operator during monthly, quarterly, semi-annual, and annual sampling events as specified in Tables 3-6. Sampling procedures should align with those described in the Extraction Wells SOP prepared by Envirogen (Envirogen 2016). Samples collected at extraction wells for total chromium analysis should not be filtered in the field or in the lab. Samples collected at extraction wells for hexavalent chromium analysis should be filtered in the lab using 0.45-micron filters, according to EPA Method 218.6. Samples collected from extraction wells for perchlorate analysis should not be filtered; instead, filled containers should contain headspace and should be agitated and immediately chilled to 4ºC. Preservation requirements are listed in Table 13.

4.11 Artesian Well Sampling Procedures

The monitoring program includes six artesian groundwater wells: M-155, TR-1, TR-3, TR-5, TR-11, and TR-12. These wells are sampled only during the annual monitoring event and should be sampled according to the procedures described in the FGD for Artesian Well Groundwater Sampling included in Appendix D.

4.12 Surface Water Sampling Procedures

Surface water sampling is carried out by the GW/SW Sampling Contractor during monthly, quarterly, semi-annual, and annual sampling events as specified in Tables 3-6 and includes a total of 31 sampling locations in the Las Vegas Wash as described in Table 10. Surface water samples should be sampled according to the procedures described in the Surface Water Sampling and Analysis Plan, Las Vegas Wash, Revision 3, prepared by Tetra Tech on October 31, 2018, as included in Appendix A.

4.13 Sampling Designation and Handling Procedures

All samples should be labeled with a sample identifier that includes the location name, the date collected, and the appropriate sample code for QA/QC samples. Guidance regarding sample designation and handling is provided in the FGDs for Low-Flow Groundwater Sampling and Artesian Well Groundwater Sampling included in Appendix D.

The GW/SW Sampling Contractor and the GWETS Operator will each create COCs for all samples they collect according to procedures in Section 4.14. COCs should be reviewed by the sample collector to make sure sample names and analytes are correctly designated and that all required analyses are listed. Samples collected for the Site's NPDES permit from monitoring well M-10 should be listed on a separate COC.

To discourage tampering during transport, a custody seal will be placed on each cooler after the samples are packed. These consist of a security tape or label with the date and signature of the sampler or person currently in possession of the sample. Receiving personnel at the laboratory will note on the cooler receipt form or an equivalent form whether or not the custody seals are intact.

4.14 Chain of Custody Protocols

Completed original COC forms will be sent with each sample shipment to document the collection and shipment of samples for off-site laboratory analysis. COCs will identify the contents of each shipment and will provide an accurate written record that traces the possession of individual samples from the time of collection in the field until they are accepted at the Analytical Laboratory.

The GW/SW Sampling Contractor and GWETS Operator will record the following information on the chain-of-custody forms:

- Client and project number
- Name or initials and signature of sampler
- Name of destination analytical laboratory
- Name and phone number of PM in case of questions
- Unique sample identifier for each sample
- Data and time of collection for each sample
- Number and type of containers included for each sample
- Analysis or analyses requested for each sample
- Preservatives used, if any, for each sample
- Sample matrix for each sample
- Any filtering performed, if applicable, for each sample
- Signatures of all persons having custody of the samples
- Dates and times of transfers of custody
- Shipping company identification number, if applicable
- Any other pertinent notes, comments, or remarks

Unused lines on the form will be crossed out and initialed.

A sample is considered to be under the control of, and in the custody of, the responsible person if the samples are in their physical possession, locked or sealed in a tamper-proof container, or stored in a secure area.

The person who collects the sample is the initial custodian of the sample. Any transfers are documented on the COC by the individuals relinquishing and receiving the sample, along with their signature, and the date and time of transfer. This transfer must continue until the custody is released to a commercial carrier (i.e. FedEx), or the laboratory (either at the laboratory or to a laboratory employed courier). If relinquished to a commercial carrier, the carrier assumes custody through their shipping receipt. A copy of the shipping receipt should be attached to the COC as a permanent part of the custody control. If the sample is relinquished to a laboratory courier, the courier will then need to relinquish the sample to the stationary laboratory upon arrival. Once the sample has arrived at the stationary laboratory, it must be entered into the sample custody control system of the laboratory. If the sample is further transported to a subcontracted laboratory, the laboratory will produce an internal COC form that will be available upon request. The Analytical Laboratory will provide copies of all completed COCs to the Data Manager.

4.15 Quality Assurance and Quality Control Samples

QC activities are those technical activities routinely performed, not to eliminate or minimize errors, but to assess/demonstrate reliability and confidence in the measurement data generated. Field QA/QC samples that should be collected at monitoring wells and extraction wells include field duplicates (FDs), field blanks (FBs), and equipment blanks (EBs). Trip blanks (TBs) should only be collected at monitoring wells. The FGD for Low-Flow Groundwater Sampling included in Appendix D describes each of these QA/QC sample types. The conventions for sample naming and identification listed in the FGD for Low-Flow Groundwater Sampling should be followed for all QA/QC samples. Field QA/QC samples for surface water monitoring are discussed in the Surface Water Sampling and Analysis Plan included in Appendix A.

EBs, FBs, and FDs in this remedial performance monitoring program should be collected at a frequency of one in every 20 primary samples.

TB samples are only necessary during the annual sampling event when samples for VOC analysis are being collected. A TB sample from the Analytical Laboratory should be added to the sample cooler or other shipping container prior to collecting samples for VOCs. TB samples should be inspected by the Analytical Laboratory prior to shipment to the Site and again by the GW/SW Sampling Contractor prior to use in the field. If any TB samples appear to be compromised (i.e. if headspace is observed in the vials), these samples should not be used and replacement TBs should be requested from the Analytical Laboratory. The TB sample should accompany the primary samples to the laboratory and be analyzed for VOCs using the same analytical method as the primary samples. When samples for VOC analysis are being collected, one TB will be included with each daily shipment of groundwater samples.

5. QUALITY CONTROL

5.1 Quality Control of Field Deliverables

The quality and accuracy of field data is paramount to remedial performance evaluation. The GW/SW Sampling Contractor will be responsible for reviewing all field data and electronic deliverables for accuracy and completeness prior to submittal to the Data Manager. Field data deliverables are expected to be delivered in a timely manner with no omissions and reasonably free of errors. In the case of field data deliverables, the GW/SW Sampling Contractor will perform data verification and QA/QC and will provide CEM-certified data to the Data Manager. In particular, the GW/SW Sampling Contractor should review all documents for: 1) consistency between hand-written field logs and the DTW and Field Parameters EDDs; 2) large or unexplained changes in DTW; and 3) conditions that could impact future sampling events (e.g., stuck bailer, damaged/inaccessible locations, etc.).

5.2 Quality Control of Laboratory Deliverables

Following groundwater sample submittal to the Analytical Laboratory, the Data Manager will review the Analytical Laboratory's deliverables to verify that: 1) the laboratory is analyzing each sample for the correct analytes; 2) the laboratory provides deliverables equivalent to USEPA Level II (USEPA 2002); 3) the laboratory provides an EDD in the appropriate format for each sample delivery group (SDG) and; 4) results are delivered within the contractual turnaround time with no omissions and reasonably free of errors. Additional information concerning these responsibilities is described below in the following sections. Where inconsistencies in the above are identified, the Data Manager will communicate these directly to the Analytical Laboratory, the GWETS Operator, and/or the GW/SW Sampling Contractor. In the event that a laboratory report needs to be corrected, the laboratory will provide revised reports, including revised EDDs and data packages.

5.3 Verification of Analytes

The GWETS Operator and GW/SW Sampling Contractor should review the laboratory acknowledgements provided by the Analytical Laboratory to verify that each sample is analyzed for the correct analytes using the correct methods (listed in Table 13) and that no typographical errors were made during sample check-in. The GWETS Operator and GW/SW Sampling Contractor are each responsible for reviewing acknowledgements for samples that they collected, and these reviews should occur within 2 days of receipt of the laboratory acknowledgements. Any corrections or changes should be communicated to the Analytical Laboratory immediately for correction and resubmittal of a revised acknowledgment.

5.4 Laboratory QA/QC Program

The laboratory QA/QC program includes 1) performing analytical methods according to prescribed protocols; 2) analyzing laboratory QA/QC samples to measure precision and accuracy of laboratory methods and equipment and instrument calibration; and 3) preventive maintenance. Laboratory QA/QC samples include method blanks, laboratory control samples, matrix spikes, laboratory duplicates, and surrogates. The laboratory will be responsible for assessing data quality and advising of any data rated "preliminary", "unacceptable", or other notations that would caution the data user of possible nonconformance. The Analytical Laboratory's QA Officer will conduct a systematic review of the data for compliance with the established quality control criteria based on laboratory QA/QC sample results and an evaluation of data precision, accuracy, and completeness will be performed.

5.5 Data Reporting Requirements

Laboratory deliverables equivalent to USEPA Level II (USEPA 2002) are required to meet the project's data validation requirement that all groundwater analytical data in the remedial performance monitoring program be validated to Stage2A (NDEP 2018). Data validation is discussed in Section 5.7.

EDDs provided by the Analytical Laboratory should be in the EQuIS 4-File EDD format as defined by the Ramboll Laboratory EDD Format Specification, EQuIS Edition. The format is provided in Attachment 4. The Analytical Laboratory will check that its EDD submittals are consistent with lists of valid values provided by the Data Manager. Prior to loading into the database, EDDs will be reviewed by the Data Manager for consistency with the file format and valid values.

It is the responsibility of the Analytical Laboratory to verify that the PDF reports, electronic data, and data posted through the Analytical Laboratory's online data portal are identical. The data reported in EDDs and in the PDF reports must correspond exactly, including significant digits and units. It is preferable that the PDF report and EDD are generated at approximately the same time from the same data source.

5.6 Sample Analysis Turnaround Time

The standard sample turnaround time (TAT) for this project is ten business days, as indicated in Table 13. All sample deliverables (e.g., COC, sample acknowledgement, laboratory report in PDF, EDD in project-specific format) should be delivered within the standard TAT. The COC and sample acknowledgement should be provided to the Data Manager within 24 hours.

5.7 Data Validation

Data validation evaluates the analytical quality of a data set. The Data Manager will coordinate efforts for data validation, which will be performed by the Data Validator. All groundwater analytical data in the remedial performance monitoring program are required to be validated to Stage-2A, consistent with NDEP and USEPA guidance (NDEP 2018, USEPA 2002).

The Data Validator will provide to the Data Manager an EDD with data qualifiers, reason codes, and validation level columns appended to the data results. Validation information will be included in the EQuIS database, maintained by the Data Manager.

6. CORRECTIVE ACTIONS

Corrective actions should be taken immediately if it is discovered that the integrity of a sample has been compromised. Instances in which corrective actions may be necessary include, but are not limited to, the following: sampling an incorrect location; sampling a location using improper equipment and/or technique; filling the incorrect bottle set for a sample; listing incorrect information on a COC; and exceedance of an analytical holding time.

6.1 Data Collection Errors

If errors are made during data collection or DTW measurement, the responsible sampling party (the GWETS Operator, GW/SW Sampling Contractor, or Transducer Network Manager) should carry out the appropriate corrective action.

If samples have not yet been shipped to the Analytical Laboratory when an issue is discovered, the shipment should be canceled. If samples have already been shipped to the Analytical Laboratory when an issue is discovered, the GW/SW Sampling Contractor or GWETS Operator should contact the Analytical Laboratory and request that all problematic samples or analyses be canceled. If the Analytical Laboratory has already analyzed samples and issued a report when an issue is discovered, the Data Manager may qualify the data as not reportable in the project database. In all cases, problems should be communicated to the Data Manager as soon as possible.

If it is discovered that an error was made on a COC, the party responsible for the error (the GWETS Operator or the GW/SW Sampling Contractor) should work with the Analytical Laboratory to correct the error on the COC and in the associated reports and EDDs, as needed, and provide a copy of the revised COC to the Data Manager.

In addition to the cancelation or qualification of the compromised samples, re-sampling should occur in order to collect valid samples. If a location is re-sampled for all analytes, only the field log from the re-sampling event should be included in the submission of field deliverables to the Data Manager. In cases where only certain analyses were compromised for a sample, only the compromised analyses need to be reanalyzed and field logs from both the initial sampling and the re-sampling event should be submitted to the Data Manager.

If during field form review, the GW/SW Sampling Contractor realizes that a required measurement or sample was not collected, they should take the necessary actions to obtain the measurement or sample.

If a sample or data could not be collected due to damage to a well or transducer, the damage should be noted on purge logs and/or DTW field logs. The party that discovered the damage should communicate the nature of the damage to the Data Manager if the well is damaged and the Transducer Network Manager if a transducer is damaged. The Data Manager or Transducer Network Manager will assess the level of damage and determine the proper repair. The Data Manager or Transducer Network Manager will then coordinate with the Trust to determine which party will implement the identified repairs. The party responsible for the repairs will implement all necessary repairs to damaged wells/transducers and will report on the nature and timing of repairs to the GW/SW Sampling Contractor, Transducer Network Manager, and the Data Manager, as appropriate. If damage prevented a well from being sampled and the well is repaired before the end of the sample period in which the damage was discovered, the sample should be collected following the repair. If the repair requires the well to be redeveloped, the sample should be collected following the redevelopment of the repaired well.

6.2 Data Deliverable Errors

If errors are made in field data deliverables, the responsible sampling party should correct the affected deliverables. If the GW/SW Sampling Contractor discovers any errors in data deliverables during data verification, the GW/SW Sampling Contractor will work with the GWETS Operator, as necessary, to rectify the errors before submission to the Data Manager. Similarly, if the Transducer Network Manager discovers any errors in data deliverables during verification of transducer data, the Transducer Network Manager will work with the GW/SW Sampling Contractor, as necessary, to rectify the errors before submission to the Data Manager.

If errors in laboratory analysis occur, the Analytical Laboratory should carry out the appropriate corrective actions. The Data Manager is responsible for resolving any issues in the data validation process.

6.3 Database Errors

The Data Manager will correct any database errors. If, in reviewing the database, the Data Manager discovers errors that were made during sample collection or lab analysis, the Data Manager will communicate these issues to the responsible party who will rectify the errors.

7. SUMMARY

This 2020 SAP provides guidance for implementing the remedial performance monitoring program for the Site. The 2020 SAP replaces the 2017 SAP, which was approved by NDEP on April 7, 2017. The 2020 SAP documents incremental changes to the monitoring program since the 2017 SAP was prepared, adds strategically-located monitoring wells installed as part of the ongoing NERT RI, incorporates the existing surface water monitoring program, and integrates the transducer network installed throughout the RI into the monitoring program. Data collected as part of the monitoring program are primarily used in the preparation of the Annual Remedial Performance Reports and the Semi-Annual Performance Memoranda, which are prepared by the Data Manager, reviewed by the Trust, and submitted to NDEP at the end of October and the end of April, respectively. Any revisions to this document will be made by the Data Manager as requested by the Trust or as necessary to comply with the remedial performance monitoring program and NDEP reporting requirements.

8. REFERENCES

AECOM, 2016. MC-MW-18 DNAPL Mobility Test and DNAPL Monitoring and Purge Program Data Submittal, Montrose Chemical Corporation of California Environmental Conditions Investigation; Henderson, Nevada. June 9. Approved by NDEP on September 8, 2016.

Envirogen Technologies, Inc. (Envirogen), 2016. Extraction Wells SOP. December 13.

Nevada Division of Environmental Protection (NDEP), 2009. BMI Plant Sites and Common Areas Project, Henderson, Nevada: Hydrogeologic and Lithologic Nomenclature Unification. January 6.

NDEP, 2011. Interim Consent Agreement, Nevada Environmental Response Trust. February 14.

NDEP, 2016. Response to: Annual Remedial Performance Report for Chromium and Perchlorate; Dated: October 31, 2016. December 6.

NDEP, 2018. Data Validation Guidance, BMI Plant Sites and Common Areas Projects, Henderson, Nevada. July 13.

Ramboll Environ US Corporation (Ramboll Environ), 2016. 2016 Groundwater Monitoring Optimization Plan, Nevada Environmental Response Trust Site; Henderson, Nevada. April 29. Approved by NDEP on June 24, 2016.

Ramboll Environ, 2017a. Remedial Performance Groundwater Sampling and Analysis Plan, Nevada Environmental Response Trust Site; Henderson, Nevada. March 24. Approved by NDEP on April 7, 2017.

Ramboll Environ, 2017b. RI Study Area Mass Estimate and Expanded Performance Metrics Technical Approach Technical Memorandum, Nevada Environmental Response Trust Site; Henderson, Nevada. October 5. Approved by NDEP on October 19, 2017.

Ramboll Environ, 2017c. Phase 2 Remedial Investigation Modification No. 3, Nevada Environmental Response Trust Site, Henderson, Nevada. Ramboll Environ Project No. 21-41400C, M08. June. Approved by NDEP on June 9, 2017.

Ramboll, 2018. Annual Remedial Performance Report for Chromium and Perchlorate, Nevada Environmental Response Trust Site, Henderson, Nevada. November 9. Approved by NDEP on January 18, 2019.

Ramboll, 2019a. Quality Assurance Project Plan, Revision 4, Nevada Environmental Response Trust Site, Henderson, Nevada. Under review. Submitted to NDEP on December 30, 2019.

Ramboll, 2019b. Semi-Annual Remedial Performance Memorandum for Chromium and Perchlorate, Nevada Environmental Response Trust Site, Henderson, Nevada. May 1.

United States Environmental Protection Agency (USEPA), 2002. Guidance on Environmental Data Verification and Data Validation, EPA/240/R-02/004. November.

TABLES

TABLE 1a: INCREMENTAL LOCATION CHANGES IN MONITORING PROGRAM SINCE THE 2017 SAP

Nevada Environmental Response Trust Site

Henderson, Nevada

Location	Note
Sampling locations added	
C12	Surface water location; added in October 2018
C1-E	Surface water location; added in October 2018
C1-W	Surface water location; added in October 2018
DFW-03	Added in May 2018 following conclusion of AP Area Treatability Study
DFW-04	Added in May 2018 following conclusion of AP Area Treatability Study
DFW-05	Added in May 2018 following conclusion of AP Area Treatability Study
DFW-06	Added in May 2018 following conclusion of AP Area Treatability Study
E1-1	Added in April 2018 following conclusion of AP Area Treatability Study
E1-2	Added in April 2018 following conclusion of AP Area Treatability Study
E1-3	Added in April 2018 following conclusion of AP Area Treatability Study
E2-1	Added in April 2018 following conclusion of AP Area Treatability Study
E2-2	Added in April 2018 following conclusion of AP Area Treatability Study
E2-3	Added in April 2018 following conclusion of AP Area Treatability Study
E2-4	Added in April 2018 following conclusion of AP Area Treatability Study
E2-5	Added in April 2018 following conclusion of AP Area Treatability Study
H-56R	Added as substitute for H-48
LVW 0.55	Surface water location; added in June 2017
LVW 3.5-1	Surface water location; added in June 2017
LVW 3.5-2	Surface water location; added in June 2017
LVW 3.5-3	Surface water location; added in June 2017
LVW 3.5-4	Surface water location; added in June 2017
LVW 3.5-5	Surface water location; added in June 2017
LVW 3.5-6	Surface water location; added in June 2017
LVW 4.2-1	Surface water location; added in June 2017
LVW 4.2-2	Surface water location; added in June 2017
LVW 4.2-3	Surface water location; added in June 2017
LVW 4.2-4	Surface water location; added in June 2017
LVW 4.75-1	Surface water location; added in May 2018
LVW 4.75-2	Surface water location; added in May 2018
LVW 4.75-3	Surface water location; added in May 2018
LVW 4.75-4	Surface water location; added in May 2018
LVW 4.75-5	Surface water location; added in May 2018
LVW 5.3-1	Surface water location; added in June 2017
LVW 5.3-2	Surface water location; added in June 2017
LVW 5.3-3	Surface water location; added in June 2017
LVW 5.3-4	Surface water location; added in October 2018
LVW 5.3-5	Surface water location; added in October 2018
LVW 5.3-6	Surface water location; added in October 2018
LVW 6.05	Surface water location; added in June 2017
LVW 6.6-1	Surface water location; added in June 2017
LVW 6.6-2	Surface water location; added in June 2017
LVW 6.6-3	Surface water location; added in June 2017
LVW 7.2	Surface water location; added in June 2017
LVW 8.85	Surface water location; added in July 2018
UFMW-01D	Added in May 2018 following conclusion of AP Area Treatability Study
UFMW-02D	Added in May 2018 following conclusion of AP Area Treatability Study
UFMW-03D	Added in May 2018 following conclusion of AP Area Treatability Study
UFMW-04D	Added in May 2018 following conclusion of AP Area Treatability Study
UFMW-05D	Added in May 2018 following conclusion of AP Area Treatability Study
UFMW-06D	Added in May 2018 following conclusion of AP Area Treatability Study

TABLE 1a: INCREMENTAL LOCATION CHANGES IN MONITORING PROGRAM SINCE THE 2017 SAP

Nevada Environmental Response Trust Site

Henderson, Nevada

Location	Note
Replacement sampling locations	
H-58R	Replaced H-58A
M-77R	Replaced M-77
MC-65R2	Replaced MC-65 and MC-65R
PC-40R	Replaced PC-40
PC-153R	PC-153R replaced PC-153
Sampling locations removed	
H-11	Destroyed by building construction in 2017 (prior to May 2017 Annual Event)
H-48	Decommissioned for Parcel A/B work
M-36	Reported as destroyed in 2013
PC-37	Decommissioned for Parcel A/B work
PC-73	Decommissioned for Parcel A/B work
Sampling locations added then removed	
W8-9 POWERLINE CROSSING	Surface water location; added in June 2017; sampling discontinued after June 2018
W1 ARCHERY	Surface water location; added in June 2017; sampling discontinued after June 2018
W4 SUNRISE MOUNTAIN	Surface water location; added in June 2017; sampling discontinued after June 2018
W4-5	Surface water location; added in June 2017; sampling discontinued after June 2018
W5 MIDDLE WAY	Surface water location; added in June 2017; sampling discontinued after June 2018
W5-6	Surface water location; added in June 2017; sampling discontinued after June 2018
W7 LOWER NARROW	Surface water location; added in June 2017; sampling discontinued after June 2018
W8-9 3KIDS WEIR	Surface water location; added in June 2017; sampling discontinued after June 2018
Locations added to transducer monitoring network	
AA-07	Transducer deployed in April 2018
AA-09	Transducer deployed in October 2017
AA-30	Transducer deployed in April 2017
AA-UW2	Transducer deployed in October 2017
COH-2B1	Transducer deployed in April 2017
DBMW-3	Transducer deployed in October 2017
DBMW-18	Transducer deployed in October 2017
LNDMW-1	Transducer deployed in April 2017
LNDMW-2	Transducer deployed in May 2017
M-13	Transducer deployed in November 2017
M-25	Transducer deployed in August 2017
M-44	Transducer deployed in August 2017
M-71	Transducer deployed in November 2017
M-145	Transducer deployed in August 2017
M-152	Transducer deployed in August 2017
M-156	Transducer deployed in August 2017
M-162D	Transducer deployed in August 2017
M-163	Transducer deployed in August 2017
M-189	Transducer deployed in August 2017
M-193	Transducer deployed in August 2017
MCF-01A	Transducer deployed in October 2017
MCF-01B	Transducer deployed in October 2017
MCF-06B	Transducer deployed in October 2017
MCF-06C	Transducer deployed in October 2017
MCF-07	Transducer deployed in April 2018
MCF-09B	Transducer deployed in October 2017
MCF-11	Transducer deployed in October 2017
MCF-20A	Transducer deployed in October 2017
MW-1	Transducer deployed in April 2018
MW-13	Transducer deployed in May 2017

TABLE 1a: INCREMENTAL LOCATION CHANGES IN MONITORING PROGRAM SINCE THE 2017 SAP

Nevada Environmental Response Trust Site

Henderson, Nevada

Location	Note
MW-20	Transducer deployed in April 2017
NERT3.35S1	Transducer deployed in June 2019
NERT3.40S1	Transducer deployed in June 2019
NERT3.58N1	Transducer deployed in June 2019
NERT3.58S1	Transducer deployed in August 2019
NERT3.60N1	Transducer deployed in June 2019
NERT3.60S1	Transducer deployed in August 2019
NERT3.63S1	Transducer deployed in June 2019
NERT3.80S1	Transducer deployed in September 2018
NERT3.98S1	Transducer deployed in June 2019
NERT4.21N1	Transducer deployed in September 2018
NERT4.38N1	Transducer deployed in September 2018
NERT4.51S1	Transducer deployed in September 2018
NERT4.64N1	Transducer deployed in June 2019
NERT4.64S1	Transducer deployed in August 2019
NERT4.65N1	Transducer deployed in June 2019
NERT4.70N1	Transducer deployed in June 2019
NERT4.71N1	Transducer deployed in August 2019
NERT4.71S1	Transducer deployed in September 2018
NERT4.71S2	Transducer deployed in June 2019
NERT4.93S1	Transducer deployed in September 2018
NERT5.11S1	Transducer deployed in September 2018
NERT5.49S1	Transducer deployed in September 2018
NERT5.91S1	Transducer deployed in September 2018
PC-40R	Transducer deployed in March 2018
PC-56	Transducer deployed in November 2017
PC-64	Transducer deployed in August 2017
PC-67	Transducer deployed in August 2017
PC-74	Transducer deployed in April 2017
PC-77	Transducer deployed in April 2017
PC-88	Transducer deployed in August 2017
PC-98R	Transducer deployed in November 2017
PC-125	Transducer deployed in August 2017
PC-130	Transducer deployed in August 2017
PC-136	Transducer deployed in August 2017
PC-137	Transducer deployed in August 2017
PC-137D	Transducer deployed in August 2017
PC-152	Transducer deployed in August 2017
PC-155A	Transducer deployed in November 2015
PC-155B	Transducer deployed in February 2016
PC-156A	Transducer deployed in November 2015
PC-156B	Transducer deployed in November 2015
PC-157A	Transducer deployed in November 2015
PC-157B	Transducer deployed in November 2015
PC-171	Transducer deployed in November 2017; barometric transducer
S3.50 SW	Surface water location; transducer deployed as S3.60 in January 2019 but renamed during AECOM's field program
S3.75 SW	Surface water location; transducer deployed in January 2019
S3.80 SW	Surface water location; transducer deployed in January 2019
S4.60 SW	Surface water location; transducer deployed in January 2019
S4.65 SW	Surface water location; transducer deployed in January 2019
S4.75 SW	Surface water location; transducer deployed in January 2019
S5.30 SW	Surface water location; transducer deployed in January 2017

TABLE 1a: INCREMENTAL LOCATION CHANGES IN MONITORING PROGRAM SINCE THE 2017 SAP

Nevada Environmental Response Trust Site

Henderson, Nevada

Location	Note
WMW3.5N	Transducer deployed in May 2017
WMW3.5S	Transducer deployed in May 2017
WMW4.9N	Transducer deployed in May 2017
WMW4.9S	Transducers deployed starting in April 2017; includes barometric transducer
WMW5.5S	Transducer deployed in April 2017
WMW5.7N	Transducer deployed in May 2017
WMW5.7S	Transducer deployed in September 2018
WMW6.15N	Transducer deployed in May 2017
WMW6.15S	Transducer deployed in November 2015
WMW6.55S	Transducer deployed in April 2017
WMW6.9N	Transducer deployed in May 2017
WMW6.9S	Transducer deployed in April 2017

Notes:

2017 SAP = Remedial Performance Groundwater Sampling and Analysis Plan (approved by NDEP in April 2017)

TABLE 1b: EXISTING WELLS ADDED TO MONITORING PROGRAM IN THE 2020 SAP

Nevada Environmental Response Trust Site

Henderson, Nevada

Location	Addition to 2020 SAP[1]		Primary Rationale for Adding Location to Monitoring Program
	Annual Sampling Event	Transducer Network	
AA-18	X		Inform mass flux estimate across OU-2/OU-3 boundary
AA-30	X	[2]	Constrain contaminant plume contours
AA-UW2	X	[2]	Inform mass flux estimate across southern OU-2 boundary
BEC-10	X		Inform mass flux estimate across OU-2/OU-3 boundary
BEC-12	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-5	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-7	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-8	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-9	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-10	X	X	Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-11	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-12	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-13	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-14	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-15	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-16	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-17	X		Inform mass flux estimate across OU-2/OU-3 boundary
DBMW-18	X	[2]	Inform mass flux estimate across OU-2/OU-3 boundary
ES-1	X		Inform mass flux estimate across southern OU-2 boundary
ES-2	X		Address monitoring gaps in Eastside Sub-Area
ES-3	X		Address monitoring gaps in Eastside Sub-Area
ES-4	X		Address monitoring gaps in Eastside Sub-Area
ES-5	X		Address monitoring gaps in Eastside Sub-Area
ES-6	X		Address monitoring gaps in Eastside Sub-Area
ES-7	X	X	Address monitoring gaps in Eastside Sub-Area
ES-8A	X	X	Address monitoring gaps in Eastside Sub-Area
ES-8B	X	X	Address monitoring gaps in Eastside Sub-Area
ES-9	X		Address monitoring gaps in Eastside Sub-Area
ES-10	X		Inform mass flux estimate across OU-2/OU-3 boundary
ES-11	X		Address monitoring gaps in Eastside Sub-Area
ES-12	X	X	Inform mass flux estimate across OU-2/OU-3 boundary
ES-13	X		Inform mass flux estimate across OU-2/OU-3 boundary
ES-14A	X		Inform mass flux estimate across OU-2/OU-3 boundary
ES-14B	X		Inform mass flux estimate across OU-2/OU-3 boundary
ES-15	X		Inform mass flux estimate across OU-2/OU-3 boundary
ES-16	X		Inform mass flux estimate across OU-2/OU-3 boundary
ES-17	X		Inform mass flux estimate across OU-2/OU-3 boundary
ES-18	X		Inform mass flux estimate across OU-2/OU-3 boundary
ES-19	X		Inform mass flux estimate across OU-2/OU-3 boundary
ES-20	X		Inform mass flux estimate across OU-2/OU-3 boundary
ES-21A	X		Address monitoring gaps in Northeast Sub-Area
ES-21B	X		Address monitoring gaps in Northeast Sub-Area
ES-22A	X		Address monitoring gaps in Northeast Sub-Area
ES-22B	X		Address monitoring gaps in Northeast Sub-Area
ES-23A	X		Address monitoring gaps in Northeast Sub-Area
ES-23B	X		Address monitoring gaps in Northeast Sub-Area

TABLE 1b: EXISTING WELLS ADDED TO MONITORING PROGRAM IN THE 2020 SAP

Nevada Environmental Response Trust Site

Henderson, Nevada

Location	Addition to 2020 SAP[1]		Primary Rationale for Adding Location to Monitoring Program
	Annual Sampling Event	Transducer Network	
ES-24	X		Address monitoring gaps in Northeast Sub-Area
ES-25A	X		Address monitoring gaps in Northeast Sub-Area
ES-25B	X		Address monitoring gaps in Northeast Sub-Area
ES-26	X	X	Address monitoring gaps in Northeast Sub-Area
ES-27	X		Address monitoring gaps in Northeast Sub-Area
ES-28	X	X	Address monitoring gaps in Eastside Sub-Area
ES-30	X		Address monitoring gaps in Eastside Sub-Area
ES-31	X		Address monitoring gaps in Eastside Sub-Area
ES-32	X		Address monitoring gaps in Eastside Sub-Area
ES-45	X		Address monitoring gaps in Northeast Sub-Area
ES-46	X		Address monitoring gaps in Northeast Sub-Area
ES-47	X		Address monitoring gaps in Northeast Sub-Area
ES-48	X		Address monitoring gaps in Northeast Sub-Area
ES-49	X		Address monitoring gaps in Northeast Sub-Area
ES-50	X		Address monitoring gaps in Northeast Sub-Area
ES-51	X		Address monitoring gaps in Northeast Sub-Area
ES-52	X		Address monitoring gaps in Northeast Sub-Area
HM-2	[3]	X	Provide broader horizontal and vertical coverage of hydrogeological conditions
LVWPS-MW102A	X		Address monitoring gaps in Downgradient Study Area
LVWPS-MW102B	X		Address monitoring gaps in Downgradient Study Area
LVWPS-MW105	X		Address monitoring gaps in Downgradient Study Area
LVWPS-MW107A		X	Provide broader horizontal and vertical coverage of hydrogeological conditions
LVWPS-MW107C		X	Provide broader horizontal and vertical coverage of hydrogeological conditions
LVWPS-MW201A	X		Constrain contaminant plume contours
LVWPS-MW201B	X		Constrain contaminant plume contours
LVWPS-MW224A	X		Constrain contaminant plume contours
LVWPS-MW224B	X		Constrain contaminant plume contours
M-121	[3]	X	Provide broader horizontal and vertical coverage of hydrogeological conditions
M-159	X		Constrain contaminant plume contours
M-160	X		Constrain contaminant plume contours
M-186D	[3]	X	Provide broader horizontal and vertical coverage of hydrogeological conditions
M-204	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-205	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-206	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-207	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-208	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-209	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-210	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-211	X	X	Inform mass flux estimate across OU-1/OU-2 boundary
M-212	X	X	Inform mass flux estimate across OU-1/OU-2 boundary
M-213	X	X	Inform mass flux estimate across OU-1/OU-2 boundary
M-214	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-220	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-260	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-261	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-262	X		Inform mass flux estimate across OU-1/OU-2 boundary

TABLE 1b: EXISTING WELLS ADDED TO MONITORING PROGRAM IN THE 2020 SAP

Nevada Environmental Response Trust Site

Henderson, Nevada

Location	Addition to 2020 SAP[1]		Primary Rationale for Adding Location to Monitoring Program
	Annual Sampling Event	Transducer Network	
M-263	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-264	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-265	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-266	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-267	X		Inform mass flux estimate across OU-1/OU-2 boundary
M-268	X		Inform mass flux estimate across OU-1/OU-2 boundary
MC-50	[3]	X	Provide broader horizontal and vertical coverage of hydrogeological conditions
MCF-06B	X	[2]	Inform mass flux estimate across OU-2/OU-3 boundary
MCF-06C	X	[2]	Inform mass flux estimate across OU-2/OU-3 boundary
MCF-24B		X	Provide broader horizontal and vertical coverage of hydrogeological conditions
MCF-28A		X	Provide broader horizontal and vertical coverage of hydrogeological conditions
MCF-28B		X	Provide broader horizontal and vertical coverage of hydrogeological conditions
MCF-31A		X	Provide broader horizontal and vertical coverage of hydrogeological conditions
MCF-31B		X	Provide broader horizontal and vertical coverage of hydrogeological conditions
MC-MW-37R2	X		Inform mass flux estimate across OU-1/OU-2 boundary
MW-02	X		Inform mass flux estimate near Las Vegas Wash
MW-3	X		Inform mass flux estimate near Las Vegas Wash
MW-4	X		Inform mass flux estimate near Las Vegas Wash
MW-13	X	[2]	Inform mass flux estimate near Las Vegas Wash
MW-20	X	[2]	Inform mass flux estimate near Las Vegas Wash
MW-25	X		Inform mass flux estimate near Las Vegas Wash
NERT3.35S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT3.40S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT3.58N1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT3.58S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT3.60N1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT3.60S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT3.63S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT3.80S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT3.98S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.21N1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.38N1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.51S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.64N1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.64S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.65N1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.70N1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.71N1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.71S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.71S2	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT4.93S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT5.11S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT5.49S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
NERT5.91S1	X	[2]	Inform mass flux estimate near Las Vegas Wash
PC-108	[3]	X	Provide broader horizontal and vertical coverage of hydrogeological conditions
PC-188	X		Inform mass flux estimate across OU-1/OU-2 boundary

TABLE 1b: EXISTING WELLS ADDED TO MONITORING PROGRAM IN THE 2020 SAP

Nevada Environmental Response Trust Site

Henderson, Nevada

Location	Addition to 2020 SAP[1]		Primary Rationale for Adding Location to Monitoring Program
	Annual Sampling Event	Transducer Network	
PC-189	X		Inform mass flux estimate across OU-1/OU-2 boundary
PC-191	X		Inform mass flux estimate across OU-2/OU-3 boundary
PC-195	X		Inform mass flux estimate across OU-2/OU-3 boundary
PC-196	X		Inform mass flux estimate across OU-2/OU-3 boundary
PC-197	X		Inform mass flux estimate across OU-2/OU-3 boundary
PC-198	X		Constrain contaminant plume contours
PC-199	X		Constrain contaminant plume contours
SWFTS-MW07A	X		Constrain contaminant plume contours
SWFTS-MW08A	X		Constrain contaminant plume contours
SWFTS-MW08C	X		Constrain contaminant plume contours
TR-4	[3]	X	Provide broader horizontal and vertical coverage of hydrogeological conditions
TR-6	[3]	X	Provide broader horizontal and vertical coverage of hydrogeological conditions
TR-7	[3]	X	Provide broader horizontal and vertical coverage of hydrogeological conditions
TR-9	[3]	X	Provide broader horizontal and vertical coverage of hydrogeological conditions
TR-10	[3]	X	Provide broader horizontal and vertical coverage of hydrogeological conditions

Notes:

2020 SAP = Remedial Performance Sampling and Analysis Plan, Revision 1

OU = Operable Unit

[1]Additions to the 2020 SAP monitoring program were only made to the annual sampling event and the transducer monitoring network. No additions were made to the monthly, quarterly, or semi-annual sampling events.

[2]Location was integrated into the existing transducer monitoring network prior to the 2020 SAP.

[3]Monitoring well was monitored for chemical analytes as part of the monitoring program implemented prior to the 2020 SAP.

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses	Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								Notes
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
AA-01																							X				X			X	
AA-07	X																														
AA-09	X																														
AA-11																							X				X			X	[6]
AA-18																							X				X			X	
AA-30	X																						X		X		X	X		X	
AA-UW2	X																						X				X			X	
ARP-1																X		X	X	X	X	X	X		X	X	X	X	X	X	
ARP-2A																X		X	X	X	X	X	X		X	X	X	X	X	X	
ARP-3A																X		X	X	X	X	X	X		X	X	X	X	X	X	
ARP-4A																X		X	X	X	X	X	X		X	X	X	X	X	X	[6]
ARP-5A																X		X	X	X	X	X	X		X	X	X	X	X	X	
ARP-6B																X		X	X	X	X	X	X		X	X	X	X	X	X	
ARP-7																X		X	X	X	X	X	X		X	X	X	X	X	X	
ART-1		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	[7]
ART-1A								X							X							X								X	Buddy well to ART-1[7]
ART-2		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	[7]
ART-2A								X							X							X								X	Buddy well to ART-2[7]
ART-3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	[7]
ART-3A								X							X							X								X	Buddy well to ART-3[7]
ART-4		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	[7]
ART-4A								X							X							X								X	Buddy well to ART-4[7]
ART-6																X		X	X	X	X	X	X		X	X	X	X	X	X	
ART-7A								X							X							X								X	Buddy well to ART-7B[7]
ART-7B		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	[7]
ART-8		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	[7]
ART-8A								X							X							X								X	Buddy well to ART-8[7]
ART-9		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
BEC-10																							X				X			X	
BEC-12																							X				X			X	
C12		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location[6]
C1-E		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
C1-W		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
		Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
COH-2B1	X																														
DBMW-3	X																														
DBMW-4																							X				X			X	
DBMW-5																							X				X			X	
DBMW-7																							X				X			X	
DBMW-8																							X				X			X	
DBMW-9																							X				X			X	
DBMW-10	X																						X				X			X	
DBMW-11																							X				X			X	
DBMW-12																							X				X			X	
DBMW-13																							X				X			X	
DBMW-14																							X				X			X	
DBMW-15																							X				X			X	
DBMW-16																							X				X			X	
DBMW-17																							X				X			X	
DBMW-18	X																						X				X			X	
DFW-03																							X		X	X	X	X	X	X	
DFW-04																							X		X	X	X	X	X	X	
DFW-05																							X		X	X	X	X	X	X	
DFW-06																							X		X	X	X	X	X	X	
E1-1		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
E1-2		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
E1-3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
E2-1		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
E2-2		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
E2-3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
E2-4		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
E2-5		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
ES-1																							X				X			X	
ES-2																							X				X			X	
ES-3																							X				X			X	
ES-4																							X				X			X	
ES-5																							X				X			X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
		Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
ES-6																							X				X			X	
ES-7	X																						X				X			X	
ES-8A	X																						X				X			X	
ES-8B	X																						X				X			X	
ES-9																							X				X			X	
ES-10																							X				X			X	
ES-11																							X				X			X	
ES-12	X																						X				X			X	
ES-13																							X				X			X	
ES-14A																							X				X			X	
ES-14B																							X				X			X	
ES-15																							X				X			X	
ES-16																							X				X			X	
ES-17																							X				X			X	
ES-18																							X				X			X	
ES-19																							X				X			X	
ES-20																							X				X			X	
ES-21A																							X		X		X			X	
ES-21B																							X		X		X			X	
ES-22A																							X		X		X			X	
ES-22B																							X		X		X			X	
ES-23A																							X		X		X			X	
ES-23B																							X		X		X			X	
ES-24																							X		X		X			X	
ES-25A																							X		X		X			X	
ES-25B																							X		X		X			X	
ES-26	X																						X		X		X			X	
ES-27																							X		X		X			X	
ES-28	X																						X				X			X	
ES-30																							X				X			X	
ES-31																							X				X			X	
ES-32																							X				X			X	
ES-45																							X		X		X			X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																													Notes
	Continuous Transducer Data[1]	Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
		Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
ES-46																							X		X		X			X	
ES-47																							X		X		X			X	
ES-48																							X		X		X			X	
ES-49																							X		X		X			X	
ES-50																							X		X		X			X	
ES-51																							X		X		X			X	
ES-52																							X		X		X			X	
H-28A											X		X	X	X								X		X	X	X	X	X	X	RCRA well; 2Q & 3Q only[8]
H-56R																							X		X	X	X	X	X	X	
H-58R																							X		X	X	X	X	X	X	
HM-2	X																						X		X		X	X		X	
HMW-13																							X			X	X	X	X	X	
HMW-14																							X			X	X	X	X	X	
HMW-15																							X			X	X	X	X	X	
HMW-16																							X			X	X	X	X	X	
I-AA		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-AB		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-AC		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-AD		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-AR		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-B		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-C		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-D		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-E		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-F		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-G		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-H		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-I		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-J		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-K		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-L		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-M		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
	Continuous Transducer Data[1]	Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
		Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
I-O		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-P		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-Q		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-R		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-S		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-T		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-U		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-V		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-W		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-Y		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
I-Z		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
LNDMW-1	X																														
LNDMW-2	X																														
LVW 0.55		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 3.5-1		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 3.5-2		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 3.5-3		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 3.5-4		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 3.5-5		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 3.5-6		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 4.2-1		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 4.2-2		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 4.2-3		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 4.2-4		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 4.75-1		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 4.75-2		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 4.75-3		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 4.75-4		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 4.75-5		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 5.3-1		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 5.3-2		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 5.3-3		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
		Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
LVW 5.3-4		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 5.3-5		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 5.3-6		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 6.05		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 6.6-1		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 6.6-2		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 6.6-3		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 7.2		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVW 8.85		X				X	X		X				X	X		X				X	X		X				X	X			Surface water location
LVWPS-MW102A																							X		X		X	X		X	
LVWPS-MW102B																							X		X		X	X		X	
LVWPS-MW105																							X		X		X	X		X	
LVWPS-MW107A	X																														
LVWPS-MW107C	X																														
LVWPS-MW201A																							X		X		X	X		X	
LVWPS-MW201B																							X		X		X	X		X	
LVWPS-MW224A																							X		X		X	X		X	
LVWPS-MW224B																							X		X		X	X		X	
M-2A																							X		X	X	X	X	X	X	
M-5A											X		X	X	X								X		X	X	X	X	X	X	RCRA well; 2Q & 3Q only[8]
M-6A											X		X	X	X								X		X	X	X	X	X	X	RCRA well; 2Q & 3Q only[8]
M-7B											X		X	X	X								X		X	X	X	X	X	X	RCRA well; 2Q & 3Q only[8]
M-10										X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NPDES Permit well[9]
M-11										X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	UIC Permit well
M-12A										X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	UIC Permit well
M-13	X																						X		X	X	X	X	X	X	
M-14A															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-19															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-21																							X		X	X	X	X	X	X	[6]
M-22A															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-23																X		X	X	X	X	X	X		X	X	X	X	X	X	
M-25	X														X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-31A																X		X	X	X	X	X	X		X	X	X	X	X	X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
		Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
M-32																							X		X	X	X	X	X	X	
M-33																							X		X	X	X	X	X	X	
M-35																X		X	X	X	X	X	X		X	X	X	X	X	X	
M-37										X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	UIC Permit well
M-38										X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	UIC Permit well
M-44	X									X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	UIC Permit well
M-48A																X		X	X	X	X	X	X		X	X	X	X	X	X	
M-52																X		X	X	X	X	X	X		X	X	X	X	X	X	
M-55															X							X								X	
M-56															X							X								X	
M-57A																X		X	X	X	X	X	X		X	X	X	X	X	X	
M-58															X							X								X	
M-60															X							X								X	
M-64								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-65								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-66								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-67								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-68								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-69								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-70								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-71	X							X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-72								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-73								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-74								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-75																							X		X	X	X	X	X	X	
M-76																							X		X	X	X	X	X	X	
M-77R																							X		X	X	X	X	X	X	
M-78															X							X								X	
M-79															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-80										X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	UIC Permit well
M-81A															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-83															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
M-92																							X		X	X	X	X	X	X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
		Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
M-93																							X		X	X	X	X	X	X	
M-95										X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	UIC Permit well[6]
M-96															X	X		X	X	X	X	X	X		X	X	X	X	X	X	[6]
M-97																							X		X	X	X	X	X	X	
M-98															X	X		X	X	X	X	X	X		X	X	X	X	X	X	[6]
M-99															X	X		X	X	X	X	X	X		X	X	X	X	X	X	[6]
M-100										X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	UIC Permit well[6]
M-101															X	X		X	X	X	X	X	X		X	X	X	X	X	X	[6]
M-103																							X		X	X	X	X	X	X	[6]
M-115																							X		X	X	X	X	X	X	
M-117																							X		X	X	X	X	X	X	
M-118																							X		X	X	X	X	X	X	
M-120																							X		X	X	X	X	X	X	
M-121	X																						X		X	X	X	X	X	X	
M-123																							X		X	X	X	X	X	X	
M-124																							X		X	X	X	X	X	X	
M-125																							X		X	X	X	X	X	X	
M-126																							X		X	X	X	X	X	X	
M-129															X							X	X		X	X	X	X	X	X	
M-132																							X		X	X	X	X	X	X	
M-133																							X		X	X	X	X	X	X	
M-134																							X		X	X	X	X	X	X	
M-135																X		X	X	X	X	X	X		X	X	X	X	X	X	
M-136																							X		X	X	X	X	X	X	
M-137																							X		X	X	X	X	X	X	
M-138																							X		X	X	X	X	X	X	
M-139																							X		X	X	X	X	X	X	
M-140																							X		X	X	X	X	X	X	
M-141																							X		X	X	X	X	X	X	
M-142																							X		X	X	X	X	X	X	
M-144																							X		X	X	X	X	X	X	
M-145	X																						X		X	X	X	X	X	X	
M-147																							X		X	X	X	X	X	X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
		Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
M-148A																							X		X	X	X	X	X	X	
M-149																							X		X	X	X	X	X	X	
M-150																							X		X	X	X	X	X	X	
M-151																							X		X	X	X	X	X	X	
M-152	X																						X		X	X	X	X	X	X	
M-153																							X		X	X	X	X	X	X	
M-154																							X		X	X	X	X	X	X	
M-155																							X		X	X	X	X	X	X	
M-156	X																						X		X	X	X	X	X	X	
M-159																							X		X	X	X	X	X	X	
M-160																							X		X	X	X	X	X	X	
M-161																							X		X	X	X	X	X	X	
M-161D																X		X	X	X	X	X	X		X	X	X	X	X	X	
M-162																							X		X	X	X	X	X	X	
M-162D	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
M-163	X																						X		X	X	X	X	X	X	
M-164																							X		X	X	X	X	X	X	
M-165																							X		X	X	X	X	X	X	
M-166															X							X								X	
M-167								X							X							X								X	
M-168															X							X								X	
M-169															X							X								X	
M-170								X							X							X								X	
M-172								X							X							X								X	
M-173								X							X							X								X	
M-174															X							X								X	
M-175								X							X							X								X	
M-176															X							X								X	
M-177								X							X							X								X	
M-181																							X		X	X	X	X	X	X	
M-182																							X		X	X	X	X	X	X	
M-186																							X		X	X	X	X	X	X	
M-186D	X															X		X	X	X	X	X	X		X	X	X	X	X	X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
		Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
M-189	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
M-190																X		X	X	X	X	X	X		X	X	X	X	X	X	
M-191																X		X	X	X	X	X	X		X	X	X	X	X	X	
M-192																X		X	X	X	X	X	X		X	X	X	X	X	X	
M-193	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
M-204																							X		X	X	X	X	X	X	
M-205																							X		X	X	X	X	X	X	
M-206																							X		X	X	X	X	X	X	
M-207																							X		X	X	X	X	X	X	
M-208																							X		X	X	X	X	X	X	
M-209																							X		X	X	X	X	X	X	
M-210																							X		X	X	X	X	X	X	
M-211	X																						X		X	X	X	X	X	X	
M-212	X																						X		X	X	X	X	X	X	
M-213	X																						X		X	X	X	X	X	X	
M-214																							X		X	X	X	X	X	X	
M-220																							X		X	X	X	X	X	X	
M-260																							X		X	X	X	X	X	X	
M-261																							X		X	X	X	X	X	X	
M-262																							X		X	X	X	X	X	X	
M-263																							X		X	X	X	X	X	X	
M-264																							X		X	X	X	X	X	X	
M-265																							X		X	X	X	X	X	X	
M-266																							X		X	X	X	X	X	X	
M-267																							X		X	X	X	X	X	X	
M-268																							X		X	X	X	X	X	X	
MC-3																							X			X	X	X	X	X	
MC-6																							X			X	X	X	X	X	
MC-7																							X			X	X	X	X	X	
MC-50	X																						X			X	X	X	X	X	
MC-51																							X			X	X	X	X	X	
MC-53																							X		X	X	X	X	X	X	
MC-65R2																							X		X	X	X	X	X	X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
		Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
MC-69																							X			X	X	X	X	X	
MC-93																							X			X	X	X	X	X	
MC-97																							X			X	X	X	X	X	
MC-MW-37R2																							X		X	X	X	X	X	X	
MCF-01A	X																														
MCF-01B	X																														
MCF-06B	X																						X				X			X	
MCF-06C	X																						X				X			X	
MCF-07	X																														
MCF-09B	X																														
MCF-11	X																														
MCF-20A	X																														
MCF-24B	X																														
MCF-28A	X																														
MCF-28B	X																														
MCF-31A	X																														
MCF-31B	X																														
MW-1	X																														
MW-02																							X		X		X	X		X	
MW-3																							X		X		X	X		X	
MW-4																							X		X		X	X		X	
MW-13	X																						X		X		X	X		X	
MW-16																							X		X	X	X	X	X	X	
MW-20	X																						X		X		X	X		X	
MW-25																							X		X		X	X		X	
MW-K4																	X		X	X	X	X	X	X		X	X	X	X	X	X	
MW-K5																X	X		X	X	X	X	X	X		X	X	X	X	X	X	
NERT3.35S1	X																						X		X		X	X		X	
NERT3.40S1	X																						X		X		X	X		X	
NERT3.58N1	X																						X		X		X	X		X	
NERT3.58S1	X																						X		X		X	X		X	
NERT3.60N1	X																						X		X		X	X		X	
NERT3.60S1	X																						X		X		X	X		X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
	Continuous Transducer Data[1]	Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
		Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
NERT3.63S1	X																						X		X		X	X		X	
NERT3.80S1	X																						X		X		X	X		X	
NERT3.98S1	X																						X		X		X	X		X	
NERT4.21N1	X																						X		X		X	X		X	
NERT4.38N1	X																						X		X		X	X		X	
NERT4.51S1	X																						X		X		X	X		X	
NERT4.64N1	X																						X		X		X	X		X	
NERT4.64S1	X																						X		X		X	X		X	
NERT4.65N1	X																						X		X		X	X		X	
NERT4.70N1	X																						X		X		X	X		X	
NERT4.71N1	X																						X		X		X	X		X	
NERT4.71S1	X																						X		X		X	X		X	
NERT4.71S2	X																						X		X		X	X		X	
NERT4.93S1	X																						X		X		X	X		X	
NERT5.11S1	X																						X		X		X	X		X	
NERT5.49S1	X																						X		X		X	X		X	
NERT5.91S1	X																						X		X		X	X		X	
PC-1																							X		X	X	X	X	X	X	[6]
PC-2																							X		X	X	X	X	X	X	
PC-4																							X		X	X	X	X	X	X	
PC-18								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-21A																							X		X	X	X	X	X	X	
PC-24																							X		X	X	X	X	X	X	
PC-28																							X		X	X	X	X	X	X	
PC-31																							X		X	X	X	X	X	X	
PC-40R	X																						X		X	X	X	X	X	X	
PC-50																							X		X	X	X	X	X	X	
PC-53															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-54																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-55								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-56	X														X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-58															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-59															X	X		X	X	X	X	X	X		X	X	X	X	X	X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses	Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								Notes
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
PC-60															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-62															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-64	X																						X		X	X	X	X	X	X	
PC-65																							X		X	X	X	X	X	X	
PC-66																							X		X	X	X	X	X	X	
PC-67	X																						X		X	X	X	X	X	X	
PC-71																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-72																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-74	X																						X			X	X	X	X	X	
PC-76																														X	
PC-77	X																						X			X	X	X	X	X	
PC-78																														X	
PC-79																							X		X	X	X	X	X	X	
PC-80																														X	
PC-81																														X	
PC-82																							X			X	X	X	X	X	
PC-83																														X	
PC-86								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-87																														X	
PC-88	X																													X	
PC-90								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-91								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-94																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-96																							X			X	X	X	X	X	
PC-97								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-98R	X														X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-99R2/R3		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
PC-101R																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-103															X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-107																							X			X	X	X	X	X	
PC-108	X																						X			X	X	X	X	X	
PC-110																							X			X	X	X	X	X	
PC-115R		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Continuous Transducer Data[1]	Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								Notes
		Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
PC-116R		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
PC-117		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
PC-118		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
PC-119		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
PC-120		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
PC-121		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
PC-122								X							X	X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-123																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-124																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-125	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-126																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-127																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-128																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-129																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-130	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-131																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-132																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-133		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
PC-134A																							X		X	X	X	X	X	X	
PC-134D																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-135A																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-136	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-137	X																						X		X	X	X	X	X	X	
PC-137D	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-142																							X		X	X	X	X	X	X	
PC-143																							X		X	X	X	X	X	X	
PC-144																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-145																							X		X	X	X	X	X	X	
PC-146																							X		X	X	X	X	X	X	[6]
PC-147																							X		X	X	X	X	X	X	[6]
PC-148																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-149																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-150		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
	Continuous Transducer Data[1]	Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
		Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
PC-151																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-152	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-153R																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-154																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-155A	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-155B	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-156A	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-156B	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-157A	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-157B	X															X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-158																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-159																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-160																X		X	X	X	X	X	X		X	X	X	X	X	X	
PC-171	X																														
PC-188																							X		X	X	X	X	X	X	
PC-189																							X		X	X	X	X	X	X	
PC-191																							X		X	X	X	X	X	X	
PC-195																							X		X	X	X	X	X	X	
PC-196																							X		X	X	X	X	X	X	
PC-197																							X		X	X	X	X	X	X	
PC-198																							X		X	X	X	X	X	X	
PC-199																							X		X	X	X	X	X	X	
S3.50 SW	X																														Surface water transducer[10]
S3.75 SW	X																														Surface water transducer
S3.80 SW	X																														Surface water transducer
S4.65 SW	X																														Surface water transducer
S4.60 SW	X																														Surface water transducer
S4.75 SW	X																														Surface water transducer
S5.30 SW	X																														Surface water transducer
SWFTS-MW07A																							X		X	X	X	X	X	X	
SWFTS-MW08A																							X		X	X	X	X	X	X	
SWFTS-MW08C																							X		X	X	X	X	X	X	
TR-1																							X		X	X	X	X	X	X	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																														Notes
	Continuous Transducer Data[1]	Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)								
		Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	
TR-2																							X		X	X	X	X	X	X	
TR-3																							X		X	X	X	X	X	X	
TR-4	X																						X		X	X	X	X	X	X	
TR-5																							X		X	X	X	X	X	X	
TR-6	X																						X		X	X	X	X	X	X	
TR-7	X																						X		X	X	X	X	X	X	
TR-8																							X		X	X	X	X	X	X	
TR-9	X																						X		X	X	X	X	X	X	
TR-10	X																						X		X	X	X	X	X	X	
TR-11																							X		X	X	X	X	X	X	
TR-12																							X		X	X	X	X	X	X	
UFMW-01D																							X		X	X	X	X	X	X	
UFMW-02D																							X		X	X	X	X	X	X	
UFMW-03D																							X		X	X	X	X	X	X	
UFMW-04D																							X		X	X	X	X	X	X	
UFMW-05D																							X		X	X	X	X	X	X	
UFMW-06D																							X		X	X	X	X	X	X	
WMW3.5N	X																														
WMW3.5S	X																														
WMW4.9N	X																														
WMW4.9S	X																														
WMW5.5S	X																														
WMW5.7N	X																														
WMW5.7S	X																														
WMW6.15N	X																														
WMW6.15S	X																														
WMW6.55S	X																														
WMW6.9N	X																														
WMW6.9S	X																														
Totals	**121**	**86**	**55**	**55**	**55**	**86**	**86**	**85**	**86**	**64**	**68**	**55**	**99**	**99**	**129**	**192**	**64**	**161**	**161**	**192**	**192**	**184**	**455**	**64**	**357**	**319**	**455**	**388**	**264**	**453**	

TABLE 2: MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Monitoring Analyses																													Notes
		Monthly							Quarterly[2] (1Q & 3Q)							Semi-Annually[3] (4Q)							Annually[4] (2Q)							
	Continuous Transducer Data[1]	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Volatile Organic Compounds[5]	Water Level	

Notes:

ft amsl = feet above mean sea level

ft bgs = feet below ground surface

NPDES = National Pollutant Discharge Elimination System

RCRA = Resource Conservation and Recovery Act

UIC = Underground Injection Control

[1]Transducer data are typically downloaded in February, May, August, and November, concurrent with sampling when possible. See Table 8.

[2]The quarterly sampling events typically take place in the middle of the first and third quarters, replacing the monthly events in February and August.

[3]The semi-annual sampling event typically takes place in the middle of the fourth quarter, replacing the monthly event in November.

[4]The annual sampling event typically takes place in the middle of the second quarter, replacing the monthly event in May.

[5]See Table 7 for list of volatile organic compound analytes and methods.

[6]Recent monitoring events indicate this location is dry (i.e., groundwater elevation is below the bottom of the well screen elevation or there is insufficient surface water to sample). The location will continue to be monitored as part of the Groundwater Monitoring Program. Samples from wells will only be collected if the water level is determined to be above the bottom of the well screen.

[7]Analytical sampling will be performed at the active extraction well in a set of buddy wells. Water level measurements are taken at all wells in a set of buddy wells.

[8]Wells sampled under RCRA requiring the following additional analyses:

Chloride	Specific Conductance
Phenols	Total Manganese
Total Iron	Total Organic Carbon
Sulfate	Total Organic Halides (4 Replicates)
Total Boron	Total Sodium

[9]Wells sampled under NPDES Permit requiring the following additional analyses:

Total Boron	Ammonia as Nitrogen
Total Iron	Nitrate as Nitrogen
Total Arsenic	Nitrite as Nitrogen
Total Selenium	Total Inorganic Nitrogen (calculated)
Chloride	Total Manganese

[10]This gage was originally named S3.60 but the identification was changed to S3.50 during AECOM's field program.

TABLE 3: MONTHLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
ART-1	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-1A	GWETS Operator	GW	X							Buddy well to ART-1. See Note 1.
ART-2	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-2A	GWETS Operator	GW	X							Buddy well to ART-2. See Note 1.
ART-3	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-3A	GWETS Operator	GW	X							Buddy well to ART-3. See Note 1.
ART-4	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-4A	GWETS Operator	GW	X							Buddy well to ART-4. See Note 1.
ART-7A	GWETS Operator	GW	X							Buddy well to ART-7B. See Note 1.
ART-7B	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-8	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-8A	GWETS Operator	GW	X							Buddy well to ART-8. See Note 1.
ART-9	GWETS Operator	GW	X	X	X	X	X	X	X	
C12	GW/SW Contractor	SW		X				X	X	
C1-E	GW/SW Contractor	SW		X				X	X	
C1-W	GW/SW Contractor	SW		X				X	X	
E1-1	GWETS Operator	GW	X	X	X	X	X	X	X	
E1-2	GWETS Operator	GW	X	X	X	X	X	X	X	
E1-3	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-1	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-2	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-3	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-4	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-5	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AA	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AB	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AC	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AD	GWETS Operator	GW	X	X	X	X	X	X	X	

TABLE 3: MONTHLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
I-AR	GWETS Operator	GW	X	X	X	X	X	X	X	
I-B	GWETS Operator	GW	X	X	X	X	X	X	X	
I-C	GWETS Operator	GW	X	X	X	X	X	X	X	
I-D	GWETS Operator	GW	X	X	X	X	X	X	X	
I-E	GWETS Operator	GW	X	X	X	X	X	X	X	
I-F	GWETS Operator	GW	X	X	X	X	X	X	X	
I-G	GWETS Operator	GW	X	X	X	X	X	X	X	
I-H	GWETS Operator	GW	X	X	X	X	X	X	X	
I-I	GWETS Operator	GW	X	X	X	X	X	X	X	
I-J	GWETS Operator	GW	X	X	X	X	X	X	X	
I-K	GWETS Operator	GW	X	X	X	X	X	X	X	
I-L	GWETS Operator	GW	X	X	X	X	X	X	X	
I-M	GWETS Operator	GW	X	X	X	X	X	X	X	
I-N	GWETS Operator	GW	X	X	X	X	X	X	X	
I-O	GWETS Operator	GW	X	X	X	X	X	X	X	
I-P	GWETS Operator	GW	X	X	X	X	X	X	X	
I-Q	GWETS Operator	GW	X	X	X	X	X	X	X	
I-R	GWETS Operator	GW	X	X	X	X	X	X	X	
I-S	GWETS Operator	GW	X	X	X	X	X	X	X	
I-T	GWETS Operator	GW	X	X	X	X	X	X	X	
I-U	GWETS Operator	GW	X	X	X	X	X	X	X	
I-V	GWETS Operator	GW	X	X	X	X	X	X	X	
I-W	GWETS Operator	GW	X	X	X	X	X	X	X	
I-X	GWETS Operator	GW	X	X	X	X	X	X	X	
I-Y	GWETS Operator	GW	X	X	X	X	X	X	X	
I-Z	GWETS Operator	GW	X	X	X	X	X	X	X	
M-64	GW/SW Contractor	GW	X							
M-65	GW/SW Contractor	GW	X							

TABLE 3: MONTHLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
M-66	GW/SW Contractor	GW	X							
M-67	GW/SW Contractor	GW	X							
M-68	GW/SW Contractor	GW	X							
M-69	GW/SW Contractor	GW	X							
M-70	GW/SW Contractor	GW	X							
M-71	GW/SW Contractor	GW	X							
M-72	GW/SW Contractor	GW	X							
M-73	GW/SW Contractor	GW	X							
M-74	GW/SW Contractor	GW	X							
M-167	GW/SW Contractor	GW	X							
M-170	GW/SW Contractor	GW	X							
M-172	GW/SW Contractor	GW	X							
M-173	GW/SW Contractor	GW	X							
M-175	GW/SW Contractor	GW	X							
M-177	GW/SW Contractor	GW	X							
PC-18	GW/SW Contractor	GW	X							
PC-55	GW/SW Contractor	GW	X							
PC-86	GW/SW Contractor	GW	X							
PC-90	GW/SW Contractor	GW	X							
PC-91	GW/SW Contractor	GW	X							
PC-97	GW/SW Contractor	GW	X							
PC-99R2/R3	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-115R	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-116R	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-117	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-118	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-119	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-120	GWETS Operator	GW	X	X	X	X	X	X	X	

TABLE 3: MONTHLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
PC-121	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-122	GW/SW Contractor	GW	X							
PC-133	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-150	GWETS Operator	GW	X	X	X	X	X	X	X	
LVW 0.55	GW/SW Contractor	SW		X				X	X	
LVW 3.5-1	GW/SW Contractor	SW		X				X	X	
LVW 3.5-2	GW/SW Contractor	SW		X				X	X	
LVW 3.5-3	GW/SW Contractor	SW		X				X	X	
LVW 3.5-4	GW/SW Contractor	SW		X				X	X	
LVW 3.5-5	GW/SW Contractor	SW		X				X	X	
LVW 3.5-6	GW/SW Contractor	SW		X				X	X	
LVW 4.2-1	GW/SW Contractor	SW		X				X	X	
LVW 4.2-2	GW/SW Contractor	SW		X				X	X	
LVW 4.2-3	GW/SW Contractor	SW		X				X	X	
LVW 4.2-4	GW/SW Contractor	SW		X				X	X	
LVW 4.75-1	GW/SW Contractor	SW		X				X	X	
LVW 4.75-2	GW/SW Contractor	SW		X				X	X	
LVW 4.75-3	GW/SW Contractor	SW		X				X	X	
LVW 4.75-4	GW/SW Contractor	SW		X				X	X	
LVW 4.75-5	GW/SW Contractor	SW		X				X	X	
LVW 5.3-1	GW/SW Contractor	SW		X				X	X	
LVW 5.3-2	GW/SW Contractor	SW		X				X	X	
LVW 5.3-3	GW/SW Contractor	SW		X				X	X	
LVW 5.3-4	GW/SW Contractor	SW		X				X	X	
LVW 5.3-5	GW/SW Contractor	SW		X				X	X	
LVW 5.3-6	GW/SW Contractor	SW		X				X	X	
LVW 6.05	GW/SW Contractor	SW		X				X	X	
LVW 6.6-1	GW/SW Contractor	SW		X				X	X	

TABLE 3: MONTHLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
LVW 6.6-2	GW/SW Contractor	SW		X				X	X	
LVW 6.6-3	GW/SW Contractor	SW		X				X	X	
LVW 7.2	GW/SW Contractor	SW		X				X	X	
LVW 8.85	GW/SW Contractor	SW		X				X	X	
EB-1	GWETS Operator	GW		X	X	X	X	X	X	Equipment Blank. See Note 2.
EB-2	GWETS Operator	GW		X	X	X	X	X	X	Equipment Blank. See Note 2.
EB-3	GWETS Operator	GW		X	X	X	X	X	X	Equipment Blank. See Note 2.
EB-4	GW/SW Contractor	SW		X				X	X	Equipment Blank. See Note 2.
EB-5	GW/SW Contractor	SW		X				X	X	Equipment Blank. See Note 2.
FB-1	GWETS Operator	GW		X	X	X	X	X	X	Field Blank. See Note 2.
FB-2	GWETS Operator	GW		X	X	X	X	X	X	Field Blank. See Note 2.
FB-3	GWETS Operator	GW		X	X	X	X	X	X	Field Blank. See Note 2.
FB-4	GW/SW Contractor	SW		X				X	X	Field Blank. See Note 2.
FB-5	GW/SW Contractor	SW		X				X	X	Field Blank. See Note 2.
FD-1	GWETS Operator	GW		X	X	X	X	X	X	Field Duplicate. See Note 2.
FD-2	GWETS Operator	GW		X	X	X	X	X	X	Field Duplicate. See Note 2.
FD-3	GWETS Operator	GW		X	X	X	X	X	X	Field Duplicate. See Note 2.
FD-4	GW/SW Contractor	SW		X				X	X	Field Duplicate. See Note 2.
FD-5	GW/SW Contractor	SW		X				X	X	Field Duplicate. See Note 2.
Total Samples			85	101	64	64	64	101	101	

TABLE 3: MONTHLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	

Notes:
GW = groundwater
GW/SW Contractor = Groundwater and Surface Water Sampling Contractor
GWETS Operator = Groundwater Extraction and Treatment System Operator
NA = not applicable
SW = surface water

1. Analytical samples will be collected at whichever extraction well within a pair of buddy wells is actively pumping at the time of sampling. DTW will be measured at both wells within a pair of buddy wells.
2. Quality Assurance/Quality Control (QA/QC) samples (equipment blanks, field blanks, and field duplicates) should be collected at locations where primary samples are analyzed for the same suite of analytes required for the QA/QC sample.

TABLE 4: QUARTERLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
ART-1	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-1A	GWETS Operator	GW	X							Buddy well to ART-1. See Note 1.
ART-2	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-2A	GWETS Operator	GW	X							Buddy well to ART-2. See Note 1.
ART-3	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-3A	GWETS Operator	GW	X							Buddy well to ART-3. See Note 1.
ART-4	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-4A	GWETS Operator	GW	X							Buddy well to ART-4. See Note 1.
ART-7A	GWETS Operator	GW	X							Buddy well to ART-7B. See Note 1.
ART-7B	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-8	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 1.
ART-8A	GWETS Operator	GW	X							Buddy well to ART-8. See Note 1.
ART-9	GWETS Operator	GW	X	X	X	X	X	X	X	
C12	GW/SW Contractor	SW		X				X	X	
C1-E	GW/SW Contractor	SW		X				X	X	
C1-W	GW/SW Contractor	SW		X				X	X	
E1-1	GWETS Operator	GW	X	X	X	X	X	X	X	
E1-2	GWETS Operator	GW	X	X	X	X	X	X	X	
E1-3	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-1	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-2	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-3	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-4	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-5	GWETS Operator	GW	X	X	X	X	X	X	X	
H-28A	GW/SW Contractor	GW	X			X		X	X	RCRA well; 2Q and 3Q only. See Note 2.
I-AA	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AB	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AC	GWETS Operator	GW	X	X	X	X	X	X	X	

TABLE 4: QUARTERLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
I-AD	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AR	GWETS Operator	GW	X	X	X	X	X	X	X	
I-B	GWETS Operator	GW	X	X	X	X	X	X	X	
I-C	GWETS Operator	GW	X	X	X	X	X	X	X	
I-D	GWETS Operator	GW	X	X	X	X	X	X	X	
I-E	GWETS Operator	GW	X	X	X	X	X	X	X	
I-F	GWETS Operator	GW	X	X	X	X	X	X	X	
I-G	GWETS Operator	GW	X	X	X	X	X	X	X	
I-H	GWETS Operator	GW	X	X	X	X	X	X	X	
I-I	GWETS Operator	GW	X	X	X	X	X	X	X	
I-J	GWETS Operator	GW	X	X	X	X	X	X	X	
I-K	GWETS Operator	GW	X	X	X	X	X	X	X	
I-L	GWETS Operator	GW	X	X	X	X	X	X	X	
I-M	GWETS Operator	GW	X	X	X	X	X	X	X	
I-N	GWETS Operator	GW	X	X	X	X	X	X	X	
I-O	GWETS Operator	GW	X	X	X	X	X	X	X	
I-P	GWETS Operator	GW	X	X	X	X	X	X	X	
I-Q	GWETS Operator	GW	X	X	X	X	X	X	X	
I-R	GWETS Operator	GW	X	X	X	X	X	X	X	
I-S	GWETS Operator	GW	X	X	X	X	X	X	X	
I-T	GWETS Operator	GW	X	X	X	X	X	X	X	
I-U	GWETS Operator	GW	X	X	X	X	X	X	X	
I-V	GWETS Operator	GW	X	X	X	X	X	X	X	
I-W	GWETS Operator	GW	X	X	X	X	X	X	X	
I-X	GWETS Operator	GW	X	X	X	X	X	X	X	
I-Y	GWETS Operator	GW	X	X	X	X	X	X	X	
I-Z	GWETS Operator	GW	X	X	X	X	X	X	X	
LVW 0.55	GW/SW Contractor	SW		X				X	X	

TABLE 4: QUARTERLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
LVW 3.5-1	GW/SW Contractor	SW		X				X	X	
LVW 3.5-2	GW/SW Contractor	SW		X				X	X	
LVW 3.5-3	GW/SW Contractor	SW		X				X	X	
LVW 3.5-4	GW/SW Contractor	SW		X				X	X	
LVW 3.5-5	GW/SW Contractor	SW		X				X	X	
LVW 3.5-6	GW/SW Contractor	SW		X				X	X	
LVW 4.2-1	GW/SW Contractor	SW		X				X	X	
LVW 4.2-2	GW/SW Contractor	SW		X				X	X	
LVW 4.2-3	GW/SW Contractor	SW		X				X	X	
LVW 4.2-4	GW/SW Contractor	SW		X				X	X	
LVW 4.75-1	GW/SW Contractor	SW		X				X	X	
LVW 4.75-2	GW/SW Contractor	SW		X				X	X	
LVW 4.75-3	GW/SW Contractor	SW		X				X	X	
LVW 4.75-4	GW/SW Contractor	SW		X				X	X	
LVW 4.75-5	GW/SW Contractor	SW		X				X	X	
LVW 5.3-1	GW/SW Contractor	SW		X				X	X	
LVW 5.3-2	GW/SW Contractor	SW		X				X	X	
LVW 5.3-3	GW/SW Contractor	SW		X				X	X	
LVW 5.3-4	GW/SW Contractor	SW		X				X	X	
LVW 5.3-5	GW/SW Contractor	SW		X				X	X	
LVW 5.3-6	GW/SW Contractor	SW		X				X	X	
LVW 6.05	GW/SW Contractor	SW		X				X	X	
LVW 6.6-1	GW/SW Contractor	SW		X				X	X	
LVW 6.6-2	GW/SW Contractor	SW		X				X	X	
LVW 6.6-3	GW/SW Contractor	SW		X				X	X	
LVW 7.2	GW/SW Contractor	SW		X				X	X	
LVW 8.85	GW/SW Contractor	SW		X				X	X	
M-5A	GW/SW Contractor	GW	X			X		X	X	RCRA well; 2Q and 3Q only. See Note 2.

TABLE 4: QUARTERLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
M-6A	GW/SW Contractor	GW	X			X		X	X	RCRA well; 2Q and 3Q only. See Note 2.
M-7B	GW/SW Contractor	GW	X			X		X	X	RCRA well; 2Q and 3Q only. See Note 2.
M-10	GW/SW Contractor	GW	X		X	X		X	X	NPDES Permit well. See Note 3.
M-11	GW/SW Contractor	GW	X		X	X		X	X	UIC Permit well.
M-12A	GW/SW Contractor	GW	X		X	X		X	X	UIC Permit well.
M-14A	GW/SW Contractor	GW	X							
M-19	GW/SW Contractor	GW	X							
M-22A	GW/SW Contractor	GW	X							
M-25	GW/SW Contractor	GW	X							UIC Permit well.
M-37	GW/SW Contractor	GW	X		X	X		X	X	UIC Permit well.
M-38	GW/SW Contractor	GW	X		X	X		X	X	UIC Permit well.
M-44	GW/SW Contractor	GW	X		X	X		X	X	UIC Permit well.
M-55	GW/SW Contractor	GW	X							
M-56	GW/SW Contractor	GW	X							
M-58	GW/SW Contractor	GW	X							
M-60	GW/SW Contractor	GW	X							
M-64	GW/SW Contractor	GW	X							
M-65	GW/SW Contractor	GW	X							
M-66	GW/SW Contractor	GW	X							
M-67	GW/SW Contractor	GW	X							
M-68	GW/SW Contractor	GW	X							
M-69	GW/SW Contractor	GW	X							
M-70	GW/SW Contractor	GW	X							
M-71	GW/SW Contractor	GW	X							
M-72	GW/SW Contractor	GW	X							
M-73	GW/SW Contractor	GW	X							
M-74	GW/SW Contractor	GW	X							
M-78	GW/SW Contractor	GW	X							

TABLE 4: QUARTERLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
M-79	GW/SW Contractor	GW	X							
M-80	GW/SW Contractor	GW	X		X	X		X	X	UIC Permit well.
M-81A	GW/SW Contractor	GW	X							
M-83	GW/SW Contractor	GW	X							
M-95	GW/SW Contractor	GW	X		X	X		X	X	UIC Permit well. See Note 4.
M-96	GW/SW Contractor	GW	X							UIC Permit well. See Note 4.
M-98	GW/SW Contractor	GW	X							UIC Permit well. See Note 4.
M-99	GW/SW Contractor	GW	X							UIC Permit well. See Note 4.
M-100	GW/SW Contractor	GW	X		X	X		X	X	UIC Permit well. See Note 4.
M-101	GW/SW Contractor	GW	X							UIC Permit well. See Note 4.
M-129	GW/SW Contractor	GW	X							
M-166	GW/SW Contractor	GW	X							
M-167	GW/SW Contractor	GW	X							
M-168	GW/SW Contractor	GW	X							
M-169	GW/SW Contractor	GW	X							
M-170	GW/SW Contractor	GW	X							
M-172	GW/SW Contractor	GW	X							
M-173	GW/SW Contractor	GW	X							
M-174	GW/SW Contractor	GW	X							
M-175	GW/SW Contractor	GW	X							
M-176	GW/SW Contractor	GW	X							
M-177	GW/SW Contractor	GW	X							
MW-K5	GW/SW Contractor	GW	X							
PC-18	GW/SW Contractor	GW	X							
PC-53	GW/SW Contractor	GW	X							
PC-55	GW/SW Contractor	GW	X							
PC-56	GW/SW Contractor	GW	X							
PC-58	GW/SW Contractor	GW	X							

TABLE 4: QUARTERLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
PC-59	GW/SW Contractor	GW	X							
PC-60	GW/SW Contractor	GW	X							
PC-62	GW/SW Contractor	GW	X							
PC-86	GW/SW Contractor	GW	X							
PC-90	GW/SW Contractor	GW	X							
PC-91	GW/SW Contractor	GW	X							
PC-97	GW/SW Contractor	GW	X							
PC-98R	GW/SW Contractor	GW	X							
PC-99R2/R3	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-103	GW/SW Contractor	GW	X							
PC-115R	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-116R	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-117	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-118	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-119	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-120	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-121	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-122	GW/SW Contractor	GW	X							
PC-133	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-150	GWETS Operator	GW	X	X	X	X	X	X	X	
EB-1	GWETS Operator	GW		X	X	X	X	X	X	Equipment Blank. See Note 5.
EB-2	GWETS Operator	GW		X	X	X	X	X	X	Equipment Blank. See Note 5.
EB-3	GWETS Operator	GW		X	X	X	X	X	X	Equipment Blank. See Note 5.
EB-4	GW/SW Contractor	GW			X	X		X	X	Equipment Blank. See Note 5.
EB-5	GW/SW Contractor	SW		X				X	X	Equipment Blank. See Note 5.
EB-6	GW/SW Contractor	SW		X				X	X	Equipment Blank. See Note 5.
FB-1	GWETS Operator	GW		X	X	X	X	X	X	Field Blank. See Note 5.
FB-2	GWETS Operator	GW		X	X	X	X	X	X	Field Blank. See Note 5.

TABLE 4: QUARTERLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
FB-3	GWETS Operator	GW		X	X	X	X	X	X	Field Blank. See Note 5.
FB-4	GW/SW Contractor	GW			X	X		X	X	Field Blank. See Note 5.
FB-5	GW/SW Contractor	SW		X				X	X	Field Blank. See Note 5.
FB-6	GW/SW Contractor	SW		X				X	X	Field Blank. See Note 5.
FD-1	GWETS Operator	GW		X	X	X	X	X	X	Field Duplicate. See Note 5.
FD-2	GWETS Operator	GW		X	X	X	X	X	X	Field Duplicate. See Note 5.
FD-3	GWETS Operator	GW		X	X	X	X	X	X	Field Duplicate. See Note 5.
FD-4	GW/SW Contractor	GW			X	X		X	X	Field Duplicate. See Note 5.
FD-5	GW/SW Contractor	SW		X				X	X	Field Duplicate. See Note 5.
FD-6	GW/SW Contractor	SW		X				X	X	Field Duplicate. See Note 5.
Total Samples			129	101	76	80	64	117	117	

TABLE 4: QUARTERLY MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	

Notes:
GW = groundwater
GW/SW Contractor = Groundwater and Surface Water Sampling Contractor
GWETS Operator = Groundwater Extraction and Treatment System Operator
NPDES = National Pollutant Discharge Elimination System
NA = not applicable
RCRA = Resource Conservation and Recovery Act
SW = surface water
UIC = Underground Injection Control

1. Analytical samples will be collected at whichever extraction well within a pair of buddy wells is actively pumping at the time of sampling. DTW will be measured at both wells within a pair of buddy wells.
2. The 4 RCRA wells (H-28A, M-5A, M-6A, M-7B) are sampled as part of the groundwater monitoring program only in second quarter (annual event) and third quarter (quarterly event). They are not sampled in first quarter (quarterly event). Additional analyses required by RCRA are total boron, chloride, total iron, total manganese, phenols, total sodium, specific conductance, sulfate, total organic carbon, and total organic halides (4 replicates).
3. Well M-10 is sampled for additional analytes per the NPDES permit (ammonia as nitrogen, total arsenic, total boron, chloride, total iron, total manganese, nitrate as nitrogen, nitrite as nitrogen, total inorganic nitrogen, total selenium).
4. Recent monitoring events indicate this well is dry (i.e. groundwater elevation is below the bottom of the well screen elevation). The well will continue to be monitored as part of the Groundwater Monitoring Program, but samples will only be collected if the water level is determined to be above the bottom of the well screen.
5. Quality Assurance/Quality Control (QA/QC) samples (equipment blanks, field blanks, and field duplicates) should be collected at wells where primary samples are analyzed for the same suite of analytes required for the QA/QC sample.

TABLE 5: SEMI-ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
ARP-1	GW/SW Contractor	GW	X	X		X	X	X	X	
ARP-2A	GW/SW Contractor	GW	X	X		X	X	X	X	
ARP-3A	GW/SW Contractor	GW	X	X		X	X	X	X	
ARP-4A	GW/SW Contractor	GW	X	X		X	X	X	X	See Note 1.
ARP-5A	GW/SW Contractor	GW	X	X		X	X	X	X	
ARP-6B	GW/SW Contractor	GW	X	X		X	X	X	X	
ARP-7	GW/SW Contractor	GW	X	X		X	X	X	X	
ART-1	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 2.
ART-1A	GWETS Operator	GW	X							Buddy well to ART-1. See Note 2.
ART-2	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 2.
ART-2A	GWETS Operator	GW	X							Buddy well to ART-2. See Note 2.
ART-3	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 2.
ART-3A	GWETS Operator	GW	X							Buddy well to ART-3. See Note 2.
ART-4	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 2.
ART-4A	GWETS Operator	GW	X							Buddy well to ART-4. See Note 2.
ART-6	GW/SW Contractor	GW	X	X		X	X	X	X	
ART-7A	GWETS Operator	GW	X							Buddy well to ART-7B. See Note 2.
ART-7B	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 2.
ART-8	GWETS Operator	GW	X	X	X	X	X	X	X	See Note 2.
ART-8A	GWETS Operator	GW	X							Buddy well to ART-8. See Note 2.
ART-9	GWETS Operator	GW	X	X	X	X	X	X	X	
C12	GW/SW Contractor	SW		X				X	X	
C1-E	GW/SW Contractor	SW		X				X	X	
C1-W	GW/SW Contractor	SW		X				X	X	
E1-1	GWETS Operator	GW	X	X	X	X	X	X	X	
E1-2	GWETS Operator	GW	X	X	X	X	X	X	X	
E1-3	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-1	GWETS Operator	GW	X	X	X	X	X	X	X	

TABLE 5: SEMI-ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
E2-2	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-3	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-4	GWETS Operator	GW	X	X	X	X	X	X	X	
E2-5	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AA	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AB	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AC	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AD	GWETS Operator	GW	X	X	X	X	X	X	X	
I-AR	GWETS Operator	GW	X	X	X	X	X	X	X	
I-B	GWETS Operator	GW	X	X	X	X	X	X	X	
I-C	GWETS Operator	GW	X	X	X	X	X	X	X	
I-D	GWETS Operator	GW	X	X	X	X	X	X	X	
I-E	GWETS Operator	GW	X	X	X	X	X	X	X	
I-F	GWETS Operator	GW	X	X	X	X	X	X	X	
I-G	GWETS Operator	GW	X	X	X	X	X	X	X	
I-H	GWETS Operator	GW	X	X	X	X	X	X	X	
I-I	GWETS Operator	GW	X	X	X	X	X	X	X	
I-J	GWETS Operator	GW	X	X	X	X	X	X	X	
I-K	GWETS Operator	GW	X	X	X	X	X	X	X	
I-L	GWETS Operator	GW	X	X	X	X	X	X	X	
I-M	GWETS Operator	GW	X	X	X	X	X	X	X	
I-N	GWETS Operator	GW	X	X	X	X	X	X	X	
I-O	GWETS Operator	GW	X	X	X	X	X	X	X	
I-P	GWETS Operator	GW	X	X	X	X	X	X	X	
I-Q	GWETS Operator	GW	X	X	X	X	X	X	X	
I-R	GWETS Operator	GW	X	X	X	X	X	X	X	
I-S	GWETS Operator	GW	X	X	X	X	X	X	X	
I-T	GWETS Operator	GW	X	X	X	X	X	X	X	

TABLE 5: SEMI-ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
I-U	GWETS Operator	GW	X	X	X	X	X	X	X	
I-V	GWETS Operator	GW	X	X	X	X	X	X	X	
I-W	GWETS Operator	GW	X	X	X	X	X	X	X	
I-X	GWETS Operator	GW	X	X	X	X	X	X	X	
I-Y	GWETS Operator	GW	X	X	X	X	X	X	X	
I-Z	GWETS Operator	GW	X	X	X	X	X	X	X	
LVW 0.55	GW/SW Contractor	SW		X				X	X	
LVW 3.5-1	GW/SW Contractor	SW		X				X	X	
LVW 3.5-2	GW/SW Contractor	SW		X				X	X	
LVW 3.5-3	GW/SW Contractor	SW		X				X	X	
LVW 3.5-4	GW/SW Contractor	SW		X				X	X	
LVW 3.5-5	GW/SW Contractor	SW		X				X	X	
LVW 3.5-6	GW/SW Contractor	SW		X				X	X	
LVW 4.2-1	GW/SW Contractor	SW		X				X	X	
LVW 4.2-2	GW/SW Contractor	SW		X				X	X	
LVW 4.2-3	GW/SW Contractor	SW		X				X	X	
LVW 4.2-4	GW/SW Contractor	SW		X				X	X	
LVW 4.75-1	GW/SW Contractor	SW		X				X	X	
LVW 4.75-2	GW/SW Contractor	SW		X				X	X	
LVW 4.75-3	GW/SW Contractor	SW		X				X	X	
LVW 4.75-4	GW/SW Contractor	SW		X				X	X	
LVW 4.75-5	GW/SW Contractor	SW		X				X	X	
LVW 5.3-1	GW/SW Contractor	SW		X				X	X	
LVW 5.3-2	GW/SW Contractor	SW		X				X	X	
LVW 5.3-3	GW/SW Contractor	SW		X				X	X	
LVW 5.3-4	GW/SW Contractor	SW		X				X	X	
LVW 5.3-5	GW/SW Contractor	SW		X				X	X	
LVW 5.3-6	GW/SW Contractor	SW		X				X	X	

TABLE 5: SEMI-ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
LVW 6.05	GW/SW Contractor	SW		X				X	X	
LVW 6.6-1	GW/SW Contractor	SW		X				X	X	
LVW 6.6-2	GW/SW Contractor	SW		X				X	X	
LVW 6.6-3	GW/SW Contractor	SW		X				X	X	
LVW 7.2	GW/SW Contractor	SW		X				X	X	
LVW 8.85	GW/SW Contractor	SW		X				X	X	
M-10	GW/SW Contractor	GW	X	X	X	X	X	X	X	NPDES Permit well. See Note 3.
M-11	GW/SW Contractor	GW	X	X	X	X	X	X	X	UIC Permit well.
M-12A	GW/SW Contractor	GW	X	X	X	X	X	X	X	UIC Permit well.
M-14A	GW/SW Contractor	GW	X	X		X	X	X	X	
M-19	GW/SW Contractor	GW	X	X		X	X	X	X	
M-22A	GW/SW Contractor	GW	X	X		X	X	X	X	
M-23	GW/SW Contractor	GW	X	X		X	X	X	X	
M-25	GW/SW Contractor	GW	X	X		X	X	X	X	
M-31A	GW/SW Contractor	GW	X	X		X	X	X	X	
M-35	GW/SW Contractor	GW	X	X		X	X	X	X	
M-37	GW/SW Contractor	GW	X	X	X	X	X	X	X	UIC Permit well.
M-38	GW/SW Contractor	GW	X	X	X	X	X	X	X	UIC Permit well.
M-44	GW/SW Contractor	GW	X	X	X	X	X	X	X	UIC Permit well.
M-48A	GW/SW Contractor	GW	X	X		X	X	X	X	
M-52	GW/SW Contractor	GW	X	X		X	X	X	X	
M-55	GW/SW Contractor	GW	X							
M-56	GW/SW Contractor	GW	X							
M-57A	GW/SW Contractor	GW	X	X		X	X	X	X	
M-58	GW/SW Contractor	GW	X							
M-60	GW/SW Contractor	GW	X							
M-64	GW/SW Contractor	GW	X	X		X	X	X	X	
M-65	GW/SW Contractor	GW	X	X		X	X	X	X	

TABLE 5: SEMI-ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
M-66	GW/SW Contractor	GW	X	X		X	X	X	X	
M-67	GW/SW Contractor	GW	X	X		X	X	X	X	
M-68	GW/SW Contractor	GW	X	X		X	X	X	X	
M-69	GW/SW Contractor	GW	X	X		X	X	X	X	
M-70	GW/SW Contractor	GW	X	X		X	X	X	X	
M-71	GW/SW Contractor	GW	X	X		X	X	X	X	
M-72	GW/SW Contractor	GW	X	X		X	X	X	X	
M-73	GW/SW Contractor	GW	X	X		X	X	X	X	
M-74	GW/SW Contractor	GW	X	X		X	X	X	X	
M-78	GW/SW Contractor	GW	X							
M-79	GW/SW Contractor	GW	X	X		X	X	X	X	
M-80	GW/SW Contractor	GW	X	X	X	X	X	X	X	UIC Permit well.
M-81A	GW/SW Contractor	GW	X	X		X	X	X	X	
M-83	GW/SW Contractor	GW	X	X		X	X	X	X	
M-95	GW/SW Contractor	GW	X	X	X	X	X	X	X	UIC Permit well. See Note 1.
M-96	GW/SW Contractor	GW	X	X		X	X	X	X	
M-98	GW/SW Contractor	GW	X	X		X	X	X	X	
M-99	GW/SW Contractor	GW	X	X		X	X	X	X	
M-100	GW/SW Contractor	GW	X	X	X	X	X	X	X	UIC Permit well. See Note 1.
M-101	GW/SW Contractor	GW	X	X		X	X	X	X	
M-129	GW/SW Contractor	GW	X							
M-135	GW/SW Contractor	GW	X	X		X	X	X	X	
M-161D	GW/SW Contractor	GW	X	X		X	X	X	X	
M-162D	GW/SW Contractor	GW	X	X		X	X	X	X	
M-166	GW/SW Contractor	GW	X							
M-167	GW/SW Contractor	GW	X							
M-168	GW/SW Contractor	GW	X							
M-169	GW/SW Contractor	GW	X							

TABLE 5: SEMI-ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
M-170	GW/SW Contractor	GW	X							
M-172	GW/SW Contractor	GW	X							
M-173	GW/SW Contractor	GW	X							
M-174	GW/SW Contractor	GW	X							
M-175	GW/SW Contractor	GW	X							
M-176	GW/SW Contractor	GW	X							
M-177	GW/SW Contractor	GW	X							
M-186D	GW/SW Contractor	GW	X	X		X	X	X	X	
M-189	GW/SW Contractor	GW	X	X		X	X	X	X	
M-190	GW/SW Contractor	GW	X	X		X	X	X	X	
M-191	GW/SW Contractor	GW	X	X		X	X	X	X	
M-192	GW/SW Contractor	GW	X	X		X	X	X	X	
M-193	GW/SW Contractor	GW	X	X		X	X	X	X	
MW-K4	GW/SW Contractor	GW	X	X		X	X	X	X	
MW-K5	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-18	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-53	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-54	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-55	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-56	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-58	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-59	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-60	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-62	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-71	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-72	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-86	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-90	GW/SW Contractor	GW	X	X		X	X	X	X	

TABLE 5: SEMI-ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
PC-91	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-94	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-97	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-98R	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-99R2/R3	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-101R	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-103	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-115R	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-116R	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-117	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-118	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-119	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-120	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-121	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-122	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-123	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-124	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-125	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-126	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-127	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-128	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-129	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-130	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-131	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-132	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-133	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-134D	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-135A	GW/SW Contractor	GW	X	X		X	X	X	X	

TABLE 5: SEMI-ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
PC-136	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-137D	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-144	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-148	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-149	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-150	GWETS Operator	GW	X	X	X	X	X	X	X	
PC-151	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-152	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-153R	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-154	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-155A	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-155B	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-156A	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-156B	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-157A	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-157B	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-158	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-159	GW/SW Contractor	GW	X	X		X	X	X	X	
PC-160	GW/SW Contractor	GW	X	X		X	X	X	X	
EB-1	GWETS Operator	GW		X	X	X	X	X	X	Equipment Blank. See Note 4.
EB-2	GWETS Operator	GW		X	X	X	X	X	X	Equipment Blank. See Note 4.
EB-3	GWETS Operator	GW		X	X	X	X	X	X	Equipment Blank. See Note 4.
EB-4	GW/SW Contractor	GW		X	X	X	X	X	X	Equipment Blank. See Note 4.
EB-5	GW/SW Contractor	GW		X		X	X	X	X	Equipment Blank. See Note 4.
EB-6	GW/SW Contractor	GW		X		X	X	X	X	Equipment Blank. See Note 4.
EB-7	GW/SW Contractor	GW		X		X	X	X	X	Equipment Blank. See Note 4.
EB-8	GW/SW Contractor	GW		X		X	X	X	X	Equipment Blank. See Note 4.
EB-9	GW/SW Contractor	GW		X		X	X	X	X	Equipment Blank. See Note 4.

TABLE 5: SEMI-ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	
EB-10	GW/SW Contractor	SW		X				X	X	Equipment Blank. See Note 4.
EB-11	GW/SW Contractor	SW		X				X	X	Equipment Blank. See Note 4.
FB-1	GWETS Operator	GW		X	X	X	X	X	X	Field Blank. See Note 4.
FB-2	GWETS Operator	GW		X	X	X	X	X	X	Field Blank. See Note 4.
FB-3	GWETS Operator	GW		X	X	X	X	X	X	Field Blank. See Note 4.
FB-4	GW/SW Contractor	GW		X	X	X	X	X	X	Field Blank. See Note 4.
FB-5	GW/SW Contractor	GW		X		X	X	X	X	Field Blank. See Note 4.
FB-6	GW/SW Contractor	GW		X		X	X	X	X	Field Blank. See Note 4.
FB-7	GW/SW Contractor	GW		X		X	X	X	X	Field Blank. See Note 4.
FB-8	GW/SW Contractor	GW		X		X	X	X	X	Field Blank. See Note 4.
FB-9	GW/SW Contractor	GW		X		X	X	X	X	Field Blank. See Note 4.
FB-10	GW/SW Contractor	SW		X				X	X	Field Blank. See Note 4.
FB-11	GW/SW Contractor	SW		X				X	X	Field Blank. See Note 4.
FD-1	GWETS Operator	GW		X	X	X	X	X	X	Field Duplicate. See Note 4.
FD-2	GWETS Operator	GW		X	X	X	X	X	X	Field Duplicate. See Note 4.
FD-3	GWETS Operator	GW		X	X	X	X	X	X	Field Duplicate. See Note 4.
FD-4	GW/SW Contractor	GW		X	X	X	X	X	X	Field Duplicate. See Note 4.
FD-5	GW/SW Contractor	GW		X		X	X	X	X	Field Duplicate. See Note 4.
FD-6	GW/SW Contractor	GW		X		X	X	X	X	Field Duplicate. See Note 4.
FD-7	GW/SW Contractor	GW		X		X	X	X	X	Field Duplicate. See Note 4.
FD-8	GW/SW Contractor	GW		X		X	X	X	X	Field Duplicate. See Note 4.
FD-9	GW/SW Contractor	GW		X		X	X	X	X	Field Duplicate. See Note 4.
FD-10	GW/SW Contractor	SW		X				X	X	Field Duplicate. See Note 4.
FD-11	GW/SW Contractor	SW		X				X	X	Field Duplicate. See Note 4.
Total Samples			184	225	76	188	188	225	225	

TABLE 5: SEMI-ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)	

Notes:
GW = groundwater
GW/SW Contractor = Groundwater and Surface Water Sampling Contractor
GWETS Operator = Groundwater Extraction and Treatment System Operator
NPDES = National Pollutant Discharge Elimination System
NA = not applicable
SW = surface water
UIC = Underground Injection Control

1. Recent monitoring events indicate this well is dry (i.e. groundwater elevation is below the bottom of the well screen elevation). The well will continue to be monitored as part of the Groundwater Monitoring Program, but samples will only be collected if the water level is determined to be above the bottom of the well screen.
2. Analytical samples will be collected at whichever extraction well within a pair of buddy wells is actively pumping at the time of sampling. DTW will be measured at both wells within a pair of buddy wells.
3. Well M-10 is sampled for additional analytes per the NPDES permit (ammonia as nitrogen, total arsenic, total boron, chloride, total iron, total manganese, nitrate as nitrogen, nitrite as nitrogen, total inorganic nitrogen, total selenium).
4. Quality Assurance/Quality Control (QA/QC) samples (equipment blanks, field blanks, and field duplicates) should be collected at wells where primary samples are analyzed for the same suite of analytes required for the QA/QC sample.

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
AA-01	GW/SW Contractor	GW	X	X				X			
AA-11	GW/SW Contractor	GW	X	X				X			See Note 1.
AA-18	GW/SW Contractor	GW	X	X				X			
AA-30	GW/SW Contractor	GW	X	X		X		X	X		
AA-UW2	GW/SW Contractor	GW	X	X				X			
ARP-1	GW/SW Contractor	GW	X	X		X	X	X	X	X	
ARP-2A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
ARP-3A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
ARP-4A	GW/SW Contractor	GW	X	X		X	X	X	X	X	See Note 1.
ARP-5A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
ARP-6B	GW/SW Contractor	GW	X	X		X	X	X	X	X	
ARP-7	GW/SW Contractor	GW	X	X		X	X	X	X	X	
ART-1	GWETS Operator	GW	X	X	X	X	X	X	X		See Note 2.
ART-1A	GWETS Operator	GW	X								Buddy well to ART-1. See Note 2.
ART-2	GWETS Operator	GW	X	X	X	X	X	X	X		See Note 2.
ART-2A	GWETS Operator	GW	X								Buddy well to ART-2. See Note 2.
ART-3	GWETS Operator	GW	X	X	X	X	X	X	X		See Note 2.
ART-3A	GWETS Operator	GW	X								Buddy well to ART-3. See Note 2.
ART-4	GWETS Operator	GW	X	X	X	X	X	X	X		See Note 2.
ART-4A	GWETS Operator	GW	X								Buddy well to ART-4. See Note 2.
ART-6	GW/SW Contractor	GW	X	X		X	X	X	X	X	
ART-7A	GWETS Operator	GW	X								Buddy well to ART-7B. See Note 2.
ART-7B	GWETS Operator	GW	X	X	X	X	X	X	X		See Note 2.
ART-8	GWETS Operator	GW	X	X	X	X	X	X	X		See Note 2.
ART-8A	GWETS Operator	GW	X								Buddy well to ART-8. See Note 2.
ART-9	GWETS Operator	GW	X	X	X	X	X	X	X		
BEC-10	GW/SW Contractor	GW	X	X				X			
BEC-12	GW/SW Contractor	GW	X	X				X			

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
C12	GW/SW Contractor	SW		X				X	X		
C1-E	GW/SW Contractor	SW		X				X	X		
C1-W	GW/SW Contractor	SW		X				X	X		
DBMW-4	GW/SW Contractor	GW	X	X				X			
DBMW-5	GW/SW Contractor	GW	X	X				X			
DBMW-7	GW/SW Contractor	GW	X	X				X			
DBMW-8	GW/SW Contractor	GW	X	X				X			
DBMW-9	GW/SW Contractor	GW	X	X				X			
DBMW-10	GW/SW Contractor	GW	X	X				X			
DBMW-11	GW/SW Contractor	GW	X	X				X			
DBMW-12	GW/SW Contractor	GW	X	X				X			
DBMW-13	GW/SW Contractor	GW	X	X				X			
DBMW-14	GW/SW Contractor	GW	X	X				X			
DBMW-15	GW/SW Contractor	GW	X	X				X			
DBMW-16	GW/SW Contractor	GW	X	X				X			
DBMW-17	GW/SW Contractor	GW	X	X				X			
DBMW-18	GW/SW Contractor	GW	X	X				X			
DFW-03	GW/SW Contractor	GW	X	X		X	X	X	X	X	
DFW-04	GW/SW Contractor	GW	X	X		X	X	X	X	X	
DFW-05	GW/SW Contractor	GW	X	X		X	X	X	X	X	
DFW-06	GW/SW Contractor	GW	X	X		X	X	X	X	X	
E1-1	GWETS Operator	GW	X	X	X	X	X	X	X		
E1-2	GWETS Operator	GW	X	X	X	X	X	X	X		
E1-3	GWETS Operator	GW	X	X	X	X	X	X	X		
E2-1	GWETS Operator	GW	X	X	X	X	X	X	X		
E2-2	GWETS Operator	GW	X	X	X	X	X	X	X		
E2-3	GWETS Operator	GW	X	X	X	X	X	X	X		
E2-4	GWETS Operator	GW	X	X	X	X	X	X	X		

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
E2-5	GWETS Operator	GW	X	X	X	X	X	X	X		
ES-1	GW/SW Contractor	GW	X	X				X			
ES-2	GW/SW Contractor	GW	X	X				X			
ES-3	GW/SW Contractor	GW	X	X				X			
ES-4	GW/SW Contractor	GW	X	X				X			
ES-5	GW/SW Contractor	GW	X	X				X			
ES-6	GW/SW Contractor	GW	X	X				X			
ES-7	GW/SW Contractor	GW	X	X				X			
ES-8A	GW/SW Contractor	GW	X	X				X			
ES-8B	GW/SW Contractor	GW	X	X				X			
ES-9	GW/SW Contractor	GW	X	X				X			
ES-10	GW/SW Contractor	GW	X	X				X			
ES-11	GW/SW Contractor	GW	X	X				X			
ES-12	GW/SW Contractor	GW	X	X				X			
ES-13	GW/SW Contractor	GW	X	X				X			
ES-14A	GW/SW Contractor	GW	X	X				X			
ES-14B	GW/SW Contractor	GW	X	X				X			
ES-15	GW/SW Contractor	GW	X	X				X			
ES-16	GW/SW Contractor	GW	X	X				X			
ES-17	GW/SW Contractor	GW	X	X				X			
ES-18	GW/SW Contractor	GW	X	X				X			
ES-19	GW/SW Contractor	GW	X	X				X			
ES-20	GW/SW Contractor	GW	X	X				X			
ES-21A	GW/SW Contractor	GW	X	X		X		X			
ES-21B	GW/SW Contractor	GW	X	X		X		X			
ES-22A	GW/SW Contractor	GW	X	X		X		X			
ES-22B	GW/SW Contractor	GW	X	X		X		X			
ES-23A	GW/SW Contractor	GW	X	X		X		X			

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
ES-23B	GW/SW Contractor	GW	X	X		X		X			
ES-24	GW/SW Contractor	GW	X	X		X		X			
ES-25A	GW/SW Contractor	GW	X	X		X		X			
ES-25B	GW/SW Contractor	GW	X	X		X		X			
ES-26	GW/SW Contractor	GW	X	X		X		X			
ES-27	GW/SW Contractor	GW	X	X		X		X			
ES-28	GW/SW Contractor	GW	X	X				X			
ES-30	GW/SW Contractor	GW	X	X				X			
ES-31	GW/SW Contractor	GW	X	X				X			
ES-32	GW/SW Contractor	GW	X	X				X			
ES-45	GW/SW Contractor	GW	X	X		X		X			
ES-46	GW/SW Contractor	GW	X	X		X		X			
ES-47	GW/SW Contractor	GW	X	X		X		X			
ES-48	GW/SW Contractor	GW	X	X		X		X			
ES-49	GW/SW Contractor	GW	X	X		X		X			
ES-50	GW/SW Contractor	GW	X	X		X		X			
ES-51	GW/SW Contractor	GW	X	X		X		X			
ES-52	GW/SW Contractor	GW	X	X		X		X			
H-28A	GW/SW Contractor	GW	X	X		X	X	X	X	X	RCRA well. See Note 3.
H-56R	GW/SW Contractor	GW	X	X		X	X	X	X	X	
H-58R	GW/SW Contractor	GW	X	X		X	X	X	X	X	
HM-2	GW/SW Contractor	GW	X	X		X		X	X		
HMW-13	GW/SW Contractor	GW	X	X			X	X	X	X	
HMW-14	GW/SW Contractor	GW	X	X			X	X	X	X	
HMW-15	GW/SW Contractor	GW	X	X			X	X	X	X	
HMW-16	GW/SW Contractor	GW	X	X			X	X	X	X	
I-AA	GWETS Operator	GW	X	X	X	X	X	X	X		
I-AB	GWETS Operator	GW	X	X	X	X	X	X	X		

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
I-AC	GWETS Operator	GW	X	X	X	X	X	X	X		
I-AD	GWETS Operator	GW	X	X	X	X	X	X	X		
I-AR	GWETS Operator	GW	X	X	X	X	X	X	X		
I-B	GWETS Operator	GW	X	X	X	X	X	X	X		
I-C	GWETS Operator	GW	X	X	X	X	X	X	X		
I-D	GWETS Operator	GW	X	X	X	X	X	X	X		
I-E	GWETS Operator	GW	X	X	X	X	X	X	X		
I-F	GWETS Operator	GW	X	X	X	X	X	X	X		
I-G	GWETS Operator	GW	X	X	X	X	X	X	X		
I-H	GWETS Operator	GW	X	X	X	X	X	X	X		
I-I	GWETS Operator	GW	X	X	X	X	X	X	X		
I-J	GWETS Operator	GW	X	X	X	X	X	X	X		
I-K	GWETS Operator	GW	X	X	X	X	X	X	X		
I-L	GWETS Operator	GW	X	X	X	X	X	X	X		
I-M	GWETS Operator	GW	X	X	X	X	X	X	X		
I-N	GWETS Operator	GW	X	X	X	X	X	X	X		
I-O	GWETS Operator	GW	X	X	X	X	X	X	X		
I-P	GWETS Operator	GW	X	X	X	X	X	X	X		
I-Q	GWETS Operator	GW	X	X	X	X	X	X	X		
I-R	GWETS Operator	GW	X	X	X	X	X	X	X		
I-S	GWETS Operator	GW	X	X	X	X	X	X	X		
I-T	GWETS Operator	GW	X	X	X	X	X	X	X		
I-U	GWETS Operator	GW	X	X	X	X	X	X	X		
I-V	GWETS Operator	GW	X	X	X	X	X	X	X		
I-W	GWETS Operator	GW	X	X	X	X	X	X	X		
I-X	GWETS Operator	GW	X	X	X	X	X	X	X		
I-Y	GWETS Operator	GW	X	X	X	X	X	X	X		
I-Z	GWETS Operator	GW	X	X	X	X	X	X	X		

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
LVW 0.55	GW/SW Contractor	SW		X				X	X		
LVW 3.5-1	GW/SW Contractor	SW		X				X	X		
LVW 3.5-2	GW/SW Contractor	SW		X				X	X		
LVW 3.5-3	GW/SW Contractor	SW		X				X	X		
LVW 3.5-4	GW/SW Contractor	SW		X				X	X		
LVW 3.5-5	GW/SW Contractor	SW		X				X	X		
LVW 3.5-6	GW/SW Contractor	SW		X				X	X		
LVW 4.2-1	GW/SW Contractor	SW		X				X	X		
LVW 4.2-2	GW/SW Contractor	SW		X				X	X		
LVW 4.2-3	GW/SW Contractor	SW		X				X	X		
LVW 4.2-4	GW/SW Contractor	SW		X				X	X		
LVW 4.75-1	GW/SW Contractor	SW		X				X	X		
LVW 4.75-2	GW/SW Contractor	SW		X				X	X		
LVW 4.75-3	GW/SW Contractor	SW		X				X	X		
LVW 4.75-4	GW/SW Contractor	SW		X				X	X		
LVW 4.75-5	GW/SW Contractor	SW		X				X	X		
LVW 5.3-1	GW/SW Contractor	SW		X				X	X		
LVW 5.3-2	GW/SW Contractor	SW		X				X	X		
LVW 5.3-3	GW/SW Contractor	SW		X				X	X		
LVW 5.3-4	GW/SW Contractor	SW		X				X	X		
LVW 5.3-5	GW/SW Contractor	SW		X				X	X		
LVW 5.3-6	GW/SW Contractor	SW		X				X	X		
LVW 6.05	GW/SW Contractor	SW		X				X	X		
LVW 6.6-1	GW/SW Contractor	SW		X				X	X		
LVW 6.6-2	GW/SW Contractor	SW		X				X	X		
LVW 6.6-3	GW/SW Contractor	SW		X				X	X		
LVW 7.2	GW/SW Contractor	SW		X				X	X		
LVW 8.85	GW/SW Contractor	SW		X				X	X		

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
LVWPS-MW102A	GW/SW Contractor	GW	X	X		X		X	X		
LVWPS-MW102B	GW/SW Contractor	GW	X	X		X		X	X		
LVWPS-MW105	GW/SW Contractor	GW	X	X		X		X	X		
LVWPS-MW201A	GW/SW Contractor	GW	X	X		X		X	X		
LVWPS-MW201B	GW/SW Contractor	GW	X	X		X		X	X		
LVWPS-MW224A	GW/SW Contractor	GW	X	X		X		X	X		
LVWPS-MW224B	GW/SW Contractor	GW	X	X		X		X	X		
M-2A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-5A	GW/SW Contractor	GW	X	X		X	X	X	X	X	RCRA well. See Note 3.
M-6A	GW/SW Contractor	GW	X	X		X	X	X	X	X	RCRA well. See Note 3.
M-7B	GW/SW Contractor	GW	X	X		X	X	X	X	X	RCRA well. See Note 3.
M-10	GW/SW Contractor	GW	X	X	X	X	X	X	X	X	NPDES Permit well. See Note 4.
M-11	GW/SW Contractor	GW	X	X	X	X	X	X	X	X	UIC Permit well.
M-12A	GW/SW Contractor	GW	X	X	X	X	X	X	X	X	UIC Permit well.
M-13	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-14A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-19	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-21	GW/SW Contractor	GW	X	X		X	X	X	X	X	See Note 1.
M-22A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-23	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-25	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-31A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-32	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-33	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-35	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-37	GW/SW Contractor	GW	X	X	X	X	X	X	X	X	UIC Permit well.
M-38	GW/SW Contractor	GW	X	X	X	X	X	X	X	X	UIC Permit well.
M-44	GW/SW Contractor	GW	X	X	X	X	X	X	X	X	UIC Permit well.

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
M-48A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-52	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-55	GW/SW Contractor	GW	X								
M-56	GW/SW Contractor	GW	X								
M-57A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-58	GW/SW Contractor	GW	X								
M-60	GW/SW Contractor	GW	X								
M-64	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-65	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-66	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-67	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-68	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-69	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-70	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-71	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-72	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-73	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-74	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-75	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-76	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-77R	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-78	GW/SW Contractor	GW	X								
M-79	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-80	GW/SW Contractor	GW	X	X	X	X	X	X	X	X	UIC Permit well.
M-81A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-83	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-92	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-93	GW/SW Contractor	GW	X	X		X	X	X	X	X	

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
M-95	GW/SW Contractor	GW	X	X	X	X	X	X	X	X	UIC Permit well. See Note 1.
M-96	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-97	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-98	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-99	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-100	GW/SW Contractor	GW	X	X	X	X	X	X	X	X	UIC Permit well. See Note 1.
M-101	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-103	GW/SW Contractor	GW	X	X		X	X	X	X	X	See Note 1.
M-115	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-117	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-118	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-120	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-121	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-123	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-124	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-125	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-126	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-129	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-132	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-133	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-134	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-135	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-136	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-137	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-138	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-139	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-140	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-141	GW/SW Contractor	GW	X	X		X	X	X	X	X	

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
M-142	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-144	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-145	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-147	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-148A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-149	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-150	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-151	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-152	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-153	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-154	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-155	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-156	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-159	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-160	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-161	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-161D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-162	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-162D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-163	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-164	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-165	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-166	GW/SW Contractor	GW	X								
M-167	GW/SW Contractor	GW	X								
M-168	GW/SW Contractor	GW	X								
M-169	GW/SW Contractor	GW	X								
M-170	GW/SW Contractor	GW	X								
M-172	GW/SW Contractor	GW	X								

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
M-173	GW/SW Contractor	GW	X								
M-174	GW/SW Contractor	GW	X								
M-175	GW/SW Contractor	GW	X								
M-176	GW/SW Contractor	GW	X								
M-177	GW/SW Contractor	GW	X								
M-181	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-182	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-186	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-186D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-189	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-190	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-191	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-192	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-193	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-204	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-205	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-206	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-207	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-208	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-209	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-210	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-211	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-212	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-213	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-214	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-220	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-260	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-261	GW/SW Contractor	GW	X	X		X	X	X	X	X	

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level NA	Chlorate EPA 300.1 (no field filtration)	Chromium, Hexavalent EPA 218.6 (no field filtration)	Chromium, Total EPA 200.7 (no field filtration)	Nitrate as N EPA 300.0 (no field filtration)	Perchlorate EPA 314.0 (no field filtration)	Total Dissolved Solids SM 2540C (no field filtration)	VOCs (see Table 7)	Comments
M-262	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-263	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-264	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-265	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-266	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-267	GW/SW Contractor	GW	X	X		X	X	X	X	X	
M-268	GW/SW Contractor	GW	X	X		X	X	X	X	X	
MC-3	GW/SW Contractor	GW	X	X			X	X	X	X	
MC-6	GW/SW Contractor	GW	X	X			X	X	X	X	
MC-7	GW/SW Contractor	GW	X	X			X	X	X	X	
MC-50	GW/SW Contractor	GW	X	X			X	X	X	X	
MC-51	GW/SW Contractor	GW	X	X			X	X	X	X	
MC-53	GW/SW Contractor	GW	X	X		X	X	X	X	X	
MC-65R2	GW/SW Contractor	GW	X	X		X	X	X	X	X	
MC-69	GW/SW Contractor	GW	X	X			X	X	X	X	
MC-93	GW/SW Contractor	GW	X	X			X	X	X	X	
MC-97	GW/SW Contractor	GW	X	X			X	X	X	X	
MC-MW-37R2	GW/SW Contractor	GW	X	X		X	X	X	X	X	
MCF-06B	GW/SW Contractor	GW	X	X				X			
MCF-06C	GW/SW Contractor	GW	X	X				X			
MW-02	GW/SW Contractor	GW	X	X		X		X	X		
MW-3	GW/SW Contractor	GW	X	X		X		X	X		
MW-4	GW/SW Contractor	GW	X	X		X		X	X		
MW-13	GW/SW Contractor	GW	X	X		X		X	X		
MW-16	GW/SW Contractor	GW	X	X		X	X	X	X	X	
MW-20	GW/SW Contractor	GW	X	X		X		X	X		
MW-25	GW/SW Contractor	GW	X	X		X		X	X		
MW-K4	GW/SW Contractor	GW	X	X		X	X	X	X	X	

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
MW-K5	GW/SW Contractor	GW	X	X		X	X	X	X	X	
NERT3.35S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT3.40S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT3.58N1	GW/SW Contractor	GW	X	X		X		X	X		
NERT3.58S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT3.60N1	GW/SW Contractor	GW	X	X		X		X	X		
NERT3.60S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT3.63S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT3.80S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT3.98S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.21N1	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.38N1	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.51S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.64N1	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.64S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.65N1	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.70N1	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.71N1	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.71S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.71S2	GW/SW Contractor	GW	X	X		X		X	X		
NERT4.93S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT5.11S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT5.49S1	GW/SW Contractor	GW	X	X		X		X	X		
NERT5.91S1	GW/SW Contractor	GW	X	X		X		X	X		
PC-1	GW/SW Contractor	GW	X	X		X	X	X	X	X	See Note 1.
PC-2	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-4	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-18	GW/SW Contractor	GW	X	X		X	X	X	X	X	

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
PC-21A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-24	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-28	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-31	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-40R	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-50	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-53	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-54	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-55	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-56	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-58	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-59	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-60	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-62	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-64	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-65	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-66	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-67	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-71	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-72	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-74	GW/SW Contractor	GW	X	X			X	X	X	X	
PC-76	GW/SW Contractor	GW	X								
PC-77	GW/SW Contractor	GW	X	X			X	X	X	X	
PC-78	GW/SW Contractor	GW	X								
PC-79	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-80	GW/SW Contractor	GW	X								
PC-81	GW/SW Contractor	GW	X								
PC-82	GW/SW Contractor	GW	X	X			X	X	X	X	

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
PC-83	GW/SW Contractor	GW	X								
PC-86	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-87	GW/SW Contractor	GW	X								
PC-88	GW/SW Contractor	GW	X								
PC-90	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-91	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-94	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-96	GW/SW Contractor	GW	X	X			X	X	X	X	
PC-97	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-98R	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-99R2/R3	GWETS Operator	GW	X	X	X	X	X	X	X		
PC-101R	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-103	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-107	GW/SW Contractor	GW	X	X			X	X	X	X	
PC-108	GW/SW Contractor	GW	X	X			X	X	X	X	
PC-110	GW/SW Contractor	GW	X	X			X	X	X	X	
PC-115R	GWETS Operator	GW	X	X	X	X	X	X	X		
PC-116R	GWETS Operator	GW	X	X	X	X	X	X	X		
PC-117	GWETS Operator	GW	X	X	X	X	X	X	X		
PC-118	GWETS Operator	GW	X	X	X	X	X	X	X		
PC-119	GWETS Operator	GW	X	X	X	X	X	X	X		
PC-120	GWETS Operator	GW	X	X	X	X	X	X	X		
PC-121	GWETS Operator	GW	X	X	X	X	X	X	X		
PC-122	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-123	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-124	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-125	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-126	GW/SW Contractor	GW	X	X		X	X	X	X	X	

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
PC-127	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-128	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-129	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-130	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-131	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-132	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-133	GWETS Operator	GW	X	X	X	X	X	X	X		
PC-134A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-134D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-135A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-136	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-137	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-137D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-142	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-143	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-144	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-145	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-146	GW/SW Contractor	GW	X	X		X	X	X	X	X	See Note 1.
PC-147	GW/SW Contractor	GW	X	X		X	X	X	X	X	See Note 1.
PC-148	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-149	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-150	GWETS Operator	GW	X	X	X	X	X	X	X		
PC-151	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-152	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-153R	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-154	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-155A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-155B	GW/SW Contractor	GW	X	X		X	X	X	X	X	

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
PC-156A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-156B	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-157A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-157B	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-158	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-159	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-160	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-188	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-189	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-191	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-195	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-196	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-197	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-198	GW/SW Contractor	GW	X	X		X	X	X	X	X	
PC-199	GW/SW Contractor	GW	X	X		X	X	X	X	X	
SWFTS-MW07A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
SWFTS-MW08A	GW/SW Contractor	GW	X	X		X	X	X	X	X	
SWFTS-MW08C	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-1	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-2	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-3	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-4	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-5	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-6	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-7	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-8	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-9	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-10	GW/SW Contractor	GW	X	X		X	X	X	X	X	

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
TR-11	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TR-12	GW/SW Contractor	GW	X	X		X	X	X	X	X	
UFMW-01D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
UFMW-02D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
UFMW-03D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
UFMW-04D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
UFMW-05D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
UFMW-06D	GW/SW Contractor	GW	X	X		X	X	X	X	X	
TB-#	GW/SW Contractor	GW								36	Trip Blank. See Note 5.
EB-1	GWETS Operator	GW		X	X	X	X	X	X		Equipment Blank. See Note 6.
EB-2	GWETS Operator	GW		X	X	X	X	X	X		Equipment Blank. See Note 6.
EB-3	GWETS Operator	GW		X	X	X	X	X	X		Equipment Blank. See Note 6.
EB-4	GW/SW Contractor	GW		X	X	X	X	X	X	X	Equipment Blank. See Note 6.
EB-5	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-6	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-7	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-8	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-9	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-10	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-11	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-12	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-13	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-14	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-15	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-16	GW/SW Contractor	GW		X		X	X	X	X	X	Equipment Blank. See Note 6.
EB-17	GW/SW Contractor	GW		X			X	X	X	X	Equipment Blank. See Note 6.
EB-18	GW/SW Contractor	GW		X		X		X	X		Equipment Blank. See Note 6.
EB-19	GW/SW Contractor	GW		X		X		X	X		Equipment Blank. See Note 6.

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
EB-20	GW/SW Contractor	GW		X		X		X			Equipment Blank. See Note 6.
EB-21	GW/SW Contractor	GW		X				X			Equipment Blank. See Note 6.
EB-22	GW/SW Contractor	GW		X				X			Equipment Blank. See Note 6.
EB-23	GW/SW Contractor	GW		X				X			Equipment Blank. See Note 6.
EB-24	GW/SW Contractor	SW		X				X	X		Equipment Blank. See Note 6.
EB-25	GW/SW Contractor	SW		X				X	X		Equipment Blank. See Note 6.
FB-1	GWETS Operator	GW		X	X	X	X	X	X		Field Blank. See Note 6.
FB-2	GWETS Operator	GW		X	X	X	X	X	X		Field Blank. See Note 6.
FB-3	GWETS Operator	GW		X	X	X	X	X	X		Field Blank. See Note 6.
FB-4	GW/SW Contractor	GW		X	X	X	X	X	X	X	Field Blank. See Note 6.
FB-5	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-6	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-7	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-8	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-9	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-10	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-11	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-12	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-13	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-14	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-15	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-16	GW/SW Contractor	GW		X		X	X	X	X	X	Field Blank. See Note 6.
FB-17	GW/SW Contractor	GW		X			X	X	X	X	Field Blank. See Note 6.
FB-18	GW/SW Contractor	GW		X		X		X	X		Field Blank. See Note 6.
FB-19	GW/SW Contractor	GW		X		X		X	X		Field Blank. See Note 6.
FB-20	GW/SW Contractor	GW		X		X		X			Field Blank. See Note 6.
FB-21	GW/SW Contractor	GW		X				X			Field Blank. See Note 6.
FB-22	GW/SW Contractor	GW		X				X			Field Blank. See Note 6.

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	**Party Responsible for Sampling**	**Matrix**	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	**Comments**
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
FB-23	GW/SW Contractor	GW		X				X			Field Blank. See Note 6.
FB-24	GW/SW Contractor	SW		X				X	X		Field Blank. See Note 6.
FB-25	GW/SW Contractor	SW		X				X	X		Field Blank. See Note 6.
FD-1	GWETS Operator	GW		X	X	X	X	X	X		Field Duplicate. See Note 6.
FD-2	GWETS Operator	GW		X	X	X	X	X	X		Field Duplicate. See Note 6.
FD-3	GWETS Operator	GW		X	X	X	X	X	X		Field Duplicate. See Note 6.
FD-4	GW/SW Contractor	GW		X	X	X	X	X	X	X	Field Duplicate. See Note 6.
FD-5	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-6	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-7	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-8	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-9	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-10	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-11	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-12	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-13	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-14	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-15	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-16	GW/SW Contractor	GW		X		X	X	X	X	X	Field Duplicate. See Note 6.
FD-17	GW/SW Contractor	GW		X			X	X	X	X	Field Duplicate. See Note 6.
FD-18	GW/SW Contractor	GW		X		X		X	X		Field Duplicate. See Note 6.
FD-19	GW/SW Contractor	GW		X		X		X	X		Field Duplicate. See Note 6.
FD-20	GW/SW Contractor	GW		X		X		X			Field Duplicate. See Note 6.
FD-21	GW/SW Contractor	GW		X				X			Field Duplicate. See Note 6.
FD-22	GW/SW Contractor	GW		X				X			Field Duplicate. See Note 6.
FD-23	GW/SW Contractor	GW		X				X			Field Duplicate. See Note 6.

TABLE 6: ANNUAL MONITORING PROGRAM SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Party Responsible for Sampling	Matrix	Water Level	Chlorate	Chromium, Hexavalent	Chromium, Total	Nitrate as N	Perchlorate	Total Dissolved Solids	VOCs (see Table 7)	Comments
			NA	EPA 300.1 (no field filtration)	EPA 218.6 (no field filtration)	EPA 200.7 (no field filtration)	EPA 300.0 (no field filtration)	EPA 314.0 (no field filtration)	SM 2540C (no field filtration)		
FD-24	GW/SW Contractor	SW		X				X	X		Field Duplicate. See Note 6.
FD-25	GW/SW Contractor	SW		X				X	X		Field Duplicate. See Note 6.
Total Samples			453	530	76	414	370	530	451	306	

Notes:

GW = groundwater
GW/SW Contractor = Groundwater and Surface Water Sampling Contractor
GWETS Operator = Groundwater Extraction and Teatment System Operator
NPDES = National Pollutant Discharge Elimination System
NA = not applicable
RCRA = Resource Conservation and Recovery Act
SW = surface water
UIC = Underground Injection Control
VOCs = volatile organic compounds

1. Recent monitoring events indicate this well is dry (i.e. groundwater elevation is below the bottom of the well screen elevation). The well will continue to be monitored as part of the Groundwater Monitoring Program, but samples will only be collected if the water level is determined to be above the bottom of the well screen.
2. Analytical samples will be collected at whichever extraction well within a pair of buddy wells is actively pumping at the time of sampling. DTW will be measured at both wells within a pair of buddy wells.
3. The 4 RCRA wells (H-28A, M-5A, M-6A, M-7B) are sampled as part of the groundwater monitoring program only in second quarter (annual event) and third quarter (quarterly event). They are not sampled in first quarter (quarterly event). Additional analyses required by RCRA are total boron, chloride, total iron, total manganese, phenols, total sodium, specific conductance, sulfate, total organic carbon, and total organic halides (4 replicates).
4. Well M-10 is sampled for additional analytes per the NPDES permit (ammonia as nitrogen, total arsenic, total boron, chloride, total iron, total manganese, nitrate as nitrogen, nitrite as nitrogen, total inorganic nitrogen, total selenium).
5. One per shipment containing VOCs. Assumed number of VOC-containing shipments in this table is 36. Trip blanks should be analyzed for VOCs, as indicated in this table.
6. Quality Assurance/Quality Control (QA/QC) samples (equipment blanks, field blanks, and field duplicates) should be collected at wells where primary samples are analyzed for the same suite of analytes required for the QA/QC sample.

TABLE 7: MONITORING PROGRAM VOCs LIST
Nevada Environmental Response Trust Site
Henderson, Nevada

Method	Analyte	CAS Number	Practical Quantitation Limit (ug/L)	Method Detection Limit (ug/L)
EPA Method 8260B SIM	1,2,3-Trichloropropane	96-18-4	0.005	0.0035
	1,4-Dioxane	123-91-1	2	0.5
EPA Method 8260B	1,1,1,2-Tetrachloroethane	630-20-6	0.5	0.25
	1,1,1-Trichloroethane	71-55-6	0.5	0.25
	1,1,2,2-Tetrachloroethane	79-34-5	0.5	0.25
	1,1,2-Trichloroethane	79-00-5	0.5	0.25
	1,1-Dichloroethane	75-34-3	0.5	0.25
	1,1-Dichloroethene	75-35-4	0.5	0.25
	1,1-Dichloropropene	563-58-6	0.5	0.25
	1,2,3-Trichlorobenzene	87-61-6	1.0	0.4
	1,2,3-Trichloropropane	96-18-4	0.5	0.25
	1,2,4-Trichlorobenzene	120-82-1	1.0	0.4
	1,2,4-Trimethylbenzene	95-63-6	0.5	0.25
	1,2-Dibromo-3-Chloropropane	96-12-8	1.0	0.5
	1,2-Dibromoethane (EDB)	106-93-4	0.5	0.25
	1,2-Dichlorobenzene	95-50-1	0.5	0.5
	1,2-Dichloroethane	107-06-2	0.5	0.25
	1,2-Dichloropropane	78-87-5	0.5	0.25
	1,3,5-Trimethylbenzene	108-67-8	0.5	0.25
	1,3-Dichlorobenzene	541-73-1	0.5	0.25
	1,3-Dichloropropane	142-28-9	0.5	0.25
	1,4-Dichlorobenzene	106-46-7	0.5	0.25
	2,2-Dichloropropane	594-20-7	1.0	0.25
	2-Butanone	78-93-3	5.0	2.5
	2-Chlorotoluene	95-49-8	0.5	0.25
	4-Chlorotoluene	106-43-4	0.5	0.25
	Benzene	71-43-2	0.5	0.25
	Bromobenzene	108-86-1	0.5	0.25
	Bromochloromethane	74-97-5	0.5	0.25
	Bromodichloromethane	75-27-4	0.5	0.25
	Bromoform	75-25-2	1.0	0.25
	Bromomethane	74-83-9	0.5	0.25
	Carbon tetrachloride	56-23-5	0.5	0.25
	Chlorobenzene	108-90-7	0.5	0.25
	Chloroethane	75-00-3	0.5	0.25
	Chloroform	67-66-3	0.5	0.25
	Chloromethane	74-87-3	0.5	0.25
	cis-1,2-Dichloroethene	156-59-2	0.5	0.25
	cis-1,3-Dichloropropene	10061-01-5	0.5	0.25
	Dibromochloromethane	124-48-1	0.5	0.25
	Dibromomethane	74-95-3	0.5	0.25
	Dichlorodifluoromethane	75-71-8	0.5	0.25
	Ethylbenzene	100-41-4	0.5	0.25
	Ethyl ter-butyl ether (ETBE)	637-92-3	0.5	0.25
	Hexachlorobutadiene	87-68-3	0.5	0.25

TABLE 7: MONITORING PROGRAM VOCs LIST
Nevada Environmental Response Trust Site
Henderson, Nevada

Method	Analyte	CAS Number	Practical Quantitation Limit (ug/L)	Method Detection Limit (ug/L)
EPA Method 8260B	Isopropyl benzene	98-82-8	0.5	0.25
	m,p-Xylene	179601-23-1	1.0	0.5
	Methylene Chloride	75-09-2	2.0	0.88
	Naphthalene	91-20-3	1.0	0.4
	n-Butylbenzene	104-51-8	1.0	0.4
	n-Propylbenzene	103-65-1	0.5	0.25
	o-Xylene	95-47-6	0.5	0.25
	p-Isopropyltoluene	99-87-6	0.5	0.25
	sec-Butylbenzene	135-98-8	0.5	0.25
	Styrene	100-42-5	0.5	0.25
	tert-Butylbenzene	98-06-6	0.5	0.25
	Tetrachloroethene	127-18-4	0.5	0.25
	Toluene	108-88-3	0.5	0.25
	trans-1,2-Dichloroethene	156-60-5	0.5	0.25
	trans-1,3-Dichloropropene	10061-02-6	0.5	0.25
	Trichloroethene	79-01-6	0.5	0.25
	Trichlorofluoromethane	75-69-4	0.5	0.25
	Vinyl chloride	75-01-4	0.5	0.25

Notes:

CAS = Chemical Abstracts Service

EPA = United States Environmental Protection Agency

SIM = Selective Ion Monitoring

ug/L = micrograms per liter

VOCs = Volatile Organic Compounds

TABLE 8: TRANSDUCER NETWORK SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
AA-07	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
AA-09	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
AA-30	TNM	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
AA-UW2	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
COH-2B1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
DBMW-3	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
DBMW-10	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
DBMW-18	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
ES-7	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
ES-8A	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
ES-8B	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
ES-12	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
ES-26	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
ES-28	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow

TABLE 8: TRANSDUCER NETWORK SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
HM-2	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
LNDMW-1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
LNDMW-2	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
LVWPS-MW107A	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	Qal	Shallow
LVWPS-MW107C	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Middle
M-13	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-25	GW/SW	GW/SW	GW/SW	GW/SW	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
M-44	GW/SW	GW/SW	GW/SW	GW/SW	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
M-71	GW/SW	GW/SW	GW/SW	GW/SW	Aqua TROLL 200 w/Tube 300R	Every 60 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
M-121	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-145	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-152	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Middle
M-156	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Middle
M-162D	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Middle

TABLE 8: TRANSDUCER NETWORK SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
M-163	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
M-186D	GW/SW	TNM	GW/SW	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
M-189	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-193	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-211	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
M-212	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-213	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
MC-50	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
MCF-01A	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Deep
MCF-01B	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
MCF-06B	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
MCF-06C	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
MCF-07	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Deep
MCF-09B	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Middle

TABLE 8: TRANSDUCER NETWORK SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
MCF-11	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Middle
MCF-20A	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Deep
MCF-24B	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
MCF-28A	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Deep
MCF-28B	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Middle
MCF-31A	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Deep
MCF-31B	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Middle
MW-1	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
MW-13	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
MW-20	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.35S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.40S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.58N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.58S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow

TABLE 8: TRANSDUCER NETWORK SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
NERT3.60N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.60S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.63S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.80S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.98S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal/UMCf	Shallow
NERT4.21N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.38N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.51S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.64N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.64S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.65N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.70N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.71N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.71S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow

TABLE 8: TRANSDUCER NETWORK SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
NERT4.71S2	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.93S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT5.11S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT5.49S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT5.91S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-40R	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
PC-56	GW/SW	GW/SW	GW/SW	GW/SW	Aqua TROLL 200 w/Tube 300R	Every 15 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
PC-64	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
PC-67	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
PC-74	GW/SW	TNM	TNM	TNM	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-77	GW/SW	TNM	TNM	TNM	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-88	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-98R[5]	GW/SW	GW/SW	GW/SW	GW/SW	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-108	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	Qal	Shallow

TABLE 8: TRANSDUCER NETWORK SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
PC-125	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
PC-130	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
PC-136	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-137	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
PC-137D	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
PC-152	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
PC-155A	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-155B	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal/UMCf	Shallow
PC-156A	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-156B	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-157A	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-157B	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-171 (Barologger)	TNM	TNM	TNM	TNM	BaroTROLL	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
S3.50[6]	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water

TABLE 8: TRANSDUCER NETWORK SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
S3.75	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
S3.80	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
S4.60	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
S4.65	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
S4.75	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
S5.30	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
TR-4	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
TR-6	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
TR-7	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
TR-9	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
TR-10	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
WMW3.5N	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW3.5S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW4.9N	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow

TABLE 8: TRANSDUCER NETWORK SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
WMW4.9S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW4.9S (Barologger)	GW/SW	GW/SW	GW/SW	GW/SW	Barologger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW5.5S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW5.7N	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW5.7S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW6.15N	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW6.15S	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW6.55S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW6.9N	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW6.9S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow

NOTES:

GW/SW = Groundwater and Surface Water Sampling Contractor

TNM = Transducer Network Manager

Qal = quaternary alluvium

UMCf = Upper Muddy Creek formation

w/ = with

xMCf = Transitional Muddy Creek formation

TABLE 8: TRANSDUCER NETWORK SUMMARY
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						

NOTES:

Transducers will be suspended and secured at a depth of either two feet above the bottom of the well or 10 feet below the water table, whichever is shallower.

1. The GW/SW is responsible for downloading transducer data from locations they visit during scheduled groundwater monitoring program events in February, May, August (data delivery to the TNM should occur by August 15th to facilitate annual remedial performance reporting), and November. The GW/SW will also download data from transducers initially deployed by AECOM for the Downgradient Study Area Investigation. All other transducer locations in the network will be visited by the TNM during scheduled transducer download events.
2. The Aqua Troll 200 and Eijkelkamp Diver instruments have telemetric capabilities and require specific materials and set-up to utilize this feature.
3. Transducer data collection duration is typically planned for one full year, after which time a reassessment will be made on the data collection points.
4. Monitoring well has screened lithology of Qal/xMCf/UMCf and is symbolized on the figures with Qal/UMCf as this is a shallow WBZ that isn't fully in the UMCf or Qal.
5. PC-98R is deployed and managed by Tetra Tech.
6. This gage was originally named S3.60 but the identification was changed to S3.50 during AECOM's field program.

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
AA-01	BRC	830921.03	26720238.72	1757.2	1755.0	NA	2.1	31.1	51.1	4	Sch 80 PVC	Qal	Monitoring
AA-07	BRC	837100.42	26729559.52	1612.6	1610.1	NA	NA	30.0	50.0	4	Sch 80 PVC	Qal	Monitoring
AA-09	BRC	831041.59	26723441.40	1695.9	1694.3	NA	NA	30.0	65.0	4	Sch 80 PVC	Qal	Monitoring
AA-11	BRC	830672.55	26725458.88	1660.0	1658.2	NA	1.8	10.8	30.8	4	Sch 80 PVC	Qal	Monitoring
AA-18	BRC	836690.87	26727656.38	1669.0	1665.6	NA	NA	NA	NA	4	Sch 80 PVC	Qal	Monitoring
AA-30	BRC	836125.80	26733691.92	1532.4	1529.1	34.1	NA	11.7	31.7	4	Sch 80 PVC	Qal	Monitoring
AA-UW2	BRC	832819.54	26718117.11	1821.4	1817.6	75.0	2.7	57.7	77.7	4	PVC	Qal/UMCf	Monitoring
ARP-1	NERT	828592.90	26728365.67	1613.4	1613.5	44.2	0.0	14.0	44.0	2	PVC	Qal	Monitoring
ARP-2A	NERT	828722.79	26728404.69	1614.3	1614.7	54.0	-0.3	23.4	53.4	2	PVC	Qal	Monitoring
ARP-3A	NERT	828856.07	26728403.15	1614.7	1615.0	41.0	-0.2	20.5	40.5	2	PVC	Qal	Monitoring
ARP-4A	NERT	829167.66	26728412.05	1615.6	1615.7	33.0	-0.1	17.6	32.6	2	PVC	Qal	Monitoring
ARP-5A	NERT	829374.74	26728458.50	1616.2	1616.5	38.0	-0.3	12.4	37.4	2	PVC	Qal	Monitoring
ARP-6B	NERT	829520.19	26728500.05	1615.5	1615.9	43.0	-0.4	27.3	42.3	2	PVC	Qal	Monitoring
ARP-7	NERT	829667.95	26728501.24	1613.7	1614.6	39.2	-0.9	13.1	38.1	2	PVC	Qal	Monitoring
ART-1	NERT	828543.85	26728123.31	1614.6	1615.8	56.0	-1.2	12.8	52.8	6	PVC	Qal	Extraction
ART-1A	NERT	828536.31	26728122.63	1614.5	1615.8	56.0	-1.3	17.7	52.7	8	PVC	Qal	Extraction
ART-2	NERT	828624.98	26728085.20	1617.2	1618.3	56.0	-1.1	17.9	52.9	6	PVC	Qal	Extraction
ART-2A	NERT	828618.40	26728086.04	1616.9	1618.0	58.0	-1.1	19.9	54.9	8	PVC	Qal	Extraction
ART-3	NERT	828774.66	26728085.42	1618.0	1619.0	48.3	-1.0	15.3	45.3	6	PVC	Qal	Extraction
ART-3A	NERT	828768.51	26728085.09	1617.7	1618.9	55.0	-1.3	16.7	51.7	8	PVC	Qal	Extraction
ART-4	NERT	828850.09	26728085.58	1617.5	1618.6	46.4	-1.1	18.3	43.3	6	PVC	Qal	Extraction
ART-4A	NERT	828844.20	26728085.04	1617.5	1618.6	45.4	-1.1	17.3	42.3	8	PVC	Qal	Extraction
ART-6	NERT	829472.70	26728140.74	1615.5	1620.1	39.9	-4.7	13.3	33.3	6	PVC	Qal	Monitoring
ART-7A	NERT	829582.58	26728143.61	1614.8	1618.4	41.7	-3.6	16.1	36.1	8	PVC	Qal	Extraction
ART-7B	NERT	829576.41	26728151.56	1615.9	1618.2	49.9	-2.3	27.5	42.5	8	PVC	Qal	Extraction
ART-8	NERT	828697.18	26728084.46	1617.7	1618.9	50.5	-1.2	16.8	46.8	6	PVC	Qal	Extraction
ART-8A	NERT	828691.54	26728083.80	1617.2	1619.0	54.0	-1.8	20.3	50.3	8	PVC	Qal	Extraction
ART-9	NERT	829525.85	26728143.91	1615.0	1618.8	45.5	-3.8	19.2	39.2	8	PVC	Qal	Extraction
BEC-10	BRC	835778.56	26727623.50	1657.4	1657.4	NA	NA	NA	NA	4	PVC	UMCf	Monitoring
BEC-12	BRC	840870.00	26728991.00	1683.8	1683.5	NA	NA	NA	NA	4	PVC	UMCf	Monitoring
COH-2B1	SNWA	832598.56	26733593.79	1547.1	1544.4	67.0	2.7	NA	NA	2	PVC	NA	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
DBMW-3	BRC	831032.81	26728150.18	1625.9	1623.4	NA	2.9	19.0	39.0	4	PVC	Qal/UMCf	Monitoring
DBMW-4	BRC	832295.68	26729903.39	1605.8	1603.5	43.7	2.8	12.8	32.8	4	PVC	Qal/UMCf	Monitoring
DBMW-5	BRC	833399.07	26729807.30	1609.6	1606.7	38.0	3.1	18.1	38.1	4	PVC	UMCf	Monitoring
DBMW-7	BRC	835304.94	26729069.98	1631.6	1629.0	73.3	3.1	53.1	73.1	4	PVC	UMCf	Monitoring
DBMW-8	BRC	835406.66	26729026.85	1632.0	1629.0	69.2	3.1	50.6	70.6	4	PVC	UMCf	Monitoring
DBMW-9	BRC	836248.43	26727788.85	1659.9	1656.8	NA	3.1	57.1	77.1	4	PVC	UMCf	Monitoring
DBMW-10	BRC	836955.59	26727918.57	1664.0	1660.8	NA	3.0	57.5	77.5	4	PVC	Qal/UMCf	Monitoring
DBMW-11	BRC	837595.56	26727990.80	1667.5	1664.2	NA	3.0	48.0	78.0	4	PVC	UMCf	Monitoring
DBMW-12	BRC	838000.97	26727975.84	1669.7	1666.4	NA	3.0	48.0	78.0	4	PVC	UMCf	Monitoring
DBMW-13	BRC	838573.96	26728026.27	1678.8	1675.9	NA	2.8	47.8	77.8	4	PVC	UMCf	Monitoring
DBMW-14	BRC	838999.37	26728032.25	1685.0	1681.9	NA	3.1	38.1	68.1	4	PVC	UMCf	Monitoring
DBMW-15	BRC	839456.96	26728062.10	1693.2	1690.3	NA	2.7	42.7	67.7	4	PVC	UMCf	Monitoring
DBMW-16	BRC	840514.78	26728557.03	1694.1	1691.1	NA	2.8	87.8	112.8	4	PVC	Qal/UMCf	Monitoring
DBMW-17	BRC	840772.27	26728097.27	1712.4	1709.6	NA	2.8	54.8	74.8	4	PVC	Qal/UMCf	Monitoring
DBMW-18	BRC	840571.34	26727750.53	1717.2	1714.1	NA	3.0	48.0	68.0	4	PVC	Qal/UMCf	Monitoring
DFW-03	NERT	827571.31	26719221.30	1764.1	1764.8	44.0	-0.6	38.4	43.4	2	Sch. 40 PVC	UMCf	Monitoring
DFW-04	NERT	827610.10	26719213.17	1765.2	1765.7	49.0	-0.5	43.5	48.5	2	Sch. 40 PVC	UMCf	Monitoring
DFW-05	NERT	827638.48	26719226.97	1765.2	1765.8	49.0	-0.6	43.4	48.4	2	Sch. 40 PVC	UMCf	Monitoring
DFW-06	NERT	827662.10	26718923.57	1772.3	1772.2	49.0	0.0	44.0	49.0	2	Sch. 40 PVC	UMCf	Monitoring
E1-1	NERT	827324.81	26719578.17	1754.4	1755.0	46.5	-0.6	21.4	46.4	6	Sch. 40 PVC	Qal/UMCf	Extraction
E1-2	NERT	827353.97	26719578.56	1754.5	1755.0	46.9	-0.6	21.9	46.9	6	Sch. 40 PVC	Qal/UMCf	Extraction
E1-3	NERT	827379.64	26719578.23	1754.6	1755.0	46.6	-0.4	21.6	46.6	6	Sch. 40 PVC	Qal/UMCf	Extraction
E2-1	NERT	827303.14	26719410.29	1757.3	1757.9	50.4	-0.6	25.4	50.4	6	Sch. 40 PVC	Qal/UMCf	Extraction
E2-2	NERT	827328.51	26719407.99	1757.6	1758.1	52.5	-0.5	27.5	52.5	6	Sch. 40 PVC	Qal/UMCf	Extraction
E2-3	NERT	827353.66	26719408.44	1758.1	1758.4	51.7	-0.3	26.7	51.7	6	Sch. 40 PVC	Qal/UMCf	Extraction
E2-4	NERT	827378.71	26719408.07	1758.1	1758.5	48.6	-0.4	23.6	48.6	6	Sch. 40 PVC	Qal/UMCf	Extraction
E2-5	NERT	827403.42	26719408.53	1758.1	1758.6	53.6	-0.4	28.6	53.6	6	Sch. 40 PVC	Qal/UMCf	Extraction
ES-1	NERT	831068.03	26720247.99	1755.6	1753.5	110.0	2.0	97.0	112.0	4	PVC	UMCf	Monitoring
ES-2	NERT	831474.03	26721263.23	1738.1	1736.2	55.0	1.8	36.8	56.8	4	PVC	Qal/UMCf	Monitoring
ES-3	NERT	830702.56	26721654.03	1724.7	1722.7	45.0	2.0	27.0	47.0	4	PVC	Qal	Monitoring
ES-4	NERT	831228.81	26721583.57	1728.8	1726.9	90.0	1.9	71.9	91.9	4	PVC	UMCf	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
ES-5	NERT	831093.61	26723491.09	1692.3	1690.4	85.0	1.9	71.9	86.9	4	PVC	UMCf	Monitoring
ES-6	NERT	830695.51	26725467.31	1660.8	1658.7	75.0	2.2	57.2	77.2	4	PVC	UMCf	Monitoring
ES-7	NERT	833810.27	26725608.57	1680.5	1678.4	80.0	2.0	62.0	82.0	4	PVC	UMCf	Monitoring
ES-8A	NERT	835755.84	26724135.49	1718.9	1716.7	80.0	2.2	62.2	82.2	4	PVC	UMCf	Monitoring
ES-8B	NERT	835743.11	26724142.40	1718.6	1716.6	110.0	2.0	92.0	112.0	4	PVC	UMCf	Monitoring
ES-9	NERT	835860.89	26726278.80	1681.2	1681.6	100.0	-0.4	79.6	99.6	4	PVC	UMCf	Monitoring
ES-10	NERT	831010.98	26728252.65	1620.9	1621.3	65.0	-0.4	44.6	64.6	4	PVC	UMCf	Monitoring
ES-11	NERT	832629.88	26728619.00	1621.6	1621.9	55.0	-0.3	34.7	54.7	4	PVC	UMCf	Monitoring
ES-12	NERT	832743.14	26729785.84	1607.2	1605.2	65.0	2.1	47.1	67.1	4	PVC	UMCf	Monitoring
ES-13	NERT	834911.16	26728997.78	1632.5	1630.6	105.0	1.9	91.9	106.9	4	PVC	UMCf	Monitoring
ES-14A	NERT	835854.83	26727285.86	1668.5	1666.3	70.0	2.2	52.2	72.2	4	PVC	UMCf	Monitoring
ES-14B	NERT	835854.63	26727300.99	1667.5	1665.4	115.0	2.1	102.1	117.1	4	PVC	UMCf	Monitoring
ES-15	NERT	836663.80	26728091.96	1654.9	1655.3	90.0	-0.4	69.6	89.6	4	PVC	UMCf	Monitoring
ES-16	NERT	837795.33	26728120.10	1660.6	1660.8	100.0	-0.3	79.7	99.7	4	PVC	UMCf	Monitoring
ES-17	NERT	838317.31	26728096.46	1666.2	1666.6	100.0	-0.4	79.6	99.6	4	PVC	UMCf	Monitoring
ES-18	NERT	839215.94	26728133.54	1679.3	1679.6	110.0	-0.3	89.7	109.7	4	PVC	UMCf	Monitoring
ES-19	NERT	840084.16	26728425.58	1685.2	1685.5	177.0	-0.3	156.7	176.7	4	PVC	UMCf	Monitoring
ES-20	NERT	840584.03	26727738.94	1718.1	1716.2	110.5	1.9	92.9	112.9	4	PVC	UMCf	Monitoring
ES-21A	NERT	836764.30	26730354.03	1593.4	1593.8	50.0	-0.4	29.7	49.7	4	PVC	UMCf	Monitoring
ES-21B	NERT	836761.38	26730362.32	1593.0	1593.6	80.0	-0.6	59.5	79.5	4	PVC	UMCf	Monitoring
ES-22A	NERT	838215.09	26729378.29	1640.0	1640.5	50.0	-0.5	29.5	49.5	4	PVC	UMCf	Monitoring
ES-22B	NERT	838219.47	26729386.04	1639.6	1640.1	80.0	-0.5	59.5	79.5	4	PVC	UMCf	Monitoring
ES-23A	NERT	840103.88	26730541.86	1602.1	1602.5	50.0	-0.4	29.6	49.6	4	PVC	UMCf	Monitoring
ES-23B	NERT	840112.56	26730539.18	1602.1	1602.5	190.0	-0.4	169.6	189.6	4	PVC	UMCf	Monitoring
ES-24	NERT	838489.46	26731540.00	1562.2	1562.7	80.0	-0.5	59.5	79.5	4	PVC	UMCf	Monitoring
ES-25A	NERT	838620.20	26732670.29	1534.1	1531.4	50.0	2.7	32.7	52.7	4	PVC	UMCf	Monitoring
ES-25B	NERT	838629.68	26732670.53	1534.1	1531.5	80.0	2.5	62.5	82.5	4	PVC	UMCf	Monitoring
ES-26	NERT	839156.96	26733027.08	1534.7	1532.1	80.0	2.7	62.7	82.7	4	PVC	UMCf	Monitoring
ES-27	NERT	839754.54	26733933.52	1541.9	1539.5	80.0	2.4	62.4	82.4	4	PVC	Qal	Monitoring
ES-28	NERT	833324.53	26720624.95	1761.0	1759.0	85.0	2.0	67.0	87.0	4	PVC	UMCf	Monitoring
ES-30	NERT	831683.05	26725401.87	1667.5	1665.3	93.0	2.1	75.1	95.1	4	PVC	UMCf	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
ES-31	NERT	832204.06	26726968.30	1646.1	1643.9	75.0	2.2	57.2	77.2	4	PVC	UMCf	Monitoring
ES-32	NERT	832493.20	26723507.75	1697.9	1695.9	92.0	2.0	74.0	94.0	4	PVC	UMCf	Monitoring
ES-45	NERT	839162.84	26732696.41	1535.3	1532.6	55.0	2.7	37.7	57.7	4	Sch 80 PVC	UMCf	Monitoring
ES-46	NERT	839179.73	26732696.91	1535.1	1532.6	195.0	2.5	177.5	197.5	4	Sch 80 PVC	UMCf	Monitoring
ES-47	NERT	839463.80	26732719.16	1535.7	1533.3	45.0	2.4	27.4	47.4	4	Sch 80 PVC	Qal	Monitoring
ES-48	NERT	839477.18	26732719.59	1535.7	1533.5	70.0	2.2	62.2	72.2	4	Sch 80 PVC	Qal/UMCf	Monitoring
ES-49	NERT	839485.42	26732719.83	1535.9	1533.3	125.0	2.6	117.6	127.6	4	Sch 80 PVC	UMCf	Monitoring
ES-50	NERT	839601.91	26732703.08	1536.2	1533.9	100.0	2.3	82.3	102.3	4	Sch 80 PVC	UMCf	Monitoring
ES-51	NERT	839716.68	26732721.86	1536.5	1533.9	45.0	2.6	27.6	47.6	4	Sch 80 PVC	Qal	Monitoring
ES-52	NERT	839728.95	26732717.80	1536.8	1534.1	88.6	2.7	71.3	91.3	4	Sch 80 PVC	UMCf	Monitoring
H-28A	Stauffer	825871.29	26721021.64	1732.9	1731.1	45.4	1.9	30.1	47.3	6	Steel	Qal	Monitoring
H-56R	NERT	825845.28	26724009.15	1679.0	1679.0	49.0	0.0	19.0	49.0	4	PVC	Qal	Monitoring
H-58R	NERT	825282.32	26723131.96	1694.5	1694.8	40.0	-0.4	19.6	39.6	4	PVC	Qal/UMCf	Monitoring
HM-2	NA	832227.03	26731037.68	1587.1	1586.0	35.2	NA	NA	NA	NA	NA	Qal	Monitoring
HMW-13	COH	827711.60	26731739.56	1595.1	1592.7	NA	2.4	12.4	27.4	NA	NA	Qal	Monitoring
HMW-14	COH	827173.59	26731535.56	1600.6	1598.9	39.0	1.7	16.3	35.2	NA	NA	Qal	Monitoring
HMW-15	COH	827608.51	26729900.79	1612.0	1608.7	25.4	3.3	10.7	24.9	NA	NA	Qal/UMCf	Monitoring
HMW-16	COH	827090.14	26728531.10	1620.7	1621.1	26.3	-0.4	6.7	21.8	2	PVC	Qal	Monitoring
I-AA	NERT	827173.97	26719770.92	1754.1	1751.3	45.6	2.8	26.7	47.0	6	PVC	UMCf	Extraction
I-AB	NERT	827224.66	26719789.97	1754.1	1751.6	51.0	2.6	27.0	46.1	6	PVC	Qal/UMCf	Extraction
I-AC	NERT	828790.46	26719887.81	1752.8	1750.1	49.1	2.7	27.2	46.4	6	PVC	Qal/UMCf	Extraction
I-AD	NERT	828804.89	26719793.31	1755.5	1753.1	50.3	2.4	28.1	47.3	6	PVC	Qal/UMCf	Extraction
I-AR	NERT	827414.31	26719429.80	1758.4	1757.9	44.0	0.5	25.5	44.5	18	Steel	UMCf	Extraction
I-B[1]	NERT	827282.89	26719808.15	1752.7	1751.5	42.8	1.4	17.7	44.2	6	PVC	Qal/xMCf/UMCf	Extraction
I-C[1]	NERT	827486.24	26719792.31	1752.0	1751.4	44.1	1.3	16.3	45.1	6	PVC	UMCf	Extraction
I-D[1]	NERT	827581.85	26719806.35	1752.4	1750.1	44.9	2.7	19.3	47.6	6	PVC	Qal/xMCf/UMCf	Extraction
I-E[1]	NERT	827733.17	26719826.67	1752.0	1749.5	43.7	2.9	17.1	46.0	6	PVC	UMCf	Extraction
I-F	NERT	827879.59	26719845.82	1749.3	1747.8	44.4	1.5	14.5	45.9	6	PVC	Qal/xMCf/UMCf	Extraction
I-G[1]	NERT	828030.23	26719866.97	1751.8	1749.5	39.0	3.2	12.8	42.2	6	PVC	Qal/xMCf/UMCf	Extraction
I-H[1]	NERT	828177.51	26719887.57	1752.6	1750.5	42.7	2.8	16.1	45.5	6	PVC	UMCf	Extraction
I-I	NERT	828374.98	26719914.61	1745.1	1742.3	39.1	2.7	14.0	41.8	6	PVC	Qal/xMCf/UMCf	Extraction

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
I-J[1]	NERT	828573.72	26719940.22	1749.1	1746.2	39.8	3.9	14.3	43.7	6	PVC	Qal/xMCf/UMCf	Extraction
I-K[1]	NERT	828737.55	26719962.98	1745.0	1744.7	35.1	1.3	7.9	36.4	6	PVC	UMCf	Extraction
I-L[1]	NERT	827352.20	26719803.12	1751.3	1748.5	38.4	3.2	11.4	41.3	6	PVC	Qal/xMCf/UMCf	Extraction
I-M[1]	NERT	827669.53	26719817.15	1752.3	1749.3	39.3	3.8	12.9	42.2	6	PVC	Qal/xMCf/UMCf	Extraction
I-N[1]	NERT	827802.31	26719837.99	1750.1	1747.6	36.4	3.7	10.4	40.1	6	PVC	Qal/xMCf/UMCf	Extraction
I-O[1]	NERT	828262.98	26719898.32	1751.6	1749.2	38.6	3.8	12.2	41.4	6	PVC	Qal/xMCf/UMCf	Extraction
I-P	NERT	828221.61	26719892.08	1751.7	1749.2	44.4	2.5	18.2	46.9	6	PVC	Qal/xMCf/UMCf	Extraction
I-Q	NERT	827952.21	26719855.30	1752.1	1749.6	37.8	2.5	11.6	40.3	6	PVC	Qal/xMCf/UMCf	Extraction
I-R	NERT	827315.52	26719801.64	1751.4	1749.2	41.4	2.2	15.1	43.6	6	PVC	Qal/xMCf/UMCf	Extraction
I-S	NERT	827403.53	26719800.34	1750.3	1748.5	45.5	1.8	15.2	44.2	6	PVC	Qal/xMCf/UMCf	Extraction
I-T	NERT	828074.17	26719871.41	1752.0	1749.4	44.9	2.6	15.8	44.7	6	PVC	Qal/xMCf/UMCf	Extraction
I-U	NERT	828117.88	26719880.91	1752.0	1749.6	44.6	2.4	15.0	44.0	6	PVC	Qal/xMCf/UMCf	Extraction
I-V	NERT	828326.14	26719895.44	1752.1	1750.0	44.5	2.1	14.6	43.6	6	PVC	Qal/xMCf/UMCf	Extraction
I-W	NERT	828245.24	26719896.07	1751.3	1749.0	50.1	2.4	23.6	52.5	6	PVC	Qal/xMCf/UMCf	Extraction
I-X	NERT	827839.66	26719843.31	1748.5	1746.7	49.6	1.8	22.9	51.4	6	PVC	Qal/xMCf/UMCf	Extraction
I-Y	NERT	827333.81	26719800.97	1751.3	1748.8	49.5	2.5	23.5	52.0	6	PVC	Qal/xMCf/UMCf	Extraction
I-Z	NERT	828467.74	26719922.96	1743.8	1742.3	36.5	1.5	18.1	38.0	4	PVC	Qal/xMCf/UMCf	Extraction
LNDMW-1	SNWA	841145.67	26736145.45	1511.2	1510.7	61.6	NA	NA	NA	2	ABS	Qal	Monitoring
LNDMW-2	SNWA	840864.28	26737125.16	1502.0	1502.0	55.1	NA	NA	NA	2	PVC	Qal	Monitoring
LVWPS-MW102A	NERT	832965.93	26732606.35	1546.8	1547.2	67.1	-0.4	46.6	66.2	2	Sch. 40 PVC	UMCf	Monitoring
LVWPS-MW102B	NERT	832973.68	26732605.06	1546.8	1547.1	97.0	-0.4	76.4	96.1	2	Sch. 40 PVC	UMCf (Semi-Consolidated)	Monitoring
LVWPS-MW105	NERT	833300.91	26732570.24	1547.3	1547.7	26.7	-0.3	16.2	25.9	2	Sch. 40 PVC	Qal	Monitoring
LVWPS-MW107A	NERT	833144.18	26732823.90	1547.6	1548.1	35.0	-0.6	24.8	34.5	4	Sch. 40 PVC	Qal	Monitoring
LVWPS-MW107C	NERT	833138.10	26732819.93	1547.9	1548.3	120.5	-0.4	100.3	120.0	2	Sch. 40 PVC	UMCf (Semi-Consolidated)	Monitoring
LVWPS-MW201A	NERT	837018.94	26734867.37	1522.8	1523.1	48.5	-0.3	27.9	47.5	4	Sch. 40 PVC	Qal	Monitoring
LVWPS-MW201B	NERT	837026.36	26734869.47	1522.8	1523.0	80.4	-0.2	59.9	79.6	2	Sch. 40 PVC	UMCf	Monitoring
LVWPS-MW224A	NERT	838859.96	26734661.76	1528.0	1528.1	75.5	-0.2	55.1	74.8	2	Sch. 40 PVC	Qal	Monitoring
LVWPS-MW224B	NERT	838863.59	26734667.53	1527.7	1527.7	127.0	0.1	106.9	126.6	2	Sch. 40 PVC	UMCf	Monitoring
M-2A	NERT	827984.27	26718769.87	1781.3	1780.3	45.8	1.0	37.7	46.7	2	Steel	Qal	Monitoring
M-5A	NERT	826178.84	26719961.19	1751.8	1749.3	50.0	2.6	42.6	52.6	3	PVC	UMCf	Monitoring
M-6A	NERT	825984.28	26721013.81	1733.3	1731.2	43.6	2.0	28.8	43.5	2	PVC	Qal/xMCf/UMCf	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
M-7B	NERT	826105.95	26720979.77	1732.9	1730.6	52.5	2.3	27.8	52.8	2	PVC	Qal/xMCf/UMCf	Monitoring
M-10	NERT	828536.01	26716636.94	1835.1	1833.9	67.0	1.2	44.2	64.2	5	Steel	Qal/xMCf/UMCf	Monitoring
M-11	NERT	828616.62	26717608.73	1815.2	1813.7	58.0	1.5	34.5	54.5	5	Steel	Qal/xMCf/UMCf	Monitoring
M-12A	NERT	828178.35	26717575.57	1812.5	1812.9	50.0	-0.3	39.7	49.7	3	PVC	UMCf	Monitoring
M-13	NERT	827805.72	26717477.79	1815.0	1813.0	52.5	2.0	30.0	50.0	5	Steel	UMCf	Monitoring
M-14A	NERT	827045.20	26719382.55	1760.9	1758.5	40.2	2.4	22.4	42.4	2	PVC	UMCf	Monitoring
M-19	NERT	828845.96	26719350.00	1766.9	1764.5	39.5	2.4	16.9	36.9	2	PVC	UMCf	Monitoring
M-21	NERT	827792.73	26718359.25	1792.2	1790.6	43.0	1.6	19.6	39.6	2	PVC	UMCf	Monitoring
M-22A	NERT	828269.84	26719531.96	1759.5	1759.0	36.4	0.5	16.5	36.5	2	PVC	Qal/xMCf/UMCf	Monitoring
M-23	NERT	827373.84	26721391.19	1720.6	1717.3	42.4	3.3	12.7	40.7	2	PVC	Qal	Monitoring
M-25	NERT	827677.53	26719504.15	1760.0	1756.9	39.0	3.1	27.1	42.1	2	PVC	Qal/xMCf/UMCf	Monitoring
M-31A	NERT	828368.02	26718289.89	1797.0	1797.1	55.0	-0.1	34.9	54.9	2	PVC	UMCf	Monitoring
M-32	NERT	828592.45	26718354.04	1795.6	1791.6	45.0	4.0	34.0	49.0	2	PVC	UMCf	Monitoring
M-33	NERT	828783.71	26718383.18	1795.7	1791.8	45.0	3.9	33.9	48.9	2	PVC	UMCf	Monitoring
M-35	NERT	828509.10	26718840.20	1772.9	1773.4	40.0	-0.5	24.5	39.5	2	PVC	UMCf	Monitoring
M-37	NERT	827414.06	26719422.28	1760.5	1758.0	35.0	2.5	22.5	37.5	2	PVC	UMCf	Monitoring
M-38	NERT	827877.68	26719523.89	1759.8	1758.4	35.0	1.3	21.3	36.3	2	PVC	UMCf	Monitoring
M-44	NERT	827005.56	26722699.07	1695.3	1695.6	35.0	-0.3	4.7	34.7	2	PVC	Qal/xMCf/UMCf	Monitoring
M-48A	NERT	828292.90	26721338.13	1718.5	1718.6	40.0	-0.2	19.5	39.5	2	PVC	Qal/UMCf	Monitoring
M-52	NERT	828394.11	26717985.41	1802.5	1799.3	45.0	3.2	37.7	47.7	2	PVC	UMCf	Monitoring
M-55	NERT	827682.57	26719819.98	1751.0	1749.3	44.6	1.8	16.4	46.4	2	PVC	Qal/xMCf/UMCf	Monitoring
M-56	NERT	827980.00	26719859.76	1750.9	1749.5	40.0	1.4	16.4	41.4	2	PVC	Qal/xMCf/UMCf	Monitoring
M-57A	NERT	826992.99	26719716.67	1753.4	1751.4	40.2	2.1	22.1	42.1	2	PVC	UMCf	Monitoring
M-58	NERT	828276.43	26719900.79	1751.3	1749.0	45.0	2.4	17.4	47.4	2	PVC	Qal/xMCf/UMCf	Monitoring
M-60	NERT	828079.02	26719872.88	1751.0	1749.5	43.0	1.6	19.4	44.4	2	PVC	UMCf	Monitoring
M-64	NERT	827599.59	26719695.77	1752.4	1752.6	37.5	-0.3	12.4	37.0	2	PVC	Qal/xMCf/UMCf	Monitoring
M-65	NERT	827899.49	26719746.61	1754.0	1752.1	39.2	1.9	16.3	40.9	2	PVC	Qal/xMCf/UMCf	Monitoring
M-66	NERT	828183.35	26719787.53	1754.0	1751.7	42.5	2.4	19.9	44.7	2	PVC	Qal/xMCf/UMCf	Monitoring
M-67	NERT	828508.35	26719830.00	1746.0	1744.1	38.0	1.9	9.7	39.7	2	PVC	Qal/xMCf/UMCf	Monitoring
M-68	NERT	828750.88	26719864.83	1750.4	1748.4	41.0	2.0	13.2	41.8	2	PVC	Qal/xMCf/UMCf	Monitoring
M-69	NERT	827265.44	26719885.82	1749.8	1748.0	39.5	1.9	21.8	41.2	2	PVC	Qal/xMCf/UMCf	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
M-70	NERT	827567.16	26719904.68	1748.3	1746.8	40.2	1.5	16.8	41.5	2	PVC	Qal/xMCf/UMCf	Monitoring
M-71	NERT	827859.30	26719943.70	1747.1	1744.9	42.2	2.2	19.7	44.2	2	PVC	Qal/xMCf/UMCf	Monitoring
M-72	NERT	828171.94	26719977.31	1746.5	1745.0	35.0	1.5	11.6	36.3	2	PVC	Qal/xMCf/UMCf	Monitoring
M-73	NERT	828427.46	26720018.54	1741.3	1742.2	36.0	-0.9	10.1	34.9	2	PVC	Qal/xMCf/UMCf	Monitoring
M-74	NERT	828713.43	26720062.52	1745.2	1742.4	39.0	2.8	12.0	41.6	2	PVC	UMCf	Monitoring
M-75	NERT	827718.66	26718702.91	1784.2	1782.1	51.5	2.1	36.7	51.4	2	PVC	Qal/xMCf/UMCf	Monitoring
M-76	NERT	827550.42	26718660.25	1785.2	1781.7	51.4	3.5	38.1	52.8	2	PVC	UMCf	Monitoring
M-77R	NERT	828940.43	26718041.06	1798.5	1798.6	45.9	-0.1	32.6	47.4	2	PVC	Qal/xMCf/UMCf	Monitoring
M-78	NERT	827777.18	26719838.28	1751.5	1749.5	43.6	2.0	23.5	43.5	2	PVC	Qal/xMCf/UMCf	Monitoring
M-79	NERT	827381.95	26720049.07	1744.9	1743.3	37.6	1.6	12.4	37.0	2	PVC	Qal/xMCf/UMCf	Monitoring
M-80	NERT	827759.54	26720113.16	1746.2	1744.0	43.7	2.1	13.6	43.6	2	PVC	Qal/xMCf/UMCf	Monitoring
M-81A	NERT	828139.49	26720176.91	1744.2	1743.1	40.0	1.1	31.1	41.1	3	PVC	Qal/xMCf/UMCf	Monitoring
M-83	NERT	827584.72	26720160.56	1742.2	1739.0	42.5	3.2	14.0	43.5	2	PVC	Qal/xMCf/UMCf	Monitoring
M-92	NERT	827137.55	26717532.14	1800.8	1798.3	45.5	2.5	37.4	47.4	2	PVC	UMCf	Monitoring
M-93	NERT	827143.16	26717686.29	1797.6	1797.7	46.0	-0.1	35.3	45.3	2	PVC	UMCf	Monitoring
M-95	NERT	827426.47	26722701.98	1694.1	1695.1	22.0	-1.0	11.0	21.0	2	PVC	Qal	Monitoring
M-96	NERT	827625.78	26722700.54	1693.9	1694.3	20.5	-0.4	10.2	20.2	2	PVC	Qal	Monitoring
M-97	NERT	827492.18	26717795.28	1800.9	1798.6	45.5	2.4	37.4	47.4	2	PVC	UMCf	Monitoring
M-98	NERT	826873.01	26720914.11	1731.9	1731.4	31.0	0.5	19.5	29.5	2	PVC	Qal	Monitoring
M-99	NERT	827309.23	26720851.81	1730.8	1729.0	33.0	1.8	17.8	32.8	2	PVC	Qal	Monitoring
M-100	NERT	827659.68	26720820.40	1731.0	1729.0	30.5	2.0	21.0	31.0	2	PVC	Qal	Monitoring
M-101	NERT	828060.54	26720786.96	1730.9	1729.2	29.0	1.7	18.7	28.7	2	PVC	Qal	Monitoring
M-103	NERT	828727.97	26715622.71	1866.9	1864.4	90.0	2.5	72.0	92.0	2	PVC	UMCf	Monitoring
M-115	NERT	827243.41	26718612.95	1783.2	1781.1	45.2	2.1	37.1	47.1	2	PVC	Qal/xMCf/UMCf	Monitoring
M-117	NERT	828916.75	26715198.67	1880.5	1878.1	155.0	2.4	132.4	152.4	2	PVC	UMCf	Monitoring
M-118	NERT	828036.21	26715068.38	1876.8	1874.5	163.0	2.4	140.4	160.4	2	PVC	UMCf	Monitoring
M-120	NERT	828387.52	26715163.04	1878.6	1875.9	105.0	2.8	82.8	102.8	2	PVC	UMCf	Monitoring
M-121	NERT	827694.20	26715011.51	1875.7	1873.1	102.0	2.6	79.6	99.6	2	PVC	UMCf	Monitoring
M-123	NERT	826514.08	26718415.73	1785.2	1782.5	51.3	2.7	38.7	53.7	2	PVC	UMCf	Monitoring
M-124	NERT	827089.92	26718225.15	1787.6	1785.3	49.3	2.3	36.3	51.3	2	PVC	UMCf	Monitoring
M-125	NERT	826529.55	26718992.85	1771.4	1768.6	50.3	2.9	37.9	52.9	2	PVC	UMCf	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
M-126	NERT	826569.21	26719505.96	1759.1	1756.4	40.0	2.7	22.4	42.4	2	PVC	UMCf	Monitoring
M-129	NERT	828806.21	26720079.71	1747.4	1747.7	40.0	-0.3	19.7	39.7	2	PVC	Qal/UMCf	Monitoring
M-132	NERT	828714.34	26720048.87	1744.6	1742.6	90.0	2.0	81.7	91.7	2	PVC	UMCf	Monitoring
M-133	NERT	828698.45	26720067.45	1743.8	1741.4	70.0	2.4	62.1	72.1	2	PVC	UMCf	Monitoring
M-134	NERT	827144.11	26719889.30	1752.2	1749.6	70.0	2.6	62.3	72.3	2	PVC	UMCf	Monitoring
M-135	NERT	827154.22	26719890.23	1752.0	1749.4	39.0	2.6	31.3	41.3	2	PVC	UMCf	Monitoring
M-136	NERT	827165.06	26719889.88	1752.0	1749.3	90.0	2.7	82.4	92.4	2	PVC	UMCf	Monitoring
M-137	NERT	827665.77	26716034.31	1847.7	1844.9	75.0	2.8	54.8	74.8	2	PVC	UMCf	Monitoring
M-138	NERT	827816.09	26716058.52	1846.5	1843.8	65.5	2.7	53.2	68.2	2	PVC	UMCf	Monitoring
M-139	NERT	829044.40	26717213.17	1813.3	1813.8	60.0	-0.6	44.4	59.4	2	PVC	UMCf	Monitoring
M-140	NERT	827427.02	26719888.37	1748.3	1745.8	43.9	2.5	26.6	46.4	4	PVC	UMCf	Monitoring
M-141	NERT	828465.30	26718195.39	1797.3	1797.5	49.5	-0.2	39.4	49.4	2	PVC	UMCf	Monitoring
M-142	NERT	827189.62	26718711.81	1773.7	1774.0	45.3	-0.3	29.7	44.7	2	PVC	UMCf	Monitoring
M-144	NERT	827644.52	26717026.09	1813.4	1813.3	45.0	0.1	35.1	45.1	2	PVC	UMCf	Monitoring
M-145	NERT	829203.27	26717449.32	1812.3	1812.7	60.0	-0.4	44.6	59.6	2	PVC	UMCf	Monitoring
M-147	NERT	828824.13	26718858.23	1777.6	1775.1	40.0	2.5	27.5	42.5	2	PVC	UMCf	Monitoring
M-148A	NERT	829028.31	26718355.61	1800.1	1797.8	50.0	2.3	42.0	52.0	2	PVC	UMCf	Monitoring
M-149	NERT	828373.07	26718285.86	1797.0	1797.2	120.0	-0.3	99.8	119.8	2	PVC	UMCf	Monitoring
M-150	NERT	828058.93	26719569.89	1759.1	1756.5	145.0	2.7	127.7	147.7	2	PVC	UMCf	Monitoring
M-151	NERT	827642.71	26720826.91	1731.1	1728.4	145.0	2.7	127.7	147.7	2	PVC	UMCf	Monitoring
M-152	NERT	826973.35	26722690.68	1695.4	1695.5	145.0	-0.1	124.9	144.9	2	PVC	UMCf	Monitoring
M-153	NERT	828385.56	26718288.14	1797.0	1797.2	170.0	-0.2	149.8	169.8	2	PVC	UMCf	Monitoring
M-154	NERT	828047.55	26719568.47	1759.1	1756.5	195.0	2.5	177.5	197.5	2	PVC	UMCf	Monitoring
M-155	NERT	827635.53	26720827.51	1727.7	1728.1	220.0	-0.5	199.5	219.5	2	PVC	UMCf	Artesian
M-156	NERT	826964.16	26722690.76	1695.5	1695.5	195.0	0.0	175.0	195.0	2	PVC	UMCf	Monitoring
M-159	NERT	826756.03	26719822.97	1754.9	1752.8	75.0	2.1	66.8	76.8	2	PVC	UMCf	Monitoring
M-160	NERT	826766.94	26719825.09	1754.7	1752.3	50.0	2.4	42.1	52.1	2	PVC	UMCf	Monitoring
M-161	NERT	827132.17	26719888.93	1752.5	1749.9	110.0	2.6	102.3	112.3	2	PVC	UMCf	Monitoring
M-161D	NERT	827237.32	26719894.14	1750.4	1747.8	140.0	2.6	132.6	142.6	4	PVC	UMCf	Monitoring
M-162	NERT	827876.08	26719944.83	1747.9	1745.7	110.0	2.2	101.9	111.9	2	PVC	UMCf	Monitoring
M-162D	NERT	827774.06	26719954.88	1747.4	1745.0	140.0	2.4	132.4	142.4	4	PVC	UMCf	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
M-163	NERT	827871.62	26719937.88	1748.0	1745.6	90.0	2.3	82.0	92.0	2	PVC	UMCf	Monitoring
M-164	NERT	827868.37	26719948.34	1747.7	1745.2	70.0	2.5	62.2	72.2	2	PVC	UMCf	Monitoring
M-165	NERT	828699.53	26720052.05	1743.9	1741.6	120.0	2.3	112.0	122.0	2	PVC	UMCf	Monitoring
M-166	NERT	827228.06	26719778.37	1751.1	1751.5	32.0	-0.4	21.3	31.3	2	PVC	Qal/UMCf	Monitoring
M-167	NERT	827335.79	26719786.68	1750.0	1749.8	30.0	0.2	19.9	29.9	2	PVC	Qal/UMCf	Monitoring
M-168	NERT	827406.15	26719787.39	1748.5	1748.8	32.0	-0.4	21.3	31.3	2	PVC	Qal/UMCf	Monitoring
M-169	NERT	827467.43	26719785.56	1750.4	1750.7	35.0	-0.3	24.4	34.4	2	PVC	Qal/UMCf	Monitoring
M-170	NERT	827575.63	26719795.30	1750.7	1750.6	35.0	0.2	24.9	34.9	2	PVC	Qal/UMCf	Monitoring
M-172	NERT	827893.02	26719834.69	1750.6	1750.4	37.0	0.2	26.9	36.9	2	PVC	Qal/UMCf	Monitoring
M-173	NERT	828180.01	26719874.39	1749.9	1749.7	40.0	0.1	24.8	39.8	2	PVC	Qal/UMCf	Monitoring
M-174	NERT	828377.26	26719901.68	1742.3	1742.3	28.0	0.0	17.7	27.7	2	PVC	Qal/UMCf	Monitoring
M-175	NERT	828469.49	26719909.88	1742.8	1742.9	29.0	-0.1	18.6	28.6	2	PVC	Qal/UMCf	Monitoring
M-176	NERT	828584.65	26719946.78	1745.5	1745.6	30.0	-0.2	19.5	29.5	2	PVC	Qal	Monitoring
M-177	NERT	828723.17	26719964.47	1743.3	1743.6	30.0	-0.3	19.4	29.4	2	PVC	Qal/UMCf	Monitoring
M-181	NERT	828814.45	26719578.25	1761.7	1759.4	115.0	2.4	107.1	117.1	2	PVC	UMCf	Monitoring
M-182	NERT	828813.66	26719587.42	1761.8	1759.4	90.0	2.4	82.1	92.1	2	PVC	UMCf	Monitoring
M-186	NERT	829020.45	26718354.57	1800.7	1798.0	115.0	2.7	107.4	117.4	2	PVC	UMCf	Monitoring
M-186D	NERT	829025.47	26718347.71	1801.0	1798.2	173.0	2.8	155.8	175.8	4	PVC	UMCf	Monitoring
M-189	NERT	828371.68	26717101.15	1812.7	1813.2	50.0	-0.5	34.5	49.5	2	PVC	UMCf	Monitoring
M-190	NERT	828816.08	26717162.21	1813.1	1813.5	50.0	-0.4	34.6	49.6	2	PVC	UMCf	Monitoring
M-191	NERT	828087.37	26717253.90	1813.1	1813.6	50.0	-0.5	34.5	49.5	2	PVC	UMCf	Monitoring
M-192	NERT	828393.70	26717297.61	1812.8	1813.2	50.0	-0.4	34.6	49.6	2	PVC	UMCf	Monitoring
M-193	NERT	828805.62	26717398.60	1812.7	1813.1	50.0	-0.4	34.6	49.6	2	PVC	UMCf	Monitoring
M-204	NERT	826060.48	26720995.04	1732.1	1732.6	110.0	-0.5	99.5	109.5	4	PVC	UMCf	Monitoring
M-205	NERT	826457.24	26720961.49	1731.6	1732.0	50.0	-0.4	29.7	49.7	4	PVC	UMCf	Monitoring
M-206	NERT	826915.80	26720918.32	1730.8	1731.1	50.0	-0.3	29.7	49.7	4	PVC	UMCf	Monitoring
M-207	NERT	827341.58	26720881.05	1729.2	1729.6	45.0	-0.3	24.7	44.7	4	PVC	Qal/UMCf	Monitoring
M-208	NERT	827657.20	26720850.39	1728.8	1729.3	45.0	-0.5	24.5	44.5	4	PVC	Qal/UMCf	Monitoring
M-209	NERT	827667.40	26720849.46	1728.9	1729.2	60.0	-0.4	49.6	59.6	4	PVC	UMCf	Monitoring
M-210	NERT	827677.41	26720849.08	1728.9	1729.3	80.0	-0.4	69.6	79.6	4	PVC	UMCf	Monitoring
M-211	NERT	828018.47	26720816.38	1730.1	1730.5	45.0	-0.4	24.6	44.6	4	PVC	Qal/UMCf	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
M-212	NERT	828028.20	26720814.73	1730.2	1730.5	70.0	-0.3	59.7	69.7	4	PVC	UMCf	Monitoring
M-213	NERT	828038.26	26720813.88	1730.3	1730.6	110.0	-0.3	99.7	109.7	4	PVC	UMCf	Monitoring
M-214	NERT	828348.83	26720699.96	1740.8	1741.2	50.0	-0.4	29.6	49.6	4	PVC	Qal/UMCf	Monitoring
M-220	NERT	828714.00	26720372.16	1749.4	1747.3	70.0	2.1	62.1	72.1	4	PVC	UMCf	Monitoring
M-260	NERT	826068.43	26720995.70	1732.0	1732.4	75.0	-0.4	64.6	74.6	4	PVC	UMCf	Monitoring
M-261	NERT	826445.91	26720962.44	1731.9	1732.0	75.0	-0.1	59.9	74.9	4	PVC	UMCf	Monitoring
M-262	NERT	826451.33	26720961.98	1731.8	1731.9	90.0	-0.2	79.8	89.8	4	PVC	UMCf	Monitoring
M-263	NERT	826925.32	26720917.97	1730.7	1731.0	70.0	-0.3	59.7	69.7	4	PVC	UMCf	Monitoring
M-264	NERT	826930.96	26720917.35	1730.8	1731.0	95.0	-0.2	84.8	94.8	4	PVC	UMCf	Monitoring
M-265	NERT	827346.35	26720880.76	1729.0	1729.5	70.0	-0.5	59.5	69.5	4	PVC	UMCf	Monitoring
M-266	NERT	827355.08	26720879.77	1729.1	1729.4	100.0	-0.4	89.6	99.6	4	PVC	UMCf	Monitoring
M-267	NERT	828348.44	26720707.77	1740.8	1741.2	95.0	-0.4	79.6	94.6	4	PVC	UMCf	Monitoring
M-268	NERT	828352.04	26720705.02	1740.7	1741.3	115.0	-0.6	99.5	114.5	4	PVC	UMCf	Monitoring
MC-3	Stauffer	825209.51	26721410.04	1725.8	1725.0	43.4	0.9	36.3	44.3	2	PVC	Qal	Monitoring
MC-6	Stauffer	825207.81	26722160.32	1713.4	1711.4	37.2	2.0	20.9	39.2	2	PVC	Qal	Monitoring
MC-7	Stauffer	824932.95	26721865.47	1718.7	1717.3	39.2	1.5	31.6	40.7	2	PVC	Qal	Monitoring
MC-50	NERT	825534.54	26722076.12	1713.3	1712.0	49.0	1.3	25.3	50.3	2	PVC	Qal	Monitoring
MC-51	NERT	825647.56	26721899.90	1716.0	1714.9	49.0	1.1	25.1	50.1	2	PVC	Qal	Monitoring
MC-53	NERT	825942.19	26721919.75	1715.3	1713.7	40.0	1.6	21.6	41.6	2	PVC	Qal/UMCf	Monitoring
MC-65R2	NERT	826131.63	26722147.29	1708.6	1708.9	41.0	-0.3	20.7	40.7	4	PVC	Qal/UMCf	Monitoring
MC-69	Stauffer	825235.31	26721806.95	1718.7	1717.0	44.0	1.8	30.8	45.8	2	PVC	Qal/UMCf	Monitoring
MC-93	Stauffer	825948.58	26721673.10	1719.3	1718.0	42.0	1.4	33.4	43.4	NA	NA	Qal/UMCf	Monitoring
MC-97	Stauffer	825838.31	26721425.70	1724.0	1723.1	41.0	0.9	31.9	41.9	2	PVC	Qal/UMCf	Monitoring
MC-MW-37R2	NERT	826160.14	26722135.65	1708.8	1709.1	63.0	-0.3	52.7	62.7	4	PVC	UMCf	Monitoring
MCF-01A	BRC	830905.30	26720244.86	1756.6	1754.4	NA	NA	335.0	355.0	4	Sch 80 PVC	UMCf	Monitoring
MCF-01B	BRC	830888.59	26720256.83	1756.3	1754.0	NA	NA	55.0	85.0	4	Sch 80 PVC	UMCf	Monitoring
MCF-06B	BRC	834930.85	26729012.56	1633.0	1630.3	85.2	NA	NA	NA	4	Sch 80 PVC	UMCf	Monitoring
MCF-06C	BRC	834945.70	26729004.80	1633.0	1630.3	62.3	NA	NA	NA	4	Sch 80 PVC	UMCf	Monitoring
MCF-07	BRC	837113.60	26729569.85	1612.7	1610.1	NA	NA	350.0	370.0	4	Sch 80 PVC	UMCf	Monitoring
MCF-09B	BRC	831019.19	26723449.62	1695.8	1693.0	NA	NA	105.0	125.0	4	Sch 80 PVC	UMCf	Monitoring
MCF-11	BRC	830656.16	26725461.46	1660.0	1657.8	NA	NA	93.5	103.5	4	Sch 80 PVC	UMCf	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
MCF-20A	BRC	833381.19	26728860.07	1626.2	1623.0	3.2	360.0	340.0	380.0	4	PVC	UMCf	Monitoring
MCF-24B	BRC	833839.36	26725619.34	1684.6	1680.0	170.0	4.4	150.0	170.0	4	Sch 80 PVC	UMCf	Monitoring
MCF-28A	BRC	830679.60	26732313.65	1569.2	1564.7	390.0	4.1	370.0	390.0	4	Sch 80 PVC	UMCf	Monitoring
MCF-28B	BRC	830661.57	26732313.02	1568.9	1565.2	NA	NA	168.0	188.0	4	Sch 80 PVC	UMCf	Monitoring
MCF-31A	BRC	838327.14	26733550.41	1526.7	1523.3	381.0	0.9	361.0	381.0	4	Sch 80 PVC	UMCf	Monitoring
MCF-31B	BRC	838313.65	26733552.59	1527.4	1523.4	234.8	NA	210.0	230.0	4	Sch 80 PVC	UMCf	Monitoring
MW-1	CGC	838593.43	26731476.23	1563.3	1563.8	42.8	NA	NA	NA	4	PVC	NA	Monitoring
MW-02	COH	838994.12	26734478.11	1533.1	1531.3	45.0	1.8	33.8	43.8	2	PVC	NA	Monitoring
MW-3	CGC	836835.36	26733434.90	1523.3	1523.5	13.0	NA	NA	NA	4	PVC	NA	Monitoring
MW-4	CGC	836666.49	26733446.64	1526.4	1526.7	14.5	NA	NA	NA	4	PVC	NA	Monitoring
MW-13	COH	840590.44	26735460.67	1512.6	1511.1	65.0	NA	50.0	65.0	2	PVC	Qal	Monitoring
MW-16	NERT	826447.19	26719904.81	1754.8	1752.3	40.0	2.6	27.3	42.3	2	PVC	UMCf	Monitoring
MW-20	COH	840590.44	26735460.67	1512.6	1511.1	65.0	NA	50.0	65.0	2	PVC	NA	Monitoring
MW-25	COH	839862.89	26734833.85	1531.7	1528.8	53.0	NA	40.9	55.9	4	PVC	NA	Monitoring
MW-K4	AMPAC	828994.26	26728410.91	1614.9	1615.4	50.0	-0.5	9.0	49.5	2	PVC	xMCf	Monitoring
MW-K5	AMPAC	829617.63	26730252.26	1598.9	1595.7	44.0	3.3	31.8	47.3	2	PVC	xMCf/UMCf	Monitoring
NERT3.35S1	NERT	845391.59	26738372.78	1470.4	1470.5	55.0	-0.1	35.0	55.0	4	PVC	Qal	Monitoring
NERT3.40S1	NERT	845198.15	26738206.49	1474.6	1474.9	57.0	-0.3	35.0	55.0	4	PVC	Qal	Monitoring
NERT3.58N1	NERT	844188.45	26738048.58	1476.5	1476.6	62.0	-0.1	40.0	60.0	4	PVC	Qal	Monitoring
NERT3.58S1	NERT	844695.30	26737583.50	1474.3	1474.5	56.0	-0.2	35.0	55.0	4	PVC	Qal	Monitoring
NERT3.60N1	NERT	844016.02	26737827.79	1483.1	1483.1	52.5	-0.1	32.0	52.0	4	PVC	Qal	Monitoring
NERT3.60S1	NERT	844579.55	26737409.27	1478.2	1478.5	56.0	-0.3	35.0	55.0	4	PVC	Qal	Monitoring
NERT3.63S1	NERT	844152.61	26737071.55	1461.8	1462.0	60.0	-0.2	15.0	35.0	4	PVC	Qal	Monitoring
NERT3.80S1	NERT	843700.76	26736780.10	1460.5	1461.1	20.0	-0.6	10.0	20.0	4	PVC	Qal	Monitoring
NERT3.98S1	NERT	842522.48	26736678.95	1466.3	1466.5	55.0	-0.2	15.0	35.0	4	PVC	Qal/UMCf	Monitoring
NERT4.21N1	NERT	841309.13	26736954.70	1502.1	1502.3	55.4	-0.2	45.0	55.0	4	PVC	Qal	Monitoring
NERT4.38N1	NERT	840337.59	26737140.64	1505.0	1505.3	40.9	-0.2	30.0	40.0	4	PVC	Qal	Monitoring
NERT4.51S1	NERT	840138.03	26735857.15	1506.2	1506.8	54.0	-0.6	40.0	50.0	4	PVC	Qal	Monitoring
NERT4.64N1	NERT	839271.62	26736269.47	1511.6	1511.9	47.5	-0.3	25.0	45.0	4	PVC	Qal	Monitoring
NERT4.64S1	NERT	839508.39	26735740.74	1513.0	1513.2	56.0	-0.2	35.0	55.0	4	PVC	Qal	Monitoring
NERT4.65N1	NERT	839107.82	26736244.72	1513.0	1513.3	47.0	-0.3	25.0	45.0	4	PVC	Qal	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
NERT4.70N1	NERT	838871.67	26736143.64	1514.9	1515.4	47.0	-0.5	25.0	45.0	4	PVC	Qal	Monitoring
NERT4.71N1	NERT	838600.29	26736123.87	1518.7	1519.1	47.5	-0.3	25.0	45.0	4	PVC	Qal	Monitoring
NERT4.71S1	NERT	838991.63	26735349.66	1519.3	1519.6	50.0	-0.4	40.0	50.0	4	PVC	Qal	Monitoring
NERT4.71S2	NERT	838770.32	26735408.27	1518.2	1518.6	55.0	-0.4	34.5	54.5	4	PVC	Qal	Monitoring
NERT4.93S1	NERT	837979.18	26734990.31	1523.3	1523.8	55.0	-0.5	45.0	55.0	4	PVC	Qal	Monitoring
NERT5.11S1	NERT	837144.38	26734881.04	1522.9	1523.2	45.4	-0.3	35.0	45.0	4	PVC	Qal	Monitoring
NERT5.49S1	NERT	835451.85	26734325.76	1543.4	1543.7	40.4	-0.4	30.0	40.0	4	PVC	Qal	Monitoring
NERT5.91S1	NERT	833571.59	26733845.83	1536.8	1537.1	50.4	-0.3	40.0	50.0	4	PVC	Qal	Monitoring
PC-1	NERT	830924.52	26730308.93	1598.3	1598.0	30.0	0.3	15.0	30.0	2	PVC	Qal	Monitoring
PC-2	NERT	830443.03	26730209.92	1596.3	1594.7	32.0	1.7	18.4	33.4	2	PVC	Qal	Monitoring
PC-4	NERT	831171.41	26730353.96	1599.5	1597.6	43.0	1.9	19.6	44.6	2	PVC	Qal	Monitoring
PC-18	NERT	828635.95	26728080.09	1618.6	1618.5	52.0	0.0	11.5	51.5	2	PVC	Qal	Monitoring
PC-21A	NERT	829267.35	26721336.20	1722.1	1722.5	34.4	-0.4	13.6	33.6	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-24	NERT	829523.90	26726730.09	1633.6	1634.1	30.2	-0.5	14.5	29.5	2	PVC	Qal	Monitoring
PC-28	NERT	828530.30	26725375.96	1650.8	1651.2	20.0	-0.4	9.6	19.1	2	PVC	Qal	Monitoring
PC-31	NERT	826781.39	26725196.08	1657.9	1658.2	50.0	-0.3	14.3	49.3	2	PVC	Qal	Monitoring
PC-40R	NERT	826511.22	26723920.75	1677.5	1677.6	55.0	-0.1	14.9	54.9	2	PVC	Qal	Monitoring
PC-50	NERT	828326.61	26726722.56	1633.5	1633.8	42.0	-0.3	11.5	41.5	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-53	NERT	829940.98	26730225.73	1595.2	1593.5	33.0	1.7	14.7	34.2	2	PVC	Qal	Monitoring
PC-54	NERT	828296.24	26722067.82	1704.2	1704.4	35.0	-0.2	9.3	34.3	2	PVC	Qal	Monitoring
PC-55	NERT	828530.36	26728057.26	1618.6	1618.1	56.2	0.5	15.8	55.8	6	PVC	Qal	Monitoring
PC-56	NERT	830645.22	26732289.58	1576.7	1573.5	55.0	3.1	7.9	57.9	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-58	NERT	831123.70	26732118.22	1576.5	1574.2	33.0	2.3	10.1	35.1	2	PVC	Qal	Monitoring
PC-59	NERT	830149.88	26732452.63	1575.9	1573.2	35.0	2.7	7.5	37.5	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-60	NERT	830404.92	26732358.91	1576.2	1573.6	40.0	2.6	7.1	42.1	2	PVC	Qal	Monitoring
PC-62	NERT	829764.07	26732733.58	1575.6	1573.2	38.0	2.3	9.9	39.9	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-64	NERT	827916.14	26723702.63	1675.3	1675.6	19.5	-0.3	3.7	18.7	2	PVC	Qal	Monitoring
PC-65	NERT	828386.88	26723682.68	1675.2	1676.1	19.1	-0.9	3.2	17.8	2	PVC	Qal	Monitoring
PC-66	NERT	828779.18	26723967.18	1673.7	1674.0	27.3	-0.4	6.5	26.5	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-67	NERT	829207.43	26723846.98	1674.0	1674.5	36.0	-0.5	10.5	35.1	2	PVC	Qal	Monitoring
PC-71	NERT	826805.39	26722688.14	1695.6	1696.0	30.4	-0.4	13.0	28.0	2	PVC	Qal/xMCf/UMCf	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
PC-72	NERT	826604.45	26722688.85	1696.5	1696.7	37.0	-0.2	14.8	34.8	2	PVC	Qal	Monitoring
PC-74	NERT	829203.18	26734003.83	1565.3	1564.6	50.0	0.7	40.2	50.2	2	PVC	Qal	Monitoring
PC-76	NERT	829183.40	26734007.04	1565.0	1564.6	20.5	0.5	15.5	20.5	2	PVC	Qal	Monitoring
PC-77	NERT	829031.24	26733568.34	1566.8	1566.8	40.0	0.0	29.5	39.5	2	PVC	Qal	Monitoring
PC-78	NERT	829032.96	26733560.54	1566.8	1566.9	22.0	-0.2	11.4	21.4	2	PVC	Qal	Monitoring
PC-79	NERT	829814.91	26733246.96	1573.2	1570.8	45.0	2.4	36.9	46.9	2	PVC	Qal	Monitoring
PC-80	NERT	829823.55	26733250.66	1573.5	1570.7	30.0	2.8	22.3	32.3	2	PVC	Qal	Monitoring
PC-81	NERT	829833.18	26733254.93	1573.5	1570.8	25.0	2.7	22.2	27.2	2	PVC	Qal	Monitoring
PC-82	NERT	830316.71	26733195.35	1568.7	1565.2	57.5	3.5	50.5	60.5	2	PVC	Qal	Monitoring
PC-83	NERT	830325.42	26733201.49	1568.9	1565.0	31.0	4.0	24.5	34.5	2	PVC	Qal	Monitoring
PC-86	NERT	830827.22	26733185.95	1561.1	1559.2	28.0	2.0	19.5	29.5	2	PVC	Qal	Monitoring
PC-87	NERT	830837.63	26733185.77	1561.2	1558.8	13.0	2.4	4.9	14.9	2	PVC	Qal	Monitoring
PC-88	NERT	831259.14	26733178.77	1550.8	1550.9	50.5	-0.1	39.9	49.9	2	PVC	Qal	Monitoring
PC-90	NERT	831271.57	26733192.94	1550.4	1550.6	15.0	-0.3	4.3	14.3	2	PVC	Qal	Monitoring
PC-91	NERT	831729.78	26733111.11	1552.2	1552.3	22.0	-0.1	11.4	21.4	2	PVC	Qal	Monitoring
PC-94	NERT	832188.77	26733122.74	1549.8	1550.1	20.0	-0.3	9.2	19.2	2	PVC	Qal	Monitoring
PC-96	NERT	830896.37	26733451.04	1552.4	1552.5	39.5	-0.2	28.9	38.9	2	PVC	Qal	Monitoring
PC-97	NERT	831565.43	26733441.67	1548.4	1548.9	33.5	-0.5	22.5	32.5	2	PVC	Qal	Monitoring
PC-98R	NERT	829522.36	26730261.00	1593.2	1593.2	40.5	0.0	20.0	35.0	4	PVC	Qal	Monitoring
PC-99R2/R3	NERT	831258.35	26733155.60	1552.6	1551.7	54.4	0.9	12.1	50.4	6	PVC	Qal	Extraction
PC-101R	NERT	828711.65	26728107.93	1618.6	1618.9	50.5	-0.3	19.7	49.7	2	PVC	Qal	Monitoring
PC-103	NERT	829110.59	26730205.91	1599.4	1597.1	29.5	2.3	11.3	31.3	2	PVC	Qal	Monitoring
PC-107	NERT	827136.13	26729287.90	1614.3	1614.6	18.0	-0.3	7.4	17.4	2	PVC	Qal	Monitoring
PC-108	NERT	828526.51	26731913.27	1588.0	1584.8	45.0	3.1	12.8	47.8	2	PVC	Qal	Monitoring
PC-110	NERT	826777.94	26731928.09	1594.3	1591.6	37.0	2.6	9.3	39.3	2	PVC	Qal	Monitoring
PC-115R	NERT	831148.78	26733131.33	1554.8	1554.5	54.9	0.2	10.6	49.8	8	PVC	Qal	Extraction
PC-116R	NERT	831348.16	26733203.37	1552.1	1552.0	55.5	0.1	10.4	50.1	8	PVC	Qal	Extraction
PC-117	NERT	831421.87	26733275.36	1550.7	1550.8	51.7	-0.1	9.7	49.1	8	PVC/SS	Qal	Extraction
PC-118	NERT	831052.11	26733167.68	1553.1	1553.0	48.1	0.1	7.0	46.4	8	PVC/SS	Qal	Extraction
PC-119	NERT	830951.41	26733188.27	1553.1	1559.1	46.6	-6.0	8.7	38.2	8	PVC/SS	Qal	Extraction
PC-120	NERT	830851.92	26733186.43	1553.2	1558.6	47.0	-5.5	8.6	39.5	8	PVC/SS	Qal	Extraction

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
PC-121	NERT	830751.43	26733180.69	1554.1	1557.1	36.7	-3.0	3.8	33.7	8	PVC/SS	Qal	Extraction
PC-122	NERT	829674.87	26728145.44	1618.1	1618.5	38.0	-0.4	22.6	37.6	2	PVC	Qal	Monitoring
PC-123	NERT	829484.73	26727358.61	1626.6	1626.9	35.2	-0.3	19.7	34.7	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-124	NERT	830132.64	26726741.67	1635.8	1636.4	35.5	-0.6	19.7	34.7	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-125	NERT	829925.63	26726740.00	1635.2	1635.6	33.9	-0.4	18.3	33.3	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-126	NERT	829724.56	26726737.98	1634.6	1634.9	34.7	-0.4	19.2	34.2	2	PVC	Qal	Monitoring
PC-127	NERT	829316.56	26726735.86	1632.5	1633.1	35.2	-0.6	14.4	34.4	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-128	NERT	828953.82	26726732.52	1633.5	1633.8	35.0	-0.3	14.5	34.5	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-129	NERT	828747.15	26726731.03	1634.0	1634.4	38.0	-0.4	12.4	37.4	2	PVC	Qal	Monitoring
PC-130	NERT	828538.02	26726729.58	1633.2	1633.7	50.0	-0.4	14.4	49.4	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-131	NERT	828123.05	26726725.49	1633.6	1634.5	40.0	-0.8	9.0	39.0	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-132	NERT	827913.71	26726723.41	1634.9	1635.2	40.0	-0.3	9.5	39.5	2	PVC	Qal/xMCf/UMCf	Monitoring
PC-133	NERT	831757.78	26733208.99	1550.2	1551.5	39.0	-1.3	1.5	36.2	4	PVC	Qal/xMCf/UMCf	Extraction
PC-134A	NERT	828775.55	26728143.21	1618.7	1618.9	70.0	-0.2	59.5	69.5	2	PVC	UMCf	Monitoring
PC-134D	NERT	828857.10	26728169.65	1618.6	1618.8	90.0	-0.3	79.7	89.7	4	PVC	UMCf	Monitoring
PC-135A	NERT	828767.26	26728143.10	1618.7	1619.0	51.0	-0.3	30.4	50.4	2	PVC	Qal	Monitoring
PC-136	NERT	829517.66	26728191.40	1618.4	1618.8	41.9	-0.5	21.3	41.3	2	PVC	Qal	Monitoring
PC-137	NERT	829517.49	26728199.02	1618.5	1618.9	73.3	-0.4	62.9	72.9	2	PVC	UMCf	Monitoring
PC-137D	NERT	829522.54	26728198.37	1618.4	1618.8	90.0	-0.4	79.6	89.6	4	PVC	UMCf	Monitoring
PC-142	NERT	828435.75	26728106.95	1619.7	1617.1	32.0	2.6	24.3	34.3	2	PVC	Qal	Monitoring
PC-143	NERT	828698.44	26728238.76	1619.3	1619.4	65.0	-0.1	29.7	64.7	2	PVC	Qal	Monitoring
PC-144	NERT	828903.52	26728223.91	1618.8	1619.0	40.0	-0.3	29.4	39.4	2	PVC	Qal/UMCf	Monitoring
PC-145	NERT	829535.99	26728324.84	1618.0	1618.2	45.0	-0.2	24.5	44.5	2	PVC	Qal	Monitoring
PC-146	NERT	829812.50	26728152.12	1617.7	1618.0	30.0	-0.3	19.5	29.5	2	PVC	Qal	Monitoring
PC-147	NERT	829767.43	26728153.08	1617.7	1617.8	32.0	-0.1	21.6	31.6	2	PVC	Qal	Monitoring
PC-148	NERT	829249.15	26728124.48	1618.1	1618.2	44.5	-0.1	24.4	44.4	6	PVC	UMCf	Monitoring
PC-149	NERT	829117.81	26728123.00	1619.1	1619.2	44.5	-0.1	24.4	44.4	6	PVC	Qal/UMCf	Monitoring
PC-150	NERT	828915.05	26728104.19	1616.2	1618.6	44.8	-2.4	17.5	37.5	6	PVC	Qal	Extraction
PC-151	NERT	826961.71	26726718.50	1638.7	1638.9	28.0	-0.2	7.8	27.8	2	PVC	Qal/UMCf	Monitoring
PC-152	NERT	827332.69	26726722.50	1637.0	1637.5	30.0	-0.4	9.6	29.6	2	PVC	Qal/UMCf	Monitoring
PC-153R	NERT	827665.62	26726723.98	1635.7	1636.1	30.0	-0.4	9.6	29.6	2	PVC	Qal	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
PC-154	NERT	827203.63	26728095.14	1624.8	1625.1	23.0	-0.3	7.7	22.7	2	PVC	Qal	Monitoring
PC-155A	NERT	830687.33	26734078.92	1555.6	1552.7	30.0	3.0	13.0	33.0	2	PVC	Qal	Monitoring
PC-155B	NERT	830681.56	26734087.49	1556.1	1552.9	48.0	3.2	41.2	51.2	2	PVC	Qal/UMCf	Monitoring
PC-156A	NERT	831227.64	26733839.41	1549.8	1546.9	20.0	2.9	12.9	22.9	2	PVC	Qal	Monitoring
PC-156B	NERT	831219.96	26733845.83	1550.5	1547.1	45.0	3.4	28.4	48.4	2	PVC	Qal	Monitoring
PC-157A	NERT	831609.73	26733942.94	1548.1	1545.0	24.0	3.1	12.1	27.1	2	PVC	Qal	Monitoring
PC-157B	NERT	831603.72	26733956.02	1548.0	1545.0	40.0	3.1	33.1	43.1	2	PVC	Qal	Monitoring
PC-158	NERT	827714.08	26728109.91	1620.1	1620.4	22.0	-0.3	6.7	21.7	2	PVC	Qal	Monitoring
PC-159	NERT	827903.56	26728109.57	1620.3	1620.7	25.0	-0.4	9.6	24.6	2	PVC	Qal	Monitoring
PC-160	NERT	828112.16	26728119.66	1619.4	1617.7	24.0	1.7	10.7	25.7	2	PVC	Qal	Monitoring
PC-171	NERT	826951.90	26723883.43	1675.6	1676.0	30.0	-0.4	15.0	30.0	2	PVC	Qal/UMCf	Monitoring
PC-188	NERT	827786.61	26721422.85	1716.7	1717.2	60.0	-0.4	49.6	59.6	4	PVC	UMCf	Monitoring
PC-189	NERT	828286.76	26721326.40	1718.3	1718.7	60.0	-0.4	49.7	59.7	4	PVC	UMCf	Monitoring
PC-191	NERT	828201.37	26728788.95	1601.9	1602.4	25.0	-0.4	9.6	24.6	2	PVC	Qal	Monitoring
PC-195	NERT	828659.53	26728440.41	1615.3	1612.9	75.0	2.4	62.4	77.4	4	PVC	UMCf	Monitoring
PC-196	NERT	829063.82	26728468.17	1615.4	1612.9	75.0	2.5	62.5	77.5	4	PVC	UMCf	Monitoring
PC-197	NERT	829518.00	26728648.39	1609.8	1610.4	75.0	-0.6	59.4	74.4	4	PVC	UMCf	Monitoring
PC-198	NERT	831215.66	26733075.32	1554.0	1554.3	70.0	-0.3	60.3	70.3	4	PVC	UMCf	Monitoring
PC-199	NERT	831225.50	26733078.35	1553.4	1554.0	105.0	-0.6	90.6	105.6	4	PVC	UMCf	Monitoring
SWFTS-MW07A	NERT	831555.99	26732895.65	1555.6	1555.9	30.1	-0.3	14.7	29.2	4	Sch. 40 PVC	Qal	Monitoring
SWFTS-MW08A	NERT	831972.55	26732720.57	1556.0	1556.5	35.3	-0.5	19.7	34.3	4	Sch. 40 PVC	Qal	Monitoring
SWFTS-MW08C	NERT	831980.38	26732718.60	1556.2	1556.6	70.0	-0.4	49.5	69.0	2	Sch. 40 PVC	UMCf	Monitoring
TR-1	NERT	826167.60	26719957.93	1748.0	1749.6	312.0	-1.6	279.9	309.9	4	PVC	UMCf	Artesian
TR-2	NERT	826156.18	26719954.86	1751.7	1749.5	175.0	2.2	146.7	176.7	4	PVC	UMCf	Monitoring
TR-3	NERT	826342.42	26718941.43	1769.2	1770.2	250.0	-1.0	218.5	248.5	4	PVC	UMCf	Artesian
TR-4	NERT	826342.03	26718951.73	1772.7	1770.2	145.0	2.5	127.0	147.0	4	PVC	UMCf	Monitoring
TR-5	NERT	826595.32	26717591.92	1796.5	1797.5	251.5	-1.0	220.0	250.0	4	PVC	UMCf	Artesian
TR-6	NERT	826593.83	26717608.59	1800.4	1797.7	80.0	2.6	62.6	82.6	4	PVC	UMCf	Monitoring
TR-7	NERT	826724.45	26716525.88	1829.1	1826.7	290.5	2.4	262.4	292.4	4	PVC	UMCf	Monitoring
TR-8	NERT	826722.60	26716512.21	1829.3	1826.7	93.5	2.5	65.5	95.5	4	PVC	UMCf	Monitoring
TR-9	NERT	827559.74	26715753.16	1854.4	1851.9	250.5	2.6	232.6	252.6	4	PVC	UMCf	Monitoring

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type
TR-10	NERT	827562.01	26715739.98	1854.2	1851.8	100.5	2.4	82.4	102.4	4	PVC	UMCf	Monitoring
TR-11	NERT	825422.22	26721918.32	1713.5	1714.4	230.5	-0.8	209.2	229.2	4	PVC	UMCf	Artesian
TR-12	NERT	825285.93	26723272.38	1692.1	1693.2	292.5	-1.1	270.9	290.9	4	PVC	UMCf	Artesian
UFMW-01D	NERT	827322.33	26719558.15	1755.1	1755.5	49.0	-0.4	43.6	48.6	2	Sch. 40 PVC	UMCf	Monitoring
UFMW-02D	NERT	827348.51	26719562.02	1755.0	1755.4	49.0	-0.4	43.6	48.6	2	Sch. 40 PVC	UMCf	Monitoring
UFMW-03D	NERT	827375.34	26719554.60	1754.8	1755.4	50.0	-0.6	44.4	49.4	2	Sch. 40 PVC	UMCf	Monitoring
UFMW-04D	NERT	827323.88	26719383.32	1758.8	1759.0	49.0	-0.2	43.8	48.8	2	Sch. 40 PVC	UMCf	Monitoring
UFMW-05D	NERT	827353.79	26719382.96	1758.9	1759.3	50.0	-0.4	44.6	49.6	2	Sch. 40 PVC	UMCf	Monitoring
UFMW-06D	NERT	827382.81	26719383.11	1758.8	1759.2	49.5	-0.5	44.5	49.5	2	Sch. 40 PVC	UMCf	Monitoring
WMW3.5N	SNWA	843836.97	26737791.35	1482.5	1482.8	56.6	NA	NA	NA	2	PVC	Qal	Monitoring
WMW3.5S	SNWA	844697.76	26737275.90	1483.5	1483.7	59.8	NA	NA	NA	2	PVC	Qal	Monitoring
WMW4.9N	SNWA	838408.40	26736756.98	1523.4	1520.7	53.0	NA	NA	NA	2	PVC	Qal	Monitoring
WMW4.9S	SNWA	838411.85	26735290.15	1518.8	1518.0	46.8	NA	NA	NA	4	PVC	Qal	Monitoring
WMW5.5S	SNWA	835768.11	26733971.74	1528.2	1529.1	38.3	NA	NA	NA	4	PVC	NA	Monitoring
WMW5.7N	SNWA	834471.76	26734425.52	1528.5	1525.9	21.0	NA	NA	NA	4	PVC	Qal	Monitoring
WMW5.7S	SNWA	834576.71	26733888.85	1537.3	1537.5	47.9	-0.1	NA	NA	4	PVC	NA	Monitoring
WMW6.15N	SNWA	832493.06	26735359.77	1552.6	1549.8	38.4	NA	NA	NA	2	PVC	Qal	Monitoring
WMW6.15S	SNWA	832119.74	26734098.93	1545.1	1542.9	19.4	NA	7.5	17.5	NA	NA	Qal	Monitoring
WMW6.55S	SNWA	830218.73	26734351.02	1559.3	1557.2	40.7	NA	18.0	43.0	2	PVC	Qal	Monitoring
WMW6.9N	SNWA	828913.10	26735560.65	1573.2	1570.0	48.6	NA	NA	NA	2	PVC	Qal	Monitoring
WMW6.9S	SNWA	828430.55	26734539.19	1570.6	1568.1	51.6	NA	15.0	45.0	2	PVC	Qal	Monitoring

Notes:

AMPAC = American Pacific Corporation

BRC = Basic Remediation Company

CGC = Chimera Golf Course

COH = City of Henderson

DTW = depth to water

ft = feet

ft amsl = feet above mean sea level

ft bgs = feet below ground surface

ft btoc = feet below top of casing

TABLE 9: SUMMARY OF WELL CONSTRUCTION INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Well ID	Owner	Easting	Northing	DTW Reference Elevation (ft amsl)	Ground Elevation (ft amsl)	Well Depth (ft bgs)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Casing Diameter (inches)	Casing Material	Lithology	Well Type

NA = not available

NERT = Nevada Environmental Response Trust

PVC = polyvinyl chloride

Sch = Schedule

SNWA = Southern Nevada Water Authority

SS = stainless steel

1. DTW measurements should be taken from the DTW Reference Elevation. The DTW Reference Elevation is equivalent to the top of casing (TOC) elevation, except at the following wells in the Interceptor Well Field (IWF) where the DTW Reference Elevation is higher than the TOC by the distance listed: I-B (0.2 ft), I-C (0.6 ft), I-D (0.4 ft), I-E (0.5 ft), I-G (0.8 ft), I-H (0.7 ft), I-J (1.0 ft), I-K (1.1 ft), I-L (0.4 ft), I-M (0.8 ft), I-N (1.2 ft), I-O (1.3 ft).

TABLE 10: SURFACE WATER LOCATIONS
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Easting	Northing	Location Type
C1-E	836786.03	26733546.79	Sample
C1-W	836786.03	26733546.79	Sample
C12	837308.17	26733542.07	Sample
LVW 0.55	856606.29	26746787.40	Sample
LVW 3.5-1	845238.81	26738797.61	Sample
LVW 3.5-2	845229.44	26738811.12	Sample
LVW 3.5-3	845211.18	26738843.34	Sample
LVW 3.5-4	845206.66	26738856.66	Sample
LVW 3.5-5	845193.07	26738864.40	Sample
LVW 3.5-6	845180.57	26738878.32	Sample
LVW 4.2-1	841922.35	26736691.36	Sample
LVW 4.2-2	841909.59	26736735.48	Sample
LVW 4.2-3	841878.65	26736794.04	Sample
LVW 4.2-4	841857.71	26736830.98	Sample
LVW 4.75-1	839787.44	26736052.85	Sample
LVW 4.75-2	839752.22	26736107.59	Sample
LVW 4.75-3	839715.54	26736160.87	Sample
LVW 4.75-4	839678.84	26736216.70	Sample
LVW 4.75-5	839640.98	26736270.70	Sample
LVW 5.3-1	836455.60	26734899.01	Sample
LVW 5.3-2	836392.91	26734972.98	Sample
LVW 5.3-3	836349.70	26735026.01	Sample
LVW 5.3-4	836306.49	26735080.01	Sample
LVW 5.3-5	836263.20	26735133.00	Sample
LVW 5.3-6	836220.00	26735185.98	Sample
LVW 6.05	832746.21	26734141.29	Sample
LVW 6.6-1	830497.87	26734599.33	Sample
LVW 6.6-2	830522.46	26734655.34	Sample
LVW 6.6-3	830529.46	26734712.09	Sample
LVW 7.2	828420.50	26735117.87	Sample
LVW 8.85	822567.52	26741136.06	Sample
S3.50 SW	844867.46	26738145.12	Transducer
S3.75 SW	844432.36	26737628.28	Transducer
S3.80 SW	844152.30	26737131.23	Transducer
S4.60 SW	840724.61	26736328.40	Transducer
S4.65 SW	840312.18	26736254.15	Transducer
S4.75 SW	839339.43	26735892.79	Transducer
S5.30 SW	836460.37	26734845.42	Transducer

Note:
Coordinates provide target sampling or transducer locations.

TABLE 11: MONITORING PROGRAM ROLES AND RESPONSIBILITIES
Nevada Environmental Response Trust Site
Henderson, Nevada

	Data Collection	Data Deliverables	Field Data Verification	Laboratory Data Verification	Laboratory Data Validation	Data Management	Data Evaluation and Reporting	Well Inspection and Maintenance	Corrective Actions
GWETS Operator	• Sampling extraction wells • Providing guidance on well access • Handing samples after collection • Taking custody of Groundwater Sampling Contractor's samples at end of day	• Preparing field documents and EDDs for extraction well sampling	• Communicating deviations from sampling program to Trust and Data Manager					• Notifying Data Manager of well maintenance issues found during sampling • Repairing wells and communicating nature and timing of repairs to other parties	• Correcting errors during sampling • Correcting errors in field deliverables
Groundwater/ Surface Water Sampling Contractor	• Sampling monitoring wells • Sampling surface water • Handling samples after collection • Downloading transducer data at sampled wells	• Preparing field documents and EDDs for monitoring well and surface water sampling • Preparing field documents for downloading transducer data • Reviewing and correcting field documents and EDDs for all sampling and data downloads • Submitting sampling field documents and EDDs to Data Manager • Submitting transducer field documents and raw transducer data to Transducer Network Manager	• Verifying that field activities follow SAP • Verifying that field documents and EDDs are complete, correct, and CEM approved • Checking consistency between field logs and EDDs/raw transducer data • Checking that all required samples and measurements are collected • Communicating deviations from sampling program to the Trust and the Data Manager • Communicating deviations from the transducer data download to the Transducer Network Manager					• Notifying Data Manager of well maintenance issues found during sampling • Notifying Transducer Network Manager of transducer maintenance issues found during sampling	• Correcting errors during sampling • Correcting errors in field deliverables
Transducer Network Manager	• Downloading transducer data at locations not visited by Groundwater/Surface Water Sampling Contractor	• Preparing field documents for downloading transducer data	• Checking consistency between field logs and raw transducer data • Communicating deviations from the transducer data download to the Trust and the Data Manager					• Repairing transducers and communicating nature and timing of repairs to other parties • Notifying Groundwater/Surface Water Sampling Contractor and Data Manager of potential transducer maintenance issues	• Correcting errors in field deliverables • Applying barometric and level corrections to transducer data

TABLE 11: MONITORING PROGRAM ROLES AND RESPONSIBILITIES
Nevada Environmental Response Trust Site
Henderson, Nevada

	Data Collection	Data Deliverables	Field Data Verification	Laboratory Data Verification	Laboratory Data Validation	Data Management	Data Evaluation and Reporting	Well Inspection and Maintenance	Corrective Actions
Data Manager			• Contacting Groundwater Sampling Contractor with questions about deliverables	• Verifying all deliverables from Analytical Laboratory have are complete and have undergone data verification	• Coordinating data validation by independent contractor	• Entering all analytical, transducer, and field data in project database • Maintaining project database • Performing QA/QC on project database • Downloading and tracking data as it is generated • Coordinating with other parties when data issues arise • Corresponding with Trust on data management issues	• Compiling, reviewing, analyzing, presenting, and interpreting groundwater monitoring data • Preparing Annual Performance Reports and Semi-Annual Performance Memoranda • Updating SAP	• Notifying sampling parties of potential well maintenance issues found during data evaluation	• Resolving issues with data validation process • Correcting errors in database
Analytical Laboratory	• Providing sample containers and coolers • Providing courier service to take samples to laboratory • Analyzing samples	• Reporting analytical results in pdf reports, EDDs, and online data portal		• Verifying all analyses are correctly performed • Verifying all laboratory data deliverables are consistent with each other					• Correcting errors in laboratory analyses
Data Validator					• Validating data to Stage-2A • Providing EDDs to Data Manager				

Notes:

CEM = Certified Environmental Manager

EDD = electronic data deliverable

SAP = sampling and analysis plan

QA/QC = quality analysis/quality control

TABLE 12: WELLS WITH POTENTIAL DNAPL OR VAPOR HAZARDS
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Potential Sampling Hazard		Easting	Northing	Ground Elevation (ft amsl)	Stick Up (ft)	Top of Screen (ft btoc)	Bottom of Screen (ft btoc)	Recent Highest VOC Concentration in Groundwater (mg/L)[2]
	DNAPL[1]	VOCs							
H-28A		X	825871.29	26721021.64	1731.06	1.88	28.22	45.41	1.3
M-22A		X	828269.84	26719531.96	1758.97	0.49	16	36	1.4
M-5A		X	826178.84	26719961.19	1749.26	2.58	40	50	3
M-65		X	827899.49	26719746.61	1752.1	1.91	14.4	39	0.93
M-66		X	828183.35	26719787.53	1751.68	2.35	17.5	42.3	0.97
M-92	X		827137.55	26717532.14	1798.3	2.5	34.9	44.9	0.089
M-93	X		827143.16	26717686.29	1797.7	-0.1	35.4	45.4	0.053
M-115	X		827243.41	26718612.95	1781.1	2.1	35	45.0	0.063
M-123	X	X	826514.08	26718415.73	1782.5	2.7	36	51	21
M-124	X		827089.92	26718225.15	1785.3	2.3	34	49	0.74 J-
M-125	X	X	826529.55	26718992.85	1768.6	2.9	35	50	17
M-126		X	826569.21	26719505.96	1756.4	2.7	19.7	39.7	20
M-142	X		827189.62	26718711.81	1774.0	-0.3	30	45	0.095
M-159		X	826756.03	26719822.97	1752.8	2.1	64.7	74.7	2.6
M-160		X	826766.94	26719825.09	1752.3	2.4	39.7	49.7	4.5
M-186		X	829020.45	26718354.57	1798.0	2.7	104.7	114.7	0.99
MC-3		X	825209.51	26721410.04	1725.0	0.9	35.4	43.42	8.2
MC-7		X	824932.95	26721865.47	1717.3	1.5	30.1	39.23	1.6

Notes:

DNAPL = dense non-aqueous phase liquid

ft amsl = feet above mean sea level

ft btoc = feet below top of casing

J- = estimated concentration, potential negative bias

mg/L = milligram per liter

VOC = volatile organic compound

1. Wells adjacent to zone with identified DNAPL contamination. DNAPL has been detected in monitoring wells screened between 80 and 120 feet below ground surface near the former Montrose Chemical Corporation of California site (AECOM 2016). If DNAPL is encountered during groundwater sampling, samplers should follow the procedures specific for wells with "free product" outlined in the FGD for Groundwater and Free Product Level Measurements included in Appendix D and should notify the Analytical Laboratory and the Data Manager.

2. The highest VOC concentration (generally chloroform or chlorobenzene) detected with EPA Method 8260 in samples collected between July 1, 2018 and August 31, 2019.

TABLE 13: SAMPLE PRESERVATION, CONTAINERS, AND HOLDING TIMES
Nevada Environmental Response Trust Site
Henderson, Nevada

Analytes	Matrix	Analytical Method	Preservation	Container[1][2]	TAT	Holding Time[3]
Metals [4]	Water	EPA Method 200.7	HNO_3 to pH < 2	500 mL plastic	10d	180d
Hexavalent Chromium	Water	EPA Method 218.6	Cool to 0 - 6˚C; Unpreserved	500 mL plastic	10d	24h [5]
Inorganic Anions [6]	Water	EPA Method 300.0	Cool to 0 - 6˚C	500 mL plastic	10d	48h [7]
Chlorate	Water	EPA Method 300.1	50 mg/L EDA; Cool to 0 - 6˚C	125 mL plastic	10d	28d
Perchlorate [8]	Water	EPA Method 314.0	Cool to 0 - 6˚C; Headspace required	250 mL plastic	10d	28d
Ammonia as N	Water	EPA Method 350.1	H_2SO_4 to pH <2; Cool to ≤ 6 ˚C	250 mL plastic	10d	28d
Phenols	Water	EPA Method 420 [9]	See footnote 8; Cool to ≤ 4 ˚C	500 mL amber glass	10d	See footnote 9
Volatile Organic Compounds (VOCs) [10]	Water	EPA Method 8260B [11]	HCl to pH<2; Cool to 0 - 6˚C; No headspace	3 x 40 mL VOA vials with Teflon-lined caps	10d	14d
Specific Conductance	Water	SM 2510	Cool to 0 - 6˚C	500 mL plastic	10d	28d
Total Dissolved Solids (TDS)	Water	SM 2540C	Cool to 0 - 6˚C	1 L plastic	10d	7d
Total Organic Carbon (TOC)	Water	SM 5310C	H_3PO_4 to pH < 2; Cool to 0 - 6˚C	250 mL amber glass	10d	28d
Total Organic Halides (Quad)	Water	SW-846 Method 9020B	H_2SO_4 to pH <2; Cool to ≤ 6 ˚C	500 mL amber glass with H_2SO_4	15d	28d

Notes:

EPA = United States Environmental Protection Agency
HDPE = High-Density Polyethylene
SIM = Selective Ion Monitoring
SM = Standard Method
TAT = Turnaround Time

EDA = ethylenediamine
HCl = Hydrochloric Acid
H_2SO_4 = Sulfuric Acid
H_3PO_4 = Phosphoric Acid
HNO_3 = Nitric Acid

d = day(s)
h = hours
mL = milliliters
L = liter

[1] Additional volume will be collected for MS/MSD samples.
[2] Laboratory may provide alternate containers as long as the containers meet the requirements of the method and allow the collection of sufficient volume to perform the analysis.
[3] Holding time begins from date of sample collection.
[4] Arsenic, Boron, Total Chromium, Iron, Manganese, Selenium, Sodium
[5] Holding time for Hexavalent Chromium is 24 hours from collection. If the sample is filtered at the time of collection, refrigerated between 0 and 6 °C, and preserved (pH 9.3-9.7) at the time of collection or at the lab within 24 hours of collection, the holding time is 28 days.

TABLE 13: SAMPLE PRESERVATION, CONTAINERS, AND HOLDING TIMES

Nevada Environmental Response Trust Site

Henderson, Nevada

Analytes	Matrix	Analytical Method	Preservation	Container[1][2]	TAT	Holding Time[3]

[6] Chloride, Sulfate, Nitrate as N, Nitrite as N

[7] Holding time is 48 hours for Nitrate and Nitrite. Holding time is 28 days for Chloride and Sulfate.

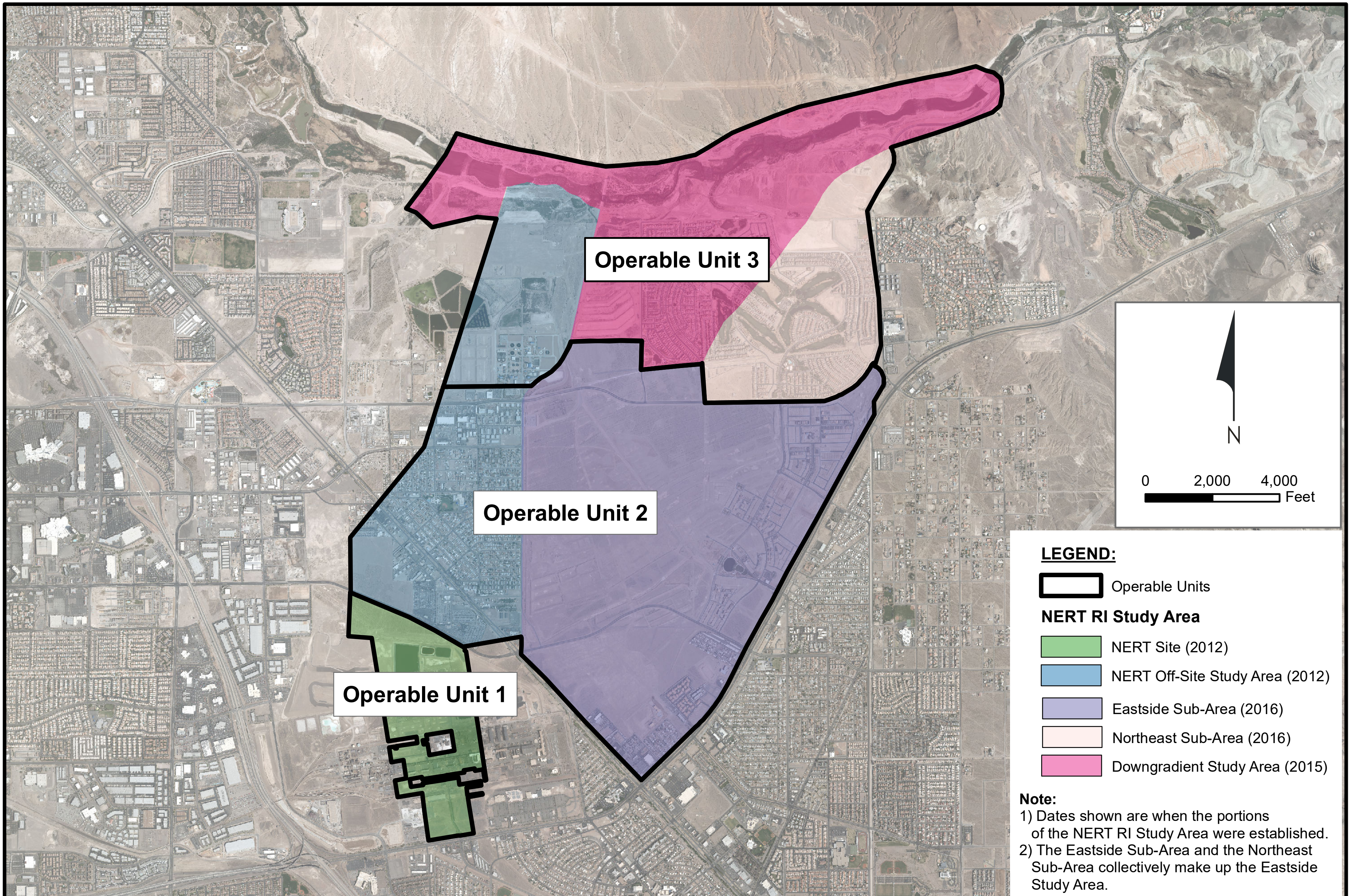
[8] Compliance samples may be subject to additional requirements as stated in their respective permits.

[9] Phenols can be run by EPA Method 420.1, 420.2, 420.3, or 420.4. Preservation and holding times for these methods are as follows:
- Method 420.1: preserve with $CuSO_4$ and H_3PO_4 to pH<4; holding time is 24 hours
- Method 420.2: preserve with $CuSO_4$ and H_3PO_4 to pH<4; holding time is 24 hours
- Method 420.3: preserve with $CuSO_4$ and H_2SO_4 to pH<4; holding time is 24 hours
- Method 420.4: preserve with H_2SO_4 to pH<4; holding time is 28 days

[10] Specific Volatile Organic Compounds (VOCs) are listed in Table 7 of this document.

[11] 1,4-Dioxane and 1,2,3-Trichloropropane will be run by EPA Method 8260B SIM.

FIGURES



RAMBOLL

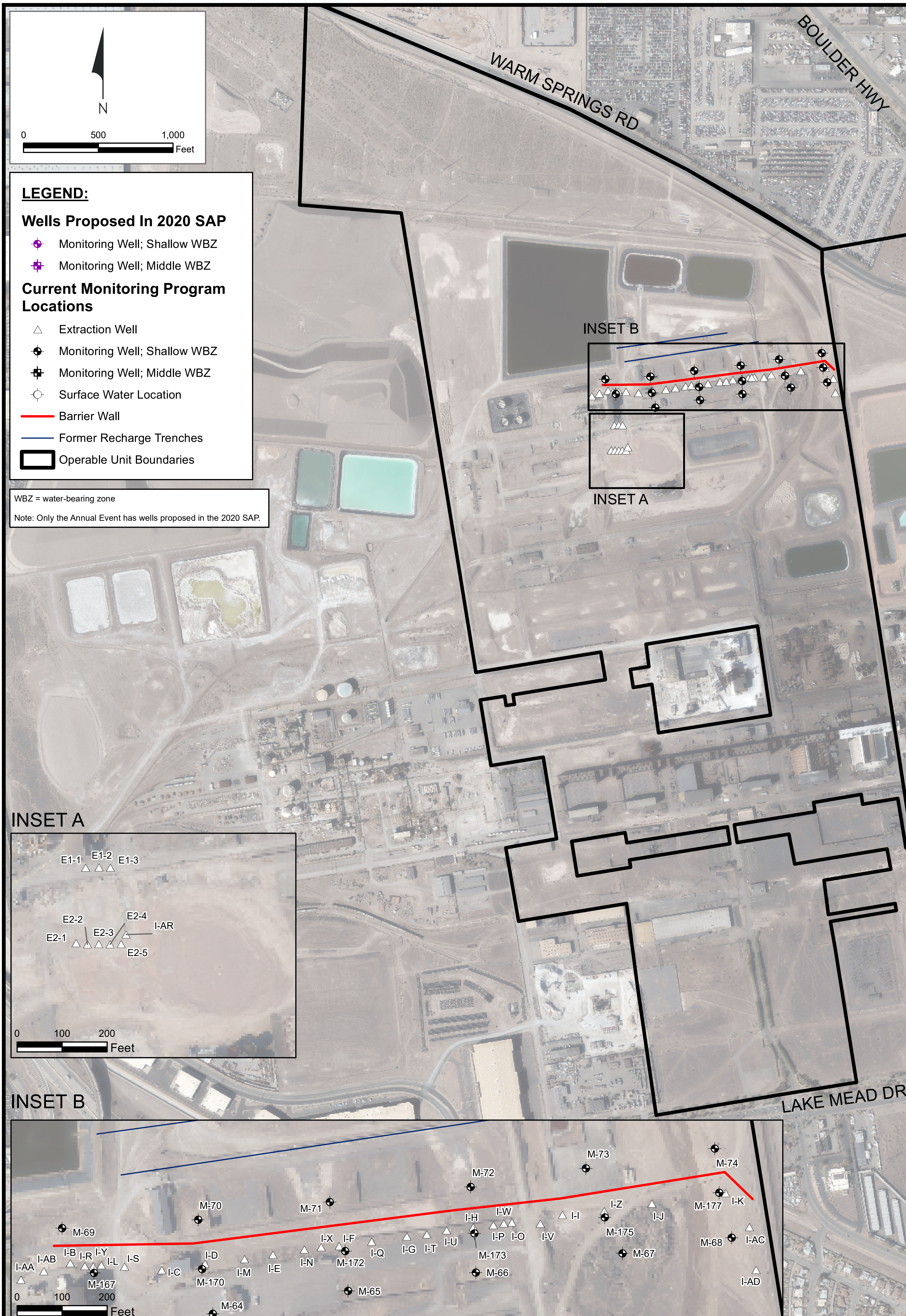
NERT RI Study Area Operable Units
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
1

Drafter: RS | Date: 8/30/2019 | Contract Number: 1690011198-028 | Approved: | Revised:

Path: \\wcevlfps1\ENG\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Fig 1 RI Study Area Operable Units.mxd

H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Final MXDs\Fig2a-OU1_Monthly_JH_AD.mxd



RAMBOLL

DRAFTED BY: JH

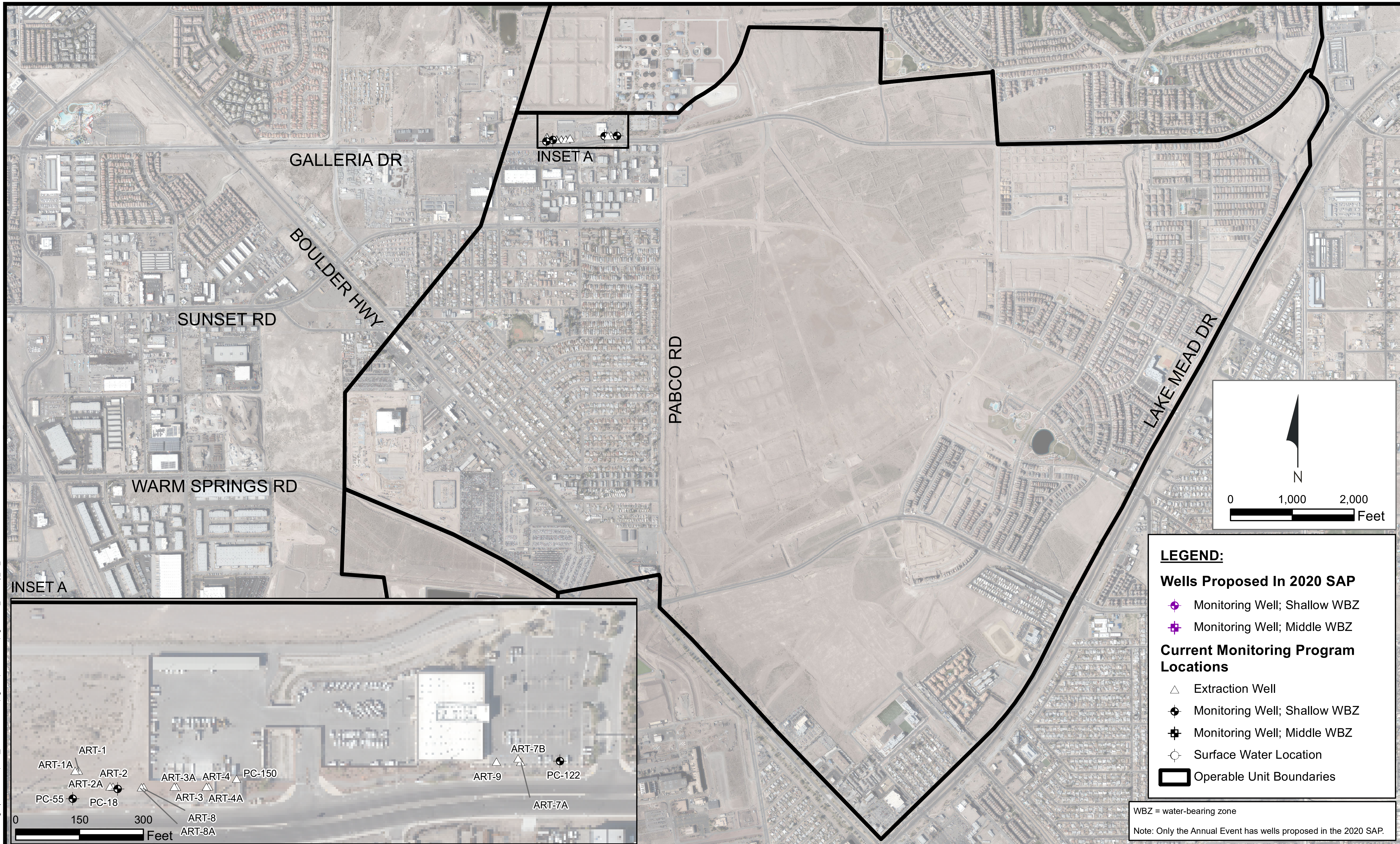
DATE: 1/7/2020

Monthly Sampling Event Locations, OU-1

Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
2a

PROJECT: 169001198-028



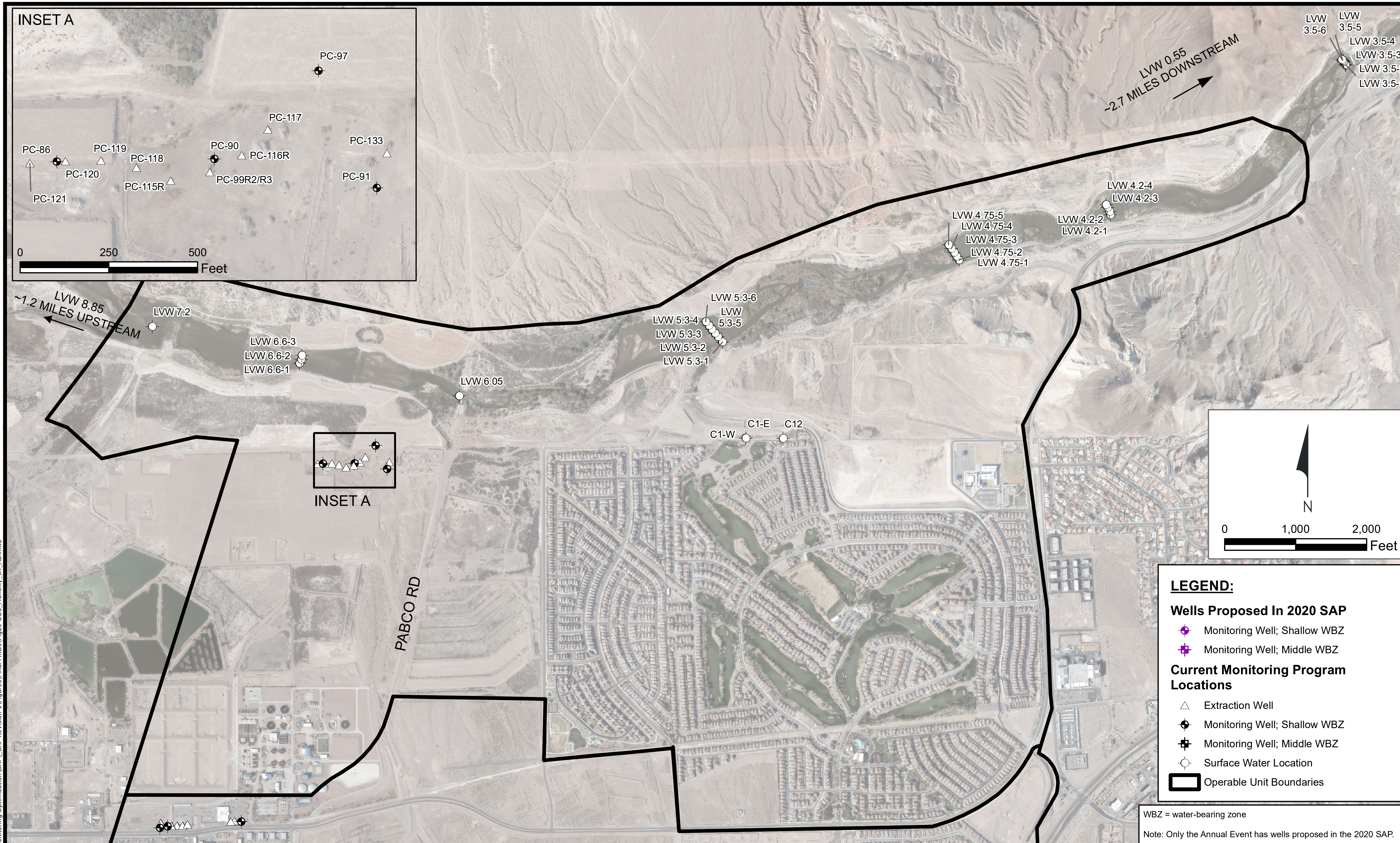
RAMBOLL

Monthly Sampling Event Locations, OU-2
Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
2b

DRAFTED BY: JH | DATE: 1/7/2020 | PROJECT: 1690011198-028

H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Final MXDs\Fig2b-OU2_Monthly_JH_AD.mxd



H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Final MXDs\Fig2c-OU3_Monthly_JH_AD.mxd

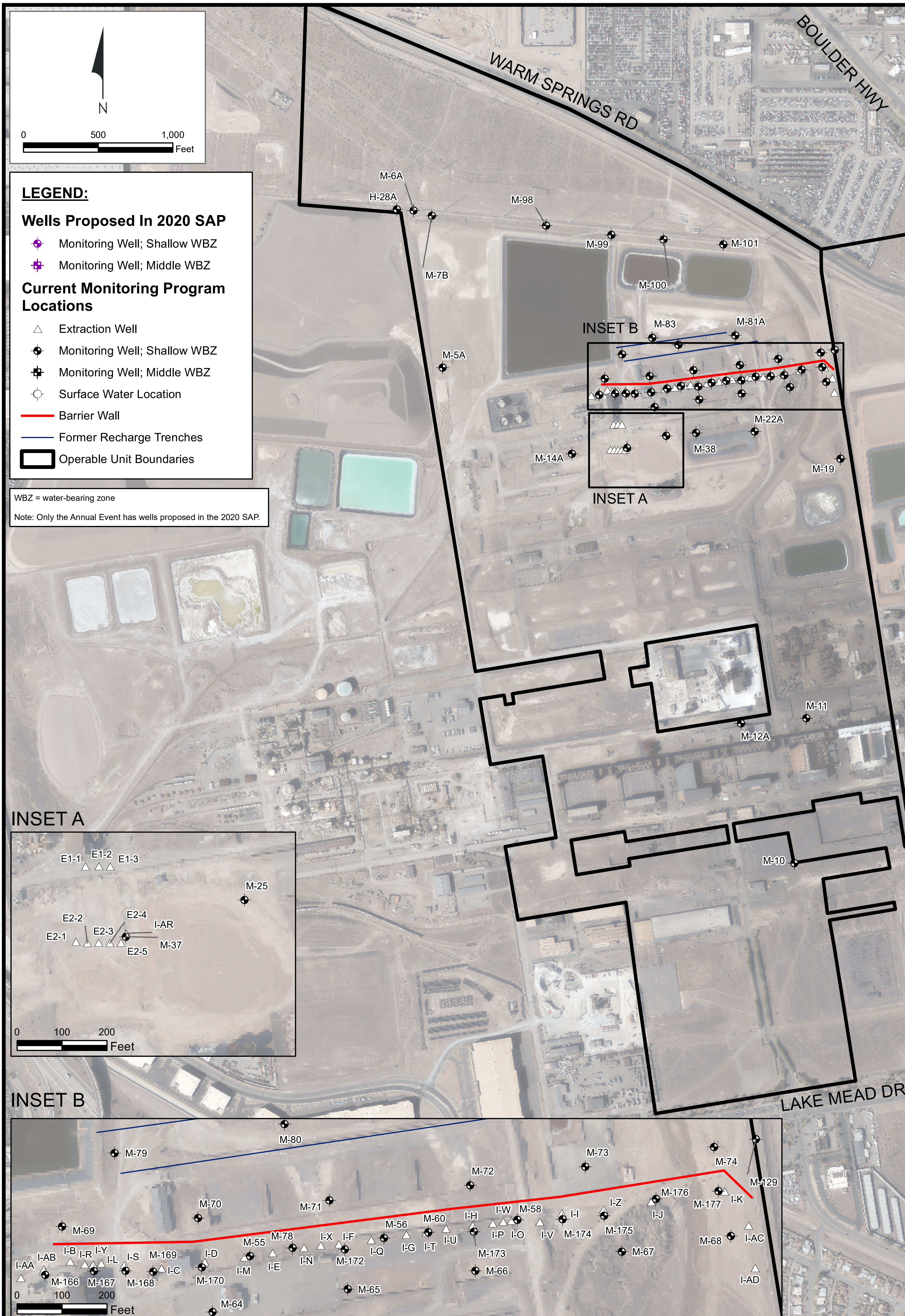
RAMBOLL

Monthly Sampling Event Locations, OU-3
Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
2c

DRAFTED BY: JH | DATE: 1/7/2020 | PROJECT: 1690011198-028

H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Final MXDs\Fig3a-OU1_Quarterly_JH_AD.mxd



RAMBOLL

DRAFTED BY: JH

DATE: 1/7/2020

Quarterly Sampling Event Locations, OU-1

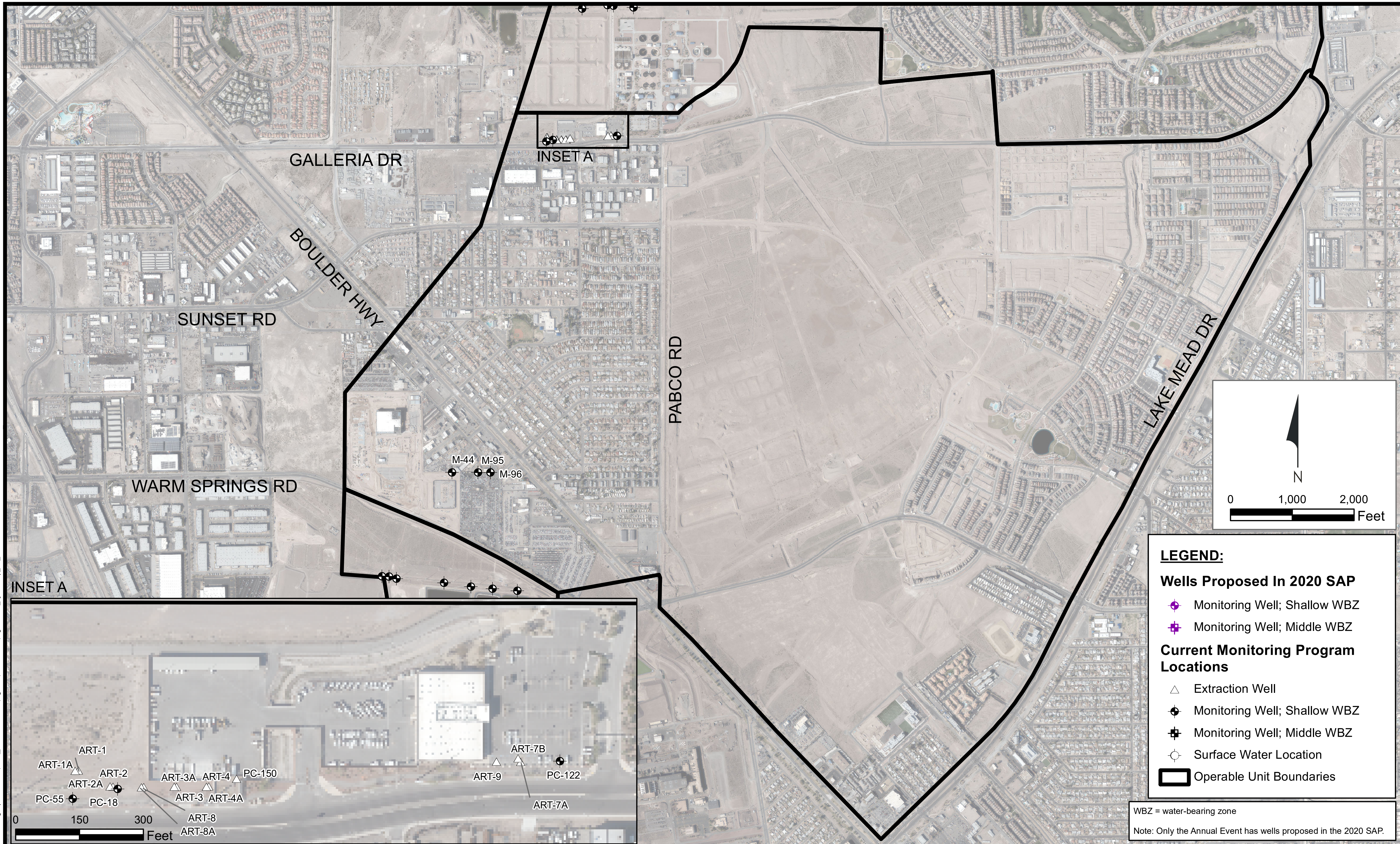
Nevada Environmental Response Trust Site

Henderson, Nevada

FIGURE

3a

PROJECT: 169001198-028



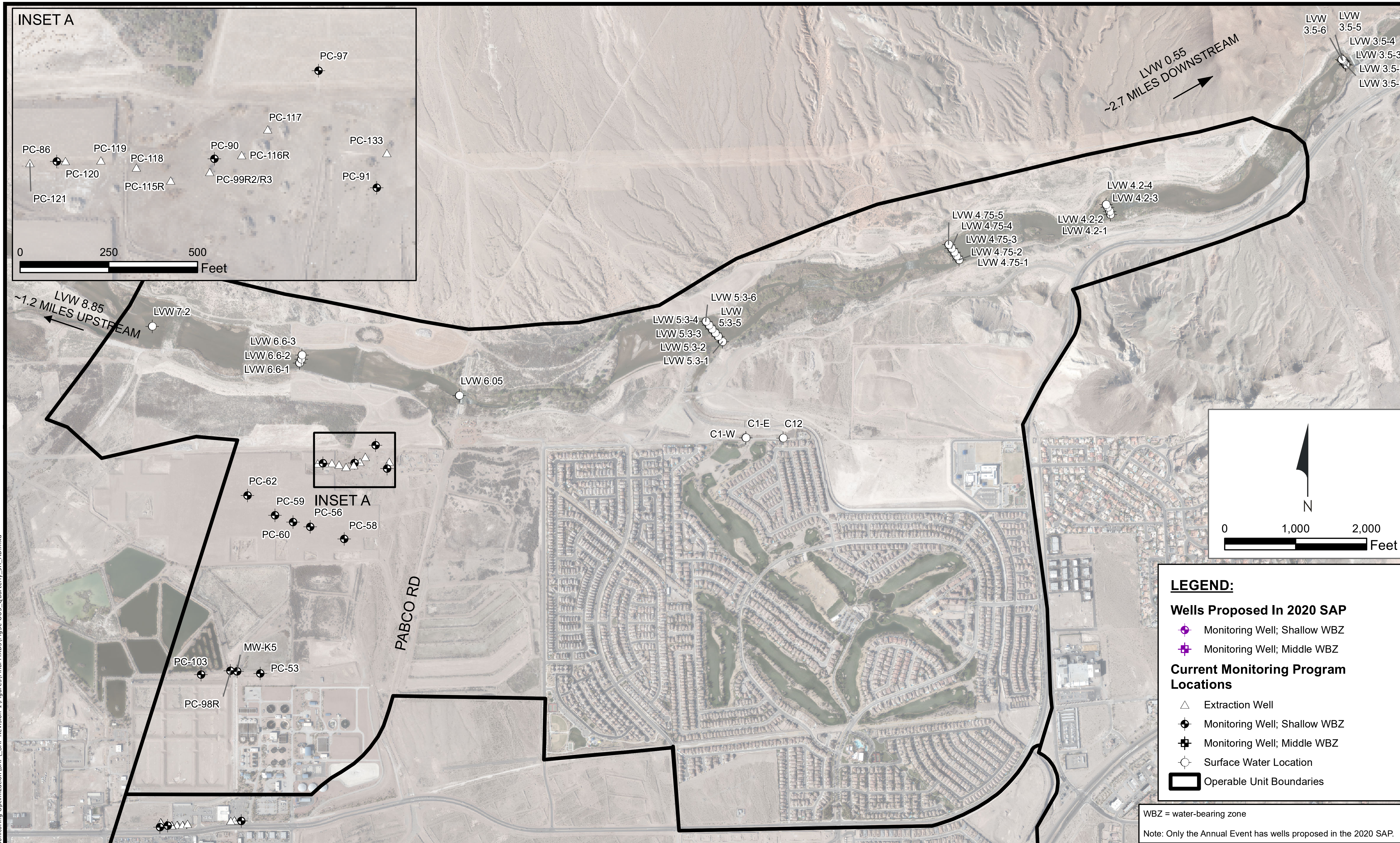
H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Final MXDs\Fig3b-OU2_Quarterly_JH_AD.mxd

RAMBOLL

Quarterly Sampling Event Locations, OU-2
Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE **3b**

DRAFTED BY: JH | DATE: 1/7/2020 | PROJECT: 1690011198-028



H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Final MXDs\Fig3c-OU3_Quarterly_JH_AD.mxd

RAMBOLL

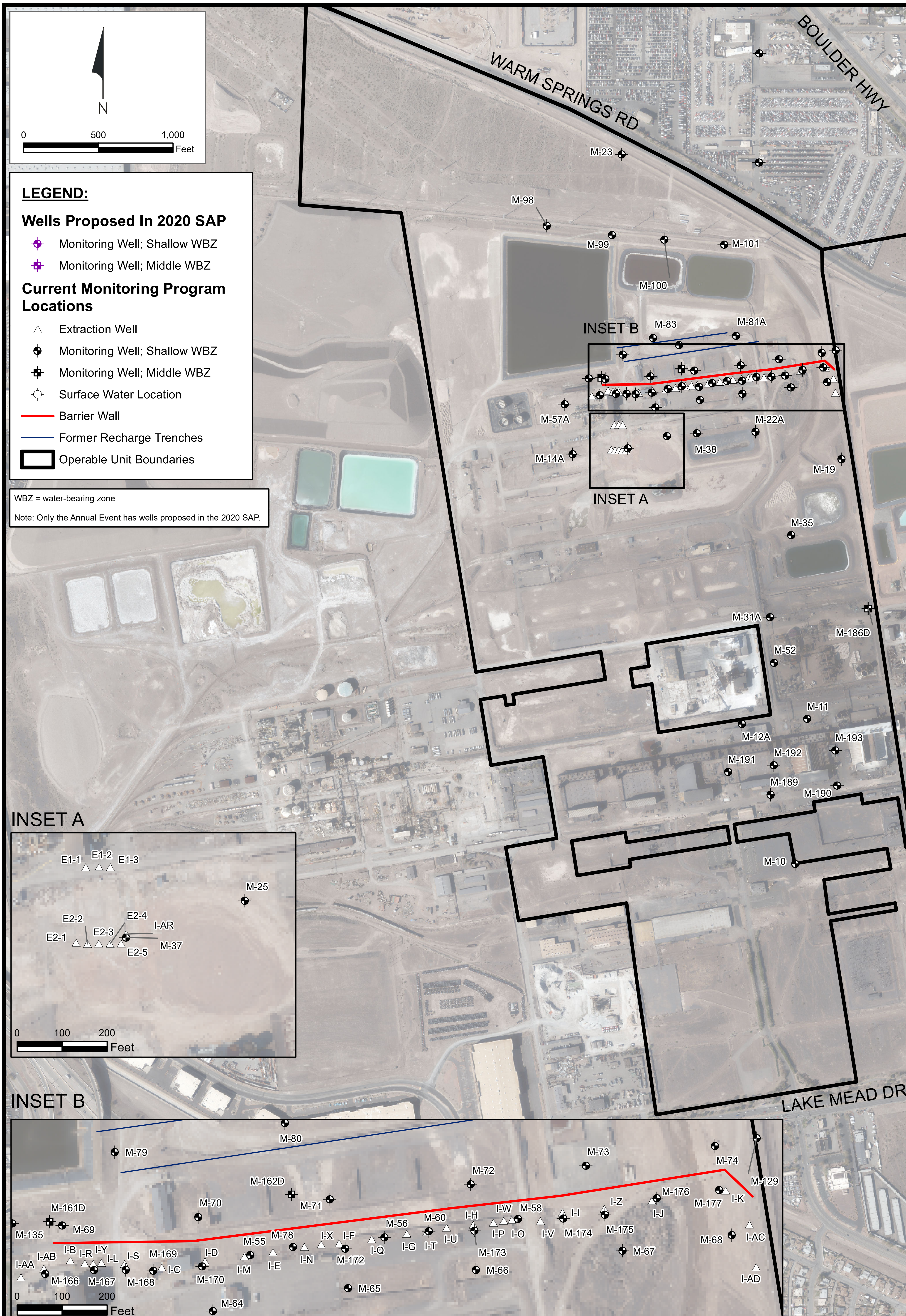
DRAFTED BY: JH | DATE: 1/7/2020

Quarterly Sampling Event Locations, OU-3
Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
3c

PROJECT: 1690011198-028

H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Final MXDs\Fig4a-OU1_Semiannual_JH_AD.mxd



RAMBOLL

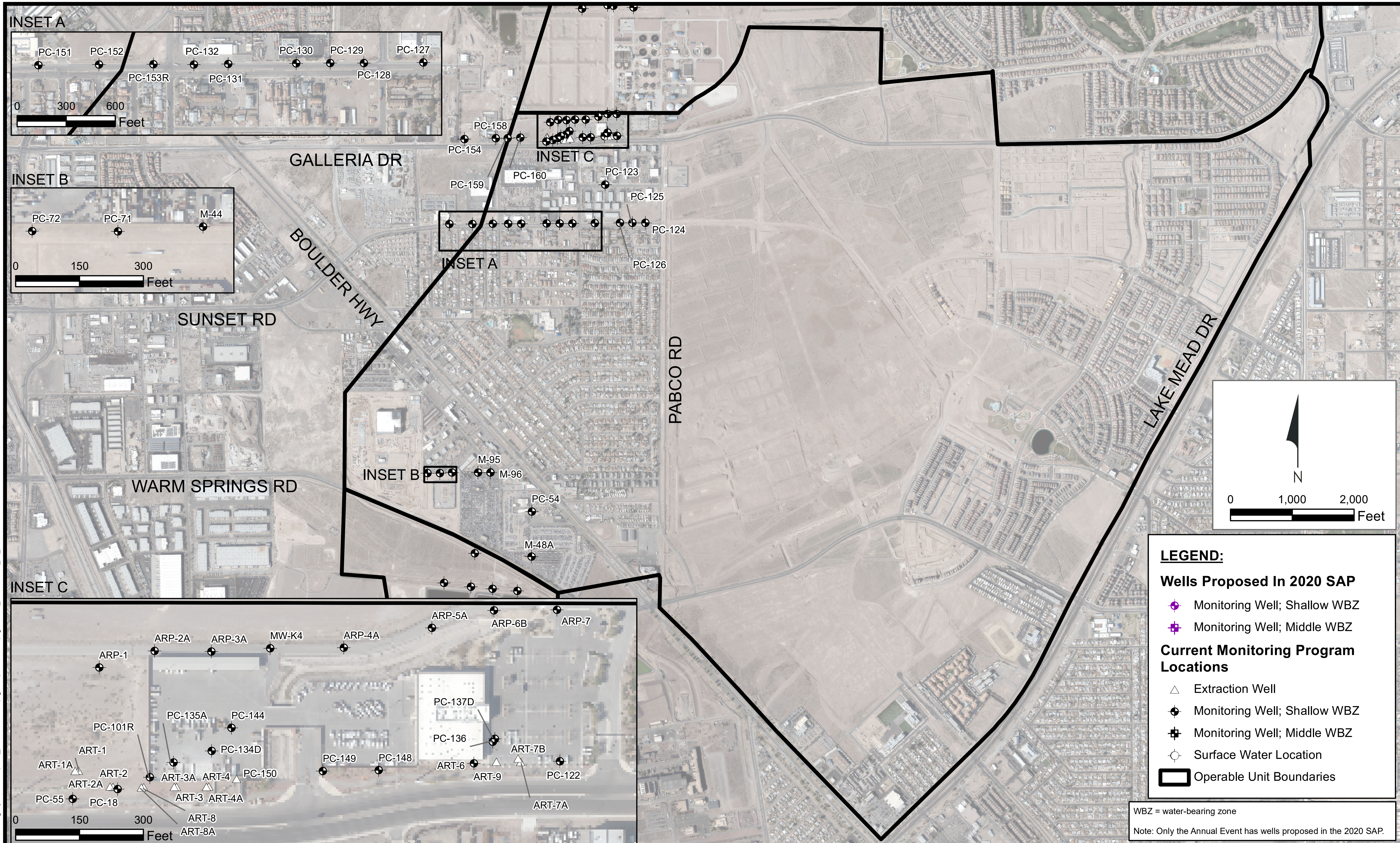
DRAFTED BY: JH | DATE: 1/7/2020

Semi-Annual Sampling Event Locations, OU-1

Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
4a

PROJECT: 169001198-028



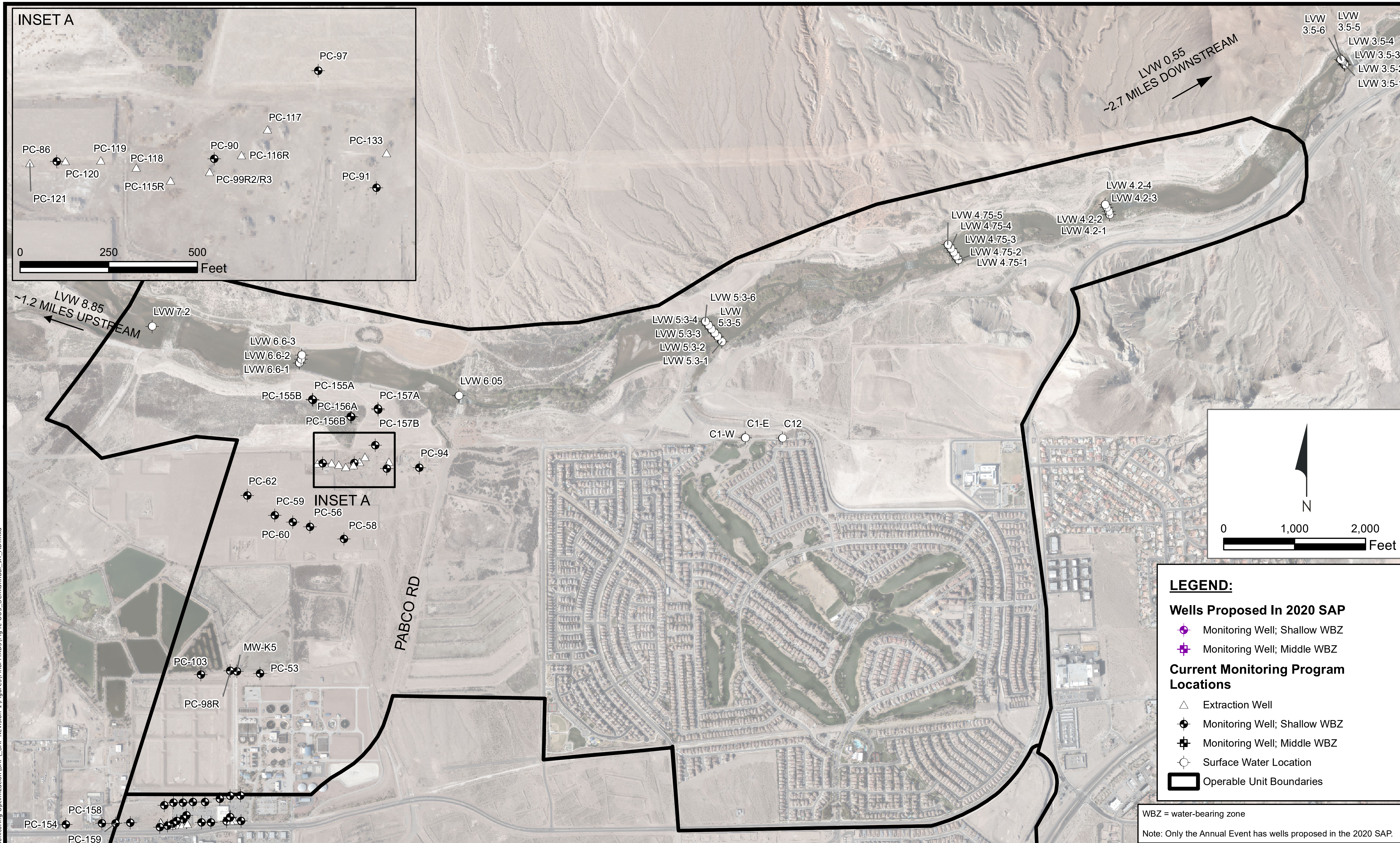
H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Final MXDs\Fig4b-OU2_Semiannual_JH_AD.mxd

RAMBOLL

Semi-Annual Sampling Event Locations, OU-2
Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
4b

DRAFTED BY: JH | DATE: 1/7/2020 | PROJECT: 1690011198-028



H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Final MXDs\Fig4c-OU3_Semiannual_JH_AD.mxd

RAMBOLL

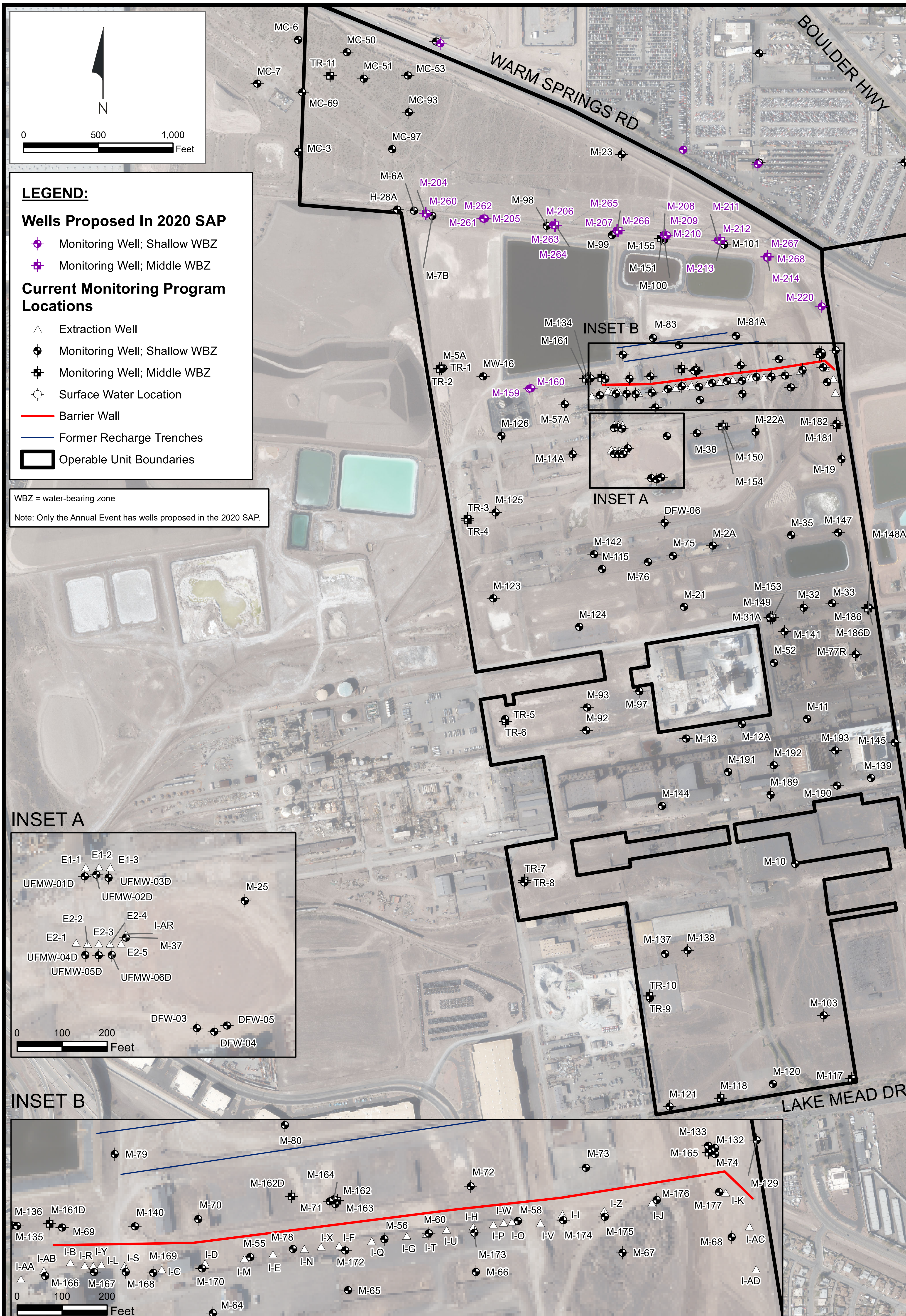
DRAFTED BY: JH | DATE: 1/7/2020

Semi-Annual Sampling Event Locations, OU-3

Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
4c

PROJECT: 1690011198-028

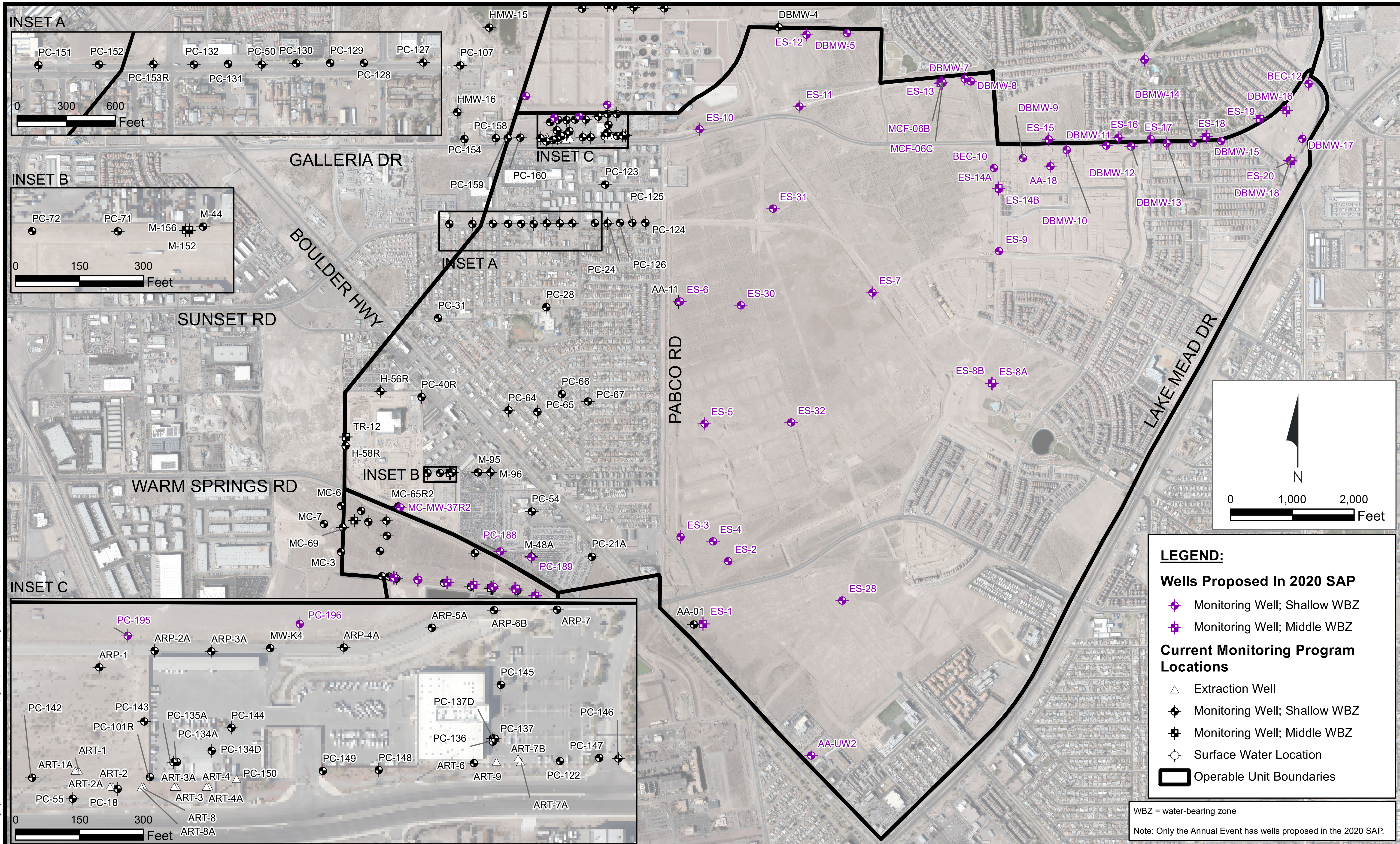


Annual Sampling Event Locations, OU-1

Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
5a

DRAFTED BY: JH | DATE: 1/7/2020 | PROJECT: 169001198-028



H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP_SAP Revision 1\Figures\Final MXDs\Fig5b-OU2_Annual_JH_AD.mxd

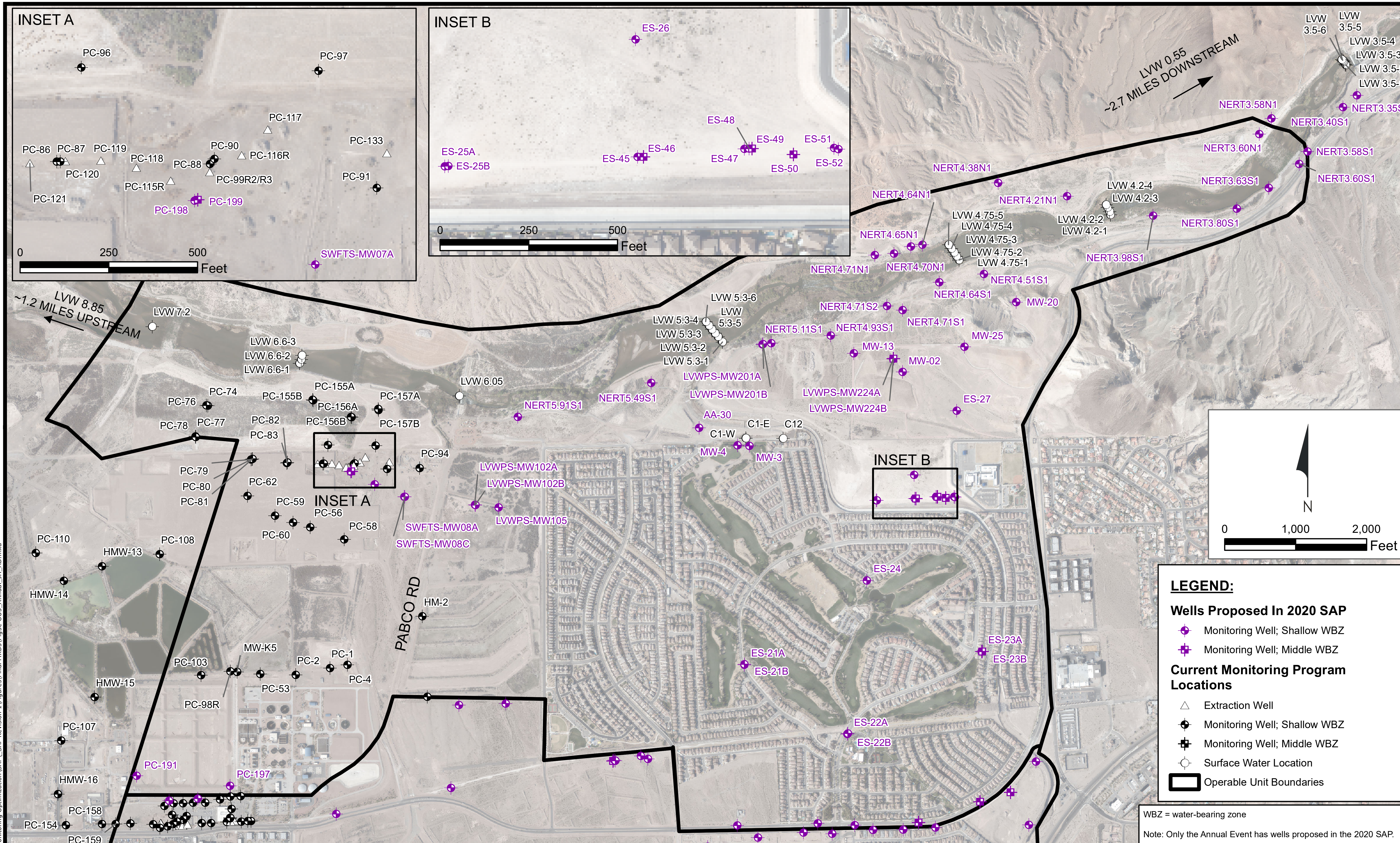
RAMBOLL

Annual Sampling Event Locations, OU-2

Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
5b

DRAFTED BY: JH | DATE: 1/7/2020 | PROJECT: 1690011198-028



H:\LePetomane\NERT\GWM\Monitoring Optimization\SAP\1_SAP Revision 1\Figures\Final MXDs\Fig5c-OU3_Annual_JH_AD.mxd

RAMBOLL

DRAFTED BY: JH | DATE: 1/7/2020

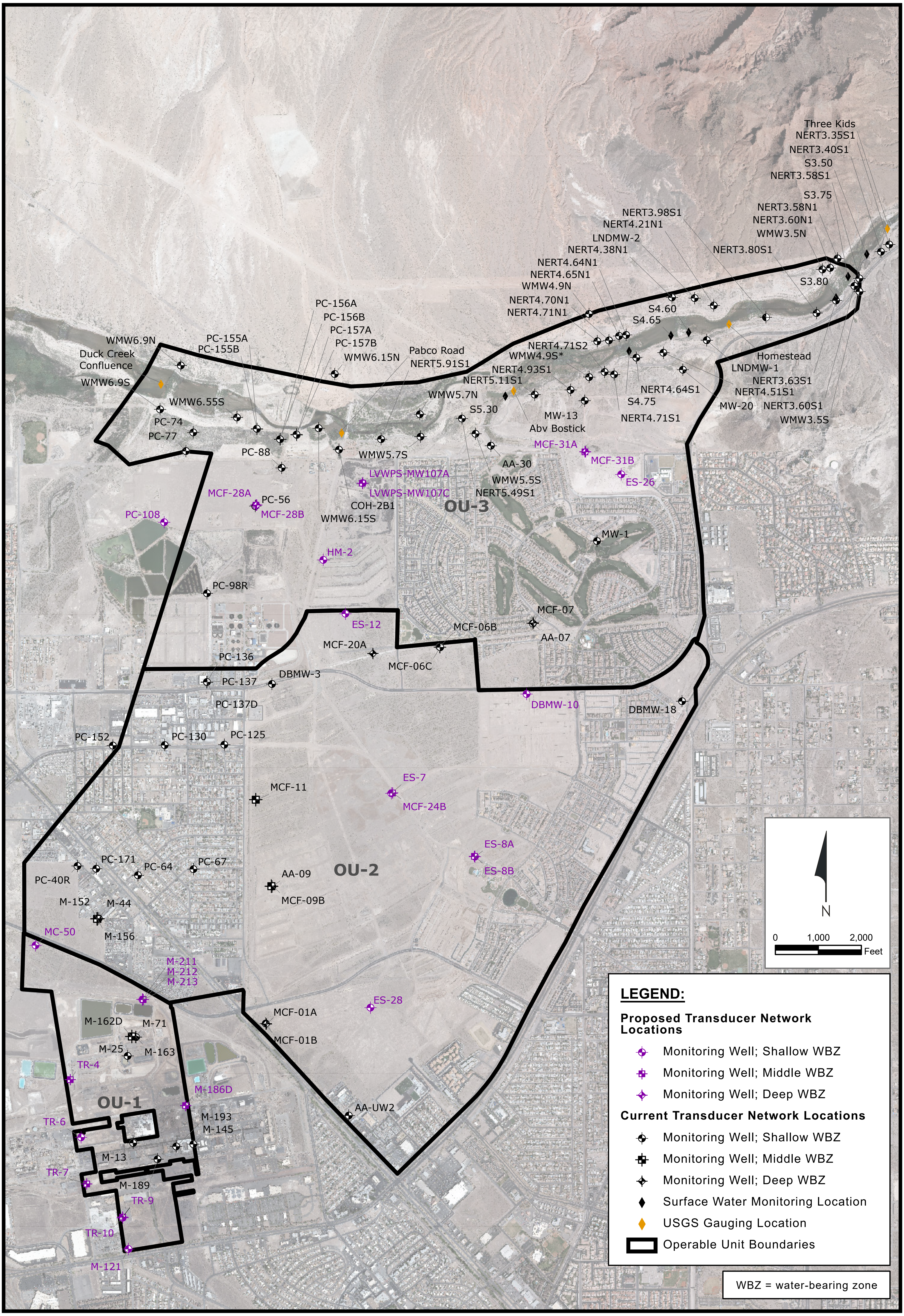
Annual Sampling Event Locations, OU-3

Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
5c

PROJECT: 1690011198-028

H:\LePetomane\NERT\GIS\Transducer Management - GIS\Transducer Network.aprx\Figure 6_Transducer Network_SAP



RAMBOLL

DRAFTED BY: JKING | DATE: 1/7/2020

Updated Transducer Network
Nevada Environmental Response Trust Site
Henderson, Nevada

FIGURE
6

PROJECT: 169001198-028

ELECTRONIC MAP

ALL WELLS LOCATION MAP

APPENDIX A
TETRA TECH SURFACE WATER SAMPLING AND ANALYSIS PLAN

Surface Water Sampling and Analysis Plan
Las Vegas Wash
Nevada Environmental Response Trust Site
Henderson, Nevada

PREPARED FOR

Nevada Environmental Response Trust
35 E. Wacker Drive, Suite 1550
Chicago, IL 60601

PRESENTED BY

Tetra Tech, Inc.
150 S. 4th Street, Unit A
Henderson, NV 89015

Revision 3. October 31, 2018

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

LIST OF ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AHA	Activity Hazard Analysis
CEM	Certified Environmental Manager
COC	chain of custody
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
GPS	global positioning system
HASP	Health and Safety Plan
IDs	identification designations
NERT	Nevada Environmental Response Trust
QA/QC	quality assurance and quality control
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
TAL	TestAmerica Laboratory
TDS	total dissolved solids
USGS	United States Geological Survey

CERTIFICATION

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 prepared 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. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

Description of Services Provided: Las Vegas Wash Surface Water Sampling and Analysis Plan.

____________________________ 10/31/18____________________

Kyle Hansen, CEM Date
Field Operations Manager/Geologist
Tetra Tech, Inc.

Nevada CEM Certificate Number: 2167
Nevada CEM Expiration Date: September 18, 2020

1.0 INTRODUCTION

At the request of the Nevada Environmental Response Trust (NERT or the Trust), Tetra Tech, Inc. (Tetra Tech) prepared this Sampling and Analysis Plan (SAP) for surface water sampling at the Las Vegas Wash (the Wash) in support of Remedial Investigation (RI) activities at the NERT site in Henderson, Nevada. The Wash is currently sampled on a monthly basis to improve understanding of perchlorate mass loading.

This SAP identifies procedures and techniques to be followed for surface water sample collection, preservation, and shipment; sample analyses; chain of custody (COC) controls; and quality assurance and quality control (QA/QC). All field work detailed in this SAP will be performed within the requirements of the NERT site-specific Health and Safety Plan (HASP) and task specific Activity Hazard Analysis (AHA). As described in this SAP, surface water sampling will be performed using a discrete grab sampling procedure with dedicated equipment. Any deviation from this SAP must first be reviewed and approved by the field team supervisor and the client prior to implementation.

2.0 ROLES AND RESPONSIBILITIES

The roles described in this section include those for the Sampling Contractor, the Data Manager, and the Analytical Laboratory. As of the date of this document, companies assuming these roles include:

- Tetra Tech, Inc. (Tetra Tech) as the Sampling Contractor,
- Ramboll Environ as the Data Manager,
- TestAmerica Laboratories, Inc. (TestAmerica) as the Analytical Laboratory.

The roles and responsibilities will be consistent with those outlined in the Remedial Performance Groundwater Sampling and Analysis Plan (Ramboll Environ, March 2017[1]).

3.0 MONTHLY SAMPLING LOCATIONS

A total of 31 independent samples will be collected from ten sampling locations within the Wash on a monthly basis. Six of the ten locations consist of transects with multiple sampling points that range from three to six sampling points per location (Figure 1). The remaining four Wash locations are single sampling points. Table 1 identifies the number of sampling points per sampling location, sampling point identification designations (IDs), and the coordinates for each sampling point.

4.0 SURFACE WATER SAMPLING

All sampling should be performed using dedicated equipment to the extent possible. In the event dedicated equipment cannot be used or is unavailable, samples will be collected with suitable reusable equipment, which has been properly decontaminated and quality control (i.e., equipment blank) procedures will be implemented.

[1] Ramboll Environ, 2017. Remedial Performance Groundwater Sampling and Analysis Plan; Nevada Environmental Response Trust Site; Henderson, Nevada. March 24, 2017.

4.1 FIELD SAMPLING DOCUMENTATION

A Surface Water Sampling Record field form will be used to document sampling at each surface water sampling point. An example of this field form is provided in Appendix A. The Surface Water Sampling Record will document general sampling event information, including location, time, sample identification, depth of water, depth of sample, sample collection method, and field parameters.

4.2 SAMPLE COLLECTION

Access to collect surface water samples will either be by wading into the Wash or, C-1 Channel, float tube, or by canoe. A shore watch must be present at all times during sample collection. The wading and float tube sampling teams must consist of at least two individuals with one individual acting as a shore watch. The canoe sampling team must include at least three individuals, with one individual acting as a shore watch, one individual managing the canoe, and one individual collecting the samples.

The Wash has a diurnal schedule with predominant high- and low-flow rates. Samples only will be collected during the periods of low-flow. While the low-flow rate typically occurs during morning hours, the most recent flow schedules will be verified and a detailed sampling schedule will be coordinated with the Sampling Contractor Project Manager prior to the start of each sampling event.

Surface water samples will be collected at the sampling points listed in Table 1 for the applicable sampling event. Samples will be collected as close as possible to each sampling point's global positioning system (GPS) coordinates. Safety precautions, changes in the Wash flow, and other unforeseen circumstances may prevent samples from being collected at the designated sampling point GPS coordinates. In such cases, the sampler will contact the Sampling Contractor Project Manager, and an alternative sampling point will be determined. GPS coordinates will be collected and recorded at each sampling point during each sampling event.

All samples will be collected on the quarter hour, as reasonably practicable, to coincide with the USGS flow data collection. Sampling point depths and depth of water will be measured and recorded (to the nearest tenth of a foot) prior to sample collection using a marked rod, weighted measuring tape, or equivalent. Samples will be collected at the approximate mid-depth using a discrete grab sample method. The sampler will take steps to collect the most representative samples possible and to minimize sediment disturbance. At locations where a canoe is required for access, the sampler may use a "bomb" discrete depth sampling device. At locations where the sampler can wade in the water to collect the sample, the sample will be collected by slowly introducing water into the container only at the sampling location. A new, non-preserved sample container will be used to collect the volume necessary for a pre-preserved sample container. Sample point identifications for labeling samples are provided in Table 1.

Monthly sampling at the C-1 Channel, which discharges into the Wash upstream of transect LVW5.3, will also be conducted. Based on preliminary observations, continuous flows are present at C-1 Chan #1E and C-1 Chan #1W and C-12 Chan #2 only flows after storm events. Monthly samples will be collected at C-1 Chan #1E and C-1 Chan #1W, and if flow is present, a sample will also be collected at C-12 Chan #2. The flow in each of the C-1 sample locations will be estimated by measuring the flow velocity and cross-sectional area, as described in Section 4.3.

The following water quality field parameters will be collected and recorded at each sample point: pH, conductivity, temperature, turbidity, dissolved oxygen, and oxygen-reduction potential. A description of the sample appearance (e.g., clarity, color) will also be recorded. All field sampling water quality meters will be calibrated at the start of each sampling day and recorded on the Field Calibration Log. An example log is provided in Appendix B. Calibration procedures shall be consistent with manufacturer instruction manuals for each instrument.

All samples will be submitted for laboratory analysis for perchlorate, chlorate, and total dissolved solids (TDS) using EPA Methods 314.0, 300.1, and SM 2540C, respectively.

4.3 CROSS-SECTIONAL AREA AND FLOW AT C-1 CHANNEL

If flow is present, the culvert cross-sectional area and flow velocity will be measured during the sampling events at the C-1 Chan #1-E, C-1 Chan #1-W, and C-12 Chan #2 sampling locations.

The diameter of the culvert and depth of water in each cylindrical culvert will be measured using a measuring tape and documented in the field notes. This information will be used to calculate the circular cross-sectional area of each culvert.

The flow velocity in each culvert will be estimated by directing the water into a graduated bucket at the discharge point. The time required to fill the bucket to a specific volume will be measured. The volume and time will be recorded, and flow will be calculated by dividing the volume by time. If the culvert flow is rapid and the discharge volume is high, this measuring procedure may not be practicable. In these cases, a stream flow meter may be used to measure the flow rate in the culvert.

At least two flow measurements will be collected and documented at each sampling location C-1 Chan #1-E, C-1 Chan #1-W, and C-12 Chan #2.

4.4 SAMPLE CONTAINERS, PRESERVATION, AND HOLDING TIMES

Appropriate laboratory-provided sample containers and preservatives will be used, and the recommended holding times will be observed for each parameter. Sample containers will be provided by TestAmerica Laboratory (TAL), located in Irvine, California; this laboratory will also perform the analyses.

4.5 SAMPLE STORAGE AND TRANSPORT

Sample containers will be labeled as detailed in Table 1, and placed into an insulated cooler or other suitable container with ice or frozen ice packs and kept at 4°C. All samples included in the container will be packed in such a manner to minimize the potential for container breakage. The samples will be stored at 4°C until the end of the sampling event when the samples will be transferred to the local TAL representative. All samples will be held until the sampling event is completed to result in a single shipment to the laboratory. The field samplers will coordinate the sample transfer with TAL to ensure that all sampled constituents holding times are met. The analytical laboratory will record the temperature of the samples when the transport container arrives at their facility.

4.6 CHAIN OF CUSTODY DOCUMENTATION

Appropriate COC procedures for samples will be implemented to ensure sample integrity and to provide technically and legally defensible surface water quality data. COC forms will be completed and delivered with the sample containers to laboratory personnel. Upon transfer, the laboratory person taking custody of the environmental samples will sign and time/date the COC forms. An example COC form is provided in Appendix C.

4.7 DECONTAMINATION PROCEDURES

Any equipment that may be used for sample collection will be decontaminated prior to use unless the equipment is dedicated or disposable. The only equipment for this project that would require decontamination is the subsurface, discrete sample collection container, referred to as the “bomb” sampler. The “bomb” sampler will be hand washed with phosphate-free detergent (e.g., Alconox™) and a scrubber, then triple rinsed with distilled water between each sampling collection point the equipment is used.

All decontamination water will be contained in sealable five-gallon buckets, transported back to the NERT site, and placed in the GW-11 Pond.

4.8 ANALYTICAL METHODS/PROCEDURES

Surface water samples will be analyzed for perchlorate by U.S. Environmental Protection Agency (EPA) Method 314.0, chlorate by EPA Method 300.1, and TDS by EPA Method SM 2540C.

5.0 SAMPLING QUALITY ASSURANCE/QUALITY CONTROL

5.1 TRIP BLANK

Samples will not be collected for analysis of volatile organic compounds as a part of these sampling events; accordingly, trip blanks are not required as part of this SAP. The conventions for sample naming and identification listed in Table 1 should be followed for all QA/QC samples.

5.2 FIELD BLANK

Field blanks will be collected during each sampling event at a frequency of one field blank per 20 samples. The field blank sample will be collected in the field by pouring laboratory-supplied deionized water or distilled water into a new sample container(s) at the same time and location as one of the surface water samples. The field blank will then be sealed, shipped, and analyzed in the same manner as the samples collected per this SAP.

5.3 EQUIPMENT BLANK

An equipment blank will be collected in the event that non-dedicated and/or non-disposable equipment use is required, such as the "bomb" sampler. An equipment blank will be collected at a frequency of one per 20 samples collected with that sampling device. Equipment blanks will be prepared by passing laboratory-supplied deionized water or distilled water through the decontaminated sampling equipment and collecting the water in appropriate sample containers. The equipment blank will then be sealed, shipped, and analyzed in the same manner as the samples collected per this SAP.

5.4 FIELD DUPLICATE

Field duplicates are collected to assure the precision of the sampling and analytical processes. Field duplicates will be collected in an interval of one sample per every range of 10 field samples (1 - 10, 11 - 20, etc.). For sampling events involving collection of five or fewer samples, no sample duplicate will be collected. The field duplicate will then be sealed, shipped, and analyzed in the same manner as the samples collected per this SAP.

5.5 SUMMARY OF FIELD QUALITY CONTROL COLLECTION FREQUENCY

Field QA/QC	Collection Frequency
Field Blank	Minimum of 1 per 20 samples
Equipment Blank	Minimum of 1 per 20 samples using non-dedicated equipment
Field Duplicate	Minimum of 1 per 10 samples for every event where 6 or more samples are collected.

5.6 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

The laboratory QA/QC program includes the following actions: 1) performing analytical methods according to prescribed protocols; 2) analyzing QA/QC samples to measure precision and accuracy of laboratory methods and equipment and instrument calibration; and 3) taking preventative maintenance measures. Laboratory QA/QC samples include method blanks, laboratory control samples, matrix spikes, laboratory duplicates, and surrogates.

Laboratory deliverables equivalent to EPA Level II are required to meet the project's data validation requirement. The standard sample turnaround time for this project is ten business days.

6.0 FIELD DELIVERABLES

Submittals should include sampling logs, equipment calibration logs, daily field notes, and the field parameter electronic data deliverable (EDD). The Sampling Contractor will review field data to evaluate completeness of the field records and provide Certified Environmental Manager (CEM) certified data to the Data Manager. These documents should be submitted to the Data Manager in a timely manner. Monthly documents should be submitted to the Data Manager by the 20th of each month (following the month when the data was collected).

Tables

Table 1. Las Vegas Wash Sampling Point Locations

General ID Nomenclature: ***SamplingLocation-SamplePoint-Depth-YearMonthDate*** Example Sample ID: ***LVW6.6-3-1.5-20170626***			
Sample Locations	**Sampling Point IDs**	**Coordinates**	**Sample Frequency**
LVW8.85	LVW8.85-D.D- XXXXXXXX	36.107231, -115.019994	Monthly
LVW7.2	LVW7.2-D.D-XXXXXXXX	36.090603933263, -115.00030216561	Monthly
LVW6.6	LVW6.6-1-D.D-XXXXXXXX	36.0891450601074, -114.99328181958	Monthly
	LVW6.6-2-D.D-XXXXXXXX	36.0893514055985, -114.993309180171	Monthly
	LVW6.6-3-D.D-XXXXXXXX	36.0894854879497, -114.993333204109	Monthly
LVW6.05	LVW6.05-D.D-XXXXXXXX	36.0878490822499, -114.985681846931	Monthly
LVW5.3	LVW5.3-1-D.D-XXXXXXXX	36.0898673, -114.9731116	Monthly
	LVW5.3-2-D.D-XXXXXXXX	36.0900716, -114.9733222	Monthly
	LVW5.3-3-D.D-XXXXXXXX	36.0902180. -114.9734673	Monthly
	LVW5.3-4- D.D-XXXXXXXX	36.0903671, -114.9736124	Monthly
	LVW5.3-5- D.D-XXXXXXXX	36.0905134, -114.9737578	Monthly
	LVW5.3-6- D.D-XXXXXXXX	36.0906597, -114.9739029	Monthly
C-1 Chan #1-E	C1-E-D.D- XXXXXXXX	36.086147, -114.972022	Monthly
C-1 Chan #1-W	C1-W-D.D- XXXXXXXX	36.086147, -114.972022	Monthly
C-12 Chan #2 (if flow is present)	C12-D.D- XXXXXXXX	36.086125, -114.970255	Monthly
LVW4.75	LVW4.75-1-D.D- XXXXXXXX	36.092979, -114.961810	Monthly
	LVW4.75-2-D.D- XXXXXXXX	36.093130, -114.961928	Monthly
	LVW4.75-3-D.D- XXXXXXXX	36.093277, -114.962051	Monthly

Table 1. Las Vegas Wash Sampling Point Locations

General ID Nomenclature: *SamplingLocation-SamplePoint-Depth-YearMonthDate* Example Sample ID: *LVW6.6-3-1.5-20170626*			
Sample Locations	**Sampling Point IDs**	**Coordinates**	**Sample Frequency**
	LVW4.75-4-D.D- XXXXXXXX	36.093431, -114.962174	Monthly
	LVW4.75-5-D.D- XXXXXXXX	36.093580, -114.962301	Monthly
LVW4.2	LVW4.2-1-D.D-XXXXXXXX	36.0946953057117, -114.95457011939	Monthly
	LVW4.2-2-D.D-XXXXXXXX	36.0948167415993, -114.954612344603	Monthly
	LVW4.2-3-D.D-XXXXXXXX	36.0949781380547, -114.954715784689	Monthly
	LVW4.2-4-D.D-XXXXXXXX	36.095108069, -114.95480565	Monthly
LVW3.5	LVW3.5-1-D.D-XXXXXXXX	36.1004217990431, -114.943297962963	Monthly
	LVW3.5-2-D.D-XXXXXXXX	36.1004590914221, -114.943329373807	Monthly
	LVW3.5-3-D.D-XXXXXXXX	36.1005479342692, -114.94339047332	Monthly
	LVW3.5-4-D.D-XXXXXXXX	36.1005845809782, -114.943405465781	Monthly
	LVW3.5-5-D.D-XXXXXXXX	36.1006060910415, -114.943451295487	Monthly
	LVW3.5-6-D.D-XXXXXXXX	36.1006445625753, -114.943493292454	Monthly
LVW0.55	LVW0.55-D.D-XXXXXXXX	36.122158, -114.904631	Monthly
Field Duplicate Example (at least 3 field duplicates)	LVW6.6-1-D.D-XXXXXXXX-FD	NA	NA
Field Blank Example (at least 2 field blanks)	LVW6.6-1-XXXXXXXX-FB	NA	NA

Table 1. Las Vegas Wash Sampling Point Locations

General ID Nomenclature: ***SamplingLocation-SamplePoint-Depth-YearMonthDate*** Example Sample ID: ***LVW6.6-3-1.5-20170626***			
Sample Locations	**Sampling Point IDs**	**Coordinates**	**Sample Frequency**
Equipment Blank Example (at least 2 equipment blanks, if applicable)	LVW6.6-1-XXXXXXXX-EB	NA	NA

Figures

Imagery Source: Esri World Map, June 2015

Legend

● Monthly Sample Locations

TETRA TECH

www.tetratech.com

150 S. 4th Street, Unit A
Henderson, Nevada 89015
PHONE: (702) 854-2293

NEVADA ENVIRONMENTAL RESPONSE TRUST

LAS VEGAS WASH MONTHLY SAMPLING
HENDERSON, NEVADA

LAS VEGAS WASH SAMPLE POINT LOCATIONS

Project No.: 117-7502018

Date: OCTOBER 08, 2018

Designed By: ES

Figure No.

1

\\TTS134FS1\SUP-GIS\ARCPRJ2\NERT\MXD\SAMPLE LOCATION M15 MONTHLY 032018.MXD

Appendix A
Surface Water Sampling Record - Example

TETRA TECH

SURFACE WATER SAMPLING LOG

NERT, Henderson, NV

Task Name: LVW Surface Water Sampling	Task Manager: Jesse Bunkers	Task No: M15	Date:
Field Samplers:		Sampling Method: Dipper Bottle	Equipment Decon. Method: DI Rinse

Time	Location ID	Depth of Water (ft)	Depth of Sample (ft)	Temp. (°C)	pH (pH Units)	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Color	Odor

QA/QC Samples/ID:	QA/QC Samples/ID:	QA/QC Samples/ID:
QA/QC Sample Time:	QA/QC Sample Time:	QA/QC Sample Time:
Bottle Set Summary:	125 mL Plastic	500 mL Plastic
	250 mL Plastic	125 mL w/ EDA

Observations/Comments:

Appendix B
Meter Calibration Record - Example

TETRA TECH

CALIBRATION LOG - WATER QUALITY METER

NERT, Henderson, NV

Task Name: LVW Surface Water Sampling	Task No.: M15	Rental from: EQUIPCO	Task Manager: Jesse Bunkers
Field Personnel:		Serial Number:	Type: YSI ProDSS

Date	Time	Temp (°C)	Pre-Calibration							Post-Calibration						
			pH (pH = 4.0)	pH (pH = 7.0)	pH (pH = 10.0)	ORP (mV)	Cond. (mS/cm)	DO (%)	Turbidity (NTU)	pH (pH = 4.0)	pH (pH = 7.0)	pH (pH = 10.0)	ORP (mV)	Cond. (mS/cm)	DO (%)	Turbidity (NTU)

Notes:

Appendix C
Chain of Custody - Example

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information

Sampler:
Lab PM:
Carrier Tracking No(s):
COC No:

Client Contact:
Phone:
E-Mail:
Page:

Company: Tetra Tech GEO
Job #:

Address: 1100 S. McCaslin Blvd, Suite 150
Due Date Requested:

City: Superior
TAT Requested (days): **7 Days**

State, Zip: CO 80027

Phone:
PO #:

Email:
WO #:

Project Name: NERT - Monthly LVW Sampling Event
Project #:

Site: Nevada Environmental Response Trust
SSOW#:

Analysis Requested

Preservation Codes:
A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 314.0 - Perchlorate (Ice)	SM 2540C - Total Dissolved Solids (Ice)	EPA 300.1 - Chlorate (EDA)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				I	I	L		
			G	Water	N	N				3	
			G	Water	N	N				3	
			G	Water	N	N				3	
			G	Water	N	N				3	
			G	Water	N	N				3	
			G	Water	N	N				3	
			G	Water	N	N				3	
			G	Water	N	N				3	
			G	Water	N	N				3	
			G	Water	N	N				3	
			G	Water	N	N				3	

Possible Hazard Identification

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☑ Archive for 1 month

Deliverable Requested: I, (II), III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Date: Time: Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

APPENDIX B
2020 TRANSDUCER NETWORK UPDATE

Prepared for
Nevada Environmental Response Trust
Henderson, Nevada

Project Number
1690016062-017

Prepared by
Ramboll US Corporation
Emeryville, California

Date
March 4, 2020

APPENDIX B - 2020 TRANSDUCER NETWORK UPDATE

NEVADA ENVIRONMENTAL RESPONSE TRUST SITE HENDERSON, NEVADA

RAMBOLL

CONTENTS

TABLES

FIGURES

1. INTRODUCTION

This Appendix to the Remedial Performance Sampling and Analysis Plan (SAP), Revision 1 presents an assessment of the network of pressure transducers ("transducers") currently deployed at the Nevada Environmental Response Trust (NERT or the "Trust") Site and Operable Units 2 and 3 (Study Area) located in Henderson, Nevada (the "Site"). This assessment also proposes changes to enhance the capabilities of the transducer network[1] for current and future project remedial performance monitoring. The results of this assessment will be used to integrate an updated transducer network into the SAP.

1 This report considers only the remote, battery-operated transducers deployed in groundwater monitoring wells at the Site as part of the remedial performance monitoring transducer network. The remote, battery-operated transducers deployed as part of the various treatability studies being performed on behalf of NERT throughout all Operable Units are not considered part of the remedial performance monitoring network assessed herein. There are also transducers installed in groundwater extraction wells, but these are hard-wired (not re-deployable to other locations) and considered part of the Groundwater Extraction and Treatment System (GWETS) infrastructure, not the remedial performance transducer network assessed herein.

2. BACKGROUND

The NERT Remedial Investigation (RI) Study Area has been divided into three operable units (OUs) for the purposes of investigation and determination of future remedial action, as shown on Figure 1 of the Remedial Performance SAP, Revision 1 (Ramboll 2020). Operable Unit 1 (OU-1) consists solely of the NERT Site. Operable Unit 2 (OU-2) comprises the southern portion of the NERT Off-Site Study Area and the Eastside Sub-Area and Operable Unit 3 (OU-3) encompasses the Downgradient Study Area, the Northeast Sub-Area and the northern portion of the NERT Off-Site Study Area. Transducers have been installed throughout the NERT RI Study Area since 2015.

Transducers have been deployed in groundwater monitoring wells to collect groundwater level data and other data (e.g., specific conductivity, pressure, temperature) for a variety of purposes. In general, transducers have been deployed to collect data for evaluating seasonal trends, vertical gradients, groundwater/surface water interaction, and/or hydraulic responses to pumping and recharge events. This section provides a brief background of the use of transducers in the NERT RI Study Area including the development of the NERT RI transducer network by Ramboll primarily within OU-1 and OU-2 and the development of the Downgradient Study Area transducer network by AECOM primarily within OU-3.

NERT RI Transducer Network

In November 2015, Ramboll installed 10 telemetric[2] conductance, temperature, and depth (CTD) loggers (In-Situ, Inc. [In-Situ] Aqua Troll 200s) in the vicinity of the Seep Well Field (SWF) to evaluate surface water and groundwater interactions (Ramboll Environ 2016a).[3] Then, in response to the June 24, 2016 letter from the Nevada Division of Environmental Protection (NDEP) (NDEP 2016) commenting on the 2016 Groundwater Monitoring Optimization Plan (Ramboll Environ 2016b), 39 additional pressure transducers (In-Situ Rugged Troll 100s) and one barometric sensor (In-Situ BaroTroll) were deployed in August 2017 to monitor for seasonal groundwater level trends throughout the Site and the NERT RI Study Area (Ramboll Environ 2017). The newly installed transducers recorded temperature and pressure, which were manually downloaded by field personnel on a quarterly basis. During the deployment of the new transducers, nine of the 10 installed CTD loggers were removed with one remaining installed. Of the nine removed, six were replaced with Rugged Troll 100 transducers and monitoring ceased at the remaining three locations. Of the nine CTD loggers removed, seven were relocated to other monitoring wells and two were placed into storage at the NERT Site.

Since 2015, several transducer network monitoring wells have been decommissioned, altered in a way that transducer monitoring can no longer take place, or have had a malfunction of the transducer equipment. The following wells have been decommissioned and are no longer part of the transducer network: DBMW-12, MCF-16A, MCF-16B, MCF-16C, and PC-40.

Several monitoring wells have been altered in a way that continued data collection at these locations is impractical. Therefore, these wells are no longer part of the transducer network: AA-UW5 (this well has been paved over), MCF-32A and MCF-32B (well casings were lowered to

2 Telemetric units have the ability to transmit data via a cellular network.

3 One additional Aqua Troll 200 CTD logger was purchased by NERT and retained in storage as a backup unit which could be deployed if another CTD logger experienced equipment failure.

the ground surface level due to recent city development around the wells; this change in casing height and the potential for these wells to be decommissioned prompted removal of the transducers in these monitoring wells). The transducers at these locations were removed in anticipation that these locations may ultimately be decommissioned. The three transducers from these locations were stored onsite or redeployed at other Site locations.

In addition to decommissioning and alterations, monitoring wells have also experienced transducer equipment failures beginning in late 2018. Monitoring wells M-13, M-162D, M-203, M-218, WMW6.15S, and PC-98R all had their transducers with telemetry (Aqua Troll 200) experience hardware malfunctions, including battery degradation and motherboard failures. Subsequently, the malfunctioning hardware was removed from the monitoring wells with replacement hardware (Rugged Troll 100s) deployed in monitoring wells M-13, M-162D, and WMW6.15S. Replacement hardware was not installed in monitoring well PC-98R as there was already a transducer (Rugged Troll 100) deployed in this monitoring well by Tetra Tech and data will be acquired from Tetra Tech for this location. Additionally, replacement hardware was not installed in monitoring wells M-203 and M-218 as data collection at these locations was intended for a short period of time, which had been completed by the time of equipment failure.

When monitoring wells are decommissioned or altered there is a risk that the installed transducer may be discarded, as occurred during the decommissioning of monitoring wells MCF-16A and PC-40. MCF-16A was decommissioned without notice by an unknown drilling subcontractor; the transducer appears to have been discarded in the process. Monitoring well PC-40 was decommissioned by Eagle Drilling (subcontractor to Landwell) and the transducer was discarded in the process. The replacement monitoring well for PC-40 (PC-40R) was installed in November 2017 and a new transducer was deployed in PC-40R in March 2018. Prior to the decommissioning of DBMW-12, MCF-16B, and MCF-16C, the transducers were removed by Ramboll and stored onsite or redeployed at other Site monitoring locations.

Downgradient Study Area Transducer Network

In 2017, AECOM installed 19 transducers in existing monitoring wells, one barometric sensor in an existing monitoring well, and eight transducers at surface water locations at the Las Vegas Wash as part of the Data Gap Investigation in the Downgradient Study Area (AECOM 2019). The purpose of the data gap investigation was to identify subsurface pathways downgradient and cross-gradient of the NERT RI Study Area through which perchlorate-impacted groundwater could be entering the Las Vegas Wash. These 27 transducers were deployed to collect groundwater and surface water levels at the Las Vegas Wash on a regular basis over a specific period of time. The anticipated data collection period at these locations was monthly for three months and then quarterly for two additional quarters thereafter. The original data collection period was completed at the end of the first quarter in 2018. To collect additional data as part of the ongoing Data Gap Investigation, data collection continues at these locations.

In 2018, AECOM installed nine additional transducers in newly installed monitoring wells as part of the ongoing Data Gap Investigation in the Downgradient Study Area (AECOM 2019). The 36 transducers and one barometric sensor installed to date by AECOM were used to continue monitoring groundwater and surface water level changes at the Las Vegas Wash. The original data collection period at these nine additional locations was six months and was completed at the end of March 2019. To collect additional data as part of the ongoing Data Gap

Investigation, data collection continues at these locations as part of NERT's remedial performance monitoring program.

In 2019, AECOM installed 14 additional transducers (10 in June 2019 and four in August 2019) in monitoring wells at the Las Vegas Wash to expand the area of water level monitoring (AECOM 2019). The planned data collection period at these locations was six months and data collection is ongoing and has been taken over by NERT.

Data downloads have taken place on a monthly basis at each of the transducer locations since their initial installation dates. During the construction of the Historic Lateral Weir in 2018, monitoring well WMW5.58S1 was decommissioned, and the transducer located in that well was removed and installed in the replacement monitoring well WMW5.58S. Then, during the 2018-2019 construction of the Sunrise Mountain Weir, one of the surface water monitoring locations (S6.35) was destroyed, leaving 49 active AECOM transducer locations. At the direction of the Trust, beginning in August 2019, all transducers installed during the Downgradient Study Area Data Gap Investigation have been integrated into the remedial performance monitoring program.

Except for the most-recently installed transducers, the transducers were deployed prior to the establishment of the expanded NERT RI Study Area. The original transducer network was not intended to monitor the expanded NERT RI Study Area and therefore included very few monitoring locations within the Eastside Sub-Area, the Northeast Sub-Area, and portions of the Downgradient Study Area.

3. CURRENT TRANSDUCER NETWORK

As shown on Figure B-1, there are currently a total of 93 transducers and two barometric sensors deployed in select monitoring wells and surface water monitoring locations in OU-1, OU-2, and OU-3. The transducer equipment types, as presented on Figure B-1 and in Table B-1, include:

- In-Situ Rugged Troll 100 pressure transducers deployed at 42 monitoring well locations;
- In-Situ Aqua Troll 200 pressure transducers deployed at two monitoring well locations;
- Solinst Levelogger Edge pressure transducers deployed at 49 monitoring well locations (Las Vegas Wash area only);
- Solinst Barologger at one location for barometric pressure readings; and
- In-Situ BaroTroll deployed at one location for barometric pressure readings.

There are currently three In-Situ Rugged Troll 100 pressure transducers in storage at the NERT Site which are available for deployment.

The transducers are programmed to record pressure and temperature in accordance with the manufacturer's instructions at different intervals depending on the transducer location, as described below:

- Transducers deployed north of Galleria Drive and throughout all OU-3 (except for MW-1, AA-07, and MCF-07) record data every 15 minutes;
- Transducers deployed south of Galleria Drive within OU-1 and OU-2 (and including MW-1, AA-07 and MCF-7 in OU-3) record data every 60 minutes; and
- Transducers deployed near active pumping systems (i.e. M-71 near the Interceptor Well Field [IWF] extraction wells) record data every 15 minutes.

The transducers were installed according to the manufacturer's recommended installation procedures and are suspended and secured at a depth of either two feet above the bottom of the well or 10 feet below the water table, whichever is shallower. During transducer deployment, the depth of the transducer below the top of casing or reference datum, depth to water before and after transducer installation, and time of data log start were all recorded.

4. USE OF THE TRANSDUCER NETWORK DATA

The transducer network is intended to provide a system capable of high-frequency data capture allowing an assessment of groundwater and surface water level conditions to be performed throughout the NERT RI Study Area for any time period to be assessed. The primary use of the transducer data augments the manually-collected groundwater level data for use in preparing the potentiometric surface contour maps and vertical gradient analysis, which are presented in the Annual Remedial Performance Reports, and the frequency of data capture provided by the transducers allows for additional uses. These potential additional uses include the following:

1. Measuring vertical gradients in co-located wells over time (OU-1, OU-2, and OU-3);
2. Measuring direction and magnitude of horizontal gradients in nearby wells over time (OU-1, OU-2, and OU-3);
3. Estimating recharge in response to storm events (OU-1, OU-2, and OU-3);
4. Identify losing and gaining reaches of the Las Vegas Wash (OU-3); and
5. Estimating hydraulic conductivity of the Las Vegas Wash alluvium and streambed by analyzing response to diurnal fluctuations of Las Vegas Wash levels (OU-3).

The assessment of the location of transducers in Section 5.1 considers the primary use, as well as these potential additional uses of the transducer network.

5. ASSESSMENT OF TRANSDUCER NETWORK

The intent of the transducer network assessment is to determine where improvements could be made in the overall coverage of transducer placement in all OUs and to assess the potential of new hardware that would make data collection more reliable and efficient. This section summarizes the assessment of transducer locations and equipment.

5.1 Assessment of Transducer Locations

As part of the transducer network assessment, a comprehensive review of the locations of all deployed transducers was performed for each of the three Water Bearing Zones (WBZs), including the Shallow, Middle, and Deep WBZs. For each WBZ, three separate evaluations were performed:

- First, a geospatial density analysis was performed to identify gaps in coverage. The geospatial analysis looked at how closely grouped transducer locations were in relationship to other transducer locations. The output from this assessment was a set of "heat maps" that identifies "hot spots" (areas of high transducer coverage) and "cold spots" (areas where transducer coverage could be improved) throughout the NERT RI Study Area for a given WBZ. As these heat maps were evaluated, additional well locations were chosen for the installation of transducers to improve network coverage. With new locations selected, the geospatial density analysis was repeated (i.e., new heat maps were created) to confirm that monitoring at these locations created a better distribution of transducer coverage for each WBZ. The heat maps for each WBZ are provided in Figures B-2a through B-4b.
- For the second analysis, monitoring well clusters that are currently used in assessing the vertical gradient using manually-collected groundwater level data throughout the NERT RI Study Area were evaluated for viability of transducer placement. This evaluation assessed where these well clusters were in relation to current transducer locations, the location density heat maps, and accessibility for transducer deployment. Study area maps which show the current and proposed improved distribution of well clusters with transducers are provided in Figures B-5a and B-5b.
- Finally, the distribution of locations and screened intervals were evaluated for the potential uses described in Section 4.

Based on these evaluations, new locations are proposed to be added to the transducer network to improve the overall coverage of the network, increase the number of locations where data could be collected to evaluate vertical gradients in the NERT RI Study Area, and improve data collection coverage for potential uses described in Section 4. With the 49 transducers installed for the Downgradient Study Area Investigation, there is a high density of transducer locations along the Las Vegas Wash relative to other areas. The reassessment of the OU-3 transducer coverage, including these 49 transducer locations, will be conducted in late 2020, allowing for at least a full year of data collection from those transducers recently deployed in 2019. Proposed changes to the transducer network based on the assessments described herein are provided below and recommended locations for new transducer installations are presented in Table B-2.

Geospatial Density Analysis Evaluation

- **Shallow WBZ Transducer Coverage:** As shown in Figure B-2a,the results from the geospatial density analysis for the Shallow WBZ indicate that the current network provides good lateral coverage in the center of OU-1, in the western portion and along the northern and southern edges of OU-2, and in the northern part of OU-3 along the Las Vegas Wash. The lateral coverage of the transducer network in the Shallow WBZ could be improved with the addition of transducers along the perimeter of OU-1, within the eastern part of OU-2, and in the central area of OU-3. Therefore, it is proposed to retain all current transducer locations (86 locations) and add transducers at 15 new locations, including six locations in OU-1 (M-121, M-211, M-212, MC-50, TR-6, and TR-10), five locations in OU-2 (DBMW-10, ES-7, ES-8A, ES-12, and ES-28), and four locations in or adjacent to OU-3 (ES-26, HM-2, LVWPS-MW107A, and PC-108). The heat map with the current and proposed transducer locations in the Shallow WBZ showing the improved coverage is provided as Figure B-2b.
- **Middle WBZ Transducer Coverage:** As shown in Figure B-3a, the results from the geospatial density analysis for the Middle WBZ indicate that the current network provides some lateral coverage in the northern portion of OU-1 and the southwest and west-central portions of OU-2. The Middle WBZ transducer network coverage is limited along the perimeter of OU-1, the eastern central, northern, and southern parts of OU-2. There are no transducers currently in place in Middle WBZ wells within OU-3. With the limited number of monitoring wells in the Study Area screened in the Middle WBZ, the lateral coverage of the transducer network in the Middle WBZ can be somewhat improved with the addition of transducers along the perimeter of OU-1, in the east-central portion of OU-2, and within the east-central and west-central portions of OU-2. Therefore, it is proposed to retain all current transducer locations (five locations) and add transducers at 10 new locations, including five locations in OU-1 (M-186D, M-213, TR-4, TR-7, and TR-9), two locations in OU-2 (MCF-24B and ES-8B), and three locations in OU-3 (LVWPS-MW107C, MCF-28B and MCF-31B). The heat map with the current and proposed transducer locations in the Middle WBZ showing the improved coverage is provided as Figure B-3b.
- **Deep WBZ Transducer Coverage:** As shown in Figure B-4a, the results from the geospatial density analysis for the Deep WBZ indicate that the current network provides limited lateral coverage along the northern and southern perimeter of OU-2 and the southeast portion of OU-3. With the limited number of monitoring wells in the Study Area screened in the Deep WBZ, the transducer network can be somewhat improved with the addition of transducer locations in the eastern and western portions of OU-3. Therefore, it is proposed to retain all current transducer locations (three locations) and add transducers at two new locations in OU-3 (MCF-28A and MCF-31A). The heat map with the current and proposed transducer locations in the Deep WBZ showing the improved coverage is provided as Figure B-4b.

Vertical Gradient Assessment Evaluation

Monitoring well clusters used in the NERT vertical gradient assessment are located throughout the RI Study Area, with most of the monitoring well clusters located in OU-1. Historically, the vertical gradient assessment has been performed primarily using manually-collected groundwater level data and transducer placement decisions have been made without consideration of data needs for the vertical gradient assessment. Figure B-5a presents the current transducer network, with orange highlights to indicate the locations of well clusters where transducers are installed and data is collected that can be used in the vertical gradient assessment. Out of approximately 71 vertical gradient well clusters, transducer are currently only in place at 11 of these monitoring well clusters. These existing monitoring well clusters are primarily located in the central part of OU-1, the western portion of OU-2, and the northern portion of OU-3.

With the addition of 15 new Shallow WBZ locations, 10 new Middle WBZ locations, and two new Deep WBZ locations, based on the geospatial density analysis presented above, the number of monitoring well clusters with transducers doubles to 22, as shown on Figure B-5b. The additional locations improve the lateral coverage and transducer dataset for use in the vertical gradient assessment throughout the RI Study Area, especially within the southern portion of OU-1, the central and eastern parts of OU-2, and the northeastern portion of OU-3.

Additional Transducer Use Evaluation

Following completion of the geospatial density analysis and vertical gradient assessment evaluations presented above, the proposed improved transducer network was reviewed against the potential additional uses of transducer network data as discussed in Section 4. With the addition of 27 new transducer locations as discussed above and as shown on Figure B-6, the intended use of the transducers as well as the potential uses identified in Section 4 will be met. The recommended changes to the transducer network are further discussed in Section 6.

5.2 Assessment of Hardware

The transducers deployed throughout the NERT RI Study Area have either been In-Situ Rugged Troll 100, In-Situ Aqua Troll 200 (which are coupled to telemetry tube units for data transmission), or Solinst Levelogger Edge transducers (Table B-1). The In-Situ Rugged Troll 100 and Aqua Troll 200 transducers were evaluated for possible continued use in the NERT RI Study Area. The Solinst Levelogger Edge transducers were deployed at the Downgradient Study Area locations, where monitoring is proposed to continue, therefore, these units were not included in the hardware assessment. The assessment of new hardware included an evaluation of Eijkelkamp Diver transducers supplemented with a telemetry tube, a system that could provide updated hardware with an online interface for data display and transducer management. The text below and Table B-3, present the results of the hardware assessment.

Existing Hardware – In-Situ Rugged Troll 100

The Rugged Troll 100 transducers appear to be ruggedly built and have operated with little battery degradation since the initial installation in 2017. These units store data on the device rather than broadcast it. The stored data from these units is then downloaded by a field staff person (typically performed on a quarterly basis). There are 42 Rugged Troll 100 transducers deployed throughout OU-1, OU-2, and OU-3. There are three Rugged Troll 100 transducers stored at the NERT Site, available for deployment. The relative cost of a new Rugged Troll transducer is low with a medium personnel cost for equipment management.

Existing Hardware – In-Situ Aqua Troll 200

The Aqua Troll 200 (or CTD logger) transducers appear to be well built devices and operated as intended from initial installation in late 2015 until late 2018. The Aqua Troll 200s (or CTD logger) were originally setup to transmit data via a Tube 300R telemetry unit (telemetry tube) at set intervals to a File Transfer Protocol (FTP) website where it was remotely downloaded quarterly and processed. By broadcasting data to an FTP website this resulted in little involvement by field personnel. These units are also capable of storing data on the device, which can be used if the telemetry device fails or cannot broadcast. The CTD loggers are also setup to record conductivity (specific/actual), salinity, total dissolved solids, resistivity, and water density. There is a total of two operable Aqua Troll 200 transducers deployed within OU-1 and OU-3. Of the ten Aqua Troll 200 transducers initially installed, eight have suffered a failure, with only one being replaced with a new unit. There are two Aqua Troll 200 transducers currently stored at the NERT Site with high levels of battery degradation, therefore these devices cannot be deployed. The relative cost of a new Aqua Troll 200 transducer is high with a medium personnel cost for equipment management. If a new telemetry tube is needed, this will increase the equipment cost; with the personal cost for equipment management remaining medium. Typically, the initial installation, setup cost, and maintenance is higher with this type of unit.

New Hardware – Eijkelkamp Diver and Telemetry Tube

The Eijkelkamp Diver and GDT-S Prime Modem (telemetry tube) setup function is similar to the In-Situ Aqua Troll 200 and telemetry tube setups, but with upgraded features and accessibility. The Eijkelkamp Diver records temperature, pressure, and depth to water. Eijkelkamp does offer other types of devices (i.e. conductivity sensors) that are compatible with the telemetry tube and are interchangeable. The Eijkelkamp Diver with telemetry tube has an online dashboard where the unit can be managed remotely (i.e. adjustment to log settings, turning on/off logging at a given point, etc.). Through this dashboard, the current status of each transducer and telemetry tube can be viewed, thus enabling the ability to identify a fault sooner, resulting in a lower possibility of a data gap. The relative cost of an Eijkelkamp Diver and telemetry tube is medium with a relatively lower personnel cost for equipment management. Typically, the initial installation and setup cost is higher with this type of unit.

6. RECOMMENDED CHANGES TO TRANSDUCER NETWORK

Based on the results of the transducer network assessment described herein, changes are recommended for the transducer network. The recommended changes include installing new transducers in some existing monitoring wells, thus expanding the transducer network coverage as shown in Figure B-5. Transducers are not proposed to be removed from any monitoring wells at this time. A total of 27 locations are proposed to be added, including 15 locations in the Shallow WBZ, 10 locations in the Middle WBZ, and two locations in the Deep WBZ. These proposed additions to the transducer network are documented below and in Figure B-5 and Tables B-2 and B-4.

With the addition of 27 new locations to the transducer monitoring program, it will be necessary to purchase new hardware. There are currently three In-Situ Rugged Troll 100s which are stored at the NERT Site that are available for use at three of the new locations; therefore new hardware will need to be purchased for 24 locations. Based on the hardware evaluation presented in Section 5, it is recommended that the Eijkelkamp Diver and telemetry tube setup be purchased for these additional locations.

Shallow WBZ – New Transducer Locations

Of the 15 proposed additional Shallow WBZ transducer locations, six locations are within OU-1, five locations are within OU-2, and four locations are within OU-3 (Figure B-2b). Monitoring wells MC-50, M-121, M-211, M-212, TR-6, and TR-10 are located on the NERT Site along the north and south perimeters of OU-1. Monitoring wells DBMW-10, ES-7, ES-8A, ES-12, and ES-28 are all located on the north, central, and southern portions of the Eastside Sub-Area within OU-2. Monitoring wells ES-26, HM-2, LVWPS-MW107A, and PC-108 are located throughout the central portion of OU-3 and span the entire OU-3 area from west to east.

Middle WBZ – New Transducer Locations

Of the 10 proposed additional Middle WBZ transducer locations, five locations are within OU-1, two locations are within OU-2, and three locations are within OU-3 (Figure B-3b). Monitoring wells M-186D, M-213, TR-4, TR-7, and TR-9 are located on the NERT Site along the perimeter of OU-1. Monitoring wells ES-8B and MCF-24B are in the central portion of the Eastside Sub-Area within OU-2. Monitoring wells LVWPS-MW107C, MCF-28B, and MCF-31B are located throughout the central portion of OU-3.

Deep WBZ – New Transducer Locations

The two proposed additional Deep WBZ transducer locations are in OU-3. Monitoring wells MCF-28A and MCF-31A are located on the west central and east central portions of OU-3, respectively (Figure B-4b).

7. REFERENCES

AECOM, 2019. Groundwater Data Gaps Investigation Technical Memorandum – Transducer Monitoring (November 2017 to August 2019); NERT Remedial Investigation – Downgradient Study Area; Nevada Environmental Response Trust Site; Henderson, Nevada. October 17.

Nevada Division of Environmental Protection (NDEP), 2016. Nevada Division of Environmental Protection (NDEP) Response to 2016 Groundwater Monitoring Optimization Plan. June 24.

Ramboll Environ US Corporation (Ramboll Environ), 2016a. Technical Memorandum – Seep Well Field Flow Quantification; Nevada Environmental Response Trust Site; Henderson, Nevada. September 9. Approved by NDEP on October 27, 2016.

Ramboll Environ, 2016b. 2016 Groundwater Monitoring Optimization Plan, Nevada Environmental Response Trust Site; Henderson, Nevada. April 29. Approved by NDEP on June 24, 2016.

Ramboll Environ, 2017. RI/FS Work Plan Addendum: Phase 3 Remedial Investigation, Revision 1, Nevada Environmental Response Trust Site, Henderson, Nevada. October 27. Approved by NDEP on November 8, 2017.

Ramboll, 2020. Remedial Performance Sampling and Analysis Plan, Revision 1, Nevada Environmental Response Trust Site; Henderson, Nevada. January 28.

TABLES

TABLE B-1: Current Transducer Locations
Nevada Environmental Response Trust Site
Henderson, Nevada

Current Transducer Monitoring Well IDs	Transducer Equipment Deployed[1]	Water Bearing Zone
AA-07	Rugged TROLL 100	Shallow
AA-09	Rugged TROLL 100	
AA-30	Levelogger Edge (Solinst)	
AA-UW2	Rugged TROLL 100	
COH-2B1	Levelogger Edge (Solinst)	
DBMW-3	Rugged TROLL 100	
DBMW-18	Rugged TROLL 100	
LNDMW-1	Levelogger Edge (Solinst)	
LNDMW-2	Levelogger Edge (Solinst)	
M-13	Rugged TROLL 100	
M-25	Rugged TROLL 100	
M-44	Rugged TROLL 100	
M-71	Aqua TROLL 200 w/Tube 300R	
M-145	Rugged TROLL 100	
M-163	Rugged TROLL 100	
M-189	Rugged TROLL 100	
M-193	Rugged TROLL 100	
MCF-01B	Rugged TROLL 100	
MCF-06B	Rugged TROLL 100	
MCF-06C	Rugged TROLL 100	
MW-1	Rugged TROLL 100	
MW-13	Levelogger Edge (Solinst)	
MW-20	Levelogger Edge (Solinst)	
NERT3.35S1	Levelogger Edge (Solinst)	
NERT3.40S1	Levelogger Edge (Solinst)	
NERT3.58N1	Levelogger Edge (Solinst)	
NERT3.58S1	Levelogger Edge (Solinst)	
NERT3.60N1	Levelogger Edge (Solinst)	
NERT3.60S1	Levelogger Edge (Solinst)	
NERT3.63S1	Levelogger Edge (Solinst)	
NERT3.80S1	Levelogger Edge (Solinst)	
NERT3.98S1	Levelogger Edge (Solinst)	
NERT4.21N1	Levelogger Edge (Solinst)	
NERT4.38N1	Levelogger Edge (Solinst)	
NERT4.51S1	Levelogger Edge (Solinst)	
NERT4.64N1	Levelogger Edge (Solinst)	
NERT4.64S1	Levelogger Edge (Solinst)	
NERT4.65N1	Levelogger Edge (Solinst)	
NERT4.70N1	Levelogger Edge (Solinst)	
NERT4.71N1	Levelogger Edge (Solinst)	
NERT4.71S1	Levelogger Edge (Solinst)	
NERT4.71S2	Levelogger Edge (Solinst)	
NERT4.93S1	Levelogger Edge (Solinst)	
NERT5.11S1	Levelogger Edge (Solinst)	

TABLE B-1: Current Transducer Locations
Nevada Environmental Response Trust Site
Henderson, Nevada

Current Transducer Monitoring Well IDs	Transducer Equipment Deployed[1]	Water Bearing Zone
NERT5.49S1	Levelogger Edge (Solinst)	Shallow
NERT5.91S1	Levelogger Edge (Solinst)	
PC-40R	Rugged TROLL 100	
PC-56	Aqua TROLL 200 w/Tube 300R	
PC-64	Rugged TROLL 100	
PC-67	Rugged TROLL 100	
PC-74	Levelogger Edge (Solinst)	
PC-77	Levelogger Edge (Solinst)	
PC-88	Rugged TROLL 100	
PC-98R[2]	Rugged TROLL 100	
PC-125	Rugged TROLL 100	
PC-130	Rugged TROLL 100	
PC-136	Rugged TROLL 100	
PC-137	Rugged TROLL 100	
PC-137D	Rugged TROLL 100	
PC-152	Rugged TROLL 100	
PC-155A	Rugged TROLL 100	
PC-155B	Rugged TROLL 100	
PC-156A	Rugged TROLL 100	
PC-156B	Rugged TROLL 100	
PC-157A	Rugged TROLL 100	
PC-157B	Rugged TROLL 100	
PC-171 (Barologger)	BaroTROLL	
WMW3.5N	Levelogger Edge (Solinst)	
WMW3.5S	Levelogger Edge (Solinst)	
WMW4.9N	Levelogger Edge (Solinst)	
WMW4.9S (Barologger)	Levelogger Edge & Barologger Edge (Solinst)	
WMW5.5S	Levelogger Edge (Solinst)	
WMW5.7N	Levelogger Edge (Solinst)	
WMW5.7S	Levelogger Edge (Solinst)	
WMW6.15N	Levelogger Edge (Solinst)	
WMW6.15S	Rugged TROLL 100	
WMW6.55S	Levelogger Edge (Solinst)	
WMW6.9N	Levelogger Edge (Solinst)	
WMW6.9S	Levelogger Edge (Solinst)	
M-152	Rugged TROLL 100	Middle
M-156	Rugged TROLL 100	
M-162D	Rugged TROLL 100	
MCF-09B	Rugged TROLL 100	
MCF-11	Rugged TROLL 100	
MCF-01A	Rugged TROLL 100	Deep
MCF-07	Rugged TROLL 100	
MCF-20A	Rugged TROLL 100	

TABLE B-1: Current Transducer Locations
Nevada Environmental Response Trust Site
Henderson, Nevada

Current Transducer Monitoring Well IDs	Transducer Equipment Deployed[1]	Water Bearing Zone
S3.50 SW[3]	Levelogger Edge (Solinst)	**Surface Water**
S3.75 SW	Levelogger Edge (Solinst)	
S3.80 SW	Levelogger Edge (Solinst)	
S4.60 SW	Levelogger Edge (Solinst)	
S4.65 SW	Levelogger Edge (Solinst)	
S4.75 SW	Levelogger Edge (Solinst)	
S5.30 SW	Levelogger Edge (Solinst)	

Notes:

1. The Aqua Troll 200 instrument has telemetric capabilities and requires specific materials and set-up to utilize this feature.
2. PC-98R is deployed and managed by Tetra Tech.
3. This gage was originally named S3.60 but the identification was changed to S3.50 during AECOM's field program.

TABLE B-2: Recommended Changes to the Transducer Locations
Nevada Environmental Response Trust Site
Henderson, Nevada

Updated Transducer Network Monitoring Well ID	Planned Transducer Equipment[1]	Water Bearing Zone
DBMW-10	Rugged TROLL 100	Shallow
ES-7	Eijkelkamp Diver w/ Telemetry	
ES-8A	Eijkelkamp Diver w/ Telemetry	
ES-12	Eijkelkamp Diver w/ Telemetry	
ES-26	Eijkelkamp Diver w/ Telemetry	
ES-28	Eijkelkamp Diver w/ Telemetry	
HM-2	Rugged TROLL 100	
LVWPS-MW107A	Eijkelkamp Diver w/ Telemetry	
M-121	Eijkelkamp Diver w/ Telemetry	
M-211	Eijkelkamp Diver w/ Telemetry	
M-212	Eijkelkamp Diver w/ Telemetry	
MC-50	Rugged TROLL 100	
PC-108	Eijkelkamp Diver w/ Telemetry	
TR-6	Eijkelkamp Diver w/ Telemetry	
TR-10	Eijkelkamp Diver w/ Telemetry	
ES-8B	Eijkelkamp Diver w/ Telemetry	Middle
LVWPS-MW107C	Eijkelkamp Diver w/ Telemetry	
M-186D	Eijkelkamp Diver w/ Telemetry	
M-213	Eijkelkamp Diver w/ Telemetry	
MCF-24B	Eijkelkamp Diver w/ Telemetry	
MCF-28B	Eijkelkamp Diver w/ Telemetry	
MCF-31B	Eijkelkamp Diver w/ Telemetry	
TR-4	Eijkelkamp Diver w/ Telemetry	
TR-7	Eijkelkamp Diver w/ Telemetry	
TR-9	Eijkelkamp Diver w/ Telemetry	
MCF-28A	Eijkelkamp Diver w/ Telemetry	Deep
MCF-31A	Eijkelkamp Diver w/ Telemetry	

Notes:
1. The Eijkelkamp Diver instrument has telemetric capabilities and requires specific materials and set-up to utilize this feature.

TABLE B-3: Transducer Equipment Comparison
Nevada Environmental Response Trust Site
Henderson, Nevada

Transducer Manufacturer	Type of Transducer	Manual Data Downloads	Data Broadcast	Failure Notification	Online User Interface	Remote Device Management	On-The-Fly Barometric Correction	Transducer Battery Longevity	Removable Transducer Battery	Telemetry Battery Longevity	Removable Telemetry Battery(ies)	Cost
In-Situ	Rugged TROLL 100[1]	X	-	-	-	-	-	10 years[3]	-	-	-	$
	Aqua TROLL 200 w/Telemetry Tube 300R	X[2]	X	X[4]	-	-	X	2.5-3 years	-	5 years[3]	-	$$$
	BaroTroll	X	-	-	-	-	-	10 years[3]	-	-	-	$
Eijkelkamp	Eijkelkamp Diver w/ GDT-S Prime Modem (Telemetry Tube)	X[2]	X	X[5]	X	X	X	10 years[3]	-	3-6 months[6]	X	$$

NOTES:

1. In order to use the data from a Rugged Troll 100 device, a BaroTroll device is required for barometric correction.
2. Units have the ability to have data downloaded manually or broadcast.
3. This battery longevity is an estimate based on the manufacturer's specifications and anticipated use.
4. Notification receivable via email only.
5. Notification receivable via email or cellular text message.
6. The GDT-S Prime Modem (Telemetry Tube) operates on two replaceable alkaline batteries.

TABLE B-4: Transducer Deployment and Download Details
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
AA-07	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
AA-09	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
AA-30	TNM	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
AA-UW2	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
COH-2B1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
DBMW-3	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
DBMW-10	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
DBMW-18	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
ES-7	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
ES-8A	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
ES-8B	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
ES-12	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
ES-26	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
ES-28	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow

TABLE B-4: Transducer Deployment and Download Details
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
HM-2	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
LNDMW-1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
LNDMW-2	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
LVWPS-MW107A	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	Qal	Shallow
LVWPS-MW107C	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Middle
M-13	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-25	GW/SW	GW/SW	GW/SW	GW/SW	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
M-44	GW/SW	GW/SW	GW/SW	GW/SW	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
M-71	GW/SW	GW/SW	GW/SW	GW/SW	Aqua TROLL 200 w/Tube 300R	Every 60 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
M-121	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-145	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-152	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Middle
M-156	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Middle
M-162D	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Middle

TABLE B-4: Transducer Deployment and Download Details
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
M-163	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
M-186D	GW/SW	TNM	GW/SW	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
M-189	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-193	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-211	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
M-212	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
M-213	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
MC-50	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
MCF-01A	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Deep
MCF-01B	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
MCF-06B	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
MCF-06C	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
MCF-07	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Deep
MCF-09B	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Middle

TABLE B-4: Transducer Deployment and Download Details
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
MCF-11	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	UMCf	Middle
MCF-20A	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Deep
MCF-24B	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
MCF-28A	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Deep
MCF-28B	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Middle
MCF-31A	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Deep
MCF-31B	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	UMCf	Middle
MW-1	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
MW-13	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
MW-20	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.35S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.40S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.58N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.58S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow

TABLE B-4: Transducer Deployment and Download Details
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
NERT3.60N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.60S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.63S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.80S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT3.98S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal/UMCf	Shallow
NERT4.21N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.38N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.51S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.64N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.64S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.65N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.70N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.71N1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.71S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow

TABLE B-4: Transducer Deployment and Download Details
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
NERT4.71S2	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT4.93S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT5.11S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT5.49S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
NERT5.91S1	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-40R	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
PC-56	GW/SW	GW/SW	GW/SW	GW/SW	Aqua TROLL 200 w/Tube 300R	Every 15 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
PC-64	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
PC-67	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal	Shallow
PC-74	GW/SW	TNM	TNM	TNM	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-77	GW/SW	TNM	TNM	TNM	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-88	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-98R[5]	GW/SW	GW/SW	GW/SW	GW/SW	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-108	TNM	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 15 minutes	Quarterly	1 year	Qal	Shallow

TABLE B-4: Transducer Deployment and Download Details
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
PC-125	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
PC-130	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/xMCf/UMCf[4]	Shallow
PC-136	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-137	GW/SW	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
PC-137D	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	UMCf	Shallow
PC-152	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
PC-155A	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-155B	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal/UMCf	Shallow
PC-156A	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-156B	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-157A	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-157B	GW/SW	TNM	GW/SW	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
PC-171 (Barologger)	TNM	TNM	TNM	TNM	BaroTROLL	Every 60 minutes	Quarterly	1 year	Qal/UMCf	Shallow
S3.50[6]	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water

TABLE B-4: Transducer Deployment and Download Details
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
S3.75	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
S3.80	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
S4.60	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
S4.65	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
S4.75	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
S5.30	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	NA	Surface Water
TR-4	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
TR-6	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
TR-7	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
TR-9	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Middle
TR-10	GW/SW	TNM	TNM	TNM	Eijkelkamp Diver w/ Telemetry	Every 60 minutes	Quarterly	1 year	UMCf	Shallow
WMW3.5N	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW3.5S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW4.9N	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow

TABLE B-4: Transducer Deployment and Download Details
Nevada Environmental Response Trust Site
Henderson, Nevada

Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						
WMW4.9S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW4.9S (Barologger)	GW/SW	GW/SW	GW/SW	GW/SW	Barologger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW5.5S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW5.7N	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW5.7S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW6.15N	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW6.15S	TNM	TNM	TNM	TNM	Rugged TROLL 100	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW6.55S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW6.9N	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow
WMW6.9S	GW/SW	GW/SW	GW/SW	GW/SW	Levelogger Edge (Solinst)	Every 15 minutes	Quarterly	1 year	Qal	Shallow

NOTES:

GW/SW = Groundwater and Surface Water Sampling Contractor
TNM = Transducer Network Manager
Qal = quaternary alluvium
UMCf = Upper Muddy Creek formation
w/ = with
xMCf = Transitional Muddy Creek formation

TABLE B-4: Transducer Deployment and Download Details
Nevada Environmental Response Trust Site
Henderson, Nevada

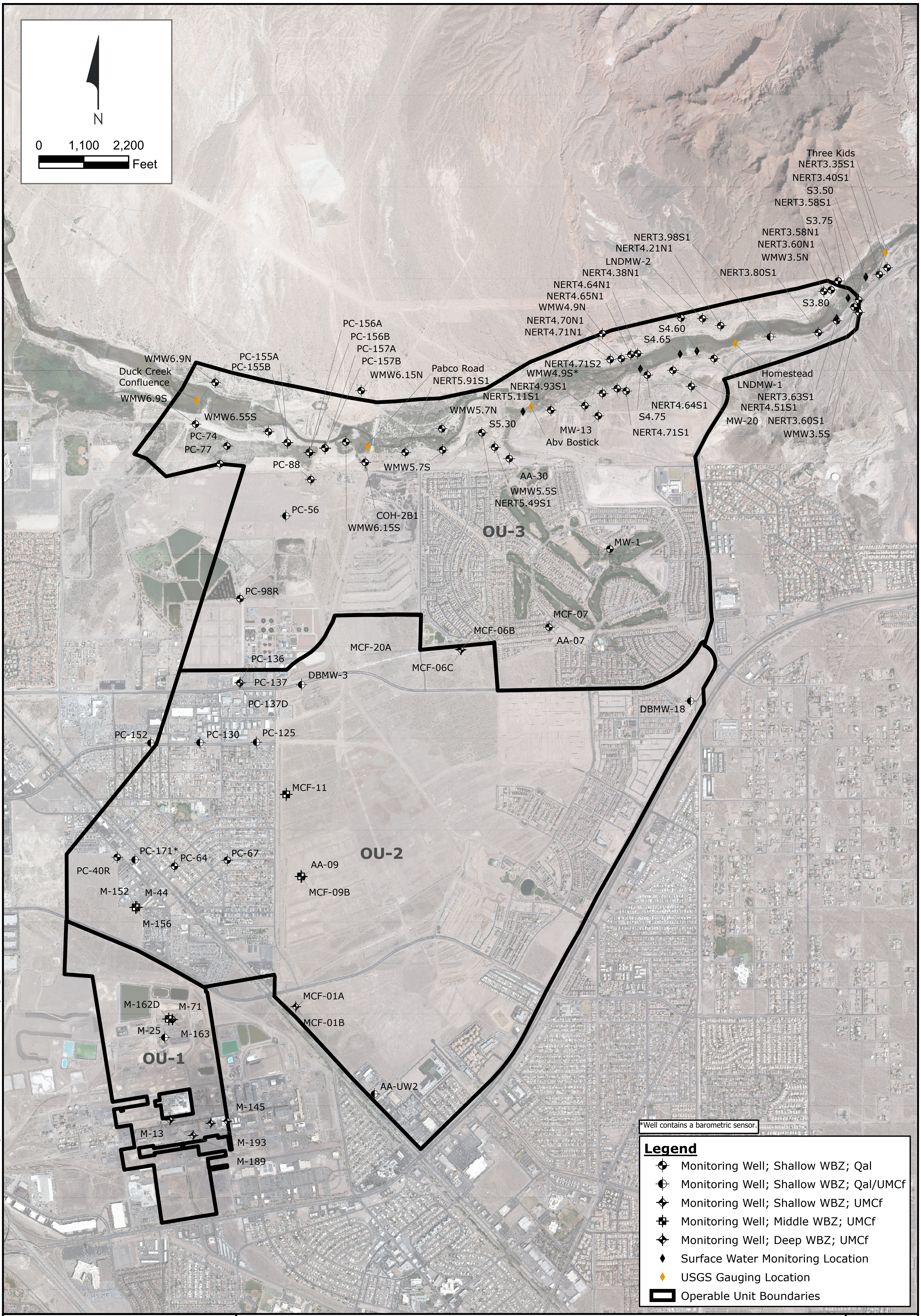
Location	Responsible Party for Data Download[1]				Type of Transducer[2]	Data Logging Frequency	Data Download Frequency	Duration of Transducer Installation[3]	Screened Lithology	Water Bearing Zone
	Feb.-Apr. Download (w/ annual event)	May-Jul. Download (w/ Aug. quarterly event)	Aug.-Oct. Download (w/ semi-annual event)	Nov.-Jan. Download (w/ Feb. quarterly event)						

NOTES:

Transducers will be suspended and secured at a depth of either two feet above the bottom of the well or 10 feet below the water table, whichever is shallower.

1. The GW/SW is responsible for downloading transducer data from locations they visit during scheduled groundwater monitoring program events in February, May, August (data delivery to the TNM should occur by August 15th to facilitate annual remedial performance reporting), and November. The GW/SW will also download data from transducers initially deployed by AECOM for the Downgradient Study Area Investigation. All other transducer locations in the network will be visited by the TNM during scheduled transducer download events.
2. The Aqua Troll 200 and Eijkelkamp Diver instruments have telemetric capabilities and require specific materials and set-up to utilize this feature.
3. Transducer data collection duration is typically planned for one full year, after which time a reassessment will be made on the data collection points.
4. Monitoring well has screened lithology of Qal/xMCf/UMCf and is symbolized on the figures with Qal/UMCf as this is a shallow WBZ that isn't fully in the UMCf or Qal.
5. PC-98R is deployed and managed by Tetra Tech.
6. This gage was originally named S3.60 but the identification was changed to S3.50 during AECOM's field program.

FIGURES



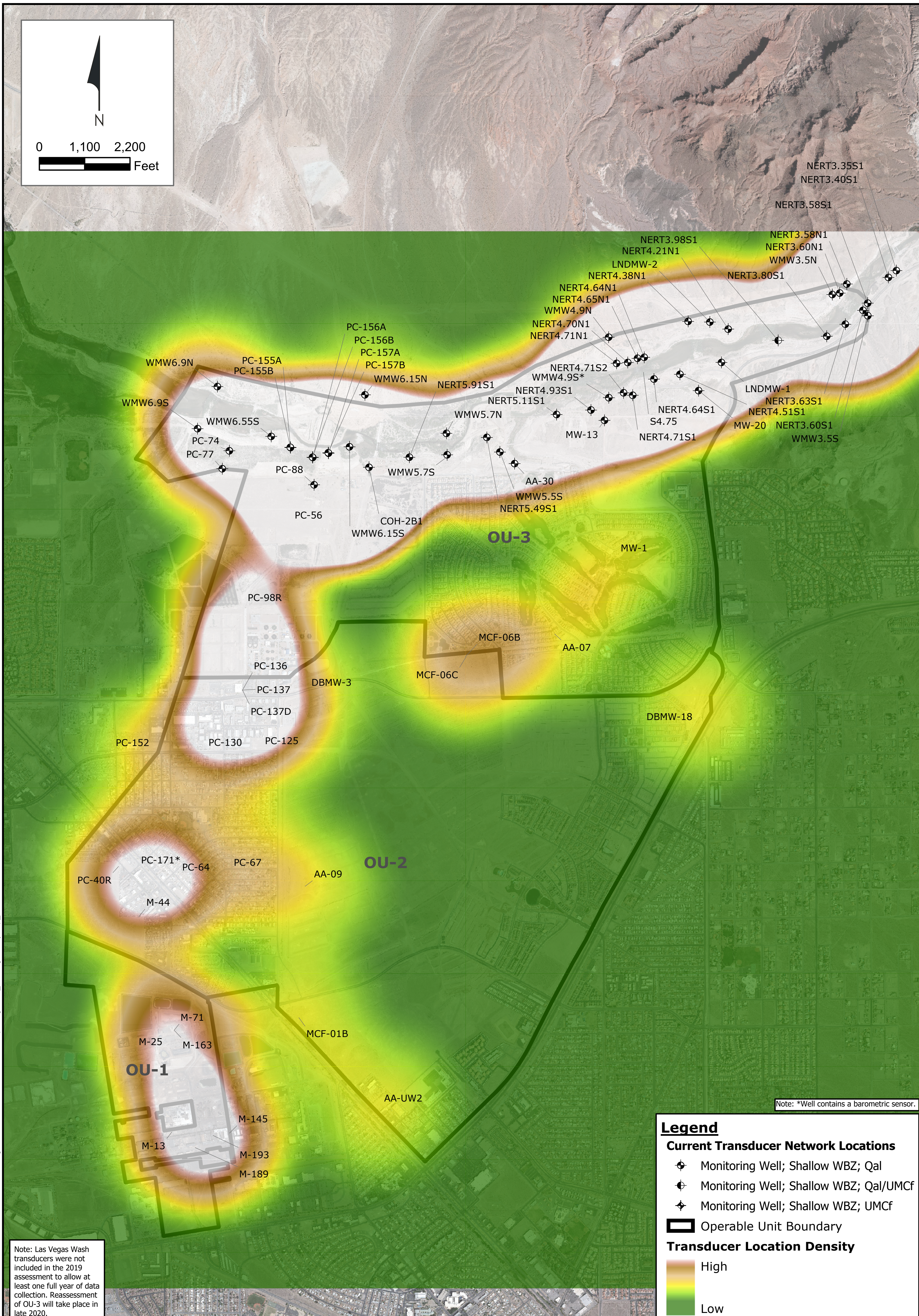
Path: H:\LePetomane\NERT\GIS\Transducer Management - GIS\Transducer Network.aprx\Figure1_Current Transducer Network

RAMBOLL

Current Transducer Network
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
B-1

Drafter: JKING | Date: 1/28/2020 | Contract Number: 1690016062-017 | Approved by: | Revised:



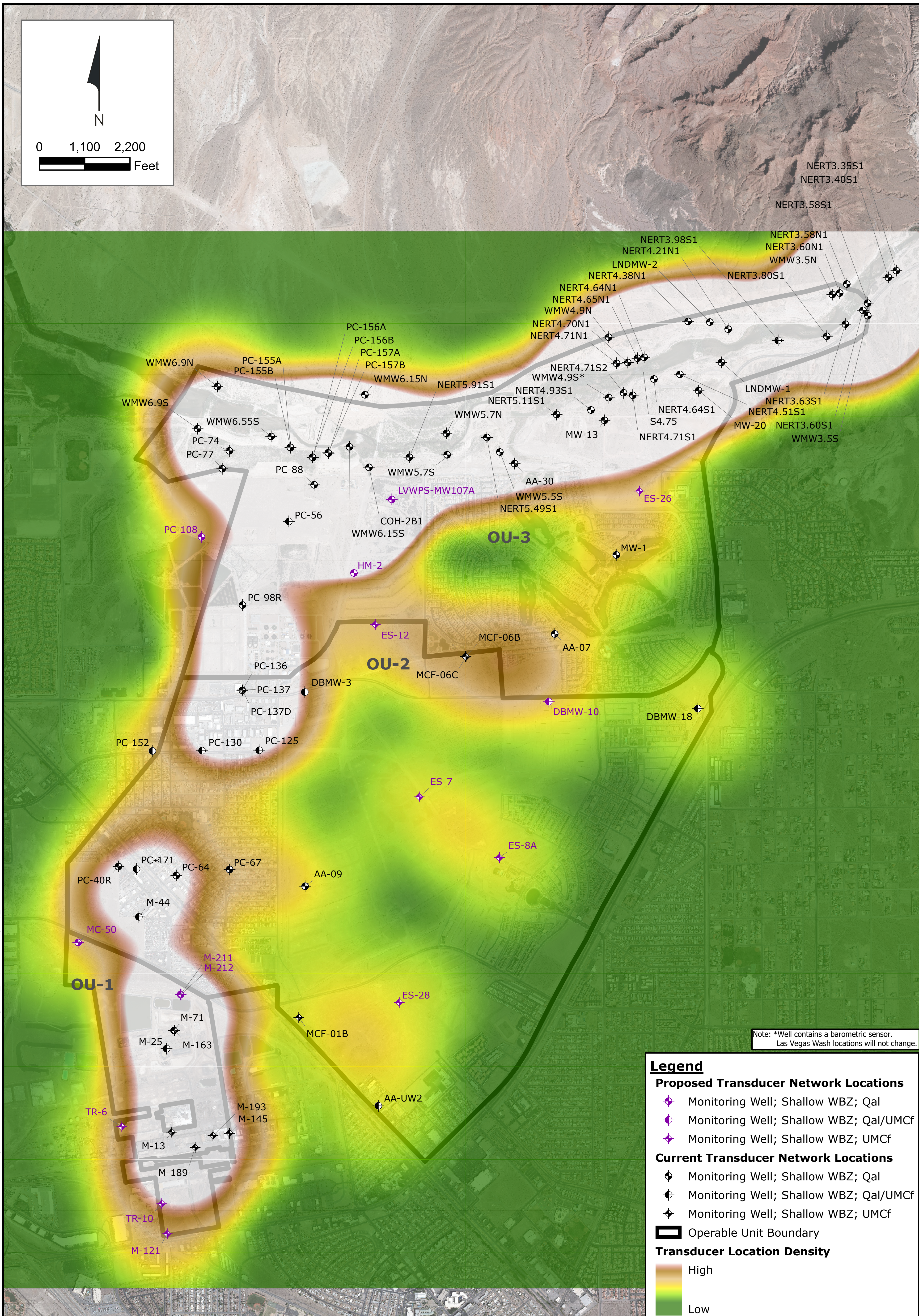
Path: H:\LePetomane\NERT\GIS\Transducer Management - GIS\Transducer Network.aprx\Figure2a_ExistingDensityMap_Shallow

RAMBOLL

Current Transducer Network and Location Density
Shallow Water Bearing Zone
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
B-2a

Drafter: JKING | Date: 1/27/2020 | Contract Number: 1690016062-017 | Approved by: | Revised:



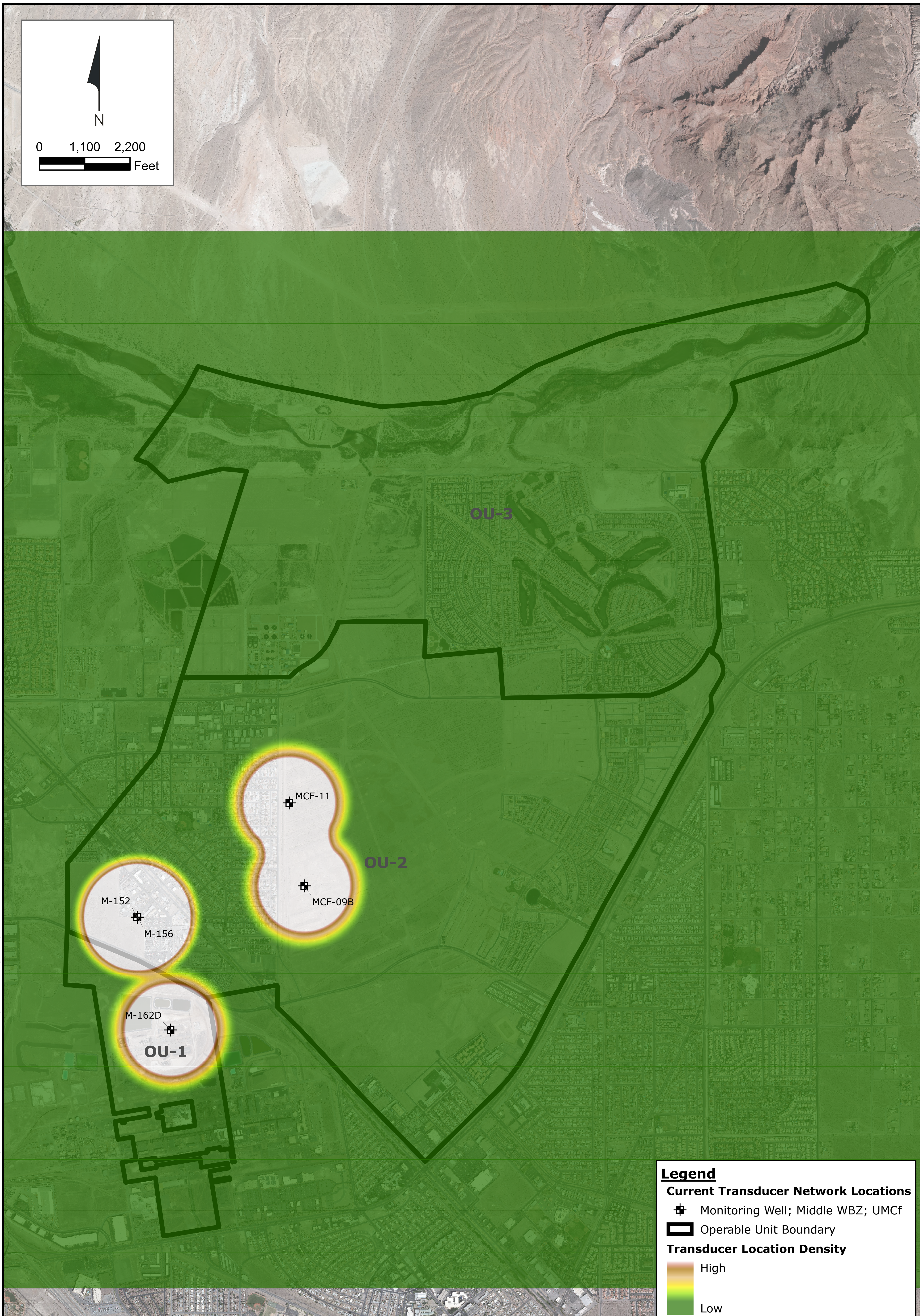
Path: H:\LePetomane\NERT\GIS\Transducer Management - GIS\Transducer Network.aprx\Figure2b_ProposedDensityMap_Shallow

RAMBOLL

Recommended Changes to the Transducer Network and Location Density
Shallow Water Bearing Zone
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
B-2b

Drafter: JKING | Date: 1/28/2020 | Contract Number: 1690016062-017 | Approved by: | Revised:



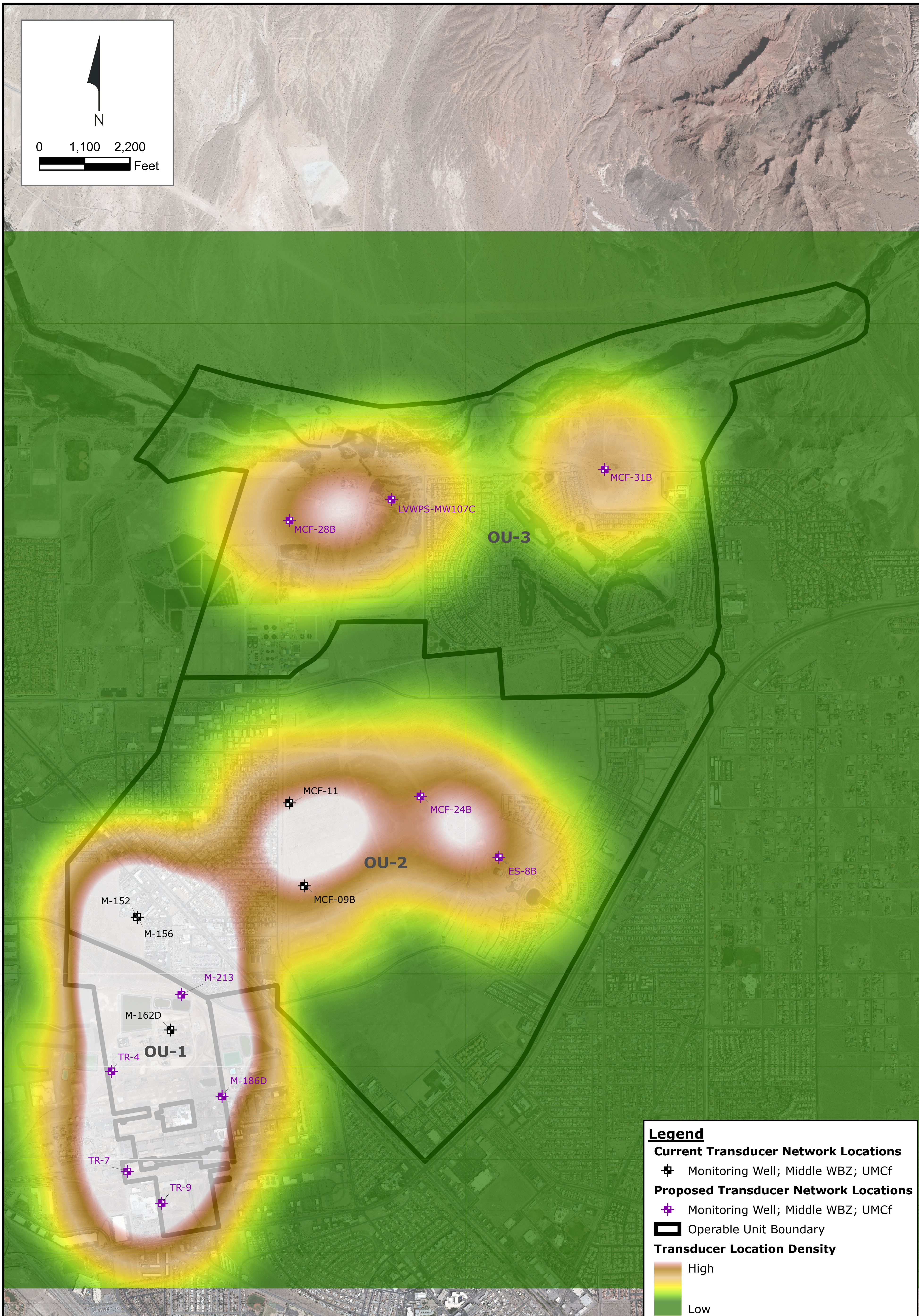
Path: H:\LePetomane\NERT\GIS\Transducer Management - GIS\Transducer Network.aprx\Figure3a_ExistingDensityMap_Middle

RAMBOLL

Current Transducer Network and Location Density
Middle Water Bearing Zone
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
B-3a

Drafter: JKING | Date: 1/28/2020 | Contract Number: 1690016062-017 | Approved by: | Revised:



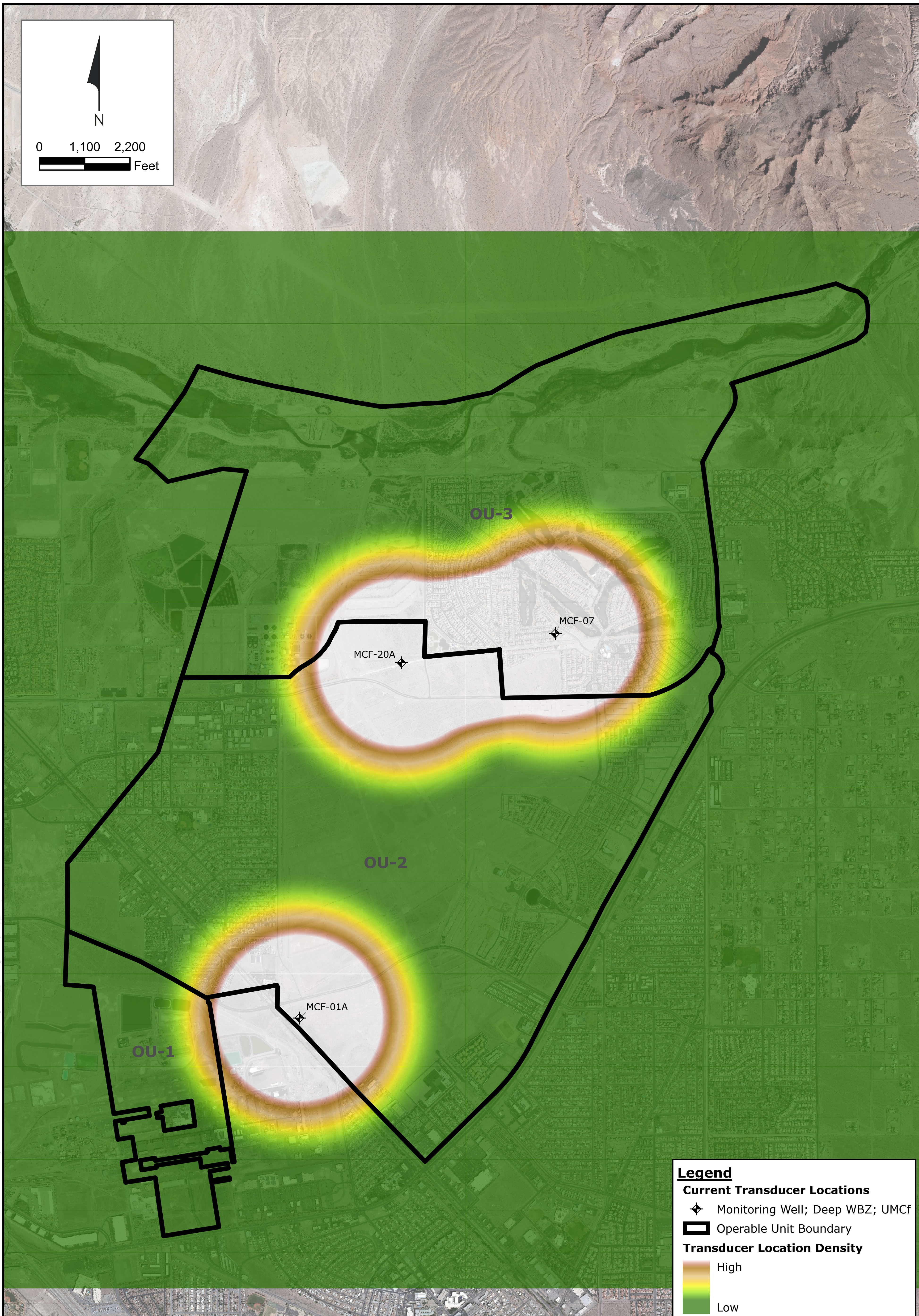
Path: H:\LePetomane\NERT\GIS\Transducer Management - GIS\Transducer Network.aprx\Figure3b_ProposedDensityMap_Middle

RAMBOLL

Recommended Changes to the Transducer Network and Location Density
Middle Water Bearing Zone
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
B-3b

Drafter: JKING | Date: 1/28/2020 | Contract Number: 1690016062-017 | Approved by: | Revised:

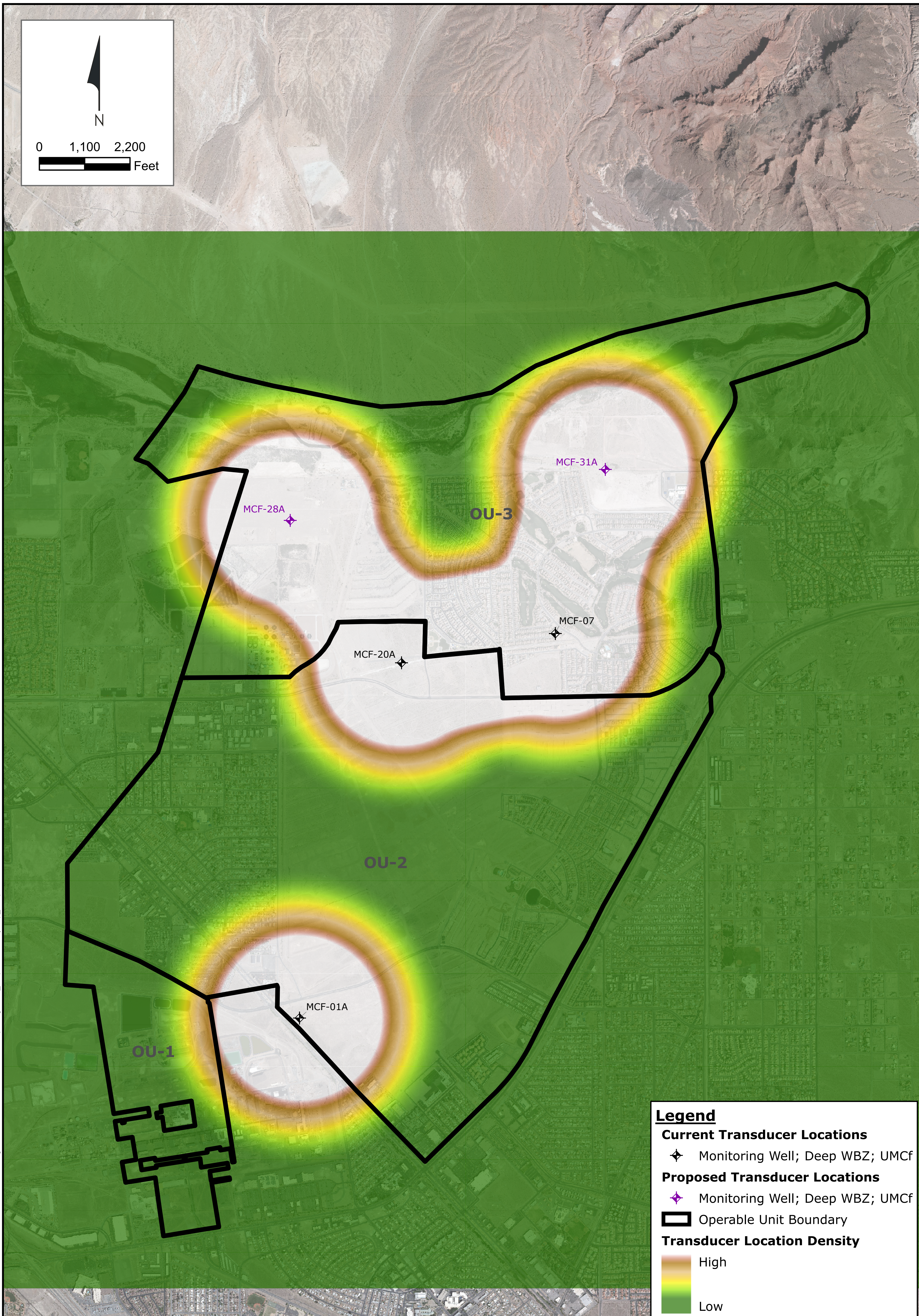


RAMBOLL

Current Transducer Network and Location Density
Deep Water Bearing Zone
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure **B-4a**

Drafter: JKING | Date: 1/28/2020 | Contract Number: 1690016062-017 | Approved by: | Revised:



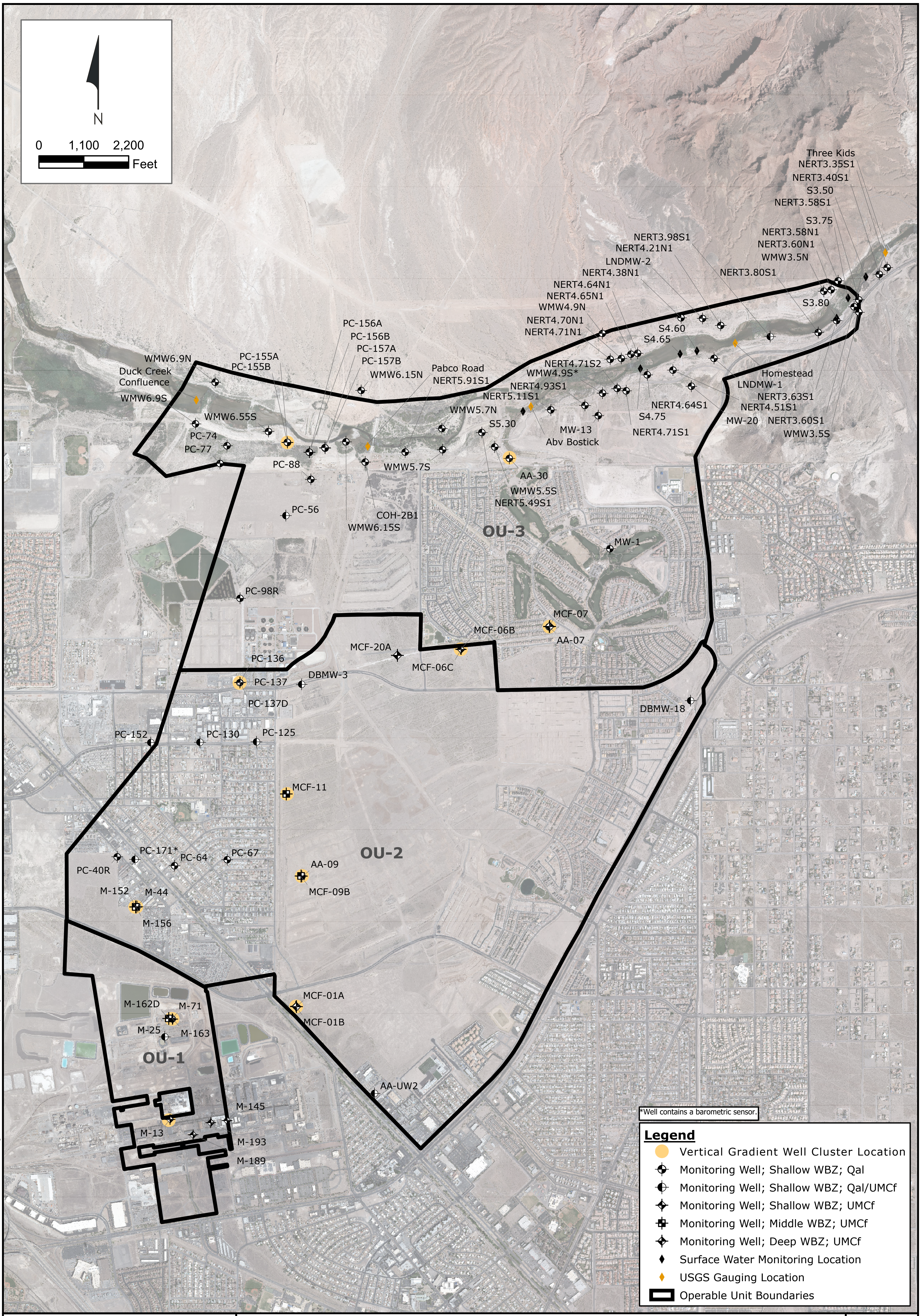
Path: H:\LePetomane\NERT\GIS\Transducer Management - GIS\Transducer Network.aprx\Figure4b_ProposedDensityMap_Deep

RAMBOLL

Recommended Changes to the Transducer Network and Location Density
Deep Water Bearing Zone
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure **B-4b**

Drafter: JKING | Date: 1/28/2020 | Contract Number: 1690016062-017 | Approved by: | Revised:



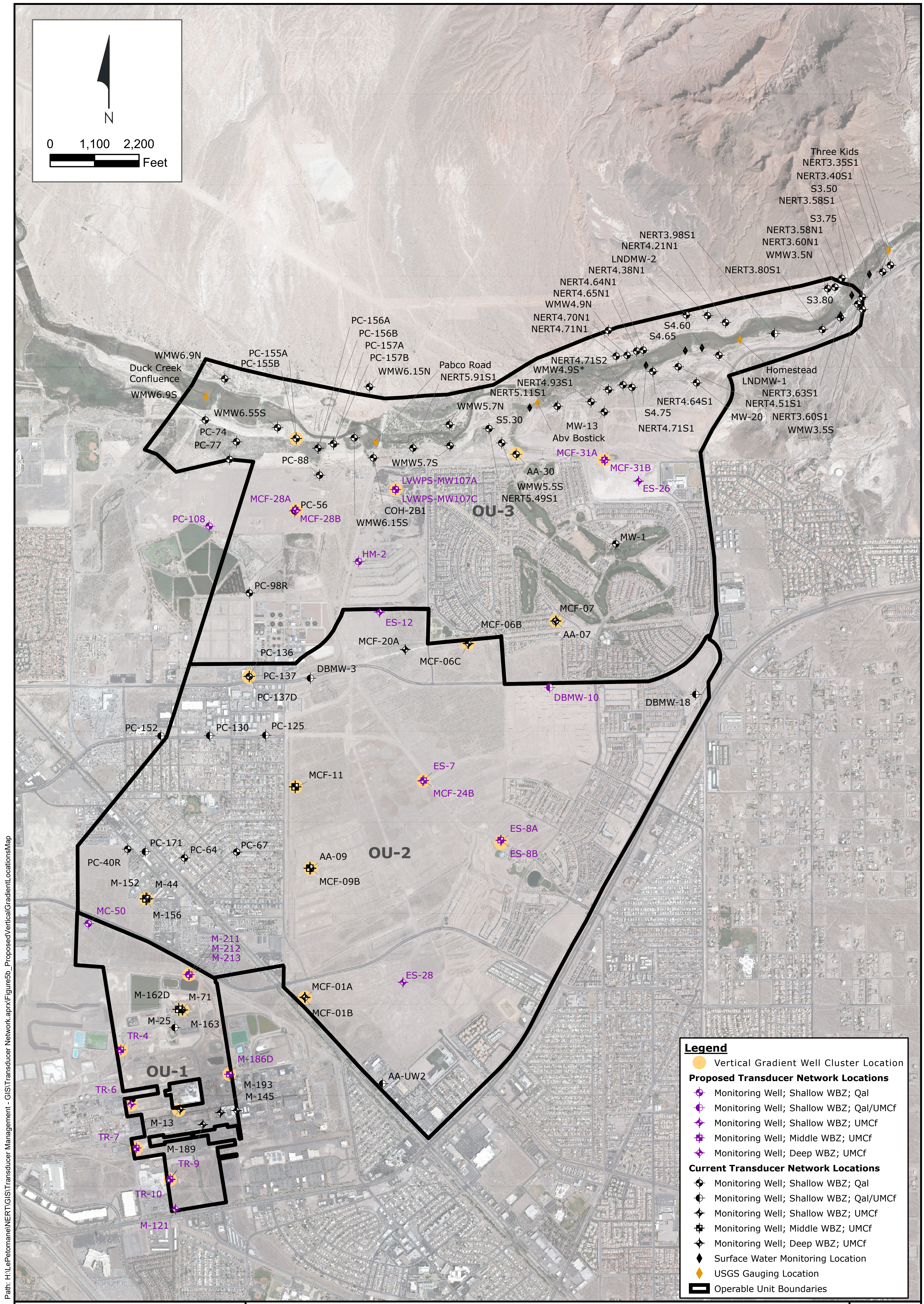
Path: H:\LePetomane\NERT\GIS\Transducer Management - GIS\Transducer Network.aprx\Figure5a_ExistingVerticalGradientLocations

RAMBOLL

Current Transducer Network with Vertical Gradient Well Cluster Locations
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
B-5a

Drafter: JKING	Date: 1/27/2020	Contract Number: 1690016062-017	Approved by:	Revised:

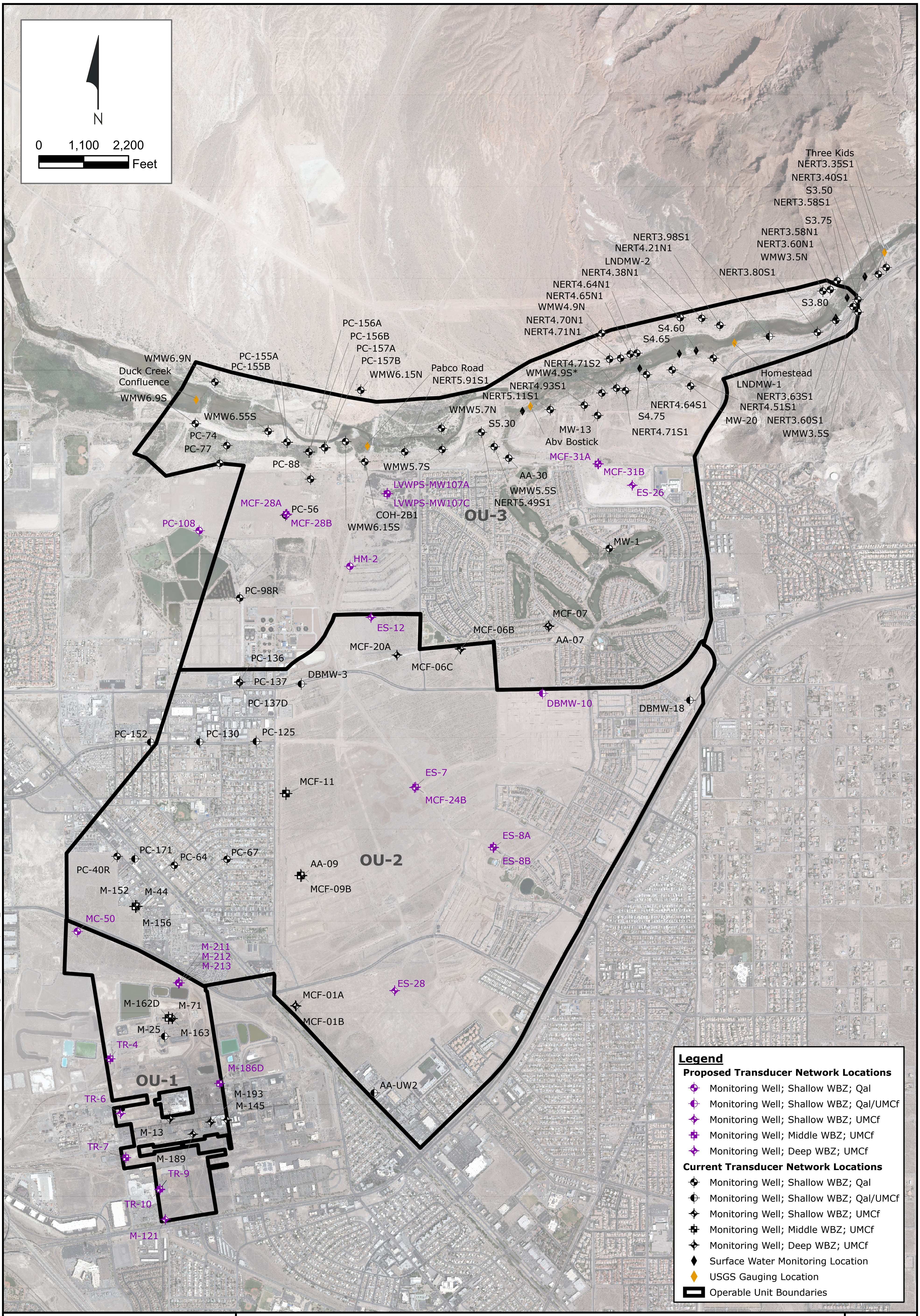


RAMBOLL

Recommended Changes to the Transducer Network with Vertical Gradient Well Cluster Locations
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
B-5b

Drafter: JKING | Date: 1/29/2020 | Contract Number: 1690016062-017 | Approved by: | Revised:



Path: H:\LePetomane\NERT\GIS\Transducer Management - GIS\Transducer Network.aprx\Figure6_Current&Proposed_Transducer Network

RAMBOLL

Recommended Changes to the Transducer Network
Nevada Environmental Response Trust Site
Henderson, Nevada

Figure
B-6

Drafter: JKING | Date: 1/27/2020 | Contract Number: 1690016062-017 | Approved by: | Revised:

APPENDIX C
ROLES AND CONTACT INFORMATION

APPENDIX C: ROLES AND CONTACT INFORMATION
Nevada Environmental Response Trust Site
Henderson, Nevada

Project Role	Responsible Company	Contact Person	Contact Information
Regulator	Nevada Division of Environmental Protection	NERT Remedial Project Manager: Weiquan Dong	wdong@ndep.nv.gov, (702) 486-2850, x252
Site Owner	Nevada Environmental Response Trust	NERT Remediation Director: Steve Clough	steve.clough@nert-trust.com, (702) 960-4309
GWETS Operator	Envirogen Technologies, Inc.	Project Manager: Wendy Prescott	wprescott@envirogen.com, (702) 371-9307
Groundwater and Surface Water Sampling Contractor	Tetra Tech, Inc.	Project Quality Control Officer: Bounkheana Chhun	bounkheana.chhun@tetratech.com, (303) 448-7406
Transducer Network Manager	Ramboll US Corporation	Transducer Specialist: Jesse King	jking@ramboll.com, (602) 734-7717
Data Manager	Ramboll US Corporation	Project Manager: Christopher Ritchie	critchie@ramboll.com, (510) 420-2542
		Project Quality Control Officer: Christopher Ritchie	critchie@ramboll.com, (510) 420-2542
		Database Manager: Craig Knox	cknox@ramboll.com, (510) 420-2518
Analytical Laboratory	Eurofins TestAmerica Laboratories, Inc.	Project Manager: Rossina Tomova	rossina.tomova@testamericainc.com, (949) 260-3276
Data Validator	Laboratory Data Consultants, Inc.	Project Manager: Stella Cuenco	scuenco@lab-data.com, (760) 827-1140

Notes:

This table will be updated and reissued as contact information changes.

APPENDIX D

REMEDIAL PERFORMANCE MONITORING FIELD GUIDANCE DOCUMENTS (FGDs)

FIELD GUIDANCE DOCUMENT NO. 005

LOW-FLOW GROUNDWATER SAMPLING

FIELD GUIDANCE DOCUMENT NO. 005

LOW-FLOW GROUNDWATER SAMPLING

Prepared By:	Elysha Anderson Revision 1: Kate Logan, Emily Gilson, Katie Linscott Revision 2: Emily Gilson, Annika Deurlington
Peer Reviewed By:	Janette Kiernan; Greg Kinsall
Approved By:	John M. Pekala
Applicable To:	Nevada Environmental Response Trust Site Henderson, Nevada
Effective Date:	January 24, 2014
Revision Notes:	0 First Issuance 1 Updated from ENVIRON to Ramboll Environ template; updated special advisory for low-yield wells in Section 4.3; updated stabilization criteria, VOA vial filling procedure, decontamination requirements; provided specific examples of sample identification labels; updated responsibilities of field personnel, field team supervisor, and client; revised information to be included on field forms. 2 Added instructions to inspect trip blanks prior to use; updated from Ramboll Environ to Ramboll template.
Documents Used as Reference During Preparation:	United States Environmental Protection Agency *(USEPA) Standard Operating Procedure for Low-Stress (Low Flow)/Minimal Drawdown Ground-Water Sample Collection*, dated 2002. United States Environmental Protection Agency *(USEPA) Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells,* dated January 19, 2010.

CONTENTS

1. INTRODUCTION

This Field Guidance Document (FGD) describes procedures for low-flow groundwater sampling at the Nevada Environmental Response Trust (NERT) Site. Although this FGD describes minimum procedures required for low-flow groundwater sampling for this project, it should be understood that there may be details of this type of work not specifically discussed in this FGD that would be followed by personnel trained in these techniques. To perform this work in a safe and competent manner, personnel involved in field activities should be sure that they are trained in those field activities they are tasked with, and they understand the scope of work and the level of detail necessary for each field activity prior to mobilizing to perform the work.

This FGD is intended as a guidance document and does not supersede Health and Safety procedures or Site-Specific Health and Safety Plan (HASP) requirements. All personnel shall follow the guidelines, rules, and procedures contained in site-specific HASPs prior to adhering to any procedures recommended in this FGD. All field personnel must review and sign the applicable HASP and the completed HASP and relevant project information must be maintained in the project file. Project personnel involved in field activities must also follow the procedures outlined in this and other applicable FGDs as well as any task-specific work plan or sampling plan. It is the responsibility of the field team supervisors to ensure compliance with all of these requirements.

2. EQUIPMENT/MATERIALS

Equipment and materials needed to conform to this FGD are listed below. The use of alternative equipment or materials for any of the items listed below must be approved by the client prior to use. Equipment and materials include:

- Health and Safety Plan
- Site information (maps, contact numbers, etc.)
- Well information (previous water levels, well depths and screen intervals, previous purge logs, etc.)
- Electronic water level meter (Solinst or similar)
- Photoionization Detector (PID) and/or Flame ionization detector (FID) if required by site or project needs
- Adjustable-rate bladder pump capable of rates <500 milliliters per minute (mL/min) (e.g., QED Sample Pro); other pumps may be acceptable, but must be approved by the client prior to use
- Bladders for sample pump
- Pump controller with or without on-board air compressor (If no on-board compressor, have a stand-alone air compressor and/or nitrogen tanks for operating bladder pumps)
- Sample tubing (Teflon® or Teflon®-lined tubing for sampling organic compounds)
- Multi-parameter meter (e.g. YSI 556 Multi-Parameter Meter or equivalent) with flow through cell capable of measuring (at a minimum) temperature, pH, specific electrical conductance (SEC), dissolved oxygen (DO), and oxidation-reduction potential (ORP)
- Turbidity meter
- In-line filters (if required, e.g., for dissolved metals)
- Certified-clean sample containers and preservation supplies, sample labels, Ziploc™ bags
- Cooler with ice
- Decontamination supplies (e.g. phosphate-free detergent, distilled water)
- Tool kit with appropriate tools (socket wrench set, pry bar, Dolphin locks/keys)
- Drum(s) to collect purged water and decontamination water
- Drum labels
- PPE typically will consist of:
  - Long-sleeved shirt and long pants
  - Steel-toed boots
  - Hardhat

  - Nitrile gloves
  - Safety glasses with side shields
  - Other as required by the site-specific Health and Safety Plan
- Field Forms
  - Field Investigation Daily Log
  - Water Level Measurement Log
  - Low-Flow Purging and Sampling Log
  - Equipment Calibration Log
  - Chain of Custody

3. METHODOLOGY

This FGD has been prepared in accordance with the United States Environmental Protection Agency (USEPA) Standard Operating Procedure for Low-Stress (Low Flow)/Minimal Drawdown Ground-Water Sample Collection, dated 2002. This guidance document is included as Attachment 3 of the Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers. Revision 1 of this FGD includes updates based on the USEPA's Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, dated January 19, 2010.

Unlike traditional purging methods, low-flow purging and sampling does not require the removal of an arbitrary volume of water from a well prior to sampling. Instead, low-flow purging and sampling relies on careful monitoring of water quality indicator parameters to determine when a representative groundwater sample can be collected. The low-flow methodology minimizes the effects on groundwater chemistry caused by the purging process by minimizing drawdown, reducing the amount of water removed from the well, and reducing the amount of turbidity in groundwater samples.

4. PROCEDURES

The following sections discuss the procedures to follow during low-flow purging and sampling of shallow monitoring wells with dedicated or non-dedicated equipment since both are employed. Where applicable and when possible, the purging and sampling techniques should remain consistent from one sampling event to the next.

Non-dedicated pumps made of inert materials may be used (see Section 2). All non-dedicated pumps must be easily decontaminated in the field. Tubing must be changed between each well. The reuse of tubing dedicated to a single well is encouraged to reduce waste between sampling events.

4.1 Pre-Sampling Activities

To the extent practical, sampling should begin at the well with the least contamination and proceed systematically to the wells with the higher expected concentrations. All measuring devices and monitoring equipment should be calibrated according to the manufacturer's instructions. Water quality meters must be calibrated daily before use. Equipment calibration details should be recorded in the *Equipment Calibration Log*.

Depending on project requirements, the headspace at the top of the wells may be monitored for volatile organic compounds (VOCs) with a PID or FID when well caps are opened for sampling. If VOCs are determined to be present, worker breathing zones should be monitored during purging/sampling and measurements should be recorded on field logs.

The proper procedure is as follows:

1. Unlock well and/or remove well cap. Note that wells may be flush-mount or above-grade completions.
2. Monitor the headspace at the top of the well for VOCs, depending on project requirements.
3. Measure the water level to obtain the static water level (see Section 4.2). Water levels should be measured to the nearest 0.01 foot relative to a well's top of casing (TOC).

4.2 Water Level Measurement

Water levels will be recorded on a *Water Level Measurement Log* and/or a *Water Purging and Sampling Log*.

Water levels can be measured by several techniques, but the most common method is using an electronic water level meter (e.g., Solinst). Other methods used at the site may include remote data logging via pressure transducers or from a pressure gauge at the top of artesian wells. Refer to manufacturer's manuals for specific protocols for collecting data from remote water level measuring devices. For artesian wells, readings of pressure in pounds per square inch (psi) are recorded from a pressure gauge at the wellhead.

Water level meters must be decontaminated before initial use and after measurements are made in each well.

The proper sequence for water level measurement is as follows:

1. Turn water level meter on and check that its indicator is working.
2. Record the following information on the *Water Level Measurement Log* or the *Water Purging and Sampling Log*:
    - Well number
    - Top of casing elevation, if available
    - Surface elevation, if available
3. Use caution when opening the well. If pressure has developed inside the well casing, allow the well to stand without a cap for a few minutes until the water level stabilizes before taking a water level measurement. Record observance of positive or negative pressures in the well.
4. Inspect well for abnormalities (e.g., broken locks, damaged casing, blockages, etc.) and note on field logs. If there is dedicated tubing inside the well, it may have to be removed prior to gauging the well to avoid blocking the water level meter.
5. Lower the water level meter cable slowly into the well until the buzzer indicates a closed circuit. Raise and lower the electric cable slightly until the maximum response on the indicator is found. Record the static water level to the nearest hundredth (0.01) foot from the surveyed reference mark or notch on the top edge of the well casing (TOC). If no reference mark is present, the measurement should be taken from the north side of the inner casing.
6. Repeat the measurement as necessary to confirm the level by raising and lowering the probe until the maximum response is observed.
7. Record the time and day of the measurement.
8. Compare measurement against historical measurements to perform a "reality check" of the measurement and recheck water level as needed. Record initial water level measurements and all confirmation measurements on the *Water Level Measurement Log* or the *Water Purging and Sampling Log*. Also note whether the well has been pumped recently, as water levels may require additional time to return to static conditions after pumping has ceased.
9. The probe (or portion of the instrument that was immersed in groundwater) will be cleaned with a solution of laboratory-grade phosphate-free detergent (e.g., Alconox™) and deionized water. The equipment will then be rinsed with deionized water and dried with a clean paper towel. Steam-cleaning is also an acceptable method of decontaminating the probe.

Water level measurements at the site will be taken as quickly as practically possible, to best represent the potentiometric surface across the site at a single time. Care will be taken not to drop foreign objects into the wells and not to allow the monitoring and sampling equipment to touch the ground or any other contaminating surfaces.

4.3 Purging and Sampling

1. If using a dedicated pump, attach sample tubing to the wellhead according to manufacturer's procedures.
2. If there is dedicated tubing in the well, but no dedicated pump, using appropriate PPE, pull the tubing and keep it from kinking or knotting by using a reel or by hand coiling it. Inspect the tubing for damage while removing it from the well and protect the tubing from touching the ground or other contaminated surfaces. If necessary to store the tubing, place in a clean plastic bag. If there is no tubing, or the dedicated tubing needs replacement, use only new tubing.
3. If using a non-dedicated pump, attach the tubing to the pump according to manufacturer's procedures, place the pump and support equipment at the well head and slowly lower the pump and tubing down into the monitoring well until the location of the pump intake is set at a predetermined location within the screen interval. Where possible, pre-measured tubing should be used to place the pump intake at the same depth as previous sampling events, or at a depth where there is known contamination within the screen interval. If there is no previous information for the well, the pump intake should be placed at the middle (or slightly above the middle) of the saturated screen interval. Record the pump depth in the *Low-Flow Purging and Sampling Log*.
4. Measure depth to water to the nearest 0.01 foot relative to the reference measuring point on the TOC with an electronic water level indicator. Record depth to groundwater information in the *Low-Flow Purging and Sampling Log*. Leave water level indicator in the well.
5. Connect the discharge line from the pump to a flow-through cell that at a minimum measures temperature, pH, SEC, DO, and ORP. Turbidity measurements can be made using a separate turbidity meter. The discharge line from the flow-through cell must be directed to a container to hold purge water collected during purging and sampling of the well. Purge water will be collected in a portable tank (e.g., trailer-mounted polyethylene tank) and discharged to the on-site groundwater treatment system at the end of the sampling or when tank is full.
6. Connect the air lines to the flow controller and start pumping the well. Note the time that purging begins on the *Low-Flow Purging and Sampling Log*. If the well has previously been sampled using low-flow techniques, review the prior purge logs if available to determine an appropriate purge rate. For new wells or wells with no purging history, start purging at the lowest flow rate allowed by the pump and slowly increase the flow rate until drawdown begins. Once drawdown is observed reduce the purge rate until a stable water level is maintained. Purge rates are not to exceed 500 mL/min. Check the water level. Maintain a steady flow rate while maintaining a drawdown of less than 0.3 feet. (Zero drawdown is optimal, but may not be achievable). If drawdown is greater than 0.3 feet, lower the flow rate; 0.3 feet is a goal to help guide with the flow rate adjustment. This goal will be difficult to achieve in some wells due to low hydraulic conductivities and limitations to the lowest flow rate a pump can produce while maintaining steady flow. When water levels will not stabilize or when drawdown in excess of 0.3 feet is observed even at minimum flow rates, refer to the Special Advisory at the end of these procedures.

7. Measure the discharge rate of the pump with a graduated cylinder and a stopwatch. Also, measure the water level and record flow rate, total purged volume, and water level on the *Low-Flow Purging and Sampling Log* every three to five minutes. Total purged volume should be measured using a graduated cylinder or calculated based on the recorded purge rate and time interval between measurements. Purging rates should be maintained to ensure minimal drawdown in the monitoring well.
8. Monitor and record the water quality indicator parameters every three to five minutes in the *Low-Flow Purging and Sampling Log*. Stable readings of temperature, pH, SEC, DO, turbidity and ORP indicate when a representative sample can be collected. The stabilization criterion is based on three successive readings of the water quality indicator parameters as shown in Table 1. Turbidity and ORP may not always be appropriate stabilization parameters and will depend on site-specific conditions. However, readings should be recorded because of their value for understanding groundwater conditions. Water level should also continue to be monitored in order to maintain a drawdown of less than 0.3 feet.

TABLE 1: Recommended Stabilization Criteria for Water Quality Indicator Parameters During Low-Flow Purging and Sampling

Parameter	Stabilization Criteria
Temperature	± 3% of reading
pH	± 0.1 pH units
Specific Electrical Conductance (SEC)	± 3% µS/cm
Dissolved Oxygen (DO)	± 10% (when DO is greater than 0.5 mg/L) If 3 consecutive DO readings are less than 0.5 mg/L, consider the values as stabilized.
Turbidity	± 10% NTUs (when turbidity is greater than 10 NTUs) If 3 consecutive turbidity readings are less than 10 NTUs, consider the values as stabilized.
Oxidation-Reduction Potential (ORP)	± 10 millivolts

9. Once stabilization of water quality indicator parameters and drawdown is achieved, and at least one system volume (including the volume of water in the pump and tubing) and the stabilized drawdown volume[1] have been purged from the well following water level stabilization, samples can be collected. Note the time that stabilization is achieved as the stop purge time on the purge log. The sample time, along with any QA/QC sample times, should also be recorded on the *Low-Flow Purging and Sampling Log*. Maintain the same pumping rate or reduce slightly for sampling as necessary in order to minimize disturbance of the water column. Disconnect the pump's tubing from the flow-through

[1] The USEPA's Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, dated January 19, 2010, defines stabilized drawdown volume as the volume of water between the initial water level and the stabilized water level.

cell so that the samples are collected from the pump's discharge tubing. For samples collected for dissolved gases or VOC analyses, the pump tubing needs to be completely full of groundwater to prevent the groundwater from being aerated as it flows through the tubing. If a bladder pump is used to collect samples for dissolved gases or VOC analyses, the pump should be set so that one pulse will deliver a water volume that is sufficient to fill a 40-mL volatile organic analysis (VOA) vial. Generally, the sequence of the samples is immaterial unless filtered (dissolved) samples are collected. VOC samples are normally collected first, and filtered samples should generally be collected last (see below). All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container. When collecting VOC samples using VOA vials, a meniscus must be formed over the mouth of the VOA vial to eliminate the formation of air bubbles and head space prior to capping. VOA vials should be capped immediately following sample collection to minimize volatilization from the sample. Effervescence and colorimetric reactions should be recorded in the *Low-Flow Purging and Sampling Log.*

10. If a field filtered (dissolved) metal sample is to be collected (or field filtered samples for any other analytes are required), then an inline filter is fitted at the end of the discharge tubing and the sample is collected after the filter. The inline filter must first be flushed in accordance with manufacturer's recommendations and if there are no recommendations for flushing, a minimum of 0.5 to 1.0 liter of groundwater from the monitoring well must pass through the filter prior to sampling. (Note: Groundwater filter cartridges are dedicated sampling equipment. A new cartridge should be used at each sampling location. Do not attempt to clean filter cartridges. If the filter becomes clogged or groundwater flow is too slow, remove and replace with a new filter cartridge.)
11. For non-dedicated systems, remove the pump from the monitoring well. Decontaminate the pump and hang the tubing within the well for the next sampling event. If tubing is damaged or otherwise needs replacing, remove and dispose of the tubing. For dedicated systems, disconnect the tubing that extends from the plate at the wellhead (or cap) and discard after use.
12. Close and lock the well.

<u>Special Advisory:</u> If a stabilized drawdown in the well cannot be maintained at the pump's lowest purge rate, samples may be collected as soon as a minimum of one (1) system volume (including the volume of water in the pump and tubing) has been purged from the well. This information should be noted in *the Low-Flow Purging and Sampling Log*.

4.4 Equipment Decontamination

The electronic water level meter and the water quality meters will be decontaminated by the following procedures:

1. The water level meter will be hand washed with phosphate-free detergent (e.g., Alconox™) and a scrubber, then triple rinsed with distilled water, or steam-cleaned.
2. The water quality meters and flow-through cell (if used) will be rinsed with distilled water between sampling locations. No other decontamination procedures are necessary or recommended for these meters since they are sensitive instruments. After the sampling

event, the flow-through cell and sensors must be cleaned and maintained per the manufacturer's requirements.

Sample tubing will either be replaced or be dedicated to an individual well. Non-dedicated pumps will be decontaminated between monitoring wells and prior to moving off-site. The pump and discharge line (including support cable and electrical wires which were in contact with the groundwater in the well casing) must be decontaminated by the following procedure:

1. The outside of the pump, support cable, and electrical wires must be pressure-sprayed with soapy water, tap water, and distilled water. Use bristle brush to help remove visible dirt and contaminants.
2. In accordance with the pump manufacturer's procedures, dismantle the pump and clean individual parts using cylindrical brushes and phosphate-free detergent (e.g., Alconox™). Double rinse the parts with tap water and then distilled water. Reassemble the pump following manufacturer's procedures and replacing disposable parts (e.g., the bladder and grab plates) with new parts.
3. If free product is encountered or other conditions are expected, additional decontamination steps may be required.
4. Decontamination water will be collected in a portable tank (e.g., trailer-mounted polyethylene tank) and discharged to the on-site groundwater treatment system.

Other decontamination procedures may be proposed but must be reviewed and approved by the client prior to implementation.

4.5 Quality Control Procedures

All field Quality Control (QC) samples must be prepared the same as primary samples with regard to sample volume, containers, and preservation. The sample handling and chain of custody procedures for the QC samples will be identical to the primary samples. The following are QC samples that may be collected during groundwater sampling:

- A field duplicate is an independent sample collected as close as possible to the same time that the primary sample is collected and from the same source. Field duplicates are used to document sample precision. Field duplicates will be labeled and packaged in the same manner as primary samples. Field duplicates are analyzed for the same suite of parameters as the primary samples. The frequency of analysis of field duplicates is generally one for every 20 primary samples but may vary depending on project requirements.
- Equipment blanks are obtained by running distilled or deionized water over or through the sample collection equipment after it has been decontaminated and capturing the water in the appropriate sample containers for analysis. Equipment blanks are analyzed for the same suite of parameters as the primary samples. The frequency of analysis of equipment blanks is generally one for every 20 primary samples but may vary depending on project requirements.

- Field blanks are used to assess the presence of contaminants arising from field sampling procedures. Field blank samples are obtained by filling a clean sampling container with reagent-grade deionized water. Field blanks are analyzed for the same suite of parameters as the primary samples. The frequency of analysis of field blanks is generally one for every 20 primary samples collected but may vary depending on project requirements.
- Trip blanks are sample containers that are used to evaluate sample cross-contamination of VOCs during shipment. For groundwater sampling, trip blanks consist of hydrochloric acid-preserved, analyte-free, deionized water prepared by the laboratory in VOA vials that will be carried to the field, stored with the samples, and returned to the laboratory for VOC analysis. Generally, one trip blank is required to accompany each sample shipping container or cooler that contains samples for VOC analysis; however, this may vary depending on project requirements. Trip blanks should be inspected at the laboratory before they are shipped to the field site for use. Trip blanks should be inspected again at the field site prior to use. If any headspace is observed in any trip blanks, they should not be used and replacement trip blanks should be requested from the laboratory.

4.6 Sample Handling and Custody

Samples will be collected, handled, and stored in such a manner that they are representative of their original condition and chemical composition. Identification of samples and maintenance of custody are important elements that must also be utilized to ensure samples characterize site conditions. All samples will be properly identified and maintained under chain of custody protocol to protect sample integrity. The following sections discuss the sample handling and custody requirements.

4.6.1 Sample Identification

To maintain consistency, a sample identification convention including unique identifiers for all groundwater and QC samples must be developed and followed throughout the project. The sample identifiers will be entered onto the sample labels, field forms, chain of custody forms, and other records documenting sampling activities. Sample names will include the well name, sample date, and appropriate sample code and number (if applicable). Example sample names are as follows:

TABLE 2: Sample Identification Conventions

Sample Type	Example Sample Name (for well M-95)
Primary Sample	M-95-20161108
Field Duplicate	M-95-20161108-FD1
Field Blank	M-95-20161108-FB1
Equipment Blank	M-95-20161108-EB1
Trip Blank	M-95-20161108-TB1

4.6.2 Sample Labels

A sample label will be affixed to all sample containers sent to the analytical laboratory. Field personnel will complete an identification label for each sample with the following information written in waterproof, permanent ink:

- Client and project number;
- Sample location and depth, if relevant;
- Unique sample identifier;
- Date and time sample collected;
- Filtering performed, if any;
- Preservative used, if any;
- Name or initials of sample collector; and,
- Analyses or analysis code requested.

The use of pre-printed sample labels is preferred in order to reduce sample misidentification problems due to transcription errors. Sample labels must be completed and affixed to the sample container in the field at the time of sample collection.

If errors are made on a sample label, corrections will be made by drawing a single line through the error and recording the correct information. Corrections will be dated and initialed.

4.6.3 Containers, Preservation, and Holding Time

Each lot of preservative and sampling containers will be certified as contaminant-free by the supplier. All preserved samples will be clearly identified on the sample label and *Chain of Custody* form. If samples requiring preservation are not preserved, field records will clearly specify the reason for the discrepancy.

Chemical activity continues in the sample until it is either analyzed or preserved. Once the sample has been preserved, the sample may be held for a period of time before analysis. The time from the collection of the sample to the analysis is defined as the holding time. The holding time varies depending on the media being sampled and the analyses being performed. The collection, preservation, and analysis of samples must be conducted to avoid exceeding relevant holding times. If the holding time for a sample is exceeded, the sample should not be analyzed. If a sample is inadvertently analyzed despite having exceeded the holding time, the project manager should be informed. A decision will then be made to inform the laboratory to not report the results whereby the sample should be recollected, or whether the results can be reported with qualifications.

4.6.4 Sample Handling and Transport

Proper sample handling techniques are used to ensure the integrity and security of the samples. Samples for field measured parameters will be analyzed immediately in the field and recorded in the appropriate field forms. Samples for laboratory analysis will be transferred immediately to appropriate laboratory supplied containers in accordance with the following sample handling protocols:

- Don clean gloves before touching any sample containers, and take care to avoid direct contact with the sample;
- Samples will be quickly observed for color, appearance, and composition and recorded as necessary;
- The sample container will be labeled before or immediately after sampling;
- Sample containers and liners will be capped with Teflon®-lined caps before being placed in Ziploc™-type plastic bags. The samples will be placed in an ice chest kept at 4 °C (+/- 2°C) for transport to the laboratory.
- All sample lids will stay with the original containers and will not be mixed.
- Sample bottles will be wrapped in bubble wrap as necessary to minimize the potential for breakage during shipment.
- The *Chain of Custody* form will be placed in a separate plastic bag and taped to the cooler lid or placed inside the cooler. A custody seal will be affixed to the cooler if the samples are to be shipped by commercial carrier. For shipped samples, U.S. Department of Transportation shipping requirements will be followed and the sample shipping receipt will be retained in the project files as part of the permanent *Chain of Custody* document.

4.6.5 Sample Chain of Custody

Sample chain of custody procedures will be used to maintain and document sample integrity during collection, transportation, storage, and analysis. A sample is considered to be under the control of, and in the custody of, the responsible person if the samples are in their physical possession, locked or sealed in a tamper-proof container, or stored in a secure area.

The *Chain of Custody* form provides an accurate written record that traces the possession of individual samples from the time of collection in the field until they are accepted at the analytical laboratory. The *Chain of Custody* form also documents the samples collected and the analyses requested. The sample collector will record the following information on the *Chain of Custody* forms:

- Client and project number;
- Name or initials and signature of sample collector;
- Name of destination analytical laboratory;
- Name and phone number of field team supervisor in case of questions;
- Unique sample identifier for each sample;
- Date and time of collection for each sample;
- Number and type of containers included for each sample;
- Analysis or analyses requested for each sample;
- Preservatives used, if any, for each sample;

- Sample matrix for each sample;
- Any filtering performed, if applicable, for each sample;
- Signatures of all persons having custody of the samples;
- Dates and times of transfers of custody;
- Shipping company identification number, if applicable; and,
- Any other pertinent notes, comments, or remarks.

Blank spaces on the *Chain of Custody* will be crossed out and initialed by the field sample collector between the last sample listed and the signatures at the bottom of the sheet.

The field sample collector will sign the *Chain of Custody* and will record the time and date at the time of transfer to the laboratory or an intermediate person. A set of signatures is required for each relinquished/received transfer, including internal transfer. The original imprint of the *Chain of Custody* will accompany the sample containers and a duplicate copy will be kept in the project file.

If the samples are to be shipped to the laboratory, the original *Chain of Custody* relinquishing the samples will be sealed inside a plastic bag within the ice chest, and the chest will be sealed with custody tape that has been signed and dated by the last person listed on the *Chain of Custody*. U.S. Department of Transportation shipping requirements will be followed and the sample shipping receipt will be retained in the project files as part of the permanent *Chain of Custody* document. The shipping company (e.g., Federal Express, UPS) will not sign the *Chain of Custody* forms as a receiver; instead the laboratory will sign as a receiver when the samples are received.

5. PRECAUTIONS

Certain precautions should be taken to ensure safety during the implementation of this FGD. It is important to always remain alert and aware of your surroundings. All personnel performing on-site operations with the potential for exposure to hazardous substances or health hazards are required to be 40-hour trained in accordance with Code of Federal Regulations (CFR) 1910.120 and will meet the personnel training requirements in accordance with 29 CFR 1910.120(e).

The laboratory must be certified by the appropriate regulating agency for the analyses to be performed.

The activities described in this FGD require the implementation of a site-specific Health and Safety Plan to inform personnel of the hazards associated with this work and to describe the methods that will be employed to mitigate those hazards. The Health and Safety Plan must be prepared and approved by the field team supervisor and Project Health and Safety Coordinator prior to initiating field work.

6. RECORDKEEPING

Information collected during groundwater sampling may be recorded on individual field forms. A project-specific Field Logbook may replace any of the individual field forms with the exception of the *Chain of Custody* form. All field forms should be reviewed by field personnel and the field team supervisor for completeness. Following review by the field team supervisor, the original field records will be kept in the project file. The following forms may be used to document the field activities:

- Field Investigation Daily Log;
- Water Level Measurement Log;
- Low-Flow Purging and Sampling Log;
- Equipment Calibration Log; and,
- Chain of Custody.

The *Field Investigation Daily Log* will be completed for each day of fieldwork containing (at a minimum) the times and descriptions of the work performed, the activities of any subcontractors or visitors on-site, arrival and departure times for all involved, and any other pertinent information. For larger projects, or when otherwise deemed appropriate by the client, this information may alternatively be recorded in a Field Logbook. In these cases, a separate Field Logbook must be used for each project or site.

The *Water Level Measurement Log* will be used to record water level measurements for all wells. The type, serial number, and calibration date for the water level measuring device will be included on this form. Additionally, this form will be used to record general observations of the conditions of the wells, wellheads, well boxes, and/or monuments.

The *Low-Flow Purging and Sampling Log* will be used to record the details of purging and sampling information for each well including the depth of the pump, purge rates, and volume purged from each well. This form will also be used to record all of the measurements of drawdown and water quality indicator parameters used for evaluating stabilization.

The *Equipment Calibration Log* will be used to document the calibration and status of any measuring instruments used in the field (e.g., PID/FID, water level measuring device, water quality meters, etc.). The frequency and method of calibration will depend on the instrument. Any instruments used will be used in accordance with the factory-provided operating and/or service manuals.

Sample names, date/times, analyses to be performed, and other pertinent information will be recorded on the *Chain of Custody* form as a means of identifying and tracking the samples.

2200 Powell Street, Suite 700, Emeryville, CA 94608
Phone: (510) 655-7400 Fax: (510) 655-9517

LOW-FLOW WATER PURGING & SAMPLING LOG
PRELIMINARY FIELD DRAFT
PENDING REVIEW

Well ID Number: ________________________

Project Name: NERT
Project Number: ____________________
Project Location: Henderson, Nevada

Field Person: ____________________
Project Manager: ____________________
Date: ____________________

Pump/Tubing Type:	**Casing Radius (in):**	**Depth to Water (ft):**
Equipment Cleaning Method:	**Total Depth (ft):**	**Pump set at (ft):**
Purge Water Disposal:	**Screened Interval Top (ft):**	**Screened Interval Bottom (ft):**

Purge Start Time:

Time	Purge Rate (ml/min)	Vol. Purged (ml)	DTW (ft)	Temp (°C)	pH	Cond. (µS/cm)	DO (mg/L)	ORP (mV)	Turb. (NTU)	Color/Odor

Stop Purge Time: **Sample Time:** **Sample ID:**

Observations/Comments:

Bottle Set Summary

	3 x VOA w/ HCl		125 mL plastic		250 mL amber w/ H3PO4
	125 mL plastic w/ EDA		250 mL plastic		500 mL amber
	250 mL plastic w/ H2SO4		500 mL plastic		500 mL amber w/ H2SO4
	500 mL plastic w/ HNO3		1 L plastic		

FIELD GUIDANCE DOCUMENT NO. 008

GROUNDWATER AND FREE PRODUCT LEVEL MEASUREMENTS

FIELD GUIDANCE DOCUMENT NO. 008

GROUNDWATER AND FREE PRODUCT LEVEL MEASUREMENTS

Prepared By:	Elysha Anderson Revision 1: Emily Gilson, Katie Linscott Revision 2: Jesse King, Annika Deurlington, Janette Kiernan
Peer Reviewed By:	Christopher Ritchie; Greg Kinsall
Approved By:	John M. Pekala
Applicable To:	Nevada Environmental Response Trust Site Henderson, Nevada
Effective Date:	January 24, 2014
Revision Notes:	0 First Issuance 1 Updated from ENVIRON to Ramboll Environ template; revised section on decontamination and QA/QC procedures; updated responsibilities of field personnel; revised information to be included on field forms; added information about transducers. 2 Included section on surface water pressure transducers; updated transducer data download procedures; moved gloves and field data sheets from suggested equipment to the task specific equipment check list; updated from Ramboll Environ to Ramboll template
Documents Used as Reference During Preparation:	

CONTENTS

1. INTRODUCTION

This Field Guidance Document (FGD) presents general guidelines for groundwater level measurements (depth to water) and free product level measurements (depth of free product) in groundwater monitoring wells or piezometers at the Nevada Environmental Response Trust (NERT) Site. Although this FGD describes minimum required procedures for groundwater and free product level measurements for this project, it should be understood that there may be details of this type of work not specifically discussed in this FGD that would be followed by personnel trained in these techniques. To ensure that work is performed in a complete and safe manner, personnel involved in field activities should be sure that they understand the scope of work and the level of detail necessary for each field activity prior to mobilizing to perform the work.

This FGD is intended as a guidance document and does not supersede Health and Safety procedures or Site-Specific Health and Safety Plan (HASP) requirements. All personnel shall follow the guidelines, rules, and procedures contained in site-specific HASPs prior to adhering to any procedures recommended in this FGD. All field personnel must review and sign the applicable HASP and the completed HASP and relevant project information must be maintained in the project file. Project personnel involved in field activities must also follow the procedures outlined in this and other applicable FGDs as well as any task-specific work plan or sampling plan. It is the responsibility of the field team supervisors to ensure compliance with these requirements.

All personnel performing on-site operations with the potential for exposure to hazardous substances or health hazards are required to be 40-hour trained in accordance with Code of Federal Regulations (CFR) 1910.120 and will meet the personnel training requirements in accordance with 29 CFR 1910.120(e).

Groundwater level measurements are collected to determine the depth to groundwater within a well relative to ground surface, top of the well casing, and/or an established elevation datum. Similarly, free product measurements are collected to determine the depth to non-aqueous phase liquid (NAPL) accumulated within a well relative to an established elevation datum. The accumulated thickness of NAPL within a well can be calculated if the bottom of the free product can also be determined. Properly collected and recorded measurements can be utilized to prepare potentiometric surface maps to establish groundwater flow direction, define horizontal and vertical hydraulic gradients, evaluate variations in groundwater elevations over time, evaluate NAPL mobility or recovery, and other project specific tasks.

2. EQUIPMENT/MATERIALS

Below is a general checklist of equipment that may be needed for typical groundwater level measurement efforts. This checklist only suggests general equipment that may be necessary for a project or task and should not be considered all inclusive.

1. General Water and Free Product Level Measurement Equipment Checklist
    - Electronic water level indicator;
    - Electronic oil/water interface probe for wells containing known or suspected NAPL;
    - GPS or other locating device;
    - Site map showing locations of wells; and,
    - Well construction records and previous water level measurements.
2. Project or Task Specific Water and Free Product Level Measurement Equipment Checklist
    - Task-specific work plan or sampling plan;
    - Well lock keys;
    - Steel tape measure or submersible water level meter for use in measuring total well depth;
    - Chemical protective gloves and other personal protective equipment (PPE) as required by the HASP;
    - Field notebook and field data sheets;
    - Decontamination supplies/equipment (non-ionic detergent, tub, brushes, etc.);
    - Wash bottles/bucket;
    - Trash Bags - used to dispose of gloves and any other non-hazardous waste generated during sampling;
    - Appropriate waste container – used to dispose of any Investigation Derived Wastes (IDW) and/or decontamination wastes;
    - Socket wrench (manhole bolt sizes vary; most commonly require a 9/16” socket);
    - Water valve gate box key (for older style flush-mounted wells);
    - Pry bar (or other equivalent tool to assist in the removal of the flush mounted well cover or handhole);
    - Syringe (or other equivalent tool such as a turkey baster to assist in removing standing water in flush mounted wells); and,
    - Extra batteries for the water level meter (usually 9-volt).
3. Miscellaneous Additional Suggested Equipment
    - Extra vehicle keys;
    - Metal locator (to find buried/obstructed flush mounted wells);

- First aid kit;
- Mobile phone;
- Credit card for gas and emergencies;
- Road and site maps;
- Waterproof pens;
- Bolt cutters (to remove rusted padlocks);
- Replacement padlocks; and
- Camera and extra batteries.

3. PROCEDURES

3.1 Pre-Field Work Preparation Guidelines

At a minimum, the following tasks should be completed by the field personnel and field team supervisors prior to mobilization to the site:

- Review and sign the site-specific HASP;
- Coordinate and obtain permission for property access;
- Review project-specific work plan/sampling plan, where applicable;
- Review project-specific Quality Assurance Project Plan (QAPP), where applicable;
- The field personnel and field team supervisors should review and discuss the proposed activities or work plan/sampling plan;
- Review the standard instruction manual provided by the manufacturer of the specific equipment being used for water level monitoring and field screening;
- Inspect the water level meter(s) for any signs of damage and test for proper operation;
- Identify well locations and any specific order in which measurements are to be collected;
- Obtain copies of recent or historic (i.e., same season) water or free product level data to be able to anticipate the approximate depth of water or free product minimizing unnecessary wetting of the tape and as a check of the measured levels;
- Obtain well construction information, as these can be used to confirm the well identification if not clearly identifiable; and
- Identify wells that are known or suspected to contain NAPL or other free product. An electronic oil/water interface meter must be used in these wells in lieu of an electronic water level indicator.

All significant field activity decisions will be approved by the field team supervisor and the client before the initiation of associated field activities. The work plan/sampling plan will be designed for the collection of quality data that will best answer the questions and meet the goals of the study/monitoring program. The work plan/sampling plan will generally provide for some discretion in the field depending on encountered conditions; however, any significant departure from prescribed field activities should be approved by the client.

Prior to the commencement of the field effort, inspect, test, and/or calibrate equipment that will be used to collect field measurements. These tasks should also be performed as necessary throughout the field effort to ensure proper equipment function.

3.2 General Water Level Measurement Procedures

Water level measurements are generally taken in monitoring wells, piezometers, or boreholes using electronic water level indicators. There are different manufacturers of electronic water level indicators including Solinst, Keck, and Heron. Electronic water level indicators consist of a reel of dual conductor wire embedded within a pre-marked tape, a probe with an insulating gap between the wire attached to the end of the tape, and an indicator on the reel. Generally, tapes are marked every 1/100th of a foot and/or millimeter. When the probe comes into contact with water, the circuit is closed and the indicator signals this contact with an audible buzzer and/or an optical light. The meters usually use 9-volt batteries within the reel as a power source. Many water level meters include a sensitivity adjustment on the indicator. The sensitivity adjustment diminishes potential short circuiting of the probe in moist environments such as those encountered in a well.

The following is a recommended list of practices for water and/or free product level measurement:

- Where applicable, contact the identified key site personnel upon arrival and assess proposed work areas.
- Because groundwater or free product depth can vary due to natural fluctuations, all measurements for a specific sampling event should be collected within as short of a time frame as possible.
- Although equipment will be decontaminated between uses, to further limit potential cross-contamination between wells, perform measurements from least to most contaminated locations.
- Complete depth to water or free product measurements prior to any planned withdrawals, sampling or disturbance of groundwater unless otherwise specified in the work plan/sampling plan.
- All water or free product level measurements should be made relative to an established reference datum and should be recorded in the field notes or applicable field forms. The reference datum is usually marked, notched or etched on the well or casing at the time of installation on the north side of the inner casing. For extraction wells, the reference datum may either be the top of well casing or a defined access point through which the water level meter probe may be lowered. In the absence of a marked, notched or etched reference datum, take water level and depth measurements from the north side of the inner casing and mark or etch it for future reference. In the case of a well casing cut at a distinct angle, the measurements should be made from the highest point in the casing. Note this procedure in the field book or on field forms.
- Record in the field book or on field forms the model name, number, and serial number of the electronic water level meter or interface probe being used.
- Identify the well to be measured and confirm by checking for proper identification markings on the well, comparing to a site map, and if needed historical water and/or product level measurements and well construction records. If the well cannot be positively identified, contact the project manager and/or client before proceeding.
- Decontaminate the water level meter probe, interface probe, and/or tape (if total well depth measurements are being conducted with a tape) prior to each use, as described below.
- Remove well cover or equivalent protective casing cover. Inspect the interior of the well box for insects, etc., that could present a biological hazard. If there is water in the well box, remove all water (at least to a level below the top of the inner well casing) prior to

removing the well cap or plug. Indicate that water was removed from the well box and identify possible causes (e.g., missing bolts, damaged well cover, etc.).

- Remove the well cap or plug, noting well identification, time of day, and date in the field book or on the field form. Also note any abnormal conditions in the well (e.g., damaged inner casing, limited clearance between the bottom of the well box and the top of the inner well casing, absence of reference datum, etc.). If the top of the well casing has been damaged, the reference datum may no longer be accurate.
- If the wells are outfitted with expansion caps, these should be removed and the wells allowed to equilibrate for an appropriate period of time prior to the collection of water level measurements. This is especially critical for wells screened below the water table or in confined units. There are no set guidelines and appropriate equilibration times can range from minutes to hours depending on well recharge, local geology and topography, and project objectives. Monitor depth to water for a period of time (5 to 10 minutes) after removing the cap to determine when equilibration has been achieved.
- Record observance of positive or negative pressure in the well upon removal of the well cap. The presence of pressure/vacuum in the well could be qualitatively assessed during loosening and removal of an expansion cap (resulting in air either being audibly pushed out or drawn in to the well casing) or using a piece of paper or other light object (i.e., easily moved or displaced by light air flow) placed immediately above the inner well casing and observing its movement (i.e., if it adheres to well casing, there is a negative pressure in the well; if it moves from the well casing, there is a positive pressure in the well). If pressure was observed, the water level should be measured multiple times over a 5 to 10 minute period to allow time for equilibration and confirm that the water level has reached static conditions. Record initial water level measurements and all confirmation measurements on the appropriate field forms. Also note whether the well is under pumping influence, has been pumped recently, or represents static water level conditions. Water levels may require additional time to return to static conditions after pumping.
- Monitor the headspace of the well with a field screening device in accordance with the applicable manufacturer instructions and FGD. Record field screening readings in the field book or on the field form. The necessity and methodology to conduct field screening should be detailed in the site-specific HASP, sampling plan or Work Plan.
- Check that the indicator is working properly by pushing the test button on the reel. Replace batteries in the electronic water level meter or product interface probe if testing or operation indicates the battery is not providing sufficient power. If the battery is replaced during a field measurement event this must be recorded in the field log book or on the field form.
- Lower the probe slowly into the well taking care to minimize contact with the well casing. If significant kinks are observed in the tape, attempt to straighten manually and record observations in the field book or on the field form.
- When a strong and steady signal from the indicator signals water or free product has been encountered slowly pull the tape up until the signal ceases.
- Manually lower and raise the probe to exactly locate the water or free product interface. This will typically be done multiple times to confirm the measured level.

- At the point where the signal indicates free water or free product has been encountered, measure and record the depth of the probe from the established reference datum using the marked tape.
- If free product is encountered, continue to manually lower the probe into the well until a strong and steady signal from the indicator signals that water has been encountered. Lower and raise the probe to exactly locate the water or free product interface. Measure and record the depth of the probe from the identified reference datum using the marked tape.
- Repeat the measurement to verify accuracy. Measurement should be recorded to the nearest 0.01 feet.
- Withdraw the probe from the well, replace the well cap, and re-secure the well.
- Total well depth measurements should be made in reference to the top of casing. Generally, total well depth should be measured each time water levels are measured. These measurements should be performed before and after sampling and measurements to estimate the degree of sediment in the well and both measurements should be recorded in the field book or on field forms.
- Record in the field book or on field form any abnormal conditions within the well (e.g., evidence of blockage, root growth into the well casing, separated casing sections, etc.). Inform the client so necessary maintenance, redevelopment, or repairs are conducted before the next planned water level measurement event.
- To minimize potential cross-contamination of samples among stations, decontaminate the probe and portions of the tape that contacted water, product, or well materials as described in Section 3.5.

3.3 Procedures for Wells Equipped with Pressure Transducers

Monitoring wells may be equipped with pressure transducers that automatically measure and record pressures at pre-programmed time intervals. Using a reference, these pressures can be converted to depth to water. Two types of pressure transducers may be encountered in wells:

- Standalone pressure transducers suspended from strings/wires or direct-read cables (In-Situ Rugged TROLL 100 or similar); and,
- Telemetric data loggers comprised of a multi-parameter instrument (In-Situ Aqua TROLL 200) paired with a cellular network telemetry system (In-Situ Tube 300R or similar) with on-board barometer.

Data can be downloaded manually from transducers deployed on wire/strings by pulling the transducers to the surface and connecting to the transducer directly. When a transducer is deployed on a direct-read cable, the data can be downloaded without pulling the transducer out of the well. Data are downloaded to field laptops by connecting to the transducers with proprietary cables and software. Transducers equipped with telemetry tubes automatically transmit data to a file transfer protocol (FTP) site every 6-12 hours, and therefore, do not require field personnel to download data.

In order to be prepared with the proper software and connector cables, field personnel should know in advance which wells are equipped with transducers, what make and model of transducer is in use, and how the transducer is deployed. For standalone transducers the following general procedures should be followed:

1. Open the well and collect a manual water level measurement using the procedures described in Section 3.3. This water level measurement will be used to program the new starting point on the transducer for subsequent data logging.

2. Connect to the direct-read cable at the top of the well (if equipped) using the manufacturer's direct-read adaptor cable. If the transducer is deployed on a wire/string, pull the transducer to the surface and connect the laptop to the transducer via the transducer manufacturer's adaptor cable. If pulling the transducer from the well, use proper PPE as the transducer and wire/string will be wet, coil the string to avoid tangling, and use plastic sheeting or a bucket to contain dripping water.

3. Turn on laptop and launch the transducer manufacturer's software.

4. Stop the active running log that is on the transducer prior to downloading the data. With the data log stopped the transducer data can now be downloaded to the laptop.

5. Download the data to the laptop. When the data file downloads are complete, open files on the laptop and review for completeness.

6. Delete all data from the transducer and re-program. Be sure that when programing a new log that the option "Set first logged reading" is selected, as this will set the manually measured water level from Step 1 as the first water level of the new data log. The new data log should be set to start automatically at the top of the hour.

7. Disconnect the laptop from the transducer. Inspect wire/string for damage and replace if necessary. Redeploy transducers on wires/strings to the same depth as initially deployed. Note that if the transducer cable is connected to the well cap, with the well cap in place the transducer will be suspended at the proper depth. If the cable is not connected to the well cap, then the cable should be remeasured to ensure that the transducer is deployed at the proper depth.

8. Close and lock well.

Although telemetric data loggers do not require field personnel to download data, they may need to be removed from the well in order to perform low-flow sampling. The telemetry tube sits inside the well casing several inches below the top of casing. A black connector cable runs from the bottom of the telemetry tube to the top of the data logger. The connector cable may be coiled to ensure that the data logger is suspended at an appropriate depth. To remove telemetric data loggers for sampling, use the following procedures.

1. Open the well lid and confirm that the transducer and tube, if present, are supported by a bolt that hangs horizontally across the well casing.

2. Holding onto the bolt, pull the telemetry tube from the well casing. Once the tube is out of the well, a cable that allows the transducer to hang down into the well will be visible. Pull on the cable until the transducer comes up out of the well casing. Care should be taken not to adjust any zip ties, tape, or coils in the cable. In shallow wells, long narrow coils in the cables allow the transducers to hang at reasonable depths. These coils were constructed carefully so that the cables fit inside 2-inch well casings. It is imperative that the cable lengths and coil structures do not change so that the effective cable lengths and the transducer deployment depths remain constant.

3. Once removed from the well, the tube, cable, and transducer should be placed in or on top of a large trash bag. The devices will continue to run while outside of the well.

4. Record the time of transducer removal on the field form.

5. Proceed to sample the well according to the guidelines in the low-flow sampling FGD.

6. After sampling and before redeploying the transducer, take a manual depth to water measurement and record it on the field form.

7. The equipment should be redeployed by lowering the transducer into the well while holding onto the cable and then the bolt. Take care not to adjust the coils in the connector cable. Once the connector cable and telemetry tube, if present, are replaced in the well, the bolt should be positioned to rest securely across the top of casing.

8. When finished record the time of transducer redeployment on the low-flow purge log.

3.4 Procedures for Surface Water Pressure Transducers

In addition to pressure transducers in monitoring wells, there may also be surface water level monitoring locations that are equipped with pressure transducers that automatically measure and record pressures at pre-programmed time intervals. The types of surface water pressure transducers encountered at the NERT site are standalone pressure transducers suspended from strings/wires (Solinst Levelogger 3001 or similar).

Data from these locations are downloaded manually from transducers deployed on wire/strings by pulling the transducers to the surface and connecting to the transducer directly. Data are downloaded to laptop computers or mobile cellular devices by connecting to the transducers via Bluetooth with proprietary cables and software.

In order to be prepared with the proper software and connector cables, field personnel should know in advance the location of the surface water monitoring locations, what make and model of transducer is in use, and how the transducer is deployed. For standalone transducers the following general procedures should be used:

1. Pull the transducer to the surface and connect to the transducer via Bluetooth and/or the transducer manufacturer's adaptor cable. When pulling the transducer, use proper PPE as the transducer and wire/string will be wet, coil the string to avoid tangling, and use plastic sheeting or a bucket to contain dripping water.

2. Turn on laptop or mobile device and launch the transducer manufacturer's software.

3. Stop the active running log that is on the transducer prior to downloading the data. With the data log stopped the transducer data can now be downloaded to the laptop.

4. Download the transducer data. When the data file downloads are complete, open files on the laptop and review for completeness.

5. Delete all data from the transducer and re-program. The new data log should be set to record a measurement every 15 minutes. Be sure that when programing a new log that the option "Set first logged reading" is selected, as this will set the manually measured water level from Step 1 as the first water level of the log. The new data log should be set to start automatically at the top of the hour.

6. Disconnect the laptop or mobile device from the transducer. Inspect wire/string for damage and replace if necessary. Redeploy the transducer on wires/strings to the same depth as initially deployed. Note that the surface transducers are attached to a specific length of wire/cable, so remeasurement should not be necessary.

3.5 Equipment Decontamination

Non-dedicated equipment should be decontaminated before and after each use. Decontamination procedures will depend upon the type of contaminants to be encountered and the specific type of equipment used. In general, any portion of the water level meter or interface probe that was submerged should be decontaminated using a non-phosphate detergent (e.g., Alconox) wash, followed by a tap water rinse and final, distilled water rinse.

Interface probes will only be used to measure water levels and NAPL thickness in wells with known or suspected presence of NAPL. Wastewater from the decontamination procedure will be containerized and properly disposed. Equipment used in wells with organic contaminants may require additional cleaning steps.

Cleaning solutions including soaps and deionized water may be sprayed onto equipment or put in tubs used for washing equipment, depending on the amount of the meter or probe that was submerged in a well. Personnel performing decontamination procedures should use appropriate PPE (e.g. gloves). Clean PPE should be used to handle cleaned equipment.

3.6 QA/QC

Quality Assurance/Quality Control (QA/QC) procedures described in the project-specific Work Plan/sampling plan and/or QAPP must be followed throughout the water level measurement process. In addition, the following QA/QC procedures should be performed:

- Calibration of instruments is to be performed per the manufacturer's operating instructions. Deviations from these procedures must be approved by the client prior to data collection.

- Water level measurements at a single well should, at a minimum, be performed with instruments similar to those used during previous monitoring events to aid in data consistency. When possible, the same instrument should be used during consecutive events as long as it is in good operating condition and is properly calibrated.

- Compare measurement data to previous measurements obtained at the well. For water level variations from previous measurements greater than 2.00 feet, NAPL thickness variations greater than 10 percent, well depth greater than 0.1 foot, or for data that cannot be explained by trends, repeat the measurements. Additional measurements should be recorded on the appropriate field forms. When repeat measurements at a given well do not match, a reason for the discrepancy should be determined and noted, and necessary actions should be taken to address the issue (e.g. acquiring a new instrument, cleaning the probe, etc.).

- Whenever a transducer is installed or removed, or when transducer data is downloaded, a manual water level measurement should also be collected to verify the transducer data. If transducers have to be pulled from the well for any reason, redeploy transducers at the same initial depth.

4. PRECAUTIONS

Certain precautions should be taken to ensure personnel safety during the implementation of this FGD. It is important to always remain alert and aware of your surroundings. All personnel performing on-site operations with the potential for exposure to hazardous substances or health hazards are required to be 40-hour trained in accordance with Code of Federal Regulations (CFR) 1910.120 and will meet the personnel training requirements in accordance with 29 CFR 1910.120(e).

The activities described in this FGD require the implementation of a site-specific Health and Safety Plan to inform personnel of the hazards associated with this work and to describe the methods that will be employed to mitigate those hazards. The Health and Safety Plan must be prepared and approved by the field team supervisor and Project Health and Safety Coordinator prior to initiating field work.

Additional precautions regarding methods for groundwater and free product level measurement are described below:

- Operate electronic water level meters and product interface probes in accordance with the manufacturer’s instructions and recommendations.
- The protective casing of flush-mount wells often fills with run-off surface water. If upon removing the well cover, the top of inner well casing is submerged, utilize a syringe, turkey baster, or equivalent tool to remove the excess water before removing the well cap in order to avoid surface water flow into the well.
- Provided well keys may not work with rusted/outdated well locks; bolt cutters may be used to remove the lock, which should be replaced upon completion of water level measurement. Do not use petroleum based solvent sprays to free seized locks as this may impact water quality in the well.
- Wells with a water-tight cap may experience a buildup of pressure, especially if they are screened below the static water level. Keep your face and body away from the top of the well when loosening or removing the cap.
- Ensure that the water level has reached the static level prior to recording the depth to water. Should the water level be in a state of flux due to pressure buildup, allow ample time (5 to 10 minutes) for the water level to stabilize to static conditions before recording measurements. Repeat depth to water measurements during this time to determine if equilibrium has been established.
- Indicator response may be indicative of potential faults that could be corrected in the field:
  - If the signal from the indicator is intermittent or weak it may be necessary to decrease the sensitivity since it may be short circuiting prior to encountering free water.
  - If there is no signal it may be necessary to increase the sensitivity since some water is less conductive and may not complete the circuit.

  - If the signal is still intermittent, weak, or absent then replace the battery and reattempt the measurement.
- Cascading water may interfere with the measurement of free water; particularly in boreholes or rock wells.
- Some well casings have sharp edges; care should be taken when lowering or withdrawing the tape to avoid damaging the tape of the water level meter.
- Oil or other product floating on the water column may insulate the contacts of the probe resulting in a misleading indication of the depth to free water. An oil/water level indicator should be used if there is known or suspected petroleum product in a well. Other types of NAPLs may require different types of meters.
- It should be noted that some water level indicators will have a 2- to 3-inch weight on the tip of the probe which can displace water in a well before it is detected by the water indicator. These models also make it difficult to detect small volumes of water in wells, i.e. thicknesses of less than 3 inches. If this is expected to be a potential issue, then request a model with the water indicator located on the tip of the probe.
- Meters should be inspected periodically to ensure accurate readings. Electronic water level meters and interface probes may not function properly if the electric wire is broken, cut, or if insulation is removed exposing the wire (resulting in short circuiting). Repaired meters may have had sections of the tape removed and/or spliced and may not meet the level of required accuracy. Damaged tapes or tapes suspected of being damaged should be repaired by the manufacturer or replaced.
- If using the water level meter for total depth measurements, confirm that the probe is designed for total immersion and the maximum acceptable depth of immersion.
- Tape lengths can be confirmed using a calibrated steel tape periodically or as necessary to adhere to data quality objectives. Discrepancies in tape length must be noted in the field log book and/or field form.
- For high conductivity water (brine), decreasing the sensitivity control prevents bridging so a moist probe is not detected as being in water.

5. RECORDKEEPING

Information collected during groundwater and free product level measurements may be recorded on individual field forms. If required, a project-specific field logbook may replace any of the individual field forms. Following review by the field team supervisor, the original field records will be kept in the project file. The following forms may be used to document the field activities:

- Field Investigation Daily Log; and,
- Water Level Measurement Log.

A *Field Investigation Daily Log* will be completed for each day of fieldwork containing (at a minimum) the times and descriptions of the work performed, the activities of any subcontractors or visitors on-site, arrival and departure times for all involved, and any other pertinent information. For larger projects, or when otherwise deemed appropriate by the client, this information may alternatively be recorded in a field logbook. In these cases, a separate field logbook must be used for each project or site.

The *Water Level Measurement Log* will be used to record the monitoring well name, date and time of measurement, total depth of well, depth to water, measuring point, presence of product, product thickness, and notes about the condition of the well.

GWPD 4—Measuring water levels by use of an electric tape

VERSION: 2010.1

PURPOSE: To measure the depth to the water surface below land-surface datum using the electric tape method.

Materials and Instruments

1. An electric tape, double-wired and graduated in feet, tenths and hundredths of feet. Electric tapes commonly are mounted on a hand-cranked and powered supply reel that contains space for the batteries and some device (“indicator”) for signaling when the circuit is closed (fig. 1).
2. An older model electric tape, also known as an “M-scope,” marked at 5-foot intervals with clamped-on metal bands (fig. 2) has been replaced by newer, more accurate models. Technical procedures for this device are available from the procedures document archives.
3. A steel reference tape for calibration, graduated in feet, tenths and hundredths of feet
4. Electric tape calibration and maintenance equipment logbook
5. Pencil or pen, blue or black ink. Strikethrough, date, and initial errors; no erasures
6. Water-level measurement field form, or handheld computer for data entry
7. Two wrenches with adjustable jaws or other tools for removing well cap
8. Key for well access
9. Clean rag
10. Cleaning supplies for water-level tapes as described in the National Field Manual (Wilde, 2004)
11. Replacement batteries

Data Accuracy and Limitations

1. A modern graduated electric tape commonly is accurate to +/– 0.01 foot.
2. Most accurate for water levels less than 200 feet below land surface.
3. The electric tape should be calibrated against an acceptable steel tape. An acceptable steel tape is one that is maintained in the office for use only for calibrating tapes, and this calibration tape never is used in the field.
4. If the water in the well has very low specific conductance, an electric tape may not give an accurate reading.
5. Material on the water surface, such as oil, ice, or debris, may interfere with obtaining consistent readings.
6. Corrections are necessary for measurements made from angled well casings.
7. When measuring deep water levels, tape expansion and stretch is an additional consideration (Garber and Koopman, 1968).

Advantages

1. Superior to a steel tape when water is dripping into the well or condensing on the inside casing walls.
2. Superior to a steel tape in wells that are being pumped, particularly with large-discharge pumps, where the splashing of the water surface makes consistent results by the wetted-tape method impossible. Also safer to use in pumped wells because the water is sensed as soon as

Figure 1. An electric tape or cable, double wired and marked the entire length in feet, tenths and hundredths of feet, that can be considered accurate to 0.01 foot at depths of less than 200 feet. Electric tapes commonly are mounted on a hand-cranked and powered supply real that contains space for the batteries and some device ("indicator") for signaling when the circuit is closed. Brand names are for illustration purposes only and do not imply endorsement by the U.S. Geological Survey. (Photographs used with permission of vendors.)

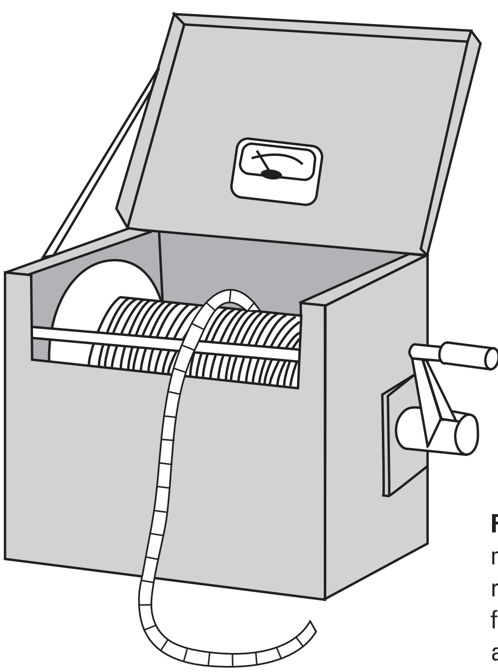


Figure 2. Older model electric tape, also known as "M-scope" marked at 5-foot intervals with clamped-on metal bands, has been replaced by newer, more accurate models. Technical procedures for this device are available from the procedures document archives.

the probe reaches the water surface and there is less danger of lowering the tape into the pump impellers.

3. Superior to a steel tape when a series of measurements are needed in quick succession, such as in aquifer tests, because the electric tape does not have to be removed from the well for each reading.

Disadvantages

1. Harder to keep calibrated than a steel tape.
2. Electric connections require maintenance.
3. Requires battery power.
4. Cable jacket is subject to wear and tear. Continuity of the electrical circuit must be maintained.

Assumptions

1. An established measuring point (MP) exists and the distance from the MP to the land-surface datum (LSD) is known. See GWPD 3 for the technical procedures on establishing a permanent MP.
2. The MP is clearly marked and described so that a person who has not measured the well will be able to recognize it.
3. The well is free of obstructions that could affect the plumbness of the steel tape and cause errors in the measurement.
4. The same field method is used for measuring depth below the MP, or depth relative to vertical datum, but with a different datum correction.
5. The tape is calibrated against a steel reference tape.
6. Field measurements will be recorded on paper forms. When using a handheld computer to record field measurements, the measurement procedure is the same, but the instructions below refer to a specific paper field form.

Tape Calibration And Maintenance

Before using an electric tape in the field, calibrate it against a steel reference tape. A reference tape is one that is maintained in the office only to calibrate other tapes.

1. Calibration of electric tape:
   - Check the distance from the probe's sensor to the nearest foot marker on the tape to ensure that this distance puts the sensor at the zero-foot point for the tape. If it does not, a correction must be applied to all depth-to-water measurements.
   - Compare length marks on the electric tape with those on the steel reference tape while the tapes are laid out straight on level ground, or compare the electric tape with a known distance between fixed points on level ground.
   - Compare water-level measurements made with the electric tape with those made with a calibrated steel tape in several wells that span the range of depths to water that is anticipated. Measurements should agree to within +/– 0.02 foot. If measurements are not repeatable to this standard, then a correction factor based on a regression analysis should be developed and applied to measurements made with the electric tape.
2. Using a repaired/spliced tape: If the tape has been repaired by cutting off a section of tape that was defective and splicing the sensor to the remaining section of the tape, then the depth to water reading at the MP will not be correct. To obtain the correct depth to water, apply the following steps, which is similar to the procedure for using a steel tape and chalk. Using the water-level measurement field form (fig. 3) to record these modifications:
   - Ensure that the splice is completely insulated from any moisture and that the electrical connection is complete.
   - Measure the distance from the sensing point on the probe to the nearest foot marker above the spliced section of tape. Subtract that distance from the nearest foot marker above the spliced section of tape. That value then becomes the "tape correction." For example, if the nearest foot marker above the splice is 20 feet, and the distance from that foot marker to the probe sensor is 0.85 foot, then the tape correction will be 19.15 feet. Write down the tape correction on the water-level measurement field form (fig. 3). Periodically recheck this value by measuring with the steel reference tape.
3. Maintain the tape in good working condition by periodically checking the tape for breaks, kinks, and possible stretch.
4. Carry extra batteries, and check battery strength regularly.
5. The electric tape should be recalibrated annually or more frequently if it is used often or if the tape has been subjected to abnormal stress that may have caused it to stretch.

USGS science for a changing world

WATER-LEVEL MEASUREMENT FIELD FORM

Calibrated Electric Tape Measurement

USGS science for a changing world

SITE INFORMATION

SITE ID (C1)

Equipment ID

Date of Field Visit

Station name (C12)

WATER-LEVEL DATA

	1	2	3	4	5
Time					
Hold					
Tape correction					
WL below MP					
MP correction					
WL below LSD					

Measured by ________________________ COMMENTS*____

*Comments should include quality concerns and changes in: M.P., ownership, access, locks, dogs, measuring problems, et al.

MEASURING POINT DATA (for MP Changes)

M.P. REMARKS (C324)

BEGINNING DATE (C321)

month – day – year

ENDING DATE (C322)

M.P. HEIGHT (C323) NOTE: (-) for MP below land surface

Final Measurement for GWSI

WATER LEVEL TYPE CODE (C243)

L	M	S
below land surface	below meas. pt.	sea level

DATE WATER LEVEL MEASURED (C235)

month – day – year

TIME (C709)

STATUS (C238)

METHOD (C239)

TYPE (C243)

WATER LEVEL (C237)

METHOD OF WATER-LEVEL MEASUREMENT(C239)

A	B	C	E	G	H	L	M	N	R	S (GWPD1)	T	V (GWPD4)	Z
airline,	analog,	calibrated airline,	estimated,	pressure gage,	calibrated press. gage,	geophysical logs,	manometer,	non-rec. gage,	reported,	steel tape,	electric tape,	calibrated elec. tape	other

SITE STATUS FOR WATER LEVEL (C238)

D	E	F	G	H	I	J	M	N	O	P	R	S	T	V	W	X	Z	BLANK
dry,	recently flowing,	flowing,	nearby flowing	nearby recently flowing,	injector site,	injector site monitor,	plugged,	measurement discon.,	obstruction,	pumping,	recently pumped,	nearby pumping,	nearby recently pumped,	foreign substance,	well destroyed,	surface water effects,	other	static

Figure 3. Water-level measurement field form for calibrated electric tape measurements. This form, or an equivalent custom-designed form, should be used to record field measurements.

Instructions

1. Check the circuitry of the electric tape before lowering the probe into the well by dipping the probe into tap water and observing whether the indicator needle, light, and (or) beeper (collectively termed the "indicator" in this document) are functioning properly to indicate a closed circuit. If the tape has multiple indicators (sound and light, for instance), confirm that they are operating simultaneously. If they are not, determine the most accurate indicator.

2. Make all readings using the same deflection point on the indicator scale, light intensity, or sound so that water levels will be consistent among measurements.

3. Lower the electrode probe slowly into the well until the indicator shows that the circuit is closed and contact with the water surface is made (fig. 4). Place the nail of the index finger on the insulated wire at the MP and read the depth to water.

4. Record the date and time of the measurement. Record the depth to water measurement in the row "Hold" (fig. 3). If the tape has been repaired and spliced or has a calibration correction (see the section above on using a repaired/spliced tape), subtract the "Tape Correction" value from the "Hold" value, and record this difference in the row "WL below MP" (fig. 3).

5. Record the MP correction length on the "MP correction" row of the field form (fig. 3). Subtract the MP correction length from the true "WL below MP" value to get the depth to water below or above LSD. The MP correction is positive if the MP is above land surface and is negative if the MP is below land surface (GWPD 3). Record the water level in the "WL below LSD" column of the water-level measurement field form (fig. 3). If the water level is above LSD, record the depth to water in feet above land surface as a negative number.

6. Pull the tape up and make a check measurement by repeating steps 3–5. Record the check measurement in column 2 of the field form. If the check measurement does not agree with the original measurement within 0.02 foot, continue to make measurements until the reason for lack of agreement is determined or the results are shown to be reliable. If more than two measurements are made, use best judgment to select the measurement most representative of field conditions. Complete the "Final Measurement for GWSI" portion of the field form.

7. After completing the water-level measurement, disinfect and rinse that part of the tape that was submerged below the water surface as described in the National Field Manual (Wilde, 2004). This will reduce the possibility of contamination of other wells from the tape. Rinse the tape thoroughly with deionized or tap water to prevent tape damage. Dry the tape and rewind onto the tape reel.

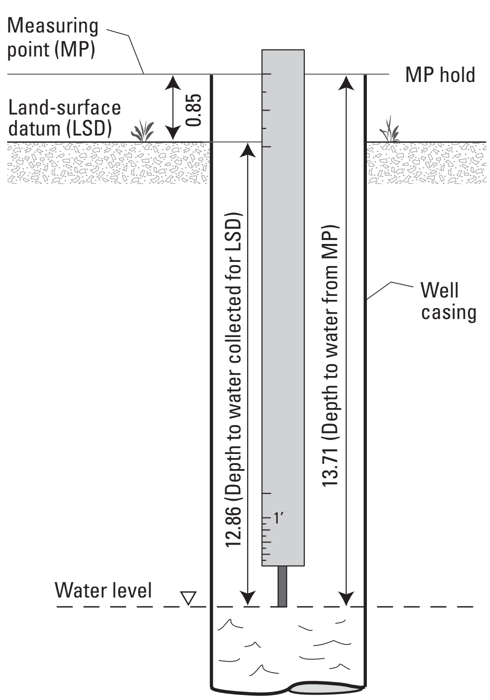


Figure 4. Water-level measurement using a graduated electric tape.

Data Recording

All calibration and maintenance data associated with the electric tape being used are recorded in the calibration and maintenance equipment logbook. All data are recorded in the water-level measurement field form (fig. 3) to the appropriate accuracy for the depth being measured.

References

Cunningham, W.L., and Schalk, C.W., comps., 2011a, Groundwater technical procedures of the U.S. Geological Survey, GWPD 1—Measuring water levels by use of a graduated steel tape: U.S. Geological Survey Techniques and Methods 1–A1, 4 p.

Cunningham, W.L., and Schalk, C.W., comps., 2011b, Groundwater technical procedures of the U.S. Geological Survey, GWPD 3—Establishing a permanent measuring point and other reference marks: U.S. Geological Techniques and Methods 1–A1, 13 p.

Garber, M.S., and Koopman, F.C., 1968, Methods of measuring water levels in deep wells: U.S. Geological Survey Techniques of Water-Resources Investigations, book 8, chap. A1, p. 6–11.

Heath, R.C., 1983, Basic ground-water hydrology: U.S. Geological Survey Water-Supply Paper 2220, p. 72–73.

Hoopes, B.C., ed., 2004, User's manual for the National Water Information System of the U.S. Geological Survey, Ground-Water Site-Inventory System (version 4.4): U.S. Geological Survey Open-File Report 2005–1251, 274 p.

U.S. Geological Survey, Office of Water Data Coordination, 1977, National handbook of recommended methods for water-data acquisition: Office of Water Data Coordination, Geological Survey, U.S. Department of the Interior, chap. 2, 149 p.

Wilde, F.D., ed., 2004, Cleaning of equipment for water sampling (version 2.0): U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chap. A3, accessed July 17, 2006, at *http://pubs.water.usgs.gov/twri9A3/*.

FIELD GUIDANCE DOCUMENT NO. 012

ARTESIAN WELL GROUNDWATER SAMPLING

FIELD GUIDANCE DOCUMENT NO. 012

ARTESIAN WELL GROUNDWATER SAMPLING

Prepared By:	Thomas Winger Revision 1: Emily Gilson, Annika Deurlington
Peer Reviewed By:	Janette Kiernan; Greg Kinsall
Approved By:	John M. Pekala
Applicable To:	Nevada Environmental Response Trust Site Henderson, Nevada
Effective Date:	March 24, 2017
Revision Notes:	0 First Issuance 1 Added instructions to inspect trip blanks prior to use; updated from Ramboll Environ to Ramboll template.
Documents Used as Reference During Preparation:	United States Environmental Protection Agency *(USEPA) Standard Operating Procedure for Low-Stress (Low Flow)/Minimal Drawdown Ground-Water Sample Collection*, dated 2002. United States Environmental Protection Agency *(USEPA) Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells,* dated January 19, 2010.

CONTENTS

1. INTRODUCTION

This Field Guidance Document (FGD) describes procedures for sampling artesian groundwater wells at the Nevada Environmental Response Trust (NERT) Site. Although this FGD describes procedures for sampling artesian wells for this project, it should be understood that these are minimum-required procedures and there may be additional procedures not specifically discussed in this FGD that would be followed by personnel trained in these techniques. To perform this work in a safe and competent manner, personnel involved in field activities should be sure that they are trained in those field activities they are tasked with, and they understand the scope of work and the level of detail necessary for each field activity prior to mobilizing to perform the work.

This FGD is intended as a guidance document and does not supersede Health and Safety procedures or Site-Specific Health and Safety Plan (HASP) requirements. All personnel shall follow the guidelines, rules, and procedures contained in site-specific HASPs prior to adhering to any procedures recommended in this FGD. All field personnel must review and sign the applicable HASP and the completed HASP and relevant project information must be maintained in the project file. Project personnel involved in field activities must also follow the procedures outlined in this and other applicable FGDs as well as any task-specific work plan or sampling plan. It is the responsibility of the field team supervisors to ensure compliance with these requirements.

2. EQUIPMENT/MATERIALS

Equipment and materials needed to conform to this FGD are listed below. The use of alternative equipment or materials for any of the items listed below must be approved by the client prior to use. Equipment and materials include:

- Health and Safety Plan
- Site information (maps, contact numbers, etc.)
- Well information (previous water levels, previous surface flow rates, well depths and screen intervals, previous purge logs, etc.)
- Electronic water level meter (Solinst or similar)
- Photoionization Detector (PID) and/or Flame ionization detector (FID) if required by site or project needs
- Sample tubing (Teflon® or Teflon®-lined tubing for sampling organic compounds) and fittings to use with existing dedicated pump and well-head equipment
- Volumetric flow calculation container (graduated cylinder, 5-gallon bucket) and surface spill containment (Visqueen, 5-gallon buckets, 55-gallon drum or similar)
- Adjustable-rate sampling bladder pump capable of rates <500 milliliters per minute (mL/min) (e.g., QED Sample Pro) if well does not already have a dedicated pump; other pumps may be acceptable, but must be approved by the client prior to use
- Bladders and tubing (Teflon® or Teflon®-lined tubing for sampling organic compounds) for sample pump if well does not already have a dedicated pump
- Pump controller with or without on-board air compressor (If no on-board compressor, have a stand-alone air compressor and/or nitrogen tanks for operating bladder pumps)
- Multi-parameter meter (e.g. YSI 556 Multi-Parameter Meter or equivalent) with flow through cell capable of measuring (at a minimum) temperature, pH, specific electrical conductance (SEC), dissolved oxygen (DO), and oxidation-reduction potential (ORP)
- Turbidity meter
- In-line filters (if required, e.g., for dissolved metals)
- Certified-clean sample containers and preservation supplies, sample labels, Ziploc™ bags
- Cooler with ice
- Decontamination supplies (e.g. phosphate-free detergent, distilled water)
- Tool kit with appropriate tools (socket wrench set, pry bar, Dolphin locks/keys)
- Drum(s) to collect purged water and decontamination water
- Drum labels
- PPE typically will consist of:

  - Long-sleeved shirt and long pants
  - Steel-toed boots
  - Hardhat
  - Nitrile gloves
  - Safety glasses with side shields
  - Other as required by the site-specific Health and Safety Plan
- Field Forms
  - Field Investigation Daily Log
  - Water Level Measurement Log
  - Low-Flow Purging and Sampling Log
  - Equipment Calibration Log
  - Chain of Custody

3. METHODOLOGY

In artesian wells, water rises within the well to a point above the top of the water-bearing formation. If the water also rises above the ground surface, the well is called a "flowing well," or "flowing artesian well." All flowing wells are artesian, but not all artesian wells are flowing wells.

A flowing artesian well will exhibit flow of groundwater at the surface if not capped, and a measurable pressure ("artesian head") when capped at the surface. Because of this, artesian wells can be sampled without the use of a pump; however, flow rates may be so low that, for practical purposes, a pump is used to collect a sample. Similar to low-flow purging and sampling, the procedure for sampling a flowing artesian well relies on careful monitoring of water quality indicator parameters to determine when a representative groundwater sample can be collected.

This FGD has been prepared in general accordance, where applicable, with the United States Environmental Protection Agency (USEPA) Standard Operating Procedure for Low-Stress (Low Flow)/Minimal Drawdown Ground-Water Sample Collection, dated 2002. This guidance document is included as Attachment 3 of the Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers.

4. PROCEDURES

The following sections discuss the procedures to follow during the sampling of an artesian well with dedicated equipment, such as a dedicated pump, wellhead pressure gauge or manometer, and discharge line. Where applicable and when possible, the purging and sampling techniques should remain consistent from one sampling event to the next.

With pre-authorization from the client, non-dedicated pumps made of inert materials may be used with additional considerations if dedicated equipment is not installed (see Section 4.4). To prevent cross-contamination, all non-dedicated pumps must be easily decontaminated in the field. Tubing must be changed between each well. The reuse of tubing dedicated to a single well is encouraged to reduce waste between sampling events.

4.1 Pre-Sampling Activities

To the extent practical, sampling should begin at the well with the least contamination and proceed systematically to the wells with the higher expected concentrations unless only dedicated equipment is being used. All measuring devices and monitoring equipment should be calibrated according to the manufacturer's instructions. Water quality meters must be calibrated daily before use. Wellhead pressure gauges should be checked prior to each sampling event. Equipment calibration details should be recorded in the *Equipment Calibration Log*.

Spill containment consisting of visqueen wrap and 5-gallon buckets or 55-gallon drums will be positioned around the well prior to any sampling activities. If the well completion is compromised, as evidenced by groundwater flow out of the well casing or monument, or the pooling of water near the well location, additional considerations can be taken to minimize release of groundwater to the surface.

4.2 Water Level Measurement

Water level measurement of a flowing artesian well must be collected by either using an installed wellhead pressure gauge, which measures the pressure at the top of casing (TOC), or a standpipe extension connected to the wellhead in a vertical orientation, allowing the water column to rise until reaching equilibrium.

Some important definitions to remember are:

- "Piezometric level" - the level to which water in a confined aquifer will rise within a well. It is the same as the static water level, except that in a flowing well, the piezometric level is above the ground surface. It is not possible to look at the volume of an artesian well discharge and determine what the piezometric level will be. The piezometric level is expressed in feet above ground surface.
- "Artesian head" – the hydraulic pressure created within the confined aquifer that drives the water upward in a well to the piezometric level. The distance from the ground surface to the piezometric level, converted into equivalent pressure (expressed as pounds per square inch, or PSI), is the artesian head.

The piezometric level and artesian head can be determined using either of the following means:

1. Extend the well casing, or a smaller diameter pipe through a well seal on the top of the casing, high enough above the ground surface until water no longer flows out the top (without pumping). The distance from the piezometric level within the casing, to the ground surface, converted from feet to pressure, is the artesian head of the aquifer. For example, a piezometric level of 30 feet is converted to artesian head by dividing 30 feet by 2.31 feet/psi. The result is 13 psi of artesian head.
2. A pressure gauge installed on a well seal at the top of the casing can be used to find the piezometric level and artesian head. Multiply the pressure reading on the gauge (in PSI) by 2.31 feet/psi to find the piezometric level. The pressure gauge reading is the artesian head at the gauge elevation.

Method 1 is less practical in most cases and the use of pressure gauges following method 2 is recommended.

The proper sequence for water level measurement is as follows:

1. Record the following information on the *Water Level Measurement Log* or the *Water Purging and Sampling Log*:
    - Well number
    - Top of casing elevation, if available
    - Surface elevation, if available
    - Surface flow, if any
2. Use caution when handling the well. The well head and piezometer are under constant pressure from the flowing aquifer.
3. Inspect well for abnormalities (e.g., broken locks, damaged casing, leaking, wet ground around well not attributable to other sources, blockages, etc.) and note on field logs.
4. Begin recording pressure readings at the wellhead, noting the time. Continue recording measurements once every 30 seconds for 5 minutes. The piezometer readings should be consistent during this period. Record the date and time for each measurement.
5. Compare measurement against historical measurements to perform a "reality check" of the measurement and recheck water level as needed. Also note whether the well has been pumped recently, as water levels may require additional time to return to static conditions after pumping has ceased.

4.3 Purging and Sampling with a Dedicated Pump

1. The well should have a dedicated pump installed in the screened interval and connected to a discharge port at the wellhead. The well will also have a separate discharge port, not connected to the dedicated pump, to allow gauging of flow rate from the formation. Identify any requirements to operate the dedicated pump (power supply, open valves) and connect sample tubing to the discharge port. Prepare for containment for purge water. **If a dedicated pump is not installed, contact the field team supervisor for authorization before proceeding.**

2. Connect the sample tubing from the discharge port to a flow-through cell that at a minimum allows measurement of temperature, pH, SEC, DO, and ORP. Turbidity measurements can be made using a separate turbidity meter. The discharge line from the flow-through cell must be directed into a container to hold purge water collected during purging and sampling of the well. Purge water will be collected in a portable tank (e.g., trailer-mounted polyethylene tank) and discharged to the on-site groundwater treatment system at the end of the sampling or when tank is full.
3. Measure pressure head at the top of casing. Record pressure head and groundwater elevation information in the *Low-Flow Purging and Sampling Log*.
4. Using a 5-gallon bucket with marked denominations, or similar, open the discharge port not connected to the bladder pump and calculate the flow rate of the flowing artesian well. Record the natural flow rate in the *Low-Flow Purging and Sampling Log.* Once an accurate flow rate measurement has been recorded, close the discharge port.
5. Open the discharge port connected to the dedicated pump and start pumping the well at a flow rate equal to or less than that of the natural formation. Note the time that purging begins on the *Low-Flow Purging and Sampling Log*. Check the piezometer at the well head for a continuous decrease in pressure. Maintain a steady flow rate while monitoring the pressure at the well head (if the pumping rate matches the flow rate of the natural formation the pressure should decrease to about zero at the well head). If the pressure reading reaches zero and drawdown of the water column within the well occurs, decrease the flow rate.
6. Measure the discharge rate of the pump with a graduated cylinder and a stopwatch. Record flow rate and total purged volume on the Low-Flow Purging and Sampling Log every three to five minutes. Total purged volume should be measured using a graduated cylinder or calculated based on the recorded purge rate and time interval between measurements.
7. Continue purging and begin to monitor and record the water quality indicator parameters every three to five minutes in the *Low-Flow Purging and Sampling Log*. Stable readings of temperature, pH, SEC, DO, turbidity and ORP indicate when a representative sample can be collected. The stabilization criterion is based on three successive readings of the water quality indicator parameters as shown in Table 1. Turbidity and ORP may not always be appropriate stabilization parameters and will depend on site-specific conditions. However, readings should be recorded because of their value for understanding groundwater conditions.

TABLE 1: Recommended Stabilization Criteria for Water Quality Indicator Parameters During Low-Flow Purging and Sampling

Parameter	Stabilization Criteria
Temperature	± 3% of reading
pH	± 0.1 pH units
Specific Electrical Conductance (SEC)	± 3% μS/cm

Dissolved Oxygen (DO)	± 10% (when DO is greater than 0.5 mg/L) If 3 consecutive DO readings are less than 0.5 mg/L, consider the values as stabilized.
Turbidity	± 10% NTUs (when turbidity is greater than 10 NTUs) If 3 consecutive turbidity readings are less than 10 NTUs, consider the values as stabilized.
Oxidation-Reduction Potential (ORP)	± 10 millivolts

8. Once stabilization of water quality parameters and pressure is achieved, and at least one system volume (including the volume of water in the pump and tubing) and the stabilized drawdown volume[1] have been purged from the well following water level stabilization, samples can be collected. Note the time that stabilization is achieved as the stop purge time on the purge log. The sample time, along with any QA/QC sample times, should also be recorded on the *Low-Flow Purging and Sampling Log.* Maintain the same pumping rate or reduce slightly for sampling as necessary in order to minimize disturbance of the water column. Disconnect the pump's tubing from the flow-through cell so that the samples are collected from the pump's discharge tubing. For samples collected for dissolved gases or VOC analyses, the pump tubing needs to be completely full of groundwater to prevent the groundwater from being aerated as it flows through the tubing. If a bladder pump is used to collect samples for dissolved gases or VOC analyses, the pump should be set so that one pulse will deliver a water volume that is sufficient to fill a 40-mL volatile organic analysis (VOA) vial. Generally, the sequence of the samples is immaterial unless filtered (dissolved) samples are collected. VOC samples are normally collected first, and filtered samples should generally be collected last (see below). All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container. When collecting VOC samples using VOA vials, a meniscus must be formed over the mouth of the VOA vial to eliminate the formation of air bubbles and head space prior to capping. VOA vials should be capped immediately following sample collection to minimize volatilization from the sample. Effervescence and colorimetric reactions should be recorded in the *Low-Flow Purging and Sampling Log.*

9. If a filtered (dissolved) metal sample is to be collected (or if filtered samples for any other analytes are required), then an inline filter is attached to the end of the discharge tubing and the sample is collected after passing through the filter. The inline filter must first be flushed in accordance with manufacturer's recommendations and if there are no recommendations for flushing, a minimum of 0.5 to 1.0 liter of groundwater from the monitoring well must pass through the filter prior to sampling.

   Groundwater filter cartridges are dedicated sampling equipment. A new cartridge should be used at each sampling location. Do not attempt to clean filter cartridges. If the filter becomes clogged or groundwater flow is too slow, remove and replace with a new filter cartridge.

[1] The USEPA's Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, dated January 19, 2010, defines stabilized drawdown volume as the volume of water between the initial water level and the stabilized water level.

10. Upon completion of sample collection, turn off the dedicated pump and close the connected discharge port. Drain all sample tubing and equipment into purge water containers and remove any additional sampling materials from the well.
11. Monitor and record the increase in pressure at the well head after completion of purging and sampling activities and record values in the *Low-Flow Purging and Sampling Log.*

Special Advisory 1: If stabilized drawdown in the well cannot be maintained at the pump's lowest purge rate, samples may be collected as soon as a minimum of one (1) system volume (including the volume of water in the pump and tubing) has been purged from the well. This information should be noted in *the Low-Flow Purging and Sampling Log*.

4.4 Purging and Sampling with a Non-Dedicated Pump

A flowing artesian well that does not have a dedicated pump, does not have a wellhead pressure gauge, or is improperly sealed at the surface will require additional considerations for purging and sampling. Purging and sampling methods for flowing artesian wells that do not have any specific well completion (incomplete artesian wells) are presented here. **Contact the field team supervisor for authorization before initiating these procedures.**

1. Prior to purging and sampling an incomplete flowing artesian well, identify any leaking surface flow, including suggestive indications such as nearby vegetative growth, weathering and erosion of well casing and monument, and other field observations. Record all observations.

2. If the well is actively flowing at the surface from the sampling port, install spill containment around the well, including but not limited to; surrounding the well with visqueen wrap, collecting surface flow into buckets, and channeling flow out of the well head directly into 5-gallon buckets or 55-gallon drums. Once surface flow has been controlled, flow rate can be determined.

3. Calculate the flow rate of the flowing artesian well using a 5-gallon bucket with marked denominations, or similar. Record the flow rate in the *Low-Flow Purging and Sampling Log.*

4. If using a non-dedicated pump, attach the tubing to the pump according to manufacturer's procedures, place the pump and support equipment at the well head and slowly lower the pump and tubing into the monitoring well until the location of the pump intake is set at a predetermined location within the screen interval. Where possible, pre-measured tubing should be used to place the pump intake at the same depth as previous sampling events, or at a depth where there is known contamination within the screen interval. If there is no previous information for the well, the pump intake should be placed at the middle (or slightly above the middle) of the saturated screen interval. Record the pump depth in the *Low-Flow Purging and Sampling Log*. **Be prepared to contain overflow water at the top of the well.**
5. Connect the discharge line from the pump to a flow-through cell that at a minimum allows measurement of temperature, pH, SEC, DO, and ORP. Turbidity measurements can be made using a separate turbidity meter. The discharge line from the flow-through

cell must be directed to a container to hold purge water collected during purging and sampling of the well. Purge water will be collected in a portable tank (e.g., trailer-mounted polyethylene tank) and discharged to the on-site groundwater treatment system at the end of the sampling or when tank is full.

a. If the natural flow rate of the incomplete artesian well is excessive, resulting in difficulty with containment of groundwater at the surface, the pump can be placed higher in the water column before pumping, and pumped while being lowered through the water column to the screened interval.

6. Connect the air lines to the flow controller (if necessary) and begin pumping the well at a flow rate equal to or less than that of the natural formation. Note the time that purging begins on the *Low-Flow Purging and Sampling Log.* Maintain a steady flow rate and monitor the expected decrease in natural flow from the artesian well. Once the water column has stabilized, record the flow rate and begin recording water quality readings.

7. Measure the discharge rate of the pump with a graduated cylinder and a stopwatch. Record flow rate and total purged volume on the *Low-Flow Purging and Sampling Log* every three to five minutes. Total purged volume should be measured using a graduated cylinder or calculated based on the recorded purge rate and time interval between measurements.

8. Monitor and record the water quality indicator parameters every three to five minutes in the *Low-Flow Purging and Sampling Log*. Stable readings of temperature, pH, SEC, DO, turbidity and ORP indicate when a representative sample can be collected. The stabilization criterion is based on three successive readings of the water quality indicator parameters as previously shown in Table 1. Turbidity and ORP may not always be appropriate stabilization parameters and will depend on site-specific conditions. However, readings should be recorded because of their value for understanding groundwater conditions.

9. Once stabilization of water quality parameters and pressure is achieved, and at least one system volume (including the volume of water in the pump and tubing) and the stabilized drawdown volume[2] have been purged from the well following water level stabilization, samples can be collected. Note the time that stabilization is achieved as the stop purge time on the purge log. The sample time, along with any QA/QC sample times, should also be recorded on the *Low-Flow Purging and Sampling Log.* Maintain the same pumping rate or reduce slightly for sampling as necessary in order to minimize disturbance of the water column. Disconnect the pump's tubing from the flow-through cell so that the samples are collected from the pump's discharge tubing. For samples collected for dissolved gases or VOC analyses, the pump tubing needs to be completely full of groundwater to prevent the groundwater from being aerated as it flows through the tubing. If a bladder pump is used to collect samples for dissolved gases or VOC analyses, the pump should be set so that one pulse will deliver a water volume that is sufficient to fill a 40-mL volatile organic analysis (VOA) vial. Generally, the sequence of

[2] The USEPA's Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, dated January 19, 2010, defines stabilized drawdown volume as the volume of water between the initial water level and the stabilized water level.

the samples is immaterial unless filtered (dissolved) samples are collected. VOC samples are normally collected first, and filtered samples should generally be collected last (see below). All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container. When collecting VOC samples using VOA vials, a meniscus must be formed over the mouth of the VOA vial to eliminate the formation of air bubbles and head space prior to capping. VOA vials should be capped immediately following sample collection to minimize volatilization from the sample. Effervescence and colorimetric reactions should be recorded in the *Low-Flow Purging and Sampling Log.*

10. If a filtered (dissolved) metal sample is to be collected (or filtered samples for any other analytes are required), then an inline filter is fitted at the end of the discharge tubing and the sample is collected after the filter. The inline filter must first be flushed in accordance with manufacturer's recommendations and if there are no recommendations for flushing, a minimum of 0.5 to 1.0 liter of groundwater from the monitoring well must pass through the filter prior to sampling. Groundwater filter cartridges are considered dedicated sampling equipment. A new cartridge should be used at each sampling location. Do not attempt to clean filter cartridges. If the filter becomes clogged or groundwater flow is too slow, remove and replace with a new filter cartridge.
11. For non-dedicated systems, remove the pump from the monitoring well. Decontaminate the pump and hang the tubing within the well for the next sampling event. If tubing is damaged or otherwise needs replacing, remove and dispose of the tubing.
12. Close and lock the well. Note any leaks or surface flow and the overall condition of the well.

4.5 Equipment Decontamination

The electronic water level meter and the water quality meters will be decontaminated by the following procedures:

1. The water level meter will be hand washed with phosphate-free detergent (e.g., Alconox™) and a scrubber, then triple rinsed with distilled water, or steam-cleaned.
2. The water quality meters and flow-through cell (if used) will be rinsed with distilled water between sampling locations. No other decontamination procedures are necessary or recommended for these meters since they are sensitive instruments. After the sampling event, the flow-through cell and sensors must be cleaned and maintained per the manufacturer's requirements.

Sample tubing will either be replaced or dedicated to an individual well. Non-dedicated pumps will be decontaminated between monitoring wells and prior to moving off-site. The pump and discharge line (including support cable and electrical wires which were in contact with the groundwater in the well casing) must be decontaminated by the following procedure:

1. The outside of the pump, support cable, and electrical wires must be pressure-sprayed with soapy water, tap water and distilled water. Use a bristle brush to help remove visible dirt and contaminants.

2. In accordance with the pump manufacturer's procedures, dismantle the pump and clean individual parts using cylindrical brushes and phosphate-free detergent (e.g., Alconox™). Double rinse the parts with tap water and then distilled water. Reassemble the pump following the manufacturer's procedures and replacing disposable parts (e.g., the bladder and grab plates) with new parts.
3. If free product is encountered or high levels of contamination are expected, additional decontamination steps may be required. Other decontamination procedures may be proposed, however they must be reviewed and approved by the client prior to implementation.
4. Decontamination water will be collected in a portable tank (e.g., trailer-mounted polyethylene tank) and discharged to the on-site groundwater treatment system.

4.6 Quality Control Procedures

All field Quality Control (QC) samples must be prepared identically to the primary samples with regard to sample volume, containers, and preservation. The sample handling and chain-of-custody procedures for the QC samples will be identical to the primary samples. The following are QC samples that may be collected during groundwater sampling:

- A field duplicate is an independent sample collected as close as possible to the same time that the primary sample is collected and from the same source. Field duplicates are used to document sample precision. Field duplicates will be labeled and packaged in the same manner as primary samples. Field duplicates are analyzed for the same suite of analytical parameters as the primary samples. The frequency of analysis of field duplicates is generally one for every 20 primary samples but may vary depending on project requirements.
- Equipment blanks are obtained by running distilled or deionized water over or through the sample collection equipment after it has been decontaminated and capturing the water in the appropriate sample containers for analysis. Equipment blanks are analyzed for the same suite of parameters as the primary samples. The frequency of analysis of equipment blanks is generally one for every 20 primary samples but may vary depending on project requirements.
- Field blanks are used to assess the presence of contaminants arising from field sampling procedures. Field blank samples are obtained by filling a clean sampling container with reagent-grade deionized water. Field blanks are analyzed for the same suite of analytical parameters as the primary samples. Field blanks may or may not be incorporated into a groundwater sampling plan depending on project requirements.
- Trip blanks are used to evaluate the potential for VOC cross-contamination that may occur during shipment. For groundwater sampling, trip blanks consist of hydrochloric acid-preserved, analyte-free, deionized water prepared by the laboratory in 40-ml VOA vials that will be carried to the field, stored with the samples, and returned to the laboratory for VOC analysis. Generally, one trip blank is required to accompany each sample shipping container or cooler that contains samples that are to be analyzed for VOCs; however, this may vary depending on project requirements. Trip blanks should be inspected at the laboratory before they are shipped to the field site for use. Trip blanks should be inspected again at the field site prior to use. If any headspace is

observed in any trip blanks, they should not be used, and replacement trip blanks should be requested from the laboratory.

4.7 Sample Handling and Custody

Samples will be collected, handled, and stored in such a manner that they are representative of their original condition and chemical composition. Identification of samples and maintenance of chain-of-custody are important elements that must also be utilized to ensure samples are representative of site conditions. All samples will be properly identified and maintained under standard chain-of-custody protocol to protect sample integrity. The following sections discuss the sample handling and custody requirements.

4.7.1 Sample Identification

To maintain consistency, a sample identification convention including unique identifiers for all groundwater and QC samples must be developed and followed throughout the project. The sample identifiers will be entered onto the sample labels, field forms, *Chain of Custody* forms, and other records documenting sampling activities. Sample names will include the well name, sample date (year, month, day), and appropriate sample code and number (if applicable). Example sample names are as follows:

TABLE 2: Sample identification convention

Sample Type	Example Sample Name (for well M-95)
Primary Sample	M-95-20161108
Field Duplicate	M-95-20161108-FD1
Field Blank	M-95-20161108-FB1
Equipment Blank	M-95-20161108-EB1
Trip Blank	M-95-20161108-TB1

4.7.2 Sample Labels

A sample label will be affixed to all sample containers sent to the analytical laboratory. Field personnel will complete an identification label for each sample with the following information written in waterproof, permanent ink:

- Client and project number;
- Sample location and depth, if relevant;
- Unique sample identifier;
- Date and time sample collected;
- Filtering performed, if any;
- Preservative used, if any;
- Name or initials of sample collector; and,

- Analyses or analysis code requested.

The use of pre-printed sample labels is preferred in order to reduce sample misidentification due to transcription errors. Sample labels must be completed and affixed to the sample container in the field at the time of sample collection.

If errors are made on a sample label, corrections will be made by drawing a single line through the error and recording the correct information. Corrections will be dated and initialed.

4.7.3 Containers, Preservation, and Holding Time

Each lot of preservative and sampling containers will be certified as contaminant-free by the supplier. All preserved samples will be clearly identified on the sample label and *Chain of Custody* form. If samples requiring preservation are not preserved, field records will clearly specify the reason for the discrepancy.

Chemical activity continues in the sample until it is either analyzed or preserved. Once the sample has been preserved, the sample may be held for a period of time before analysis. The time from the collection of the sample to the analysis is defined as the holding time. The holding time varies depending on the media being sampled and the analyses being performed. The collection, preservation, and analysis of samples must be conducted to avoid exceeding relevant holding times. If the holding time for a sample is exceeded, the sample should not be analyzed. If a sample is inadvertently analyzed despite having exceeded the holding time, the sample collector should inform the project manager. The project manager will either inform the laboratory to not report the results and instruct the field team to recollect the sample or instruct the laboratory to report the analytical results with appropriate qualifiers.

4.7.4 Sample Handling and Transport

Proper sample handling techniques are used to ensure the integrity and security of the samples. Samples for field measured parameters will be analyzed immediately in the field and recorded in the appropriate field forms. Samples for laboratory analysis will be transferred immediately to appropriate laboratory supplied containers in accordance with the following sample handling protocols:

- Don clean gloves before touching any sample containers and take care to avoid direct contact with the sample.
- Samples will be quickly observed for color, appearance, and composition and recorded as necessary.
- The sample container will be labeled before or immediately after sampling.
- Sample containers and liners will be capped with Teflon®-lined caps before being placed in Ziploc™-type plastic bags. The samples will be placed in an ice chest kept at 4 °C (+/- 2°C) for transport to the laboratory.
- All sample lids will stay with the original containers and will not be mixed.

- Sample bottles will be wrapped in bubble wrap as necessary to minimize the potential for breakage during shipment.
- The *Chain of Custody* form will be placed in a separate plastic bag and taped to the cooler lid or placed inside the cooler. A custody seal will be affixed to the cooler if the samples are to be shipped by commercial carrier. For shipped samples, U.S. Department of Transportation shipping requirements will be followed, and the sample shipping receipt will be retained in the project files as part of the permanent *Chain of Custody* documentation.

4.7.5 Sample Chain of Custody

Sample chain of custody procedures will be used to maintain and document sample integrity during collection, transportation, storage, and analysis. A sample is considered to be under the control of, and in the custody of, the responsible person if the samples are in their physical possession, locked or sealed in a tamper-proof container, or stored in a secure area.

The *Chain of Custody* form provides an accurate written record that traces the possession of individual samples from the time of collection in the field until they are accepted at the analytical laboratory. The *Chain of Custody* form also documents the samples collected and the analyses requested. The sample collector will record the following information on the *Chain of Custody* forms:

- Client and project number;
- Name or initials and signature of sample collector;
- Name of destination analytical laboratory;
- Name and phone number of field team supervisor in case of questions;
- Unique sample identifier for each sample;
- Date and time of collection for each sample;
- Number and type of containers included for each sample;
- Analysis or analyses requested for each sample;
- Preservatives used, if any, for each sample;
- Sample matrix for each sample;
- Any filtering performed, if applicable, for each sample;
- Signatures of all persons having custody of the samples;
- Dates and times of transfers of custody;
- Shipping company identification number, if applicable; and,
- Any other pertinent notes, comments, or remarks.

Blank spaces on the *Chain of Custody* will be crossed out and initialed by the field sample collector between the last sample listed and the signatures at the bottom of the sheet.

The field sample collector will sign the *Chain of Custody* and will record the time and date at the time of transfer to the laboratory or an intermediate person. A set of signatures is required for each relinquished/received transfer, including internal transfer. The original imprint of the *Chain of Custody* will accompany the sample containers and a duplicate copy will be kept in the project file.

If the samples are to be shipped to the laboratory, the original *Chain of Custody* relinquishing the samples will be sealed inside a plastic bag within the ice chest, and the chest will be sealed with custody tape that has been signed and dated by the last person listed on the *Chain of Custody*. U.S. Department of Transportation shipping requirements will be followed, and the sample shipping receipt will be retained in the project files as part of the permanent *Chain of Custody* document. The shipping company (e.g., Federal Express, UPS) will not sign the *Chain of Custody* forms as a receiver; instead the laboratory will sign as a receiver when the samples are received.

5. PRECAUTIONS

Certain precautions should be taken to ensure safety during the implementation of this FGD. It is important to always remain alert and aware of your surroundings. All personnel performing on-site operations with the potential for exposure to hazardous substances or health hazards are required to be 40-hour trained in accordance with Code of Federal Regulations (CFR) 1910.120 and will meet the personnel training requirements in accordance with 29 CFR 1910.120(e).

The laboratory must be certified by the appropriate regulating agency for the analyses to be performed.

The activities described in this FGD require the implementation of a site-specific Health and Safety Plan to inform personnel of the hazards associated with this work and to describe the methods that will be employed to mitigate those hazards. The Health and Safety Plan must be prepared and approved by the field team supervisor and Project Health and Safety Coordinator prior to initiating field work.

6. RECORDKEEPING

Information collected during groundwater sampling may be recorded on individual field forms. A project-specific Field Logbook may replace any of the individual field forms with the exception of the *Chain of Custody* form. All field forms should be reviewed by field personnel and the field team supervisor for completeness. Following review by the field team supervisor, the original field records will be kept in the project file. The following forms may be used to document the field activities:

- Field Investigation Daily Log;
- Water Level Measurement Log;
- Low-Flow Purging and Sampling Log;
- Equipment Calibration Log; and,
- Chain of Custody.

The *Field Investigation Daily Log* will be completed for each day of fieldwork containing (at a minimum) the times and descriptions of the work performed, the activities any subcontractors or visitors on-site, arrival and departure times for all involved, and any other pertinent information. For larger projects, or when otherwise deemed appropriate by the client, this information may alternatively be recorded in a Field Logbook. In these cases, a separate Field Logbook must be used for each project or site.

The *Water Level Measurement Log* will be used to record water level measurements for all wells. The type, serial number, and calibration date for the water level measuring device will be included on this form. Additionally, this form will be used to record general observations of the conditions of the wells, wellheads, well boxes, and/or monuments.

The *Low-Flow Purging and Sampling Log* will be used to record the details of purging and sampling information for each well including the depth of the pump, purge rates, and volume purged from each well. This form will also be used to record all of the measurements of drawdown and water quality indicator parameters used for evaluating stabilization.

The *Equipment Calibration Log* will be used to document the calibration and status of any measuring instruments used in the field (e.g., PID/FID, water level measuring device, water quality meters, etc.). The frequency and method of calibration will depend on the instrument. Any instruments used will be used in accordance with the factory-provided operating and/or service manuals.

Sample names, date/times, analyses to be performed, and other pertinent information will be recorded on the *Chain of Custody* form as a means of identifying and tracking the samples.

ATTACHMENT 1
ALL REPORT TABLES IN EXCEL FORMAT (PROVIDED ELECTRONICALLY)

ATTACHMENT 2

DEPTH TO WATER (DTW) EDD TEMPLATE (PROVIDED ELECTRONICALLY)

ATTACHMENT 3
FIELD PARAMETERS EDD TEMPLATE (PROVIDED ELECTRONICALLY)

ATTACHMENT 4
LABORATORY EDD FORMAT SPECIFICATIONS (PROVIDED ELECTRONICALLY)