

# OFFICE OF THE NEVADA ENVIRONMENTAL RESPONSE TRUST TRUSTEE

Le Petomane XXVII, Inc., Not Individually, But Solely as the Nevada Environmental Response Trust Trustee

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August 3, 2016

Mr. Weiquan Dong, Ph.D.  
Bureau of Industrial Site Cleanup  
Nevada Division of Environmental Protection  
2030 E. Flamingo Rd, Suite 230  
Las Vegas NV 89119

RE: Response to Comments - In-Situ Chromium Treatability Study Work Plan  
Nevada Environmental Response Trust  
Henderson, Nevada

Dear Mr. Dong:

The Nevada Environmental Response Trust (NERT) is pleased to present this Response to Comments associated with comments received from Nevada Division of Environmental Protection (NDEP) regarding the In-Situ Chromium Treatability Study Work Plan. NERT received written comments from NDEP via letter dated June 28, 2016. Each of NDEP's comments is repeated below in italics followed by NERT's response.

- 1. One concern identified is the potential for operation/maintenance challenges of either the abiotic or biotic methods. Well scaling is a risk for the calcium polysulfide/abiotic approach, and well biofouling is a risk for the carbohydrate/biotic approach. While the work plan identifies these challenges, it does not address ways that these potential O&M issues can be managed in a full-scale in-situ chromium treatment program. The work plan should, to the extent feasible, evaluate these operational challenges during the 6-month field study.*

## **Trust's Response:**

The potential for well scaling and biofouling will be evaluated during the bench-scale testing and the results incorporated into the field study implementation. Additionally, the effect of well scaling and biofouling will be evaluated throughout the field study by monitoring injection pressure versus injection volumes, and adjusting injectate concentrations. Slug tests and a down-hole camera will be used to evaluate the effect of scaling and biofouling on the surrounding formation and the injection wells. If scaling or biofouling occurs to an extent that prohibits injection or monitoring activities, the wells will be mechanically scrubbed and/or an anti-scalant will be used. The amount of scaling and biofouling occurring during the 6-month field study will be utilized to develop a plan to address scaling and biofouling during full-scale implementation.

- 2. The layout of the downgradient monitoring wells from the two injection wells should be modified to consider hydraulic dispersion. The further location from the injection wells should have wider row of the monitoring wells;*

**Trust's Response:**

NERT concurs that the monitoring well layout should be modified. The proposed downgradient monitoring well layout has been modified, adding an additional monitoring well and spreading out the monitoring wells furthest downgradient of the injection wells. Revised Figure 4 is attached. Please note that the well layout may change based on the results of the bench-scale tests and field testing.

3. *The emulsified oil substrate (EOS®), blackstrap molasses, and industrial sugar wastewater were selected to be tested in the bench-scale biodegradation tests and the calcium polysulfide was proposed to be tested in the bench-scale abiotic test but one biological carbon substrate will be selected for further evaluation in the field test based on the overall effectiveness and feasibility (cost, hexavalent chromium reduction, limited scale/sludge formation). There is no plan for field test on abiotic test with the calcium polysulfide. If the calcium polysulfide will be used for the AP-5 downward and upward IRM flushing, it makes more sense to test it at smaller scale like this in-situ chromium treatability study site first;*

**Trust's Response:**

The NERT acknowledges the strategic approach to conducting a calcium polysulfide treatability study; however, due to the NERT Continuous Optimization Program's (COP) timeline and objectives as defined by NDEP, NERT has identified the necessity to conduct the field testing for calcium polysulfide as part of the COP soil flushing IRM to obtain the results as quickly as possible. Under this IRM, NERT will initially start with small scale testing, similar to this biological field test, prior to implementing on a larger scale. NERT will provide briefings regarding the results of the IRM small scale test during monthly Continuous Optimization Program meetings and incorporate the results into the In-Situ Chromium Treatability Study Report to be submitted at the end of the treatability study.

4. *Please add Arsenic to the analytical parameters of Table 3 (Biological Performance Monitoring Sampling Protocol).*

**Trust's Response:**

As indicated in the footnote for Table 3, Arsenic is included as part of the dissolved metals analysis.

Upon approval of these comment response from NDEP, the NERT will prepare a budget for implementation of the In-Situ Chromium Treatability Study.

If you have any questions or concerns regarding this matter, feel to contact me at (702) 960-4309 or at [steve.clough@nert-trust.com](mailto:steve.clough@nert-trust.com).

Office of the Nevada Environmental Response Trust



Stephen R. Clough, P.G., CEM  
Remediation Director

CEM Certification Number: 2399, exp. 3/24/17

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August 3, 2016

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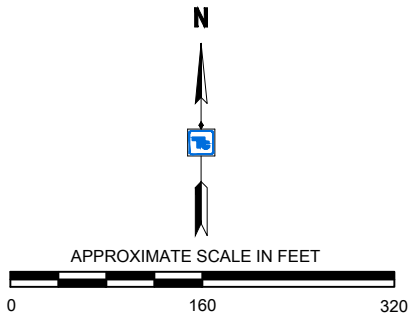
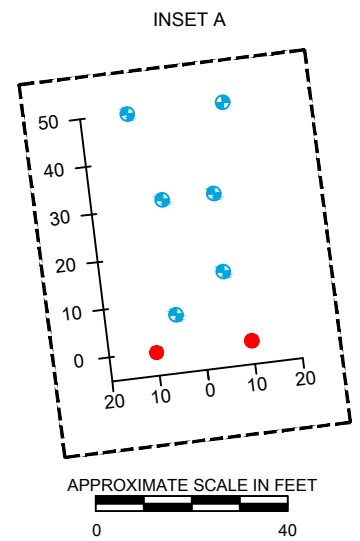
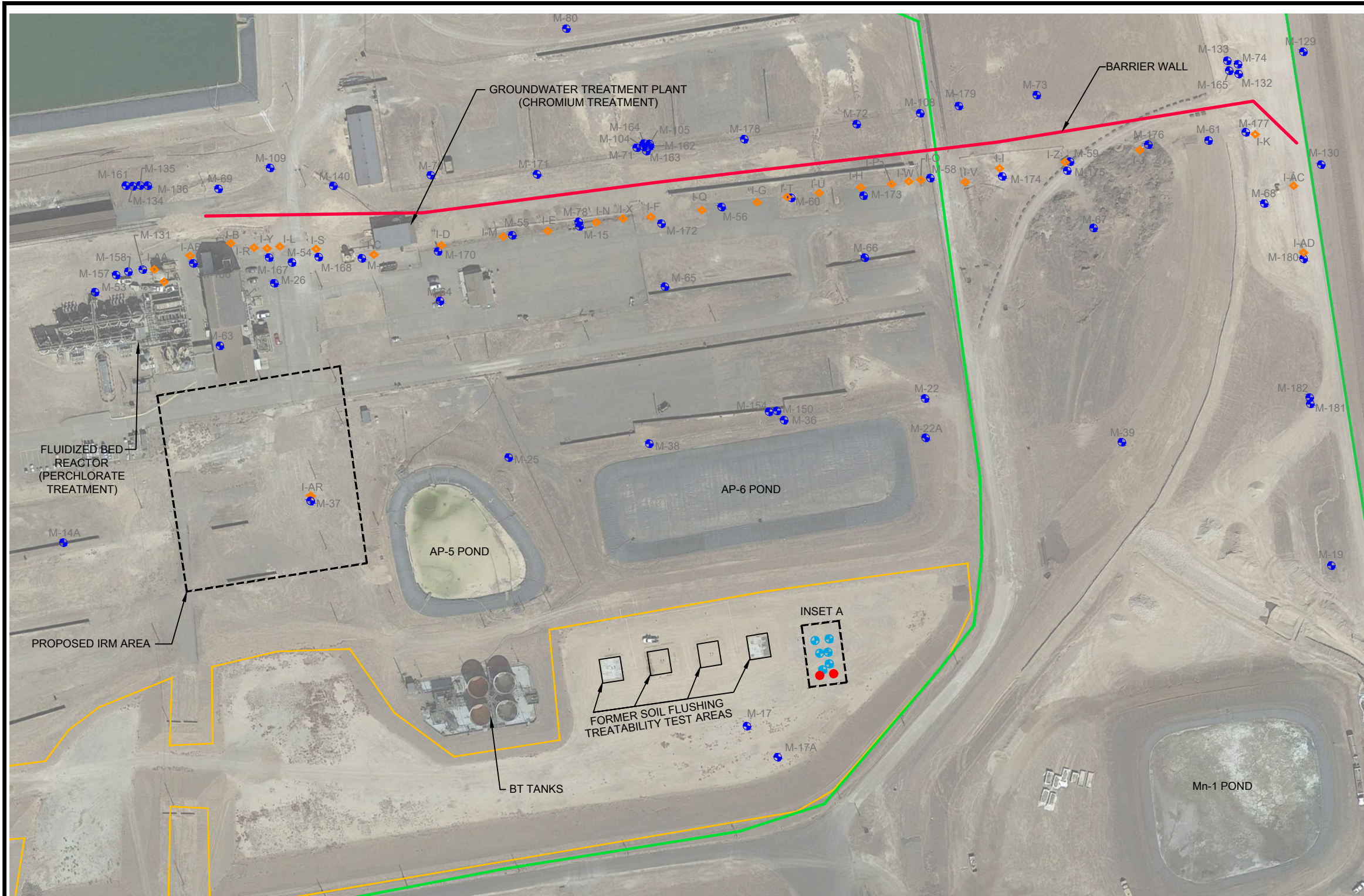
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John Pekala, Ramboll Environ

P:\87600001-NERT - L07\CAD\FIG 4-5 RICK.dwg Jul 06, 2016 - 2:41pm DANIEL KEADY



NOTES:  
 1. "LAS VEGAS, NV." MAP. GOOGLE EARTH PRO. GOOGLE, 22 MAR. 2015.  
 2. ALL LOCATIONS ARE APPROXIMATE.

REFERENCE:  
 1. 2014-2015 ANNUAL PERFORMANCE REPORT (RAMBOLL ENVIRON, 2015)

- LEGEND**
- TRONOX OPERATIONAL AREA
  - CENTRAL RETENTION BASIN
  - GROUNDWATER BARRIER WALL
  - M-14A MONITORING WELL
  - I-G EXTRACTION WELL
  - PROPOSED MONITORING WELL
  - PROPOSED INJECTION WELL

## PROPOSED TREATABILITY TEST LOCATION

NEVADA ENVIRONMENTAL RESPONSE TRUST    HENDERSON, NEVADA



PREPARED BY:  
**TETRA TECH, INC.**  
 1489 WEST WARM SPRINGS ROAD, SUITE 110  
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PROJECT NUMBER	APPROVED BY	DRAWN BY	DATE	FIGURE
87600001	CL	WRI	MAY 2016	<b>4</b>