

**Part III  
Attachment III-E  
Appendix III-E.5**

**SUPPLEMENTAL SUBSURFACE INVESTIGATION REPORT  
PHASE V**

**Pescadito Environmental Resource Center  
MSW No. 2374  
Webb County, Texas**



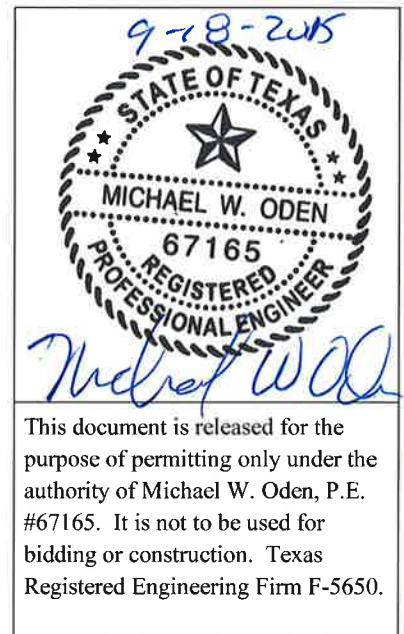
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## 1.0 INTRODUCTION

The purpose of this report is to provide additional information regarding the subsurface soils and groundwater at the Pescadito Environmental Resource Center (PERC) project in Webb County, Texas. Subsurface investigation and geotechnical testing for the PERC project was originally conducted in four phases. The results of the Phases I-IV subsurface investigation and geotechnical testing are presented in Part III, Attachment III-E, Appendix III-E.2, Subsurface Investigation Report (SIR) and Part III, Attachment III-E, Appendix III-E.3, Geotechnical Data Report (GDR). Both reports were originally dated February 25, 2015 and updated in September 2015. That information was provided to meet the requirements of 30 TAC §330.63(e)(4) and §330.63(e)(5)(A-E) and the requirements of the approved Soil Boring Plan.

Subsequent to Phases I-IV, supplemental field work and additional testing (Phase V) has been conducted to provide additional information useful for general landfill design. This supplemental information is provided to address the following:

1. Information limitations imposed by the use of Sonic drilling/sampling methods used predominantly in Phases II and III of the earlier investigations.
2. Obtain undisturbed geotechnical test samples to depths of 150 feet to supplement those from the Phase IV test pits.
3. Obtain additional information about shallow subsurface water and/or groundwater and hydraulic interconnection and to test techniques for annular seal of piezometers and monitoring wells.
4. Reconcile the term “moist” used to describe the Yegua-Jackson (Y-J) soils on the Phase I-III boring logs with the very dry geotechnical test results and subsurface water observations, etc. and specifically the regional geology and soil characteristics.
5. Provide additional information regarding the presence/absence of the Y-J contact within the project boundary.
6. Obtain additional laboratory and field testing to supplement previous investigative results.



## 2.0 PREVIOUS INVESTIGATIONS – PHASES I-IV

The Y-J encountered at the site is predominantly (>90%) “claystone” with minor amounts of “sandstone” and “siltstone.” The encountered Y-J materials appear “rock-like” due to the fact that they have been heavily over-consolidated during their geologic history. In essence they are “compaction” claystones as opposed to cemented claystones. However, when exposed to the elements for a brief period or when processed, these rock-like materials quickly regain their soil identities. This rapid transformation is due to the fact that the “claystones” have a blocky, intensely-fissured structure (see Photo 1 - Test Pit - January 2012). A good example of the transformation is evident from the Phase IV test pits (See Photo 2 - Test Pit 1 January 2015 below). Other examples are the various dams constructed in the immediate area where only the Y-J colors remain, the rock-like materials have transformed back to soil.



**Photo 1 - Test Pit 1 - January 2012**



**Photo 2 – Test Pit 1 - January 2015**

### **2.1.1 Sonic Drilling Limitations**

Sonic drilling is a recognized method for geoenvironmental drilling (ASTM D6914-04 (2010)) suitable for meeting the requirements of the Municipal Solid Waste Management Regulations (MSWMR). However, the Sonic drilling/sampling methods used predominantly in Phases II and III of the earlier investigations imposed certain limitations. The method does not provide “undisturbed” samples for such geotechnical testing purposes as strength, consolidation, or permeability. In the earlier investigations, two deep test pits (Phase IV) were utilized to obtain representative, undisturbed test samples of all four identified subsurface strata for subsequent laboratory testing.

The SIR and GDR discuss the following issues that are now further addressed by this Report:

- *SIR, § 2.2.1 Soil Borings* discusses both the advantages and the limitations of the Sonic drilling methodology.
- *SIR, § 2.2.2 Piezometers* discusses the possible ramifications, i.e., formation disturbance, etc., of setting piezometers in borings drilled in the Y-J with Sonic methods.
- *SIR, § 4.2.2 Water Levels Measured in Piezometers* assumed vertical hydraulic connection between near-surface and deeper stratigraphic units as a consequence of Sonic drilling. Note that this assumption is a significant variance from the Y-J Groundwater Availability Model (GAM) (TWDB, 2010)
- The annular seal in all Phase I-III piezometers consisted of “granular bentonite chips” added from the surface. *SIR, Appendix F, Piezometer Construction Diagrams*. There does not appear to have been any attempt to address the possible formation damage and caving due to the Sonic drilling by the use of pressure grout from the bottom to the top.

### **2.1.2 Subsurface Water Information**

Some of the field descriptions of cores from the previous Phases I to III boring logs described the subsurface conditions as “moist”, but approximately 200 Atterberg Limit and natural moisture content determinations showed that moisture contents were consistently dry of the Plastic Limit. In fact, natural moisture contents were seven to eight percentage points (on average) below the Plastic Limit. (GDR, *§ 5.0 Conclusions*, R-K, 2015). In general, the following is noted regarding the Phase I to IV investigations:

- The Phase I to III piezometer installations showed comparable stable water levels regardless of the installed depth (*SIR, § 4.2.2 Water Levels Measured in Piezometers*, R-K, 2015).
- The Phase IV Test Pits encountered slight seepage in TP-1 associated with the Recent-Pleistocene (R-P) and Y-J contact zone during excavation; however, TP-1 was left open and the seepage dried up overnight and no accumulation occurred. TP-2 did not encounter shallow subsurface water. (*SIR, § 4.2.4 Observations from Test Pits*, R-K, 2015).

- Note that the landfill design assumes the water level at the ground surface as a conservative measure.

### 2.1.3 Hydrogeologic Testing of Phase III Piezometers

Part III, Attachment III-E, Appendix III-E.4, *Summary of Hydrogeologic Testing in Selected Piezometers* discusses the hydrogeologic testing that was conducted in ten piezometers installed as part of the Phase III site investigation at the site. The Phase III piezometers were installed in what appeared to be potentially transmissive zones, i.e., isolated sandy and/or silty intervals in the predominantly clay matrix based on the evaluation of the previous Phase I, II, and III boring logs and geophysical data. Information on the piezometer installations can be found in Part III, Attachment III-E, Appendix III-E.2, *Subsurface Investigation Report*. The hydrogeologic tests on select piezometers included falling head and rising head tests induced by inserting and removing solid slugs (i.e., slug tests). Based on the results of the slug tests, a subset of five piezometers indicating the highest transmissive potential were selected for additional higher-stress, single-well, pump-down tests.

The test results, including those from what were the most transmissive units in the subsurface, as determined by the borings and geophysical logs, showed that subsurface conditions are not transmissive. In fact, all of the test results were in the poorly permeable to practically impervious range as defined by Terzaghi, Peck, and Mesri [3rd Edition, 1996] and others. That is, the pump down tests proved that the materials that were indicated to be the most transmissive, were not very transmissive at all.

### **3.0 PHASE V INVESTIGATION**

As discussed above, the Phase V investigation was developed and implemented to obtain additional information regarding the soils and subsurface water at the site for design considerations. The information is presented to update and augment the information previously presented to meet the MSWMR.

#### **3.1.1 Field Investigation**

The field portion of the Phase V Investigation was conducted in January and February, 2015. A total of three core (sample) borings were drilled as shown on Figure 1 in Attachment A to this Appendix III-E.5 (Figure III-E.5-A.1 in Attachment III-E.5-A to this Appendix). The borings have been included (annotated) on the cross sections previously provided in Appendix III-E.2 (SIR) for comparison purposes. They are included as Figures III-E.5-A.2 and 3 in Attachment III-E.5-A.

A large truck-mounted Gardner-Denver Model 15W drilling rig was used. Sample borings were drilled to an approximate depth of 150 feet. A total of five piezometers were set – four of the piezometers were set in “twin” holes adjacent (approximately 0 – 50 feet away) to the sample boring locations. All drilling and piezometer installation was performed by a Texas-Licensed Water Well Driller under the direction of a Professional Geologist (PG) with over twenty seven years of experience employed by CB&I. The PG, licensed in Illinois, Indiana and Wisconsin, also logged the samples as they were obtained and prepared them for shipment for review and laboratory testing. See the Phase V Logs of Borings included as Attachment B to Appendix III-E.5 (III-E.5-B). The drilling method used was primarily “air rotary” with “mud-rotary” used in one instance. Surface casing was employed to “seal” down to below the highly-weathered Y-J and particularly, the “contact zone” between the R-P and Y-J to minimize the intrusion of shallow subsurface water, eliminate shallow caving of unconsolidated materials and fall-in of any gravel potentially damaging to either the core bit or the core recovery. At B-52, a watertight seal was not obtained and the combination of minimal amounts of water combined with highly plastic clay cuttings required a switch to mud rotary drilling.



Sample drilling of the Y-J was conducted using a conventional Christensen 4-5/8 x 3-inch double tube core barrel employing a face-discharge ChrisDril bit and equipped with a split inner barrel. See photos 1 and 2 in Attachment C to this Appendix (III-E.5-C). Sample borings were cored continuously to the total depth with the recovered core being 3-inches in diameter. Both core recovery (as a percent) and Rock Quality Index or RQD (as a percent) are provided for each core run on the boring log. Recovered core was logged along with drilling observations, etc. Core samples were packaged and placed in waxed core boxes specifically manufactured for core storage. Visual reference samples were placed in glass jars. Boring B-58 was converted to a piezometer while borings B-55 and B-52 were pressure grouted from the bottom to top using a tremie and bentonite grout.



**Photo 3 - Grouting Boring B-52 – January 2015**

Two piezometers were set at the B-52 location – P-52S or shallow and P-52D or deep. Both piezometers were drilled with air rotary in separate holes for accurate subsurface water identification possibly unavailable from the original B-52 boring. Since the original B-52 was drilled using mud-rotary techniques, the process could have masked the identification of limited subsurface water and produced the results shown as moist on the log of borings. The "twin" holes were also used to avoid potential problems associated with plugging the original borehole back up to the desired screen interval.

Piezometer P-55D was also set in a separately drilled "twin" hole in lieu of plugging (grouting) boring B-55 back up to the screened interval. Piezometer P-58D was set to the full depth in boring B-58 and the shallow piezometer P-58S was set in an adjacent "twin" hole. Two-inch diameter piezometers were set in holes that were drilled using a 6-1/4-inch drag or wing bit (including the reaming of B-58 for piezometer installation). Nominal 10-foot long screens, centered in a 15-foot filter-packed interval, were used for all piezometers. The annular seal was provided using a grout pump and tremie to place bentonite grout from the bottom to top. For the shallow piezometer installation P-52S, the annular seal was constructed from bentonite chips placed in 6-inch lifts and hydrated. Piezometer data sheets are included in Attachment III-E.5-D. Copies of well reports furnished to the Texas Department of Licensing and Regulation (TDLR) are included in Attachment III-E.5-E.

**Table 1 – Piezometer Construction Summary**

<b>Piezometer</b>	<b>Screened Unit</b>	<b>Total Depth Interval (feet bgs)</b>	<b>Screened Interval (feet bgs)</b>
P-52S	Shallow, Wet Sandstone	30	18-28
P-52D	Deep, Dry Sandstone	92	80-90
P-55D	Deep, Wet Sandstone	105	93-103
P-58S	Shallow, Wet Claystone	35	20-30
P-58D	Deep, Dry Claystone	150	140-150

Upon completion of piezometer installation, either falling head tests (piezometers P-52S, P-52D, P-55D, and P-58D) and/or rising head tests (piezometer P-58S) were conducted for at least twenty-four hours to verify piezometer functionality. The results of those tests are discussed below.

### 3.1.2 Subsurface Water Observations

Observations of subsurface water were of particular interest during this investigation since almost all strata in the previous Phase I-III borings were logged as “moist”; while subsequent geotechnical testing on the materials consistently showed moisture contents 7 to 8 percentage points below the plastic limit. Further, excavated materials were dry and there was an absence of water in the Phase IV test pit excavations. This difference may be related to the fact that significant water amounts were added downhole during the Phase II and III Sonic drilling activities because of the very dense, overconsolidated subsurface materials. This water addition may have created a wet skin on recovered samples that were logged as “moist.”

For Phase V, observations of subsurface water were made during the drilling of the holes and examination of the recovered samples after boring completion and during installation of the piezometers and piezometer installation. The use of air rotary drilling was the preferred method to aid in these observations since no water was introduced.

#### During Core Drilling

- Boring B-52 began with air-rotary drilling and encountered limited amounts of subsurface water associated with the Y-J and R-P contact zone at about the 10-foot depth. The underlying Y-J was mostly sandstone to approximately 28 feet. A surface casing was set to 20 feet and was ineffective in eliminating water entrance into the boring. To assist in efficiently removing the clay cuttings as the core hole was advanced, the coring technique was switched to mud rotary and continued to the termination depth of 150 feet. However, all core was logged as dry upon close examination using the standard technique of carefully removing any “skin” from the core surface before field examination (see photographs in Attachment III-E.5-C of this Appendix).
- Boring B-55 used air-rotary drilling to core all the way down to the completion depth of 153 feet. Moist soil materials were encountered in Shelby Tube samples down to the R-P and Y-J contact zone (approximately 11 to 12 feet in depth); however, no shallow subsurface water was encountered. While reaming out the borehole for the surface casing, moisture was indicated in the cuttings from approximately the 10-foot depth. Surface casing was set to 17



feet. Moisture was noted in some of the recovered core samples and small amounts of water were observed at several intervals during drilling; notably 32 to 36 feet and 95.5 to 101 feet.

- Boring B-58 used air-rotary drilling to core all the way down to the completion depth of 150 feet. Moist soil materials were encountered in Shelby Tube samples down to the R-P and Y-J contact zone (approximately 11 to 12 feet in depth); however, no shallow subsurface water was encountered. Moisture was noted in some of the recovered core samples and small amounts of water were observed at several intervals during drilling; notably 12 to 17 feet, 22.5 to 30.5 and 32 to 32.3 feet.

Select photos of the core material are included as Attachment C to this Appendix (III-E.5-C).

#### During Piezometer Installation

- Piezometer P-52S was installed in a twin borehole some 10 feet west of boring B-52. The 30-foot-deep piezometer boring was drilled with air. Moisture was observed in the cuttings at approximately the 22-foot depth during drilling; however, the hole was dry at the completion of drilling activities.
- Piezometer P-52D was installed in a twin borehole some 30 feet west of boring B-52. Surface casing was set to a depth of 30 feet. The 92-foot-deep piezometer boring was drilled with air. Moisture was observed in the cuttings at approximately the 40-foot depth during drilling; however, the hole was dry at completion of drilling.
- Piezometer P-55D was installed in a twin borehole approximately 40 feet southwest of boring B-55. Surface casing was set to a depth of 45 feet. The 105-foot-deep piezometer boring was drilled with air. Moisture was observed in the cuttings at approximately the 32 to 36-foot and 90 to 105-foot depth intervals during drilling; however, the hole was dry at completion of drilling.
- Piezometer P-58S was installed in a twin hole approximately 30 feet northwest of boring B-58. No moisture was observed during drilling of the twin hole with air rotary to a depth of 35-feet; however, slight water entered the hole during piezometer installation.

- Piezometer P-58D was set in the B-58 borehole to 150-feet. Surface casing was set to a depth of 40 feet. No moisture was observed at depth during coring or during reaming for the piezometer installation.

#### After Boring and/or Piezometer Completion

- Boring B-52 took several days to complete drilling. Water levels were taken each day prior to the resumption of drilling. Water levels were approximately 8 feet below ground surface (bgs). Water levels observed in piezometers P-52S and P-52D were approximately the same as in boring B-52.
- Boring B-55 took several days to complete drilling. Water levels were taken each day prior to the resumption of drilling. Water levels were approximately 7 to 10 feet bgs. Water levels in piezometer P-55D was approximately the same as in boring B-55.
- Boring B-58 took several days to complete drilling. Water levels were taken each day prior to the resumption of drilling. After the first day, the 40-foot deep hole was dry. After the second day, water was at 22 feet bgs in the 105-foot deep hole. Water levels in piezometer P-58D measured over several days were approximately 116 feet bgs prior to the falling head test. The piezometer P-58S water level was approximately 23 feet bgs prior to the rising head test.

#### **3.1.3 Piezometer Recovery Testing Results**

Although primarily intended to verify piezometer functionality, the falling head and or rising head testing did provide an opportunity for evaluating the in situ permeability (hydraulic conductivity) of the Y-J materials represented in the screened interval of piezometers P-52S, P-52D, P-55D, and P-58S. Not unexpectedly, the time lag for piezometer P-58D was so large that a 28-hour test provided insufficient recovery for reasonable analysis. For hydraulic conductivity analyses, Hvorslev's Method "F" was used along with the standard assumption that horizontal permeability is ten times (an order of magnitude) greater than vertical permeability. Method F is probably most appropriate for the piezometers screened in discrete sand units, i.e., the discrete sandstone unit piezometers, P-52S, P-52D and P-55D whereas Method G, i.e., uniform

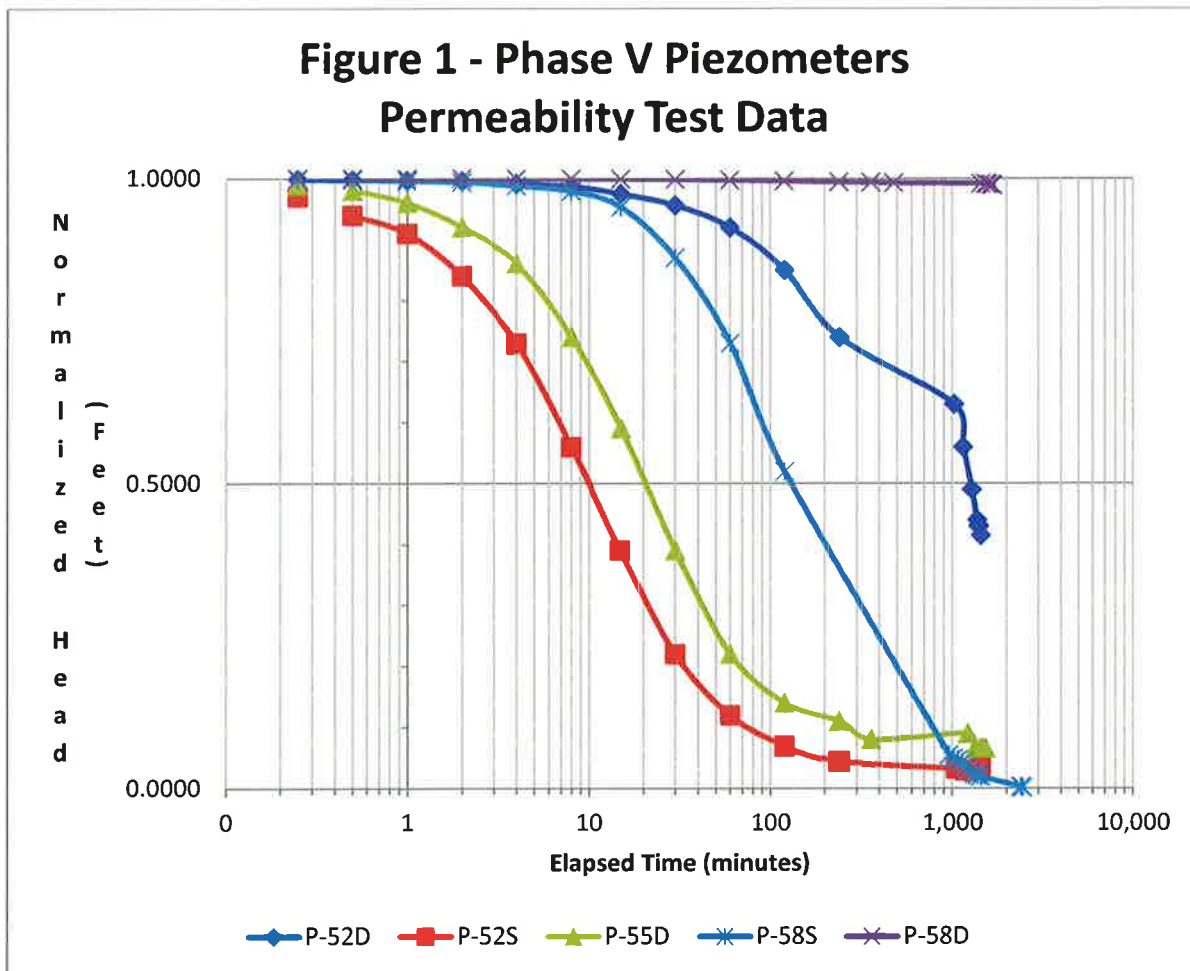
conditions, might be more appropriate for the general claystone matrix piezometers, P-58S and P-58D. However, Method F will estimate a permeability about 10% higher than Method G and thus its use is conservative. Note that if an anisotropy ratio of 100 had been assumed, which is more consistent with the Y-J GAM, the horizontal permeability would increase approximately 20% when compared to an anisotropy ratio of 10. Based on the recovery test data, calculated horizontal permeabilities are as follows:

<b>Piezometer</b>	<b>Screened Unit</b>	<b>Test Type</b>	<b>Initial Test Head, H<sub>0</sub> (feet below TOC)</b>	<b>Test Duration (hours)</b>	<b>Equilibrium Reached? (Y / N)</b>	<b>Recovery (%)</b>	<b>Horizontal Permeability (cm/sec)</b>
P-52S	Shallow, Wet Sandstone	Falling Head	11.63	24	Y	>99	3.21x10 <sup>-5</sup>
P-52D	Deep, Dry Sandstone	Falling Head	11.29	24	N	>58	6.91x10 <sup>-7</sup>
P-55D	Deep, Wet Sandstone	Falling Head	10.28	25.45	Y	>99	1.64x10 <sup>-5</sup>
P-58S	Shallow, Wet Claystone	Rising Head	25.38	43	Y	100	3.81x10 <sup>-6</sup>
P-58D	Deep, Dry Claystone	Falling Head	118.56	28	N	<1	NA

Piezometer Test Data:

Piezometer recovery test data was obtained through February 14, 2015 for all five of the Phase V piezometers. Although recovery was not complete for all tests, the data for four piezometers was sufficiently complete for analysis. Semi-logarithmic plotting of the data indicated a classic or typical response with a good straight-line section in the middle of the signature. Points defining the ends of the straight lines on the graphs were picked from the tabular data. In addition, all data were tabulated and plotted in “normalized” form, i.e., the piezometer head reading at a given time was divided by the head reading at time zero. This procedure allows comparative

plotting of all piezometer tests to the same scale and is a useful tool to compare differences between geologic units, etc. See Figure 1.



Methodology:

Hvorslev’s Variable Head Method “F” (Hvorslev, 1951) was selected for the preliminary analysis. Method F may provide a more realistic estimate for a “sand” unit between “confining layers.” In addition, Method F provides a more conservative (higher) estimate of horizontal permeability than Method G. It should be noted that Method G is for a screen / filterpack in a uniform matrix without confining layers. Method G would also be potentially more applicable to the conditions at P-58S set in a shallow moist claystone interval. The Anisotropy ratio,  $m$ , was based on the typical assumption that horizontal permeability is at least 10 times the vertical permeability for bedded sedimentary materials. Note also that by assuming an anisotropy ratio

of 10 results in a higher calculated horizontal permeability than would be calculated assuming equal permeabilities in both the horizontal and vertical directions (therefore conservative for this purpose).

Piezometer Calculations:

Calculations were made using the filter pack length (recommended). All piezometers have the same construction dimensions. Applicable parameters (dimensional data and assumed anisotropy) used in the calculations are as follows:

- **d** (screen / riser diameter) = 2 inches = 5.08 cm
- **D** (borehole / filter pack diameter) = 6.5 inches = 16.51 cm
- **L<sub>s</sub>** (screen length) = 10 feet = 304.8 cm
- **L<sub>fp</sub>** (filter pack length) = 15 feet = 457.2 cm
- **k<sub>h</sub>** (horizontal permeability) = to be calculated in cm/sec
- **k<sub>v</sub>** (vertical permeability) = assumed to be k<sub>h</sub>/10
- **m** (transformation ratio) = (k<sub>h</sub> / k<sub>v</sub>)<sup>1/2</sup> = 3.162
- **m · L/D** = 58.38 (based on screen length) or 87.56 (based on filter pack length)
- **H** = piezometer reading relative to still water level (SWL) in cm at elapsed time, **t**
- **t** = elapsed time corresponding to piezometer level reading in seconds

Since  $2 \times m \times L/D \gg 4$ , then Hvorslev's Equation [Method "F"] can be simplified to:

$$k_h = \left( \frac{d^2 \times \ln \left( 4 \times m \times \frac{L}{D} \right)}{8 \times L \times (t_2 - t_1)} \right) \times \ln(H_1 \div H_2)$$

Since the construction dimensions are the same for all piezometers, Hvorslev's Method F Equation, for the filter pack length based calculations, can be expressed as:

$$k_h = 0.041336676 \text{ cm} \times \ln(H_1/H_2) \div (t_2 - t_1)$$

Calculations are summarized in the Table below:

<b>Piezometer (Piez.)</b>	<b>Elapsed Time, t<sub>1</sub> (minutes)</b>	<b>Elapsed Time, t<sub>2</sub> (minutes)</b>	<b>t<sub>2</sub> – t<sub>1</sub> (sec)</b>	<b>Piez. Head, H<sub>1</sub> (ft)</b>	<b>Piez. Head, H<sub>2</sub> (ft)</b>	<b>H<sub>1</sub>/H<sub>2</sub></b>	<b>Method F k<sub>h</sub> (cm/sec)</b>
P-52S	4	30	1,560	8.46	2.52	3.3571428	3.21x10 <sup>-5</sup>
P-52D	1025	1440	24,900	7.11	4.69	1.5159915	6.91x 10 <sup>-7</sup>
P-55D	8	60	3,120	7.65	2.22	3.4459459	1.64x10 <sup>-5</sup>
P-58S	60	120	3,600	10.9	7.82	1.3938619	3.81x10 <sup>-6</sup>

Note that Hvorslev’s Method G Equation, for the filter pack length based calculations, can be expressed as:

$$k_h = 0.03644527 \text{ cm} * \ln (H_1/H_2) \div (t_2 - t_1)$$

and, Hvorslev’s Method F Equation, for screen length based calculations, can be expressed as:

$$k_h = 0.057713842 \text{ cm} * \ln (H_1/H_2) \div (t_2 - t_1)$$

### 3.1.4 Geotechnical Test Results

Surface material from where Test Pit 1 was backfilled after excavation, afforded an opportunity to observe landfill component materials in a “processed” state. Geotechnical testing, consisting of Atterberg Limits and Percent Passing the No. 200 Sieve, was conducted on two bulk samples of backfill from the Test Pit #1 location where they had weathered in place since the original construction in early 2012. The bulk samples collected represented two predominant types of material – Green Clay (CH) and Red Clay (CH) – resulting from the pit excavation. Plasticity Indices were 59 to 60 and Percent Passing the No. 200 Sieve ranged from 75 (green clay) to 98 (Red Clay). Significantly, exposure to weathering had completely transformed the clays from their original rock-like appearance to near-homogeneous soils. See Photos 1 and 2 above. The appearance of test pit backfill material is similar to the constructed pond dams and other drainage features on site.

Geotechnical testing was conducted on representative samples of materials encountered in all three Phase V borings. Results of the testing can be found in Appendix III-E.5-F and are as follows:

- Atterberg Limits (ASTM D4318) – Thirty-two tests were conducted. With the exception of one non-plastic result, the remaining thirty one tests showed a consistent relationship when plotted on a Plasticity Chart commonly used as part of soil classification. The plotted data was consistent with previous Phases I-IV results. It is noted that all of the data plots well above the “A-Line” and only eight results had Liquid limits less than 50, i.e., the majority of the tested materials were highly plastic.
- Moisture Content (ASTM D2216) – Thirty moisture content determinations were made. Twenty-six of the moisture content tests were on samples that were also tested for Atterberg Limits. A comparison of moisture contents to Plastic Limits indicated moisture contents averaging nine to ten percentage points below the corresponding Plastic Limit, i.e., the *in situ* moisture conditions are very dry and indicative of significant over-consolidation.
- Percent Passing the No. 200 Sieve (ASTM D422) – Fourteen tests were conducted on samples that appeared to have some coarse-grained material. Percent passing the No. 200 sieve varied from 18 to 100 percent. Predictably, materials with a lower percentage passing the No. 200 sieve also exhibited the lower plasticities.
- Unconfined Compressive Strength (ASTM D2166) – Four unconfined compression tests were run on undisturbed samples. Compressive strengths ranged from 31.1 to 124.9 tons per square foot (tsf). The unconfined compression test results confirm that the subsurface materials are heavily over-consolidated or pre-consolidated over geologic time. It is concluded that foundation strata are strong and incompressible.
- Permeability tests (ASTM D5084-10) – Four tests were conducted on undisturbed samples to determine their vertical-axis permeability. Three test results indicated permeability (hydraulic conductivity) in the  $10^{-9}$  to  $10^{-11}$  cm/sec range. A fourth test result was in the  $10^{-7}$  range; however, testing of that sample was delayed in the laboratory and micro-cracking was observed in the test specimen that could have affected the test result.

#### **4.0 Yegua-Jackson Boundary Definition**

A common basis for distinguishing between the Yegua and Jackson has been to assign the lowest predominantly sandstone strata to the Jackson. A review of the NRCS Web Soil Survey “Parent Material Name” mapping indicated that soils on higher elevation areas to the north, east and south of the site were derived from sandstone. With respect to Figure 4 in Attachment III-E.5-A (III.E-5.A-4), these sandstone-derived soils are the Aguilares (AgB) and Copita (CpB) soils. Similarly, the NRCS indicates that soils in the lower elevation “salt flat” and areas to the west of the site were derived from shale. The previous Phase I-IV investigations and associated site reconnaissance had established that the soils in the flat areas dominating the site are clayey in nature to a significant depth with only a few isolated sand units. During the Phase V investigation, a site reconnaissance was conducted in the elevated areas immediately to the north, east, and south of the salt flat area. The site reconnaissance of those elevated areas found a distinct sandy character to the surface soils and a significant change in vegetation compared to the lower elevation “salt flat” that covers most of the PERC site.

Based on the Phase V site reconnaissance, evidence suggests that most of site is located just below the Yegua-Jackson boundary (in the Yegua formation) due to surface erosion and remnants of the Jackson that surround the site at higher elevations.



## 5.0 Subsurface Water Quality Information

In July 2010, subsurface water samples from Phase I and II borings B-1, B-2, B-6, B-10, B-13, B-18, and the deep ranch well, were analyzed for:

- Aluminum
- Chromium
- Copper
- Iron
- Manganese
- Silver
- Zinc
- Chloride
- Fluoride
- Nitrate as N
- Sulfate
- pH
- Specific Conductance
- Total Dissolved Solids

With the exception of the deep ranch well with a Total Dissolved Solids (TDS) content of 2,100 mg/L, the remaining shallow subsurface water samples had TDS in the range of 34,600 to 66,600 mg/L. Chloride ranged from 22,600 to 37,800 mg/L for the shallow subsurface water samples.

In March 2011, additional subsurface water samples from Phase I and II borings B-1, B-2, B-6, B-10, B-11, B-13, B-18, B-24, B-26, B-27, and surface water samples from Burrito Tank (T-1) and the unnamed tank (T-2) above Burrito Tank, were analyzed for:

- Fluoride
- Chloride
- Nitrate as N
- Sulfate
- Specific Conductance
- pH

The shallow subsurface water samples had Chloride ranging from 12,000 to 31,800 mg/L.

A commonly used classification system for water based on TDS and Conductivity is as follows:

- Fresh <1,000 mg/L TDS
- Brackish  $\geq 1,000$  to <10,000 mg/L TDS
- Saline  $\geq 10,000$  to <30,000 mg/L TDS
- Brine  $\geq 30,000$  mg/L TDS
- Sea Water  $\sim 55,000$   $\mu\text{mhos/cm}$

Based on the above classification system, the shallow subsurface water would be classified as saline or brine and the deep ranch well would be classified as brackish based on the July 2010 analysis. Only the two surface water bodies contain water that could be considered fresh.

Additionally, sea water is anticipated to have conductivity values of around 55,000  $\mu\text{mhos/cm}$ . Except for the ranch well, conductivity values from the subsurface water tests for July 2010 ranged from 60,300 to 114,000. Values for subsurface water in March 2011 ranged from 55,100 to 84,100. See results of the subsurface water quality testing in Appendix III-E.5-G.

## 6.0 CONCLUSIONS

The Phase V subsurface investigation was successful in meeting the desired objectives. The following conclusions have been determined from this effort.

**Drilling and sampling** – With a single exception, air-rotary drilling was successfully used to both core subsurface materials and to drill boreholes for piezometer installation. The use of air rotary without any water addition allowed careful evaluation of the presence and quantity of subsurface water. Mud rotary coring was required in one boring due to problems associated with a shallow perched water table. Sampling with a double-tube core barrel recovered undisturbed samples (three-inch diameter core) for detailed logging and geotechnical testing purposes.

**Subsurface materials** – The borings demonstrated that predominant Yegua-Jackson materials were highly plastic, moderately hard, heavily overconsolidated claystones with thin horizontal silty/sandy partings down to the approximate 150-foot completion depths of the borings. The claystones were fissured with occasional slickensides and fractures. Some isolated sandstone units were encountered. With the exception of some moist zones encountered near the Yegua-Jackson contact with surficial Recent-Pleistocene deposits, i.e, an intermittent perched water table location, and some moist zones associated with either fractured claystone and/or sandstone units, the recovered materials were dry.

**Subsurface water** – Subsurface water was encountered during drilling at shallow depth in association with a shallow perched water table near the Yegua-Jackson contact with surficial Recent-Pleistocene deposits. There was a limited occurrence of subsurface water at depth associated with either fractured claystone and/or sandstone units. Both shallow (S) and deep (D) piezometers were installed to further evaluate the encountered subsurface water and to obtain estimates of subsurface permeability. To ensure annular seal integrity, bentonite grout was placed using a grout pump and tremie for the three deep piezometers and for the deeper of the two shallow piezometers.

**Geotechnical testing** – Representative samples of subsurface materials were tested in the laboratory for classification properties, moisture content, permeability, and compressive strength. The classification, moisture content, and compressive strength results were consistent with the description of subsurface materials made in the field. Falling head and/or rising head permeability tests were conducted in all piezometers to provide additional information. The field permeability test results were consistent with the laboratory results and demonstrate poorly permeable and/or practically impervious subsurface conditions. The unconfined compression test results confirmed the subsurface materials are heavily over-consolidated or pre-consolidated over geologic time and demonstrated that foundation strata are strong and incompressible.

**Consistency with results from previous Phase I-IV investigations** – Phase V confirmed the predominance of highly plastic claystone materials in the Yegua-Jackson at the site. Geotechnical classification and moisture content testing results were also consistent. Phase V laboratory and piezometer permeability testing was consistent with results from piezometer testing of Phase II and III piezometers and demonstrate poorly permeable and/or practically impervious subsurface conditions. As expected, Phase V permeability testing confirmed that Phase II and III laboratory permeability testing was apparently impacted by the poor quality of recovered Roto-Sonic samples. The results of the Phase V investigation, earlier Phase IV test pit investigation, and Phase I-III geotechnical testing, all indicate that subsurface conditions are predominantly dry and the term “moist” as applied to the strata descriptions on the Phase II and III boring logs was apparently an artifact of water addition during Roto-Sonic drilling.

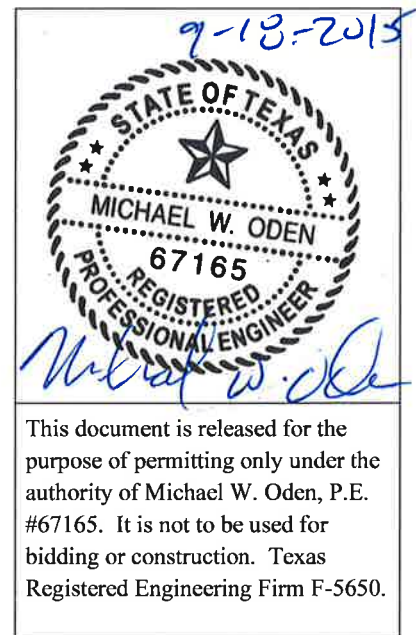
Both the earlier Phase IV test pit investigation and this Phase V investigation indicate minimal presence and quantity of subsurface water – particularly at depth. The results of the Phase II and III investigation could be interpreted to indicate more subsurface water is present and less random in occurrence. Again, it is believed this inconsistency can be traced to the consequences associated with Sonic drilling and the use of bentonite chips in the piezometers as opposed to bentonite grout. All investigations to date indicate the potential for a shallow perched water table, containing saline water, associated with the Yegua-Jackson contact with surficial Recent-Pleistocene deposits that appears to be partially recharged by the perennial surface water bodies. Regardless, all investigative results confirm that subsurface materials are poorly permeable to

practically impervious and are incapable of transmitting significant quantities of subsurface water. The investigative results are consistent with the Yegua-Jackson Groundwater Availability Model (TWDB, 2010) calibrated input parameters.

## III-E.5-A

### Figures

III-E.5-A.1 Cross Section Index Map.....	1
III-E.5-A.2 Interpretive Geologic Cross Section B-B' .....	2
III-E.5-A.3 Interpretive Geologic Cross Section J-J' .....	3
III-E.5-A.4 Webb County Soil Survey (Pages 1-4).....	4







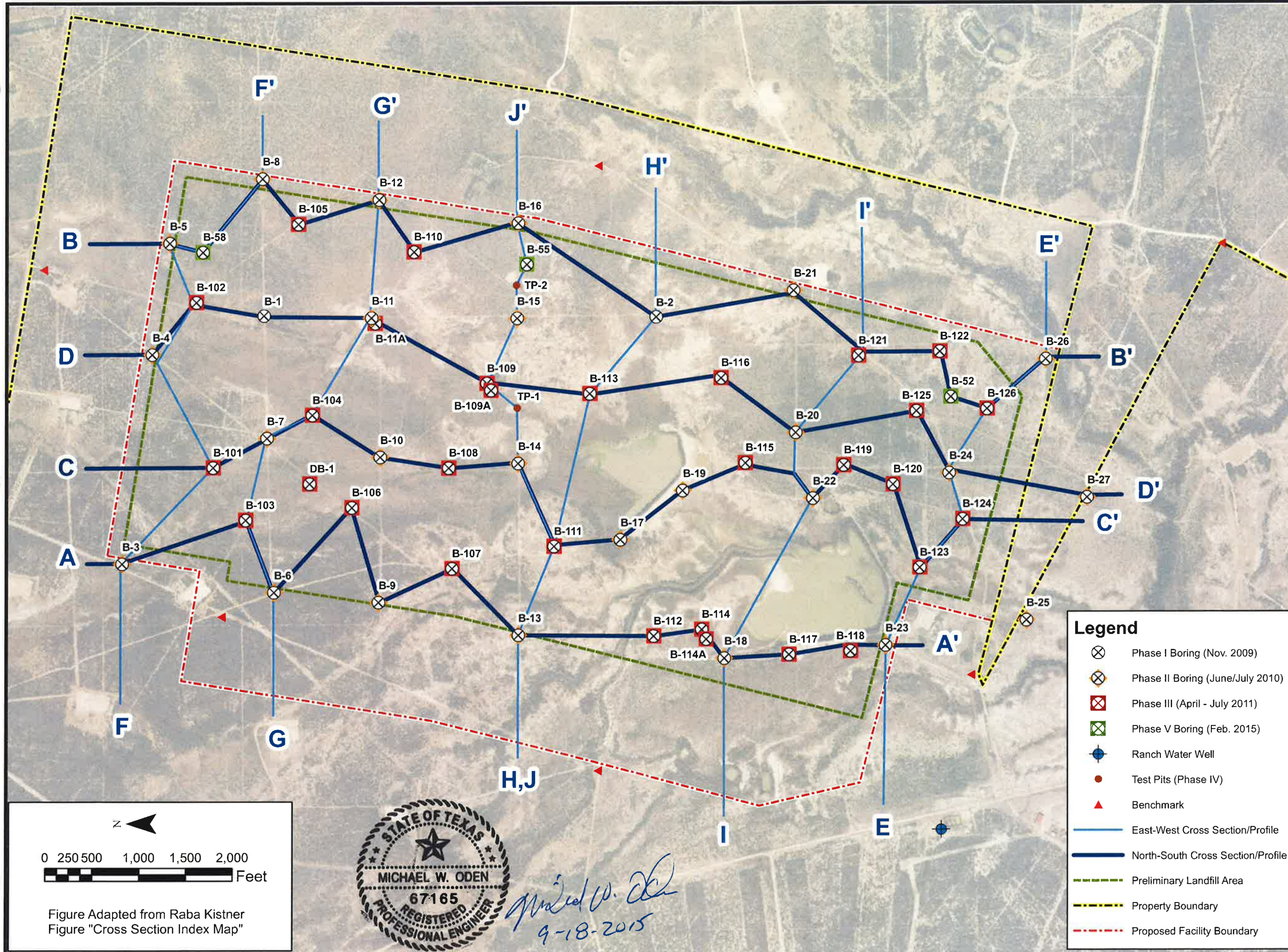
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### CROSS SECTION INDEX MAP

PESCADITO ENVIRONMENTAL RESOURCE CENTER  
RANCHO VIEJO WASTE MANAGEMENT, LLC  
WEBB COUNTY, TEXAS - MSW PERMIT No. 2374



**Legend**

- ⊗ Phase I Boring (Nov. 2009)
- ⊗ Phase II Boring (June/July 2010)
- ⊗ Phase III (April - July 2011)
- ⊗ Phase V Boring (Feb. 2015)
- ⊕ Ranch Water Well
- Test Pits (Phase IV)
- ▲ Benchmark
- East-West Cross Section/Profile
- North-South Cross Section/Profile
- - - Preliminary Landfill Area
- - - Property Boundary
- - - Proposed Facility Boundary

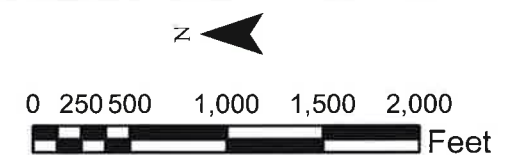


Figure Adapted from Raba Kistner  
Figure "Cross Section Index Map"

STATE OF TEXAS  
MICHAEL W. ODEN  
67165  
REGISTERED PROFESSIONAL ENGINEER  
*Michael W. Oden*  
9-18-2015

REVISIONS:

No.	DATE	DESCRIPTION

PROJECT No.:  
148866

ISSUE DATE: SEPT 2015

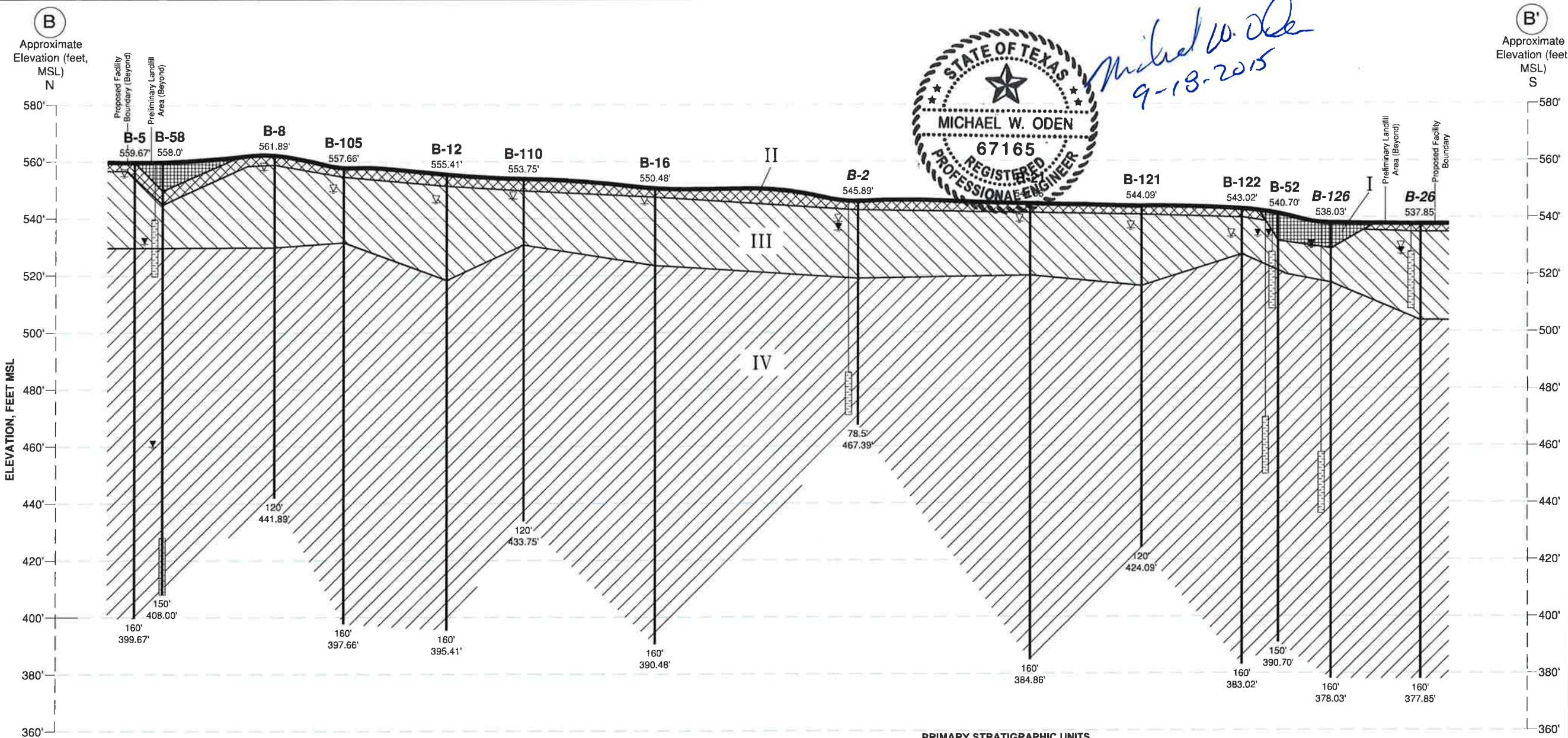
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CHECKED BY: MWO

REVIEWED BY: MWO

**FIGURE**  
**III-E.5-A.1**





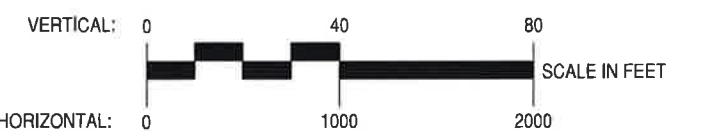
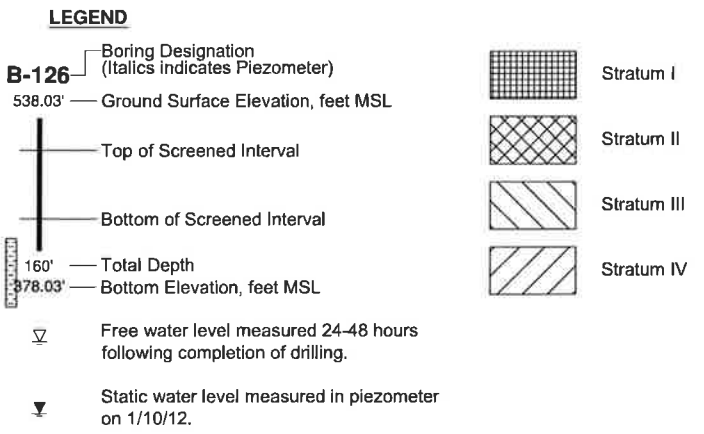
*Michael W. Oden*  
9-18-2015



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**INTERPRETIVE GEOLOGIC CROSS SECTION B-B'**  
PESCADITO ENVIRONMENTAL RESOURCE CENTER  
RANCHO VIEJO WASTE MANAGEMENT, LLC  
WEBB COUNTY, TEXAS - MSW PERMIT No. 2374



**PRIMARY STRATIGRAPHIC UNITS**

**STRATUM I - Recent-Pleistocene Soils:**  
This stratum consists of Recent-Pleistocene (R-P) deposits and generally corresponds to surface and near-surface soil strata logged within low-lying portions of the site underlain by Quaternary Alluvium (Qal) as designated on the published geologic maps of the area, in addition to upland areas having little to no topographic slope. This stratum consists of clays and sandy clays, with limited sand and occasional gravel and cobbles. The clays are stiff to firm, brown to light brown, and occur at ground surface (where present) to depths of approximately 18 feet bgs. At most boring/test pit locations the base of Stratum I may be identified by the presence of a thin gravel layer containing a wide variety of igneous and sedimentary rock types. Stratum I was not identified at all boring locations and is inferred to be absent in areas of the site having a slight to moderate topographic slope adjacent to upland areas. Seasonally, perched subsurface water may be encountered in this stratum. Based on observations during test pit excavation, an ephemeral fresh water lens appears to be present following rainfall events to depths on the order of 1 to 3 feet bgs, which controls the thickness of the plant root zone.

**STRATUM II - Highly Weathered Eocene Residuum:**  
This stratum corresponds to highly weathered surface and near-surface Eocene age soil strata logged throughout the majority of the site, both below the Qal, and in upland areas designated on the *Geologic Atlas of Texas Laredo Sheet (1976)* geologic map as the Yegua-Jackson Group formation (Y-J). This stratum is essentially a weathered-in-place (residual) soil horizon exhibiting similar structure and layering as underlying, less-weathered materials. This stratum consists of predominantly clay with minor sandy clay with ferruginous staining, calcareous nodules, and organic (plant root) materials. The clays are fissured, stiff to hard, overconsolidated, and brown to light reddish brown with some brownish gray to greenish gray layers. At some locations, gypsum (selenite) and ironstone concretions were encountered. This stratum occurs from ground surface (where exposed) or below Stratum I soils to depths of up to 10 feet bgs, with a maximum thickness of 10 feet. Transmissive secondary soil structure (i.e., fissures, fractures, joints, and horizontal bedding) is present, but pursuant to criteria established by Terzaghi and Peck in *Soil Mechanics in Engineering Practice (1967)*, materials are classified as relatively or practically impermeable based on measured laboratory permeability values. As a result of post-Eocene geologic processes, Stratum II is not uniformly developed or laterally continuous throughout the site; and therefore was not always identified discretely in boring logs. In many instances, Stratum II was not logged as a separate unit, but simply described as the uppermost weathered portion of Stratum III as described below. Seasonally, the perched shallow subsurface water associated with Stratum I may also be encountered in this stratum. Based on observations during test pit excavation, an ephemeral fresh water lens appears to be present following rainfall events to depths on the order of 1 to 3 feet bgs, which controls the thickness of the plant root zone. Below this depth, scattered ephemeral saline water lenses occur throughout the remaining vertical extent of weathered Stratum II and/or Stratum III soils.

**STRATUM III - Weathered Eocene Sediments:**  
This near-surface stratum underlies Stratum I and Stratum II throughout the site and is considered to represent Eocene sediments associated with the upper weathered (e.g., ferruginous stained) surface of the Yegua-Jackson Group formation (Y-J). This stratum consists of clay and sandy, silty clay with thinly to very thinly interbedded claystone, siltstone, and sandstone seams and lenses (i.e., bedding units typically 1 to 2 feet or less). The clays are fissured, hard, overconsolidated, light brown and brown to reddish brown with some olive to pale yellow layers, with scattered greenish gray to gray mottling and ferruginous staining, and have a blocky structure. Stratum III is encountered at depths ranging from approximately 2 to 39 feet bgs, and ranges from approximately 8 to 33 feet in total thickness. This stratum is generally differentiated from Stratum IV as defined below by its consistently weathered appearance along partings (i.e., ferruginous and carbonaceous staining), isolated presence of weathered zones containing groundwater, and the less frequent occurrence of interbedded sandstone, siltstone, or claystone layers. Transmissive secondary soil structure (i.e., fissures, fractures, joints, and horizontal bedding) is present, but pursuant to criteria established by Terzaghi and Peck (1967), materials are classified as relatively or practically impermeable based on measured laboratory permeability values.

**STRATUM IV - Relatively Unweathered Eocene Soils:**  
This stratum underlies Strata III throughout the site, was encountered to total exploration depth for the landfill project on the order of 160 to 500 feet (based on single deep boring, DB-1), and is considered to represent relatively unweathered Eocene soils of the Yegua-Jackson Group formation (Y-J). This stratum consists predominantly of clay and sandy, silty clay, with thinly to very thinly interbedded claystone, siltstone and sandstone seams and lenses (i.e., bedding units 1 to 2 feet or less). The clays are hard and fractured, overconsolidated, light green to green and greenish gray (with some dark gray to gray and brown to reddish brown layer with scattered greenish gray mottling) with some ferruginous staining, and have a blocky (intensely fissured) structure. Stratum IV is encountered throughout the site at depths ranging from approximately 16 feet to greater than 160 feet bgs, and has a thickness exceeding 144 feet. As indicated on boring logs, this stratum is complexly interbedded and does exhibit significant variation in the nature and occurrence of indurated materials, although very thinly interbedded claystone units are most frequently encountered throughout. Although relatively unweathered relative to Stratum III, zones of localized weathering indicated by ferruginous staining and weathered surfaces of clay partings are present likely in association with shallow groundwater movement. Transmissive secondary soil structure (i.e., fissures, fractures, joints, and horizontal bedding) is present, but pursuant to criteria established by Terzaghi and Peck (1967), materials are classified as relatively or practically impermeable based on measured laboratory permeability values.

**REVISIONS:**

No.	DATE	DESCRIPTION

**PROJECT No.:** 148866

**ISSUE DATE:** SEPT 2015

**DRAWN BY:** MTE

**CHECKED BY:** MWO

**REVIEWED BY:** MWO

**FIGURE**  
**III-E.5-A.2**

NOTE: FIGURE ADAPTED FROM RABA KISTNER ENVIRONMENTAL FIGURE TITLED "INTERPRETIVE GEOLOGIC CROSS SECTION B-B'"





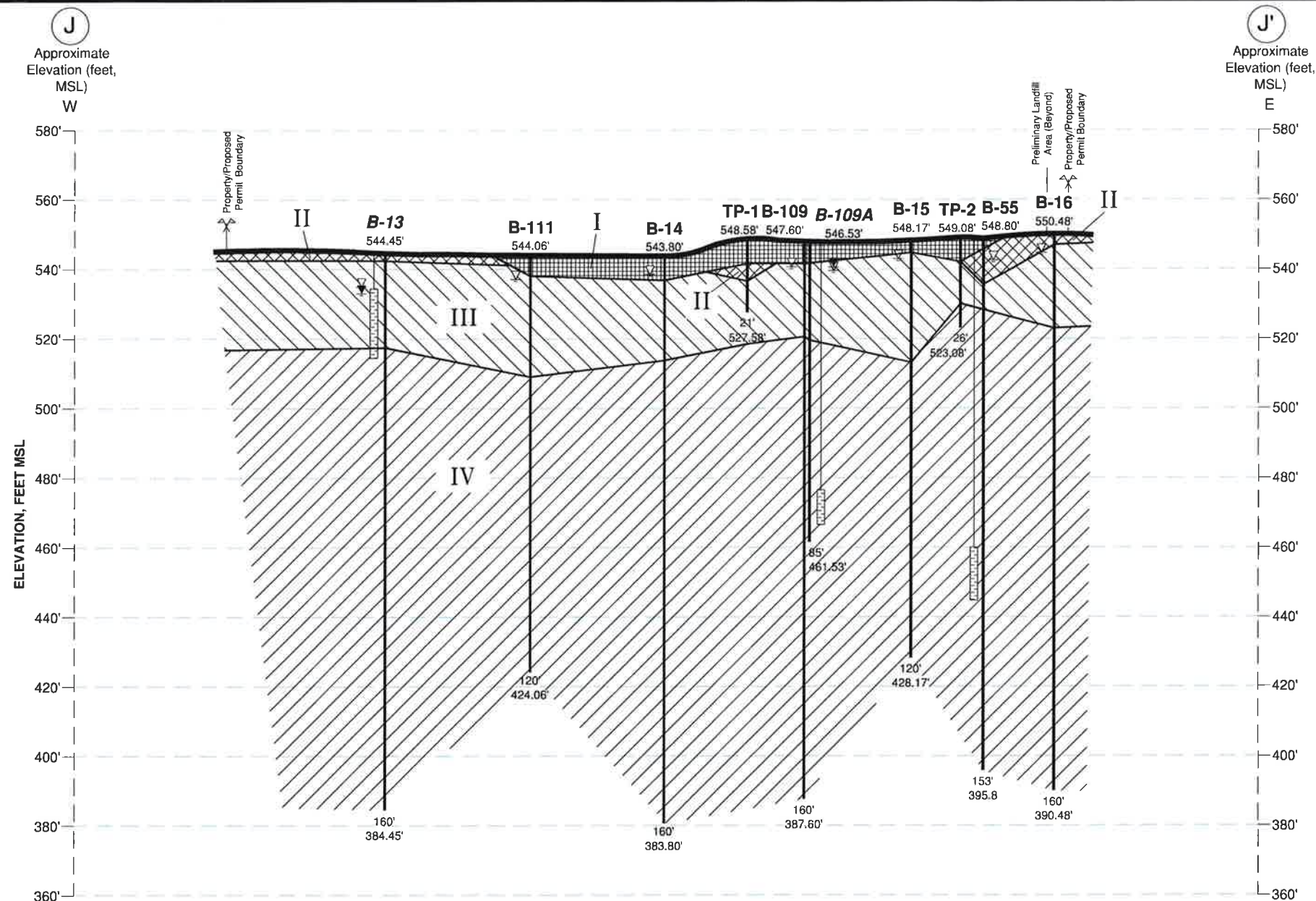
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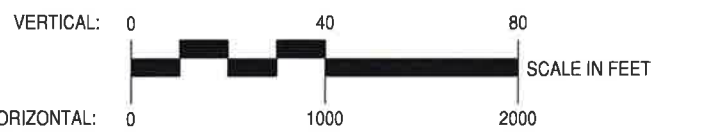
INTERPRETIVE GEOLOGIC CROSS SECTION J-J' PESCADITO ENVIRONMENTAL RESOURCE CENTER RANCHO VIEJO WASTE MANAGEMENT, LLC WEBB COUNTY, TEXAS - MSW PERMIT No. 2374



PRIMARY STRATIGRAPHIC UNITS

LEGEND

- Boring Designation (Italics indicates Piezometer)
Ground Surface Elevation, feet MSL
Top of Screened Interval
Bottom of Screened Interval
Total Depth
Bottom Elevation, feet MSL
Free water level measured 24-48 hours following completion of drilling.
Static water level measured in piezometer on 1/10/12.



STRATUM I - Recent-Pleistocene Soils: This stratum consists of Recent-Pleistocene (R-P) deposits and generally corresponds to surface and near-surface soil strata... STRATUM II - Highly Weathered Eocene Residuum: This stratum corresponds to highly weathered surface and near-surface Eocene age soil strata... STRATUM III - Weathered Eocene Sediments: This near-surface stratum underlies Stratum I and Stratum II throughout the site... STRATUM IV - Relatively Unweathered Eocene Soils: This stratum underlies Strata III throughout the site, was encountered to total exploration depth for the landfill project...

REVISIONS:

Table with columns: No., DATE, DESCRIPTION

PROJECT No.: 148866

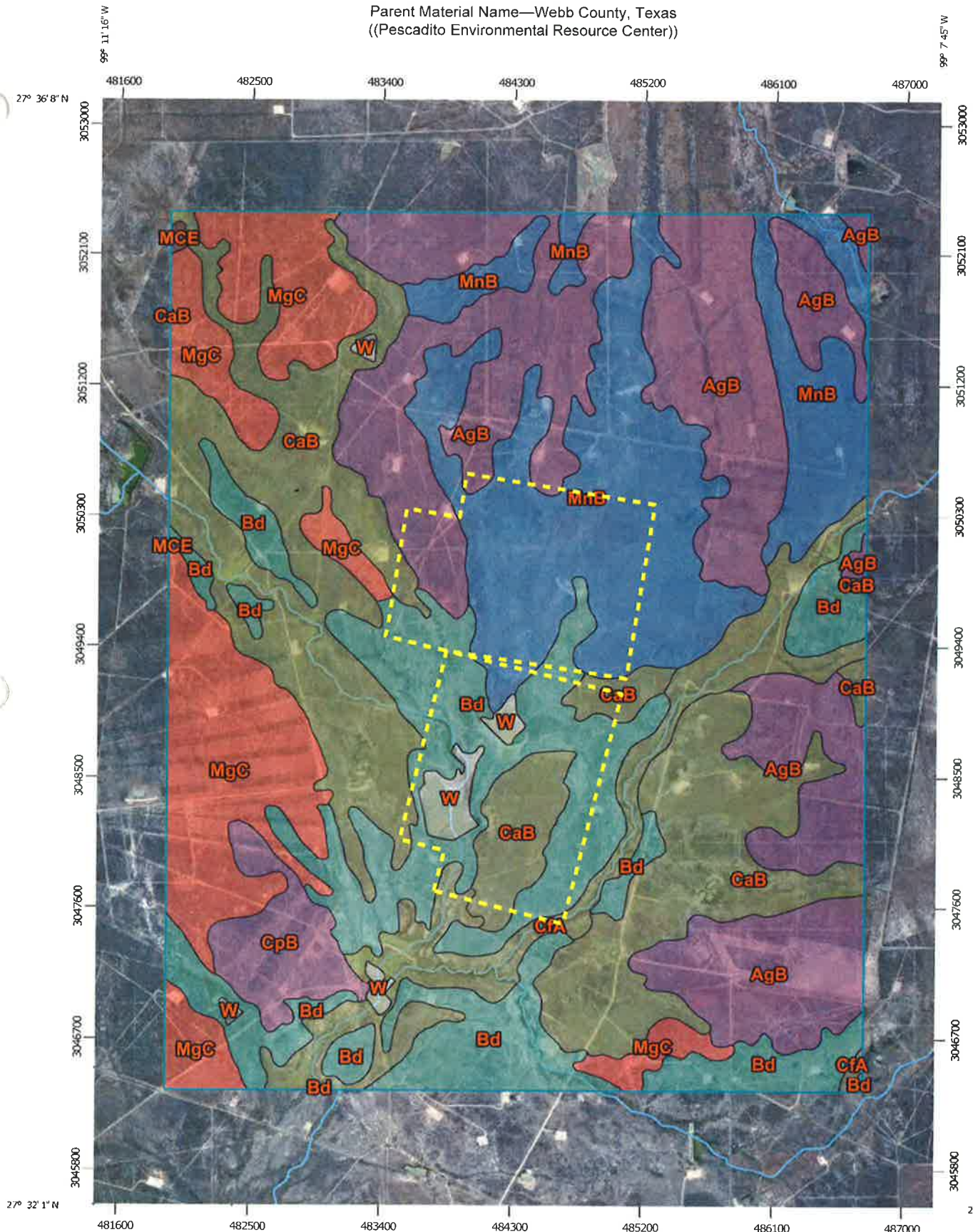
ISSUE DATE: SEPT 2015
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REVIEWED BY: MWO

FIGURE III-E.5-A.3

NOTE: FIGURE ADAPTED FROM RABA KISTNER ENVIRONMENTAL FIGURE TITLED "INTERPRETIVE GEOLOGIC CROSS SECTION J-J'"



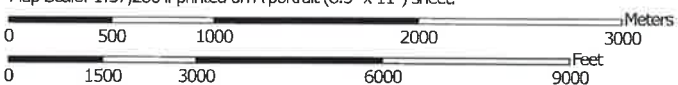
Parent Material Name—Webb County, Texas  
 ((Pescadito Environmental Resource Center))



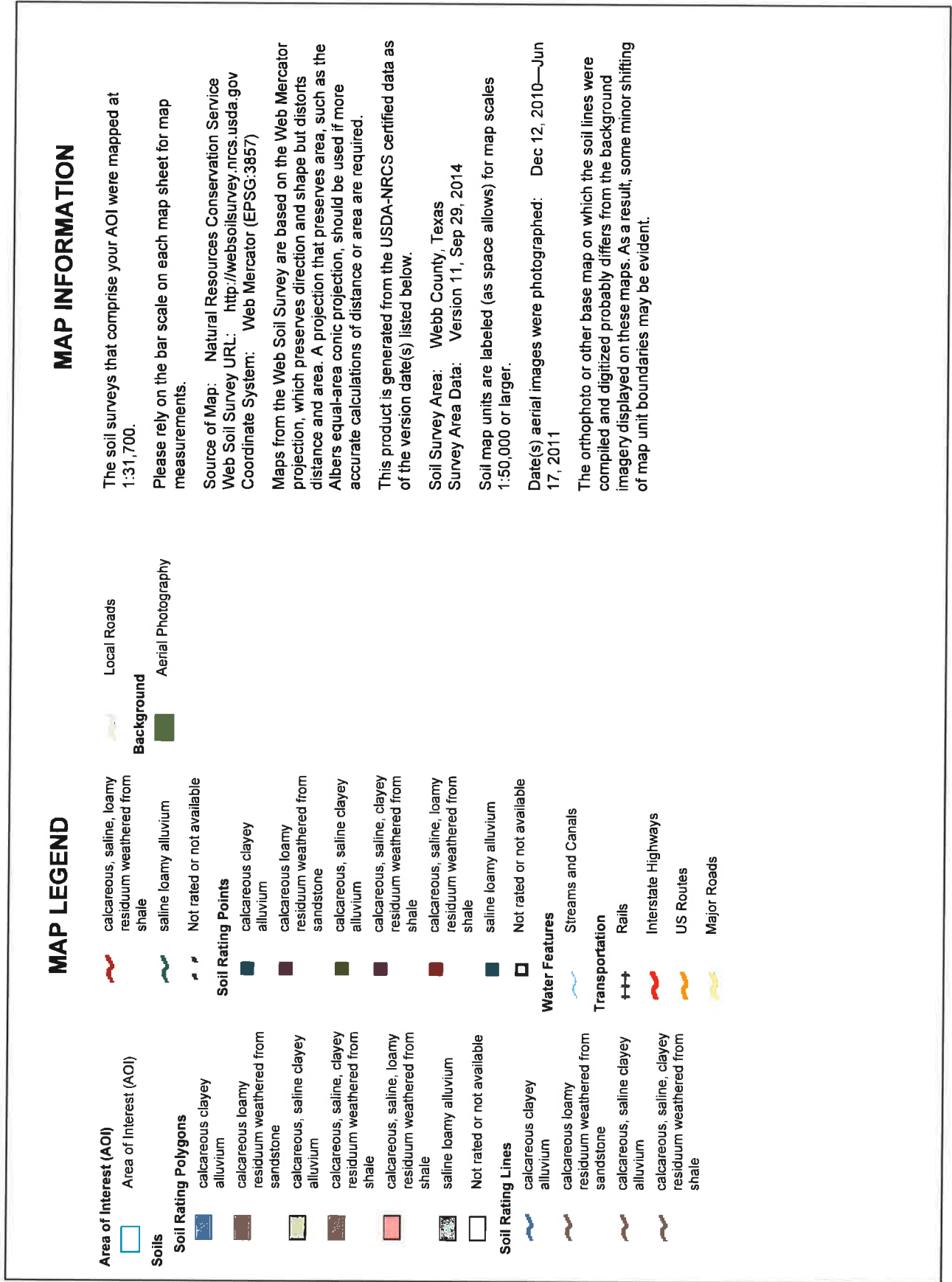
BB&I  
 September 2015

Page 1 of 4

Map Scale: 1:37,200 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 14N WGS84



## Parent Material Name

Parent Material Name— Summary by Map Unit — Webb County, Texas (TX479)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AgB	Aguilares sandy clay loam, 0 to 3 percent slopes	calcareous loamy residuum weathered from sandstone	1,672.0	23.2%
Bd	Brundage fine sandy loam, 0 to 1 percent slopes, occasionally flooded	saline loamy alluvium	1,255.0	17.4%
CaB	Catarina clay, 0 to 2 percent slopes	calcareous, saline clayey alluvium	1,477.5	20.5%
CfA	Catarina clay, occasionally flooded	calcareous, saline clayey alluvium	414.9	5.8%
CpB	Copita fine sandy loam, 0 to 3 percent slopes	calcareous loamy residuum weathered from sandstone	175.4	2.4%
MCE	Maverick-Catarina complex, gently rolling	calcareous, saline, clayey residuum weathered from shale	5.9	0.1%
MgC	Moglia clay loam, 1 to 5 percent slopes	calcareous, saline, loamy residuum weathered from shale	918.4	12.8%
MnB	Montell clay, 0 to 3 percent slopes	calcareous clayey alluvium	1,208.9	16.8%
W	Water		72.8	1.0%
<b>Totals for Area of Interest</b>			<b>7,200.8</b>	<b>100.0%</b>

## Description

Parent material name is a term for the general physical, chemical, and mineralogical composition of the unconsolidated material, mineral or organic, in which the soil forms. Mode of deposition and/or weathering may be implied by the name.

The soil surveyor uses parent material to develop a model used for soil mapping. Soil scientists and specialists in other disciplines use parent material to help interpret soil boundaries and project performance of the material below the soil. Many soil properties relate to parent material. Among these properties are proportions of sand, silt, and clay; chemical content; bulk density; structure; and the kinds and amounts of rock fragments. These properties affect interpretations and may be criteria used to separate soil series. Soil properties and landscape information may imply the kind of parent material.

For each soil in the database, one or more parent materials may be identified. One is marked as the representative or most commonly occurring. The representative parent material name is presented here.

## Rating Options

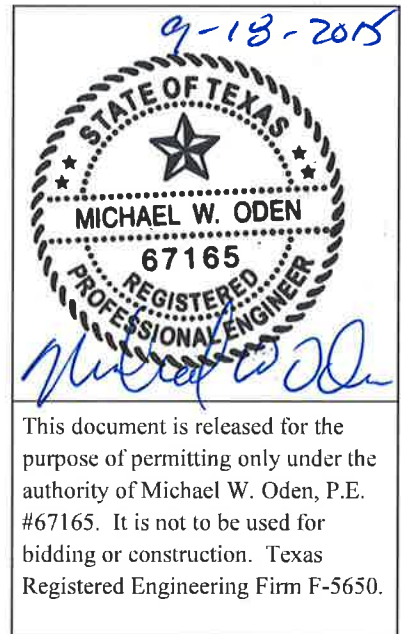
*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Lower



**III-E.5-B**  
**Phase V Logs of Borings**





SURFACE ELEVATION: 540  
 NORTHING: 17090901  
 EASTING: 771370

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.**  
**B-52**

Depth in Feet	Surf. Elev. 540	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS			
0	540	[Hatched Area]	Dark Brown FAT CLAY(CH), trace fine sand and silt, firm to stiff, high plasticity, moist, moderately saline and calcareous, blocky structure.	CH	Blind Drill (0-11') Rec=106"		0.75		(0-11'): Blind Drilled. Logged based on drilling cuttings observations during installation of 8" PVC surface casing (0-10.5'). 8" PVC casing later removed from boring and reinstalled (0-20').			
1	539									1.75		
2	538											
3	537		Light Brown FAT CLAY(CH), little to some fine sand and silt, stiff, high plasticity, moist, moderately saline and calcareous, blocky structure.	CH							1.25	
4	536											
5	535											
6	534											
7	533											
8	532											
9	531											
10	530		Trace subangular fine gravel (17mm), black coal gravel, and dark gray clay.	CH								
11	529		Hard, Brown FAT CLAYSTONE(CH), trace fine sand, dry, aphanitic to very fine grained, massive, well indurated, strongly calcareous, slightly saline, slightly weathered.									
12	528		Hard, Pale Olive with Pale Brown FAT CLAYSTONE(CH), yellowish brown with strong brown iron staining, trace fine sand, dry, aphanitic to very fine grained, blocky, well indurated, strongly calcareous, slightly saline, slightly weathered.	CH								
13	527			SC			CB-1 (11-17') Rec=36"				19.44%	
14	526		Hard, Pale Brown to Light Yellowish Brown with Light Olive Brown CLAYEY SANDSTONE(SC), little yellowish brown iron staining, trace manganese infilling vertical fracture (13.1-14'), dry, fine grained, massive, well indurated, strongly calcareous, slightly saline, slightly weathered.									
15	525											
16	524											
17	523							(17-23'); Low recovery. Based on drilling observations, it appeared that the core barrel bit had ground away the sandstone.				
18	522											
19	521		trace chert gravel.		CB-2 (17-23') Rec=8"		0%					
20			(Continued on next page)									

07\_08-2015 T:\cisis2013\Pescadito Landfill\Boring Logs\B-52.bor

DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air/Water Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/16/15 ENDED: 1/27/15

**WATER LEVEL (FT.)**

**REMARKS**

6.25" Dia. Drag Bit(0-11'); 8.75" Dia. Tricone Roller Bit (0-20'); Installed 8" PVC casing (0-20'); Core(11-150'). Boring was tremie-grouted with Quik-Grout bentonite/water from 0-139' on 1/27/15. Boring had caved-in/sealed from (139-150') prior to placement of bentonite grout.



SURFACE ELEVATION: 540  
 NORTHING: 17090901  
 EASTING: 771370

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO  
 B-52**

Depth in Feet	Surf. Elev. 540	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
20	520		(Continued from previous page)						
21	519		Same, CLAYEY SANDSTONE(SC).						
22	518			SC	CB-2 (17-23') Rec=8"			0%	(23-25');No recovery. Based upon driller's/geologist's observations and logging of drilling cuttings, it appeared that the core barrel bit had ground away the sandstone.
23	517								
24	516								
25	515		Same, CLAYEY SANDSTONE(SC).		CB-3 (23-25') Rec=0"			14.58%	
26	514								
27	513								
28	512								
29	511		Hard, Greenish Gray SANDSTONE, poorly graded, dry, fine grained, massive, well indurated, strongly calcareous, slightly saline, fresh.	SP	CB-4 (25-29') Rec=28"			25%	
30	510								
31	509								
32	508								
33	507								
34	506								
35	505								
36	504		(28-28.2');Hard, Dark Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic, blocky, strongly cemented, moderately calcareous, slightly saline, fresh.	CH	CB-5 (29-32') Rec=19"			23.33%	
37	503								
38	502								
39	501		Hard, Reddish Brown with Light Reddish Brown and trace Greenish Gray and White FAT CLAYSTONE(CH), dry, aphanitic to very fine grained, laminated, well indurated, moderately calcareous, slightly saline, slightly weathered, 45 degree compression fracture (28.6-29').		CB-6 (32-37') Rec=60"			0%	
40	501								
			(32-38.8') Hard, Reddish Brown with Light Reddish Brown and little Greenish Gray FAT CLAYSTONE(CH), trace silt and light gray calcareous material, trace gypsum, dry, aphanitic to very fine grained, massive to blocky, well indurated, slightly calcareous, slightly saline, slightly weathered.		CB-7 (37-42') Rec=60"				
			Hard, Gray with little Light Gray FAT CLAYSTONE(CH), trace fine sand, dry, aphanitic to very fine grained, massive, well indurated, highly calcareous. (Continued)	CH					

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air/Water Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/16/15 ENDED: 1/27/15

**WATER LEVEL (FT.)**

**REMARKS**

6.25" Dia. Drag Bit(0-11');8.75"Dia. Tricone Roller Bit (0-20');Installed 8" PVC casing (0-20'); Core(11-150'). Boring was tremie-grouted with Quik-Grout bentonite/water from 0-139' on 1/27/15. Boring had caved-in/sealed from (139-150') prior to placement of bentonite grout.



SURFACE ELEVATION: 540  
 NORTHING: 17090901  
 EASTING: 771370

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.**  
**B-52**



Depth in Feet	Surf. Elev. 540	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
40	500	(Continued from previous page)	(Continued from previous page)	CH	CB-7 (37-42') Rec=60"				
41	499		(Cont'd) FAT CLAYSTONE (CH), slightly saline, fresh.						
42	498		Hard, Weak Red with Reddish Brown and trace Greenish Gray FAT CLAYSTONE(CH), trace light gray highly calcareous silt, trace slickensides, dry, aphanitic to very fine grained, massive to trace blocky, well indurated, moderately calcareous, slightly saline, fresh.	CH	CB-8 (42-47') Rec=60"				
43	497								
44	496								
45	495								
46	494		Hard, Dark Gray to Gray FAT CLAYSTONE(CH), trace to little light gray highly calcareous material, dry, aphanitic to very fine grained, massive, well indurated, moderately calcareous, saline, fresh.	CH	CB-9 (47-53') Rec=50"				
47	493								
48	492								
49	491								
50	490								
51	489	(51.5-53'); Hard, Dark Reddish Brown with Dark Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic to very fine grained, massive, well indurated, slightly calcareous and saline, fresh.	CH	CB-10 (53-60') Rec=81"					
52	488								
53	487								
54	486								
55	485	(53-59.5'); Hard, Greenish Gray to Dark Greenish Gray with little Reddish Brown FAT CLAYSTONE(CH), trace to little silt, trace fine sand, trace very dark gray staining in horizontal fractures (@54', 54.9', 55.3', and 55.5'), trace vertical fractures (53-53.5'), dry, aphanitic to very fine grained, massive to thinly bedded, well indurated, slightly to moderately calcareous, slightly saline, slightly weathered.	CH						
56	484								
57	483								
58	482								
59	481								
60		LEAN CLAYSTONE(CL) (Continued)	CL						

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air/Water Rotary  
 3" I.D., 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/16/15 ENDED: 1/27/15

**WATER LEVEL (FT.)**

**REMARKS**

6.25" Dia. Drag Bit(0-11'); 8.75" Dia. Tricone Roller Bit (0-20'); Installed 8" PVC casing (0-20'); Core(11-150'). Boring was tremie-grouted with Quik-Grout bentonite/water from 0-139' on 1/27/15. Boring had caved-in/sealed from (139-150') prior to placement of bentonite grout.



SURFACE ELEVATION: 540  
 NORTHING: 17090901  
 EASTING: 771370

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO  
 B-52**

Depth in Feet	Surf. Elev. 540	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
60	480		(Continued from previous page)						
61	479		Hard, Dark Greenish Gray to Greenish Gray with Light Greenish Gray LEAN CLAYSTONE(CL), trace to little fine sand, dry, very fine grained, very thinly to medium bedded, well indurated, moderately calcareous and saline, fresh.	CL					
62	478								
63	477		Hard, Dark Greenish Gray to Greenish Gray FAT CLAYSTONE(CH), trace silt, dry, aphanitic, massive with little blocky structure, well indurated, slightly calcareous and saline, fresh.	CH					
64	476								
65	475		Moderately hard to hard, Dark Reddish Brown with trace Greenish Gray and Grayish Brown FAT CLAYSTONE(CH), trace silt, dry, aphanitic to very fine grained, trace slickensides, massive to blocky structure, moderately to well indurated, slightly calcareous and saline, trace horizontal and vertical fractures, fresh.	CH	CB-11 (60-70') Rec=84"			36.7%	
66	474								
67	473								
68	472								
69	471		Same, hard, well indurated, moderately calcareous and saline.						
70	470								
71	469		Hard, Weak Red with Greenish Gray and Grayish Brown FAT CLAYSTONE(CH), dry, very fine grained to aphanitic, massive, well indurated, slightly calcareous and saline, fresh.	CH	CB-12 (70-74') Rec=43"			50%	
72	468								
73	467		Hard, Weak Red to Dusky Red with little Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic to very fine grained, massive with slightly blocky structure, well indurated, slightly calcareous and saline, fresh.	CH					
74	466								
75	465		Hard, Reddish Brown with little Greenish Gray LEAN CLAYSTONE(CL), trace fine sand and calcareous nodules, dry, very fine grained to aphanitic, massive with slight blocky structure, well indurated, moderately calcareous to saline, fresh.	CL	CB-13 (74-80') Rec=59"			41.67%	
76	464								
77	463								
78	462								
79	461								
80			(Continued on next page)						

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air/Water Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/16/15 ENDED: 1/27/15

**WATER LEVEL (FT.)**

**REMARKS**

6.25" Dia. Drag Bit(0-11'); 8.75" Dia. Tricone Roller Bit (0-20'); Installed 8" PVC casing (0-20'); Core(11-150').  
 Boring was tremie-grouted with Quik-Grout bentonite/water from 0-139' on 1/27/15. Boring had caved-in/sealed from (139-150') prior to placement of bentonite grout.

SURFACE ELEVATION: 540  
 NORTHING: 17090901  
 EASTING: 771370

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.  
 B-52**



Depth in Feet	Surf. Elev. 540	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
80	460		(Continued from previous page)						
81	459		Same, LEAN CLAYSTONE(CL).						
82	458			CL					
83	457								
84	456		Hard, Reddish Brown with Greenish Gray (84-84.2') grading to Greenish Gray(84.2-84.8') FAT CLAYSTONE(CH), trace white silty calcareous material, dry, aphanitic to very fine grained, blocky, well indurated, trace very fine grained sand, mica and pyrite, slightly to highly calcareous, slightly saline, fresh.	CH	CB-14 (80-90') Rec=120"		100%		
85	455			SC					
86	454								
87	453		Hard, Greenish Gray CLAYEY SANDSTONE(SC), trace mica and pyrite, dry, fine grained to very fine grained, massive, well indurated, slightly calcareous and saline, fresh.	CH					
88	452			CH					
89	451		Hard, Greenish Gray to Light Greenish Gray with trace Gray FAT CLAYSTONE(CH) with little interbedded sandstone, trace calcareous concretions, trace pyrite, dry, very fine grained, laminated bedding, slightly to highly calcareous, saline, vertical fracture.	CH					
90	450			CH					
91	449								
92	448		Hard, Reddish Gray to Weak Red with trace Greenish Gray FAT CLAYSTONE(CH), dry, very fine grained to aphanitic, laminated, well indurated, moderately calcareous and saline, vertical fracture.						
93	447								
94	446		Hard, Reddish Brown with Greenish Gray FAT CLAYSTONE(CH), trace highly calcareous material, dry, aphanitic, blocky to massive, well indurated, slightly to moderately calcareous, saline.	CL	CB-15 (90-100') Rec=111"		84.16%		
95	445								
96	444		Hard, Light Reddish Brown with trace Greenish Gray LEAN CLAYSTONE(CL), dry, aphanitic, massive, well indurated, slightly calcareous and saline, fresh.						
97	443								
98	442		Hard, Greenish Gray with light Greenish Gray LEAN CLAYSTONE(CL), dry, very fine grained, laminated to thinly bedded, well indurated, moderately calcareous, saline, fresh.	CL					
99	441			CH					
100									

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DRILLING CONTRACTOR: Andrews & Foster DRILLING METHOD: Air/Water Rotary 3" I.D.; 4.875" O.D. Double Tube Core Barrel DRILLING EQUIPMENT: Gardner Denver 15W Truck Mounted Drill Rig DRILLING STARTED: 1/16/15 ENDED: 1/27/15	<b>WATER LEVEL (FT.)</b>	<b>REMARKS</b> 6.25" Dia. Drag Bit(0-11'); 8.75" Dia. Tricone Roller Bit (0-20'); Installed 8" PVC casing (0-20'); Core(11-150'). Boring was tremie-grouted with Quik-Grout bentonite/water from 0-139' on 1/27/15. Boring had caved-in/sealed from (139-150') prior to placement of bentonite grout.
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SURFACE ELEVATION: 540  
 NORTHING: 17090901  
 EASTING: 771370

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.**  
**B-52**

Depth in Feet	Surf. Elev. 540	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
100	440		(Continued from 98.5') Moderately hard, Dark Reddish Gray with little Reddish Brown and Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic, blocky, moderately indurated, slightly calcareous and saline, slightly weathered.	CH					
101	439								
102	438								
103	437			Moderately hard, Dark Reddish Gray with little Greenish Gray and trace Reddish Brown FAT CLAYSTONE(CH), 45 degree angular fractures with slickensides, dry, aphanitic, blocky, moderately indurated, slightly calcareous to saline, slightly weathered.					
104	436								
105	435			Moderately hard to hard, Reddish Brown with Greenish Gray and trace Dark Reddish Gray FAT CLAYSTONE(CH), 45 degree angular fractures with slickensides, dry, aphanitic, blocky, moderately indurated, slightly calcareous to saline, slightly weathered.		CB-16 (100-110') Rec=93"			36.67%
106	434								
107	433								
108	432			(107-110'); hard, well indurated.	CH				
109	431								
110	430			(110-113'); hard, well indurated.					
111	429								
112	428								
113	427								
114	426			Hard, Reddish Brown with Greenish Gray FAT CLAYSTONE(CH), little silt, trace fine sand, dry, very fine grained to aphanitic, massive, well indurated, slightly calcareous and saline, fresh.	CH				
115	425					CB-17 (110-119') Rec=82"			54.63%
116	424			Hard, Dark Reddish Brown with Greenish Gray FAT CLAYSTONE(CH), trace white to light gray calcareous nodules and limestone concretions, dry, aphanitic, massive with slight blocky structures, well indurated, slightly to highly calcareous and slightly saline, slightly weathered.	CH				
117	423								
118	422								
119	421		FAT CLAYSTONE(CH).	CH					
120			(Continued on next page)		CB-18 (119-129') Rec=60"				

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air/Water Rotary  
 3" I.D., 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/16/15 ENDED: 1/27/15

**WATER LEVEL (FT.)**

**REMARKS**

6.25" Dia. Drag Bit(0-11'); 8.75" Dia. Tricone Roller Bit (0-20'); Installed 8" PVC casing (0-20'); Core(11-150'). Boring was tremie-grouted with Quik-Grout bentonite/water from 0-139' on 1/27/15. Boring had caved-in/sealed from (139-150') prior to placement of bentonite grout.

SURFACE ELEVATION: 540  
 NORTHING: 17090901  
 EASTING: 771370

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.  
 B-52**



Depth in Feet	Surf. Elev. 540	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS	
120	420	[Hatched pattern]	(Continued from 119')	CH	CB-18 (119-129') Rec=60"			0%		
121	419		Hard, Dark Reddish Brown to Reddish Brown with Greenish Gray stratified FAT CLAYSTONE(CH), trace to little silt and fine sand, dry, aphanitic to very fine grained, medium bedded with trace laminations, well indurated, moderately to highly calcareous, saline, slightly weathered to fresh.							
122	418									
123	417									
124	416									
125	415									
126	414									
127	413									
128	412			Moderately hard to hard, Dark Greenish Gray to Greenish Gray with trace Dark Gray FAT CLAYSTONE(CH), trace pyrite, trace light gray highly calcareous silt, dry, aphanitic, blocky, well indurated, slightly calcareous, saline, fresh.	CH	CB-19 (129-131') Rec=0"				0%
129	411									
130	410									
131	409			Hard, Dark Reddish Brown with Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic, massive with slight blocky structure, well indurated, slightly calcareous, saline, fresh.	CH					
132	408									
133	407	Hard, Dark Greenish Gray to Greenish Gray with trace Dark Reddish Brown and Gray FAT CLAYSTONE(CH), trace white highly calcareous nodules, massive with slight low angle and horizontal fractures with slickensides, well indurated, slightly calcareous, slightly weathered.		CH	CB-20 (131-141') Rec=112"			45.0%		
134	406									
135	405	Hard, Dark Gray to Gray with little Greenish Gray LEAN CLAYSTONE(CL), little silt, trace fine sand, trace calcareous nodules, dry, aphanitic to very fine grained, massive, well indurated, mildly to highly calcareous, saline, fresh.	CL							
136	404									
137	403									
138	402									
139	401	[Hatched pattern]	(Continued on next page)							
140										

(129-131'); No recovery. Logged based on drilling observations and cuttings. It appeared that the core barrel bit ground away the claystone.

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DRILLING CONTRACTOR: Andrews & Foster DRILLING METHOD: Air/Water Rotary 3" I.D.; 4.875" O.D. Double Tube Core Barrel DRILLING EQUIPMENT: Gardner Denver 15W Truck Mounted Drill Rig DRILLING STARTED: 1/16/15 ENDED: 1/27/15	<b>WATER LEVEL (FT.)</b>	<b>REMARKS</b> 6.25" Dia. Drag Bit(0-11'); 8.75" Dia. Tricone Roller Bit (0-20'); Installed 8" PVC casing (0-20'); Core(11-150'). Boring was tremie-grouted with Quik-Grout bentonite/water from 0-139' on 1/27/15. Boring had caved-in/sealed from (139-150') prior to placement of bentonite grout.
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SURFACE ELEVATION: 540  
 NORTHING: 17090901  
 EASTING: 771370

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.**  
**B-52**

Depth in Feet	Surf. Elev. 540	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
140	400		(Continued from previous page)	CL	CB-20 (131-141") Rec=112"				
141	399		Same, LEAN CLAYSTONE(CL) with highly calcareous Light Gray limestone concretions(140-140.6').						
142	398		Hard to moderately hard, Reddish Brown, Light Reddish Brown, and Dark Reddish Gray with Greenish Gray FAT CLAYSTONE(CH), alternating thin to medium beds, trace white to light gray highly calcareous limestone, trace to little silt, trace fine sand, dry, aphanitic to very fine grained, moderately to well indurated, slightly calcareous, saline, slightly weathered, massive with little blocky structure.	CH					
143	397								
144	396								
145	395								
146	394		Hard, Gray grading to Dark Gray with little Greenish Gray CLAYEY SANDSTONE(SC), dry, very fine grained, massive, well indurated, high calcareous, fresh.	SC	CB-21 (141-150") Rec=87.5"			54.16%	
147	393								
148	392								
149	391		(149-150); little dark reddish brown.						
150	390		End of Boring @150'						
151	389								
152	388								
153	387								
154	386								
155	385								
156	384								
157	383								
158	382								
159	381								
160									

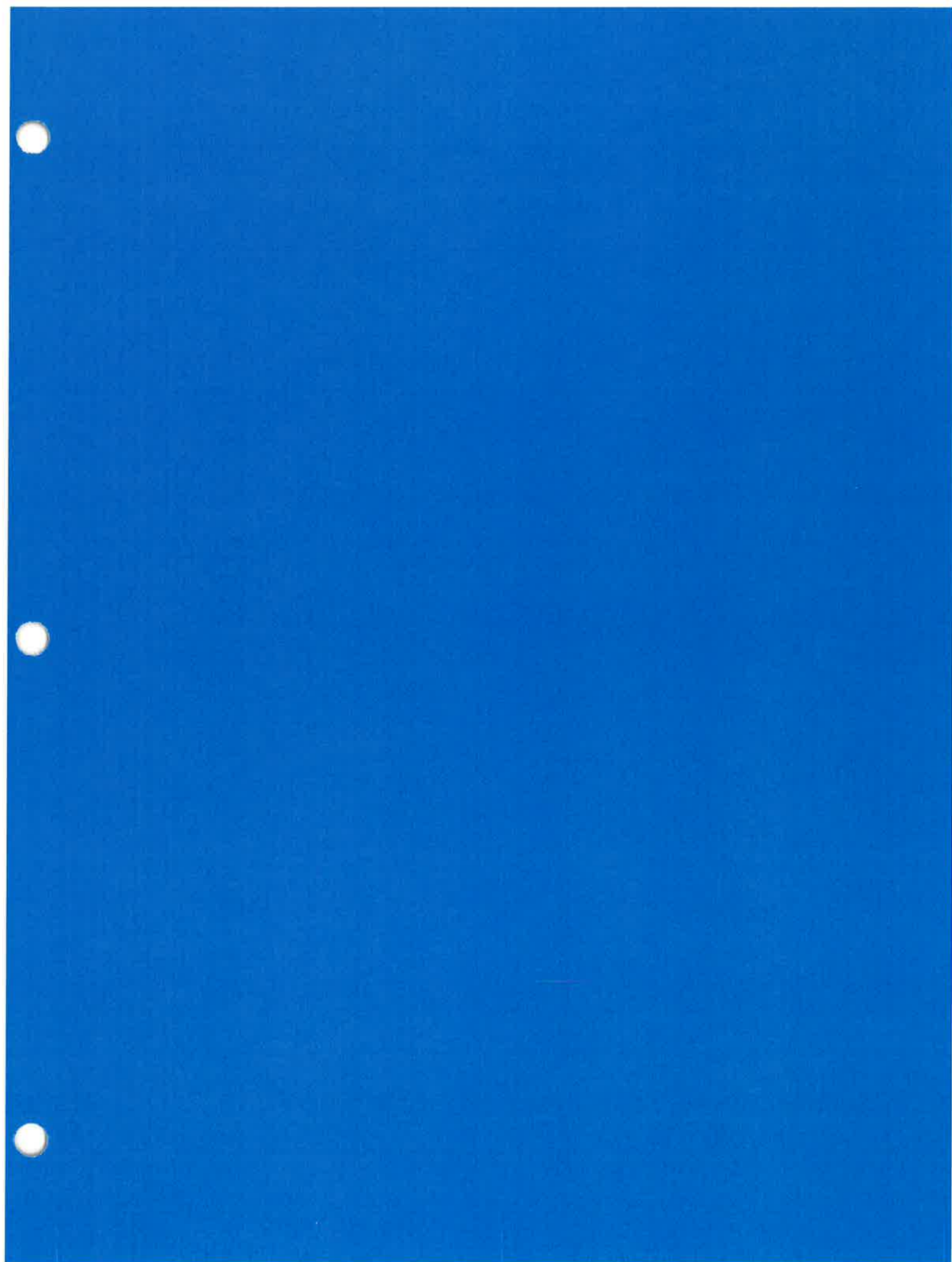
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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air/Water Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/16/15 ENDED: 1/27/15

**WATER LEVEL (FT.)**

**REMARKS**

6.25" Dia. Drag Bit(0-11'); 8.75" Dia. Tricone Roller Bit (0-20'); Installed 8" PVC casing (0-20'); Core(11-150'). Boring was tremie-grouted with Quik-Grout bentonite/water from 0-139' on 1/27/15. Boring had caved-in/scaled from (139-150') prior to placement of bentonite grout.











SURFACE ELEVATION: 548  
 NORTHING: 17095438  
 EASTING: 772808

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.  
 B-55**

Depth in Feet	Surf. Elev. 548	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
0	548		Brown FAT CLAY(CH), little silt and fine sand, trace organics, stiff, high plasticity, moist, slightly calcareous and saline, massive.	CH	ST-1 (0-1.5') Rec=18"		1.75		
1	547				2.5				
2	546		Brown FAT CLAY(CH), little silt and fine sand, trace roots, very stiff, high plasticity, moist, highly calcareous and moderately saline, slight blocky structure.	CH	ST-2 (1.5-3') Rec=14"		2.0		
3	545				2.75				
4	544		Light Brown, little Pinkish Gray and Brown FAT CLAY(CH), little silt and sand, trace yellowish brown iron staining, very stiff grading to hard, high plasticity, moist, moderately calcareous and saline, blocky.	CH	ST-3 (3-4.5') Rec=12"		3.5		
5	543				4.5+				
6	542				4.5 +				
7	541				4.5 +				
8	540		Light Olive Brown with trace Pale Brown FAT CLAY(CH), little fine sand and silt, trace yellowish brown and black staining, hard, high plasticity, moist, moderately calcareous and saline(gypsum crystals).  (10.5-11'); Trace reddish brown, very stiff. (11-12'); Blocky structure with trace laminations, trace medium to coarse sand and fine gravel.	CH	ST-4 (4.5-6') Rec=17"		4.5 +		
9	539				4.5 +				
10	538				2.25				
11	537				4.5+				
12	536	Moderately hard to hard Light Brown to Brown with Light Gray FAT CLAYSTONE(CH), little fine sand and silt, trace yellowish brown, strong brown and black staining in fissures, dry, aphanitic to very fine grained, blocky with trace thin beds and laminations, moderately to well indurated, moderately calcareous and saline, slightly weathered.	CH	ST-5 (6-7.5') Rec=17"			0%		
13	535			ST-6 (7.5-9') Rec=18"					
14	534			ST-7 (9-10.5') Rec=18"					
15	533			ST-8 (10.5-12') Rec=18"					
16	532			CB-9 (12-20') Rec=25"					
17	531								
18	530								
19	529								
20		(Continued on next page)							

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DRILLING CONTRACTOR: Andrews & Foster DRILLING METHOD: Air Rotary 3" I.D.; 4.875" O.D. Double Tube Core Barrel DRILLING EQUIPMENT: Gardner Denver 15W Truck Mounted Drill Rig DRILLING STARTED: 1/28/15 ENDED: 2/5/15	<b>WATER LEVEL (FT.)</b>	<b>REMARKS</b> 3"x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-20') Installed 8" PVC casing (0-17'); Core(12-153'). Boring was tremie-grouted with Quik-Grout bentonite/water from 0-142' on 2/5/15. Boring had caved-in/sealed from (142-153') prior to placement of bentonite grout.
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SURFACE ELEVATION: 548  
 NORTHING: 17095438  
 EASTING: 772808

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO  
 B-55**

Depth in Feet	Surf. Elev. 548	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
20	528	[Hatched Strata Column]	(Continued from previous page)	CH	CB-10 (20-27") Rec=23"			0%	
21	527		Moderately hard to hard, stratified Pale Olive to Olive to Grayish Brown to Gray FAT CLAYSTONE(CH), trace yellowish brown and yellowish red staining, dry, aphanitic to very fine grained, blocky, moderately to well indurated, slightly to highly calcareous, saline, slightly weathered.						
22	526								
23	525								
24	524								
25	523								
26	522								
27	521		CH	Hard, Gray to Dark Gray with Greenish Gray FAT CLAYSTONE(CH), trace fine sand and silt, trace yellowish brown and yellowish red staining, dry, aphanitic, blocky to slightly laminated, well indurated, moderately calcareous, saline, slightly weathered.	CB-11 (27-32") Rec=47"			48.33%	
28	520								
29	519								
30	518								
31	517								
32	516	CH	Hard with thin beds of moderately hard, Greenish Gray with trace Gray FAT CLAYSTONE(CH), trace very dark gray lean claystone with brown saline material in partings and fissures, trace fine sand and silt, dry, aphanitic, blocky, well indurated, slightly calcareous and saline, slightly weathered.	CB-12 (32-36") Rec=46"			27.08%	(32-36'); Moisture in boring after 32-36' core run.	
33	515								
34	514								
35	513								
36	512								
37	511	Same, little fine sand.							
38	510	CL	Hard, Dark Greenish Gray SANDY LEAN CLAYSTONE(CL), little silt, dry, aphanitic to very fine grained, massive, (Continued)	CB-13 (36-41") Rec=56"			35%		
39	509								
40									

DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**  
 3"x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-20')  
 Installed 8" PVC casing (0-17'); Core(12-153').  
 Boring was tremie-grouted with Quik-Grout bentonite/water  
 from 0-142' on 2/5/15. Boring had caved-in/sealed  
 from (142-153') prior to placement of bentonite grout.

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SURFACE ELEVATION: 548  
 NORTHING: 17095438  
 EASTING: 772808

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.  
 B-55**



Depth in Feet	Surf. Elev. 548	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS	
40	508		(Continued from previous page); SANDY LEAN CLAYSTONE(CL), well indurated, non calcareous, saline, fresh.	CL	CB-13 (36-41') Rec=56"					
41	507									
42	506									
43	505		Same, dark greenish gray with light greenish gray SANDY LEAN CLAYSTONE(CL).							
44	504									
45	503									
46	502						CB-14 (41-49') Rec=92"		34.37%	
47	501									
48	500									
49	499									
50	498		Moderately hard to hard, Dark Greenish Gray with Light Gray FAT CLAYSTONE(CH), trace fine sand and silt, dry, aphanitic, thinly to very thinly bedded with some laminations, well indurated, non calcareous, slightly saline, fresh.	CH	CB-15 (49-52') Rec=34"			0%		
51	497									
52	496									
53	495									
54	494		Same, with trace to little silt, trace black staining in fissures.							
55	493									
56	492						CB-16 (52-62') Rec=103"		28.33%	
57	491									
58	490									
59	489									
60			(Continued on next page)							

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**  
 3"x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-20')  
 Installed 8" PVC casing (0-17'); Core(12-153').  
 Boring was tremie-grouted with Quik-Grout bentonite/water from 0-142' on 2/5/15. Boring had caved-in/sealed from (142-153') prior to placement of bentonite grout.



SURFACE ELEVATION: 548  
 NORTHING: 17095438  
 EASTING: 772808

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO**  
**B-55**

Depth in Feet	Surf. Elev. 548	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS				
60	488	(Continued from previous page)	(Continued from previous page)	CH									
61	487		Same, FAT CLAYSTONE(CH).										
62	486										CB-16 (52-62') Rec=103"		
63	485											Same, FAT CLAYSTONE(CH)	
64	484												
65	483												
66	482											27.5%	
67	481												CB-17 (62-72') Rec=106"
68	480												
69	479	Moderately hard to hard, Dark Greenish Gray and Dark Reddish Gray FAT CLAYSTONE(CH), trace fine sand and silt, dry, aphanitic, blocky, moderately to well indurated, non calcareous, saline, fresh.	CH										
70	478												
71	477												
72	476												
73	475	Moderately hard to hard, Dark Greenish Gray with trace Greenish Gray FAT CLAYSTONE(CH), trace fine sand and silt, dry, aphanitic, blocky, well indurated, non calcareous, saline.	CH		CB-18 (72-82') Rec=91"		10%						
74	474												
75	473												
76	472	Moderately hard to hard, Dusky Red to Weak Red with little Greenish Gray FAT CLAYSTONE(CH), trace fine sand and silt, dry, aphanitic, blocky, moderately to well indurated, slightly to moderately calcareous, saline, fresh. (Continued on next page)	CH										
77	471												
78	470												
79	469												
80													

DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**

3"x2' Long Shelby Tube (ST) (0-12'); 12.25" Dia. Drag Bit (0-20')  
 Installed 8" PVC casing (0-17'); Core (12-153').  
 Boring was tremie-grouted with Quik-Grout bentonite/water  
 from 0-142' on 2/5/15. Boring had caved-in/sealed  
 from (142-153') prior to placement of bentonite grout.



SURFACE ELEVATION: 548  
 NORTHING: 17095438  
 EASTING: 772808

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.**  
**B-55**



Depth in Feet	Surf. Elev. 548	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS			
80	468	[Hatched pattern]	(Continued from previous page)	CH								
81	467		Same, FAT CLAYSTONE(CH)							CB-18 (72-82') Rec=91"		
82	466		Same, with trace pale red.									
83	465											
84	464											
85	463											
86	462											
87	461										CB-19 (82-92') Rec=91"	
88	460										0%	
89	459											
90	458	[Hatched pattern]	Moderately hard to hard, Greenish Gray with little Light Gray SANDY LEAN CLAYSTONE(CL), dry, aphanitic to very fine grained, massive, moderately to well indurated, slightly calcareous, saline, fresh.	CL	CB-20 (92-98') Rec=69"		0%					
94	454											
95	453							Moderately hard, Greenish Gray with little Light Gray SILTY SANDSTONE(SM), little clay, moist, fine grained to very fine grained, massive, moderately indurated, slightly calcareous, saline, fresh.	SM			
96	452											
97	451							SC				
98	450							Moderately hard, Greenish Gray with little Light Gray CLAYEY SANDSTONE(SC), little silt, moist, fine grained to very fine grained, massive, moderately indurated, slightly calcareous, saline, fresh.	SC	CB-21 (98-102') Rec=16"		0%
99	449											
100												

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DRILLING CONTRACTOR: Andrews & Foster DRILLING METHOD: Air Rotary 3" I.D.; 4.875" O.D. Double Tube Core Barrel DRILLING EQUIPMENT: Gardner Denver 15W Truck Mounted Drill Rig DRILLING STARTED: 1/28/15 ENDED: 2/5/15	<b>WATER LEVEL (FT.)</b>	<b>REMARKS</b> 3"x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-20') Installed 8" PVC casing (0-17'); Core(12-153'). Boring was tremie-grouted with Quik-Grout bentonite/water from 0-142' on 2/5/15. Boring had caved-in/sealed from (142-153') prior to placement of bentonite grout.
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SURFACE ELEVATION: 548  
 NORTHING: 17095438  
 EASTING: 772808

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO**  
**B-55**

Depth in Feet	Surf. Elev. 548	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
100	448		(Continued from previous page)(97.7-101'); Moderately hard, Greenish Gray with little	SC					
101	447		Light Gray CLAYEY SANDSTONE(SC), little silt, moist, aphanitic to very fine grained, blocky, moderately indurated, slightly calcareous, saline, fresh.	CH	CB-21 (98-102') Rec=16"				
102	446		Hard, Dark Greenish Gray with trace Light Gray FAT CLAYSTONE(CH), trace slickensides, dry, aphanitic, blocky with trace laminations, well indurated, slightly calcareous, saline, fresh.						
103	445		(101.5-103.5'); Hard, Dark Reddish Brown FAT CLAYSTONE(CH), trace slickensides, dry, aphanitic, blocky with trace laminations, well indurated, moderately calcareous, saline, fresh.						
104	444		(103.5-127.7'); Hard, Dark Reddish Brown with Reddish Brown and Light Reddish Brown and trace Greenish Gray FAT CLAYSTONE(CH), trace fine sand and silt, dry, aphanitic, massive with some blocky structure, thin beds and laminations, well indurated, moderately to highly calcareous, saline, fresh.	CH	CB-22 (102-112') Rec=105"			10%	
105	443								
106	442								
107	441								
108	440								
109	439								
110	438								
111	437								
112	436								
113	435								
114	434								
115	433				CB-23 (112-117') Rec=52"			0%	
116	432								
117	431								
118	430								
119	429				CB-24 (117-127') Rec=82"				
120			(Continued on next page)						

DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**

3"x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-20')  
 Installed 8" PVC casing (0-17'); Core(12-153').  
 Boring was tremie-grouted with Quik-Grout bentonite/water from 0-142' on 2/5/15. Boring had caved-in/sealed from (142-153') prior to placement of bentonite grout.

SURFACE ELEVATION: 548  
 NORTHING: 17095438  
 EASTING: 772808

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.  
 B-55**



Depth in Feet	Surf. Elev. 548	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
120	428	(Continued from previous page)	(Continued from previous page)						
121	427		Same, FAT CLAYSTONE(CH)						
122	426								
123	425								
124	424				CH	CB-24 (117-127') Rec=82"			0%
125	423								
126	422								
127	421								
128	420			Brown FAT CLAY(CH), trace fine sand and silt, very stiff, high plasticity, dry highly calcareous, slightly saline, massive.	CH	CB-25 (127-129') Rec=18"		3.5	0%
129	419			Hard, Dark Greenish Gray with little Light Greenish Gray FAT CLAYSTONE(CH), trace fine sand and silt, dry, aphanitic, massive with trace thin beds and laminations, well indurated, moderately calcareous, saline, fresh. (130.5-131.2'); Dark Reddish Brown with trace Dark Greenish Gray.					
130	418				CH				
131	417								
132	416								
133	415								
134	414		Hard, Dark Reddish Brown with Reddish Gray and Pinkish Gray with trace Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic, massive with slight blocky structure and some thin beds and laminations, well indurated, moderately calcareous, slightly saline, fresh.						
135	413			CH	CB-26 (129-139') Rec=95"			6.66%	
136	412								
137	411								
138	410		Hard, Dark Reddish Gray with little Greenish Gray FAT CLAYSTONE(CH), trace slickensides, dry, aphanitic, blocky, well indurated, slightly calcareous, saline, fresh.						
139	409			CH					
140			FAT CLAYSTONE(CH). (Continued)	CH	CB-27 (139-149') Rec=110"				

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**  
 3"x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-20')  
 Installed 8" PVC casing (0-17'); Core(12-153')  
 Boring was tremie-grouted with Quik-Grout bentonite/water from 0-142' on 2/5/15. Boring had caved-in/sealed from (142-153') prior to placement of bentonite grout.



SURFACE ELEVATION: 548  
 NORTHING: 17095438  
 EASTING: 772808

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.**  
**B-55**

Depth in Feet	Surf. Elev. 548	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
140	408	(Continued from previous page)(139.3-143')	Hard, Dark Reddish Brown with little Greenish Gray FAT CLAYSTONE(CH), trace slickensides, trace light brownish gray limestone nodules, dry, aphanitic, blocky, well indurated, slightly to moderately calcareous, saline.	CH					
141	407								
142	406	(142-149')	Hard, Weak Red with little Pale Red and trace Greenish Gray LEAN CLAYSTONE(CL), trace fine sand and silt, dry, aphanitic, massive with slight blocky structure with trace thin beds and laminations, well indurated, moderately calcareous, saline, fresh.	CL	CB-27 (139-149') Rec=110"			0%	
143	405								
144	404								
145	403	(149-153')	Hard, Dark Reddish Brown with trace Greenish Gray FAT CLAYSTONE(CH), trace slickensides, dry, aphanitic, massive with slight blocky structure and trace thin beds and laminations, well indurated, moderately to highly calcareous, saline, fresh. Same, moderately hard to hard, moderately to well indurated.	CH	CB-28 (149-153') Rec=48"			0%	
146	402								
147	401								
148	400								
149	399	(152-153'); Some gray and pinkish gray.							
150	398								
151	397								
152	396								
153	395								
154	394								
155	393								
156	392								
157	391								
158	390								
159	389								
160									

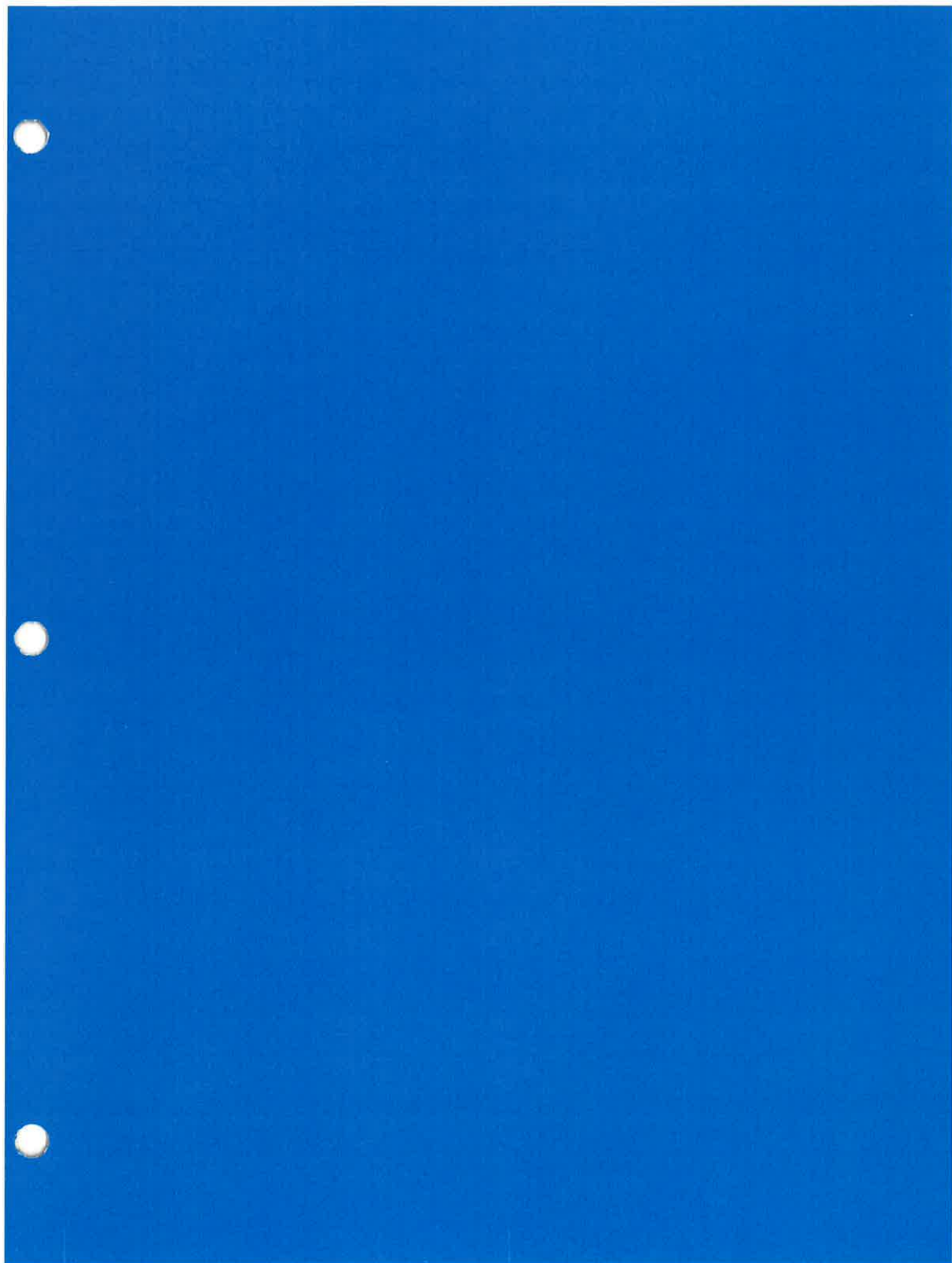
End of Boring @153'

DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**

3"x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-20')  
 Installed 8" PVC casing (0-17'); Core(12-153').  
 Boring was tremie-grouted with Quik-Grout bentonite/water  
 from 0-142' on 2/5/15. Boring had caved-in/sealed  
 from (142-153') prior to placement of bentonite grout.









SURFACE ELEVATION: 558  
 NORTHING: 17098900  
 EASTING: 772960

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.**  
**B-58**

Depth in Feet	Surf. Elev. 558	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS														
0	558	[Hatched Strata]	Dark Brown FAT ORGANIC CLAY(OH), little fine sand, very stiff, high plasticity, moist, highly calcareous, saline, massive with slight blocky structure.	OH	ST-1 (0-1.5') Rec=18"		3.5																
1	557																						
2	556									Reddish Brown FAT CLAY(CH), little fine sand, very stiff, high plasticity, moist, moderately to highly calcareous, saline, massive.	CH	ST-2 (1.5-3') Rec=14"		3.0									
3	555																						
4	554																						
5	553																Stiff.						
6	552																Very stiff.						
7	551																Stiff.						
8	550																Pale Olive with little Grayish Brown and Reddish Brown FAT CLAY(CH), trace strong brown staining, little fine sand, very stiff grading to hard, high plasticity, dry to moist, slightly calcareous, saline, blocky.	CH	ST-6 (7.5-9') Rec=18"		2.25		
9	549																						
10	548	Moderately hard to hard, Grayish Brown FAT CLAYSTONE(CH), dry, aphanitic, blocky with some thin beds, moderately to well indurated, slightly calcareous, saline, slightly weathered,	CH	ST-7 (9-10.5') Rec=18"		4.5 +																	
11	547																						
12	546																						
13	545	Moderately hard to hard, Reddish Brown FAT CLAYSTONE(CH), trace yellowish brown staining, dry, aphanitic, blocky with some thin beds, moderately calcareous, saline, slightly weathered.	CH	CB-9 (12-17') Rec=17"			0%																
14	544																						
15	543																						
16	542																						
17	541	Same, with reddish gray and weak red.	CH	CB-10 (17-22') Rec=23"			10%																
18	540																						
19	539																						
20																							

(Continued on next page)

DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**  
 3'x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-40')  
 Installed 8" PVC casing (0-40'); Core(12-150').  
 Piezometer P-58D was installed into the boring to 148'  
 upon the completion of drilling activities.

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SURFACE ELEVATION: 558  
 NORTHING: 17098900  
 EASTING: 772960

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO  
 B-58**

Depth in Feet	Surf. Elev. 558	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
20	538		(Continued from previous page)	CH	CB-10 (17-22') Rec=23"				
21	537		Same, FAT CLAYSTONE(CH).						
22	536		Soft to moderately hard, Olive with Pale Olive and trace Yellowish Brown FAT CLAYSTONE(CH), moist to wet, aphanitic, blocky with some thin beds and laminations, moderately indurated, slightly calcareous, saline, slightly weathered.	CH	CB-11 (22-27') Rec=28"				
23	535								
24	534								
25	533								
26	532		Moderately hard, Brown with Pale Brown and Very Pale Brown FAT CLAYSTONE(CH), trace reddish brown, strong brown and black staining in partings, trace low angle slickensides, moist(27-30.5'), dry(30.5-32'), little fine sand, aphanitic to very fine grained, massive with slight blocky structure, moderately indurated, slightly calcareous, saline, slightly weathered.	CH	CB-12 (27-32') Rec=58"				
27	531								
28	530								
29	529								
30	528								
31	527								
32	526	Brown FAT CLAY(CH), trace fine sand, hard, high plasticity, moist, slightly calcareous, saline, slightly weathered.	CH	CB-13 (32-40') Rec=33"					
33	525								
34	524								
35	523	Moderately hard to hard(32.3-34'), soft to moderately hard(34-40'), Brown with Pale Brown and little Olive FAT CLAYSTONE(CH), little fine sand, trace yellowish brown, yellow and black staining in partings, dry, aphanitic to very fine grained, massive, moderately to well indurated, slightly calcareous, slightly weathered.	CH	CB-13 (32-40') Rec=33"					
36	522								
37	521								
38	520								
39	519	(Continued on next page)							
40									

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**  
 3'x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-40')  
 Installed 8" PVC casing (0-40'); Core(12-150').  
 Piezometer P-58D was installed into the boring to 148'  
 upon the completion of drilling activities.



SURFACE ELEVATION: 558  
 NORTHING: 17098900  
 EASTING: 772960

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.**  
**B-58**

Depth in Feet	Surf. Elev. 558	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
40	518	(Continued from previous page)	(Continued from previous page)						
41	517		Same, moderately hard to hard, FAT CLAYSTONE(CH).	CH					
42	516		Hard, Greenish Gray with little Light Greenish Gray FAT CLAYSTONE(CH), trace fine sand, dry, aphanitic, massive, well indurated, highly calcareous grading to slightly calcareous, slightly saline, fresh.						
43	515				CB-14 (40-45') Rec=39"			0%	
44	514								
45	513				CH				
46	512		Trace yellowish red and black staining in partings and fissures, slightly calcareous, slightly weathered.						
47	511								
48	510								
49	509		Hard, Dark Gray with little Gray and trace Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic, massive with slight blocky structure, well indurated, highly calcareous, saline, fresh.						
50	508			CB-15 (45-53') Rec=74.5"			21.87%		
51	507								
52	506			CH					
53	505								
54	504	Little to some greenish gray, trace slickensides.							
55	503								
56	502								
57	501	Hard, Dark Gray with Greenish Gray and little Dark Greenish Gray FAT CLAYSTONE(CH), often stratified, trace fine sand, dry, aphanitic, massive with some thin bedding and laminations, well indurated, moderately to highly calcareous, saline, fresh.							
58	500			CB-16 (53-63') Rec=106"			85.83%		
59	499			CH					
60			(Continued on next page)						

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**  
 3"x2' Long Shelby Tube (ST) (0-12'); 1.25" Dia. Drag Bit (0-40')  
 Installed 8" PVC casing (0-40'); Core (12-150').  
 Piezometer P-58D was installed into the boring to 148' upon the completion of drilling activities.





SURFACE ELEVATION: 558  
 NORTHING: 17098900  
 EASTING: 772960

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.**  
**B-58**

Depth in Feet	Surf. Elev. 558	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
60	498	(Continued from previous page)	Same, FAT CLAYSTONE(CH).	CH	CB-16 (53-63') Rec=106"				
61	497								
62	496								
63	495								
64	494	Hard, Greenish Gray with Dark Gray, Gray and Light Gray FAT CLAYSTONE(CH), stratified, trace fine sand, dry, aphanitic, massive with some thin beds and laminations, well indurated, slightly to highly calcareous, saline, fresh.	CH	CB-17 (63-73') Rec=110"			62.92%		
65	493								
66	492								
67	491								
68	490	Hard, Dark Gray with Gray and Light Gray with trace Greenish Gray LEAN CLAYSTONE(CL), trace to little fine sand, dry, aphanitic to very fine grained, massive, well indurated, highly calcareous, saline, fresh.	CL	CB-18 (73-83') Rec=103"			67.5%		
69	489								
70	488								
71	487								
72	486	Hard, Dark Greenish Gray with Greenish Gray and Light Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic, massive, well indurated, highly calcareous, saline, fresh. (79-80'); Trace black lignite. (Continued)	CH						
73	485								
74	484								
75	483								
76	482								
77	481								
78	480								
79	479								
80									

DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**

3'x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-40')  
 Installed 8" PVC casing (0-40'); Core(12-150').  
 Piezometer P-58D was installed into the boring to 148'  
 upon the completion of drilling activities.

SURFACE ELEVATION: 558  
 NORTHING: 17098900  
 EASTING: 772960

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.**  
**B-58**



Depth in Feet	Surf. Elev. 558	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
80	478		(Continued from previous page)						
81	477		Same, FAT CLAYSTONE(CH).	CH					
82	476		Hard, Dark Greenish Gray with Greenish Gray and Dark Gray LEAN CLAYSTONE(CL), trace dark yellowish brown staining in fissures, dry, aphanitic to very fine grained, slight brecciation, well indurated, slightly calcareous, slightly to moderately weathered, saline.	CL	CB-18 (73-83') Rec=103"				
83	475								
84	474								
85	473		Hard, Dark Greenish Gray with Greenish Gray, Light Greenish Gray and little Dark Gray to Gray FAT CLAYSTONE(CH), trace fine sand, dry, well indurated, aphanitic, slightly calcareous, saline, slightly weathered.		CB-19 (83-87') Rec=46.5"			72.92%	
86	472								
87	471		Trace slickensides.						
88	470								
89	469			CH					
90	468								
91	467				CB-20 (87-95') Rec=93.5"			67.18%	
92	466								
93	465								
94	464								
95	463		Hard, Dark Gray with Gray CLAYEY SANDSTONE(SC), dry, very fine grained to fine grained, well indurated, non calcareous, saline, massive, fresh.	SC					
96	462								
97	461								
98	460		Hard, Dark Gray FAT CLAYSTONE(CH), dry, aphanitic, massive, well indurated, highly calcareous, saline, fresh.	CH	CB-21 (95-105') Rec=91.5"			27.08%	
99	459								
100			(Continued on next page)						

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**

3"x2' Long Shelby Tube(ST)(0-12'); 1.25" Dia. Drag Bit(0-40')  
 Installed 8" PVC casing (0-40'); Core(12-150').  
 Piezometer P-58D was installed into the boring to 148'  
 upon the completion of drilling activities.



SURFACE ELEVATION: 558  
 NORTHING: 17098900  
 EASTING: 772960

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO.  
 B-58**

Depth in Feet	Surf. Elev. 558	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
100	458	(Continued from previous page)	(Continued from previous page)						
101	457		Same, FAT CLAYSTONE(CH).						
102	456								
103	455				CH	CB-21 (95-105') Rec=91.5"			
104	454								
105	453								
106	452		(@105.6');45 degree slickenslides (106.6-106.7');Very dark gray.						
107	451								
108	450		Hard, Greenish Gray LEAN CLAYSTONE(CL), trace fine sand, dry, aphanitic, massive, well indurated, non calcareous, saline, fresh.	CL	CB-22 (105-111') Rec=61"			50%	
109	449								
110	448		Very hard, Gray LEAN CLAYSTONE(CL), little silt, trace fine sand, dry, very fine grained to aphanitic, massive, well indurated, non calcareous, saline, fresh.	CL					
111	447								
112	446	Hard, Greenish Gray to Dark Greenish Gray with Light Greenish Gray and trace Dark Gray FAT CLAYSTONE(CH), dry, aphanitic, massive, well indurated, non calcareous, saline, fresh.							
113	445		CH	CB-23 (111-115') Rec=39.5"		47.92%			
114	444								
115	443								
116	442	Moderately hard, Dark Reddish Gray with trace Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic, blocky with trace slickenslides, moderately indurated, slightly calcareous, saline, slightly weathered.							
117	441								
118	440		CH	CB-24 (115-125') Rec=48"		5.8%			
119	439								
120			(Continued on next page)						

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**  
 3"x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-40')  
 Installed 8" PVC casing (0-40'); Core(12-150').  
 Piezometer P-58D was installed into the boring to 148' upon the completion of drilling activities.



SURFACE ELEVATION: 558  
 NORTHING: 17098900  
 EASTING: 772960

PROJECT: Pescadito Environmental Resource Center  
 CLIENT: Rancho Viejo Waste Management, LLC  
 PROJECT NO.: 148866  
 LOGGED BY: RWB

**BORING NO**  
**B-58**

Depth in Feet	Surf. Elev. 558	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS
120	438	[Hatched Area]	(Continued from previous page)						
121	437		Same, FAT CLAYSTONE(CH).	CH					
122	436		Moderately hard, Dark Reddish Brown with little Reddish Brown, Light Reddish Brown and little Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic, massive to blocky with trace slickensides, saline, moderately indurated, highly calcareous, slightly weathered.	CH	CB-24 (115-125') Rec=48"				
123	435								
124	434								
125	433		(124-125'); Hard, well indurated, massive.						
126	432		Moderately hard to hard, Dark Reddish Brown with Reddish Brown, Light Reddish Brown, Dark Reddish Gray and little Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic, massive to blocky with trace slickensides, moderately to well indurated, highly calcareous, saline, slightly weathered.	CH	CB-25 (125-135') Rec=73"			10.83%	
127	431								
128	430								
129	429								
130	428		Hard, Reddish Brown with Light Reddish Brown and trace to little Greenish Gray FAT CLAYSTONE(CH), trace fine sand, dry, aphanitic, massive with slight blocky structure, well indurated, moderately calcareous, saline, slightly weathered.	CL	CB-26 (135-145') Rec=94.5"			37.92%	
136	422								
137	421		Hard, Greenish Gray with Light Greenish Gray and little Reddish Brown and Reddish Gray FAT CLAYSTONE(CH), dry, aphanitic, massive with slight blocky structure, thin beds and laminations, (Continued)	CH					
138	420								
139	419								
140									

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DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**  
 3"x2' Long Shelby Tube(ST)(0-12'); 12 25" Dia. Drag Bit(0-40')  
 Installed 8" PVC casing (0-40'); Core(12-150').  
 Piezometer P-58D was installed into the boring to 148'  
 upon the completion of drilling activities.



SURFACE ELEVATION: 558

PROJECT: Pescadito Environmental Resource Center

NORTHING: 17098900

CLIENT: Rancho Viejo Waste Management, LLC

EASTING: 772960

PROJECT NO.: 148866

LOGGED BY: RWB

BORING NO.

B-58



Depth in Feet	Surf. Elev. 558	Strata	DESCRIPTION	USCS/ Material Abbreviation	Sample Type & No. Depth (ft) Recovery (in)	Blow Count	UCS (tsf) Using Pocket Penetrometer	RQD	REMARKS	
140	418	(Continued from previous page)	(Cont'd) FAT CLAYSTONE(CH), well indurated, moderately calcareous, saline, slightly weathered.	CH	CB-26 (135-145') Rec=94.5"					
141	417									
142	416									
143	415									
144	414									
145	413		Hard, Reddish Brown with trace to little Greenish Gray FAT CLAYSTONE(CH), dry, aphanitic, massive, well indurated, highly calcareous, saline, fresh.	CH	CB-27 (145-150') Rec=57"			70.83%		
146	412									
147	411									
148	410									
149	409									
150	408	End of Boring @150'								
151	407									
152	406									
153	405									
154	404									
155	403									
156	402									
157	401									
158	400									
159	399									
160										

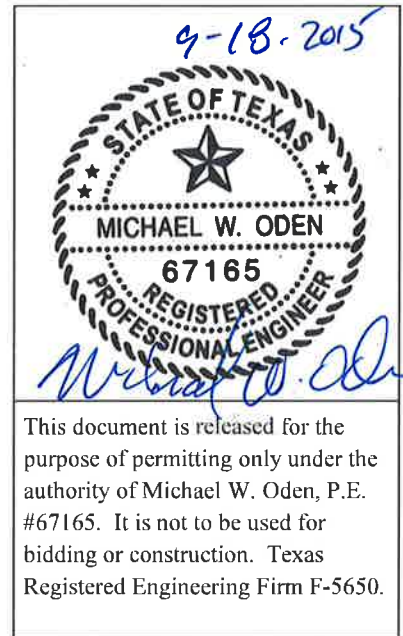
DRILLING CONTRACTOR: Andrews & Foster  
 DRILLING METHOD: Air Rotary  
 3" I.D.; 4.875" O.D.  
 Double Tube Core Barrel  
 DRILLING EQUIPMENT: Gardner Denver 15W  
 Truck Mounted Drill Rig  
 DRILLING STARTED: 1/28/15 ENDED: 2/5/15

**WATER LEVEL (FT.)**

**REMARKS**  
 3'x2' Long Shelby Tube(ST)(0-12'); 12.25" Dia. Drag Bit(0-40')  
 Installed 8" PVC casing (0-40'); Core(12-150').  
 Piezometer P-58D was installed into the boring to 148'  
 upon the completion of drilling activities.

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**III-E.5-C**  
**Photographs**







## Phase V Site Investigation

Client: Rancho Viejo Waste Management, LLC

Location: Pescadito Environmental Resource Center – Webb County, Texas

### Photograph No. 1

**Description:**  
Double Tube Core Barrel



### Photograph No. 2

**Description:**  
Drill Bit







**Phase V Site Investigation**

**Client:** Rancho Viejo Waste Management, LLC

**Location:** Pescadito Environmental Resource Center – Webb County, Texas



<p><b>Photograph No. 3</b></p>	
<p><b>Description:</b> B-52  53' to 60'</p>	
<p><b>Photograph No. 4</b></p>	
<p><b>Description:</b> B-52  60' to 70'</p>	



**Phase V Site Investigation**

**Client:** Rancho Viejo Waste Management, LLC

**Location:** Pescadito Environmental Resource Center – Webb County, Texas

<p><b>Photograph No. 5</b></p>	
<p><b>Description:</b> B-52  90' to 100'</p>	
<p><b>Photograph No. 6</b></p>	
<p><b>Description:</b> B-52  141' to 150'</p>	







**Phase V Site Investigation**

**Client:** Rancho Viejo Waste Management, LLC

**Location:** Pescadito Environmental Resource Center – Webb County, Texas

<p><b>Photograph No. 7</b></p>	
<p><b>Description:</b> B-55  27' to 32'</p>	
<p><b>Photograph No. 8</b></p>	
<p><b>Description:</b> B-55  36' to 41'</p>	



**Phase V Site Investigation**

**Client:** Rancho Viejo Waste Management, LLC

**Location:** Pescadito Environmental Resource Center – Webb County, Texas

<p><b>Photograph No. 9</b></p>	
<p><b>Description:</b> B-55  102' to 112'</p>	
<p><b>Photograph No. 10</b></p>	
<p><b>Description:</b> B-55  129' to 139'</p>	





**Phase V Site Investigation**

**Client:** Rancho Viejo Waste Management, LLC

**Location:** Pescadito Environmental Resource Center – Webb County, Texas

**Photograph No. 11**

**Description:**

B-58

27' to 32'



**Photograph No. 12**

**Description:**

B-58



53' to 63'



**Phase V Site Investigation**

**Client:** Rancho Viejo Waste Management, LLC

**Location:** Pescadito Environmental Resource Center – Webb County, Texas

<p><b>Photograph No. 13</b></p>	
<p><b>Description:</b> B-58  63' to 73'</p>	
<p><b>Photograph No. 14</b></p>	
<p><b>Description:</b> B-58  111' to 115'</p>	





**Phase V Site Investigation**

**Client:** Rancho Viejo Waste Management, LLC

**Location:** Pescadito Environmental Resource Center – Webb County, Texas

**Photograph No. 15**

**Description:**


B-58

145' to 150'



**III-E.5-D**  
**Piezometer Data Sheets**

9-18-2015



MICHAEL W. ODEN  
67165  
REGISTERED  
PROFESSIONAL ENGINEER

*Michael W. Oden*

This document is released for the purpose of permitting only under the authority of Michael W. Oden, P.E. #67165. It is not to be used for bidding or construction. Texas Registered Engineering Firm F-5650.







# Piezometer Data Sheet

Texas Commission on Environmental Quality  
Waste Permits Division

Permittee or Site Name: Pescadito Environmental Resource Center

County: Webb

Date of Piezometer Installation: 1/25/15

Piezometer Latitude: N:17090899.039 Longitude: E:771382.827

Piezometer Hydraulic Position:  
Upgradient N/A Downgradient N/A

MSW Permit No.: 2374

Piezometer I.D. No.: P-52S

Date of Development: NA

Driller  
Name: Jimmy Ellis(Andrews & Foster)  
License No.: 3243

Geologist, Hydrologist, or Engineer Supervising Piezometer Installation: Ralph Bonk, P.G.(CB&I)

Static Water Level Elevation (with respect to MSL) after Development: 531.308

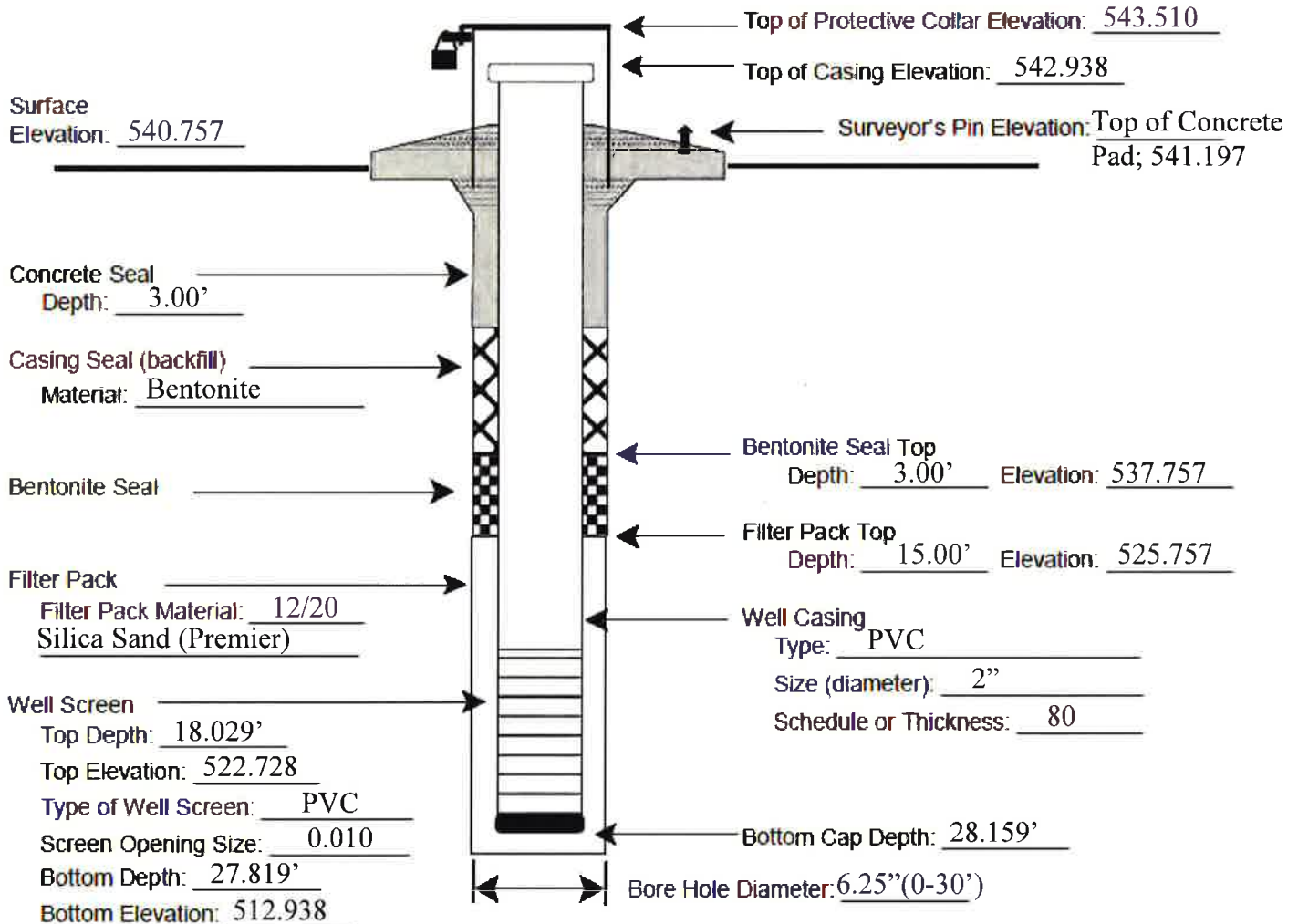
Name of Geologic Formation(s) in which Piezometer is completed: Yegua-Jackson

Type of Locking Device: Nut/Bolt Type of Casing Protection: 4" x 4" Dia. X 5' Long (Steel)

Concrete Surface Pad (with steel reinforcement) Dimensions: 4' x 4' x 5" thick

### Notes:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).





# Piezometer Data Sheet

Texas Commission on Environmental Quality  
Waste Permits Division

Permittee or Site Name: Pescadito Environmental Resource Center

County: Webb

Date of Piezometer Installation: 1/27/15

Piezometer Latitude: N:17090899.250 Longitude: E:771364.129

Piezometer Hydraulic Position:  
Upgradient N/A Downgradient N/A

MSW Permit No.: 2374

Piezometer I.D. No.: P-52D

Date of Development: NA

Driller  
Name: Jimmy Ellis(Andrews & Foster)  
License No.: 3243

Geologist, Hydrologist, or Engineer Supervising Piezometer Installation: Ralph Bonk, P.G.(CB&I)

Static Water Level Elevation (with respect to MSL) after Development: 531.465

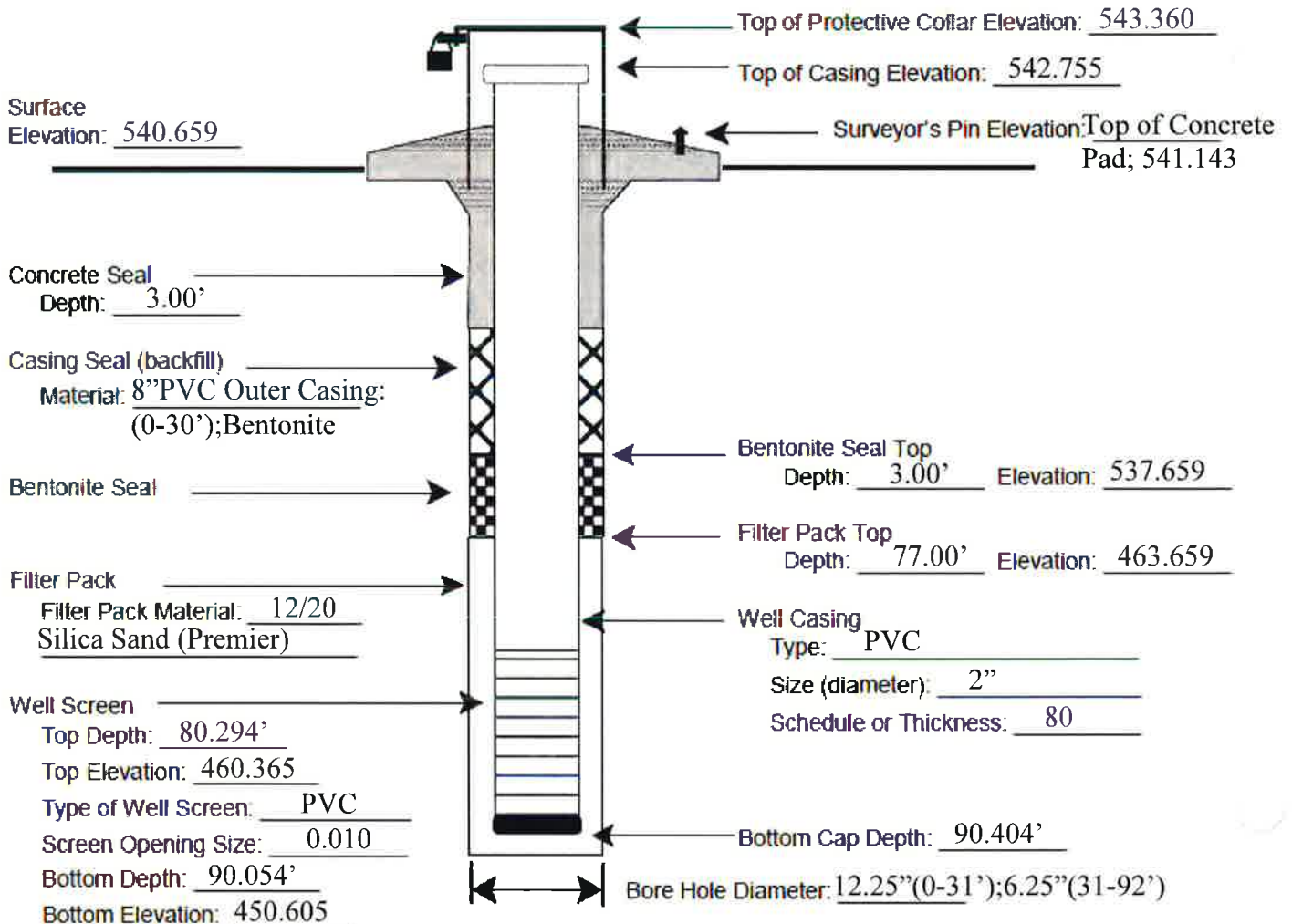
Name of Geologic Formation(s) in which Piezometer is completed: Yegua-Jackson

Type of Locking Device: Nut/Bolt Type of Casing Protection: 4" x 4" Dia. X 5' Long (Steel)

Concrete Surface Pad (with steel reinforcement) Dimensions: 4' x 4' x 5" thick

### Notes:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).





# Piezometer Data Sheet

Texas Commission on Environmental Quality  
Waste Permits Division

Permittee or Site Name: Pescadito Environmental Resource Center

County: Webb

Date of Piezometer Installation: 2/6/15

Piezometer Latitude: N:17095437.396 Longitude: E:772808.836

Piezometer Hydraulic Position:  
Upgradient N/A Downgradient N/A

MSW Permit No.: 2374

Piezometer I.D. No.: P-55D

Date of Development: NA

Driller  
Name: Jimmy Ellis(Andrews & Foster)  
License No.: 3243

Geologist, Hydrologist, or Engineer Supervising Piezometer Installation: Ralph Bonk, P.G.(CB&I)

Static Water Level Elevation (with respect to MSL) after Development: 541.833

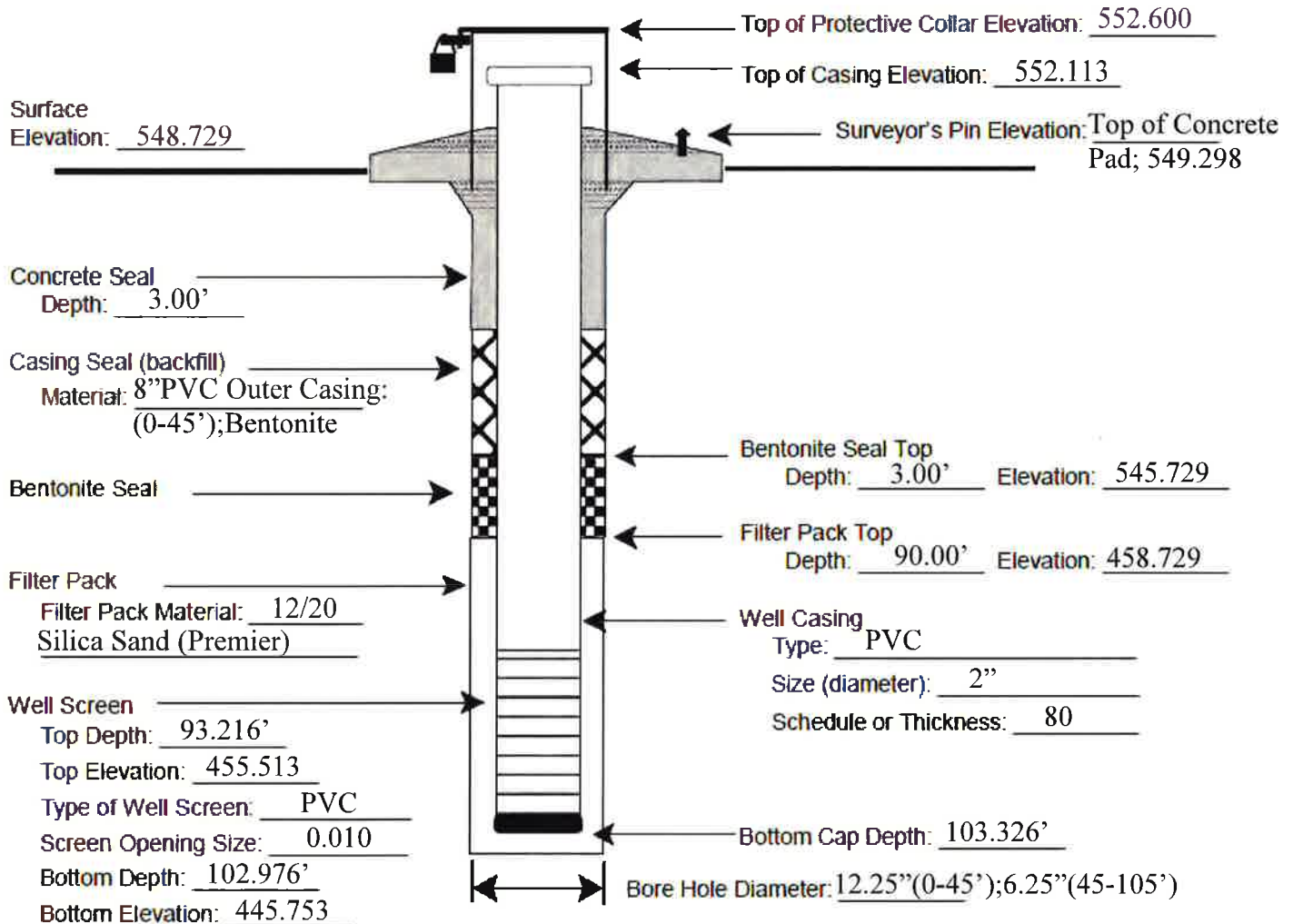
Name of Geologic Formation(s) in which Piezometer is completed: Yegua-Jackson

Type of Locking Device: Nut/Bolt Type of Casing Protection: 4" x 4" Dia. X 5' Long (Steel)

Concrete Surface Pad (with steel reinforcement) Dimensions: 4' x 4' x 5" thick

### Notes:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).







# Piezometer Data Sheet

Texas Commission on Environmental Quality  
Waste Permits Division

Permittee or Site Name: Pescadito Environmental Resource Center

County: Webb

Date of Piezometer Installation: 2/11/15

Piezometer Latitude: N:17098904.202 Longitude: E:772957.408

Piezometer Hydraulic Position:  
Upgradient N/A Downgradient N/A

MSW Permit No.: 2374

Piezometer I.D. No.: P-58S

Date of Development: NA

Driller  
Name: Jimmy Ellis(Andrews & Foster)  
License No.: 3243

Geologist, Hydrologist, or Engineer Supervising Piezometer Installation: Ralph Bonk, P.G.(CB&I)

Static Water Level Elevation (with respect to MSL) after Development: 535.238

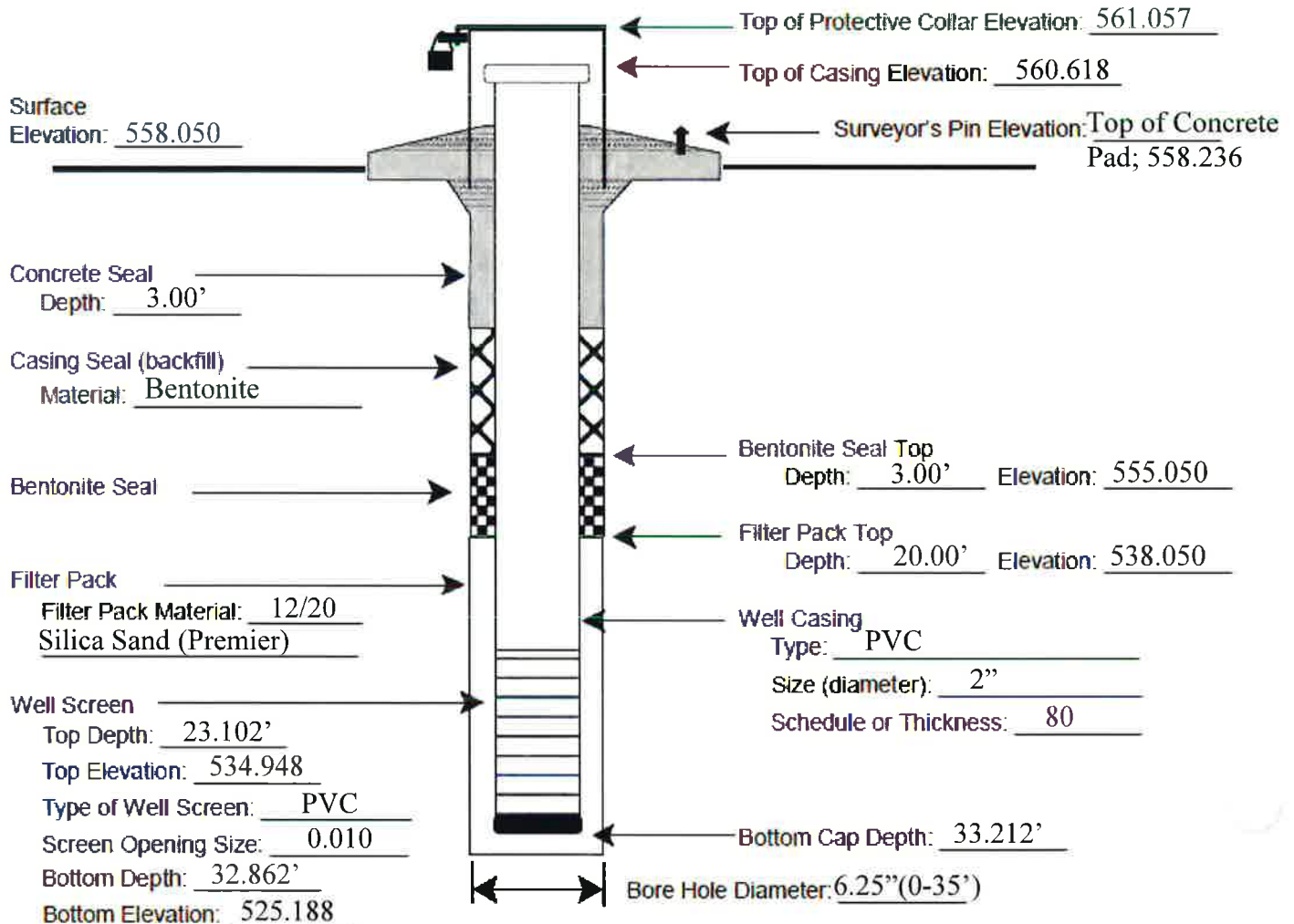
Name of Geologic Formation(s) in which Piezometer is completed: Yegua-Jackson

Type of Locking Device: Nut/Bolt Type of Casing Protection: 4" x 4" Dia. X 5' Long (Steel)

Concrete Surface Pad (with steel reinforcement) Dimensions: 4' x 4' x 5" thick

### Notes:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).





# Piezometer Data Sheet

Texas Commission on Environmental Quality  
Waste Permits Division

Permittee or Site Name: Pescadito Environmental Resource Center

County: Webb

Date of Piezometer Installation: 2/12/15

Piezometer Latitude: N:17098878.889 Longitude: 772970.399

Piezometer Hydraulic Position:  
Upgradient N/A Downgradient N/A

MSW Permit No.: 2374

Piezometer I.D. No.: P-58D

Date of Development: NA

Driller  
Name: Jimmy Ellis(Andrews & Foster)  
License No.: 3243

Geologist, Hydrologist, or Engineer Supervising Piezometer Installation: Ralph Bonk, P.G.(CB&I)

Static Water Level Elevation (with respect to MSL) after Development: 441.847

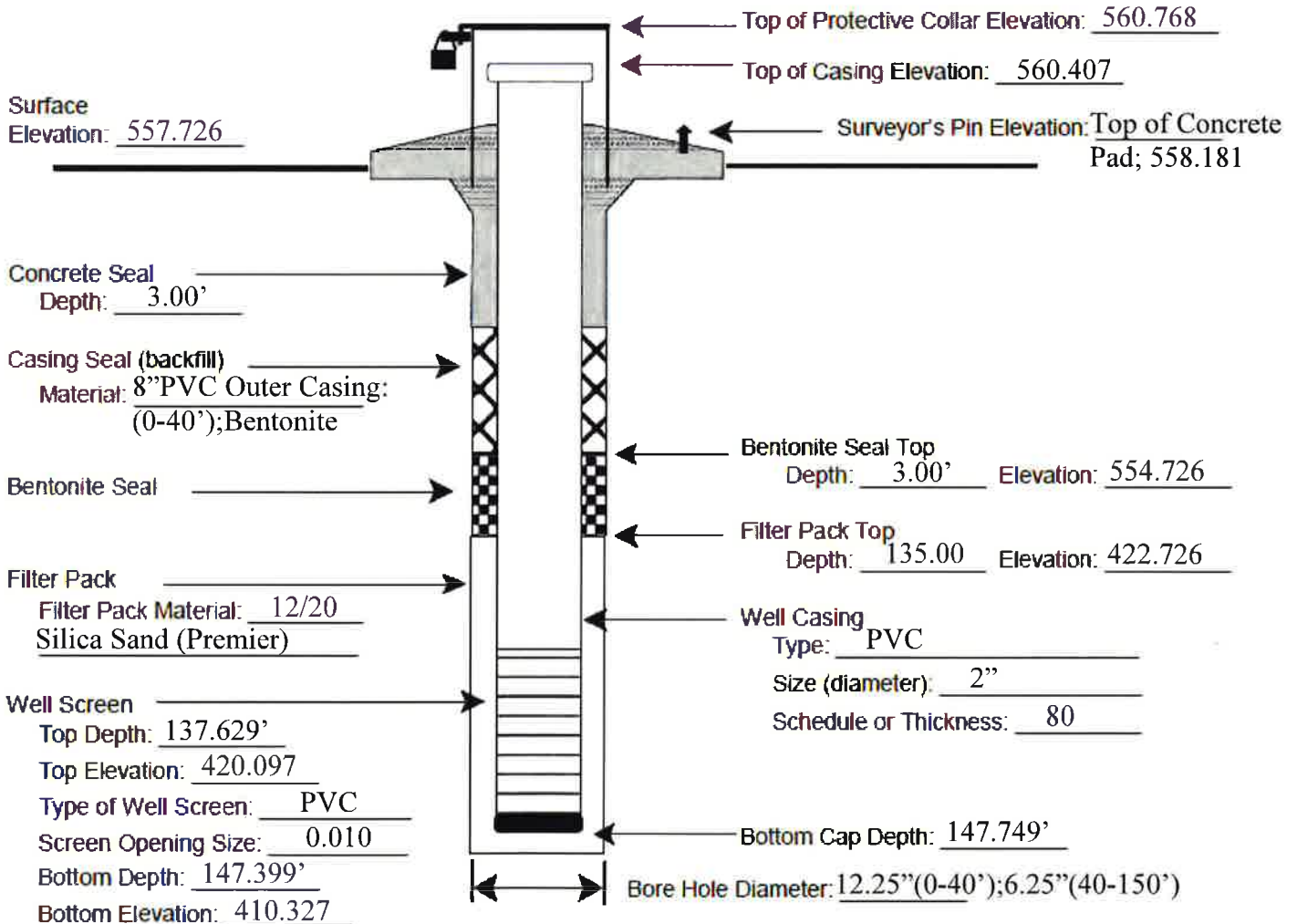
Name of Geologic Formation(s) in which Piezometer is completed: Yegua-Jackson

Type of Locking Device: Nut/Bolt Type of Casing Protection: 4" x 4" Dia. X 5' Long (Steel)

Concrete Surface Pad (with steel reinforcement) Dimensions: 4' x 4' x 5" thick

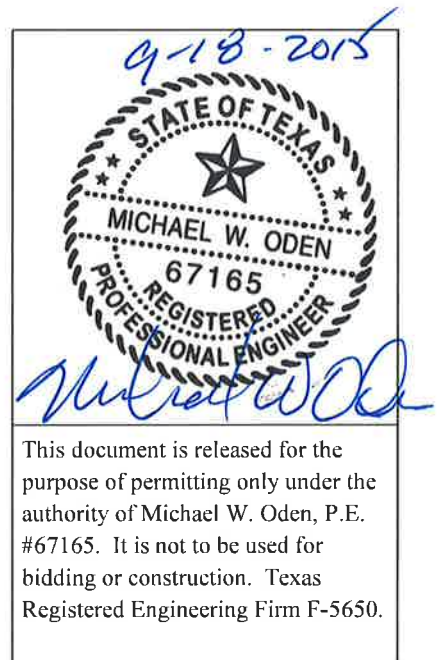
### Notes:

- Report all depths from Surface Elevation and all Elevations relative to Mean Sea Level (MSL), to nearest hundredth of a foot.
- Diameter of boring should be at least 4 inches larger than diameter of casing.
- Use flush screw joint casing only, 2-inch diameter or larger, with o-rings or PTFE tape in joints (4-inch diameter recommend).





**III-E.5-E**  
**TDLR Well Reports**







Attention Owner:  
Confidentiality Privilege Notice  
on reverse side of owner's copy

**Texas Department of Licensing and Regulation**  
Water Well Driller/Pump Installer Section  
P.O. Box 12157 Austin, Texas 78711 Toll free (800) 803-9202 X7880  
Email address: [water.well@license.state.tx.us](mailto:water.well@license.state.tx.us) Web address: [www.tdlr.texas.gov](http://www.tdlr.texas.gov)

This form must be  
completed and filed with the  
department and owner  
within 60 days upon  
completion of the well.

### WELL REPORT

#### A. WELL IDENTIFICATION AND LOCATION DATA

##### 1) OWNER

Name: RANCHO VIEJO WASTE MNG. Address: 1116 CALLE DEL NORTE City: LAREDO State: TX Zip: 78401

##### 2) WELL LOCATION

County: WEBB COUNTY Physical Address: 59 & LOS CENTENARIOS City: LAREDO State: TX Zip: 78401

##### 3) Type of Work

Lat. 27.554393 Long. 99.156985 GPS Datum Elevation  
 New Well  Reconditioning  Proposed Use (check)  Monitor  Environmental Soil Boring  Domestic  Industrial  Frac  
 Replacement  Deepening  Irrigation  Injection  Extraction  De-watering  Testwell  Rig Supply  Stock or Livestock  
 Other  Public Supply --- If Public Supply, were plans approved?  Yes  No

##### 5) Drilling Date

Started 1/25/2015  
Completed 1/25/2015

##### 6) Diameter of Hole

Dia. (in)	From (ft)	To (ft)
6-1/4	0	30

##### 7) Drilling Method (check)

Driven  Air Rotary  Mud Rotary  
 Bored  Air Hammer  Cable Tool  Jetted  Hollow stem Auger  
 Reverse Circulation  Other

Number of identical wells drilled  
at this location:

##### 8) Borehole Completion

Open Hole  Straight Wall  
 Under-reamed  Filter Packed  Other

##### Filter packed interval from 30 ft. to: 17 ft. Size: 12X20 Type

From (ft.) To (ft.) Description and color of formation material

0 13 SANDY CLAY

13 30 RED CLAY

##### 9) Casing, Blank Pipe, and Well Screen Data

Dia. (in.)	New Or Used	Steel, Plastic, etc. Perf., Slotted, etc Screen Mfg., if commercial	Setting (ft)		Gage Casing Screen
			From	To	
2	N	PVC SCH 80	18	+2	
2	N	PVC SCH 80 SLOTTED	28	18	0.010"

##### 10) Annular Seal Data: i.e. (from 0 ft. to 100 ft. 15 sacks of cement)

from: 10 ft. to: 0 ft. 2 sacks of CEMENT  
from: 17 ft. to: 10 ft. 2 sacks of BENTONITE

Method Used: TREMIE Sealed By: A&F

Distance to septic field or other concentrated contamination: 150 ft.  
Distance to Septic Tank: 150 ft. Distance to Property Line: 150 ft.  
Method of Measurement: OWNER Approved by Variance #:

##### 14) Plugged Well plugged within 48 hours

Casing left in well: Cement/Bentonite placed in well:

From (ft.) To (ft.) From (ft.) To (ft.) #Sacks or Material used:

##### 11) Surface Completion

Completed by Driller?  Yes  
 Surface Slab Installed  Surface Sleeve Installed  
 Pitless Adapter Used  Alternative Procedure Used  
 Other  Steel Cased

##### 12) Water Level

Static level 11.63 ft. Date: 2/14/15  
Artesian Flow gpm Method of Measurement

##### 13) Packers:

Type	Depth	Type	Depth

##### 15) Type Pump

Turbine  Jet  Submersible  Cylinder

Other N/A

Depth to pump bowls, cylinder, jet, etc., ft.

##### 16) Water Test

Type test  Pump  Bailor  Jetted  Estimated  Other

Yield: gpm with ft. drawdown after hrs

##### 17) Water Quality

Depth of Strata: 18 Was a chemical analysis made?  Yes  No Did you knowingly penetrate a strata which contains injurious constituents?  Yes  No

If yes, Type of water

Check One:  Naturally poor-quality groundwater type  Hydrocarbons (i.e. gas, oil, etc.)  Hazardous material/waste contamination encountered

Other (describe)

I certify that while drilling, deepening, or otherwise altering the above described well, injurious water or constituents was encountered and the landowner was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.

18) Company & Individual's Name: (type or print) Ronald D. Ellis Lic. No.: 3243

Address: PO BOX 348 City: ATHENS State: TX Zip: 75751

By signing this well report, you certify that you drilled or supervised the drilling of this well and that each and all of the statements herein are true and correct.

Signature: Ronald D. Ellis Date: 3/6/15 Name: Unlicensed Assistant (printed)

Licensed Driller/Pump Installer

TDLR FORM 001WWD / 11-13 TDLR (Original) OVER Landowner (copy) Driller/Pump Installer (copy)



Attention Owner:  
Confidentiality Privilege Notice  
on reverse side of owner's copy

**Texas Department of Licensing and Regulation**  
Water Well Driller/Pump Installer Section  
P.O. Box 12157 Austin, Texas 78711 Toll free (800) 803-9202 X7880  
Email address: [water.well@license.state.tx.us](mailto:water.well@license.state.tx.us) Web address: [www.tdlr.texas.gov](http://www.tdlr.texas.gov)

This form must be  
completed and filed with the  
department and owner  
within 60 days upon  
completion of the well.

### WELL REPORT

#### A. WELL IDENTIFICATION AND LOCATION DATA

##### 1) OWNER

Name: RANCHO VIEJO WASTE MGN Address: 1116 CALLE DEL NORTE City: LAREDO State: TX Zip: 78401

##### 2) WELL LOCATION

County: WEBB COUNTY Physical Address: 59 & LOS CENTENARIOS City: LAREDO State: TX Zip: 78041

##### 3) Type of Work

New Well  Reconditioning  
 Replacement  Deepening  
 Other \_\_\_\_\_

Lat. 27.554394 Long. 99.157043 GPS Datum Elevation

4) Proposed Use (check)  Monitor  Environmental Soil Boring  Domestic  Industrial  Frac  
 Irrigation  Injection  Extraction  De-watering  Testwell  Rig Supply  Stock or Livestock  
 Other \_\_\_\_\_  Public Supply -- If Public Supply, were plans approved?  Yes  No

##### 5) Drilling Date

Started 1/26/2015  
Completed 1/27/2015

##### 6) Diameter of Hole

Dia. (in)	From (ft)	To (ft)
6-1/4	0	92
12-1/4	0	30

##### 7) Drilling Method (check) Driven Air Rotary Mud Rotary

Bored  Air Hammer  Cable Tool  Jetted  Hollow stem Auger  
 Reverse Circulation  Other

Number of identical wells drilled  
at this location:

##### 8) Borehole Completion Open Hole Straight Wall

Under-reamed  Filter Packed  Other

Filter packed interval from 92 ft. to: 78 ft. Size: 12X20 Type

From (ft.)	To (ft.)	Description and color of formation material
0	13	SANDY CLAY
13	40	RED CLAY
40	60	BLUE CLAY
60	92	LAYERED RED CLAY & SANDSTONE

##### 9) Casing, Blank Pipe, and Well Screen Data

Dia. (in.)	New Or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft)		Gage Casing Screen
			From	To	
2	N	PVC SCH 80	80	+2	
2	N	PVC SCH 80 SLOTTED	90	80	0.010"
8	N	PVC SCH 40-Surface	30	0	

##### 14) Plugged Well plugged within 48 hours

Casing left in well: Cement/Bentonite placed in well:

From (ft)	To (ft)	From (ft)	To (ft)	#Sacks or Material used

##### 10) Annular Seal Data: i.e. (from 0 ft. to 100 ft. 15 sacks of cement)

from: 10ft. to: 0ft. 2 sacks of CEMENT  
from: 78ft. to: 10ft. 6 sacks of BENTONITE

Method Used: TREMIE Sealed By: A&F

Distance to septic field or other concentrated contamination: 150ft.

Distance to Septic Tank: 150ft. Distance to Property Line: 150ft.

Method of Measurement: OWNER Approved by Variance #:

##### 11) Surface Completion Completed by Driller? Yes

Surface Slab Installed  Surface Sleeve Installed  
 Pitless Adapter Used  Alternative Procedure Used  
 Other  Steel Cased

##### 15) Type Pump

Turbine  Jet  Submersible  Cylinder

Other N/A

Depth to pump bowls, cylinder, jet, etc., ft.

##### 12) Water Level

Static level 11.29ft. Date: 2/14/15

Artesian Flow gpm Method of Measurement

##### 16) Water Test

Type test  Pump  Bailer  Jetted  Estimated  Other

Yield: gpm with ft. drawdown after hrs

##### 13) Packers:

Type	Depth	Type	Depth

##### 17) Water Quality

Depth of Strata: 80 Was a chemical analysis made?  Yes  No Did you knowingly penetrate a strata which contains injurious constituents?  Yes  No

If yes, Type of water

Check One:  Naturally poor-quality groundwater type \_\_\_\_\_  Hydrocarbons (i.e. gas, oil, etc.)  Hazardous material/waste contamination encountered  
 Other (describe) \_\_\_\_\_

I certify that while drilling, deepening, or otherwise altering the above described well, injurious water or constituents was encountered and the landowner was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.

##### 18) Company & Individual's Name: (type or print) | Ronald D. Ellis

Lic. No.: 3243

Address: PO BOX 348

City: ATHENS

State: TX

Zip: 75751

By signing this well report, you certify that you drilled or supervised the drilling of this well and that each and all of the statements herein are true and correct.

Signature: Ronald D. Ellis

Date: 3/6/15

Name:

Unlicensed Assistant (printed)

TDLR FORM 001 WWD / 11-13

TDLR (Original)

OVER

Landowner (copy)

Driller/Pump Installer (copy)





Attention Owner:  
Confidentiality Privilege Notice  
on reverse side of owner's copy

**Texas Department of Licensing and Regulation**  
Water Well Driller/Pump Installer Section  
P.O. Box 12157 Austin, Texas 78711 Toll free (800) 803-9202 X7880  
Email address: [water.well@license.state.tx.us](mailto:water.well@license.state.tx.us) Web address: [www.tdlr.texas.gov](http://www.tdlr.texas.gov)

This form must be completed and filed with the department and owner within 60 days upon completion of the well.

**WELL REPORT**

**A. WELL IDENTIFICATION AND LOCATION DATA**

**1) OWNER**

Name: <b>RANCHO VIEJO WASTE MNG.</b>	Address: <b>1116 CALLE DEL NORTE</b>	City: <b>LAREDO</b>	State: <b>TX</b>	Zip: <b>78401</b>
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**2) WELL LOCATION**

County: <b>WEBB COUNTY</b>	Physical Address: <b>59 &amp; LOS CENTENARIOS</b>	City: <b>LAREDO</b>	State: <b>TX</b>	Zip: <b>78041</b>
-------------------------------	------------------------------------------------------	------------------------	---------------------	----------------------

**3) Type of Work**

New Well     Reconditioning  
 Replacement     Deepening  
 Other \_\_\_\_\_

Lat. 27.566898	Long. 99.152657	GPS Datum	Elevation
<b>4) Proposed Use (check)</b> <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Environmental Soil Boring <input type="checkbox"/> Domestic <input type="checkbox"/> Industrial <input type="checkbox"/> Frac <input type="checkbox"/> Irrigation <input type="checkbox"/> Injection <input type="checkbox"/> Extraction <input type="checkbox"/> De-watering <input type="checkbox"/> Testwell <input type="checkbox"/> Rig Supply <input type="checkbox"/> Stock or Livestock <input type="checkbox"/> Other _____ <input type="checkbox"/> Public Supply --- If Public Supply, were plans approved? <input type="checkbox"/> Yes <input type="checkbox"/> No			

**5) Drilling Date**

Started 2/5/2015  
 Completed 2/6/2015

**6) Diameter of Hole**

Dia. (in)	From (ft)	To (ft)
6-1/4	0	105
12-1/4	0	40

**7) Drilling Method (check)**     Driven     Air Rotary     Mud Rotary

Bored     Air Hammer     Cable Tool     Jetted     Hollow stem Auger  
 Reverse Circulation     Other \_\_\_\_\_

Number of identical wells drilled at this location:

12-1/4	0	40
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**8) Borehole Completion**     Open Hole     Straight Wall  
 Under-reamed     Filter Packed     Other \_\_\_\_\_

Filter packed interval from 105 ft. to: 92 ft. Size: 12X20 Type

From (ft.)	To (ft.)	Description and color of formation material
0	13	SANDY CLAY
13	35	RED CLAY
35	50	BLUE CLAY & SANDSTONE
50	100	DARK RED CLAY
100	105	SANDSTONE & RED CLAY

**9) Casing, Blank Pipe, and Well Screen Data**

Dia. (in.)	New Or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft)		Gage Casing Screen
			From	To	
2	N	PVC SCH 80	93	+2	
2	N	PVC SCH 80 SLOTTED	103	93	0.010"
8	N	PVC SCH 40 - SURFACE	40	0	

B55-D

(Use reverse side of Well Owner's copy, if necessary)

**10) Annular Seal Data:** i.e. (from 0 ft. to 100 ft. 15 sacks of cement)  
 from: 10ft. to: 0ft. 2 sacks of **CEMENT**  
 from: 92ft. to: 10ft. 6 sacks of **BENTONITE**  
 Method Used: **TREMIE** Sealed By: **A&F**

Distance to septic field or other concentrated contamination: **150ft.**  
 Distance to Septic Tank: **150ft.**    Distance to Property Line: **150ft.**  
 Method of Measurement: **OWNER**    Approved by Variance #: \_\_\_\_\_

**14) Plugged**     Well plugged within 48 hours

Casing left in well:		Cement/Bentonite placed in well:		
From (ft)	To (ft)	From (ft)	To (ft)	#Sacks or Material used

**11) Surface Completion**    Completed by Driller?  Yes

Surface Slab Installed     Surface Sleeve Installed  
 Pitless Adapter Used     Alternative Procedure Used  
 Other \_\_\_\_\_     Steel Cased

**15) Type Pump**

Turbine     Jet     Submersible     Cylinder  
 Other N/A  
 Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

**12) Water Level**

Static level 10.28ft.    Date: 2/14/15  
 Artesian Flow \_\_\_\_\_ gpm    Method of Measurement \_\_\_\_\_

**16) Water Test**

Type test  Pump     Bailor     Jetted     Estimated     Other  
 Yield: \_\_\_\_\_ gpm with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs

**13) Packers:**

Type	Depth	Type	Depth

**17) Water Quality**

Depth of Strata: **93** Was a chemical analysis made?  Yes     No Did you knowingly penetrate a strata which contains injurious constituents?  Yes     No  
 If yes, Type of water \_\_\_\_\_

Check One:  Naturally poor-quality groundwater type \_\_\_\_\_  Hydrocarbons (i.e. gas, oil, etc.)  Hazardous material/waste contamination encountered  
 Other (describe) \_\_\_\_\_

I certify that while drilling, deepening, or otherwise altering the above described well, injurious water or constituents was encountered and the landowner was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.

**18) Company & Individual's Name: (type or print)**    Ronald D. Ellis    Lic. No.: **3243**

Address: **PO BOX 348**    City: **ATHENS**    State: **TX**    Zip: **75751**

By signing this well report, you certify that you drilled or supervised the drilling of this well and that each and all of the statements herein are true and correct.

Signature: Ronald D. Ellis    Date: 2/16/15    Name: \_\_\_\_\_

Licensed Driller/Pump Installer    Unlicensed Assistant (printed)



Attention Owner:  
Confidentiality Privilege Notice  
on reverse side of owner's copy

**Texas Department of Licensing and Regulation**  
Water Well Driller/Pump Installer Section  
P.O. Box 12157 Austin, Texas 78711 Toll free (800) 803-9202 X7880  
Email address: [water.well@license.state.tx.us](mailto:water.well@license.state.tx.us) Web address: [www.tdlr.texas.gov](http://www.tdlr.texas.gov)

This form must be  
completed and filed with the  
department and owner  
within 60 days upon  
completion of the well.

**WELL REPORT**

**A. WELL IDENTIFICATION AND LOCATION DATA**

**1) OWNER**

Name: <b>RANCHO VIEJO WASTE MNG.</b>	Address: <b>1116 CALLE DEL NORTE</b>	City: <b>LAREDO</b>	State: <b>TX</b>	Zip: <b>78401</b>
-----------------------------------------	-----------------------------------------	------------------------	---------------------	----------------------

**2) WELL LOCATION**

County: <b>WEBB COUNTY</b>	Physical Address: <b>59 &amp; LOS CENTENARIOS</b>	City: <b>LAREDO</b>	State: <b>TX</b>	Zip: <b>78041</b>
-------------------------------	------------------------------------------------------	------------------------	---------------------	----------------------

**3) Type of Work**

New Well     Reconditioning  
 Replacement     Deepening  
 Other

Lat. <b>27.576437</b>	Long. <b>99.152254</b>	GPS Datum	Elevation
<b>4) Proposed Use (check)</b> <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Environmental Soil Boring <input type="checkbox"/> Domestic <input type="checkbox"/> Industrial <input type="checkbox"/> Frac <input type="checkbox"/> Irrigation <input type="checkbox"/> Injection <input type="checkbox"/> Extraction <input type="checkbox"/> De-watering <input type="checkbox"/> Testwell <input type="checkbox"/> Rig Supply <input type="checkbox"/> Stock or Livestock <input type="checkbox"/> Other <input type="checkbox"/> Public Supply --- If Public Supply, were plans approved? <input type="checkbox"/> Yes <input type="checkbox"/> No			

**5) Drilling Date**

Started 2/11/2015  
 Completed 2/11/2015

**6) Diameter of Hole**

Dia. (in)	From (ft)	To (ft)
<b>6-1/4</b>	<b>0</b>	<b>32</b>

**7) Drilling Method (check)**     Driven     Air Rotary     Mud Rotary

Bored     Air Hammer     Cable Tool     Jetted     Hollow stem Auger  
 Reverse Circulation     Other

Number of identical wells drilled  
at this location:

**8) Borehole Completion**     Open Hole     Straight Wall  
 Under-reamed     Filter Packed     Other

**From (ft.)**    **To (ft.)**    **Description and color of formation material**

<b>0</b>	<b>13</b>	<b>SANDY CLAY</b>
<b>13</b>	<b>35</b>	<b>RED CLAY</b>
		<b>B58-S</b>

Filter packed interval from 32 ft. to: 19 ft. Size: 12X20 Type

**9) Casing, Blank Pipe, and Well Screen Data**

Dia. (in.)	New Or Used	Steel, Plastic, etc. Perf., Slotted, etc Screen Mfg., if commercial	Setting (ft)		Gage Casing Screen
			From	To	
<b>2</b>	<b>N</b>	<b>PVC SCH 80</b>	<b>20</b>	<b>+2</b>	
<b>2</b>	<b>N</b>	<b>PVC SCH 80 SLOTTED</b>	<b>30</b>	<b>20</b>	<b>0.010"</b>

**10) Annular Seal Data:** i.e. (from 0 ft. to 100 ft. 15 sacks of cement)

from: **10ft.** to: **0ft.** 2 sacks of **CEMENT**  
 from: **19ft.** to: **10ft.** 1 sacks of **BENTONITE**  
 Method Used: **TREMI** Sealed By: **A&F**  
 Distance to septic field or other concentrated contamination: **150ft.**  
 Distance to Septic Tank: **150ft.**    Distance to Property Line: **150ft.**  
 Method of Measurement: **OWNER**    Approved by Variance #:

**14) Plugged**     Well plugged within 48 hours

Casing left in well:		Cement/Bentonite placed in well:		#Sacks or Material used
From (ft)	To (ft)	From (ft)	To (ft)	

**11) Surface Completion**    Completed by Driller?  Yes

Surface Slab Installed     Surface Sleeve Installed  
 Pitless Adapter Used     Alternative Procedure Used  
 Other     Steel Cased

**15) Type Pump**

Turbine     Jet     Submersible     Cylinder  
 Other **N/A**

Depth to pump bowls, cylinder, jet, etc.,    ft.

**12) Water Level**

Static level **10.38ft.**    Date: **2/14/15**  
 Artesian Flow    gpm    Method of Measurement

**16) Water Test**

Type test     Pump     Bailer     Jetted     Estimated     Other  
 Yield:    gpm with    ft. drawdown after    hrs

**13) Packers:**

Type	Depth	Type	Depth

**17) Water Quality**

Depth of Strata: **20** Was a chemical analysis made?     Yes     No Did you knowingly penetrate a strata which contains injurious constituents?     Yes     No  
 If yes, Type of water \_\_\_\_\_  
 Check One:     Naturally poor-quality groundwater type     Hydrocarbons (i.e. gas, oil, etc.)     Hazardous material/waste contamination encountered  
 Other (describe) \_\_\_\_\_

*I certify that while drilling, deepening, or otherwise altering the above described well, injurious water or constituents was encountered and the landowner was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.*

**18) Company & Individual's Name: (type or print)**

**Rowald D Ellis**    Lic. No.: **3243**  
 Address: **PO BOX 348**    City: **ATHENS**    State: **TX**    Zip: **75751**

By signing this report, you certify that you drilled or supervised the drilling of this well and that each and all of the statements herein are true and correct.

Signature: **Rowald D. Ellis**    Date: **2/16/15**    Name: \_\_\_\_\_  
 Licensed Driller/Pump Installer    Unlicensed Assistant (printed)





Attention Owner:  
Confidentiality Privilege Notice  
on reverse side of owner's copy

**Texas Department of Licensing and Regulation**  
Water Well Driller/Pump Installer Section  
P.O. Box 12157 Austin, Texas 78711 Toll free (800) 803-9202 X7880  
Email address: [water.well@license.state.tx.us](mailto:water.well@license.state.tx.us) Web address: [www.tdlr.texas.gov](http://www.tdlr.texas.gov)

This form must be  
completed and filed with the  
department and owner  
within 60 days upon  
completion of the well.

**WELL REPORT**

**A. WELL IDENTIFICATION AND LOCATION DATA**

**1) OWNER**

Name: <b>RANCHO VIEJO WASTE MNG.</b>	Address: <b>1116 CALLE DEL NORTE</b>	City: <b>LAREDO</b>	State: <b>TX</b>	Zip: <b>78401</b>
-----------------------------------------	-----------------------------------------	------------------------	---------------------	----------------------

**2) WELL LOCATION**

County: <b>WEBB COUNTY</b>	Physical Address: <b>59 &amp; LOS CENTENARIOS</b>	City: <b>LAREDO</b>	State: <b>TX</b>	Zip: <b>78041</b>
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**3) Type of Work**

New Well     Reconditioning  
 Replacement     Deepening  
 Other \_\_\_\_\_

Lat. 27.576367	Long. 99.152213	GPS Datum	Elevation
<b>4) Proposed Use (check)</b> <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Environmental Soil Boring <input type="checkbox"/> Domestic <input type="checkbox"/> Industrial <input type="checkbox"/> Frac <input type="checkbox"/> Irrigation <input type="checkbox"/> Injection <input type="checkbox"/> Extraction <input type="checkbox"/> De-watering <input type="checkbox"/> Testwell <input type="checkbox"/> Rig Supply <input type="checkbox"/> Stock or Livestock <input type="checkbox"/> Other _____ <input type="checkbox"/> Public Supply -- If Public Supply, were plans approved? <input type="checkbox"/> Yes <input type="checkbox"/> No			

**5) Drilling Date**

Started 2/12/2015  
 Completed 2/12/2015

**6) Diameter of Hole**

Dia. (in)	From (ft)	To (ft)
6-1/4	0	150
12-1/4	0	40

**7) Drilling Method (check)**     Driven     Air Rotary     Mud Rotary

Bored     Air Hammer     Cable Tool     Jetted     Hollow stem Auger  
 Reverse Circulation     Other \_\_\_\_\_

Number of identical wells drilled  
at this location:

**8) Borehole Completion**     Open Hole     Straight Wall  
 Under-reamed     Filter Packed     Other \_\_\_\_\_

From (ft.)	To (ft.)	Description and color of formation material
0	13	SANDY CLAY
13	50	RED CLAY
50	100	LAYERED RED CLAY & SANDSTONE
100	150	DARK RED CLAY

Filter packed interval from 152 ft. to: 119 ft. Size: 12X20 Type

(Use reverse side of Well Owner's copy, if necessary)

**9) Casing, Blank Pipe, and Well Screen Data**

Dia. (in.)	New Or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft)		Gage Casing Screen
			From	To	
2	N	PVC SCH 80	140	+2	
2	N	PVC SCH 80 SLOTTED	150	140	0.010"
8	N	PVC SCH 40-Surface	40	0	

**10) Annular Seal Data:** i.e. (from 0 ft. to 100 ft. 15 sacks of cement)  
 from: 10ft. to: 0ft. 2 sacks of **CEMENT**  
 from: 119ft. to: 10ft. 8 sacks of **BENTONITE**  
 Method Used: **TREMIÉ** Sealed By: **A&F**

**14) Plugged**     Well plugged within 48 hours

Distance to septic field or other concentrated contamination: 150ft.  
 Distance to Septic Tank: 150ft.    Distance to Property Line: 150ft.  
 Method of Measurement: **OWNER**    Approved by Variance #: \_\_\_\_\_

From (ft)	To (ft)	From (ft)	To (ft)	#Sacks or Material used

**11) Surface Completion**    Completed by Driller?  Yes

Surface Slab Installed     Surface Sleeve Installed  
 Pitless Adapter Used     Alternative Procedure Used  
 Other \_\_\_\_\_     Steel Cased

**15) Type Pump**

Turbine     Jet     Submersible     Cylinder  
 Other N/A  
 Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

**12) Water Level**

Static level 18.56ft.    Date: 2/14/15  
 Artesian Flow \_\_\_\_\_ gpm    Method of Measurement \_\_\_\_\_

**16) Water Test**

Type test     Pump     Bailer     Jetted     Estimated     Other  
 Yield: \_\_\_\_\_ gpm with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs

**13) Packers:**

Type	Depth	Type	Depth

**17) Water Quality**

Depth of Strata: 140 Was a chemical analysis made?     Yes     No Did you knowingly penetrate a strata which contains injurious constituents?     Yes     No  
 If yes, Type of water \_\_\_\_\_  
 Check One:     Naturally poor-quality groundwater type \_\_\_\_\_     Hydrocarbons (i.e. gas, oil, etc.)     Hazardous material/waste contamination encountered  
 Other (describe) \_\_\_\_\_

I certify that while drilling, deepening, or otherwise altering the above described well, injurious water or constituents was encountered and the landowner was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.

**18) Company & Individual's Name: (type or print)**

Ronald D. Ellis

Lic. No.: 3243

Address: <b>PO BOX 348</b>	City: <b>ATHENS</b>	State: <b>TX</b>	Zip: <b>75751</b>
----------------------------	---------------------	------------------	-------------------


By signing this well report, you certify that you drilled or supervised the drilling of this well and that each and all of the statements herein are true and correct.

Signature: <u>Ronald D. Ellis</u>	Date: <u>3/6/15</u>	Name: _____	Unlicensed Assistant (printed): _____
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**III-E.5-F**  
**Geotechnical Test Data**

9-18-2015



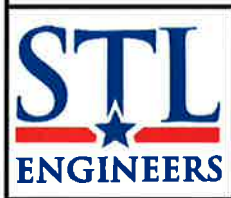
The seal is circular with a five-pointed star in the center. The outer ring contains the text "STATE OF TEXAS" at the top and "REGISTERED PROFESSIONAL ENGINEER" at the bottom, separated by two small stars. Inside the ring, the name "MICHAEL W. ODEN" and the number "67165" are printed.

This document is released for the purpose of permitting only under the authority of Michael W. Oden, P.E. #67165. It is not to be used for bidding or construction. Texas Registered Engineering Firm F-5650.





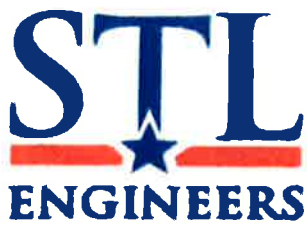
Borehole	Depth (ft.)	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Maximum Size (mm)	% <#200 Sieve	Hydraulic Conductivity (cm/sec)	Dry Density (pcf)	Compressive Strength (tsf)	Strain at Failure (%)
B-52	13.5	11.4	31	17	14	0.075	48				
B-52	27.5	6.7	NP	NP	NP	0.075	18				
B-52	40.5		85	25	60	0.075	99				
B-52	49.0	17.0	58	21	37	0.075	93				
B-52	60.0	8.1	45	18	27						
B-52	73.0	15.2	65	23	42						
B-52	77.0	7.7	45	18	27	0.075	62				
B-52	86.0	10.0	32	18	14	0.075	28				
B-52	88.0	10.7	86	25	61						
B-52	89.0	11.0	57	22	35						
B-52	98.0	8.0	47	18	29						
B-52	114.0	11.7	70	24	46				128.4	31.1	0.5
B-52	125.0	9.4	77	26	51						
B-52	140.0	11.0							129.9	54.2	0.4
B-52	141.0	12.6	58	23	35	0.075	97				
B-52	146.5	8.0	45	18	27	0.075	39	1.733x10(-9)			
B-55	14.0	14.3	61	22	39						
B-55	25.0	14.8	90	27	63						
B-55	27.5	13.3	85	26	59						
B-55	79.0		66	24	42			2.843x10(-7)			
B-55	98.0		34	17	17	0.075	26				
B-55	103.0		55	21	34	0.075	90				
B-55	128.0		50	19	31	0.075	85				
B-55	138.5	19.3	112	30	82						
B-58	12.5	20.6	67	24	43						
B-58	23.0	24.7	90	29	61						
B-58	28.0	27.5	85	28	57						
B-58	32.5	23.9	114	31	83						
B-58	57.0	13.7	89	25	64						
B-58	67.0	15.2	124	31	93						
B-58	95.5	11.4	54	20	34	0.075	44	1.942x10(-9)			
B-58	96.5	10.1							124.4	64.8	0.5
B-58	106.0	13.2	120	31	89	0.075	100				
B-58	148.5	10.0	63	22	41	0.075	94	5.424x10(-11)			
B-58	149.5	6.2							136.6	124.9	0.7



**Pescadito Environmental Resource Center**  
**Laredo, Texas**  
**Project No: 15-1772**

## Data Summary





Atterberg Limits & Passing # 200 Sieve Report

**CLIENT:** CB&I  
12005 Ford Road, Suite 600  
Dallas, Texas 75234

**DATE OF REPORT:** 2/5/2015

**PROJECT:** Pescadito Environmental Resource Center  
Webb County  
Laredo, Texas

**STL Project No:** G15-1772

Sample	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing # 200 Sieve (%)
Light greenish CLAY (CH)	75	16	59	75
Light reddish CLAY (CH)	83	23	60	98

  
Raj Bhupatiraju, P.E.  
Staff Engineer # 117596  
Registered Engineering Firm # 8133

1341 W Mockingbird Lane, # 1200 W, Dallas, Texas 75247

**Test Pit 1 Sample Results**



Test Pit 1 Sample - January 2015



Test Pit 1 Sample - January 2015



**ASTM D 5084 - 10**  
**Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous**  
**Materials Using a Flexible Wall Permeameter**  
**Method A - Constant Head**

Job No.: 04-4015-1038  
 Project: Pescadito Environmental Resource Center  
 Boring: B-52  
 Depth, ft: 146.5'

Client: STL ENGINEERS



<b>SAMPLE:</b>				<b>APPLIED PRESSURES:</b>		
Weight:	Initial: 702.3	Final: 705.5	g.	Inlet:	105.00 psi	
Height:	2.674	2.683	in.	Outlet:	100.00 psi	
Diameter:	2.910	2.898	in.	Confining: 110.00 psi		
MC:	7.2	8.0	%			
Wet Density:	150.4	151.9	pcf			
Dry Density:	140.2	140.6	pcf			
Void Ratio:	0.224	0.221				
Saturation:	89.0	99.9	%			
Assumed Sp. Gr.:	2.750	2.750				
			<b>INFLUENT PIPETTE</b>		<b>EFFLUENT PIPETTE</b>	
			Diameter:	1.128 cm	Diameter:	1.128 cm
			Area:	1.00 cm <sup>2</sup>	Area:	1.00 cm <sup>2</sup>
Area:	6.60	in <sup>2</sup>				
Volume:	17.64	in <sup>3</sup>				
Solid Volume:	14.20	in <sup>3</sup>				
Pore Volume:	3.44	in <sup>3</sup>				
Average water temp.	24.3	C <sup>o</sup>				

Initial		Final		Initial		Final		Temp. (C <sup>o</sup> )	Time (min.)	Average Flow, ΔQ (cm <sup>3</sup> )	Hydraulic Conductivity, k (cm/sec)	Hydraulic Conductivity at 20°C, k <sub>20</sub> (cm/sec)
date	time	date	time	I <sub>0</sub> (cm)	E <sub>0</sub> (cm)	I <sub>f</sub> (cm)	E <sub>f</sub> (cm)					
3/27/2015	16:10:00	3/27/2015	9:10:00	10.00	10.00	10.66	9.71	23.1	1020.00	0.48	3.534E-09	3.283E-09
3/27/2015	9:10:00	3/27/2015	15:20:00	10.66	9.71	10.80	9.61	23.3	370.00	0.12	2.462E-09	2.276E-09
3/27/2015	15:20:00	3/28/2015	19:50:00	10.80	9.61	11.50	9.18	25.3	1710.00	0.56	2.497E-09	2.205E-09
3/28/2015	19:50:00	3/29/2015	18:25:00	11.50	9.18	11.92	8.88	25.2	1355.00	0.36	2.030E-09	1.797E-09
3/29/2015	18:25:00	3/30/2015	9:35:00	11.92	8.88	12.21	8.70	24.5	910.00	0.24	1.960E-09	1.763E-09
3/30/2015	9:35:00	3/30/2015	16:00:00	12.21	8.70	12.36	8.64	24.2	385.00	0.10	2.070E-09	1.875E-09
3/30/2015	16:00:00	3/31/2015	8:50:00	12.36	8.64	12.67	8.49	24.2	1010.00	0.23	1.728E-09	1.565E-09

	Hydraulic Conductivity, k	Hydraulic Conductivity at 20°C, k <sub>20</sub>
<b>Weighted Averages:</b>	1.934E-09	1.733E-09
	(cm/sec)	

Tested by: TP                      Date: 3/25/2015  
 Checked by: CT                      Date: 4/1/2015



B-52 at 146.5'

**ASTM D 5084 - 10**  
**Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous**  
**Materials Using a Flexible Wall Permeameter**  
**Method A - Constant Head**

Job No.: 04-4015-1038  
 Project: Pescadito Environmental Resource Center Client: STL ENGINEERS  
 Boring: B-58  
 Depth, ft: 95.5'



<b>SAMPLE:</b>	Initial	Final		<b>APPLIED PRESSURES:</b>					
	Weight:	727.3	729.3	gr.	Inlet:	105.00 psi	Confining:	110.00 psi	
	Height:	2.857	2.863	in.	Outlet:	100.00 psi			
	Diameter:	2.969	2.961	in.					
	MC:	11.3	12.2	%					
	Wet Density:	140.1	140.9	pcf					
	Dry Density:	125.8	125.6	pcf					
Void Ratio:	0.324	0.327							
Saturation:	93.2	100.0	%						
Assumed Sp. Gr.:	2.670	2.670							
				<b>INFLUENT PIPETTE</b>			<b>EFFLUENT PIPETTE</b>		
Area:		6.88	in <sup>2</sup>	Diameter:	1.128	cm	Diameter:	1.128	cm
Volume:		19.67	in <sup>3</sup>	Area:	1.00	cm <sup>2</sup>	Area:	1.00	cm <sup>2</sup>
Solid Volume:		14.64	in <sup>3</sup>						
Pore Volume:		5.02	in <sup>3</sup>						
Average water temp.		24.2	C°	<b>Initial</b>			<b>Final</b>		

Initial		Final		I <sub>0</sub>	E <sub>0</sub>	I <sub>f</sub>	E <sub>f</sub>	Temp.	Time	Average Flow, ΔQ	Hydraulic Conductivity, k	Hydraulic Conductivity at 20°C, k <sub>20</sub>
date	time	date	time	(cm)	(cm)	(cm)	(cm)	(C°)	(min.)	(cm <sup>3</sup> )	(cm/sec)	(cm/sec)
3/27/2015	16:10:00	3/27/2015	9:10:00	10.00	10.00	10.55	9.58	23.1	1020.00	0.49	3.691E-09	3.429E-09
3/27/2015	9:10:00	3/27/2015	15:20:00	10.55	9.58	10.70	9.45	23.3	370.00	0.14	2.937E-09	2.716E-09
3/27/2015	15:20:00	3/28/2015	19:50:00	10.70	9.45	11.38	8.80	25.3	1710.00	0.67	3.019E-09	2.667E-09
3/28/2015	19:50:00	3/29/2015	18:25:00	11.38	8.80	11.81	8.35	25.2	1355.00	0.44	2.521E-09	2.232E-09
3/29/2015	18:25:00	3/30/2015	9:35:00	11.81	8.35	12.09	8.09	24.5	910.00	0.27	2.303E-09	2.072E-09
3/30/2015	9:35:00	3/30/2015	16:00:00	12.09	8.09	12.22	8.00	24.2	385.00	0.11	2.218E-09	2.009E-09
3/30/2015	16:00:00	3/31/2015	8:50:00	12.22	8.00	12.52	7.73	24.2	1010.00	0.28	2.191E-09	1.984E-09
3/31/2015	8:50:00	3/31/2015	14:40:00	12.52	7.73	12.63	7.66	23.9	350.00	0.09	1.996E-09	1.820E-09

<b>Weighted Averages:</b>	<b>Hydraulic Conductivity, k</b>	<b>Hydraulic Conductivity at 20°C, k<sub>20</sub></b>
	2.141E-09	1.942E-09
(cm/sec)		

Tested by: TP Date: 3/22/2015  
 Checked by: SBM Date: 4/1/2015





B-58 at 95.5'

## ASTM D 5084 - 10

### Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

#### Method A - Constant Head

Job No.: 04-4015-1038  
 Project: Pescadito Environmental Resource Center Client: STL ENGINEERS  
 Boring: B-58  
 Depth, ft: 148.5'



SAMPLE:		Initial	Final		APPLIED PRESSURES:	
Weight:		812	816	g.	Inlet:	105.00 psi
Height:		2.977	2.963	in.	Outlet:	100.00 psi
Diameter:		2.967	2.972	in.	Confining:	110.00 psi
MC:		5.9	8.6	%		
Wet Density:		150.3	151.3	pcf		
Dry Density:		141.9	139.2	pcf		
Void Ratio:		0.223	0.246			
Saturation:		73.8	97.6	%		
Assumed Sp. Gr.:		2.780	2.780			

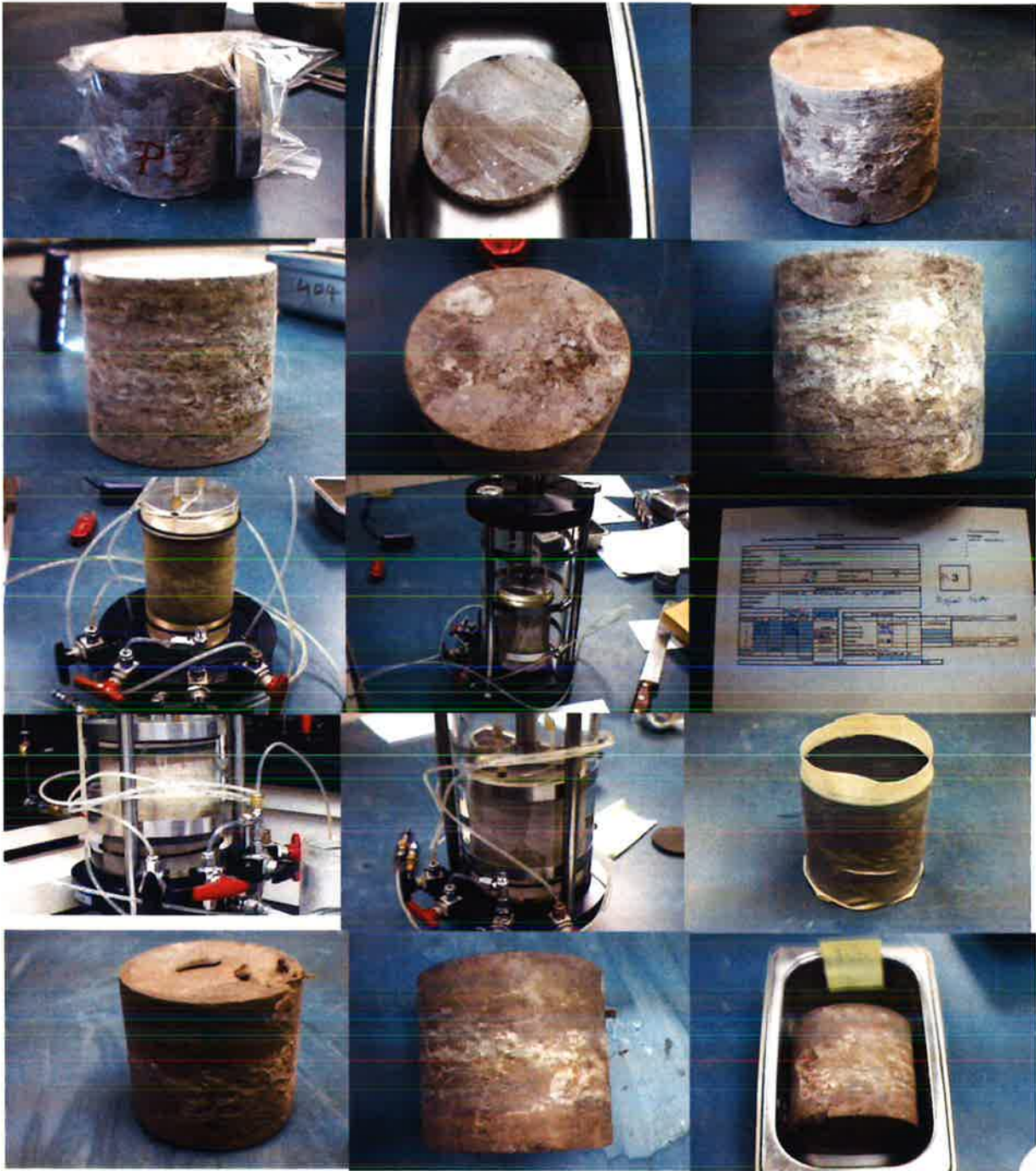
INFLUENT PIPETTE			EFFLUENT PIPETTE		
Diameter:		1.128 cm	Diameter:		1.128 cm
Area:		1.00 cm <sup>2</sup>	Area:		1.00 cm <sup>2</sup>

Initial		Final		Initial		Final		Temp. (C°)	Time (min.)	Average Flow, ΔQ (cm <sup>3</sup> )	Hydraulic Conductivity, k (cm/sec)	Hydraulic Conductivity at 20°C, k <sub>20</sub> (cm/sec)
date	time	date	time	I <sub>0</sub> (cm)	E <sub>0</sub> (cm)	I <sub>f</sub> (cm)	E <sub>f</sub> (cm)					
3/27/2015	16:10:00	3/27/2015	9:10:00	10.00	10.00	10.03	9.99	23.1	1020.00	0.02	1.563E-10	1.452E-10
3/27/2015	9:10:00	3/27/2015	15:20:00	10.03	9.99	10.05	9.99	23.3	370.00	0.01	2.693E-10	2.490E-10
3/27/2015	15:20:00	3/28/2015	19:50:00	10.05	9.99	10.17	9.99	25.3	1710.00	0.06	2.914E-10	2.573E-10
3/28/2015	19:50:00	3/29/2015	18:25:00	10.17	9.99	10.20	9.99	25.2	1355.00	0.02	8.825E-11	7.812E-11
3/29/2015	18:25:00	3/30/2015	9:35:00	10.20	9.99	10.21	9.99	24.5	910.00	0.01	8.760E-11	7.879E-11
3/30/2015	9:35:00	3/30/2015	16:00:00	10.21	9.99	10.22	9.99	24.2	385.00	0.00	5.176E-11	4.688E-11
3/30/2015	16:00:00	3/31/2015	8:50:00	10.22	9.99	10.23	9.99	24.2	1010.00	0.00	3.946E-11	3.574E-11
3/31/2015	8:50:00	3/31/2015	14:40:00	10.23	9.99	10.23	9.99	23.9	350.00	0.00	5.694E-11	5.192E-11

Weighted Averages:	Hydraulic Conductivity, k	Hydraulic Conductivity at 20°C, k <sub>20</sub>
	6.005E-11	5.424E-11
	(cm/sec)	

Tested by: TP Date: 3/22/2015  
 Checked by: CT Date:





B-58 at 148.5'

**ASTM D 5084 - 10**  
**Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous**  
**Materials Using a Flexible Wall Permeameter**  
**Method A - Constant Head**

Job No.: 04-4015-1038  
 Project: Pescadito Environmental Resource Center  
 Boring: B-55  
 Depth, ft: 79'

Client: STL ENGINEERS



<b>SAMPLE:</b>	Initial	Final		<b>APPLIED PRESSURES:</b>			
Weight:	517.5	527.72	gr.	Inlet:	102.00 psi	Confining:	105.00 psi
Height:	2.106	2.117	in.	Outlet:	100.00 psi		
Diameter:	2.904	2.939	in.				
MC:	13.0	16.6	%				
Wet Density:	141.3	140.0	pcf				
Dry Density:	125.0	120.1	pcf				
Void Ratio:	0.413	0.470					
Saturation:	89.3	99.6	%				
Assumed Sp. Gr.:	2.830	2.830					
				<b>INFLUENT PIPETTE</b>		<b>EFFLUENT PIPETTE</b>	
				Diameter:	1.128 cm	Diameter:	1.128 cm
				Area:	1.00 cm <sup>2</sup>	Area:	1.00 cm <sup>2</sup>
Area:	6.78	in <sup>2</sup>					
Volume:	14.29	in <sup>3</sup>					
Solid Volume:	9.86	in <sup>3</sup>					
Pore Volume:	4.43	in <sup>3</sup>					
Average water temp.	24.3	C°		<b>Initial</b>		<b>Final</b>	

Initial		Final		$I_0$	$E_0$	$I_f$	$E_f$	Temp.	Time	Average Flow, $\Delta Q$	Hydraulic Conductivity, k	Hydraulic Conductivity at 20°C, $k_{20}$
date	time	date	time	(cm)	(cm)	(cm)	(cm)	(C°)	(min.)	(cm <sup>3</sup> )	(cm/sec)	(cm/sec)
5/27/2015	8:32:00	5/27/2015	9:19:00	10.00	10.00	14.58	5.40	23.7	47.00	4.59	1.422E-06	1.303E-06
5/27/2015	9:19:00	5/27/2015	9:56:00	14.58	5.40	17.35	2.70	23.9	37.00	2.74	1.076E-06	9.815E-07
5/27/2015	9:56:00	5/27/2015	10:31:00	17.35	2.70	19.50	0.68	23.5	35.00	2.09	8.673E-07	7.983E-07
5/27/2015	10:32:00	5/27/2015	11:37:00	5.00	20.00	9.30	15.70	23.5	65.00	4.30	9.632E-07	8.865E-07
5/27/2015	11:37:00	5/27/2015	12:19:00	9.30	15.70	11.50	13.53	23.8	42.00	2.19	7.574E-07	6.923E-07
5/27/2015	12:19:00	5/27/2015	14:19:00	11.50	13.53	16.00	9.18	23.7	120.00	4.43	5.369E-07	4.919E-07
5/27/2015	14:19:00	5/27/2015	14:58:00	16.00	9.18	17.80	8.01	23.9	39.00	1.49	5.544E-07	5.056E-07
5/27/2015	14:58:00	5/27/2015	15:48:00	17.80	8.01	19.10	6.70	23.7	50.00	1.31	3.800E-07	3.481E-07
5/28/2015	11:05:00	5/28/2015	11:32:00	8.00	24.00	8.96	23.17	24.7	27.00	0.90	4.826E-07	4.321E-07
5/28/2015	11:32:00	5/28/2015	12:00:00	8.96	23.17	9.68	22.44	24.6	28.00	0.73	3.770E-07	3.383E-07
5/28/2015	12:00:00	5/28/2015	12:30:00	9.68	22.44	10.50	21.61	24.6	30.00	0.83	4.004E-07	3.593E-07
5/28/2015	12:30:00	5/28/2015	13:00:00	10.50	21.61	11.21	20.91	25.0	30.00	0.71	3.422E-07	3.043E-07
5/28/2015	13:00:00	5/28/2015	13:30:00	11.21	20.91	11.94	20.26	25.1	30.00	0.69	3.349E-07	2.971E-07
5/28/2015	13:30:00	5/28/2015	14:06:00	11.94	20.26	12.76	19.43	24.8	36.00	0.83	3.337E-07	2.981E-07
5/28/2015	14:06:00	5/28/2015	14:34:00	12.76	19.43	13.36	18.80	24.8	28.00	0.61	3.198E-07	2.857E-07
5/28/2015	14:34:00	5/28/2015	15:04:00	13.36	18.80	14.00	18.27	24.8	30.00	0.59	2.839E-07	2.536E-07

Remarks: Sample was saturated to 96%, Deaired water was used. Micro-cracks were observed during preparation of specimen (see photos), that could have affected the hydraulic conductivity values. Liquid Limit = 66% Plastic Index = 42%

<b>Hydraulic Conductivity, k</b>	<b>Hydraulic Conductivity at 20°C, <math>k_{20}</math></b>
<b>3.188E-07</b>	<b>2.843E-07</b>
(cm/sec)	

**Weighted Averages:**

Tested by: TP Date: 5/22/2015  
 Checked by: SBM Date: 5/29/2015



Project:04.4015-1038

Pescadito Environmental Resource Center

Photos of permeability sample

B-55

T-9

79'



PLASTICITY CHART - FUGRO DATA TEMPLATE 100610.GDT FUGRO LIBRARY 052413.GLB I:\PROJECT FILES\PROJECTS\3-1038 PESCADITO ENVIRONMENTAL RESOURCE CENTER\MISC\04.4015-1038.GPJ vargasrn 6/27/15



Specimen Identification	LL	PL	PI	Fines	Classification
<input type="checkbox"/> B-55	79.0	66	24	42	



**Pescadito Enviromental Resource Center**  
**, Texas**

**PLASTICITY CHART**

ASTM D 4318 - Wet

Project No.  
**04.4015-1038**

**PLATE 1**






### III-E.5-G

## Subsurface Water Analytical Testing Results

9-18-2015



The seal is circular with a five-pointed star in the center. The text "STATE OF TEXAS" is at the top, "MICHAEL W. ODEN" is in the middle, and "67165 REGISTERED PROFESSIONAL ENGINEER" is at the bottom. A blue signature is written across the bottom of the seal.

This document is released for the purpose of permitting only under the authority of Michael W. Oden, P.E. #67165. It is not to be used for bidding or construction. Texas Registered Engineering Firm F-5650.





July 29, 2010

James Neyens  
TRC Environmental Corp.  
505 East Huntland Drive Suite 250  
Austin, Texas 78752

Order No: 1007201

TEL: (512) 684-3156  
FAX: (512) 329-8750

RE: Rancho Viejo

Dear James Neyens:

DHL Analytical received 5 sample(s) on 7/24/2010 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAC except where noted in the Case Narrative. All non-NELAC methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in black ink that reads "John DuPont".

John DuPont  
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number:  
T104704211-10-3





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2300 Double Creek Dr. ■ Round Rock, TX 78664  
 Phone (512) 388-8222 ■ FAX (512) 388-8229  
 Web: www.dhlanalytical.com  
 E-Mail: login@dhlanalytical.com



No 45617  
 CHAIN-OF-CUSTODY

CL: TRC Solutions  
 ADDRESS: 505 E. Huntland Dr., Suite 250, Austin, TX 78752  
 PHONE: (512) 329-6080 FAX/E-MAIL:  
 DATA REPORTED TO: James F. Neujens, P.E.  
 ADDITIONAL REPORT COPIES TO:

DATE: 7/23/2010 PAGE 1 OF 1  
 PO #: \_\_\_\_\_ DHL WORK ORDER #: 1007201  
 PROJECT LOCATION OR NAME: Rancho Viejo  
 CLIENT PROJECT #: 170401 P.13 COLLECTOR:

Field Sample I.D.	DHL Lab #	Date	Time	Matrix	Container Type	# of Containers	PRESERVATION					ANALYSES	FIELD NOTES	
							HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub> □ NaOH □	ICE	UNPRESERVED			
B-1	01	7/23/10	0845	W		2		X	X					X ANIONS = Chloride, Fluoride, Sulfate, and Nitrate
B-1 DUP	02	7/23/10	0845	W		2		X	X					
B-6	03	7/23/10	0953	W		2		X	X					
B-13	04	7/23/10	1612	W		2		X	X					
B-10	05	7/23/10	1453	W		2		X	X					X METALS = Chromium, Aluminum, Copper, Iron, Manganese, Silver, and Zinc

OTAL

RELINQUISHED BY: (Signature) <u>[Signature]</u>	DATE/TIME <u>7/23/10</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	TURN AROUND TIME RUSH <input type="checkbox"/> CALL FIRST 1 DAY <input type="checkbox"/> CALL FIRST 2 DAY <input type="checkbox"/> NORMAL <input checked="" type="checkbox"/> OTHER <input type="checkbox"/>	LABORATORY USE ONLY: RECEIVING TEMP: <u>12°</u> THERM #: <u>57</u> CUSTODY SEALS: <input type="checkbox"/> BROKEN <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> NOT USED CARRIER-BILL #: <u>[Signature]</u> <input type="checkbox"/> APC DELIVERY <input type="checkbox"/> HAND DELIVERED
----------------------------------------------------	-----------------------------	------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

DHL DISPOSAL @ \$5.00 each     Return

# FedEx Express Airbill

Tracking Number: 8592 2369 6974

Recipient's Copy

**1 From**  
 Date: \_\_\_\_\_  
 Sender's Name: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: TX Zip: 75202

**2 Your Internal Billing**  
 Invoice # 730161463027X6613  
 Date: \_\_\_\_\_

**3 To**  
 Recipient's Name: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: TX Zip: 75264



8592 2369 6974

**4 Express Package Service**  
 FedEx Priority Overnight  
 FedEx Standard Overnight  
 FedEx 2Day  
 FedEx Home Delivery  
 FedEx International Priority  
 FedEx International Economy

**5 Packaging**  
 FedEx Tube  
 FedEx Box  
 FedEx Envelope  
 FedEx Pallet  
 Other \_\_\_\_\_

**6 Special Handling**  
 Signature Required  
 Signature Restricted  
 Restricted Access  
 Fragile  
 Perishable  
 Hazardous  
 High Value  
 Insured  
 Registered Mail  
 Registered Mail Restricted  
 Registered Mail Signature Required  
 Registered Mail Signature Restricted  
 Registered Mail Signature Restricted Signature Required  
 Registered Mail Signature Restricted Signature Restricted  
 Registered Mail Signature Restricted Signature Restricted Signature Required  
 Registered Mail Signature Restricted Signature Restricted Signature Restricted Signature Required  
 Registered Mail Signature Restricted Signature Restricted Signature Restricted Signature Required Signature Required

**7 Payment**  
 Cash  
 Money Order  
 Check  
 Credit Card  
 Debit Card  
 CashCheck

**8 NEW Residential Delivery Signature Options**  
 No Signature Required  
 Restricted Signature Required  
 Signature Required  
 Signature Restricted  
 Signature Restricted Signature Required  
 Signature Restricted Signature Restricted  
 Signature Restricted Signature Restricted Signature Required  
 Signature Restricted Signature Restricted Signature Restricted  
 Signature Restricted Signature Restricted Signature Restricted Signature Required  
 Signature Restricted Signature Restricted Signature Restricted Signature Required Signature Required



**CUSTODY SEAL**  
 DATE: 7/23/2010  
 SIGNATURE: [Handwritten Signature]

Sample Receipt Checklist

Client Name TRC Environmental Corp.

Date Received: 7/24/2010

Work Order Number 1007201

Received by JB

Completed by: OB 7/26/10  
Signature Date

Reviewed by: SS 7-26-10  
Initials Date

Carrier name: FedEx 1day

- Shipping container/cooler in good condition? Yes  No  Not Present
- Custody seals intact on shipping container/cooler? Yes  No  Not Present
- Custody seals intact on sample bottles? Yes  No  Not Present
- Chain of custody present? Yes  No
- Chain of custody signed when relinquished and received? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Samples in proper container/bottle? Yes  No
- Sample containers Intact? Yes  No
- Sufficient sample volume for indicated test? Yes  No
- All samples received within holding time? Yes  No
- Container/Temp Blank temperature in compliance? Yes  No  1.2 °C
- Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted
- Water - pH acceptable upon receipt? Yes  No  Not Applicable

Adjusted? no Checked by OB

Any No response must be detailed in the comments section below.

Client contacted TRC Date contacted: 7/24/10 Person contacted James

Contacted by: OB Regarding: Nitrate Hold Time

Comments: Per James, proceed with analysis, be aware nitrate is out of hold time.

Action logged in for requested analysis



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CLIENT: TRC Environmental Corp.  
Project: Rancho Viejo  
Lab Order: 1007201

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**CASE NARRATIVE**

The samples were analyzed using the methods outlined in the following references:

Method SW6020 - Metals Analysis  
Method E300 - Anions Analysis  
Method M4500-H+ B (18th Edition) - pH of a Water  
Method M2540C (18th Edition) - TDS Analysis  
Method M2510 B (18th Edition) - Specific Conductance

**LOG IN**

Samples were received and log-in performed on 7/24/10. A total of 5 samples were received. For Nitrate-N analysis the samples arrived at DHL Analytical outside of HoldTime. Proceeded with analysis as per the client. All Nitrate-N results are flagged with a "C" to designate this.

**METALS ANALYSIS**

For Metals analysis all samples were diluted prior to analysis due to the nature of the samples (high salt content).

For Metals analysis performed on 7/28/10 the matrix spike and matrix spike duplicate recoveries were below control limits for a few analytes. These are flagged accordingly in the QC summary report. The reference sample selected for the matrix spike and matrix spike duplicate was from this work order. The LCS was within control limits for these analytes. No further corrective actions were taken.

For Metals analysis performed on 7/28/10 the RPD for the serial dilution was slightly above control limits for Iron and Zinc. These are flagged accordingly. The PDS was within control limits for these analytes. No further corrective actions were taken.

**ANIONS ANALYSIS**

For Anions analysis all samples were diluted prior to analysis due to the nature of the samples (high conductivity).

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CLIENT: TRC Environmental Corp.  
Project: Rancho Viejo  
Lab Order: 1007201

**Work Order Sample Summary**

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<b>Lab Smp ID</b>	<b>Client Sample ID</b>	<b>Tag Number</b>	<b>Date Collected</b>	<b>Date Recv'd</b>
1007201-01	B-1		07/23/10 08:45 AM	07/24/10
1007201-02	B-1 DUP		07/23/10 08:45 AM	07/24/10
1007201-03	B-6		07/23/10 09:53 AM	07/24/10
1007201-04	B-13		07/23/10 04:12 PM	07/24/10
1007201-05	B-10		07/23/10 02:53 PM	07/24/10

CLIENT: TRC Environmental Corp.  
 Project: Rancho Viejo  
 Lab Order: 1007201

## PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1007201-01A	B-1	07/23/10 08:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	07/27/10 08:58 AM	42163
1007201-01B	B-1	07/23/10 08:45 AM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-1	07/23/10 08:45 AM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-1	07/23/10 08:45 AM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-1	07/23/10 08:45 AM	Aqueous	M4500-H+ B	pH Preparation	07/26/10 12:00 PM	42155
	B-1	07/23/10 08:45 AM	Aqueous	M2510 B	Conductivity Preparation	07/26/10 09:32 AM	42138
	B-1	07/23/10 08:45 AM	Aqueous	M2540C	TDS Preparation	07/27/10 03:15 PM	42156
1007201-02A	B-1 DUP	07/23/10 08:45 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	07/27/10 08:58 AM	42163
1007201-02B	B-1 DUP	07/23/10 08:45 AM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-1 DUP	07/23/10 08:45 AM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-1 DUP	07/23/10 08:45 AM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-1 DUP	07/23/10 08:45 AM	Aqueous	M4500-H+ B	pH Preparation	07/26/10 12:00 PM	42155
	B-1 DUP	07/23/10 08:45 AM	Aqueous	M2510 B	Conductivity Preparation	07/26/10 09:32 AM	42138
	B-1 DUP	07/23/10 08:45 AM	Aqueous	M2540C	TDS Preparation	07/27/10 03:15 PM	42156
1007201-03A	B-6	07/23/10 09:53 AM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	07/27/10 08:58 AM	42163
1007201-03B	B-6	07/23/10 09:53 AM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-6	07/23/10 09:53 AM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-6	07/23/10 09:53 AM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-6	07/23/10 09:53 AM	Aqueous	M4500-H+ B	pH Preparation	07/26/10 12:00 PM	42155
	B-6	07/23/10 09:53 AM	Aqueous	M2510 B	Conductivity Preparation	07/26/10 09:32 AM	42138
	B-6	07/23/10 09:53 AM	Aqueous	M2540C	TDS Preparation	07/27/10 03:15 PM	42156
1007201-04A	B-13	07/23/10 04:12 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	07/27/10 08:58 AM	42163
1007201-04B	B-13	07/23/10 04:12 PM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-13	07/23/10 04:12 PM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-13	07/23/10 04:12 PM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-13	07/23/10 04:12 PM	Aqueous	M4500-H+ B	pH Preparation	07/26/10 12:00 PM	42155
	B-13	07/23/10 04:12 PM	Aqueous	M2510 B	Conductivity Preparation	07/26/10 09:32 AM	42138
	B-13	07/23/10 04:12 PM	Aqueous	M2540C	TDS Preparation	07/27/10 03:15 PM	42156
1007201-05A	B-10	07/23/10 02:53 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	07/27/10 08:58 AM	42163

**PREP DATES REPORT**

CLIENT: TRC Environmental Corp.  
 Project: Rancho Viejo  
 Lab Order: 1007201

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1007201-05B	B-10	07/23/10 02:53 PM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-10	07/23/10 02:53 PM	Aqueous	E300	Anion Preparation	07/26/10 09:00 AM	42151
	B-10	07/23/10 02:53 PM	Aqueous	M4500-H+ B	pH Preparation	07/26/10 12:00 PM	42155
	B-10	07/23/10 02:53 PM	Aqueous	M2510 B	Conductivity Preparation	07/26/10 09:32 AM	42138
	B-10	07/23/10 02:53 PM	Aqueous	M2540C	TDS Preparation	07/27/10 03:15 PM	42156

CLIENT: TRC Environmental Corp.  
 Project: Rancho Viejo  
 Lab Order: 1007201

## ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1007201-01A	B-1	Aqueous	SW6020	Trace Metals: ICP-MS - Water	42163	5	07/28/10 02:01 PM	ICP-MS3_100728A
1007201-01B	B-1	Aqueous	E300	Anions by IC method - Water	42151	10	07/26/10 11:01 AM	IC_100726A
	B-1	Aqueous	E300	Anions by IC method - Water	42151	100	07/26/10 01:30 PM	IC_100726A
	B-1	Aqueous	E300	Anions by IC method - Water	42151	1000	07/26/10 02:49 PM	IC_100726A
	B-1	Aqueous	M4500-H+ B	pH	42155	1	07/26/10 12:56 PM	TITRATOR_100726A
	B-1	Aqueous	M2510 B	Specific Conductance	42138	10	07/26/10 10:05 AM	WC_100726A
	B-1	Aqueous	M2540C	Total Dissolved Solids	42156	1	07/27/10 04:15 PM	WC_100727B
1007201-02A	B-1 DUP	Aqueous	SW6020	Trace Metals: ICP-MS - Water	42163	5	07/28/10 01:11 PM	ICP-MS3_100728A
1007201-02B	B-1 DUP	Aqueous	E300	Anions by IC method - Water	42151	10	07/26/10 11:15 AM	IC_100726A
	B-1 DUP	Aqueous	E300	Anions by IC method - Water	42151	100	07/26/10 01:45 PM	IC_100726A
	B-1 DUP	Aqueous	E300	Anions by IC method - Water	42151	1000	07/26/10 03:48 PM	IC_100726A
	B-1 DUP	Aqueous	M4500-H+ B	pH	42155	1	07/26/10 12:58 PM	TITRATOR_100726A
	B-1 DUP	Aqueous	M2510 B	Specific Conductance	42138	10	07/26/10 10:05 AM	WC_100726A
	B-1 DUP	Aqueous	M2540C	Total Dissolved Solids	42156	1	07/27/10 04:15 PM	WC_100727B
1007201-03A	B-6	Aqueous	SW6020	Trace Metals: ICP-MS - Water	42163	5	07/28/10 01:16 PM	ICP-MS3_100728A
1007201-03B	B-6	Aqueous	E300	Anions by IC method - Water	42151	10	07/26/10 11:30 AM	IC_100726A
	B-6	Aqueous	E300	Anions by IC method - Water	42151	100	07/26/10 01:59 PM	IC_100726A
	B-6	Aqueous	E300	Anions by IC method - Water	42151	1000	07/26/10 04:02 PM	IC_100726A
	B-6	Aqueous	M4500-H+ B	pH	42155	1	07/26/10 01:00 PM	TITRATOR_100726A
	B-6	Aqueous	M2510 B	Specific Conductance	42138	10	07/26/10 10:05 AM	WC_100726A
	B-6	Aqueous	M2540C	Total Dissolved Solids	42156	1	07/27/10 04:15 PM	WC_100727B
1007201-04A	B-13	Aqueous	SW6020	Trace Metals: ICP-MS - Water	42163	5	07/28/10 01:22 PM	ICP-MS3_100728A
1007201-04B	B-13	Aqueous	E300	Anions by IC method - Water	42151	10	07/26/10 11:44 AM	IC_100726A
	B-13	Aqueous	E300	Anions by IC method - Water	42151	100	07/26/10 02:13 PM	IC_100726A
	B-13	Aqueous	E300	Anions by IC method - Water	42151	1000	07/26/10 04:16 PM	IC_100726A
	B-13	Aqueous	M4500-H+ B	pH	42155	1	07/26/10 01:01 PM	TITRATOR_100726A
	B-13	Aqueous	M2510 B	Specific Conductance	42138	10	07/26/10 10:05 AM	WC_100726A
	B-13	Aqueous	M2540C	Total Dissolved Solids	42156	1	07/27/10 04:15 PM	WC_100727B
1007201-05A	B-10	Aqueous	SW6020	Trace Metals: ICP-MS - Water	42163	5	07/28/10 01:27 PM	ICP-MS3_100728A



# ANALYTICAL DATES REPORT

CLIENT: TRC Environmental Corp.  
 Project: Rancho Viejo  
 Lab Order: 1007201

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1007201-05B	B-10	Aqueous	E300	Anions by IC method - Water	42151	10	07/26/10 11:58 AM	IC_100726A
	B-10	Aqueous	E300	Anions by IC method - Water	42151	1000	07/26/10 02:27 PM	IC_100726A
	B-10	Aqueous	M4500-H+ B	pH	42155	1	07/26/10 01:02 PM	TITRATOR_100726A
	B-10	Aqueous	M2510 B	Specific Conductance	42138	10	07/26/10 10:05 AM	WC_100726A
	B-10	Aqueous	M2540C	Total Dissolved Solids	42156	1	07/27/10 04:15 PM	WC_100727B

**CLIENT:** TRC Environmental Corp.  
**Project:** Rancho Viejo  
**Project No:** 170401 P.13  
**Lab Order:** 1007201

**Client Sample ID:** B-1  
**Lab ID:** 1007201-01  
**Collection Date:** 07/23/10 08:45 AM  
**Matrix:** Aqueous

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>Trace Metals: ICP-MS - Water</b>		<b>SW6020</b>					<b>Analyst: KL</b>
Aluminum	18.5	0.0500	0.150		mg/L	5	07/28/10 02:01 PM
Chromium	0.0319	0.0100	0.0300		mg/L	5	07/28/10 02:01 PM
Copper	0.0498	0.0100	0.0500	J	mg/L	5	07/28/10 02:01 PM
Iron	14.0	0.250	0.750		mg/L	5	07/28/10 02:01 PM
Manganese	3.67	0.0150	0.0500		mg/L	5	07/28/10 02:01 PM
Silver	ND	0.00500	0.0100		mg/L	5	07/28/10 02:01 PM
Zinc	0.0650	0.0100	0.0250		mg/L	5	07/28/10 02:01 PM
<b>Anions by IC method - Water</b>		<b>E300</b>					<b>Analyst: JBC</b>
Chloride	33900	300	1000		mg/L	1000	07/26/10 02:49 PM
Fluoride	ND	1.00	4.00		mg/L	10	07/26/10 11:01 AM
Nitrate-N	ND	1.00	5.00	C	mg/L	10	07/26/10 11:01 AM
Sulfate	1810	100	300		mg/L	100	07/26/10 01:30 PM
<b>pH</b>		<b>M4500-H+ B</b>					<b>Analyst: JBC</b>
pH	6.87	0	0		pH Units	1	07/26/10 12:56 PM
<b>Specific Conductance</b>		<b>M2510 B</b>					<b>Analyst: SW</b>
Specific Conductance	106000	100	100		µmhos/cm	10	07/26/10 10:05 AM
<b>Total Dissolved Solids</b>		<b>M2540C</b>					<b>Analyst: SW</b>
Total Dissolved Solids (Residue, Filterable)	60900	200	200		mg/L	1	07/27/10 04:15 PM

**Qualifiers:** \* Value exceeds TCLP Maximum Concentration Level  
 B Analyte detected in the associated Method Blank  
 C Sample Result or QC discussed in the Case Narrative  
 DF Dilution Factor  
 E TPH pattern not Gas or Diesel Range Pattern

J Analyte detected between MDL and RL  
 MDL Method Detection Limit  
 N Parameter not NELAC certified  
 ND Not Detected at the Method Detection Limit  
 RL Reporting Limit  
 S Spike Recovery outside control limits

**CLIENT:** TRC Environmental Corp.  
**Project:** Rancho Viejo  
**Project No:** 170401 P.13  
**Lab Order:** 1007201

**Client Sample ID:** B-1 DUP  
**Lab ID:** 1007201-02  
**Collection Date:** 07/23/10 08:45 AM  
**Matrix:** Aqueous

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>Trace Metals: ICP-MS - Water</b>		<b>SW6020</b>		<b>Analyst: KL</b>			
Aluminum	21.5	0.0500	0.150		mg/L	5	07/28/10 01:11 PM
Chromium	0.0344	0.0100	0.0300		mg/L	5	07/28/10 01:11 PM
Copper	0.0578	0.0100	0.0500		mg/L	5	07/28/10 01:11 PM
Iron	16.3	0.250	0.750		mg/L	5	07/28/10 01:11 PM
Manganese	4.02	0.0150	0.0500		mg/L	5	07/28/10 01:11 PM
Silver	ND	0.00500	0.0100		mg/L	5	07/28/10 01:11 PM
Zinc	0.0611	0.0100	0.0250		mg/L	5	07/28/10 01:11 PM
<b>Anions by IC method - Water</b>		<b>E300</b>		<b>Analyst: JBC</b>			
Chloride	33300	300	1000		mg/L	1000	07/26/10 03:48 PM
Fluoride	ND	1.00	4.00		mg/L	10	07/26/10 11:15 AM
Nitrate-N	ND	1.00	5.00	C	mg/L	10	07/26/10 11:15 AM
Sulfate	1700	100	300		mg/L	100	07/26/10 01:45 PM
<b>pH</b>		<b>M4500-H+ B</b>		<b>Analyst: JBC</b>			
pH	7.04	0	0		pH Units	1	07/26/10 12:58 PM
<b>Specific Conductance</b>		<b>M2510 B</b>		<b>Analyst: SW</b>			
Specific Conductance	105000	100	100		µmhos/cm	10	07/26/10 10:05 AM
<b>Total Dissolved Solids</b>		<b>M2540C</b>		<b>Analyst: SW</b>			
Total Dissolved Solids (Residue, Filterable)	60700	200	200		mg/L	1	07/27/10 04:15 PM

**Qualifiers:**

- \* Value exceeds TCLP Maximum Concentration Level
- B Analyte detected in the associated Method Blank
- C Sample Result or QC discussed in the Case Narrative
- DF Dilution Factor
- E TPH pattern not Gas or Diesel Range Pattern

- J Analyte detected between MDL and RL
- MDL Method Detection Limit
- N Parameter not NELAC certified
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- S Spike Recovery outside control limits

**CLIENT:** TRC Environmental Corp.  
**Project:** Rancho Viejo  
**Project No:** 170401 P.13  
**Lab Order:** 1007201

**Client Sample ID:** B-6  
**Lab ID:** 1007201-03  
**Collection Date:** 07/23/10 09:53 AM  
**Matrix:** Aqueous

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>Trace Metals: ICP-MS - Water</b>		<b>SW6020</b>		<b>Analyst: KL</b>			
Aluminum	0.804	0.0500	0.150		mg/L	5	07/28/10 01:16 PM
Chromium	0.0105	0.0100	0.0300	J	mg/L	5	07/28/10 01:16 PM
Copper	ND	0.0100	0.0500		mg/L	5	07/28/10 01:16 PM
Iron	0.770	0.250	0.750		mg/L	5	07/28/10 01:16 PM
Manganese	0.574	0.0150	0.0500		mg/L	5	07/28/10 01:16 PM
Silver	ND	0.00500	0.0100		mg/L	5	07/28/10 01:16 PM
Zinc	0.0230	0.0100	0.0250	J	mg/L	5	07/28/10 01:16 PM
<b>Anions by IC method - Water</b>		<b>E300</b>		<b>Analyst: JBC</b>			
Chloride	22600	300	1000		mg/L	1000	07/26/10 04:02 PM
Fluoride	ND	1.00	4.00		mg/L	10	07/26/10 11:30 AM
Nitrate-N	ND	1.00	5.00	C	mg/L	10	07/26/10 11:30 AM
Sulfate	3120	100	300		mg/L	100	07/26/10 01:59 PM
<b>pH</b>		<b>M4500-H+ B</b>		<b>Analyst: JBC</b>			
pH	6.95	0	0		pH Units	1	07/26/10 01:00 PM
<b>Specific Conductance</b>		<b>M2510 B</b>		<b>Analyst: SW</b>			
Specific Conductance	60300	100	100		µmhos/cm	10	07/26/10 10:05 AM
<b>Total Dissolved Solids</b>		<b>M2540C</b>		<b>Analyst: SW</b>			
Total Dissolved Solids (Residue, Filterable)	34600	200	200		mg/L	1	07/27/10 04:15 PM

**Qualifiers:**

- \* Value exceeds TCLP Maximum Concentration Level
- B Analyte detected in the associated Method Blank
- C Sample Result or QC discussed in the Case Narrative
- DF Dilution Factor
- E TPH pattern not Gas or Diesel Range Pattern

- J Analyte detected between MDL and RL
- MDL Method Detection Limit
- N Parameter not NELAC certified
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- S Spike Recovery outside control limits

**CLIENT:** TRC Environmental Corp.  
**Project:** Rancho Viejo  
**Project No:** 170401 P.13  
**Lab Order:** 1007201

**Client Sample ID:** B-13  
**Lab ID:** 1007201-04  
**Collection Date:** 07/23/10 04:12 PM  
**Matrix:** Aqueous

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>Trace Metals: ICP-MS - Water</b>		<b>SW6020</b>		<b>Analyst: KL</b>			
Aluminum	4.95	0.0500	0.150		mg/L	5	07/28/10 01:22 PM
Chromium	ND	0.0100	0.0300		mg/L	5	07/28/10 01:22 PM
Copper	0.0120	0.0100	0.0500	J	mg/L	5	07/28/10 01:22 PM
Iron	4.81	0.250	0.750		mg/L	5	07/28/10 01:22 PM
Manganese	2.21	0.0150	0.0500		mg/L	5	07/28/10 01:22 PM
Silver	ND	0.00500	0.0100		mg/L	5	07/28/10 01:22 PM
Zinc	0.0623	0.0100	0.0250		mg/L	5	07/28/10 01:22 PM
<b>Anions by IC method - Water</b>		<b>E300</b>		<b>Analyst: JBC</b>			
Chloride	32900	300	1000		mg/L	1000	07/26/10 04:16 PM
Fluoride	ND	1.00	4.00		mg/L	10	07/26/10 11:44 AM
Nitrate-N	ND	1.00	5.00	C	mg/L	10	07/26/10 11:44 AM
Sulfate	1760	100	300		mg/L	100	07/26/10 02:13 PM
<b>pH</b>		<b>M4500-H+ B</b>		<b>Analyst: JBC</b>			
pH	6.78	0	0		pH Units	1	07/26/10 01:01 PM
<b>Specific Conductance</b>		<b>M2510 B</b>		<b>Analyst: SW</b>			
Specific Conductance	97200	100	100		µmhos/cm	10	07/26/10 10:05 AM
<b>Total Dissolved Solids</b>		<b>M2540C</b>		<b>Analyst: SW</b>			
Total Dissolved Solids (Residue, Filterable)	58700	200	200		mg/L	1	07/27/10 04:15 PM

**Qualifiers:**

- \* Value exceeds TCLP Maximum Concentration Level
- B Analyte detected in the associated Method Blank
- C Sample Result or QC discussed in the Case Narrative
- DF Dilution Factor
- E TPH pattern not Gas or Diesel Range Pattern

- J Analyte detected between MDL and RL
- MDL Method Detection Limit
- N Parameter not NELAC certified
- ND Not Detected at the Method Detection Limit
- RL Reporting Limit
- S Spike Recovery outside control limits



**CLIENT:** TRC Environmental Corp.  
**Project:** Rancho Viejo  
**Project No:** 170401 P.13  
**Lab Order:** 1007201

**Client Sample ID:** B-10  
**Lab ID:** 1007201-05  
**Collection Date:** 07/23/10 02:53 PM  
**Matrix:** Aqueous

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>Trace Metals: ICP-MS - Water</b>		<b>SW6020</b>		<b>Analyst: KL</b>			
Aluminum	3.99	0.0500	0.150		mg/L	5	07/28/10 01:27 PM
Chromium	ND	0.0100	0.0300		mg/L	5	07/28/10 01:27 PM
Copper	ND	0.0100	0.0500		mg/L	5	07/28/10 01:27 PM
Iron	5.27	0.250	0.750		mg/L	5	07/28/10 01:27 PM
Manganese	0.858	0.0150	0.0500		mg/L	5	07/28/10 01:27 PM
Silver	ND	0.00500	0.0100		mg/L	5	07/28/10 01:27 PM
Zinc	0.0292	0.0100	0.0250		mg/L	5	07/28/10 01:27 PM
<b>Anions by IC method - Water</b>		<b>E300</b>		<b>Analyst: JBC</b>			
Chloride	28700	300	1000		mg/L	1000	07/26/10 02:27 PM
Fluoride	ND	1.00	4.00		mg/L	10	07/26/10 11:58 AM
Nitrate-N	ND	1.00	5.00	C	mg/L	10	07/26/10 11:58 AM
Sulfate	1200	10.0	30.0		mg/L	10	07/26/10 11:58 AM
<b>pH</b>		<b>M4500-H+ B</b>		<b>Analyst: JBC</b>			
pH	7.10	0	0		pH Units	1	07/26/10 01:02 PM
<b>Specific Conductance</b>		<b>M2510 B</b>		<b>Analyst: SW</b>			
Specific Conductance	88100	100	100		µmhos/cm	10	07/26/10 10:05 AM
<b>Total Dissolved Solids</b>		<b>M2540C</b>		<b>Analyst: SW</b>			
Total Dissolved Solids (Residue, Filterable)	51700	200	200		mg/L	1	07/27/10 04:15 PM

<b>Qualifiers:</b>	*	Value exceeds TCLP Maximum Concentration Level	J	Analyte detected between MDL and RL
	B	Analyte detected in the associated Method Blank	MDL	Method Detection Limit
	C	Sample Result or QC discussed in the Case Narrative	N	Parameter not NELAC certified
	DF	Dilution Factor	ND	Not Detected at the Method Detection Limit
	E	TPH pattern not Gas or Diesel Range Pattern	RL	Reporting Limit
			S	Spike Recovery outside control limits

CLIENT: TRC Environmental Corp.  
 Work Order: 1007201  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: ICP-MS3\_100728A

Sample ID:	MB-42163	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L			
SampType:	MBLK	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 12:49 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	ND	0.0300								
Chromium	ND	0.00600								
Copper	ND	0.0100								
Iron	ND	0.150								
Manganese	ND	0.0100								
Silver	ND	0.00200								
Zinc	ND	0.00500								

Sample ID:	LCS-42163	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L			
SampType:	LCS	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 12:54 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	5.05	0.0300	5.00	0	101	80	120			
Chromium	0.204	0.00600	0.200	0	102	80	120			
Copper	0.204	0.0100	0.200	0	102	80	120			
Iron	5.12	0.150	5.00	0	102	80	120			
Manganese	0.202	0.0100	0.200	0	101	80	120			
Silver	0.197	0.00200	0.200	0	98.7	80	120			
Zinc	0.200	0.00500	0.200	0	99.8	80	120			

Sample ID:	LCSD-42163	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L			
SampType:	LCSD	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 01:00 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	4.83	0.0300	5.00	0	96.5	80	120	4.50	15	
Chromium	0.196	0.00600	0.200	0	98.2	80	120	3.80	15	
Copper	0.195	0.0100	0.200	0	97.7	80	120	4.31	15	
Iron	4.85	0.150	5.00	0	97.1	80	120	5.26	15	
Manganese	0.195	0.0100	0.200	0	97.6	80	120	3.42	15	
Silver	0.192	0.00200	0.200	0	95.8	80	120	2.98	15	
Zinc	0.189	0.00500	0.200	0	94.4	80	120	5.56	15	

Sample ID:	1007201-01A SD	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L			
SampType:	SD	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 02:06 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	19.5	0.750	0	18.5				5.21	10	
Chromium	0	0.150	0	0.0319				0	10	
Copper	0.0534	0.250	0	0.0498				6.96	10	
Iron	16.0	3.75	0	14.0				13.8	10	R
Manganese	3.98	0.250	0	3.67				8.03	10	
Silver	0	0.0500	0	0				0	10	
Zinc	0.0742	0.125	0	0.0650				13.1	10	R

Sample ID:	1007201-01A PDS	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L			
SampType:	PDS	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 02:12 PM	Prep Date:	07/27/10			

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

**CLIENT:** TRC Environmental Corp.  
**Work Order:** 1007201  
**Project:** Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: ICP-MS3\_100728A

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	46.7	0.150	25.0	18.5	113	75	125			
Chromium	0.998	0.0300	1.00	0.0319	96.6	75	125			
Copper	1.01	0.0500	1.00	0.0498	95.8	75	125			
Iron	40.3	0.750	25.0	14.0	105	75	125			
Manganese	4.91	0.0500	1.00	3.67	124	75	125			
Silver	0.928	0.0100	1.00	0	92.8	75	125			
Zinc	0.946	0.0250	1.00	0.0650	88.0	75	125			

Sample ID:	1007201-01A MS	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L			
SampType:	MS	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 02:17 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	22.6	0.150	5.00	18.5	82.1	80	120			
Chromium	0.212	0.0300	0.200	0.0319	89.8	80	120			
Copper	0.236	0.0500	0.200	0.0498	92.9	80	120			
Iron	18.5	0.750	5.00	14.0	91.1	80	120			
Manganese	3.80	0.0500	0.200	3.67	65.8	80	120			S
Silver	0.182	0.0100	0.200	0	91.1	80	120			
Zinc	0.230	0.0250	0.200	0.0650	82.3	80	120			

Sample ID:	1007201-01A MSD	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L			
SampType:	MSD	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 02:23 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	22.3	0.150	5.00	18.5	75.8	80	120	1.40	15	S
Chromium	0.209	0.0300	0.200	0.0319	88.4	80	120	1.40	15	
Copper	0.226	0.0500	0.200	0.0498	88.2	80	120	4.09	15	
Iron	17.8	0.750	5.00	14.0	77.3	80	120	3.79	15	S
Manganese	3.71	0.0500	0.200	3.67	23.2	80	120	2.26	15	S
Silver	0.179	0.0100	0.200	0	89.6	80	120	1.60	15	
Zinc	0.226	0.0250	0.200	0.0650	80.3	80	120	1.73	15	

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

**CLIENT:** TRC Environmental Corp.  
**Work Order:** 1007201  
**Project:** Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: ICP-MS3\_100728A

Sample ID:	ICV1-100728	Batch ID:	R50539	TestNo:	SW6020	Units:	mg/L			
SampType:	ICV	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 11:02 AM	Prep Date:				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	2.48	0.0300	2.50	0	99.2	90	110			
Chromium	0.0989	0.00600	0.100	0	98.9	90	110			
Copper	0.100	0.0100	0.100	0	100	90	110			
Iron	2.56	0.150	2.50	0	103	90	110			
Manganese	0.0988	0.0100	0.100	0	98.8	90	110			
Silver	0.0985	0.00200	0.100	0	98.5	90	110			
Zinc	0.101	0.00500	0.100	0	101	90	110			

Sample ID:	CCV1-100728	Batch ID:	R50539	TestNo:	SW6020	Units:	mg/L			
SampType:	CCV	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 12:21 PM	Prep Date:				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	5.22	0.0300	5.00	0	104	90	110			
Chromium	0.205	0.00600	0.200	0	103	90	110			
Copper	0.205	0.0100	0.200	0	102	90	110			
Iron	5.12	0.150	5.00	0	102	90	110			
Manganese	0.205	0.0100	0.200	0	103	90	110			
Silver	0.207	0.00200	0.200	0	104	90	110			
Zinc	0.204	0.00500	0.200	0	102	90	110			

Sample ID:	CCV2-100728	Batch ID:	R50539	TestNo:	SW6020	Units:	mg/L			
SampType:	CCV	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 02:28 PM	Prep Date:				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	5.38	0.0300	5.00	0	108	90	110			
Chromium	0.202	0.00600	0.200	0	101	90	110			
Copper	0.208	0.0100	0.200	0	104	90	110			
Iron	5.16	0.150	5.00	0	103	90	110			
Manganese	0.199	0.0100	0.200	0	99.4	90	110			
Silver	0.205	0.00200	0.200	0	103	90	110			
Zinc	0.200	0.00500	0.200	0	100	90	110			

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

**CLIENT:** TRC Environmental Corp.  
**Work Order:** 1007201  
**Project:** Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

**RunID: IC\_100726A**

Sample ID:	LCS-42151	Batch ID:	42151	TestNo:	E300	Units:	mg/L			
SampType:	LCS	Run ID:	IC_100726A	Analysis Date:	07/26/10 09:45 AM	Prep Date:	07/26/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	9.51	1.00	10.00	0	95.1	90	110			
Fluoride	3.86	0.400	4.000	0	96.4	90	110			
Nitrate-N	4.90	0.500	5.000	0	98.1	90	110			
Sulfate	28.6	3.00	30.00	0	95.4	90	110			

Sample ID:	LCSD-42151	Batch ID:	42151	TestNo:	E300	Units:	mg/L			
SampType:	LCSD	Run ID:	IC_100726A	Analysis Date:	07/26/10 09:58 AM	Prep Date:	07/26/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	9.53	1.00	10.00	0	95.3	90	110	0.177	20	
Fluoride	3.84	0.400	4.000	0	96.0	90	110	0.465	20	
Nitrate-N	4.93	0.500	5.000	0	98.6	90	110	0.604	20	
Sulfate	28.3	3.00	30.00	0	94.3	90	110	1.19	20	

Sample ID:	MB-42151	Batch ID:	42151	TestNo:	E300	Units:	mg/L			
SampType:	MBLK	Run ID:	IC_100726A	Analysis Date:	07/26/10 10:27 AM	Prep Date:	07/26/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	ND	1.00								
Fluoride	ND	0.400								
Nitrate-N	ND	0.500								
Sulfate	ND	3.00								

Sample ID:	1007201-05B MS	Batch ID:	42151	TestNo:	E300	Units:	mg/L			
SampType:	MS	Run ID:	IC_100726A	Analysis Date:	07/26/10 12:35 PM	Prep Date:	07/26/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Fluoride	39.7	4.00	40.00	0	99.2	90	110			
Nitrate-N	45.6	5.00	50.00	0	91.2	90	110			
Sulfate	1020	30.0	300.0	718.5	99.2	90	110			

Sample ID:	1007201-05B MSD	Batch ID:	42151	TestNo:	E300	Units:	mg/L			
SampType:	MSD	Run ID:	IC_100726A	Analysis Date:	07/26/10 01:16 PM	Prep Date:	07/26/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Fluoride	40.6	4.00	40.00	0	101	90	110	2.25	20	
Nitrate-N	48.1	5.00	50.00	0	96.2	90	110	5.32	20	
Sulfate	1030	30.0	300.0	718.5	103	90	110	1.19	20	

Sample ID:	1007201-05B MS	Batch ID:	42151	TestNo:	E300	Units:	mg/L			
SampType:	MS	Run ID:	IC_100726A	Analysis Date:	07/26/10 03:04 PM	Prep Date:	07/26/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	26600	1000	10000	17200	93.5	90	110			

Sample ID:	1007201-05B MSD	Batch ID:	42151	TestNo:	E300	Units:	mg/L			
SampType:	MSD	Run ID:	IC_100726A	Analysis Date:	07/26/10 03:17 PM	Prep Date:	07/26/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	26500	1000	10000	17200	93.0	90	110	0.186	20	

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified



**CLIENT:** TRC Environmental Corp.  
**Work Order:** 1007201  
**Project:** Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

**RunID: IC\_100726A**

<b>Sample ID:</b>	ICV-100726	<b>Batch ID:</b>	R50483	<b>TestNo:</b>	E300	<b>Units:</b>	mg/L			
<b>SampType:</b>	ICV	<b>Run ID:</b>	IC_100726A	<b>Analysis Date:</b>	07/26/10 09:23 AM	<b>Prep Date:</b>	07/26/10			
<b>Analyte</b>	<b>Result</b>	<b>RL</b>	<b>SPK value</b>	<b>Ref Val</b>	<b>%REC</b>	<b>LowLimit</b>	<b>HighLimit</b>	<b>%RPD</b>	<b>RPD Limit</b>	<b>Qual</b>
Chloride	24.6	1.00	25.00	0	98.5	90	110			
Fluoride	10.0	0.400	10.00	0	100	90	110			
Nitrate-N	12.6	0.500	12.50	0	101	90	110			
Sulfate	73.2	3.00	75.00	0	97.7	90	110			

<b>Sample ID:</b>	CCV1-100726	<b>Batch ID:</b>	R50483	<b>TestNo:</b>	E300	<b>Units:</b>	mg/L			
<b>SampType:</b>	CCV	<b>Run ID:</b>	IC_100726A	<b>Analysis Date:</b>	07/26/10 12:18 PM	<b>Prep Date:</b>	07/26/10			
<b>Analyte</b>	<b>Result</b>	<b>RL</b>	<b>SPK value</b>	<b>Ref Val</b>	<b>%REC</b>	<b>LowLimit</b>	<b>HighLimit</b>	<b>%RPD</b>	<b>RPD Limit</b>	<b>Qual</b>
Chloride	10.2	1.00	10.00	0	102	90	110			
Fluoride	3.92	0.400	4.000	0	98.1	90	110			
Nitrate-N	4.98	0.500	5.000	0	99.5	90	110			
Sulfate	28.9	3.00	30.00	0	96.4	90	110			

<b>Sample ID:</b>	CCV2-100729	<b>Batch ID:</b>	R50483	<b>TestNo:</b>	E300	<b>Units:</b>	mg/L			
<b>SampType:</b>	CCV	<b>Run ID:</b>	IC_100726A	<b>Analysis Date:</b>	07/26/10 03:31 PM	<b>Prep Date:</b>	07/26/10			
<b>Analyte</b>	<b>Result</b>	<b>RL</b>	<b>SPK value</b>	<b>Ref Val</b>	<b>%REC</b>	<b>LowLimit</b>	<b>HighLimit</b>	<b>%RPD</b>	<b>RPD Limit</b>	<b>Qual</b>
Chloride	9.82	1.00	10.00	0	98.2	90	110			
Fluoride	3.90	0.400	4.000	0	97.4	90	110			
Nitrate-N	5.00	0.500	5.000	0	100	90	110			
Sulfate	29.2	3.00	30.00	0	97.3	90	110			

<b>Sample ID:</b>	CCV3-100726	<b>Batch ID:</b>	R50483	<b>TestNo:</b>	E300	<b>Units:</b>	mg/L			
<b>SampType:</b>	CCV	<b>Run ID:</b>	IC_100726A	<b>Analysis Date:</b>	07/26/10 04:44 PM	<b>Prep Date:</b>	07/26/10			
<b>Analyte</b>	<b>Result</b>	<b>RL</b>	<b>SPK value</b>	<b>Ref Val</b>	<b>%REC</b>	<b>LowLimit</b>	<b>HighLimit</b>	<b>%RPD</b>	<b>RPD Limit</b>	<b>Qual</b>
Chloride	9.70	1.00	10.00	0	97.0	90	110			
Nitrate-N	4.99	0.500	5.000	0	99.8	90	110			

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007201  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**  
 RunID: TITRATOR\_100726A

Sample ID:	1007201-01B DUP	Batch ID:	42155	TestNo:	M4500-H+ B	Units:	pH Units				
SampType:	DUP	Run ID:	TITRATOR_100726A	Analysis Date:	07/26/10 12:57 PM	Prep Date:	07/26/10				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
pH		6.98	0	0	6.870				1.59	5	

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007201  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: TITRATOR\_100726A

Sample ID:	ICV-100726	Batch ID:	R50485	TestNo:	M4500-H+ B	Units:	pH Units				
SampType:	ICV	Run ID:	TITRATOR_100726A	Analysis Date:	07/26/10 12:55 PM	Prep Date:	07/26/10				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
pH		9.99	0	10.00	0	99.9	99	101			

Sample ID:	CCV-100726	Batch ID:	R50485	TestNo:	M4500-H+ B	Units:	pH Units				
SampType:	CCV	Run ID:	TITRATOR_100726A	Analysis Date:	07/26/10 01:03 PM	Prep Date:	07/26/10				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
pH		7.01	0	7.000	0	100	97.1	102.9			

**Qualifiers:**  
 B Analyte detected in the associated Method Blank  
 DF Dilution Factor  
 J Analyte detected between MDL and RL  
 MDL Method Detection Limit  
 ND Not Detected at the Method Detection Limit

R RPD outside accepted control limits  
 RL Reporting Limit  
 S Spike Recovery outside control limits  
 J Analyte detected between SDL and RL  
 N Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007201  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: WC\_100726A

Sample ID: MB-42138	Batch ID: 42138	TestNo: M2510 B	Units: µmhos/cm
SampType: MBLK	Run ID: WC_100726A	Analysis Date: 07/26/10 10:05 AM	Prep Date: 07/26/10
Analyte	Result	RL	SPK value
Specific Conductance	ND	10.0	

Sample ID: LCS-42138	Batch ID: 42138	TestNo: M2510 B	Units: µmhos/cm
SampType: LCS	Run ID: WC_100726A	Analysis Date: 07/26/10 10:05 AM	Prep Date: 07/26/10
Analyte	Result	RL	SPK value
Specific Conductance	1460	10.0	1413

Sample ID: 1007201-01B-DUP	Batch ID: 42138	TestNo: M2510 B	Units: µmhos/cm
SampType: DUP	Run ID: WC_100726A	Analysis Date: 07/26/10 10:05 AM	Prep Date: 07/26/10
Analyte	Result	RL	SPK value
Specific Conductance	106000	100	0

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007201  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: WC\_100726A

Sample ID: ICV-100726	Batch ID: CONDW-7/26/10	TestNo: M2510 B	Units: µmhos/cm							
SampType: ICV	Run ID: WC_100726A	Analysis Date: 07/26/10 10:05 AM	Prep Date: 07/26/10							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Specific Conductance	12800	10.0	12880	0	99.6	95	105			

Sample ID: CCV-100726	Batch ID: CONDW-7/26/10	TestNo: M2510 B	Units: µmhos/cm							
SampType: CCV	Run ID: WC_100726A	Analysis Date: 07/26/10 10:05 AM	Prep Date: 07/26/10							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Specific Conductance	12600	10.0	12880	0	98.1	95	105			

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified



CLIENT: TRC Environmental Corp.  
 Work Order: 1007201  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: WC\_100727B

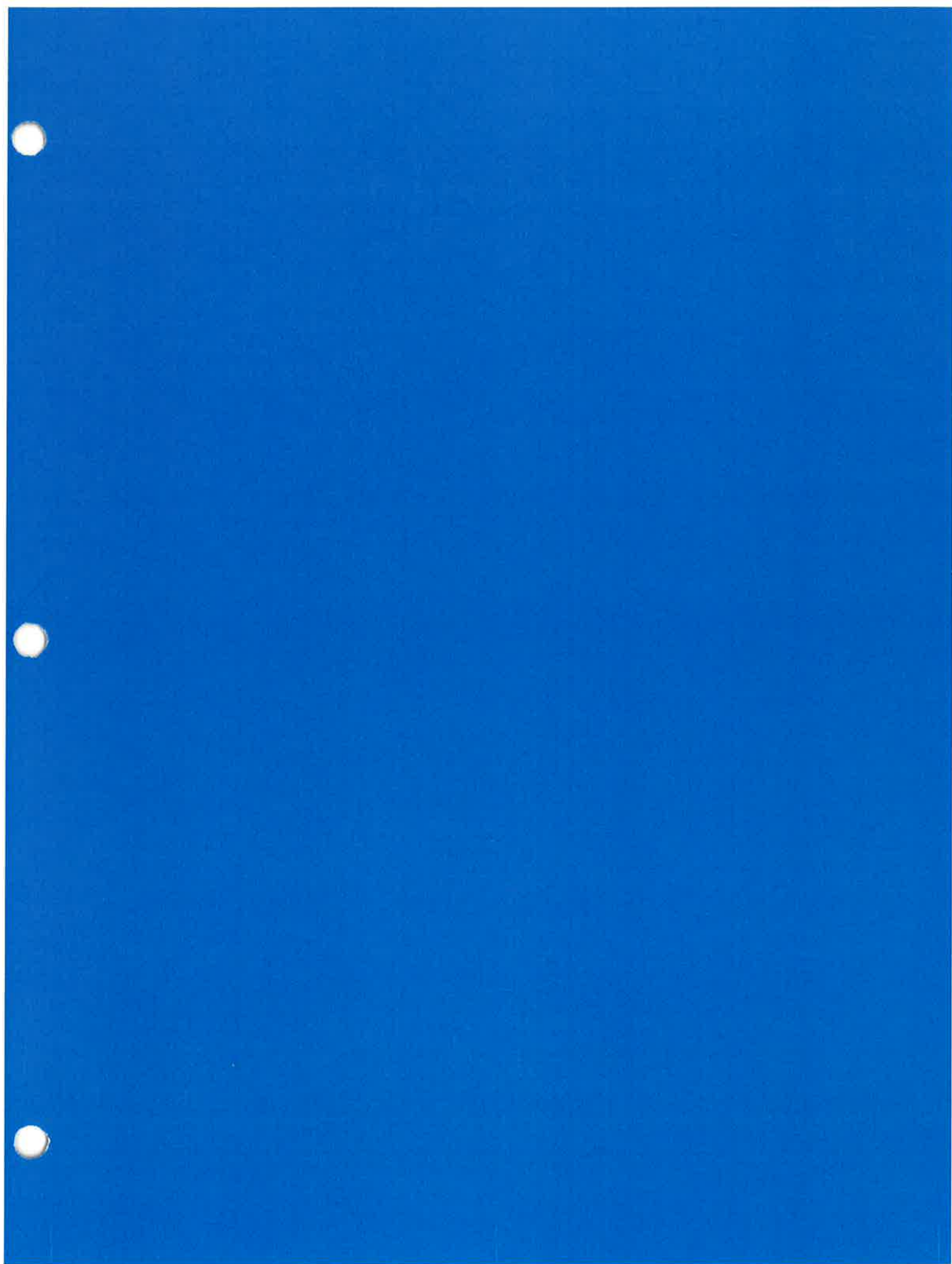
Sample ID: MB-42156	Batch ID: 42156	TestNo: M2540C	Units: mg/L
SampType: MBLK	Run ID: WC_100727B	Analysis Date: 07/27/10 04:15 PM	Prep Date: 07/27/10
Analyte	Result	RL	SPK value
Total Dissolved Solids (Residue, Fi	ND	10.0	

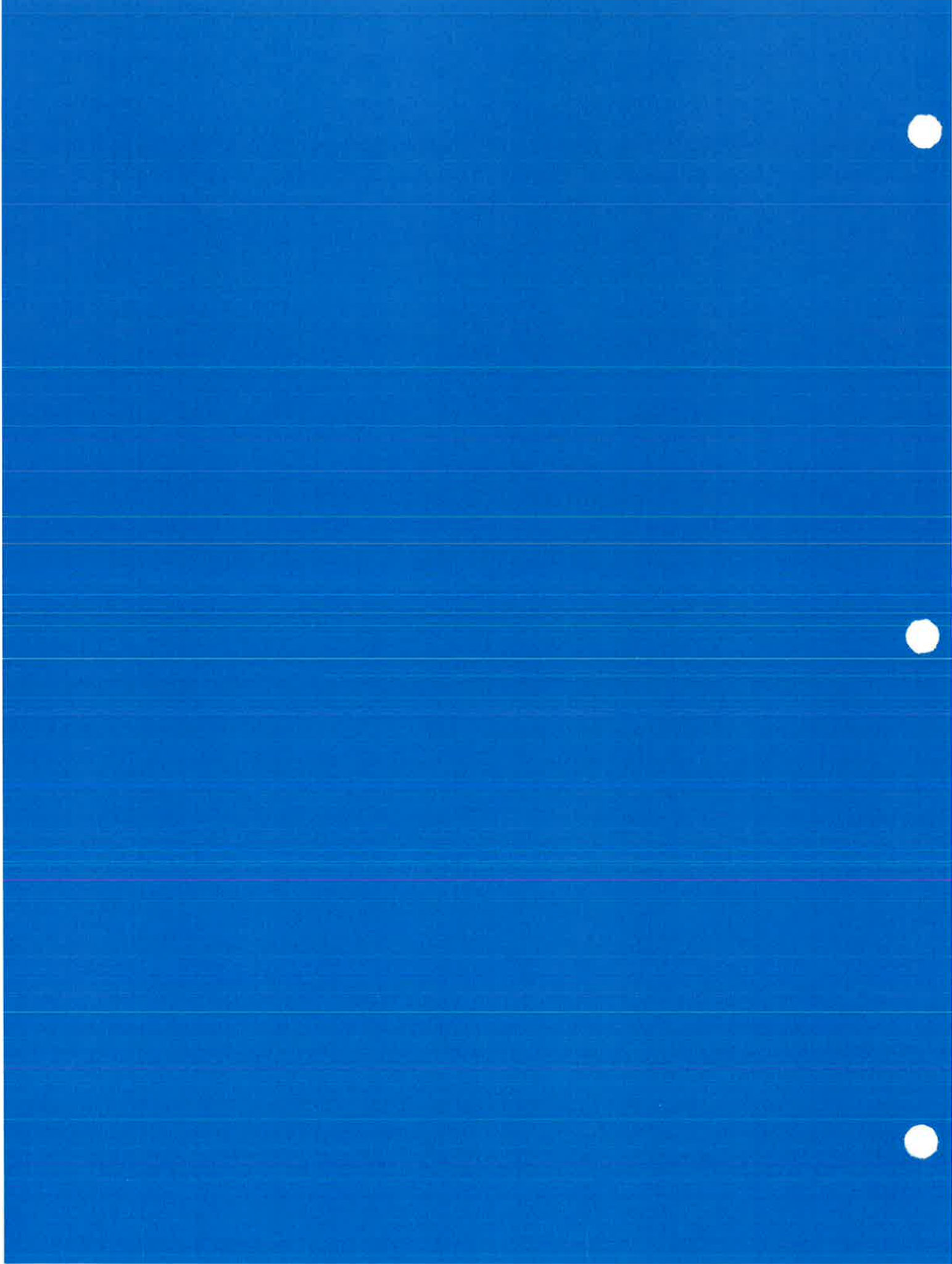
Sample ID: LCS-42156	Batch ID: 42156	TestNo: M2540C	Units: mg/L
SampType: LCS	Run ID: WC_100727B	Analysis Date: 07/27/10 04:15 PM	Prep Date: 07/27/10
Analyte	Result	RL	SPK value
Total Dissolved Solids (Residue, Fi	728	10.0	745.6

Sample ID: 1007188-01C-DUP	Batch ID: 42156	TestNo: M2540C	Units: mg/L
SampType: DUP	Run ID: WC_100727B	Analysis Date: 07/27/10 04:15 PM	Prep Date: 07/27/10
Analyte	Result	RL	SPK value
Total Dissolved Solids (Residue, Fi	1130	10.0	0

Sample ID: 1007192-03C-DUP	Batch ID: 42156	TestNo: M2540C	Units: mg/L
SampType: DUP	Run ID: WC_100727B	Analysis Date: 07/27/10 04:15 PM	Prep Date: 07/27/10
Analyte	Result	RL	SPK value
Total Dissolved Solids (Residue, Fi	633	10.0	0

<b>Qualifiers:</b>	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified







August 03, 2010

James Neyens  
TRC Environmental Corp.  
505 East Huntland Drive Suite 250  
Austin, Texas 78752

Order No: 1007213

TEL: (512) 684-3156  
FAX: (512) 329-8750

RE: Rancho Viejo

Dear James Neyens:

DHL Analytical received 3 sample(s) on 7/27/2010 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAC except where noted in the Case Narrative. All non-NELAC methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

A handwritten signature in black ink that reads "John DuPont".

John DuPont  
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-10-3



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Sample Receipt Checklist

Client Name TRC Environmental Corp.

Date Received: 7/27/2010

Work Order Number 1007213

Received by JB

Checklist completed by: [Signature] 7/27/10

Reviewed by: SS 7-27-10

Carrier name: Hand Delivered

- Shipping container/cooler in good condition? Yes  No  Not Present
- Custody seals intact on shipping container/cooler? Yes  No  Not Present
- Custody seals intact on sample bottles? Yes  No  Not Present
- Chain of custody present? Yes  No
- Chain of custody signed when relinquished and received? Yes  No
- Chain of custody agrees with sample labels? Yes  No
- Samples in proper container/bottle? Yes  No
- Sample containers intact? Yes  No
- Sufficient sample volume for indicated test? Yes  No
- All samples received within holding time? Yes  No
- Container/Temp Blank temperature in compliance? Yes  No  1.9 °C
- Water - VOA vials have zero headspace? Yes  No  No VOA vials submitted
- Water - pH acceptable upon receipt? Yes  No  Not Applicable

Adjusted? ND Checked by [Signature]

Any No response must be detailed in the comments section below.

Client contacted \_\_\_\_\_ Date contacted: \_\_\_\_\_ Person contacted \_\_\_\_\_

Contacted by: \_\_\_\_\_ Regarding: \_\_\_\_\_

Comments: \_\_\_\_\_

Corrective Action \_\_\_\_\_

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CLIENT: TRC Environmental Corp.  
Project: Rancho Viejo  
Lab Order: 1007213

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## CASE NARRATIVE

The samples were analyzed using the methods outlined in the following references:

Method SW6020 - Metals Analysis  
Method E300 - Anions Analysis  
Method M4500-H+ B (18th Edition) - pH of a Water  
Method M2540C (18th Edition) - TDS Analysis  
Method M2510 B (18th Edition) - Specific Conductance

## LOG IN

Samples were received and log-in performed on 7/27/10. A total of 3 samples were received. The samples arrived in good condition and were properly packaged.

## METALS ANALYSIS

For Metals analysis all samples were diluted prior to analysis due to the nature of the samples (high salt content).

For Metals analysis performed on 7/28/10 the matrix spike and matrix spike duplicate recoveries were below control limits for a few analytes. These are flagged accordingly in the QC summary report. The reference sample selected for the matrix spike and matrix spike duplicate was not from this work order. The LCS was within control limits for these analytes. No further corrective actions were taken.

For Metals analysis performed on 7/28/10 the RPD for the serial dilution was slightly above control limits for Iron and Zinc. These are flagged accordingly. The PDS was within control limits for these analytes. No further corrective actions were taken.

## ANIONS ANALYSIS

For Anions analysis samples B-18 and B-2 were diluted prior to analysis due to the nature of the samples (high conductivity).

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CLIENT: TRC Environmental Corp.  
Project: Rancho Viejo  
Lab Order: 1007213

**Work Order Sample Summary**

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Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recv'd
1007213-01	Ranch Well		07/25/10 12:30 PM	07/27/10
1007213-02	B-18		07/25/10 02:50 PM	07/27/10
1007213-03	B-2		07/25/10 04:30 PM	07/27/10

CLIENT: TRC Environmental Corp.  
 Project: Rancho Viejo  
 Lab Order: 1007213

## PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
1007213-01A	Ranch Well	07/25/10 12:30 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	07/27/10 08:58 AM	42163
1007213-01B	Ranch Well	07/25/10 12:30 PM	Aqueous	E300	Anion Preparation	07/27/10 09:00 AM	42179
	Ranch Well	07/25/10 12:30 PM	Aqueous	E300	Anion Preparation	07/27/10 09:00 AM	42179
	Ranch Well	07/25/10 12:30 PM	Aqueous	E300	Anion Preparation	07/27/10 09:00 AM	42179
	Ranch Well	07/25/10 12:30 PM	Aqueous	M4500-H+ B	pH Preparation	07/27/10 12:30 PM	42183
	Ranch Well	07/25/10 12:30 PM	Aqueous	M2510 B	Conductivity Preparation	07/27/10 10:00 AM	42172
	Ranch Well	07/25/10 12:30 PM	Aqueous	M2540C	TDS Preparation	07/27/10 03:15 PM	42156
1007213-02A	B-18	07/25/10 02:50 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	07/27/10 08:58 AM	42163
1007213-02B	B-18	07/25/10 02:50 PM	Aqueous	E300	Anion Preparation	07/27/10 09:00 AM	42179
	B-18	07/25/10 02:50 PM	Aqueous	E300	Anion Preparation	07/27/10 09:00 AM	42179
	B-18	07/25/10 02:50 PM	Aqueous	E300	Anion Preparation	07/27/10 09:00 AM	42179
	B-18	07/25/10 02:50 PM	Aqueous	M4500-H+ B	pH Preparation	07/27/10 12:30 PM	42183
	B-18	07/25/10 02:50 PM	Aqueous	M2510 B	Conductivity Preparation	07/27/10 10:00 AM	42172
	B-18	07/25/10 02:50 PM	Aqueous	M2540C	TDS Preparation	07/27/10 03:15 PM	42156
1007213-03A	B-2	07/25/10 04:30 PM	Aqueous	SW3005A	Aq Prep Metals : ICP-MS	07/27/10 08:58 AM	42163
1007213-03B	B-2	07/25/10 04:30 PM	Aqueous	E300	Anion Preparation	07/27/10 09:00 AM	42179
	B-2	07/25/10 04:30 PM	Aqueous	E300	Anion Preparation	07/27/10 09:00 AM	42179
	B-2	07/25/10 04:30 PM	Aqueous	E300	Anion Preparation	07/27/10 09:00 AM	42179
	B-2	07/25/10 04:30 PM	Aqueous	M4500-H+ B	pH Preparation	07/27/10 12:30 PM	42183
	B-2	07/25/10 04:30 PM	Aqueous	M2510 B	Conductivity Preparation	07/27/10 10:00 AM	42172
	B-2	07/25/10 04:30 PM	Aqueous	M2540C	TDS Preparation	07/27/10 03:15 PM	42156



CLIENT: TRC Environmental Corp.  
 Project: Rancho Viejo  
 Lab Order: 1007213

## ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
1007213-01A	Ranch Well	Aqueous	SW6020	Trace Metals: ICP-MS - Water	42163	5	07/28/10 01:38 PM	ICP-MS3_100728A
1007213-01B	Ranch Well	Aqueous	E300	Anions by IC method - Water	42179	1	07/27/10 10:21 AM	IC_100727A
	Ranch Well	Aqueous	E300	Anions by IC method - Water	42179	10	07/27/10 11:23 AM	IC_100727A
	Ranch Well	Aqueous	E300	Anions by IC method - Water	42179	100	07/27/10 01:17 PM	IC_100727A
	Ranch Well	Aqueous	M4500-H+ B	pH	42183	1	07/27/10 01:03 PM	TITRATOR_100727A
	Ranch Well	Aqueous	M2510 B	Specific Conductance	42172	1	07/27/10 10:45 AM	WC_100727A
	Ranch Well	Aqueous	M2540C	Total Dissolved Solids	42156	1	07/27/10 04:15 PM	WC_100727B
1007213-02A	B-18	Aqueous	SW6020	Trace Metals: ICP-MS - Water	42163	5	07/28/10 01:44 PM	ICP-MS3_100728A
1007213-02B	B-18	Aqueous	E300	Anions by IC method - Water	42179	10	07/27/10 10:35 AM	IC_100727A
	B-18	Aqueous	E300	Anions by IC method - Water	42179	100	07/27/10 11:38 AM	IC_100727A
	B-18	Aqueous	E300	Anions by IC method - Water	42179	1000	07/27/10 01:58 PM	IC_100727A
	B-18	Aqueous	M4500-H+ B	pH	42183	1	07/27/10 01:05 PM	TITRATOR_100727A
	B-18	Aqueous	M2510 B	Specific Conductance	42172	10	07/27/10 10:45 AM	WC_100727A
	B-18	Aqueous	M2540C	Total Dissolved Solids	42156	1	07/27/10 04:15 PM	WC_100727B
1007213-03A	B-2	Aqueous	SW6020	Trace Metals: ICP-MS - Water	42163	5	07/28/10 01:50 PM	ICP-MS3_100728A
1007213-03B	B-2	Aqueous	E300	Anions by IC method - Water	42179	10	07/27/10 10:50 AM	IC_100727A
	B-2	Aqueous	E300	Anions by IC method - Water	42179	100	07/27/10 11:52 AM	IC_100727A
	B-2	Aqueous	E300	Anions by IC method - Water	42179	1000	07/27/10 02:12 PM	IC_100727A
	B-2	Aqueous	M4500-H+ B	pH	42183	1	07/27/10 01:06 PM	TITRATOR_100727A
	B-2	Aqueous	M2510 B	Specific Conductance	42172	10	07/27/10 10:45 AM	WC_100727A
	B-2	Aqueous	M2540C	Total Dissolved Solids	42156	1	07/27/10 04:15 PM	WC_100727B

CLIENT: TRC Environmental Corp.  
 Project: Rancho Viejo  
 Project No: 170401  
 Lab Order: 1007213

Client Sample ID: Ranch Well  
 Lab ID: 1007213-01  
 Collection Date: 07/25/10 12:30 PM  
 Matrix: Aqueous

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>Trace Metals: ICP-MS - Water</b>		<b>SW6020</b>					<b>Analyst: KL</b>
Aluminum	ND	0.0500	0.150		mg/L	5	07/28/10 01:38 PM
Chromium	ND	0.0100	0.0300		mg/L	5	07/28/10 01:38 PM
Copper	ND	0.0100	0.0500		mg/L	5	07/28/10 01:38 PM
Iron	0.828	0.250	0.750		mg/L	5	07/28/10 01:38 PM
Manganese	0.0266	0.0150	0.0500	J	mg/L	5	07/28/10 01:38 PM
Silver	ND	0.00500	0.0100		mg/L	5	07/28/10 01:38 PM
Zinc	ND	0.0100	0.0250		mg/L	5	07/28/10 01:38 PM
<b>Anions by IC method - Water</b>		<b>E300</b>					<b>Analyst: JBC</b>
Chloride	712	30.0	100		mg/L	100	07/27/10 01:17 PM
Fluoride	1.14	0.100	0.400		mg/L	1	07/27/10 10:21 AM
Nitrate-N	ND	0.100	0.500		mg/L	1	07/27/10 10:21 AM
Sulfate	197	10.0	30.0		mg/L	10	07/27/10 11:23 AM
<b>pH</b>		<b>M4500-H+ B</b>					<b>Analyst: JBC</b>
pH	8.45	0	0		pH Units	1	07/27/10 01:03 PM
<b>Specific Conductance</b>		<b>M2510 B</b>					<b>Analyst: SW</b>
Specific Conductance	3700	10.0	10.0		µmhos/cm	1	07/27/10 10:45 AM
<b>Total Dissolved Solids</b>		<b>M2540C</b>					<b>Analyst: SW</b>
Total Dissolved Solids (Residue, Filterable)	2100	10.0	10.0		mg/L	1	07/27/10 04:15 PM

Qualifiers: \* Value exceeds TCLP Maximum Concentration Level  
 B Analyte detected in the associated Method Blank  
 C Sample Result or QC discussed in the Case Narrative  
 DF Dilution Factor  
 E TPH pattern not Gas or Diesel Range Pattern  
 J Analyte detected between MDL and RL  
 MDL Method Detection Limit  
 N Parameter not NELAC certified  
 ND Not Detected at the Method Detection Limit  
 RL Reporting Limit  
 S Spike Recovery outside control limits

# DHL Analytical

Date: 08/03/10

CLIENT: TRC Environmental Corp.  
 Project: Rancho Viejo  
 Project No: 170401  
 Lab Order: 1007213

Client Sample ID: B-18  
 Lab ID: 1007213-02  
 Collection Date: 07/25/10 02:50 PM  
 Matrix: Aqueous

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>Trace Metals: ICP-MS - Water</b>		<b>SW6020</b>					<b>Analyst: KL</b>
Aluminum	1.96	0.0500	0.150		mg/L	5	07/28/10 01:44 PM
Chromium	ND	0.0100	0.0300		mg/L	5	07/28/10 01:44 PM
Copper	ND	0.0100	0.0500		mg/L	5	07/28/10 01:44 PM
Iron	1.62	0.250	0.750		mg/L	5	07/28/10 01:44 PM
Manganese	0.524	0.0150	0.0500		mg/L	5	07/28/10 01:44 PM
Silver	ND	0.00500	0.0100		mg/L	5	07/28/10 01:44 PM
Zinc	0.0123	0.0100	0.0250	J	mg/L	5	07/28/10 01:44 PM
<b>Anions by IC method - Water</b>		<b>E300</b>					<b>Analyst: JBC</b>
Chloride	37800	300	1000		mg/L	1000	07/27/10 01:58 PM
Fluoride	ND	1.00	4.00		mg/L	10	07/27/10 10:35 AM
Nitrate-N	14.3	1.00	5.00		mg/L	10	07/27/10 10:35 AM
Sulfate	2210	100	300		mg/L	100	07/27/10 11:38 AM
<b>pH</b>		<b>M4500-H+ B</b>					<b>Analyst: JBC</b>
pH	7.08	0	0		pH Units	1	07/27/10 01:05 PM
<b>Specific Conductance</b>		<b>M2510 B</b>					<b>Analyst: SW</b>
Specific Conductance	114000	100	100		µmhos/cm	10	07/27/10 10:45 AM
<b>Total Dissolved Solids</b>		<b>M2540C</b>					<b>Analyst: SW</b>
Total Dissolved Solids (Residue, Filterable)	66600	200	200		mg/L	1	07/27/10 04:15 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	J	Analyte detected between MDL and RL
	B	Analyte detected in the associated Method Blank	MDL	Method Detection Limit
	C	Sample Result or QC discussed in the Case Narrative	N	Parameter not NELAC certified
	DF	Dilution Factor	ND	Not Detected at the Method Detection Limit
	E	TPH pattern not Gas or Diesel Range Pattern	RL	Reporting Limit
			S	Spike Recovery outside control limits

**DHL Analytical**

Date: 08/03/10

CLIENT: TRC Environmental Corp.  
 Project: Rancho Viejo  
 Project No: 170401  
 Lab Order: 1007213

Client Sample ID: B-2  
 Lab ID: 1007213-03  
 Collection Date: 07/25/10 04:30 PM  
 Matrix: Aqueous

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>Trace Metals: ICP-MS - Water</b>		<b>SW6020</b>					<b>Analyst: KL</b>
Aluminum	0.264	0.0500	0.150		mg/L	5	07/28/10 01:50 PM
Chromium	ND	0.0100	0.0300		mg/L	5	07/28/10 01:50 PM
Copper	ND	0.0100	0.0500		mg/L	5	07/28/10 01:50 PM
Iron	0.318	0.250	0.750	J	mg/L	5	07/28/10 01:50 PM
Manganese	0.563	0.0150	0.0500		mg/L	5	07/28/10 01:50 PM
Silver	ND	0.00500	0.0100		mg/L	5	07/28/10 01:50 PM
Zinc	0.0102	0.0100	0.0250	J	mg/L	5	07/28/10 01:50 PM
<b>Anions by IC method - Water</b>		<b>E300</b>					<b>Analyst: JBC</b>
Chloride	36900	300	1000		mg/L	1000	07/27/10 02:12 PM
Fluoride	ND	1.00	4.00		mg/L	10	07/27/10 10:50 AM
Nitrate-N	1.98	1.00	5.00	J	mg/L	10	07/27/10 10:50 AM
Sulfate	1980	100	300		mg/L	100	07/27/10 11:52 AM
<b>pH</b>		<b>M4500-H+ B</b>					<b>Analyst: JBC</b>
pH	6.93	0	0		pH Units	1	07/27/10 01:06 PM
<b>Specific Conductance</b>		<b>M2510 B</b>					<b>Analyst: SW</b>
Specific Conductance	114000	100	100		µmhos/cm	10	07/27/10 10:45 AM
<b>Total Dissolved Solids</b>		<b>M2540C</b>					<b>Analyst: SW</b>
Total Dissolved Solids (Residue, Filterable)	64000	200	200		mg/L	1	07/27/10 04:15 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	J	Analyte detected between MDL and RL
	B	Analyte detected in the associated Method Blank	MDL	Method Detection Limit
	C	Sample Result or QC discussed in the Case Narrative	N	Parameter not NELAC certified
	DF	Dilution Factor	ND	Not Detected at the Method Detection Limit
	E	TPH pattern not Gas or Diesel Range Pattern	RL	Reporting Limit
			S	Spike Recovery outside control limits

CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: ICP-MS3\_100728A

Sample ID:	MB-42163	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L				
SampType:	MBLK	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 12:49 PM	Prep Date:	07/27/10				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual	
Aluminum	ND	0.0300									
Chromium	ND	0.00600									
Copper	ND	0.0100									
Iron	ND	0.150									
Manganese	ND	0.0100									
Silver	ND	0.00200									
Zinc	ND	0.00500									

Sample ID:	LCS-42163	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L				
SampType:	LCS	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 12:54 PM	Prep Date:	07/27/10				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual	
Aluminum	5.05	0.0300	5.00	0	101	80	120				
Chromium	0.204	0.00600	0.200	0	102	80	120				
Copper	0.204	0.0100	0.200	0	102	80	120				
Iron	5.12	0.150	5.00	0	102	80	120				
Manganese	0.202	0.0100	0.200	0	101	80	120				
Silver	0.197	0.00200	0.200	0	98.7	80	120				
Zinc	0.200	0.00500	0.200	0	99.8	80	120				

Sample ID:	LCSD-42163	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L				
SampType:	LCSD	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 01:00 PM	Prep Date:	07/27/10				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual	
Aluminum	4.83	0.0300	5.00	0	96.5	80	120	4.50	15		
Chromium	0.196	0.00600	0.200	0	98.2	80	120	3.80	15		
Copper	0.195	0.0100	0.200	0	97.7	80	120	4.31	15		
Iron	4.85	0.150	5.00	0	97.1	80	120	5.26	15		
Manganese	0.195	0.0100	0.200	0	97.6	80	120	3.42	15		
Silver	0.192	0.00200	0.200	0	95.8	80	120	2.98	15		
Zinc	0.189	0.00500	0.200	0	94.4	80	120	5.56	15		

Sample ID:	1007201-01A SD	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L				
SampType:	SD	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 02:06 PM	Prep Date:	07/27/10				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual	
Aluminum	19.5	0.750	0	18.5				5.21	10		
Chromium	0	0.150	0	0.0319				0	10		
Copper	0.0534	0.250	0	0.0498				6.96	10		
Iron	16.0	3.75	0	14.0				13.8	10		R
Manganese	3.98	0.250	0	3.67				8.03	10		
Silver	0	0.0500	0	0				0	10		
Zinc	0.0742	0.125	0	0.0650				13.1	10		R

Sample ID:	1007201-01A PDS	Batch ID:	42163	TestNo:	SW6020	Units:	mg/L				
SampType:	PDS	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 02:12 PM	Prep Date:	07/27/10				

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified



CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: ICP-MS3\_100728A

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	46.7	0.150	25.0	18.5	113	75	125			
Chromium	0.998	0.0300	1.00	0.0319	96.6	75	125			
Copper	1.01	0.0500	1.00	0.0498	95.8	75	125			
Iron	40.3	0.750	25.0	14.0	105	75	125			
Manganese	4.91	0.0500	1.00	3.67	124	75	125			
Silver	0.928	0.0100	1.00	0	92.8	75	125			
Zinc	0.946	0.0250	1.00	0.0650	88.0	75	125			

Sample ID: 1007201-01A MS      Batch ID: 42163      TestNo: SW6020      Units: mg/L  
 SampType: MS      Run ID: ICP-MS3\_100728A      Analysis Date: 07/28/10 02:17 PM      Prep Date: 07/27/10

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	22.6	0.150	5.00	18.5	82.1	80	120			
Chromium	0.212	0.0300	0.200	0.0319	89.8	80	120			
Copper	0.236	0.0500	0.200	0.0498	92.9	80	120			
Iron	18.5	0.750	5.00	14.0	91.1	80	120			
Manganese	3.80	0.0500	0.200	3.67	65.8	80	120			S
Silver	0.182	0.0100	0.200	0	91.1	80	120			
Zinc	0.230	0.0250	0.200	0.0650	82.3	80	120			

Sample ID: 1007201-01A MSD      Batch ID: 42163      TestNo: SW6020      Units: mg/L  
 SampType: MSD      Run ID: ICP-MS3\_100728A      Analysis Date: 07/28/10 02:23 PM      Prep Date: 07/27/10

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	22.3	0.150	5.00	18.5	75.8	80	120	1.40	15	S
Chromium	0.209	0.0300	0.200	0.0319	88.4	80	120	1.40	15	
Copper	0.226	0.0500	0.200	0.0498	88.2	80	120	4.09	15	
Iron	17.8	0.750	5.00	14.0	77.3	80	120	3.79	15	S
Manganese	3.71	0.0500	0.200	3.67	23.2	80	120	2.26	15	S
Silver	0.179	0.0100	0.200	0	89.6	80	120	1.60	15	
Zinc	0.226	0.0250	0.200	0.0650	80.3	80	120	1.73	15	

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: ICP-MS3\_100728A

Sample ID:	ICV1-100728	Batch ID:	R50539	TestNo:	SW6020	Units:	mg/L			
SampType:	ICV	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 11:02 AM	Prep Date:				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	2.48	0.0300	2.50	0	99.2	90	110			
Chromium	0.0989	0.00600	0.100	0	98.9	90	110			
Copper	0.100	0.0100	0.100	0	100	90	110			
Iron	2.56	0.150	2.50	0	103	90	110			
Mangancsc	0.0988	0.0100	0.100	0	98.8	90	110			
Silver	0.0985	0.00200	0.100	0	98.5	90	110			
Zinc	0.101	0.00500	0.100	0	101	90	110			

Sample ID:	CCV1-100728	Batch ID:	R50539	TestNo:	SW6020	Units:	mg/L			
SampType:	CCV	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 12:21 PM	Prep Date:				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	5.22	0.0300	5.00	0	104	90	110			
Chromium	0.205	0.00600	0.200	0	103	90	110			
Copper	0.205	0.0100	0.200	0	102	90	110			
Iron	5.12	0.150	5.00	0	102	90	110			
Manganese	0.205	0.0100	0.200	0	103	90	110			
Silver	0.207	0.00200	0.200	0	104	90	110			
Zinc	0.204	0.00500	0.200	0	102	90	110			

Sample ID:	CCV2-100728	Batch ID:	R50539	TestNo:	SW6020	Units:	mg/L			
SampType:	CCV	Run ID:	ICP-MS3_100728A	Analysis Date:	07/28/10 02:28 PM	Prep Date:				
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Aluminum	5.38	0.0300	5.00	0	108	90	110			
Chromium	0.202	0.00600	0.200	0	101	90	110			
Copper	0.208	0.0100	0.200	0	104	90	110			
Iron	5.16	0.150	5.00	0	103	90	110			
Manganese	0.199	0.0100	0.200	0	99.4	90	110			
Silver	0.205	0.00200	0.200	0	103	90	110			
Zinc	0.200	0.00500	0.200	0	100	90	110			

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: IC\_100727A

Sample ID:	LCS-42179	Batch ID:	42179	TestNo:	E300	Units:	mg/L			
SampType:	LCS	Run ID:	IC_100727A	Analysis Date:	07/27/10 09:37 AM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	9.85	1.00	10.00	0	98.5	90	110			
Fluoride	3.95	0.400	4.000	0	98.7	90	110			
Nitrate-N	5.18	0.500	5.000	0	104	90	110			
Sulfate	29.5	3.00	30.00	0	98.4	90	110			

Sample ID:	LCSD-42179	Batch ID:	42179	TestNo:	E300	Units:	mg/L			
SampType:	LCSD	Run ID:	IC_100727A	Analysis Date:	07/27/10 09:51 AM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	10.0	1.00	10.00	0	100	90	110	1.49	20	
Fluoride	3.98	0.400	4.000	0	99.6	90	110	0.918	20	
Nitrate-N	5.25	0.500	5.000	0	105	90	110	1.37	20	
Sulfate	30.3	3.00	30.00	0	101	90	110	2.77	20	

Sample ID:	MB-42179	Batch ID:	42179	TestNo:	E300	Units:	mg/L			
SampType:	MBLK	Run ID:	IC_100727A	Analysis Date:	07/27/10 10:06 AM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	ND	1.00								
Fluoride	ND	0.400								
Nitrate-N	ND	0.500								
Sulfate	ND	3.00								

Sample ID:	1007213-01B MS	Batch ID:	42179	TestNo:	E300	Units:	mg/L			
SampType:	MS	Run ID:	IC_100727A	Analysis Date:	07/27/10 12:20 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Fluoride	4.43	0.400	4.000	0.6800	93.7	90	110			
Nitrate-N	4.83	0.500	5.000	0	96.7	90	110			

Sample ID:	1007213-01B MSD	Batch ID:	42179	TestNo:	E300	Units:	mg/L			
SampType:	MSD	Run ID:	IC_100727A	Analysis Date:	07/27/10 12:34 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Fluoride	4.47	0.400	4.000	0.6800	94.6	90	110	0.834	20	
Nitrate-N	4.92	0.500	5.000	0	98.3	90	110	1.70	20	

Sample ID:	1007213-01B MS	Batch ID:	42179	TestNo:	E300	Units:	mg/L			
SampType:	MS	Run ID:	IC_100727A	Analysis Date:	07/27/10 12:48 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Sulfate	426	30.0	300.0	118.5	103	90	110			

Sample ID:	1007213-01B MSD	Batch ID:	42179	TestNo:	E300	Units:	mg/L			
SampType:	MSD	Run ID:	IC_100727A	Analysis Date:	07/27/10 01:03 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Sulfate	422	30.0	300.0	118.5	101	90	110	0.952	20	

Sample ID:	1007213-01B MS	Batch ID:	42179	TestNo:	E300	Units:	mg/L
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Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: IC\_100727A

SampType:	MS	Run ID:	IC_100727A	Analysis Date:	07/27/10 01:31 PM	Prep Date:	07/27/10				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride		1430	100	1000	427.0	100	90	110			

Sample ID:	1007213-01B MSD	Batch ID:	42179	TestNo:	E300	Units:	mg/L				
SampType:	MSD	Run ID:	IC_100727A	Analysis Date:	07/27/10 01:44 PM	Prep Date:	07/27/10				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride		1430	100	1000	427.0	100	90	110	0	20	

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: IC\_100727A

Sample ID:	ICV-100727	Batch ID:	R50502	TestNo:	E300	Units:	mg/L			
SampType:	ICV	Run ID:	IC_100727A	Analysis Date:	07/27/10 09:20 AM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	25.8	1.00	25.00	0	103	90	110			
Fluoride	10.2	0.400	10.00	0	102	90	110			
Nitrate-N	13.3	0.500	12.50	0	106	90	110			
Sulfate	76.7	3.00	75.00	0	102	90	110			

Sample ID:	CCV1-100727	Batch ID:	R50502	TestNo:	E300	Units:	mg/L			
SampType:	CCV	Run ID:	IC_100727A	Analysis Date:	07/27/10 12:06 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	10.2	1.00	10.00	0	102	90	110			
Fluoride	3.96	0.400	4.000	0	99.0	90	110			
Nitrate-N	5.25	0.500	5.000	0	105	90	110			
Sulfate	30.2	3.00	30.00	0	101	90	110			

Sample ID:	CCV2-100727	Batch ID:	R50502	TestNo:	E300	Units:	mg/L			
SampType:	CCV	Run ID:	IC_100727A	Analysis Date:	07/27/10 02:40 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Chloride	10.1	1.00	10.00	0	101	90	110			
Fluoride	3.92	0.400	4.000	0	98.0	90	110			
Nitrate-N	5.26	0.500	5.000	0	105	90	110			
Sulfate	30.4	3.00	30.00	0	101	90	110			

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: TITRATOR\_100727A

Sample ID:	1007213-01B DUP	Batch ID:	42183	TestNo:	M4500-H+ B	Units:	pH Units			
SampType:	DUP	Run ID:	TITRATOR_100727A	Analysis Date:	07/27/10 01:04 PM	Prep Date:	07/27/10			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
pH	8.43	0	0	8.450				0.237	5	

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified



CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: TITRATOR\_100727A

Sample ID: ICV-100727	Batch ID: R50506	TestNo: M4500-H+ B	Units: pH Units
SampType: ICV	Run ID: TITRATOR_100727A	Analysis Date: 07/27/10 01:02 PM	Prep Date: 07/27/10
Analyte	Result	RL	SPK value
pH	9.99	0	10.00
		Ref Val	%REC
		0	99.9
		LowLimit	HighLimit
		99	101
		%RPD	RPD Limit
			Qual

Sample ID: CCV-100727	Batch ID: R50506	TestNo: M4500-H+ B	Units: pH Units
SampType: CCV	Run ID: TITRATOR_100727A	Analysis Date: 07/27/10 01:07 PM	Prep Date: 07/27/10
Analyte	Result	RL	SPK value
pH	7.01	0	7.000
		Ref Val	%REC
		0	100
		LowLimit	HighLimit
		97.1	102.9
		%RPD	RPD Limit
			Qual

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: WC\_100727A

Sample ID: MB-42172	Batch ID: 42172	TestNo: M2510 B	Units: μmhos/cm
SampType: MBLK	Run ID: WC_100727A	Analysis Date: 07/27/10 10:45 AM	Prep Date: 07/27/10
Analyte	Result RL SPK value	Ref Val %REC LowLimit HighLimit	%RPD RPD Limit Qual
Specific Conductance	ND 10.0		

Sample ID: LCS-42172	Batch ID: 42172	TestNo: M2510 B	Units: μmhos/cm
SampType: LCS	Run ID: WC_100727A	Analysis Date: 07/27/10 10:45 AM	Prep Date: 07/27/10
Analyte	Result RL SPK value	Ref Val %REC LowLimit HighLimit	%RPD RPD Limit Qual
Specific Conductance	1460 10.0 1413	0 104 95 105	

Sample ID: 1007213-01B-DUP	Batch ID: 42172	TestNo: M2510 B	Units: μmhos/cm
SampType: DUP	Run ID: WC_100727A	Analysis Date: 07/27/10 10:45 AM	Prep Date: 07/27/10
Analyte	Result RL SPK value	Ref Val %REC LowLimit HighLimit	%RPD RPD Limit Qual
Specific Conductance	3730 10.0 0	3700	0.808 2

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: WC\_100727A

Sample ID: ICV-100727	Batch ID: CONDW-7/27/10	TestNo: M2510 B	Units: μmhos/cm							
SampType: ICV	Run ID: WC_100727A	Analysis Date: 07/27/10 10:45 AM	Prep Date: 07/27/10							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Specific Conductance	12900	10.0	12880	0	99.9	95	105			

Sample ID: CCV-100727	Batch ID: CONDW-7/27/10	TestNo: M2510 B	Units: μmhos/cm							
SampType: CCV	Run ID: WC_100727A	Analysis Date: 07/27/10 10:45 AM	Prep Date: 07/27/10							
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Specific Conductance	12800	10.0	12880	0	99.0	95	105			

Qualifiers: B Analyte detected in the associated Method Blank  
 DF Dilution Factor  
 J Analyte detected between MDL and RL  
 MDL Method Detection Limit  
 ND Not Detected at the Method Detection Limit

R RPD outside accepted control limits  
 RL Reporting Limit  
 S Spike Recovery outside control limits  
 J Analyte detected between SDL and RL  
 N Parameter not NELAC certified

CLIENT: TRC Environmental Corp.  
 Work Order: 1007213  
 Project: Rancho Viejo

**ANALYTICAL QC SUMMARY REPORT**

RunID: WC\_100727B

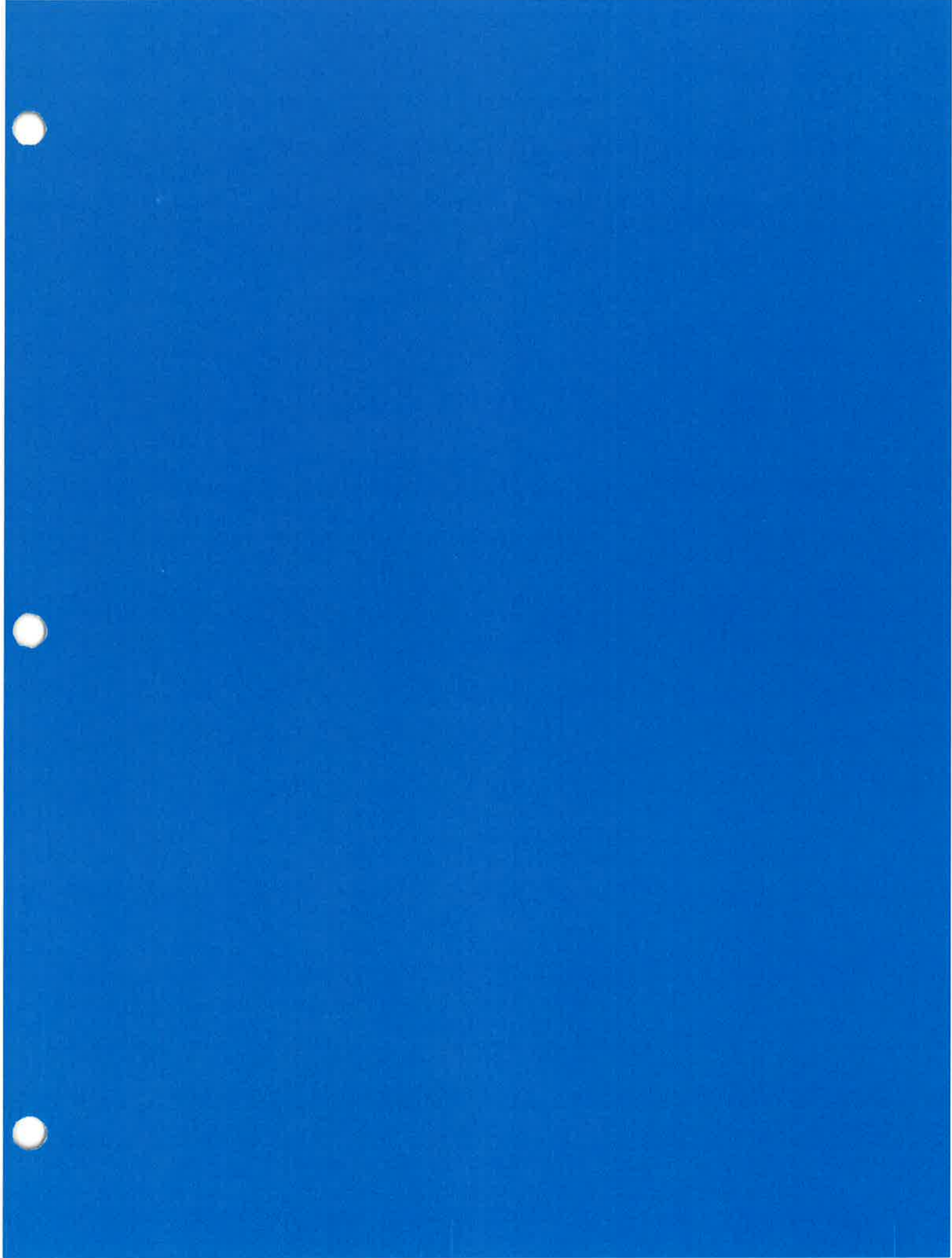
Sample ID: MB-42156	Batch ID: 42156	TestNo: M2540C	Units: mg/L
SampType: MBLK	Run ID: WC_100727B	Analysis Date: 07/27/10 04:15 PM	Prep Date: 07/27/10
Analyte	Result RL SPK value	Ref Val %REC LowLimit HighLimit	%RPD RPD Limit Qual
Total Dissolved Solids (Residue, Fi	ND 10.0		

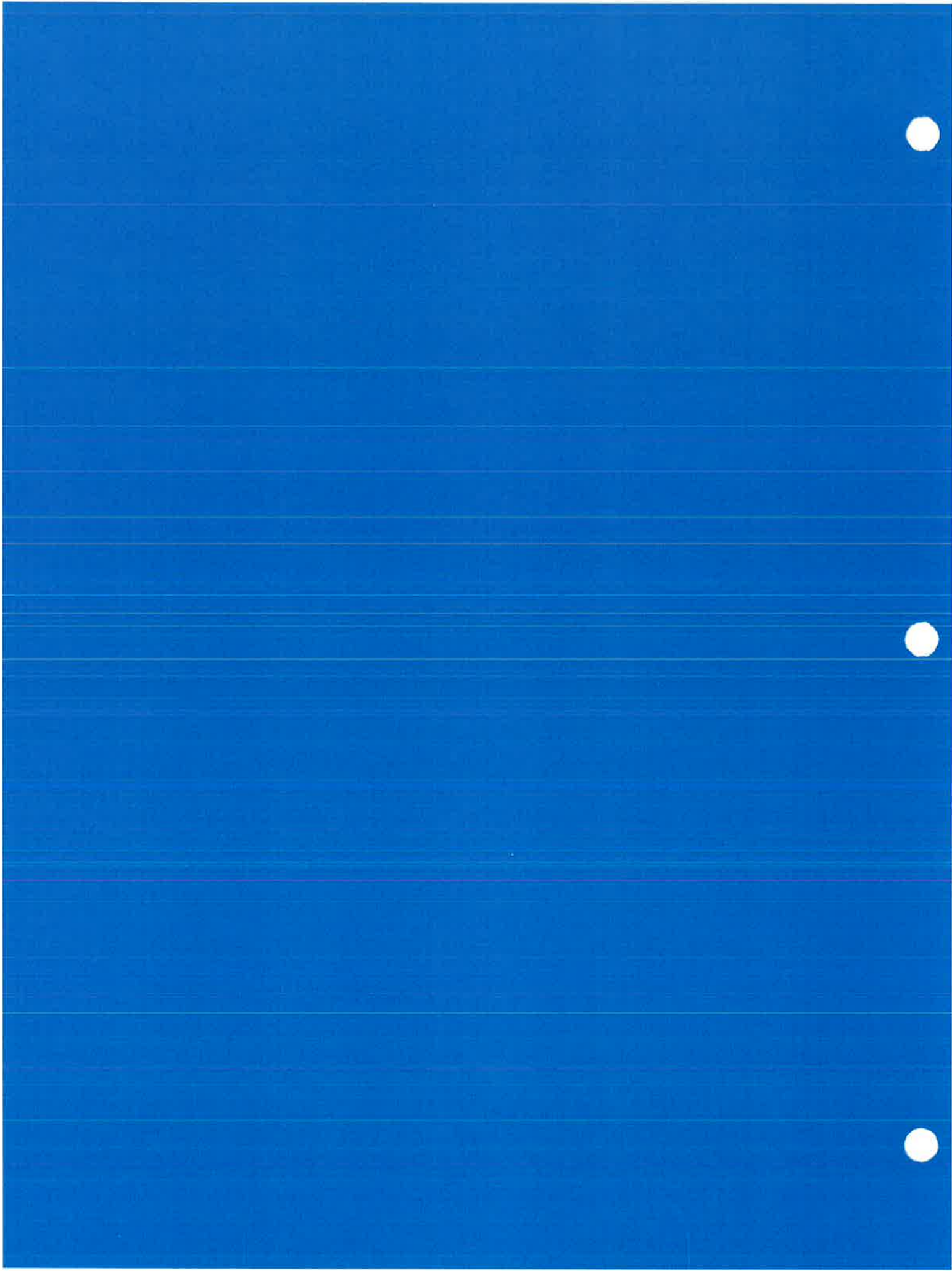
Sample ID: LCS-42156	Batch ID: 42156	TestNo: M2540C	Units: mg/L
SampType: LCS	Run ID: WC_100727B	Analysis Date: 07/27/10 04:15 PM	Prep Date: 07/27/10
Analyte	Result RL SPK value	Ref Val %REC LowLimit HighLimit	%RPD RPD Limit Qual
Total Dissolved Solids (Residue, Fi	728 10.0 745.6	0 97.6 90 113	

Sample ID: 1007188-01C-DUP	Batch ID: 42156	TestNo: M2540C	Units: mg/L
SampType: DUP	Run ID: WC_100727B	Analysis Date: 07/27/10 04:15 PM	Prep Date: 07/27/10
Analyte	Result RL SPK value	Ref Val %REC LowLimit HighLimit	%RPD RPD Limit Qual
Total Dissolved Solids (Residue, Fi	1130 10.0 0	1111	1.61 5

Sample ID: 1007192-03C-DUP	Batch ID: 42156	TestNo: M2540C	Units: mg/L
SampType: DUP	Run ID: WC_100727B	Analysis Date: 07/27/10 04:15 PM	Prep Date: 07/27/10
Analyte	Result RL SPK value	Ref Val %REC LowLimit HighLimit	%RPD RPD Limit Qual
Total Dissolved Solids (Residue, Fi	633 10.0 0	623.0	1.59 5

Qualifiers:	B Analyte detected in the associated Method Blank	R RPD outside accepted control limits
	DF Dilution Factor	RL Reporting Limit
	J Analyte detected between MDL and RL	S Spike Recovery outside control limits
	MDL Method Detection Limit	J Analyte detected between SDL and RL
	ND Not Detected at the Method Detection Limit	N Parameter not NELAC certified







Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX

Project Number: ASF09-192-01  
Project Manager: Rick Klar

**Reported:**  
04/01/11 15:50  
**Received:**  
03/25/11 10:50

**Report No. 1103321**

Sample ID #: DRAFT: B-1

Sampling Method: Grab

Lab Sample ID #: 1103321-01

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 10:04

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	31800	mg/L	2000		B114131	04/01/11	300.0	AK	
Nitrate as N *	14.0	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	1500	mg/L	25.0		B114131	04/01/11	300.0	AK	
Specific conductance *	82400	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	7.37	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	12	°F	1.0		B114036	03/25/11	170.1	AK	H



**SAN ANTONIO  
TESTING LABORATORY, INC.**



Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX

Project Number: ASF09-192-01

Project Manager: Rick Klar

**Reported:**  
04/01/11 15:50  
**Received:**  
03/25/11 10:50

**Report No. 1103321**

Sample ID #: DRAFT: B-2

Sampling Method: Grab

Lab Sample ID #: 1103321-02

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 09:55

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	29400	mg/L	2000		B114131	04/01/11	300.0	AK	
Nitrate as N *	10.3	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	1900	mg/L	50.0		B114131	04/01/11	300.0	AK	
Specific conductance *	80600	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	7.08	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	11	°F	1.0		B114036	03/25/11	170.1	AK	H

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX

Project Number: ASF09-192-01  
Project Manager: Rick Klar

Reported:  
04/01/11 15:50  
Received:  
03/25/11 10:50

**Report No. 1103321**

Sample ID #: DRAFT: B-6

Sampling Method: Grab

Lab Sample ID #: 1103321-03

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 10:20

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	17600	mg/L	1000		B114131	04/01/11	300.0	AK	
Nitrate as N *	3.35	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	2520	mg/L	500		B114131	04/01/11	300.0	AK	
Specific conductance *	55100	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	7.02	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	11	°F	1.0		B114036	03/25/11	170.1	AK	H

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX

Project Number: ASF09-192-01

Project Manager: Rick Klar

Reported:

04/01/11 15:50

Received:

03/25/11 10:50

Report No. 1103321

Sample ID #: DRAFT: B-10

Sampling Method: Grab

Lab Sample ID #: 1103321-04

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 10:10

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	30800	mg/L	1000		B114131	04/01/11	300.0	AK	
Nitrate as N *	11.1	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	1250	mg/L	500		B114131	04/01/11	300.0	AK	
Specific conductance *	76500	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	7.21	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	11	°F	1.0		B114036	03/25/11	170.1	AK	H

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo. Webb Co., TX

Project Number: ASF09-192-01  
Project Manager: Rick Klar

**Reported:**  
04/01/11 15:50  
**Received:**  
03/25/11 10:50

**Report No. 1103321**

Sample ID #: DRAFT: B-11

Sampling Method: Grab

Lab Sample ID #: 1103321-05

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 10:25

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	12000	mg/L	1000		B114131	04/01/11	300.0	AK	
Nitrate as N *	16.7	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	1860	mg/L	500		B114131	04/01/11	300.0	AK	
Specific conductance *	54800	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	7.00	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	11	°F	1.0		B114036	03/25/11	170.1	AK	H

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX  
Project Number: ASF09-192-01  
Project Manager: Rick Klar

Reported:  
04/01/11 15:50  
Received:  
03/25/11 10:50

Report No. 1103321

Sample ID #: DRAFT: B-13

Sampling Method: Grab

Lab Sample ID #: 1103321-06

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 09:47

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	30800	mg/L	2000		B114131	04/01/11	300.0	AK	
Nitrate as N *	13.4	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	1650	mg/L	1000		B114131	04/01/11	300.0	AK	
Specific conductance *	81400	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	6.98	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	10	°F	1.0		B114036	03/25/11	170.1	AK	H



Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX

Project Number: ASF09-192-01  
Project Manager: Rick Klar

Reported:  
04/01/11 15:50

Received:  
03/25/11 10:50

Report No. 1103321

Sample ID #: DRAFT: B-18

Sampling Method: Grab

Lab Sample ID #: 1103321-07

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 09:25

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	31000	mg/L	2000		B114131	04/01/11	300.0	AK	
Nitrate as N *	11.4	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	1660	mg/L	1000		B114131	04/01/11	300.0	AK	
Specific conductance *	84000	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	7.16	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	9.6	°F	1.0		B114036	03/25/11	170.1	AK	H

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX

Project Number: ASF09-192-01

Project Manager: Rick Klar

**Reported:**

04/01/11 15:50

**Received:**

03/25/11 10:50

**Report No. 1103321**

Sample ID #: DRAFT: B-24

Sampling Method: Grab

Lab Sample ID #: 1103321-08

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 09:17

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	14600	mg/L	1000		B114131	04/01/11	300.0	AK	
Nitrate as N *	15.7	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	1100	mg/L	500		B114131	04/01/11	300.0	AK	
Specific conductance *	54600	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	6.91	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	9.9	°F	1.0		B114036	03/25/11	170.1	AK	H

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX  
Project Number: ASF09-192-01  
Project Manager: Rick Klar

**Reported:**  
04/01/11 15:50  
**Received:**  
03/25/11 10:50

**Report No. 1103321**

Sample ID #: DRAFT: B-26

Sampling Method: Grab

Lab Sample ID #: 1103321-09

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 09:06

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	29300	mg/L	1000		B114131	04/01/11	300.0	AK	
Nitrate as N *	10.8	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	1320	mg/L	500		B114131	04/01/11	300.0	AK	
Specific conductance *	84100	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	7.14	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	9.2	°F	1.0		B114036	03/25/11	170.1	AK	H

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX

Project Number: ASF09-192-01

Project Manager: Rick Klar

**Reported:**  
04/01/11 15:50  
**Received:**  
03/25/11 10:50

**Report No. 1103321**

Sample ID #: DRAFT: B-27

Sampling Method: Grab

Lab Sample ID #: 1103321-10

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 08:55

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	27700	mg/L	1000		B114131	04/01/11	300.0	AK	
Nitrate as N *	7.63	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	1330	mg/L	500		B114131	04/01/11	300.0	AK	
Specific conductance *	70700	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	7.08	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	8.8	°F	1.0		B114036	03/25/11	170.1	AK	H

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX  
Project Number: ASF09-192-01  
Project Manager: Rick Klar

**Reported:**  
04/01/11 15:50  
**Received:**  
03/25/11 10:50

**Report No. 1103321**

**Sample ID #: DRAFT: T-1 (Burrito Tank)**

**Sampling Method: Grab**

**Lab Sample ID #: 1103321-11**

**Sample Matrix: Liquid**

**Date/Time Collected: 03/24/11 09:32**

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	<0.100	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	271	mg/L	10.0		B114131	04/01/11	300.0	AK	
Nitrate as N *	<0.50	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	11.0	mg/L	0.50		B114004	03/26/11	300.0	AK	
Specific conductance *	1520	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	7.28	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	9.8	°F	1.0		B114036	03/25/11	170.1	AK	H

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX

Project Number: ASF09-192-01

Project Manager: Rick Klar

Reported:

04/01/11 15:50

Received:

03/25/11 10:50

**Report No. 1103321**

Sample ID #: DRAFT: T-2

Sampling Method: Grab

Lab Sample ID #: 1103321-12

Sample Matrix: Liquid

Date/Time Collected: 03/24/11 09:39

Analyte	Result	Units	PQL	Prep Method	Batch	Analyzed	Method	Analyst	Notes
<b>DRAFT: General Chemistry</b>									
Fluoride *	0.387	mg/L	0.100		B114004	03/26/11	300.0	AK	
Chloride *	82.2	mg/L	10.0		B114131	04/01/11	300.0	AK	
Nitrate as N *	<0.50	mg/L	0.50		B114004	03/26/11	300.0	AK	
Sulfate *	13.7	mg/L	0.50		B114004	03/26/11	300.0	AK	
Specific conductance *	1040	umhos/cm	1.00		B114037	03/25/11	SM2510B	AK	
pH *	8.02	pH Units	0.05		B114036	03/25/11	SM4500HB	AK	H
Temperature	11	°F	1.0		B114036	03/25/11	170.1	AK	H



Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX  
Project Number: ASF09-192-01  
Project Manager: Rick Klar

Reported:  
04/01/11 15:50  
Received:  
03/25/11 10:50

Report No. 1103321

**DRAFT: General Chemistry - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch B114004 - NO PREP</b>									
<b>DRAFT: Blank (B114004-BLK1)</b> Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25									
Fluoride	<0.100	0.100	mg/L						
Nitrate as N	<0.50	0.50	mg/L						
Sulfate	<0.50	0.50	mg/L						
<b>DRAFT: Blank (B114004-BLK2)</b> Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25									
Fluoride	<0.100	0.100	mg/L						
Nitrate as N	<0.50	0.50	mg/L						
Sulfate	<0.50	0.50	mg/L						
<b>DRAFT: Blank (B114004-BLK3)</b> Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25									
Fluoride	<0.100	0.100	mg/L						
Nitrate as N	<0.50	0.50	mg/L						
Sulfate	<0.50	0.50	mg/L						
<b>DRAFT: LCS (B114004-BS1)</b> Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25									
Fluoride	0.921	0.100	mg/L	1.00		92	90-110		
Nitrate as N	4.81	0.50	mg/L	5.00		96	90-110		
Sulfate	5.22	0.50	mg/L	5.00		104	90-110		
<b>DRAFT: LCS (B114004-BS2)</b> Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25									
Fluoride	0.992	0.100	mg/L	1.00		99	90-110		
Nitrate as N	4.95	0.50	mg/L	5.00		99	90-110		
Sulfate	5.38	0.50	mg/L	5.00		108	90-110		
<b>DRAFT: LCS (B114004-BS3)</b> Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25									
Fluoride	0.957	0.100	mg/L	1.00		96	90-110		
Nitrate as N	4.68	0.50	mg/L	5.00		94	90-110		
Sulfate	5.16	0.50	mg/L	5.00		103	90-110		CCVL
<b>DRAFT: LCS Dup (B114004-BSD1)</b> Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25									
Fluoride	0.915	0.100	mg/L	1.00		92	90-110	0.7	20
Nitrate as N	4.78	0.50	mg/L	5.00		96	90-110	0.6	20
Sulfate	5.21	0.50	mg/L	5.00		104	90-110	0.2	20
<b>DRAFT: LCS Dup (B114004-BSD2)</b> Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25									
Fluoride	0.986	0.100	mg/L	1.00		99	90-110	0.6	20
Nitrate as N	5.02	0.50	mg/L	5.00		100	90-110	1	20
Sulfate	5.36	0.50	mg/L	5.00		107	90-110	0.4	20
<b>DRAFT: LCS Dup (B114004-BSD3)</b> Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25									

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX

Project Number: ASF09-192-01  
Project Manager: Rick Klar

Reported:  
04/01/11 15:50  
Received:  
03/25/11 10:50

Report No. 1103321

**DRAFT: General Chemistry - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch B114004 - NO PREP</b>									
<b>DRAFT: LCS Dup (B114004-BSD3)</b>					Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25				
Fluoride	0.933	0.100	mg/L	1.00		93	90-110	3	20
Nitrate as N	4.62	0.50	mg/L	5.00		92	90-110	1	20
Sulfate	4.96	0.50	mg/L	5.00		99	90-110	4	20
<b>DRAFT: Duplicate (B114004-DUP2)</b>					Source: 1103321-04 Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25				
Fluoride	<0.100	0.100	mg/L	<0.100					20
Nitrate as N	12.0	0.50	mg/L	11.1				8	20
<b>DRAFT: Duplicate (B114004-DUP3)</b>					Source: 1103321-10 Prepared: 03/25/11 09:53 Analyzed: 03/26/11 02:25				
Fluoride	<0.100	0.100	mg/L	<0.100					20
Nitrate as N	7.85	0.50	mg/L	7.63				3	20
<b>Batch B114036 - NO PREP</b>									
<b>DRAFT: LCS (B114036-BS1)</b>					Prepared: 03/25/11 14:20 Analyzed: 03/25/11 14:20				
pH	4.06	0.05	pH Units	4.00		102	80-120		
<b>DRAFT: LCS (B114036-BS2)</b>					Prepared: 03/25/11 14:20 Analyzed: 03/25/11 14:20				
pH	4.09	0.05	pH Units	4.00		102	80-120		
<b>DRAFT: Duplicate (B114036-DUP1)</b>					Source: 1103321-01 Prepared: 03/25/11 14:20 Analyzed: 03/25/11 14:20				
pH	7.43	0.05	pH Units	7.37				0.8	20
Temperature	12.0	1.0	°F	12.1				0.8	30
<b>DRAFT: Duplicate (B114036-DUP2)</b>					Source: 1103321-11 Prepared: 03/25/11 14:20 Analyzed: 03/25/11 14:20				
pH	7.30	0.05	pH Units	7.28				0.3	20
Temperature	9.70	1.0	°F	9.80				1	30
<b>Batch B114037 - NO PREP</b>									
<b>DRAFT: LCS (B114037-BS1)</b>					Prepared: 03/25/11 14:20 Analyzed: 03/25/11 14:20				
Specific conductance	993	1.00	umhos/cm	1000		99	80-120		
<b>DRAFT: LCS (B114037-BS2)</b>					Prepared: 03/25/11 14:20 Analyzed: 03/25/11 14:20				
Specific conductance	997	1.00	umhos/cm	1000		100	80-120		
<b>DRAFT: Duplicate (B114037-DUP1)</b>					Source: 1103321-01 Prepared: 03/25/11 14:20 Analyzed: 03/25/11 14:20				
Specific conductance	82800	1.00	umhos/cm	82400				0.5	20
<b>DRAFT: Duplicate (B114037-DUP2)</b>					Source: 1103321-11 Prepared: 03/25/11 14:20 Analyzed: 03/25/11 14:20				
Specific conductance	1520	1.00	umhos/cm	1520				0.3	20

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo. Webb Co., TX  
Project Number: ASF09-192-01  
Project Manager: Rick Klar

**Reported:**  
04/01/11 15:50  
**Received:**  
03/25/11 10:50

**Report No. 1103321**

**DRAFT: General Chemistry - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch B114131 - NO PREP</b>									
<b>DRAFT: Blank (B114131-BLK1)</b>					Prepared: 03/31/11 15:14 Analyzed: 04/01/11 01:40				
Chloride	<1.00	1.00	mg/L						
Sulfate	<0.50	0.50	mg/L						
<b>DRAFT: Blank (B114131-BLK2)</b>					Prepared: 03/31/11 15:14 Analyzed: 04/01/11 01:40				
Chloride	<1.00	1.00	mg/L						
Sulfate	<0.50	0.50	mg/L						
<b>DRAFT: LCS (B114131-BS1)</b>					Prepared: 03/31/11 15:14 Analyzed: 04/01/11 01:40				
Chloride	5.19	1.00	mg/L	5.00		104	90-110		
Sulf	5.36	0.50	mg/L	5.00		107	90-110		
<b>DRAFT: LCS (B114131-BS2)</b>					Prepared: 03/31/11 15:14 Analyzed: 04/01/11 01:40				
Chloride	4.97	1.00	mg/L	5.00		99	90-110		
Sulfate	5.12	0.50	mg/L	5.00		102	90-110		
<b>DRAFT: LCS Dup (B114131-BSD1)</b>					Prepared: 03/31/11 15:14 Analyzed: 04/01/11 01:40				
Chloride	5.21	1.00	mg/L	5.00		104	90-110	0.4	20
Sulfate	5.30	0.50	mg/L	5.00		106	90-110	1	20
<b>DRAFT: LCS Dup (B114131-BSD2)</b>					Prepared: 03/31/11 15:14 Analyzed: 04/01/11 01:40				
Chloride	5.02	1.00	mg/L	5.00		100	90-110	1	20
Sulfate	5.13	0.50	mg/L	5.00		103	90-110	0.2	20
<b>DRAFT: Duplicate (B114131-DUP1)</b>					Source: 1103321-08		Prepared: 03/31/11 15:14 Analyzed: 04/01/11 01:40		
Chloride	13900	1000	mg/L		14600			5	20
Sulfate	1030	500	mg/L		1100			7	20
<b>DRAFT: Duplicate (B114131-DUP2)</b>					Source: 1103321-12		Prepared: 03/31/11 15:14 Analyzed: 04/01/11 01:40		
Chloride	91.3	10.0	mg/L		82.2			10	20
Sulfate	13.6	5.00	mg/L		12.7			7	20

**Definitions and Notes**

All quality control samples and checks are within acceptance limits unless otherwise indicated.  
Test results pertain only to those items tested.  
All samples were in good condition when received by the laboratory unless otherwise noted.

Cert. No. T104704360-10-2

Raba-Kistner Consultants, Inc.  
12821 W. Golden Lane  
San Antonio TX, 78249

Project: Rancho Viejo, Webb Co., TX

Project Number: ASF09-192-01  
Project Manager: Rick Klar

**Reported:**  
04/01/11 15:50  
**Received:**  
03/25/11 10:50

**Report No. 1103321**

H pH and temperature are field tests and should be analyzed within 15 minutes. Due to transportation, hold time has been exceeded.

CCVL CCV recovery is outside QC limits, the results may have a slight low bias.

PQL Practical Quantitation Limit

mg/Kg Milligrams per Kilogram (Parts per Million)

mg/L Milligrams per Liter (Parts per Million)

PPM Parts per Million

\* NELAC accredited analyte

RMCLL Recommended Maximum Concentration of Contaminants Level

Test Methods Standard Methods for the Examination of Water and Wastewater, 20th Edition 1998  
Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, Rev. March 1983  
EPA SW Test Methods for the Examination of Solid Waste, SW-846, 1996

DRAFT REPORT, DATA SUBJECT TO CHANGE For

*The results in this report apply to the sample analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



Richard Hawk, General Manager

REPORT TO: **Raba-Kistner** COMPANY: **TRC Environmental Corp.**

INVOICE TO:

P.O. #

COMPANY: **Raba-Kistner** ADDRESS: **505 E. Hurland Dr. Suite 250** CITY: **Austin** STATE: **TX** ZIP: **78752**  
 CITY: **San Antonio** STATE: **TX** ZIP: **78249** ATTN: **Jim Meyers** PHONE: **(512) 684-3156** E-MAIL: **rklar@rki.com**  
 ATTN: **Rick Klat** PHONE: **(210) 619-9090** REQUESTED TURNAROUND TIME:  7-10 Business Days  2 Business Days  3-5 Business Days  SAME DAY WHEN POSSIBLE

PROJECT NAME/LOCATION/SITE: **Rancho Yiejo, Webb Co., TX**  
 PROJECT NO.: **ASF09-172-01**  
 TRRP 13 REQUEST:  YES  NO COMMENTS/SPECIAL REQUESTS: **\* Standard R-K 5-day TAT**

SAMPLE TEMPERATURE WITHIN COMPLIANCE (> 0°C ≤ 6°C)  YES  NO IF NO, SIGN HERE TO AUTHORIZE ANALYSIS  
 PROPER CONTAINERS:  YES  NO  
 TEMP ON RECP: **2.1°C** CONDENSE SAMPLE: **Feed**

DATE	TIME	MATRIX	SAMPLING METHOD	ANALYSIS REQUESTED
3-24	10:04	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)

DATE	TIME	MATRIX	SAMPLING METHOD	ANALYSIS REQUESTED	REMARKS
3-24	10:04	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	
3-24	9:55	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	
3-24	10:20	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	
3-24	10:10	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	
3-24	10:25	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	
3-24	9:47	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	
3-24	9:25	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	
3-24	9:17	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	
3-24	9:06	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	
3-24	8:55	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	

DATE	TIME	MATRIX	SAMPLING METHOD	ANALYSIS REQUESTED	REMARKS
3-24	9:32	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	
3-24	9:39	GCL		Fluoride (300.0) Nitrate (340.1) Sulfate (300.0) PH (SM-4500) Conductivity (SM-2510)	

RELINQUISHED BY (SIGNATURE): **M. Hawk** DATE/TIME: **3-25-11 10:50 AM**  
 RECEIVED BY (SIGNATURE): **M. Hawk**  
 RELINQUISHED BY (PRINT NAME): **M. Hawk** RECEIVED BY (PRINT NAME): **M. Hawk**  
 RELINQUISHED BY (SIGNATURE): **M. Hawk** DATE/TIME: **3-25-11 10:50 AM**  
 RECEIVED BY (SIGNATURE): **M. Hawk**  
 RELINQUISHED BY (PRINT NAME): **M. Hawk** RECEIVED BY (PRINT NAME): **M. Hawk**  
 RELINQUISHED BY (SIGNATURE): **M. Hawk** DATE/TIME: **3-25-11 10:50 AM**  
 RECEIVED BY (SIGNATURE): **M. Hawk**  
 RELINQUISHED BY (PRINT NAME): **M. Hawk** RECEIVED BY (PRINT NAME): **M. Hawk**

Sample Receipt Checklist

Client: Raba Report Number: 1103321  
 Project Name: Pancho Viejo, Webb Co., TX Date Received: 3/25/11  
 Shipped via:  FedEx  UPS  Lonestar  Hand Delivered  DHL  SATL  Other Date Due: 4/1/11  
 Rush:  Specify:  5  2  1

Items to be checked upon Receipt: [Yes, No, N/A]

1. Custody Seals present?	Yes	No	NA	If NA-reason:
2. Custody Seals intact?	Yes	No	NA	If NA-reason:
3. Air Bill included in folder, if received?	Yes	No	NA	If NA-reason:
4. Is COC included with samples?	Yes	No	NA	If NA-reason:
5. Is COC signed and dated by client?	Yes	No	NA	If NA-reason:
6. Sample temperature: Thermal preservation between >0°- 6° C? (Samples that are delivered to the laboratory on the same day that they are collected may not meet this criterion, but are acceptable if they arrive on ice.)	Yes	No	NA	Temp: <u>2.1</u> °C
7. Samples received with ice <input checked="" type="checkbox"/> ice packs <input type="checkbox"/> other cooling <input type="checkbox"/>	Yes	No	NA	If NA-reason:
8. Is the COC filled out correctly, and completely?	Yes	No	NA	If NA-reason:
9. Information on the COC matches the samples?	Yes	No	NA	If NA-reason:
10. Samples received within holding time?	Yes	No	NA	If NA-reason:
11. Samples properly labeled?	Yes	No	NA	If NA-reason:
12. Samples submitted with chemical preservation? (e.g. pH adjusted, or sodium thiosulfate added for microbiological tests)	Yes	No	NA	If NA-reason: <u>not needed</u>
13. Proper sample containers used?	Yes	No	NA	If NA-reason:
14. All samples received intact, containers not damaged or leaking?	Yes	No	NA	If NA-reason:
15. VOA vials (requesting BTEX/VOC analysis) received with no air bubbles? Bubbles acceptable on VOA vials for TPH.	Yes	No	NA	If NA-reason: <u>no VOA vials</u>
16. Sample volume sufficient for requested analysis?	Yes	No	NA	If NA-reason:
17. Subcontracted Samples: [if Yes, complete the next section]	Yes	No	NA	If NA-reason:

Analyses Subcontracted Out: \_\_\_\_\_ No. of Samples \_\_\_\_\_  
 Samples sent to: \_\_\_\_\_ Sent By: \_\_\_\_\_  
 Date samples sent: \_\_\_\_\_ Samples shipped via: \_\_\_\_\_  
 TAT Requested: \_\_\_\_\_  
 Tracking number [if any]: \_\_\_\_\_

Comments:

\_\_\_\_\_  
 \_\_\_\_\_

Received By: mtt Date: 3/25/11  
 Labeled By: [Signature] Date: \_\_\_\_\_  
 Logged into LIMS By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Logged into RF By: [Signature] Date: \_\_\_\_\_