

June 7, 2017

## **TECHNICAL MEMORANDUM**

**To:** Steve Clough  
Nevada Environmental Response Trust

**From:** Jessica Donovan, Ramboll Environ  
John Pekala, CEM#2347, Expires 9/20/2018, Ramboll Environ

**Re:** **RI Phase 2 Modification No. 4**  
**Nevada Environmental Response Trust Site**  
**Henderson, Nevada**  
**Ramboll Environ Project No. 21-41400C, M03B**

This Technical Memorandum presents Ramboll Environ's recommended Modification No. 4 to the scope of work for the Remedial Investigation (RI) Phase 2 Investigation currently in progress at the Nevada Environmental Response Trust Site (the "Site") located in Henderson, Nevada. Based on the discovery of perchlorate in the Upper Muddy Creek formation during the recent Unit 4 and 5 Buildings Investigation, second mobilization sampling effort, we are recommending a modification to the RI Phase 2 sampling plan for six monitoring wells (M-194 through M-199) located at the Site. These six wells are located downgradient of Unit Buildings 4 and 5, as shown on Figure 1. The proposed modification described herein is designed to expand on the recent data; however, additional data may be needed to fully understand the vertical distribution of perchlorate in the subsurface. Once the additional data described herein are acquired, additional modifications to the Phase 2 RI may be recommended.

As summarized in Table 1, the Nevada Division of Environmental Protection (NDEP)-approved sampling plan specifies that these well pilot borings (M-194 through M-199) will be advanced to depths of 120 feet below ground surface (ft bgs) with planned well screen intervals of 95-110 ft bgs or 100-115 ft bgs, depending on location. As shown in Table 1, the planned well screen intervals have been adjusted based on the actual ground elevations at the planned well locations. In addition, in order to better delineate the vertical extent of perchlorate and other chemicals of potential concern (COPCs) in the Upper Muddy Creek formation in the Leach Plant area, we are recommending that these six well pilot borings be deepened to 150 ft bgs. Six soil samples will be collected from each boring beneath the planned well screens at approximate depths of 100, 110, 120, 130, 140, and 150 ft bgs. The soil samples will be analyzed for perchlorate, chlorate, total chromium, hexavalent chromium, nitrate, volatile organic compounds (VOCs), and moisture content. Prior to installation of the planned monitoring well, the pilot borings will be sealed by backfilling with bentonite chips from the base of the boring (approximately 150 ft bgs) to a depth of one foot below the bottom of the planned well depth. Approximately one foot of sand will be placed on top of the backfill to minimize the potential for bentonite intrusion into the well

screen. The additional soil sampling at well pilot borings M-194 through M-199 will be conducted in accordance with the procedures in the approved Field Sampling Plan (FSP).

Please contact us should you have any questions about the recommended deepening of the six planned RI Phase 2 well pilot borings located in the Leach Plant area.

**Attachments**

Table 1 Revised New Groundwater Monitoring Well Construction Details –  
Leach Plant Area

Figure 1 RI Phase 2 Modification No. 4

**TABLE 1. REVISED NEW GROUNDWATER MONITORING WELL CONSTRUCTION DETAILS - LEACH PLANT AREA**

**RI Phase 2 Modification No. 4**

**Nevada Environmental Response Trust Site; Henderson, Nevada**

Monitoring Well ID	NERT On-Site Location	Rationale for Sampling	Initial Planned Well Construction Details						Revised Planned Well Construction Details*						
			Pilot Boring Depth (ft bgs)	Casing Diameter and Type	Screen Size (inches)	Screened Interval (ft bgs)	Sand Pack Interval (ft bgs)	Sand Pack Size	Pilot Boring Depth (ft bgs)	Casing Diameter and Type	Screen Size (inches)	Screened Interval (ft bgs)	Sand Pack Interval (ft bgs)	Sand Pack Size	Notes
<b>Leach Plant Area</b>															
M-194	North (downgradient) of Unit Buildings 4 and 5 (within the Leach Plant area)	Evaluate the presence of COPCs in the Middle WBZ UMCf.	120	4" PVC	0.01	95-110	93-110	No. 2/12	150	4" PVC	0.01	105-120	103-121	No. 2/12	[a]
M-195			120	4" PVC	0.01	95-110	93-110	No. 2/12	150	4" PVC	0.01	95-110	93-111	No. 2/12	[a]
M-196			120	4" PVC	0.01	100-115	98-115	No.2/12	150	4" PVC	0.01	95-110	93-111	No.2/12	[a]
M-197			120	4" PVC	0.01	100-115	98-115	No.2/12	150	4" PVC	0.01	100-115	98-116	No.2/12	[a]
M-198			120	4" PVC	0.01	100-115	98-115	No.2/12	150	4" PVC	0.01	100-115	98-116	No.2/12	[a]
M-199			120	4" PVC	0.01	100-115	98-115	No.2/12	150	4" PVC	0.01	90-105	88-106	No.2/12	[a,b]

**Notes:**

\* The initial planned well screen depths were adjusted based on actual ground surface elevations at the well locations. As-built well construction details may be further adjusted based on subsurface lithologies encountered during drilling.

ft bgs: feet below ground surface

[a] Soil samples will be collected for chemical analysis from depths of 100, 110, 120, 130, 140, and 150 ft bgs. The soil samples will be analyzed for perchlorate, chlorate, total chromium, hexavalent chromium, nitrate, volatile organic compounds (VOCs), and moisture content. Each pilot borehole will be sealed with bentonite from the total depth of 150 ft bgs to the base of the planned well.

[b] Well M-199 was moved approximately 50 feet north to the base of sloped ground. Since the ground surface elevation is lower, the planned well screen is higher than the other Leach Plant wells.

