



December 3, 2021

TECHNICAL MEMORANDUM

To: Steve Clough
Nevada Environmental Response Trust

From: John Pekala, CEM#2347, Expires 9/20/2022, Ramboll
Chris Stubbs, Jessica Donovan, Greg Kinsall, Ramboll

**Re: Phase 3 RI Modification No. 14
Nevada Environmental Response Trust Site
Henderson, Nevada
Ramboll Project No. 1690020169-023**

This Technical Memorandum presents Ramboll's recommended Modification No. 14 to the scope of work for the Phase 3 Remedial Investigation (RI) currently in progress within the Nevada Environmental Response Trust (NERT) RI Study Area located in Henderson, Nevada.

Phase 3 RI Modification No. 8, Revision 1, dated March 19, 2020, proposed field work necessary to address data gaps within NERT Operable Unit 3 (OU-3) that need to be resolved prior to the completion of the OU-3 RI. Modification No. 8 was approved by the Nevada Division of Environmental Protection (NDEP) on March 20, 2020. The OU-3 soil and groundwater investigation scope of work has subsequently been amended by the following:

- Modification No. 11 (submitted to NDEP on October 21, 2020 and approved by NDEP on October 28, 2020), which adds additional soil sampling and groundwater wells to address concerns raised by NDEP after the approval of Modification No. 8 related to historic contamination in the alluvium and Upper Muddy Creek formation located between the Seep Well Field and Las Vegas Wash.
- Modification No. 12 (submitted to NDEP on March 9, 2021 and approved by NDEP on March 10, 2021), which adds three existing wells to the comprehensive groundwater monitoring program described in Modification Nos. 8 and 11.
- Modification No. 13 (submitted to NDEP on August 25, 2021 and approved by NDEP on September 1, 2021), which incorporates additional analytes into the comprehensive groundwater monitoring program and adds shallow soil sampling within the area of the former seep discovered in 1999 where historical perchlorate-impacted groundwater discharged to the ground surface adjacent to Las Vegas Wash.

Modification No. 14 further amends the Phase 3 RI scope of work by adding the following tasks: 1) installation of two shallow monitoring wells in the paleochannel near Transect I (identified as Transect 2 in Modification No. 8), and 2) slug testing of 16 shallow monitoring wells near Las Vegas Wash. The collection of this additional data is necessary to fully characterize perchlorate concentrations in groundwater within the Transect I paleochannel and provide additional hydraulic property data near Las Vegas Wash.

Transect I Monitoring Wells

As described in Modification No. 8, six soil borings were drilled along Transect I to evaluate the presence of a paleochannel identified during previous investigations. The location of Transect I is shown on Figure 1. At two of the soil borings along Transect I, soil samples were collected at 10-foot intervals to a depth of 90 feet below ground surface (ft bgs) and analyzed for perchlorate. The preliminary, unvalidated soil analytical results are shown in Table 1. Elevated concentrations of perchlorate in soil were detected to a depth of approximately 50 ft bgs. The water table was encountered at approximately 20 ft bgs within the alluvium. The top of the Upper Muddy Creek formation (UMCf) was encountered at approximately 29 ft bgs. Due to the presence of elevated soil perchlorate concentrations were found in both the alluvium and UMCf, a monitoring well is proposed to be installed in each unit as specified below:

- NERT5.15S1 (screened in the alluvium from approximately 15 to 30 ft bgs)
- NERT5.15S2 (screened in the UMCf from approximately 35 to 45 ft bgs)

This data will be used to quantify the mass flux of perchlorate in the paleochannel that discharges into Las Vegas Wash. Consistent with Phase 3 RI Modification No. 8, these wells will be sampled and analyzed for perchlorate, chlorate, chromium, and general chemistry parameters.

Slug Testing

To acquire hydraulic property data in the portion of OU-3 north of Las Vegas Wash (LVW), single-well hydraulic (slug) testing will be conducted at nine monitoring wells (see Figure 1). In addition, to fill in the gaps in hydraulic property data to the south of LVW, slug testing will be conducted at seven wells at three locations (see Figure 1). These tests will be conducted in accordance with the RI Field Sampling Plan, Revision 1, dated July 18, 2014.

Reporting

The results of this additional investigation will be presented in the forthcoming RI Report for OU-3. Please contact us should you have any questions regarding the recommended scope of Phase 3 RI Modification No. 14.

Attachments

Figure 1 Planned Monitoring Well and Slug Test Locations

Table 1 Summary of Preliminary Soil Results and Proposed Well Screen at Transect I

Phase 3 RI Modification No. 14
Nevada Environmental Response Trust Site
Henderson, Nevada

**RI Phase 3 Modification No. 14
Installation of Shallow Monitoring Wells at Transect I and Slug
Testing of Select Monitoring Wells at the Las Vegas Wash**


**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:  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: 12/2/21

Phase 3 RI Modification No. 14
Nevada Environmental Response Trust Site
Henderson, Nevada

**RI Phase 3 Modification No. 14
Installation of Shallow Monitoring Wells at Transect I and Slug
Testing of Select Monitoring Wells at the Las Vegas Wash**

**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.

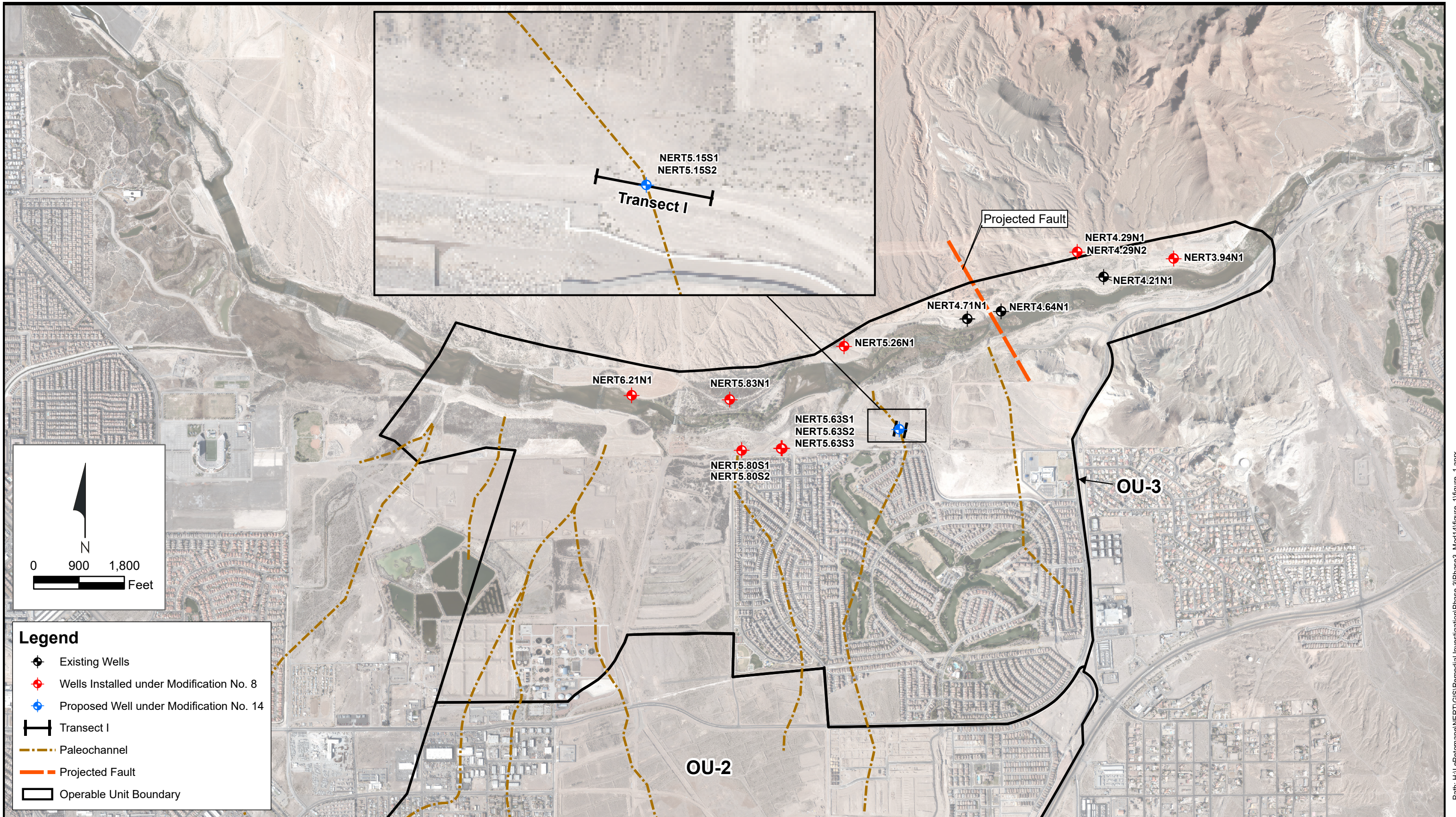


**John M. Pekala, PG
Principal**

December 3, 2021

Date

Certified Environmental Manager
Ramboll US Consulting, Inc.
CEM Certificate Number: 2347
CEM Expiration Date: September 20, 2022



Legend

- ⊕ Existing Wells
- ◆ Wells Installed under Modification No. 8
- ◆ Proposed Well under Modification No. 14
- ⊢ Transect I
- Paleochannel
- Projected Fault
- ▭ Operable Unit Boundary



Planned Monitoring Well and Slug Test Locations
Phase 3 RI Modification No. 14
 Nevada Environmental Response Trust Site; Henderson, Nevada

Figure
1

**TABLE 1. SUMMARY OF PRELIMINARY SOIL RESULTS AND PROPOSED WELL SCREEN AT TRANSECT I
Phase 3 RI Modification 14
Nevada Environmental Response Trust Site; Henderson, Nevada**

Soil Sample Depth (ft bgs)	<i>Boring TB-11</i>	<i>Boring TB-12</i>	Well (screen, ft)
	Soil Perchlorate (mg/kg)	Soil Perchlorate (mg/kg)	
10	<0.00355	0.816	
20	<0.00359	1.43	NERT5.15S1 (15-30, WT)
30	1.25	1.38	
40	0.234	0.628	NERT5.15S2 (35-45)
50	<0.0177	<0.0115	
60	<0.0187	<0.0174	
70	<0.0200	<0.0206	
80	<0.0193	<0.0189	
90	<0.0175	<0.0115	

Notes:

1. Well screen selected based on review of soil perchlorate results and lithology. 'WT' means the well is screened across the water table.
2. Preliminary soil perchlorate data provided by Pace Analytical; final results subject to validation and QC review.