



Susan Crowley
Staff Environmental Specialist

(702) 651-2234
Fax (405) 302-4607
Susan.crowley@tronox.com

November 28, 2007

Ms. Shannon Harbour, P.E.
Nevada Division of Environmental Protection
2030 East Flamingo Road, Suite 230
Las Vegas, Nevada 89119-0818

Subject: Response to Nevada Division of Environmental Protection (NDEP) Comments to the Revised Work Plan to Evaluate Effective Groundwater Capture at Tronox LLC, Henderson, Nevada

Dear Ms. Harbour:

Tronox LLC (Tronox) has undertaken an Environmental Conditions Assessment (ECA) as directed by the Nevada Division of Environmental Protection (NDEP). On August 29, 2007, Tronox provided a revised work plan to NDEP outlining our approach to evaluate the effectiveness of groundwater systems at the Henderson site. On October 3, 2007, NDEP provided comments to the draft work plan, which were subsequently discussed during a conference call between NDEP and Tronox on November 14, 2007. Attached is our annotated response to the October 3 NDEP comments, which incorporate the discussions of our conference call. Additionally, Tronox initiated the proposed field program to evaluate groundwater capture on November 25, 2007 following verbal approval from NDEP received during the conference call.

Additionally, per our discussions, attached is an electronic copy of the August 29, 2007 revised work plan in Adobe format which has been revised to include the corrected tables in Appendix B. Please contact me at (702) 651-2234 if you have any comments or questions concerning this correspondence.

Sincerely,

Susan M. Crowley
Staff Environmental Specialist

Overnight Mail

Attachment: As stated
CC: See attached Distribution List

Tronox LLC

8000 West Lake Mead Parkway, Henderson, Nevada 89015 • P.O. Box 55, Henderson, Nevada 89009

**Tronox response to October 3, 2007 NDEP comments on
Capture Work Plan dated August 29, 2007**

NDEP Comment

1. General comment: TRX interchangeably uses the terms “slurry wall” and “barrier wall” in the text and figures of the Work Plan. Please resolve this terminology in future Deliverables.

Tronox Response

The term “barrier wall” will be used in future documents.

NDEP Comment

2. General comment: the NDEP did not note the reference of any standard operating procedures (SOPs) in the Work Plan. Please provide references for all applicable, approved SOPs by **October 24, 2007**. If new SOPs are needed please forward them to the NDEP as soon as possible for review.

Tronox Response

The Standard Operating Procedures applicable to the work proposed are identified below and are provided in the BRC Field Sampling and Standard Operating Procedures – BMI Common Areas, Clark County, Nevada, ERM-West, Incorporated, Sacramento, California and Montgomery-Watson Harza, Sacramento, California, August 2007:

- SOP-1 Drilling Methods*
- SOP-2 Groundwater Monitoring Well Design*
- SOP-3 Groundwater Monitoring Well Development*
- SOP-4 Aquifer Testing*
- SOP-5 Water Sampling and Field Measurements*
- SOP-6 Sampling Management and Shipping*
- SOP-10 Surveying*
- SOP-13 Operating and Calibration Procedures – Field Equipment*
- SOP-14 Field Documentation*
- SOP-15 Field Logbook*
- SOP-17 Soil Logging*
- SOP-20 Filter Pack and Well Screen Slot Size Determination*
- SOP-23 Split Spoon Sampling*
- SOP-31 Drilling Equipment Decontamination*
- SOP-34 Investigative Derived Waste (IDW) Management*

NDEP Comment

3. General comment, please discuss if any hydraulic testing will be conducted in the wells that are proposed to be installed (e.g.: slug testing or pump testing) **at the meeting referenced in the cover letter**.

Tronox Response

As discussed during our November 14, 2007 conference call, Tronox will evaluate the vertical permeability of the Muddy Creek Formation with ASTM 5084 using a constant head method. A soil sample will be collected from the Muddy Creek Formation at the following proposed wells at both the Interceptor and Athens Road Well Fields:

- M-129 (IM-1)*
- M-130 (IM-2)*
- M-134 (IM-5b)*
- M-136 (IM-6b)*
- PC-134 (AM-1a)*
- PC-136 (AM-2a)*

The locations of these wells are shown on the revised figures attached to this document. Please note the change in the nomenclature and the reference to the prior well identification in parentheses.

NDEP Comment

4. Section 2.1.1, Performance Evaluation, Flow Budget, the NDEP has the following comments (please note that these comments are also applicable to Appendix B):
 - a. TRX states that “The presumed upward flow of groundwater is further enhanced by the pumping upgradient of the barrier. Given this enhancement to upward flow, it would be anticipated that perchlorate mass if present within the upper portion of the Muddy would be locally influenced in the vicinity of the barrier and interceptor well field.” The first sentence starts with a presumption about upward flow and the second sentence starts with the upward flow as a “given.” Please clarify what is meant by this statement and if this refers to the unconfined portion of the Muddy Creek formation or the confined portions.
 - b. TRX states that the “Groundwater in the Muddy Creek, subsequently “dammed up” behind the groundwater barrier wall...” Please provide a cross-section of the Interceptor Well Field including the as-built dimensions of the barrier wall for a comparison of well depths versus the depth of the barrier wall and the depths of the geologic units.
 - c. TRX states that the “Groundwater flowing vertically and “daylighting” from the Muddy Creek upwards into the incised alluvial channels up-gradient from the slurry wall. The third flow element is included in the budget, since the estimates of flow from the alluvium and Muddy Creek dammed behind the barrier do not adequately account for the water being pumped at the interceptor well field. The calculations and input parameters are provided in Appendix B.” If this is truly a vertical flow component then the hydraulic conductivity used should not be the same as the horizontal hydraulic conductivity. Vertical hydraulic conductivity is typically several orders of magnitude less than horizontal hydraulic conductivity. It is suggested that TRX collect this data as part of the implementation of the Work Plan. **Please discuss this matter with the NDEP at the meeting referenced in the cover letter.**
 - d. Please consider that the existence of water dammed up behind the barrier wall and water mounded in the “dead zone” may produce a downward gradient into the Muddy Creek formation.
 - e. Please consider that the density of the water may produce a downward gradient into the Muddy Creek formation.
 - f. Please consider installing several co-located wells which are screened in the various portions of the unconfined aquifer (e.g.: the Quaternary alluvium; the transition zone; and the Tertiary Muddy Creek formation). **Please discuss this matter with the NDEP at the meeting referenced in the cover letter.**
 - g. Please develop a block diagram for each well field which demonstrates the relationships between the water bearing zones and utilizes existing gradients and density data. If sufficient information is not available to develop these block diagrams the scope of work for this Work Plan should be revised. **Please discuss this matter with the NDEP at the meeting referenced in the cover letter.**

Tronox Response

- a. *The statement refers to the unconfined portion of the Muddy Creek formation and upward gradients are believed to be present. The work proposed under the Capture workplan will generate data to evaluate vertical gradients in the Muddy Creek.*
- b. *Figure 2 of the Annual Remedial Performance Report for Chromium and Perchlorate, Tronox LLC, Henderson, Nevada, July 2006 – June 2007 is a cross section of the Interceptor well field and includes the dimensions of the barrier wall for a comparison of well depths versus the depth of the barrier wall and the depths of the geologic units. This figure was also provided for the conference call on November 14, 2007 and is attached as Figure 6 to this document.*
- c. *As discussed during the conference call of November 14, 2007, vertical gradients and hydraulic conductivity will be evaluated through the installation of nested wells M-133, M-134, M-135, M-136, PC-134, PC-135, PC-136 and PC-137, which will be installed at various depths within the Muddy Creek Formation. The approximate depth and completion of the*

proposed wells that will be installed as part of the Capture Zone evaluation are shown on the attached hydrogeologic cross sections (see Figures 6, 7 and 8).

- d. *Tronox will consider the potential for a downward gradient induced from groundwater mounded behind the barrier wall. Though as discussed during the November 14, 2007 conference call, the nested monitor wells proposed under the capture evaluation workplan will provide data to further evaluate this potential hydrologic condition and hypothesized potential downward vertical gradient suggested by NDEP.*
- e. *Please see the response to comment 4d above.*
- f. *Two nested monitoring well sets (M-133/M134 and M135/M136) have already been proposed to be screened at different levels of the Muddy Creek formation. Well M-74 on the east side of the barrier wall will serve as the alluvial well in the M-133/134 set whereas M-132 on the western side of the barrier wall will serve as the alluvial well in the M-135/136 set. Tronox has not observed a "Transition Zone" (i.e., reworked Muddy Creek Formation) in the Interceptor well field area.*
- g. *As discussed during the November 14, 2007 conference call, block diagrams consistent to those provided via email by NDEP on November 14, 2007, will be prepared from the data gathered during the Capture Zone evaluation.*

NDEP Comment

5. Section 2.1.1, Performance Evaluation, Downgradient Concentration Declines over Time, the NDEP has the following comments:

- a. *The NDEP does not believe that the recharge water is "totally" responsible for the expansion of the area containing less than 100 mg/L perchlorate but a contributing factor. Incremental analysis using either concentrations or pumping rates does not adequately demonstrate what is responsible for the expanding area of < 100 mg/L perchlorate. The NDEP suggests that this analysis requires a mass balance approach.*
- b. *TRX calculated the percent decrease of the perchlorate concentration downgradient of the barrier wall from approximately 1,000 mg/L in July 1998 to less than 100 mg/L currently. TRX then used this percent decrease to determine that a maximum of 6 gpm of 1,000 mg/L perchlorate could be flowing around the barrier wall. This calculation assumes that the groundwater concentration for perchlorate flowing around the barrier wall is 1,000 mg/L. Please discuss this assumption. As part of this discussion, TRX should consider the groundwater containing less than 10 mg/l and 25 mg/l which is traveling around the east and west ends of the barrier wall, respectively. This groundwater could certainly contribute to the expansion of the less than 100 mg/l zone of perchlorate.*
- c. *TRX states that "clean Lake Mead water" is injected for infiltration to the area north of the barrier wall. Please quantify what is meant by "clean". There is an incremental concentration of perchlorate in Lake Mead water which has varied over time. For clarity it would be helpful to understand this range of inputs.*
- d. *Additionally see Appendix A, RTC 12 below.*

Tronox Response

- a. *The analysis provided in the revised work plan was to demonstrate, through a simple mass balance, that the mass of perchlorate getting around the slurry wall is only a very small fraction of the mass flowing toward the barrier wall.*
- b. *This calculation assumes a concentration of 1,000 mg/L based on the June 2007 average perchlorate concentration in the Interceptor Well Field. The calculation was presented to help quantify the maximum mass of perchlorate that could be getting around the barrier wall. Tronox has proposed an additional recovery well at the west end of the barrier wall to improve capture. In addition, Tronox will be installing observation wells at both the east and west ends of the barrier wall to determine the nature of groundwater flow at the ends of the barrier wall. In the Annual Remedial Performance Report for Chromium and Perchlorate, Tronox LLC, Henderson, Nevada, July 2006 – June 2007 the average perchlorate concentration in the well field for June 2007 is 1079 mg/L. Tronox has considered the*

contribution of the groundwater containing less than 10 mg/L and 25 mg/L which is traveling around the east and west ends of the barrier wall, respectively.

- c. *“Clean Lake Mead water” refers to water obtained from Lake Mead which has not been processed or re-used within the BMI complex. It comes directly from the lake to the City of Henderson’s reservoir and then is piped directly to the BMI companies, including the Tronox facility. This water is now less than 5 ug/L perchlorate. The perchlorate concentration has been below 6 ug/L since January 2006 and below 10 ug/L since November 2003.*
- d. *The NDEP Comments on Appendix A, RTC 12 are provided below.*

NDEP Comment

6. Section 2.1.3, Data Gaps and Proposed Additional Evaluation, the NDEP has the following comments:
 - a. In the second bullet, TRX proposes the installation of two monitoring wells at the east and west ends of the barrier wall to demonstrate the existence of an upward gradient from the MCFf to the alluvium. As noted above, the NDEP additionally suggests that core samples should be collected and tested for vertical hydraulic conductivity from the proposed monitoring wells to be installed in the Tertiary Muddy Creek formation (TMCf). The assessed vertical hydraulic conductivity should then be substituted into Table B-1 for the “Muddy Creek upflow” to be used for calculations.
 - b. In the last paragraph of section, TRX states that “Though not a data gap...” The NDEP believes that a data gap does exist in this area; however, the NDEP does acknowledge that proposed monitoring wells IM-2 and IM-4 are being installed to address the data gap to the west of the barrier wall and that the purpose for installing proposed extraction well, IEX-1, is for remediation and not necessarily for additional characterization.

Tronox Response

- a. *As noted under comment No. 3 above, core samples will be collected and tested for vertical permeability by ASTM Method 5084.*
- b. *The NDEP comment has been noted and Tronox agrees.*

NDEP Comment

7. Section 2.2, Athens Road Well Field, the NDEP has the following comments:
 - a. In this Section and throughout the Work Plan, TRX refers to the model completed by the NDEP’s contractor; however, TRX does not recognize all of the data gaps identified by the model. Examples follow.
 - b. The model states “Perchlorate concentration data for key well positions do not appear to indicate complete ARF capture is being achieved. The results of this analysis are not consistent with the results of the particle tracking exercise described above, which indicated that all particle pathways end at extraction well locations, and that “complete capture” is achieved.”
 - c. The Model also states “Additional modeling efforts beyond those described herein, pending the discovery of significantly different data, may include expanding the model to three dimensions (e.g., simulating interaction between Qal and MCf or the Muddy Creek transition zone). Also, calibration of the current solute transport model may be warranted in the case of modified project objectives (e.g., more precise evaluation of mass removal efficiency is deemed necessary).
 - d. Another noted limitation of the model was stated as “Given the large hydraulic conductivity contrast between the Qal and MCf, groundwater. However, some degree of communication is presumed to occur.”

Tronox Response

- a. *Tronox recognizes that data gaps exist at the Athens Road Well Field as discussed in the McGinley and Associates Report (June 30, 2007) and during their presentation at the Desert Research Institute on November 7, 2007. Tronox believes that the numerical model provides*

important lines of evidence showing capture at Athens Road, but, also acknowledges that additional wells are required to evaluate inward flow.

- b. Tronox will be installing monitor wells downgradient of ART recovery wells in both the eastern and western subchannels in order to establish inward flow, further supporting the effectiveness of up to 95% for the capture system at Athens Road. Tronox agrees that the analog modeling done by NDEP's contractor is not consistent with the results of their particle tracking exercise which indicated complete capture.*
- c. Tronox does not believe that this is a data gap. Expanding the modeling into a third dimension would not likely provide significantly different results, as the contrast in horizontal hydraulic conductivity between the alluvium and Muddy Creek Formation would be several orders of magnitude. As noted, by McGinley and Associates in their report and during the November 7, 2007 presentation, while the solute model was not calibrated, the approach taken provided a reasonable evaluation of the mass flux and capture for the well field. Tronox believes that the additional wells proposed in the work plan to evaluate inward flow will serve along with the numerical modeling results to provide sufficient lines of evidence that capture is being achieved at Athens Road.*
- d. Since "vertical hydraulic conductivity is typically several orders of magnitude less than the horizontal hydraulic conductivity" (see NDEP Comment 4c, above) and that flow and solute transport are inferred to be largely dominant in the alluvium. To evaluate vertical flux, as noted in Comment No. 3 above, soil cores will be tested for vertical permeability from the Muddy Creek Formation and nested wells are proposed to evaluate vertical gradients at the Athens Road Well Field.*

NDEP Comment

8. Section 2.2.1, Performance Evaluation, Overlapping Cones of Depression, TRX states that "Overlapping cones of depression are evident from data collected from adjacent piezometers and monitoring wells, indicating that the well field has developed a capture zone sufficient to encompass the width of the plume in this area." Please note that drawdown does not equal capture. The NDEP suggests that it would be more accurate to state "Overlapping cones of depression are evident from data collected from adjacent piezometers and monitoring wells, indicating that the well field has developed an area of drawdown sufficient to encompass the width of the plume in this area."

Tronox Response

Tronox acknowledges this statement, though in the June 26, 2007 letter commenting on the Tronox Groundwater Capture Work Plan, the NDEP Comment 6 says regarding EPA lines of evidence and capture zones, "However, given the geometry of the line of extraction wells within and extending across a mapped paleochannel, the NDEP acknowledges that overlapping cones of depression can be a line of evidence".

NDEP Comment

9. Table 1, the NDEP requests that TRX prepare and submit cross-sections which present the proposed locations and depths of the new wells relative to existing wells, geologic units and saturated thicknesses. Please provide this at the meeting referenced in the cover letter.

Tronox Response

Tronox provided draft cross sections for the November 14, 2007 conference call with NDEP. These sections have been revised showing the corrected nomenclature for the well identification and are provided as Figures 6, 7 and 8 (attached). In addition, the plan-view maps provided in the work plan have also been revised to reflect the corrected nomenclature and are also attached.

NDEP Comment

10. Appendix A, the NDEP has the following comments:
 - a. Response to comment (RTC) 12, the NDEP has the following comments:

- i. The NDEP acknowledges TRX's RTC, but please note that the RTC does not rebut the implication that dilution could also be a factor in the concentration decline.
 - ii. In Section 2.1.1 Performance Evaluation, Flow Budget, TRX states that "The slurry wall, installed in 2001, has dramatically improved groundwater capture. Current capture rates of about 65 gpm are double those before the wall was installed." Please reconcile the above-statement with RTC 12.
 - iii. Additionally see comments above for Section 2.1.1.
 - b. RTC 14, TRX proposes to "mine" wells M-70 and M-71 by pumping contaminated groundwater from the "dead zone" north of the barrier wall allowing the injected Lake Mead water to "migrate further into this area and assist in lowering the groundwater concentrations via flushing or dilution. In Section 2.1.3, TRX proposes to pump wells M-70 and M-71 and monitor the perchlorate concentration over time to "demonstrate the slurry wall is continuous and does not leak significantly along its length". The NDEP does not understand that if TRX is expecting the infiltration of Lake Mead water into this area, thereby reducing the contaminant concentrations, how pumping M-70 and M-71 will demonstrate the integrity of the barrier wall. Please explain if the injection of Lake Mead water will be halted during these pump tests. **Please clarify. This matter must be discussed at the meeting requested in the cover letter.**

Tronox Response

- a.i. *Tronox certainly agrees that dilution can be a factor in the concentration decline.*
 - a.ii. *The text was meant to demonstrate that the groundwater flow getting around the barrier wall is only a very small fraction of the groundwater flow flowing toward the barrier wall and captured by the Interceptor Well Field.*
 - a.iii. *Comments regarding Section 2.1.1 have been responded to above.*
 - b. *As discussed during the November 14, 2007 conference call, injection of Lake Mead water will not be halted during the proposed tests, though the recent decline in flow and pending replacement of the infiltration trenches will likely produce a short period of reduced influence from the injected Lake Mead water. The text of the workplan will be revised to clarify the purpose and expected outcome of the activities proposed in this area. As discussed, weekly water levels and groundwater samples will be collected to from these wells to monitor performance. It is proposed that onsite screening level analysis of the water samples could be performed by Tronox to track the progress of water mining.*

NDEP Comment

11. Appendix B, the NDEP has the following comments:
 - a. Table B-1, as noted previously, the NDEP does not agree with the use of a horizontal hydraulic conductivity to calculated vertical flow.
 - b. Table B-2, the NDEP noted that the electronic version provided with the original document included a duplicate of Table B-1 instead of Table B-2. Please provide a corrected electronic version of this Work Plan to the NDEP by **October 24, 2007**.

Tronox Response

- a. *As noted previously, TRX will collect cores and test for vertical hydraulic conductivity.*
 - b. *The corrected "electronic" version of the Work Plan is provided in the attached CD.*

NDEP Comment

12. Appendix C, the NDEP has the following comments:
 - a. TRX states that "... Lake Mead water containing very low concentrations of total chromium and perchlorate has moved a sufficient distance in the groundwater to a monitor well..." Please quantify what is meant by "very low concentrations of total chromium and perchlorate" and "sufficient distance".
 - b. In Table C-1, TRX reports groundwater velocities ranging from 1.1 ft/d to 12.3 ft/d. Please discuss if separate groundwater velocities should be calculated for the alluvium, alluvial channels, and the inter-channel areas.

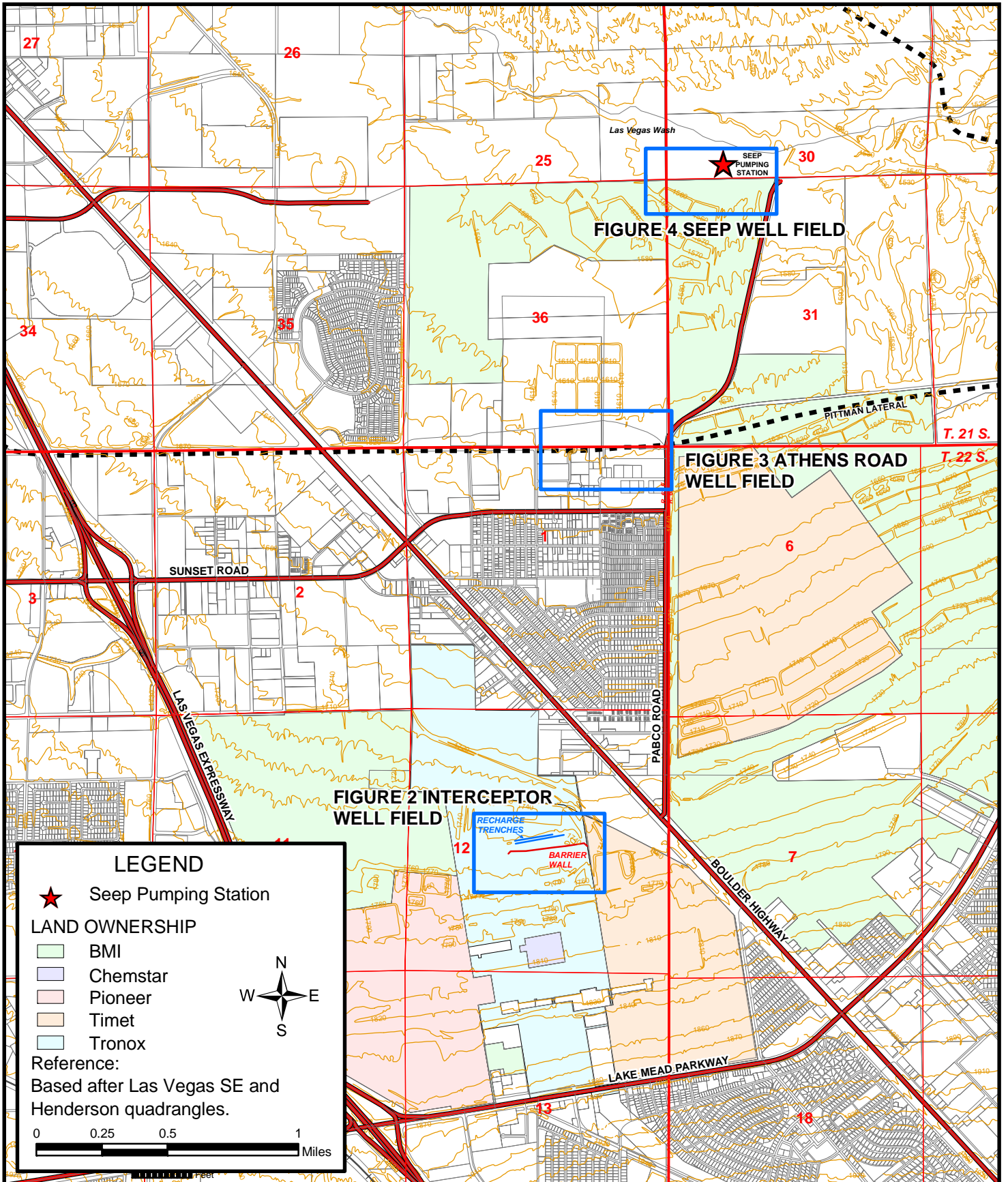
- c. The NDEP requests that the seepage velocity be calculated using hydraulic parameters for comparison. It is requested that TRX also collect physical parameter data in applicable geologic units during the implementation of this Work Plan (e.g.: dry bulk density, specific gravity, etc.). Please discuss this matter with the NDEP at the meeting referenced in the cover letter.

Tronox Response

- a. *“Very low concentrations” are those concentrations that are present in the injected Lake Mead water which have ranged up to 24 µg/L though most recently equate to less than 6 ug/l perchlorate and less than 50 ug/l total chromium concentrations. Perchlorate in the injected water is several orders of magnitude lower than historic concentrations down-gradient of the barrier wall. “Sufficient distance” is the distance from the monitor wells used in the evaluation and the on-site recharge trenches.*
- b. *The bulk of the estimated groundwater velocities generated from both the perchlorate and total chromium decline curves fall within the 1 to 4 ft/day range and the most common velocity estimates is between 1 and 2 ft/day. The highest (11.4 and 12.3 ft/day for perchlorate and total chromium, respectively), and the lowest (0.9 ft/day for perchlorate) estimates were found to be data outliers. TRX therefore does not think that separate groundwater velocities should be calculated for the alluvium, alluvial channels, and the inter-channel areas.*
- c. *Hydraulic conductivity values listed in Appendix B, Tables B-1, B-2, and B-3 were utilized to calculate average and high/low groundwater seepage velocities for the alluvium. The seepage velocity calculations utilized an average gradient of 0.015 and an average porosity of 0.20. The groundwater seepage velocity values for the Interceptor well area (Table B-1), Sunset Road traverse (Table B-2), and Seep (Table B-3) are as follows:*
 - *Interceptor well area: $K= 453 \text{ gpd/ft}^2$ **$v= 4.5 \text{ ft/day}$***
 - *Sunset Road traverse: $K= 565 \text{ gpd/ft}^2$ (average of 10 wells) **$v= 5.7 \text{ ft/day}$** (note: the highest velocity was 9.3 ft/day and the lowest was 2.4 ft/day)*
 - *Seep traverse: $K= 6547 \text{ gpd/ft}^2$ (average of 8 wells) **$v= 65 \text{ ft/day}$** (note: the highest velocity was 341 ft/day and the lowest was 1 ft/day)*

In addition, hydraulic conductivities were taken from onsite well testing conducted in 1986 prior to installation of the initial Interceptor wells. These wells (7) had an average $K= 577 \text{ gpd/ft}^2$ and a calculated seepage velocity of 5.8 ft/day. The highest calculated velocity was 15.5 ft/day and the lowest was 0.5 ft/day.

These seepage velocity values compare well with the groundwater velocity data listed in Table C-1 of Appendix C (0.9 – 12.3 ft/day).



ENSR | AECOM

ENSR CORPORATION
 1220 AVENIDA ACASO
 CAMARILLO, CALIFORNIA 93012
 PHONE: (805) 388-3775
 FAX: (805) 388-3577
 WEB: HTTP://WWW.ENSR.AECOM.COM

LOCATION MAP
 Capture Zone Work Plan
 Tronox Facility
 Henderson, Nevada

FIGURE NUMBER:

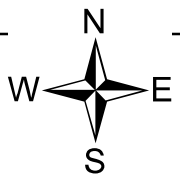
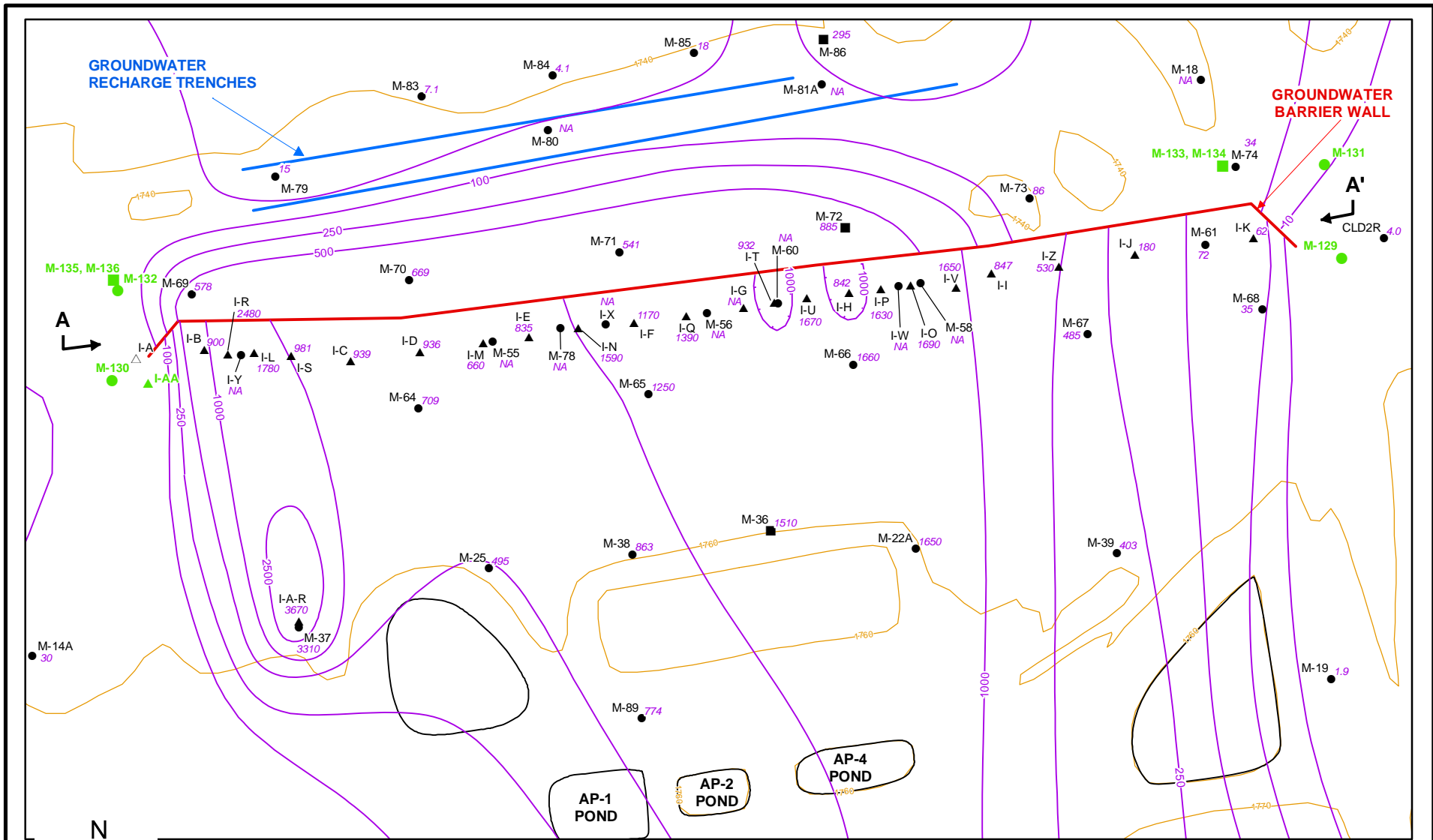
1

DRAWN BY:
 M. Scop

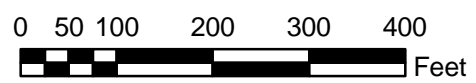
DATE:
 8/27/2007

PROJECT NUMBER:
 04020-023-160

SHEET NUMBER:
 X



SEE FIGURE 5 FOR
EXPANDED LEGEND
ELEMENTS



ENSR | AECOM

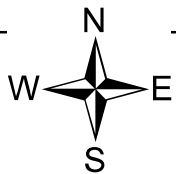
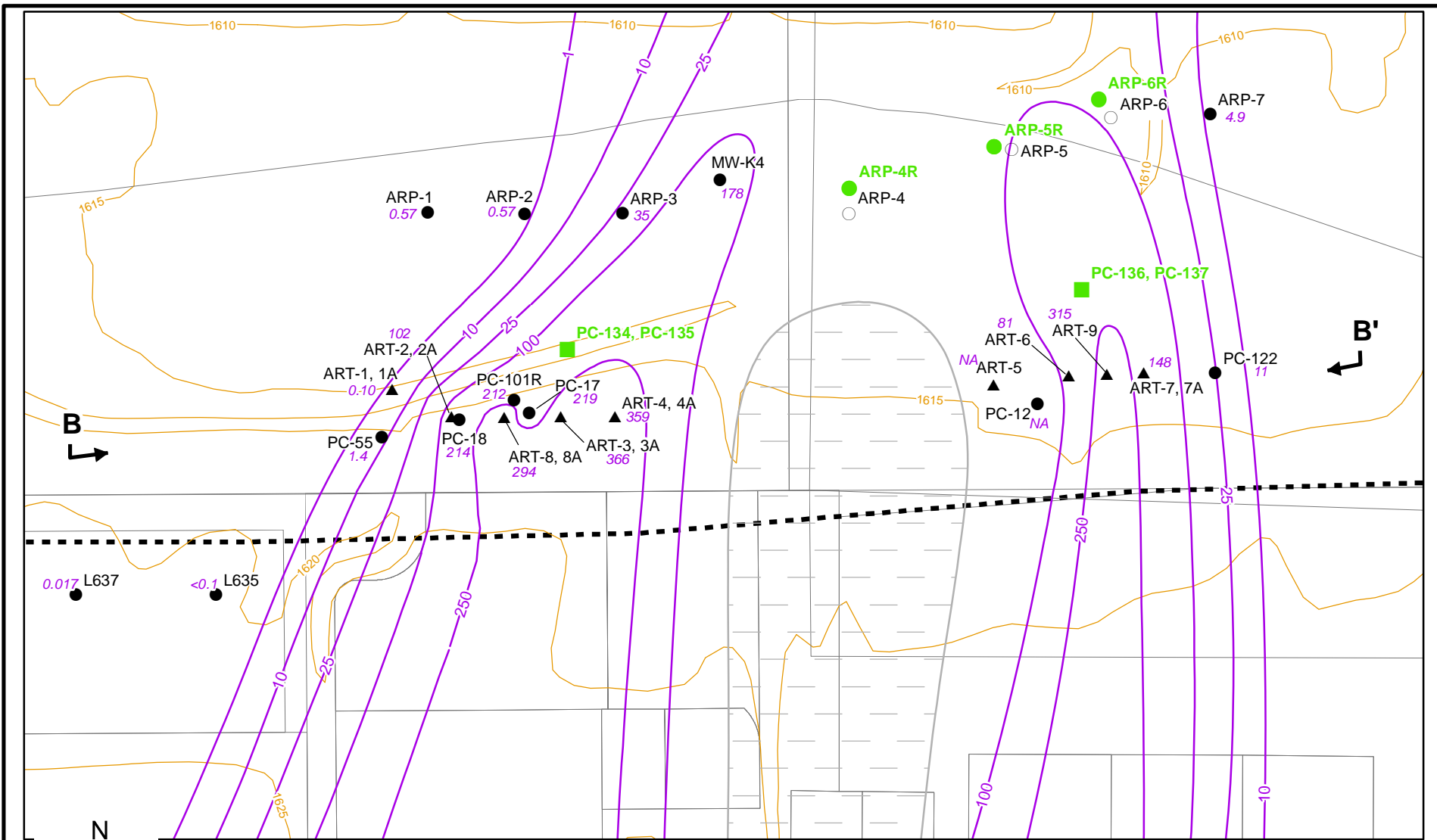
ENSR CORPORATION
1220 AVENIDA ACASO
CAMARILLO, CALIFORNIA 93012
PHONE: (805) 388-3775
FAX: (805) 388-3577
WEB: HTTP://WWW.ENSR.AECOM.COM

**PROPOSED WELLS AT
THE INTERCEPTOR WELL FIELD**
Capture Zone Work Plan
Tronox Facility
Henderson, Nevada

FIGURE NUMBER:

2

DRAWN BY:	DATE:	PROJECT NUMBER:	SHEET NUMBER:
M. Scop	8/27/2007 Rev-1 11/21/07	04020-023-160	X



SEE FIGURE 5 FOR
EXPANDED LEGEND
ELEMENTS



ENSR | AECOM

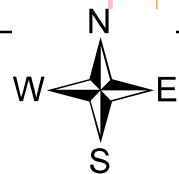
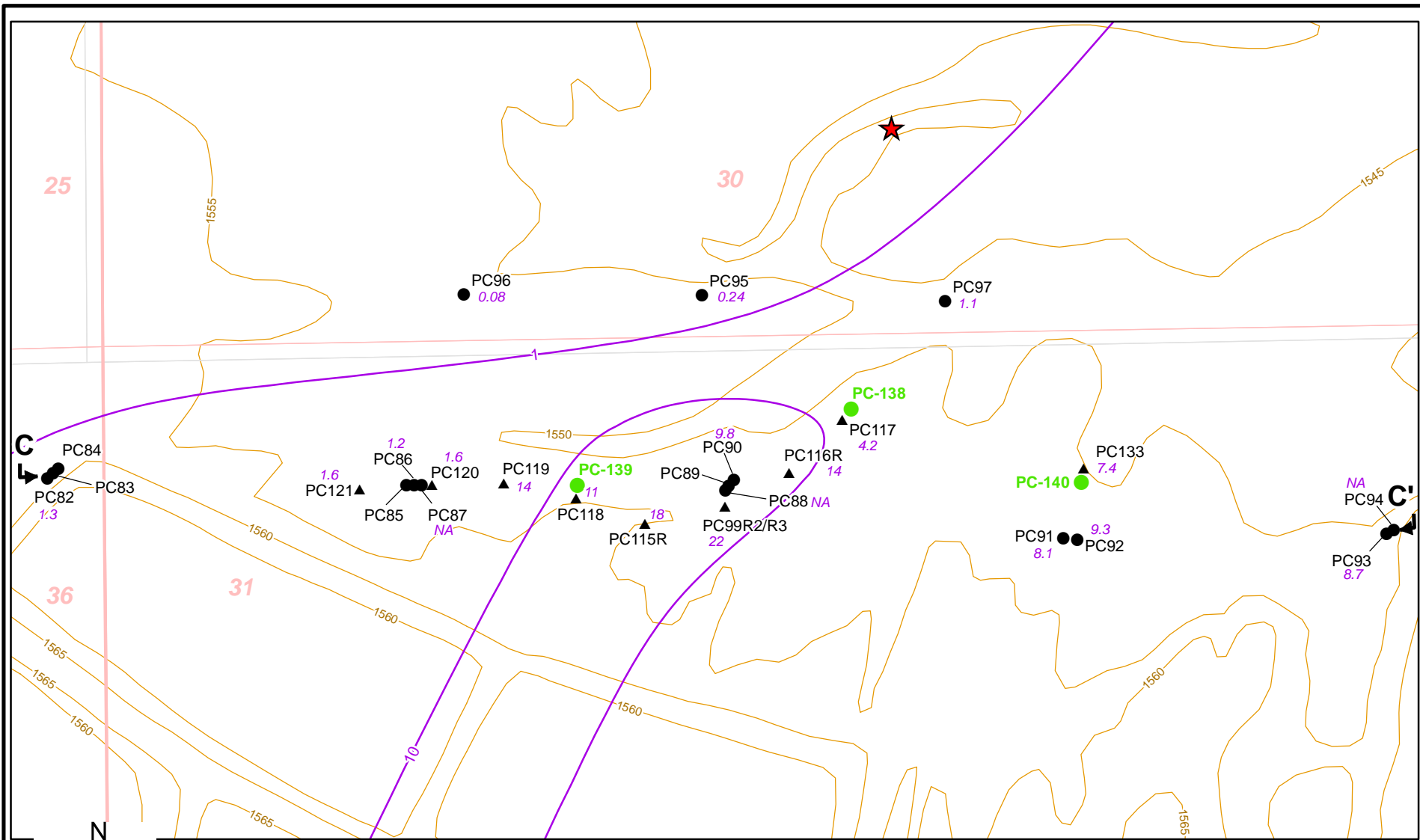
ENSR CORPORATION
1220 AVENIDA ACASO
CAMARILLO, CALIFORNIA 93012
PHONE: (805) 388-3775
FAX: (805) 388-3577
WEB: [HTTP://WWW.ENSR.AECOM.COM](http://www.ensr.aecom.com)

**PROPOSED WELLS AT
THE ATHENS ROAD WELL FIELD**
Capture Zone Work Plan
Tronox Facility
Henderson, Nevada

FIGURE NUMBER:

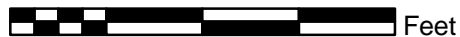
3

DRAWN BY:	DATE:	PROJECT NUMBER:	SHEET NUMBER:
M. Scop	8/27/2007 Rev-1 11/21/07	04020-023-160	X



SEE FIGURE 5 FOR
EXPANDED LEGEND
ELEMENTS

0 50 100 200 300 400



ENSR | AECOM

ENSR CORPORATION
1220 AVENIDA ACASO
CAMARILLO, CALIFORNIA 93012
PHONE: (805) 388-3775
FAX: (805) 388-3577
WEB: HTTP://WWW.ENSR.AECOM.COM

**PROPOSED WELLS AT
THE SEEP WELL FIELD**
Capture Zone Work Plan
Tronox Facility
Henderson, Nevada


FIGURE NUMBER:

4

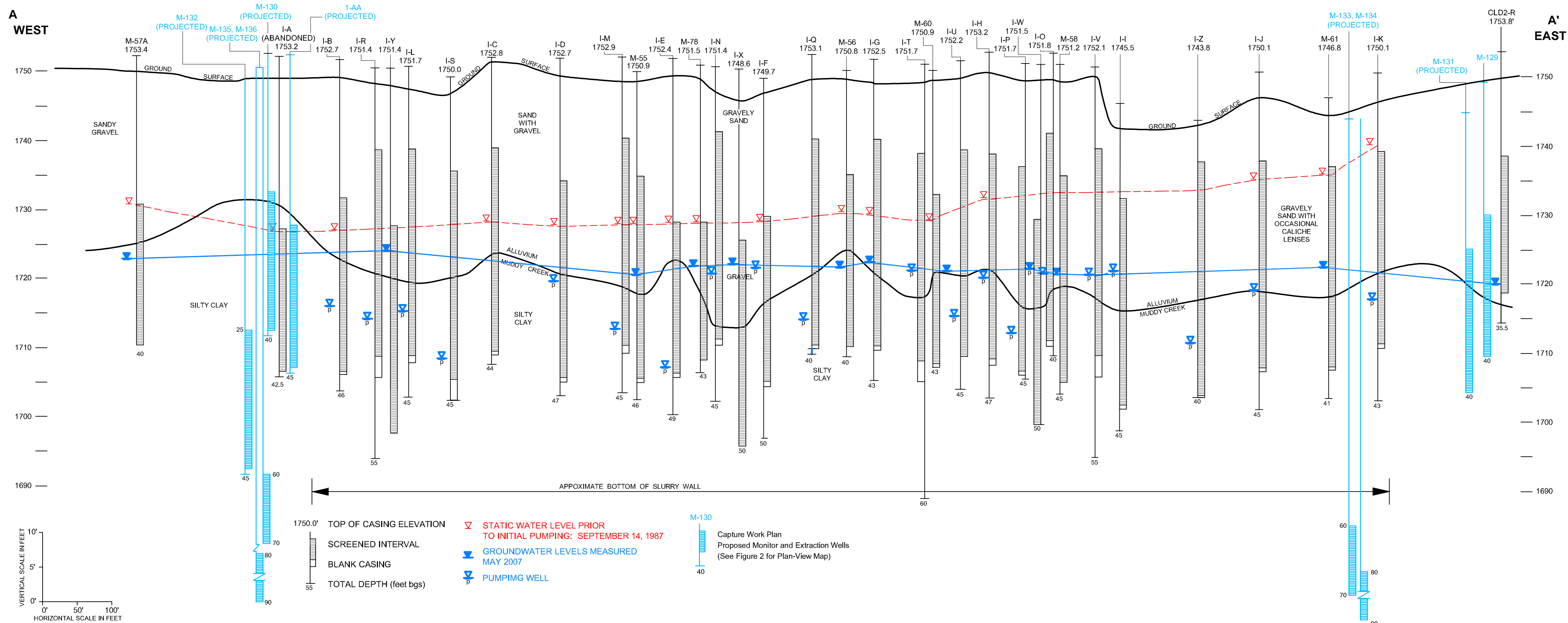
DRAWN BY:	DATE:	PROJECT NUMBER:	SHEET NUMBER:
M. Scop	8/27/2007 Rev-1 11/26/07	04020-023-160	X

LEGEND

- Monitoring Well
 - Appendix J Monitoring Well
 - ▲ Recovery Well
 - Abandoned Monitoring Well
 - △ Abandoned Recovery Well
 - Proposed Monitor Well
 - Proposed Nested Monitoring Well
Wells will be installed either one bore hole or in separate boreholes at in close proximity to one another.
 - ▲ Proposed Recovery Well
 - ★ Well Identification, Two IDs are Provided for Nested Well Locations.
 - ★ Seep Pumping Station
-
- 15 Perchlorate Concentration (mg/L)
May 2007 (ENSR 2007b, Plate 7)
 - Perchlorate Contour (mg/L)
(Dashed where approximate)
May 2007 (ENSR 2007b, Plate 7)
 - Closed Perchlorate Contour (mg/L)
Concentrations are lower inside relative to surrounding values
May 2007 (ENSR 2007b, Plate 7)
 - Unsaturated Alluvium
 - 1760— Topographic Contour Line
 - A A' Line of Hydrogeologic Cross Section
(see figures 6, 7 & 8)

	EXPANDED LEGEND ELEMENTS			FIGURE NUMBER:
	Capture Zone Work Plan Tronox Facility Henderson, Nevada			5
	DRAWN BY:	DATE:	PROJECT NUMBER:	SHEET NUMBER:
M. Scop	8/27/2007 Rev-1 11/26/07	04020-023-160	X	

ENSR CORPORATION
 1220 AVENIDA ACASO
 CAMARILLO, CALIFORNIA 93012
 PHONE: (805) 388-3775
 FAX: (805) 388-3577
 WEB: HTTP://WWW.ENSR.AECOM.COM

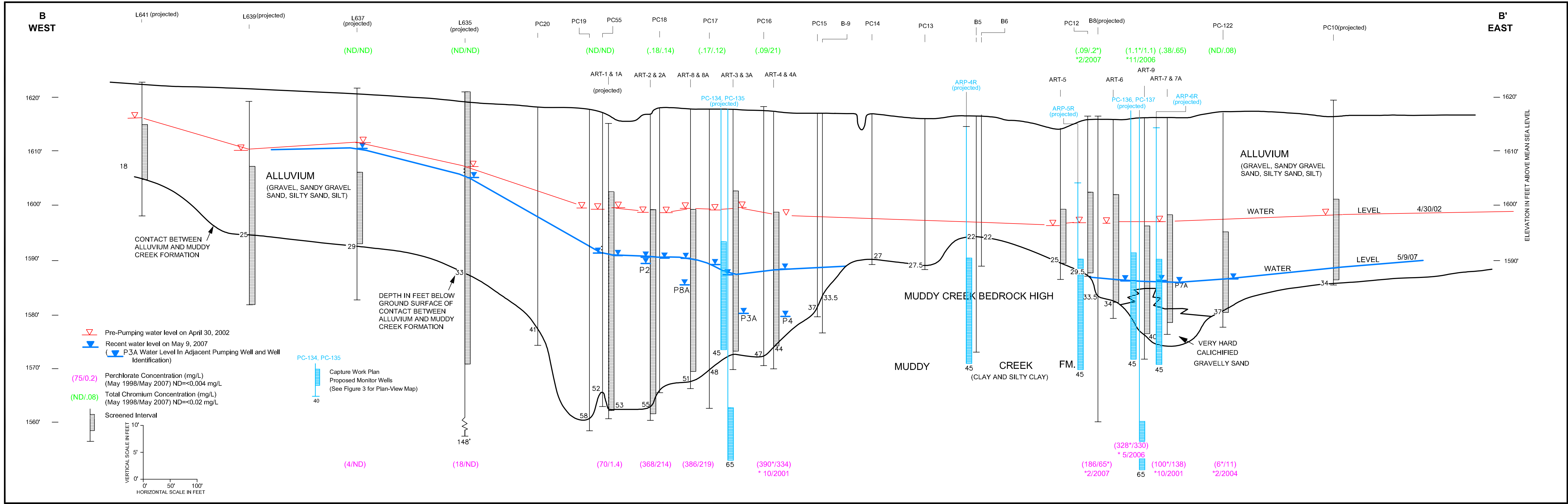


DESIGNED BY:	E. Kish
DRAWN BY:	M. Scop
CHECKED BY:	M. Flack
APPROVED BY:	M. Flack

ENSR | AECOM
ENSR CORPORATION
 1220 AVENIDA ACASO
 CAMARILLO, CALIFORNIA 93012
 PHONE: (805) 388-3775
 FAX: (805) 388-3577
 WEB: HTTP://WWW.ENSR-AECOM.COM

WEST - EAST HYDROGEOLOGIC CROSS SECTION A-A'
INTERCEPTOR WELL FIELD
 Proposed Monitoring Wells
 Capture Zone Workplan
 Tronox Facility, Henderson, Nevada
 SCALE: as noted
 DATE: 7/19/2007
 PROJECT NUMBER: 04020-023-160
 Rev: 11/27/07

FIGURE NUMBER:
6
 SHEET NUMBER:
 X



DESIGNED BY:	E. Krish
DRAWN BY:	M. Scop
CHECKED BY:	M. Flack
APPROVED BY:	M. Flack

ENSR AECOM

ENSR CORPORATION
 1220 AVENIDA ACASO
 CAMARILLO, CALIFORNIA 93012
 PHONE: (805) 398-3775
 FAX: (805) 398-3776
 WEB: HTTP://WWW.ENSR.AECOM.COM

WEST - EAST HYDROGEOLOGIC CROSS SECTION B-B'
ATHENS ROAD WELL FIELD

Proposed Monitoring Wells
 Capture Zone Workplan
 Tronox Facility, Henderson, Nevada

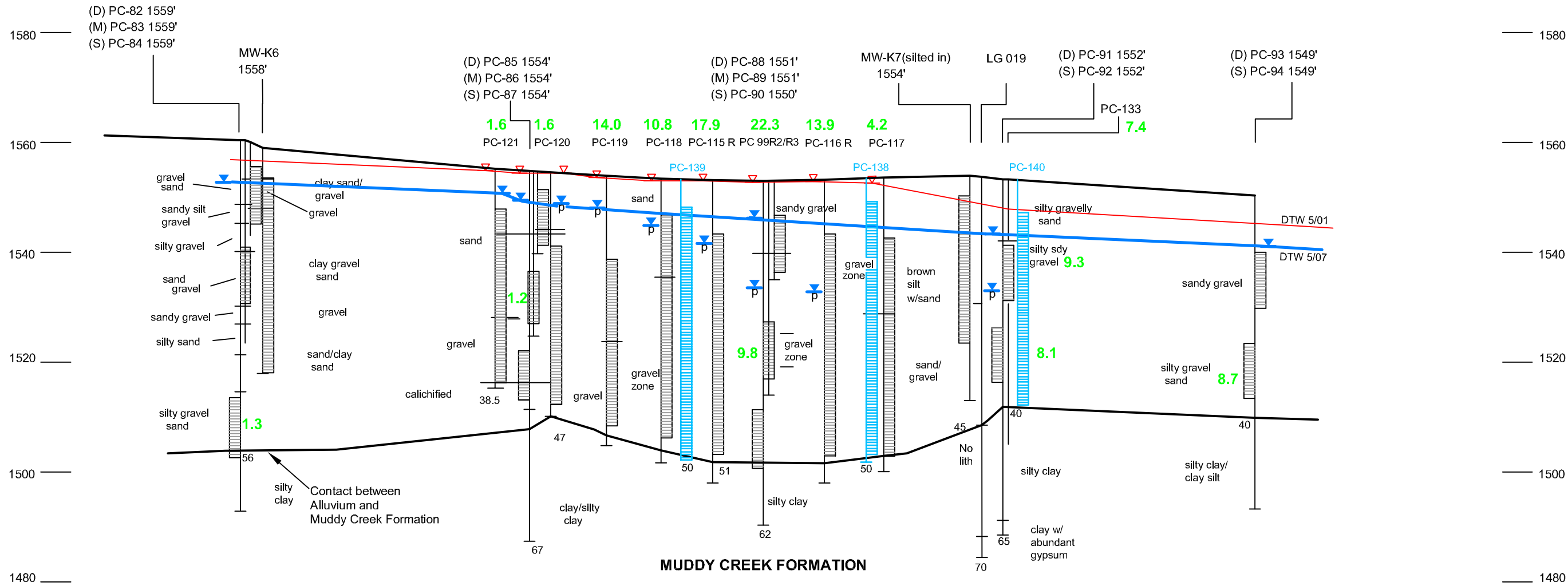
DATE: 1/12/07
 PROJECT NUMBER: 04020-423-160
 SCALE: as noted

FIGURE NUMBER:
7


SHEET NUMBER:
 X


**C
WEST**





**C'
EAST**

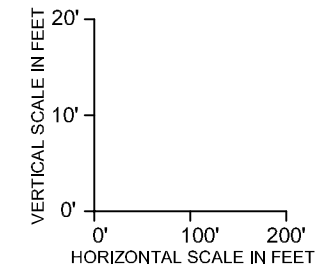


FILENAME:

PC-139

 Capture Work Plan
 Proposed Monitor Wells
 (See Figure 4 for Plan-View Map)

 Screened Interval
 (D) Deep
 (M) Middle
 (S) Shallow

 = Water levels as of May 2007
 = Water levels as of May 2001
 = Perchlorate concentration (ppm) as of May 2007
 = Pumping well May 2007



DESIGNED BY:	E. Krish
DRAWN BY:	M. Scop
CHECKED BY:	M. Flack
APPROVED BY:	M. Flack

ENSR | AECOM

ENSR CORPORATION
 1220 AVENIDA ACASO
 CAMARILLO, CALIFORNIA 93012
 PHONE: (805) 388-3775
 FAX: (805) 388-3577
 WEB: HTTP://WWW.ENSR.AECOM.COM

WEST - EAST HYDROGEOLOGIC CROSS SECTION C-C' SEEP WELL FIELD	
Proposed Monitoring Wells Capture Zone Workplan Tronox Facility, Henderson, Nevada	
SCALE:	as noted
DATE:	7/19/2007 Rev: 1.1/2/07
PROJECT NUMBER:	04020-023-160

FIGURE NUMBER:	8
SHEET NUMBER:	X