



STATE OF NEVADA  
Department of Conservation & Natural Resources  
DIVISION OF ENVIRONMENTAL PROTECTION

Jim Gibbons, Governor

Allen Biaggi, Director

Leo M. Drozdoff, P.E., Administrator

September 24, 2010

Matt Paque  
Tronox LLC  
PO BOX 268859  
Oklahoma City, OK 73134

Re: **Tronox LLC (TRX)**  
**NDEP Facility ID #H-000539**  
Nevada Division of Environmental Protection (NDEP) Response to:  
*Work Plan to Conduct In-Situ Permeable Reactive Barrier Pilot Test For Perchlorate-  
Impacted Groundwater, Tronox LLC, Henderson, Nevada*  
Dated: August 27, 2010

Dear Mr. Paque,

The NDEP has received and reviewed TRX's above-identified Deliverable and provides comments in Attachment A. NDEP provides conditional approval for Task 1 (Section 4.0) so that TRX may proceed with implementation of Task 1 pending completion of Comment 3.

TRX should provide errata or a revised Deliverable and a response-to-comments letter to NDEP for approval prior to the implementation of Tasks 2 through 6.

Please contact the undersigned with any questions at [sharbour@ndep.nv.gov](mailto:sharbour@ndep.nv.gov) or 775-687-9332.

Sincerely,

Shannon Harbour, P.E.  
Staff Engineer III  
Bureau of Corrective Actions  
Special Projects Branch  
NDEP-Carson City Office  
Fax: 775-687-8335

SH:gl:sh

EC: Jim Najima, Bureau of Corrective Actions, NDEP  
Greg Lovato, Bureau of Corrective Actions, NDEP  
William Knight, Bureau of Corrective Actions, NDEP  
Brenda Pohlmann, City of Henderson  
Mitch Kaplan, U.S. Environmental Protection Agency, Region 9  
Mike Skromyda, Tronox LLC



Michael J. Foster, Tronox LLC  
Keith Bailey, Environmental Answers LLC  
Susan Crowley, Tronox LLC (Contractor)  
Deni Chambers, Northgate Environmental  
Brian Rakvica, McGinley and Associates  
Joe McGinley, McGinley & Associates  
Barry Conaty, Holland & Hart LLP  
Ranajit Sahu, BRC  
Rick Kellogg, BRC  
Lee Farris, BRC  
Mark Paris, Landwell  
Craig Wilkinson, TIMET  
Kirk Stowers, Broadbent & Associates  
Victoria Tyson, Tyson Contracting  
George Crouse, Syngenta Crop Protection, Inc.  
Nick Pogoncheff, PES Environmental  
Lee Erickson, Stauffer Management Company  
Michael Bellotti, Olin Corporation  
Curt Richards, Olin Corporation  
Paul Sundberg, Montrose Chemical Corporation  
Joe Kelly, Montrose Chemical Corporation of CA  
Jeff Gibson, AMPAC  
Larry Cummings, AMPAC  
Ebrahim Juma , Clean Water Team  
Joe Leedy, Clean Water Team  
Kathryn Hoffmann, Clean Water Team

CC: Susan Crowley, C/O Tronox LLC, PO Box 55, Henderson, NV 89009  
Lee Farris, BRC, 875 W. Warm Springs Road, Henderson, NV 89011  
Lee Erickson, Stauffer Management Company

## Attachment A

1. Section 2.0, page 2, 3rd paragraph of section, please show the location and orientation of the City of Henderson (CoH) transect.
2. Section 2.0, page 2, last bullet on page, TRX should clarify that sulfate may degrade but iron and manganese change valence states.
3. Section 3.1.1, page 4, 1st line at top of page, TRX stated that a “laboratory experienced in the setup and conduct of treatability tests for environmental remediation will perform the tests.” NDEP requests that TRX notify NDEP prior to the selection of the laboratory so NDEP can provide input into this selection.
4. Section 3.1.1, page 4, Item 1, NDEP provides the following comments:
  - a. Please specify to whom “others” refers.
  - b. As NDEP has previously indicated to TRX, ASTM D422 using both sieve and hydrometer for soil particles finer than #200 sieve must be used for soil particle size analysis. Please revise.
5. Section 3.1.1, pages 4 and 5, Item 4, NDEP provides the following comments:
  - a. Please specify the specific method(s) to be employed for the proposed sampling (i.e. ASTM...)
  - b. As this area is downgradient of the CoH RIBs, please clarify whether there is any issue with regards to TOC from the previously disposed municipal wastewater.
6. Section 3.1.2, page 5, NDEP provides the following comments:
  - a. 1st paragraph of section, TRX should notes that the change in mobility of metals may not be restricted to arsenic and iron at this location. NDEP requests review of the following in developing a list of metals:
    - i. Groundwater monitoring results upgradient of proposed pilot test site,
    - ii. SPLP testing done by TRX/NGEM
    - iii. EPA Priority Pollutant Metals (13 metals)
  - b. 1st and 3rd bullets, please add DO and pH in additional to ORP.
  - c. Last bullet, please refer to above-comment 6.a for guidance.
7. Section 3.1.2, page 6, Task 1, DI WET test, if this refers to the CA DTSC WET, NDEP has not recommended this test for the BMI Complex. For the leaching to groundwater pathway, NDEP has recommended EPA SPLP using extraction fluids #2 and #3. The latter procedure should be used as it would produce comparable results to the Phase B SPLP testing done for on-Site soils.
8. Section 3.1.2, page 6 and Table on page 7, please clarify that the control reactors will be run under sterile conditions (*i.e.* will a sterilant be added to the control test).
9. Section 3.1.2, page 7, Task 4, please clarify that the attenuation evaluation will use soil samples from the saturated zone.
10. Section 3.1.2, page 8, Task 5, Analytical Methods Table, NDEP has the following comments:
  - a. Please correct spelling to “pH” for clarity.
  - b. Please clarify that Hach analyses are sufficiently accurate and precise enough for the decisions to be made from the test results.
11. Section 3.2.3, page 10 and Figure 4, there appears to be an insufficient number of wells to monitor the groundwater for the pilot test. Please review the proposed monitoring network and propose additional wells for sufficient coverage. Include discussion on the adequateness

of the proposed well field. TRX should contact NDEP by **September 28, 2010** to schedule a conference call to discuss this issue for timely resolution.

12. Section 3.2.3, page 11, NDEP has noted that the well screen length for the monitoring wells appears quite large and seems to be based on the assumption that the edible oil injection will be uniform across the wellbore. The NDEP requests cluster well completions with a minimum of two separate vertical screen intervals to provide a more detailed and reliable view of the reactions taking place. Please revise the Deliverable as necessary to address this concern.
13. Section 3.2.4, page 12, 1<sup>st</sup> paragraph, TRX states that “Some wells will be sampled and analyzed for additional compounds, such as bromide, chloride, and/or dissolved methane.” TRX should specify which wells will be sampled for which analytes. Additionally, NDEP believes that all wells should be sampled for the same constituents.
14. Section 3.2.4, page 12, 3<sup>rd</sup> paragraph, please provide supporting calculations or model, which ever was used, for the volume of edible oil substrate to be injected.
15. Section 3.3, page 14, please include a list of all the SOPs that will be used including SOP number and title in this section or a referenced appendix.
16. Section 4.0, page 15, NDEP requests a Technical Memoranda at the conclusion of Task 3 that presents all field and laboratory data collected, interpretations, slug test results, and re-assessment of the volume of edible oil substrate to be injected prior to starting injection.
17. Section 5, p 16, References, NDEP provides the following comments:
  - a. The Environmental Security Technology Certification Program (ESTCP) is listed eight times in the references but is not referenced in the text. Please provide the appropriate citations in the work plan text.
  - b. Strategic Environmental Research and Development Program is listed in the references but not referenced in the text. Please provide the appropriate citations in the work plan text.
  - c. Interstate Technology & Regulatory Council (ITRC) is listed twice in the references but not referenced in the text. Please provide the appropriate citations in the work plan text.