

# TECHNICAL MEMORANDUM

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**To:** Nevada Environmental Response Trust

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**Cc:** Nevada Division of Environmental Protection  
United States Environmental Protection Agency

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**From:** Dan Pastor and Dana Grady

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**Date:** June 8, 2018

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**Subject:** Galleria Road Bioremediation Treatability Study Monthly Progress Report

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At the direction of the Nevada Environmental Response Trust (NERT or Trust), Tetra Tech, Inc. (Tetra Tech) has prepared this memorandum which summarizes Tetra Tech's progress during April 2018 toward successfully implementing the Galleria Road Bioremediation Treatability Study.

## Task Progress Update: April 2018

### Task M17 – Galleria Road Bioremediation Treatability Study

- Task Leader – Dana Grady/Dan Pastor
- Current Status
  - Phase 1 pre-design field activities are being performed to gather relevant data and information required to optimize the final treatability study design (targeted treatment interval and depth, contaminant concentrations, etc.). The Phase 1 findings and resulting Phase 2 treatability study design will be presented in a third quarter 2018 Stakeholder's Roundtable meeting, followed by an independent third-party review and submittal of the Galleria Road Bioremediation Treatability Study Work Plan Addendum.
  - Phase 1 pre-design field activities are ongoing. The following activities were completed in April:
    - Geophysical surveys were completed on March 28, 2018 and April 10, 2018. The results report received from GeoVision indicates that no paleochannel was identified immediately within the treatability study area, which confirmed historical surveys of the area and was preferred to ensure the treatability study targeted contamination within the UMCf. The attached Figure 1 presents the location of these geophysical transect lines.
    - All drilling locations were cleared to a depth of 10 feet using air knife procedures.
    - Soil borings were advanced at five locations throughout the study area to a depth of approximately 120 feet below ground surface (ft bgs) to obtain area-specific lithological information. Soil samples were collected on approximately 10-foot intervals from the top of the water table to the base of the boring and analyzed for perchlorate. Select soil

samples were also analyzed for total organic carbon, pH, total dissolved solids, chlorate, nitrate, sulfate, chloride, carbonate and bicarbonate, hexavalent chromium, dissolved metals, total kjeldahl nitrogen, total phosphorus, phospholipid fatty acid, and perchlorate reductase. Once all results have been received and reviewed, the draft results will be tabulated and presented in subsequent monthly progress reports.

- A total of 10 wells were installed within the treatability study area as prescribed in the Galleria Road Bioremediation Treatability Study Work Plan. All five soil borings were converted to permanent monitoring wells. An additional well was installed adjacent to each location and screened in a separate interval within the UMCf to evaluate the perchlorate concentration and hydraulic gradient changes with depth. In general, monitoring wells were screened across the interval of 90 – 110 ft bgs in the deeper borings and in the interval of 65 – 85 ft bgs in the shallower well pair. Saturated alluvium was not encountered within the treatability study area. Following completion of well installation, all monitoring wells were surveyed by a land surveyor, which included both horizontal coordinates and the elevation of the ground surface and top of well casing relative to North American Vertical Datum 88. The attached Table 1 presents monitoring well construction details, and the attached Figure 1 provides a map of the Phase 1 pre-design monitoring wells.
  - During soil boring installation, soil was also collected and transported to the University of Nevada Las Vegas (UNLV) for use in the laboratory bench-scale study.
  - Well development began on April 25, 2018 and is on-going with an expected completion date of May 4, 2018.
- Schedule and Progress Updates
    - Task remains on schedule.
    - Upon completion of well development, groundwater sampling and aquifer testing activities will begin. Groundwater sampling is tentatively scheduled for the week of May 7, 2018, followed by aquifer testing beginning the week of May 14, 2018.
  - Health and Safety
    - There were no safety incidents related to Task M17 during April 2018.

## CERTIFICATION

### Galleria Road Bioremediation Treatability Study Monthly Progress Report

**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 systems(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, not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

*not individually, but solely as President*

**Signature:** Jay A Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust 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:** 6/8/18

## CERTIFICATION

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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:** Galleria Road Bioremediation Treatability Study Monthly Progress Report, Nevada Environmental Response Trust Site, Henderson, Nevada



June 8, 2018

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

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Date

Nevada CEM Certificate Number: 2167  
Nevada CEM Expiration Date: September 18, 2018

# Figures

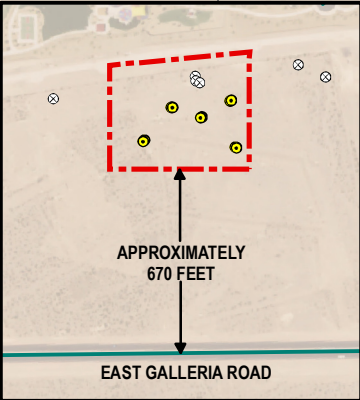
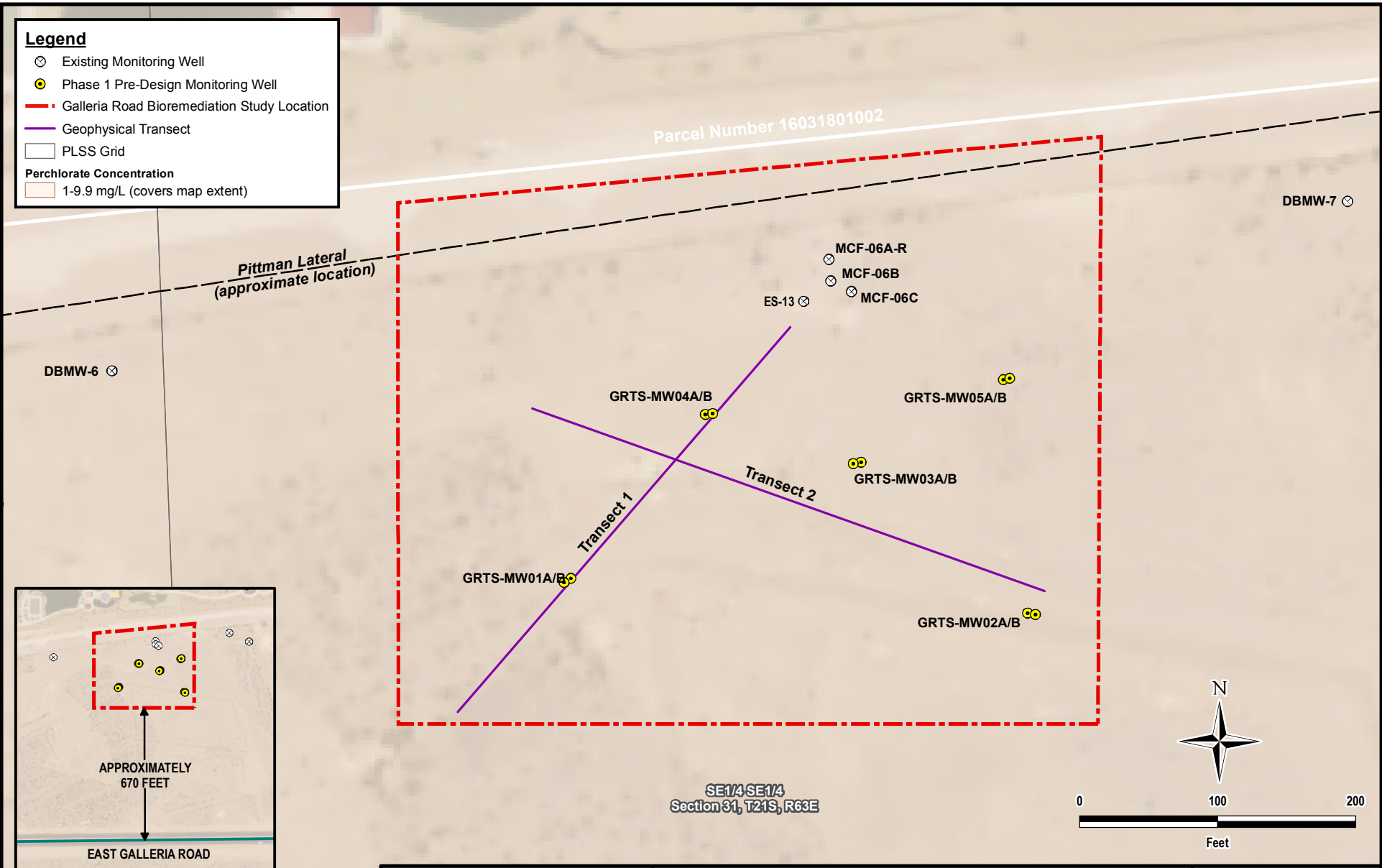
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**Legend**

- ⊗ Existing Monitoring Well
- ⊙ Phase 1 Pre-Design Monitoring Well
- - - Galleria Road Bioremediation Study Location
- Geophysical Transect
- PLSS Grid

**Perchlorate Concentration**

- 1-9.9 mg/L (covers map extent)



**Notes:**

- Perchlorate concentrations sourced from the Annual Remedial Performance Report for Chromium and Perchlorate (Ramboll Environ, 2017).
- Imagery Source: Esri World Map, June 2015

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NEVADA ENVIRONMENTAL RESPONSE TRUST

MONTHLY PROGRESS UPDATE

**GALLERIA ROAD BIOREMEDIATION TREATABILITY STUDY  
 PRE-DESIGN SOIL BORING AND MONITORING WELL LOCATIONS**

Project No.:	117-7502018
Date:	MAY 17, 2018
Designed By:	SRA
Figure No.	<b>1</b>

# Tables

# DRAFT

**Table 1. Galleria Road Bioremediation Treatability Study Monitoring Wells**

Monitoring Well/Borehole ID	Northing	Easting	Top of Casing Elevation	Well Diameter	Borehole Diameter	Borehole Total Depth	Well Total Depth	Bottom of Screen	Top of Screen	Screen Length	Slot Size
			feet amsl	inches	inches	feet bgs	feet bgs	feet bgs	feet bgs	feet	inches
<b>Newly Installed Monitoring Wells (April 2018)</b>											
<b>GRTS-MW01A</b>	26728794.03	834737.35	1633.882	2	6	82	80.5	80	60	20	0.010
<b>GRTS-MW01B</b>	26728796.86	834742.46	1633.883	2	6	120	110.5	110	90	20	0.010
<b>GRTS-MW02A</b>	26728771.59	835074.09	1632.586	2	6	82	80.5	80	60	20	0.010
<b>GRTS-MW02B</b>	26728770.64	835079.15	1632.432	2	6	120	110.5	110	90	20	0.010
<b>GRTS-MW03A</b>	26728879.93	834947.17	1630.720	4	8	80	75.5	75	65	10	0.010
<b>GRTS-MW03B</b>	26728880.75	834952.83	1630.625	4	8	120	110.5	110	90	20	0.010
<b>GRTS-MW04A</b>	26728915.61	834839.84	1631.086	2	6	86.5	85.4	85	70	15	0.010
<b>GRTS-MW04B</b>	26728916.48	834845.04	1631.186	2	6	120	110	109.5	89.5	20	0.010
<b>GRTS-MW05A</b>	26728941.02	835055.82	1628.633	2	6	80	70.5	70	60	10	0.010
<b>GRTS-MW05B</b>	26728941.82	835060.59	1628.605	2	6	120	85.5	85	75	10	0.010
<b>Existing Monitoring Wells within Treatability Study Area</b>											
<b>MCF-06B</b>	26729012.56	834930.85	1630.270	4	8	266	85.15	82	67	15	0.010
<b>MCF-06C</b>	26729004.80	834945.70	1630.280	4	8	67.42	62.30	59	44	15	0.010
<b>ES-13</b>	26728998.71	834911.17	1630.615	4	8	120	105	105	90	15	0.010

Notes:

amsl - above mean sea level

bgs - below ground surface