Central Valley Dairy Representative Monitoring Program

2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

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March 27, 2015

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LSCE File No. 13-7-099

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1. Introduction and Purpose

This Workplan has been prepared for the Central Valley Dairy Representative Monitoring Program (CVDRMP), the administrative body managing the Representative Monitoring Program (RMP). The RMP undergoes continuous assessment as part of the data analysis and interpretation process and annually as part of the external review provided by the Groundwater Technical Advisory Committee and the Multidisciplinary Advisory Committee to identify critical data gaps (LSCE, 2012a). This document reports on the results of the work proposed in the *2014 Lagoon Perimeter Subsurface Hydrologic Investigation Workplan* (LSCE, 2014c), which focused on lagoons at twelve dairies in the Central Area (**Table 1** and **Figure 1**). Specifically, the investigations focused on lagoons at twelve Phase 1 dairies[1] where lagoon seepage was either not evident or inconclusive based on groundwater testing conducted in 2012 and 2013 (LSCE, 2014a). The purpose of this data collection effort was to develop a more comprehensive data set that provides additional insight into shallow groundwater quality near lagoons.

Table 1: Field testing sites – 2014 lagoon perimeter subsurface hydrogeologic investigation

Dairy	County	Location	Soil Cores	Groundwater Samples
ANC	Merced	Stevinson	6	6
BET	Merced	Hilmar	6	6
FG1	Merced	Stevinson	5	5
COT	Merced	Atwater	4	4
SAN	Merced	Atwater	3	3
PLS	Merced	Hilmar	2	2
ANT	Stanislaus	Newman	3	2
COR	Merced	Gustine	4	4
FG2	Merced	Gustine	5	5
GOD	Merced	Los Banos	6	5
MAC	Merced	Los Banos	5	5
NUN	Merced	Los Banos	4	4

[1] Phase 1 RMP dairies are those where groundwater data collection efforts commenced in January 2012.

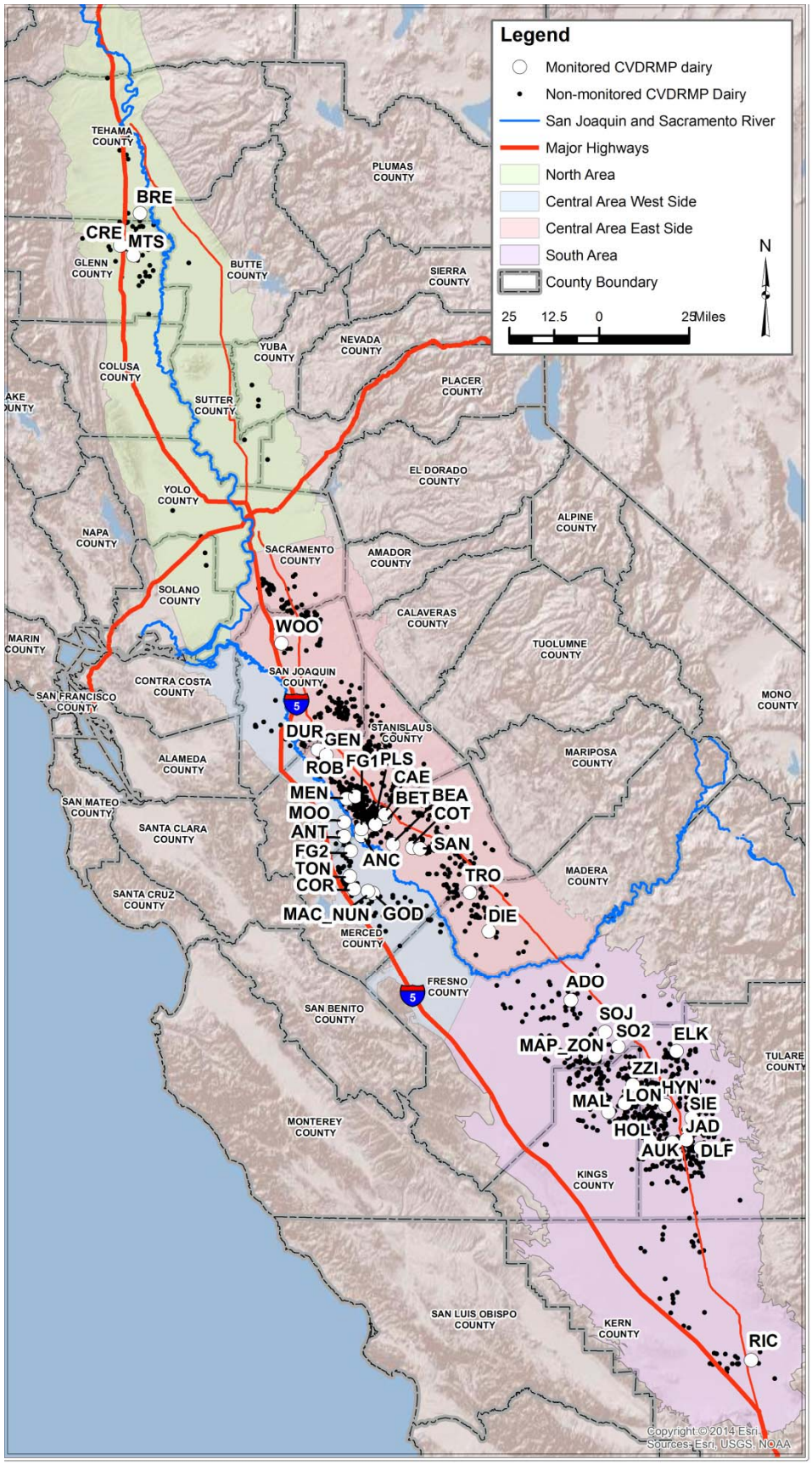

Figure 1: Location Map of Monitored CVDRMP Dairies.

2. Methods

The investigated lagoons do not have construction information available and many were likely built to minimal construction standards. The lagoons represent a wide range of ages (1960s to mid-2000s) and were constructed both in areas of highly permeable, sandy soils and in areas of clay-rich soils. Earthen lagoon depths range from 8 to 25 feet (**Table 2**).

Table 2: Lagoon Information

ID	Soil Type with Clay Content at Lagoon Sites[1]	Construction Year	Earthen Lagoon Depth (feet)
ANC	loamy sand 0-15	1993	13
BET	sand 0-15	2000	14
FG1	loam 8-20	1979	14
COT	sand 0-5	1980s	10
SAN	loam 10-35; loamy sand 0-15	2001	25
PLS	sandy loam 7-18	1960s	15
ANT	loam 18-30	~2002	15
COR	loam 18-50; clay 30-50	2001	9
FG2	clay loam 27-50	2002	11
GOD	loam 18-35	2005	13
MAC	clay loam 18-45; silty clay 30-65	1979	17
NUN	silty clay 30-65	1986	8

[1]From NRCS SSURGO database.

Two to six boreholes were advanced along the perimeter of twelve lagoons for a total of 53 boreholes. Drilling services were provided by EnProbe (C-57 license 777007; Oroville, CA - http://enprobedirectpush.com/) using 5410, 6600, and 7822DT rigs and GeoProbe™ direct push dual-tube technology with a borehole diameter of 2.25 inches. Continuous soil cores (1.25-inch diameter) were retrieved in plastic (butyrate) single-use tubes. Tubes were double-cut lengthwise to expose the soil core for examination. Earthen materials were described and logged in the field by California licensed professional geologists experienced in water well and environmental drilling, testing, and construction. The description of the samples followed the American Society for Testing and Materials (ASTM) Unified Soil Classification System (USCS). Representative material samples were collected and archived.

The boreholes were abandoned in accordance with County requirements and in the presence, or under the direction of, a County inspector. The boreholes were backfilled using Portland cement based grout. PVC tremie pipe was installed in the borehole with its opening near the bottom of the borehole. Cement grout was then mixed and poured into the tremie until the cement grout approached ground surface. The lower end of the tremie remained immersed in fresh grout so that the rising grout from the bottom displaced groundwater in the borehole without washing out or diluting the grout. The tremie was then removed and additional grout was poured from the surface to bring it to ground surface.

Groundwater samples were retrieved from the uppermost few inches or feet of first-encountered groundwater. This is the saturated zone nearest to the bottom of the ponds; therefore, groundwater chemical characteristics in the test holes are expected to more closely resemble

chemical characteristics of the lagoon liquor than groundwater samples retrieved from monitoring wells.

Samples were retrieved with the inertial pumping technique using HDPE tubing and foot valves. New materials were used for each sample. Field measurements of specific conductance (SC), pH, and temperature were obtained. Chemical analyses were provided by BC Laboratories, Inc. (ELAP certificate # 1186; Bakersfield, CA - http://www.bclabs.com/) (**Table 3**).

Table 3: Laboratory analytical methods and reporting limits for groundwater samples[1]

Constituent	Analytical Method[2]	Reporting Limit (mg/L)
Sodium	EPA 200.7	1.0
Potassium	EPA 200.7	1.0
Magnesium	EPA 200.7	1.0
Calcium	EPA 200.7	1.0
Chloride	EPA 300.0	0.5
Sulfate	EPA 300.0	1.0
Bicarbonate (as CaCO3)	SM2310B	5.0
Carbonate (as CaCO3)	SM2310B	5.0
Hydroxide (as CaCO3)	SM2310B	5.0
Phosphate (as PO4)	EPA 365.4	0.15
Total Dissolved Solids	SM2540C	10
Nitrate-N	EPA 300.0	0.5
Nitrite-N	EPA 353.2	0.4
Ammoniacal-N	EPA 350.1	0.1
Total Kjeldahl Nitrogen-N	EPA 351.2	0.2

[1]Alkalinity, TKN, and phosphate were analyzed from the unfiltered sample. Other constituents were analyzed from the filtered sample. [2]Or equivalent method.

Groundwater quality samples were collected in laboratory-supplied bottles without preservative according to laboratory instructions. Bottles were labeled with laboratory-supplied labels, immediately placed on ice, and kept in a dark ice chest (at 4 °C) until received by the laboratory. Sample pick-up was coordinated between the field technicians and the laboratory's courier service under observance of applicable holding times.

A chain-of-custody (COC) form was used to record sample identification numbers, type of samples (matrix), date and time of collection, and the analytical tests requested. In addition, times, dates, and individuals who had possession of the samples were documented to record sample custody.

3. Results

A total of 53 test holes were advanced between October 16 and 30, 2014. A minimum of three holes were drilled per dairy with the exception of PLS, where underground utilities were encountered and, as a result, only two holes were drilled. The total depths of the test holes were consistent with the preliminary target depths (LSCE, 2014c) (**Table 4**). The locations of the test

holes are shown on individual site maps together with select laboratory analytical results for the GeoProbe samples (i.e., total dissolved solids, nitrate-N, nitrite-N, ammoniacal-N, and total Kjeldahl-N) (**Attachment A**). Lithologic log plots developed from the continuous soil cores are provided in **Attachment B**. Test hole groundwater quality information is summarized in **Attachment C** and results from the on-site monitoring wells are tabulated in **Attachment D**. Laboratory reports for the test hole samples are provided in **Attachment E**.

Table 4: Preliminary target depth (PTD) and actual depth of soil borings in feet below ground surface

Dairy	ANC	BET	FG1	COT	SAN	PLS	ANT	COR	FG2	GOD	MAC	NUN
PTD	25	25	20	30	40	15	20	15	15	15	15	15
SB1	28	24	20	36	48	16	36	16	20	35	24	20
SB2	28	24	20	36	44	16	36	16	20	32	16	20
SB3	28	24	20	40	40		40*	16	24	24	25	20
SB4	28	24	20	40				16	28	24	20	20
SB5	28	23	20						32	24	20	
SB6	28	24								27*		

* No groundwater sample collected.

ANC

At this facility, six soil borings were advanced and six groundwater samples were retrieved. All soil borings were advanced on the downgradient edge of the lagoon or between the lagoons.

1. Ammoniacal N concentrations ranged from 1.0 to 160 mg/L.
2. TKN concentrations ranged from 4.6 to 190 mg/L.
3. Nitrite-N concentrations were nondetect or near the reporting limit.
4. Nitrate-N concentrations ranged from 0.57 to 17 mg/L.
5. K concentrations ranged from 9.4 to 200 mg/L.
6. HCO_3 concentrations ranged from 560 to 2,200 mg/L.
7. PO_4 concentrations ranged from 51 to 87 mg/L.

Groundwater chemistry at all six soil borings is indicative of lagoon seepage. Soil boring SB5, which is centrally located and near MW1, exhibits the least indication of seepage. Its water chemistry is very similar to that at MW1, but with slightly higher salinity and slightly elevated levels of TKN (and organic N), K, HCO_3, and significantly higher PO_4. For comparison, groundwater chemistry at MW1 and the other lagoon wells (i.e., MW2 and MW4) is not indicative of lagoon seepage.

Nitrogen in the groundwater samples retrieved from the soil borings exists predominantly in the form of ammoniacal N and organic nitrogen. In contrast, these constituents have been found below or near their detection limits in groundwater samples retrieved from the lagoon monitoring wells. This indicates essentially complete oxidation of the reduced nitrogen forms within a few feet from the bottom of the ponds. Furthermore, TKN concentrations from the soil boring samples are more than twice as high compared to the lagoon monitoring well samples. TDS and several individual constituents show similar concentration decreases. For example, K

concentrations are less than 10 mg/L in the monitoring wells, while they are up to 200 mg/L in the groundwater samples from the bore holes.

These stark concentration decreases and changing redox conditions indicate substantial moderation of impacts to groundwater within the immediate proximity of this pond. The extreme constituent variability among Geoprobe groundwater results demonstrates the randomness of a small sample size and demonstrates that groundwater constituent concentrations do not correlate to the rate of subsurface mass emissions from a lagoon. Similar variability is observed in groundwater quality observations in the monitoring wells.

BET

At this facility, six soil borings were advanced and six groundwater samples were retrieved. Groundwater flow directions have been nonsteady in the vicinity of the lagoon since monitoring started in January 2012 such that none of the soil borings can be considered to be in a solely downgradient location. However, two of the soil borings (i.e., SB5 and SB6) were advanced between the lagoon and the settling basin.

1. Ammoniacal N concentrations ranged from 0.12 to 5.4 mg/L.
2. TKN concentrations ranged from 0.59 to 8.4 mg/L.
3. Nitrite-N concentrations ranged from 0.057 to 0.37 mg/L.
4. Nitrate-N concentrations ranged from 12 to 38 mg/L.
5. K concentrations ranged from 3.5 to 15 mg/L.
6. HCO_3 concentrations ranged from 93 to 1,200 mg/L.
7. TDS concentrations ranged from 390 to 1,600 mg/L.

Groundwater chemistry at SB1, 3, 4, and 5 does not exhibit typical characteristics of lagoon seepage. However, the occurrence of low but persistent nitrite-N concentrations in comparison to those at the eight monitoring wells at this dairy (i.e., generally below the reporting limit) may provide an indication of lagoon seepage. Nitrate-N concentrations from the Geoprobe investigation are within the range of observed values from monitoring wells across the dairy. It is possible that ammoniacal N is rapidly oxidized to nitrate-N in the coarse-textured subsurface.

Groundwater chemistry at SB2 (i.e., mainly the moderately elevated ammoniacal N and TKN concentrations) is indicative of lagoon seepage. SB2 also exhibits moderately elevated K and HCO_3 concentrations (i.e., 15 and 780 mg/L, respectively). However, K concentrations of equal or greater magnitude (up to 270 mg/L at MW4) have also been observed at all but one of the eight monitoring wells at this dairy. At SB6, indications for lagoon seepage are limited to an elevated HCO_3 concentration (1,200 mg/L) and slightly elevated TKN (4.6 mg/L).

Groundwater chemistry at the soil borings nearest to MW1 (i.e., SB3 and SB4) is very similar to MW1. For comparison, groundwater chemistry at MW1 does not exhibit typical indications of lagoon seepage. However, it is possible that ammoniacal N is rapidly oxidized to nitrate-N in the coarse-textured subsurface.

ANT

At this facility, three soil borings were advanced and two groundwater samples were retrieved.

1. Ammoniacal N concentrations ranged from 2.2 to 3.2 mg/L.
2. TKN concentrations ranged from 3.3 to 5.2 mg/L.
3. Nitrite-N concentrations were below the reporting limit.
4. Nitrate-N concentrations ranged from 17 to 25 mg/L.
5. K concentrations ranged from 13 to 21 mg/L.
6. HCO_3 concentrations ranged from 480 to 670 mg/L.

Although soil borings were advanced between the lagoon and settling basin, the groundwater chemistry does not exhibit strong indications of lagoon seepage; TKN and ammoniacal N concentrations were only slightly elevated over those encountered at the monitoring wells at this site. For comparison, groundwater chemistry at MW1 is not indicative of lagoon seepage. However, due to its up- to crossgradient position to the lagoon, this well may not be favorably located for purposes of lagoon seepage detection.

COR

At this facility, four soil borings were advanced and four groundwater samples were retrieved.

1. Ammoniacal N concentrations ranged from below the reporting limit to 0.47 mg/L.
2. TKN concentrations ranged from 1.3 to 5.5 mg/L.
3. Nitrite-N concentrations ranged from nondetect to 0.24 mg/L.
4. Nitrate-N concentrations ranged from 0.82 to 97 mg/L.
5. K concentrations ranged from 5.0 to 65 mg/L.
6. HCO_3 concentrations ranged from 490 to 1,600 mg/L.

Overall, these results are indicative of lagoon seepage. This includes slightly elevated TKN and organic nitrogen concentrations in all soil borings, high K concentrations at SB 3 and SB4 (60 and 65 mg/L, respectively), and high salinity (TDS=4,200 mg/L) and HCO_3 concentrations (1,600 mg/L) at SB3, compared to monitoring well data.

SB4 was advanced next to MW1, yet, groundwater quality was significantly different. For example, nitrate-N concentrations were 97 mg/L at SB4 whereas they never exceeded 2.7 mg/L at MW1. Similarly, TKN and K concentrations were 5.5 and 65 mg/L at SB4 vs. 0.60-0.82 and 2.7-3.0 mg/L at MW1, respectively.

The groundwater chemistry at SB1 and SB2 does not exhibit strong indications of lagoon seepage. At SB1, the only indication is an elevated HCO_3 concentration (1,100 mg/L), and SB2 exhibits a somewhat elevated K concentration (16 mg/L).

At MW1, ammoniacal N was essentially absent and TKN concentrations were low. Only the presence of organic N in conjunction with elevated salinity, including Na, Cl, and HCO_3, suggests that groundwater at this location is impacted by lagoon seepage.

COT

At this facility, four soil borings were advanced and four groundwater samples were retrieved.

1. Ammoniacal N concentrations ranged from near the reporting limit to 58 mg/L.

2. TKN concentrations ranged from near the reporting limit to 59 mg/L.
3. Nitrite-N concentrations ranged from nondetect to 0.38 mg/L.
4. Nitrate-N concentrations ranged from below the reporting limit to 87 mg/L.
5. K concentrations ranged from 30 to 74 mg/L.
6. HCO_3 concentrations ranged from 380 to 840 mg/L.

Groundwater chemistry at SB3 and SB4 is indicative of lagoon seepage although they are located on the upgradient edge of the lagoon. Groundwater chemistry at the downgradient soil borings SB1 and SB2 does not exhibit typical indications of lagoon seepage, with the exception of elevated K concentrations (38 and 30 mg/L, respectively) and a slightly elevated PO_4 concentration at SB1 (9.0 mg/L). SB1 was advanced next to MW11, and the water quality was very similar.

FG1

At this facility, five soil borings were advanced and five groundwater samples were retrieved.

1. Ammoniacal N concentrations ranged from near the reporting limit to 70 mg/L.
2. TKN concentrations ranged from near the reporting limit to 73 mg/L.
3. Nitrite-N concentrations were below or near the reporting limit.
4. Nitrate-N concentrations ranged from nondetect to 43 mg/L.
5. K concentrations ranged from 5.3 to 330 mg/L.
6. HCO_3 concentrations ranged from 470 to 1,200 mg/L.

The groundwater chemistry at SB4 and SB5 is indicative of lagoon seepage. Groundwater chemistry at the other three soil borings does not exhibit typical indications of lagoon seepage (except possibly PO_4 concentration of 33 mg/L at SB1). For comparison, groundwater chemistry at MW1 does not exhibit typical indications of lagoon seepage. However, this well may not be favorably located for purposes of lagoon seepage detection.

FG2

At this facility, five soil borings were advanced and five groundwater samples were retrieved.

1. Ammoniacal N concentrations ranged from near the reporting limit to 4.5 mg/L.
2. TKN concentrations ranged from near the reporting limit to 7.9 mg/L.
3. Nitrite-N concentrations were below the reporting limit.
4. Nitrate-N concentrations ranged from 1.1 to 95 mg/L.
5. K concentrations ranged from 3.1 to 11 mg/L.
6. HCO_3 concentrations ranged from 290 to 1,300 mg/L.
7. TDS concentrations ranged from 1,700 to 8,000 mg/L.

Groundwater chemistry at three of the locations (SB3-SB5) does not exhibit typical indications of lagoon seepage although they were advanced along the downgradient edge of the lagoon. Indication for lagoon seepage at SB1 and SB2 is mainly limited to moderately elevated TKN and a high HCO_3 concentration (1,300 mg/L).

For comparison, groundwater chemistry at MW1 does not exhibit typical indications of lagoon seepage. However, this well may not be favorably located for purposes of lagoon seepage detection.

GOD

At this facility, six soil borings were advanced and five groundwater samples were retrieved (not at SB6).

1. Ammoniacal N concentrations ranged from near the reporting limit to 2.8 mg/L.
2. TKN concentrations ranged from 1.4 to 8.1 mg/L.
3. Nitrite-N concentrations were near the reporting limit.
4. Nitrate-N concentrations ranged from 57 to 110 mg/L.
5. K concentrations ranged from 2.9 to 47 mg/L.
6. HCO_3 concentrations ranged from 700 to 1,800 mg/L.
7. TDS concentrations ranged from 2,000 to 3,700 mg/L.

Overall, these results are indicative of lagoon seepage, although mainly at SB4 and SB5, which were advanced in between the lagoon and the settling basins. For comparison, groundwater chemistry at MW1 does not exhibit typical indications of lagoon seepage. However, this well may not be favorably located for purposes of lagoon seepage detection.

MAC

At this facility, five soil borings were advanced and five groundwater samples were retrieved.

1. Ammoniacal N concentrations ranged from below the reporting limit to 0.74 mg/L.
2. TKN concentrations ranged from 1.1 to 7.6 mg/L.
3. Nitrite-N concentrations were near the reporting limit.
4. Nitrate-N concentrations ranged from 2.4 to 21 mg/L.
5. K concentrations ranged from 3.1 to 160 mg/L.
6. HCO_3 concentrations ranged from 600 to 1,200 mg/L.
7. TDS concentrations ranged from 1,400 to 2,500 mg/L.

Groundwater chemistry at SB2 exhibits some characteristics that are typical of lagoon seepage (i.e., the highest TKN, K, and PO_4 concentrations). However, this soil boring was advanced at the most remote location to the lagoon, namely within the corrals (due to overhead wires, concrete slab, and other difficulties along the berm of the lagoon), and groundwater quality at S2 is likely not merely attributable to lagoon seepage but possibly more so to corral activities.

At SB3, the K concentration was much smaller (13 mg/L) and only a slightly elevated HCO_3 concentration (1,200 mg/L) may provide an indication for lagoon seepage (concentrations at monitoring wells across this dairy were as high as 940 mg/L). Groundwater chemistry at the other three soil boring locations was not indicative of lagoon seepage.

For comparison, groundwater chemistry at MW1 and MW2 is also not indicative of lagoon seepage.

NUN

At this facility, four soil borings were advanced and four groundwater samples were retrieved.

1. Ammoniacal N concentrations ranged from 1.2 to 19 mg/L.
2. TKN concentrations ranged from 2.9 to 20 mg/L.
3. Nitrite-N concentrations were below or near the reporting limit.
4. Nitrate-N concentrations ranged from 12 to 550 mg/L.
5. K concentrations ranged from 8.6 to 40 mg/L.
6. HCO_3 concentrations ranged from 380 to 930 mg/L.
7. TDS concentrations ranged from 5,400 to 16,000 mg/L.

Overall, these results are indicative of lagoon seepage, although mainly at SB3 and SB4, which were advanced on the upgradient side of the lagoon. Local groundwater mounding provides a mechanism for affecting groundwater quality at these locations. Groundwater mounding is conceivable at this location, even if lagoon seepage is minimal, due to shallow groundwater conditions and clay-rich subsurface materials (i.e., small hydraulic conductivity).

For comparison, groundwater chemistry at MW1 is not indicative of lagoon seepage. However, due to its crossgradient position to the lagoon, this well may not be favorably located for purposes of lagoon seepage detection.

PLS

At this facility, two soil borings were advanced and two groundwater samples were retrieved. Soil borings were also planned on the south side of the lagoon but could not be advanced due to subsurface infrastructure.

1. Ammoniacal N concentrations ranged from 0.16 to 0.59 mg/L.
2. TKN concentrations ranged from 2.5 to 2.8 mg/L.
3. Nitrite-N concentrations ranged from 0.42 to 1.1 mg/L.
4. Nitrate-N concentrations ranged from 69 to 98 mg/L.
5. K concentrations ranged from 4.0 to 15 mg/L.
6. HCO_3 concentrations ranged from 600 to 660 mg/L.
7. TDS concentrations ranged from 1,700 to 1,800 mg/L.

Overall, these results do not exhibit typical indications of lagoon seepage, except possibly slightly elevated TKN concentrations. It is possible that ammoniacal N is rapidly oxidized to nitrate-N in the coarse-textured subsurface. Likewise, groundwater chemistry at MW1 and MW2 does not exhibit typical indications of lagoon seepage. These wells may not be favorably located for purposes of lagoon seepage detection.

SAN

At this facility, three soil borings were advanced and three groundwater samples were retrieved.

1. Ammoniacal N concentrations ranged from below the reporting limit to 0.63 mg/L.
2. TKN concentrations ranged from 1.3 to 1.4 mg/L.

3. Nitrite-N concentrations were near the reporting limit.
4. Nitrate-N concentrations ranged from 17 to 25 mg/L.
5. K concentrations ranged from 7.4 to 12 mg/L.
6. HCO_3 concentrations ranged from 890 to 1,300 mg/L.
7. TDS concentrations ranged from 1,100 to 1,600 mg/L.

Overall, these results do not exhibit typical indications of lagoon seepage, except possibly very slightly elevated TKN concentrations and moderately elevated HCO_3 concentrations. All soil borings were advanced directly downgradient of the lagoon; two of the borings were also located between the lagoon and the settling basins.

Groundwater chemistry at MW1 does not exhibit typical indications of lagoon seepage. MW1 is located upgradient of the lagoon.

4. Discussion

The lagoon subsurface hydrogeologic investigation produced strong evidence of lagoon seepage as indicated by high ammoniacal N and/or TKN concentrations at four of the twelve dairies. These were ANC, COT, FG1, and NUN. However, even at ANC, where the highest ammoniacal N and TKN concentrations were observed, concentrations ranged over several orders of magnitude, including a measurement of only 1.0 mg/L of ammoniacal N in a downgradient soil boring. None of the dedicated monitoring wells at ANC exhibits groundwater chemical characteristics that are indicative of lagoon seepage. This evidences substantial moderation of impacts to groundwater within the immediate proximity of the lagoon. At COT and NUN, chemical characteristics strongly indicative of lagoon seepage were only observed on one side of the investigated lagoons and, interestingly, on their upgradient side. Similarly, impacts to groundwater quality at FG1 appeared limited to one side of the lagoon.

The results from six dairy lagoons indicate lesser effects to groundwater quality both in terms of magnitude of concentrations and spatial distribution (BET, ANT, COR, FG2, GOD, MAC). In these cases, indicator constituents were only slightly or moderately elevated. Sometimes only one or two constituents were elevated (such as K, PO_4, or HCO_3) and/or only one or two of the soil borings produced groundwater samples indicative of lagoon seepage. In some cases, non-lagoon monitoring wells exhibit higher concentrations than the samples retrieved from the soil borings.

At two dairies, groundwater chemical characteristics were not typical of lagoon seepage. At SAN, this was despite the fact that all soil borings were advanced directly downgradient of the lagoon; two of the borings were also located between the lagoon and the settling basins. At PLS, soil borings could not be advanced along the side of the lagoon that is most consistently downgradient. However, testing at the other downgradient side (possibly crossgradient at times) yielded essentially no indication of seepage impacts.
The results of this investigation indicate that the effects of lagoon seepage on groundwater quality are minimal and remain localized in the immediate vicinity of the lagoons. The results also demonstrate that, for purposes of detecting whether lagoon seepage has had an effect on groundwater quality, groundwater monitoring wells are not an effective means of investigation. Years of groundwater monitoring yielded either inconclusive results or indicated no impact to

groundwater quality. In comparison, groundwater sampling from multiple temporary boreholes indicated that lagoon seepage in fact affected groundwater quality at ten of the twelve sites. Several apparent reasons for this phenomenon are discussed below.

Temporary boreholes provide data redundancy, i.e., data can be collected from multiple locations around a lagoon in a relatively short time frame. This tends to address the heterogeneous subsurface distribution of impacts to groundwater. This is not only affected by the heterogeneity of subsurface materials, but also by nonsteady groundwater flow directions and spatially nonuniform seepage. Temporary boreholes can also be advanced in locations where permanent structures are not desirable (e.g., unstable ground, high traffic areas, areas used for storage during part of the year, etc.). As a result, they can sometimes be drilled closer to the wetted perimeter of the lagoon than a monitoring well.

Temporary boreholes enable groundwater sample collection from the uppermost few inches or feet of the water table at any moment in time. This type of measurement approaches that of a point measurement in proximity to the source. Therefore, constituents percolating from the bottom of the lagoon are more likely to be detected in higher concentrations than in a monitoring well. The technical limitations of monitoring wells, particularly with respect to the assessment of lagoon seepage, were discussed in the Year 2 Annual Report (LSCE, 2014a). Specifically, lagoons are often the smallest management unit on a dairy (i.e., compared to animal housing and fields); and if lagoon seepage approaches zero, the source area of a downgradient monitoring well will extend beyond the lagoon's footprint. In that case, groundwater chemical characteristics cannot be isolated to the lagoon as the sole contributing source, and the identification of seepage impacts on groundwater relies on unique identifiers such as elevated ammoniacal nitrogen.

Under ideal conditions, a groundwater constituent concentration may yield information on the effect of one source on groundwater quality at a specific point in the aquifer. However, it yields no information on the concentration of the seepage, the seepage rate, overall subsurface mass loading rate, or the duration of the loading. This means that the presence of a high concentration of an indicator parameter does not necessarily equate to "lots of seepage". A high concentration may be associated with a small seepage rate and an overall small subsurface mass loading rate. Similarly, a low concentration of an indicator parameter does not necessarily equate to "little seepage". A low concentration may be associated with a high seepage rate and an overall high subsurface mass loading rate.

The results of this investigation, particularly the large variability of groundwater constituent concentrations found in boreholes and monitoring wells around individual lagoons, demonstrates the non-uniqueness of these concentrations with regard to lagoon performance. Although groundwater monitoring generates quantitative information, this information can only be used qualitatively with respect to lagoon seepage, i.e., supporting a statement such as, "groundwater chemistry is (or is not) indicative of lagoon seepage".

5. Conclusions and Recommendations

Conclusions

The results of this investigation indicate that the effects of lagoon seepage on groundwater quality are minimal and remain localized in the immediate vicinity of the lagoons. The results

also demonstrate that, for purposes of detecting if lagoon seepage has an effect on groundwater quality, groundwater monitoring wells are not an effective means of investigation. More fundamentally, groundwater concentrations do not yield information on the concentration of the seepage, the seepage rate, overall subsurface mass loading rate, or the duration of the loading. Although groundwater monitoring generates quantitative information, this information can only be used qualitatively with respect to lagoon seepage. Because guidelines, standards, and laws for the construction of existing earthen lagoons intended to control seepage but not to stop it, seepage is to be expected and a data collection effort (e.g., groundwater sampling via monitoring wells or other means) that supports a qualitative statement of whether a lagoon seeps or not, has limited utility.

Recommendations

Since groundwater monitoring provides merely a qualitative measure of lagoon seepage, this investigative approach has limited utility for the evaluation of different lagoon management practices. A more informative approach is recommended that designs and implements a program that is based on a semi-quantitative comparative analysis of lagoon mass emissions and field mass emissions (i.e., via deep percolation below the root zone). Such an approach is needed to guide the informed allocation of resources such that mass emissions of nutrients and salts to groundwater can be efficiently and effectively reduced on a large scale. The Central Valley dairy community initiated such an approach in 2008 with a comprehensive literature review on animal waste lagoon performance and its impact on soils and groundwater (LSCE, 2008). This effort led to extensive field work in 2010/11 and the preparation of *Protocols for Measuring Dairy Lagoon Seepage Using the Water Balance Method* (LSCE, 2012c). In 2013/14, CVDRMP successfully determined actual seepage rates on working dairy lagoons and continued this effort in winter 2014/15. This effort generated the first data set of its kind on California dairies. Field work included the collection of multiple depth-specific liquor samples, spatially distributed over the area of individual lagoons, to obtain representative concentration estimates for the computation of lagoon mass emissions to the subsurface.

A comprehensive report on the results, including seepage rates, mass loading estimates, and comparisons to field emission estimates, is planned to be completed in early summer 2015 (LSCE, 2014d). Findings of this report will determine further CVDRMP recommendations with regard to the identification and implementation of potentially alternative new lagoon management practices in 2015 and the relative merits of management practice evaluation of such practices with respect to subsurface loading rates.

6. References

Luhdorff and Scalmanini, Consulting Engineers. **2008**. *Liquid Animal Waste Lagoons, Input Loading to Subsurface Soils and Groundwater*. Technical Memorandum. In cooperation with University of California Cooperative Extension. September 2, 2008.

Luhdorff and Scalmanini, Consulting Engineers. **2012c**. *Protocols for Measuring Dairy Lagoon Seepage Using the Water Balance Method – Technical Field Guide*. March 31, 2012.

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Luhdorff & Scalmanini Consulting Engineers. **2014a**. *Central Valley Dairy Representative Monitoring Program Year 2 Annual Report (2013).* April 1, 2014, bound in six parts.

Luhdorff & Scalmanini Consulting Engineers. **2014c**. *Central Valley Dairy Representative Monitoring Program, 2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation – Workplan.* June 19, 2014.

Luhdorff and Scalmanini, Consulting Engineers. **2014d**. *Status on CVDRMP Activities since the Release of the Year 2 Annual Monitoring Report (April 1, 2014).* Letter to Clay L. Rodgers, November 28, 2014.

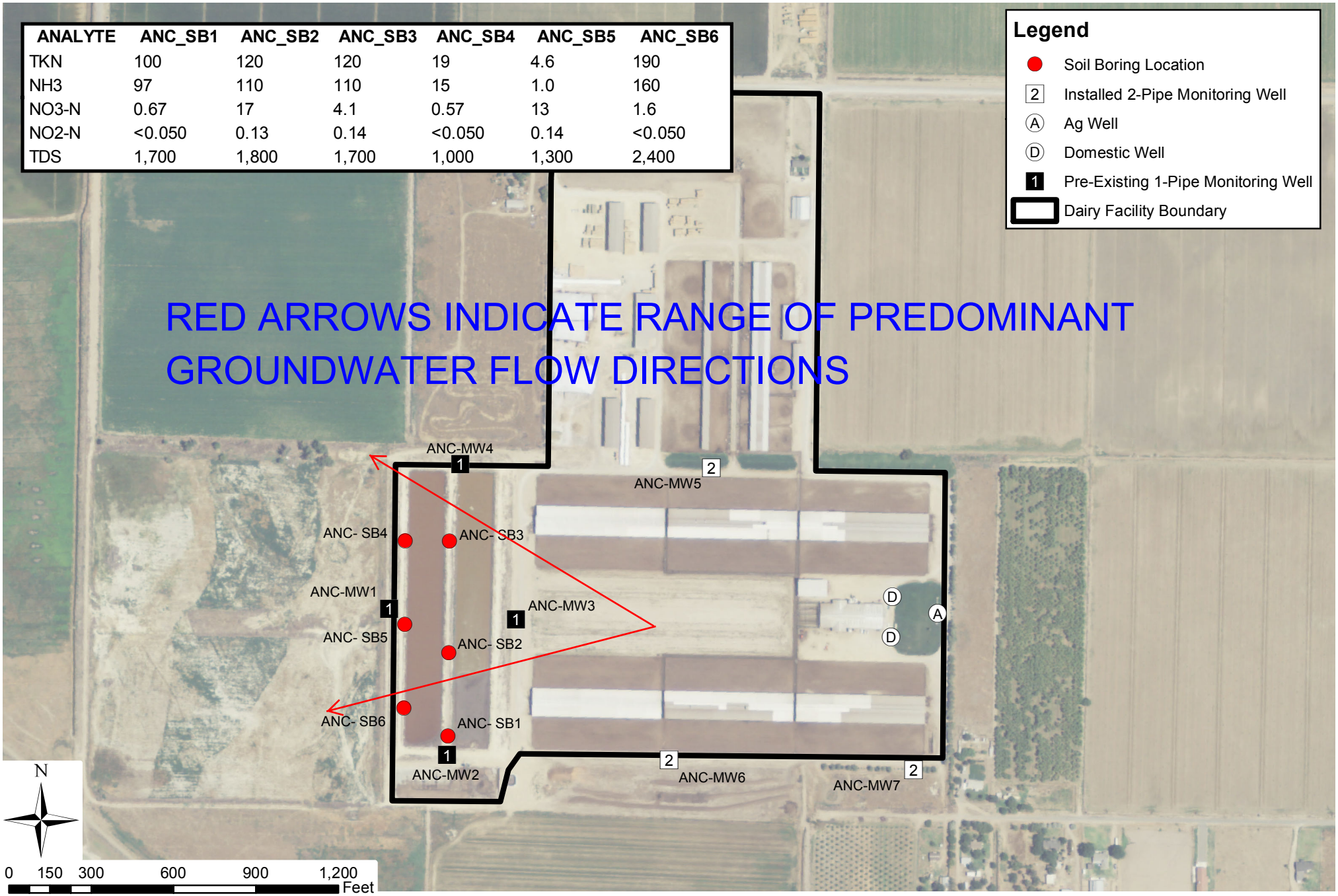
Attachments

A. Site Maps with Borehole Locations and Selected Water Quality Results
B. Lithologic Log Plots
C. Test Hole Groundwater Quality
D. Monitoring Well Groundwater Quality
E. Laboratory Analytical Reports

Attachment A

Site Maps with Borehole Locations and Selected Water Quality Results

ANALYTE	ANC_SB1	ANC_SB2	ANC_SB3	ANC_SB4	ANC_SB5	ANC_SB6
TKN	100	120	120	19	4.6	190
NH3	97	110	110	15	1.0	160
NO3-N	0.67	17	4.1	0.57	13	1.6
NO2-N	<0.050	0.13	0.14	<0.050	0.14	<0.050
TDS	1,700	1,800	1,700	1,000	1,300	2,400



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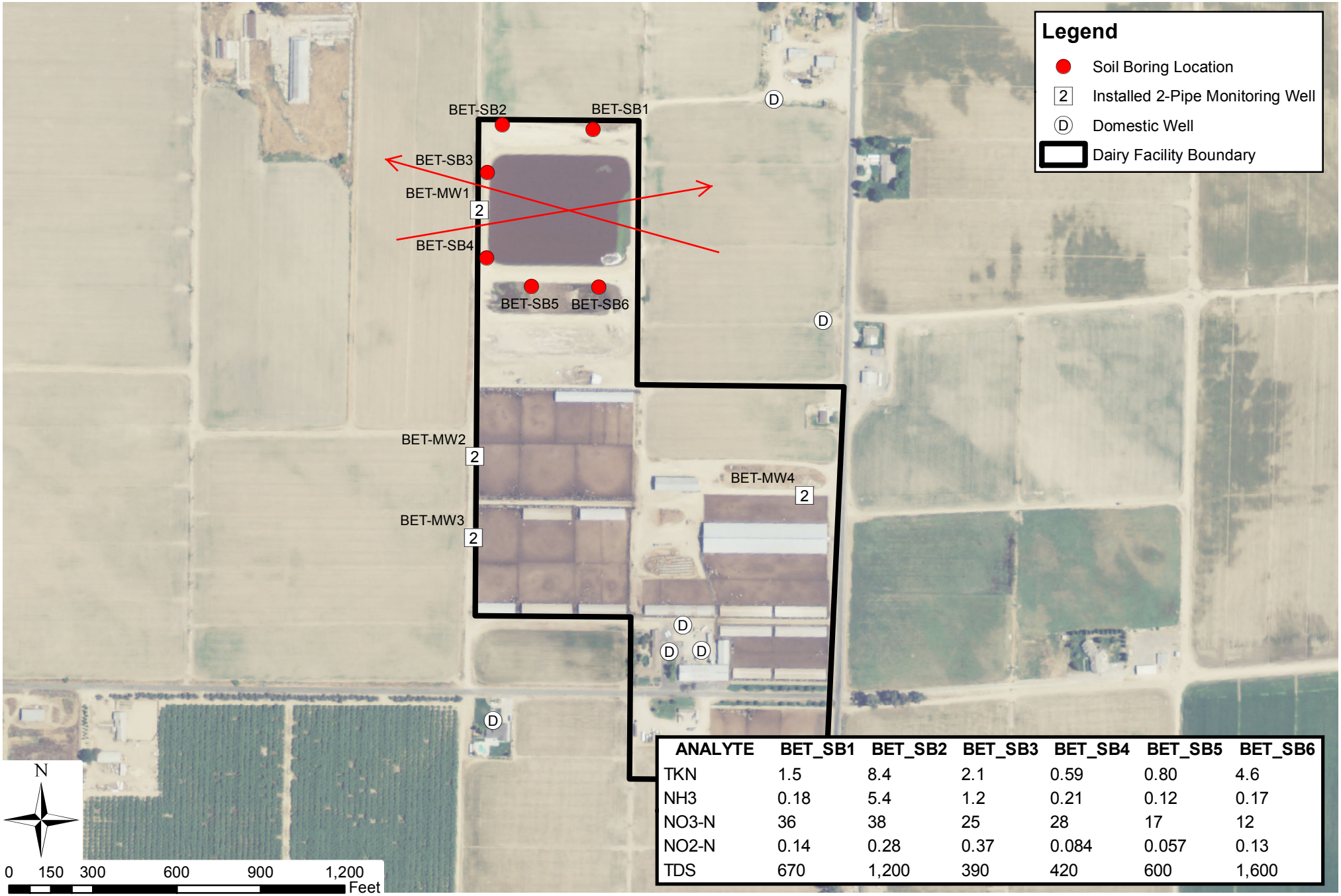
LUHDORFF & SCALMANINI CONSULTING ENGINEERS

Soil Boring Locations and Select Analytical Results as mg/L
ANC
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation



ANALYTE	BET_SB1	BET_SB2	BET_SB3	BET_SB4	BET_SB5	BET_SB6
TKN	1.5	8.4	2.1	0.59	0.80	4.6
NH3	0.18	5.4	1.2	0.21	0.12	0.17
NO3-N	36	38	25	28	17	12
NO2-N	0.14	0.28	0.37	0.084	0.057	0.13
TDS	670	1,200	390	420	600	1,600

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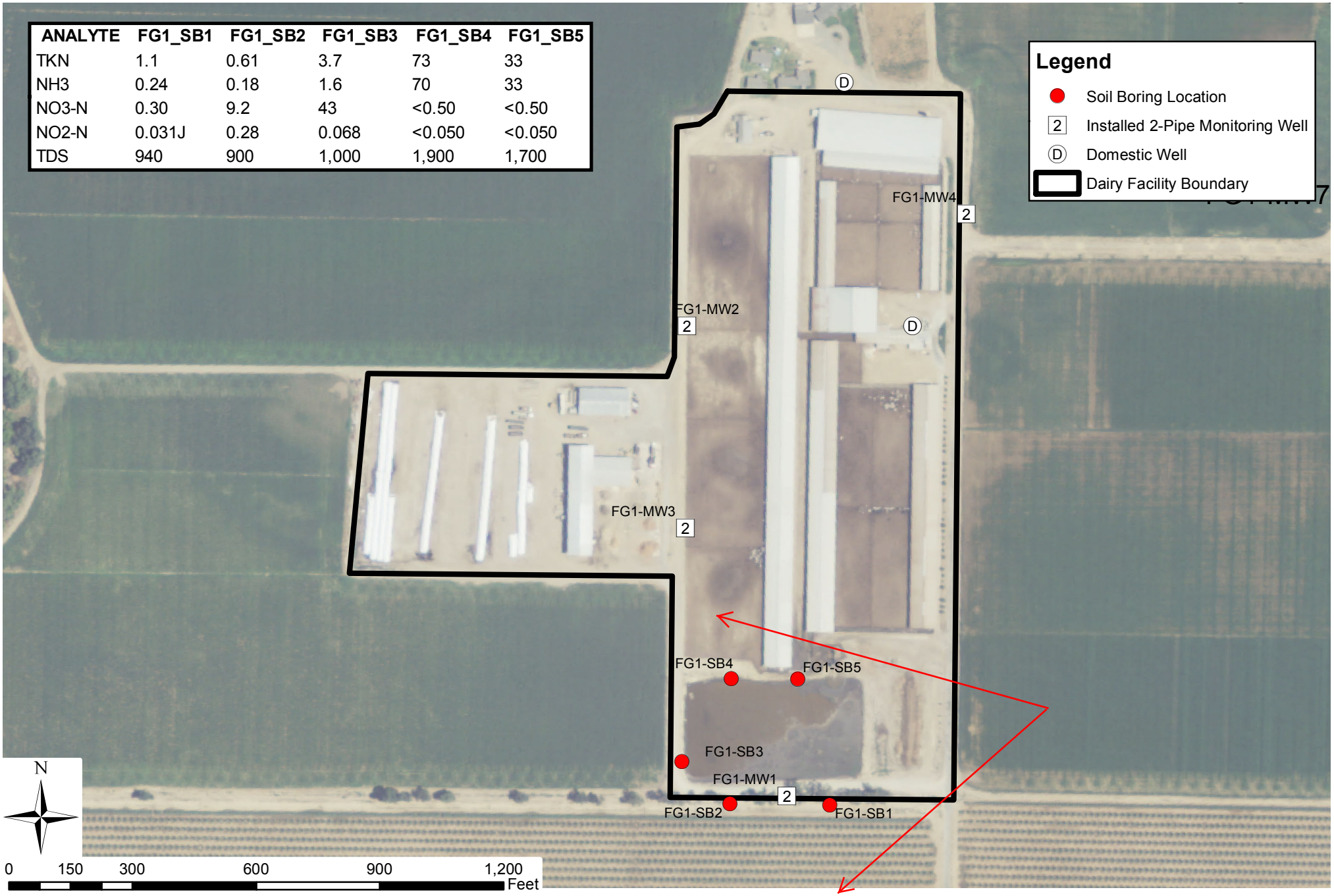
Soil Boring Locations and Select Analytical Results as mg/L
BET
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

ANALYTE	FG1_SB1	FG1_SB2	FG1_SB3	FG1_SB4	FG1_SB5
TKN	1.1	0.61	3.7	73	33
NH3	0.24	0.18	1.6	70	33
NO3-N	0.30	9.2	43	<0.50	<0.50
NO2-N	0.031J	0.28	0.068	<0.050	<0.050
TDS	940	900	1,000	1,900	1,700



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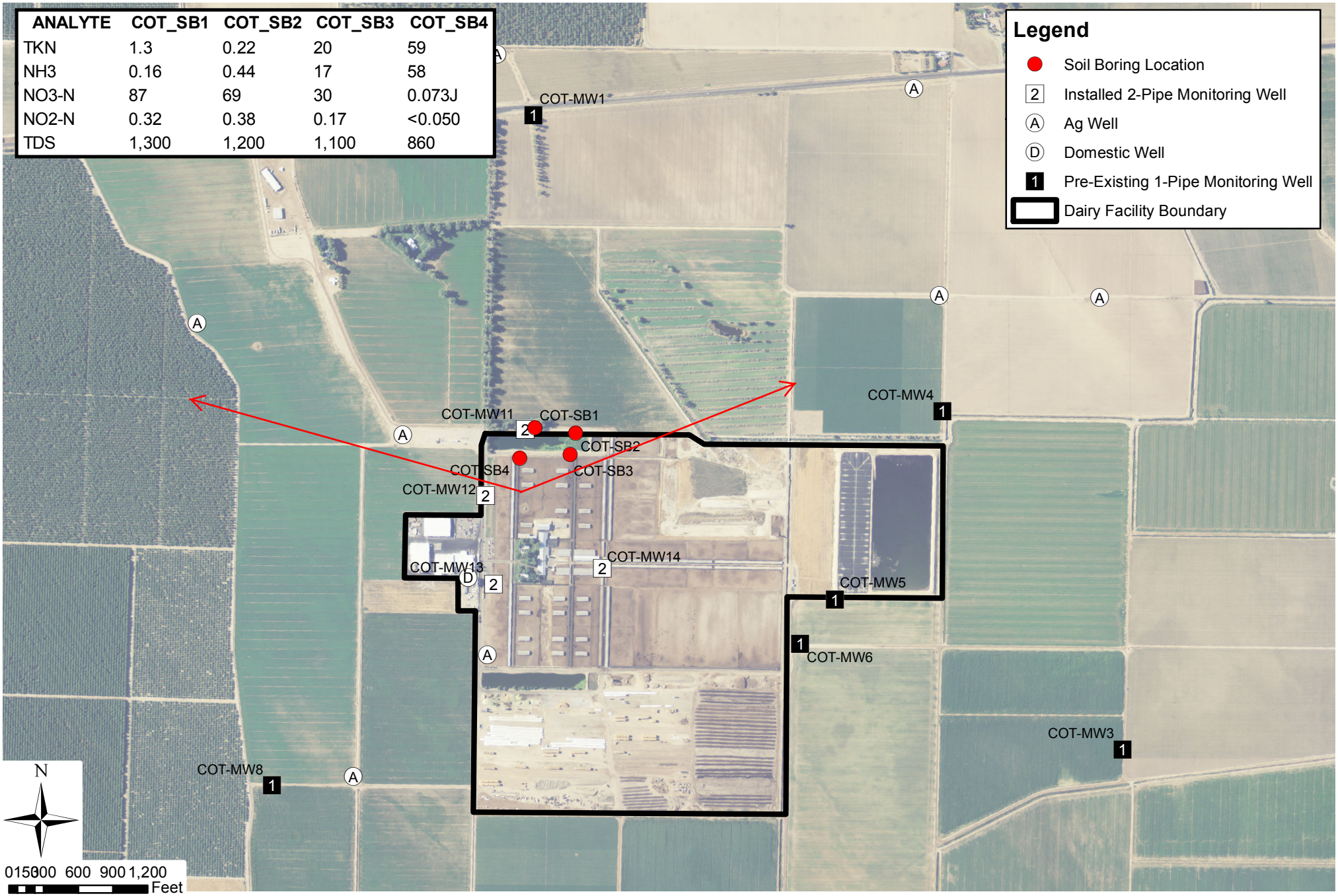
LUHDORFF & SCALMANINI CONSULTING ENGINEERS

Soil Boring Locations and Select Analytical Results as mg/L
FG1
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

ANALYTE	COT_SB1	COT_SB2	COT_SB3	COT_SB4
TKN	1.3	0.22	20	59
NH3	0.16	0.44	17	58
NO3-N	87	69	30	0.073J
NO2-N	0.32	0.38	0.17	<0.050
TDS	1,300	1,200	1,100	860



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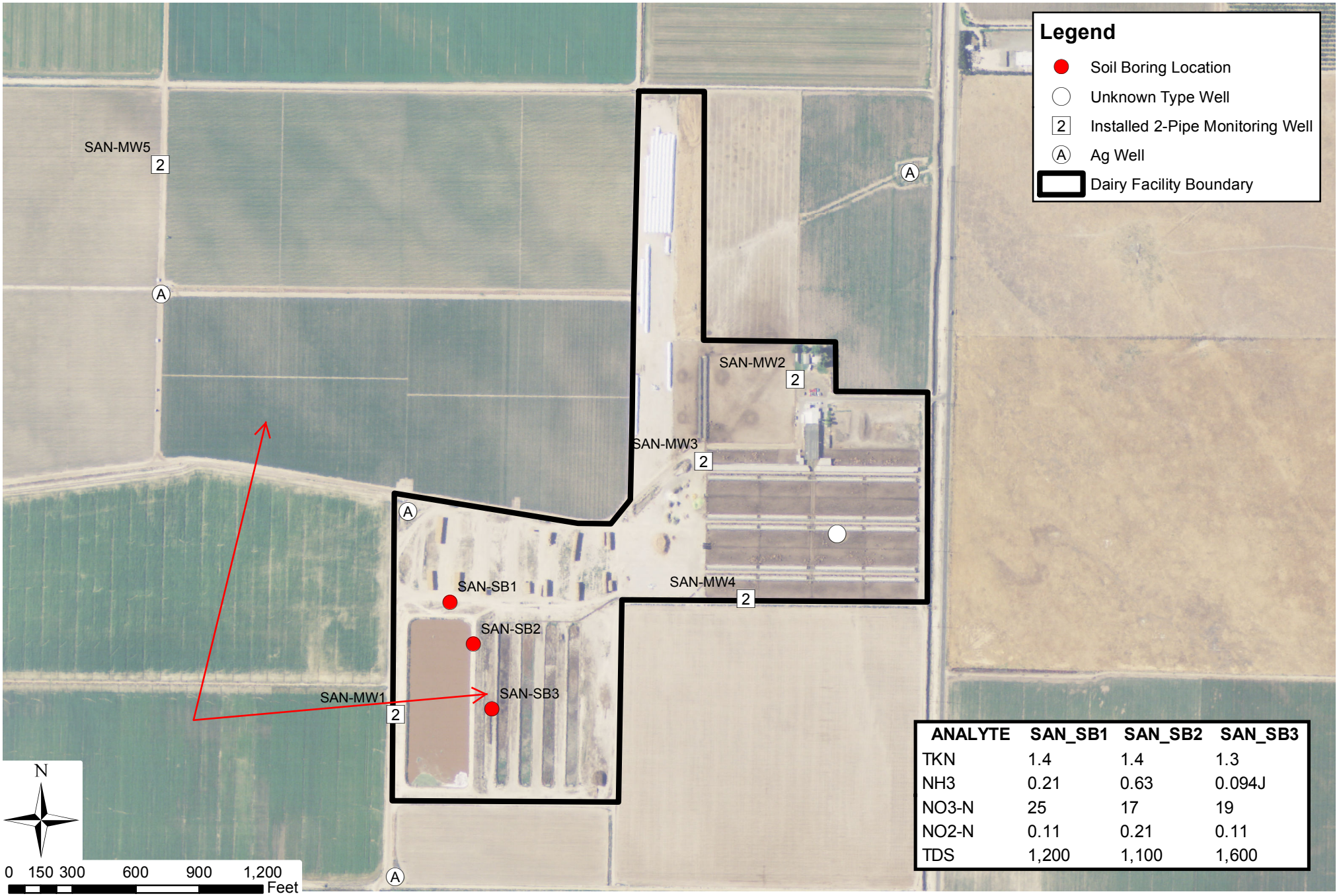
Soil Boring Locations and Select Analytical Results as mg/L
COT
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation



ANALYTE	SAN_SB1	SAN_SB2	SAN_SB3
TKN	1.4	1.4	1.3
NH3	0.21	0.63	0.094J
NO3-N	25	17	19
NO2-N	0.11	0.21	0.11
TDS	1,200	1,100	1,600

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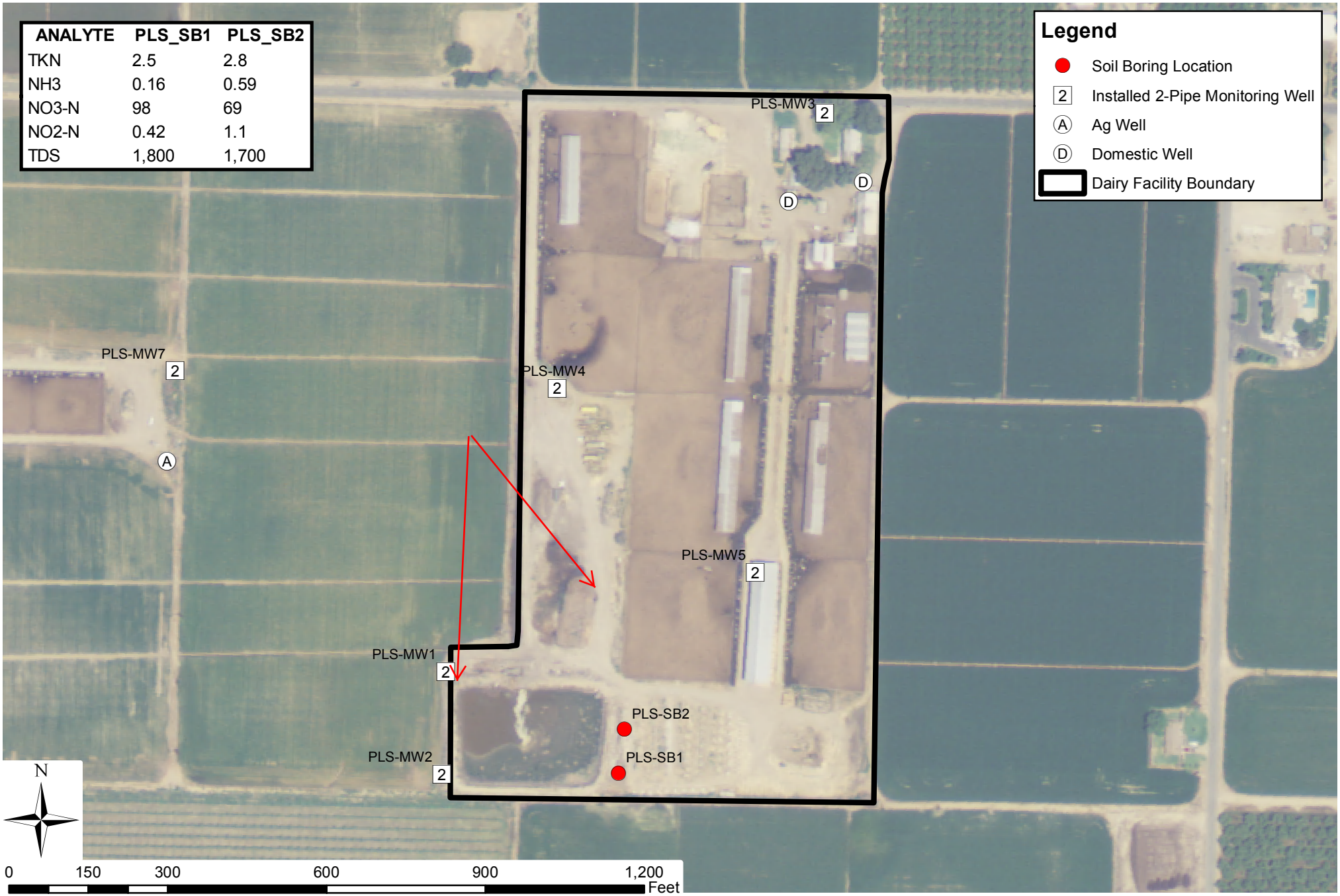
Soil Boring Locations and Select Analytical Results as mg/L
SAN
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation



ANALYTE	PLS_SB1	PLS_SB2
TKN	2.5	2.8
NH3	0.16	0.59
NO3-N	98	69
NO2-N	0.42	1.1
TDS	1,800	1,700

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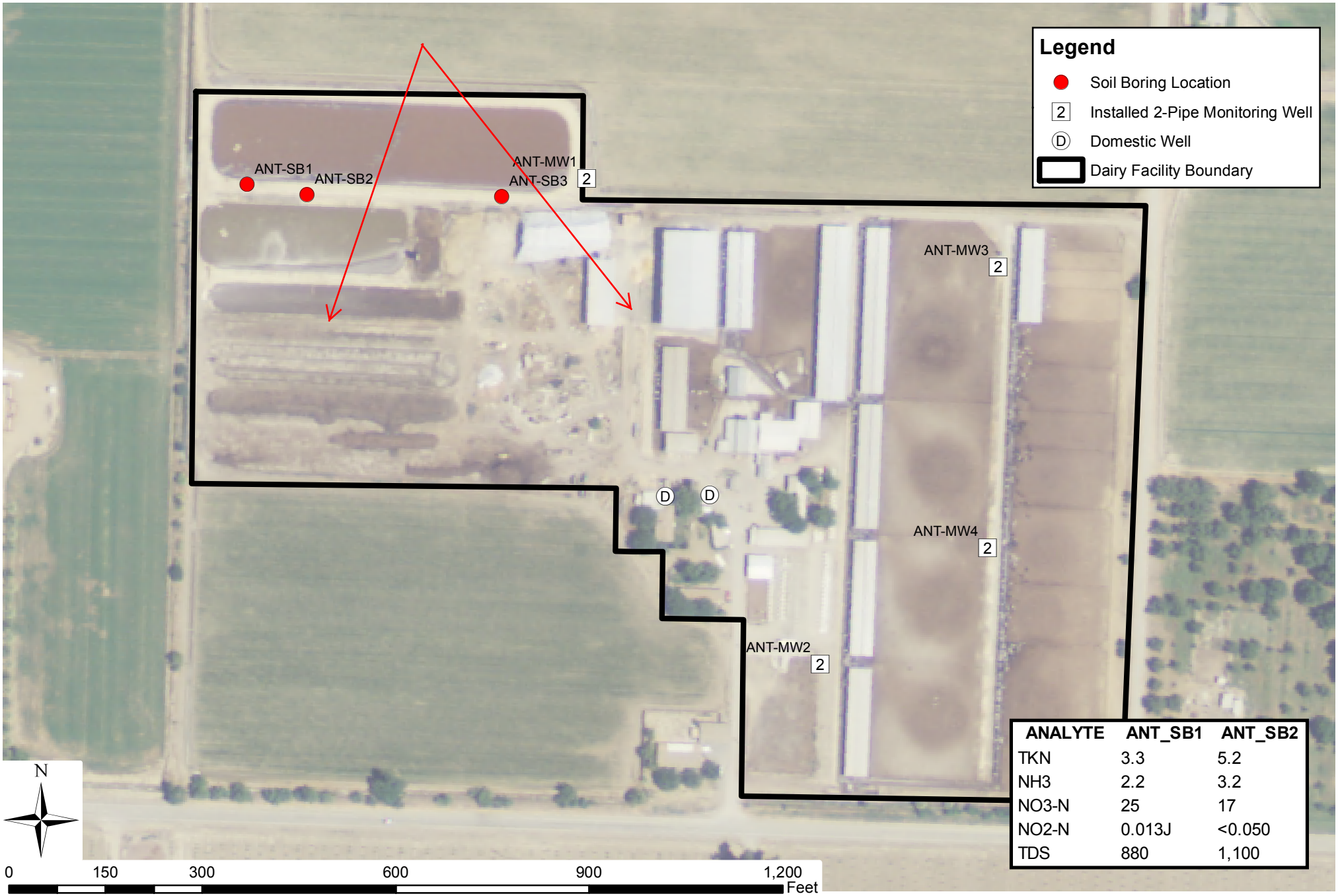
Soil Boring Locations and Select Analytical Results as mg/L
PLS
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation



ANALYTE	ANT_SB1	ANT_SB2
TKN	3.3	5.2
NH3	2.2	3.2
NO3-N	25	17
NO2-N	0.013J	<0.050
TDS	880	1,100

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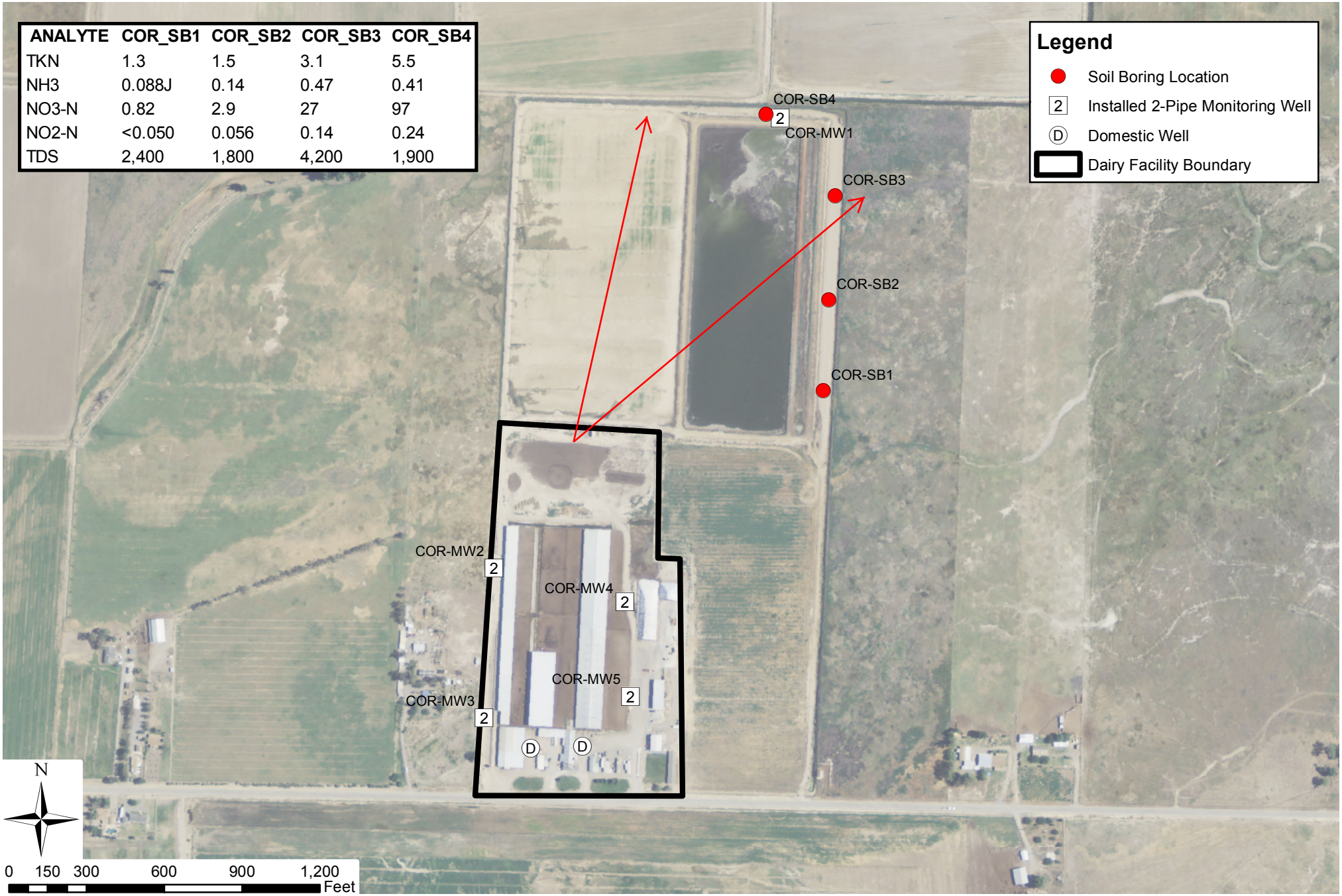
Soil Boring Locations and Select Analytical Results as mg/L
ANT
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

ANALYTE	COR_SB1	COR_SB2	COR_SB3	COR_SB4
TKN	1.3	1.5	3.1	5.5
NH3	0.088J	0.14	0.47	0.41
NO3-N	0.82	2.9	27	97
NO2-N	<0.050	0.056	0.14	0.24
TDS	2,400	1,800	4,200	1,900



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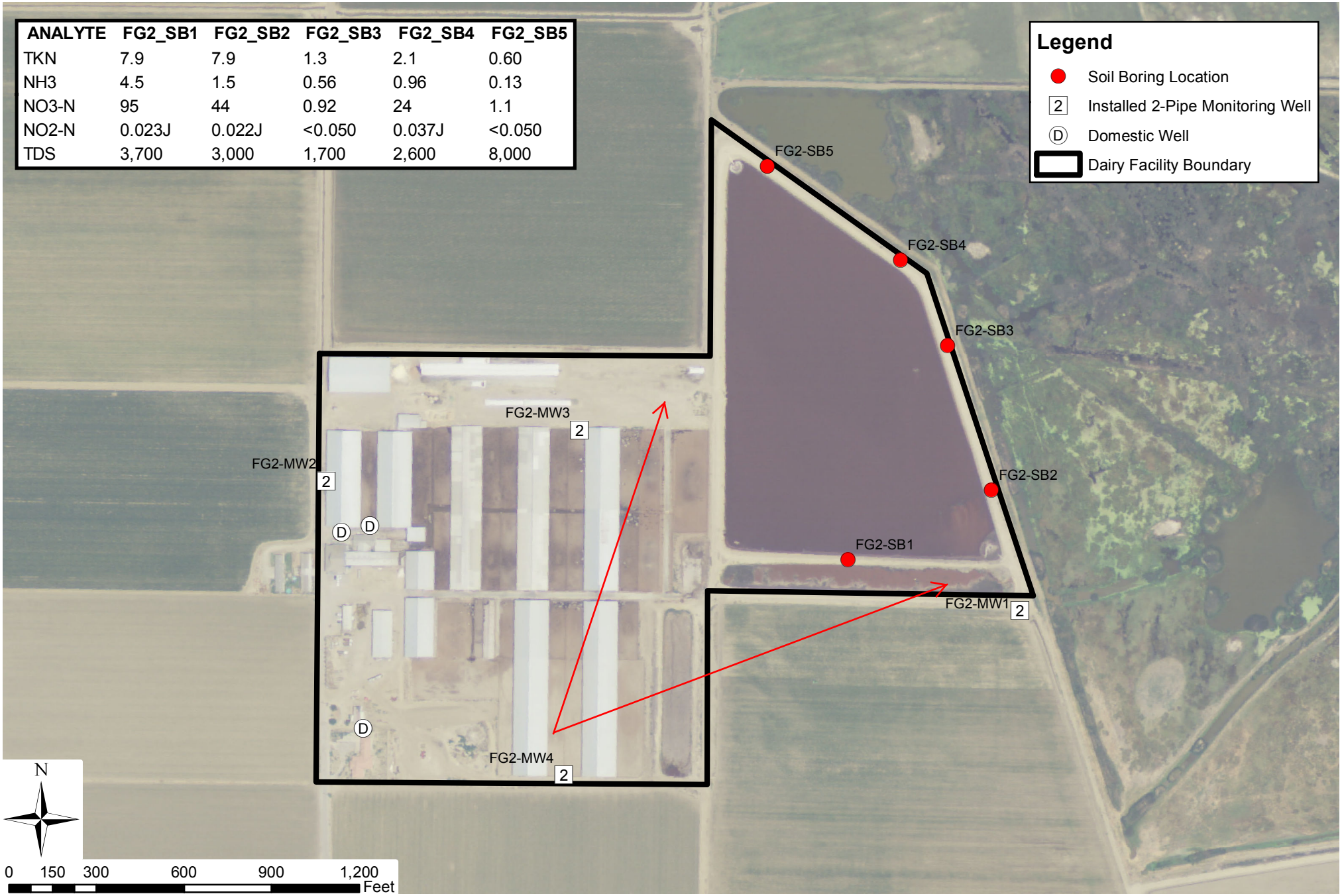
LUHDORFF & SCALMANINI CONSULTING ENGINEERS

Soil Boring Locations and Select Analytical Results as mg/L
COR
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

ANALYTE	FG2_SB1	FG2_SB2	FG2_SB3	FG2_SB4	FG2_SB5
TKN	7.9	7.9	1.3	2.1	0.60
NH3	4.5	1.5	0.56	0.96	0.13
NO3-N	95	44	0.92	24	1.1
NO2-N	0.023J	0.022J	<0.050	0.037J	<0.050
TDS	3,700	3,000	1,700	2,600	8,000



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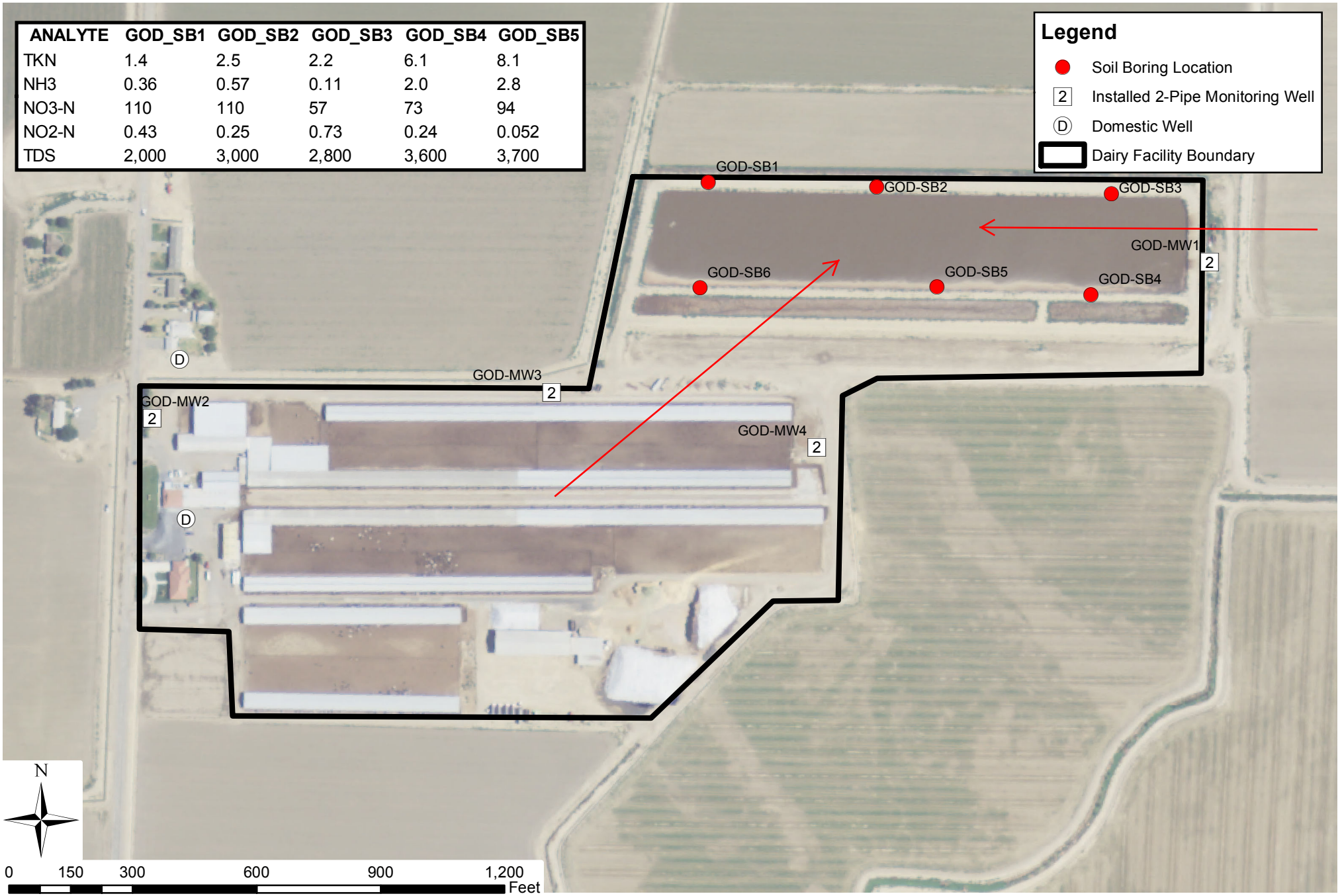
LUHDORFF & SCALMANINI CONSULTING ENGINEERS

Soil Boring Locations and Select Analytical Results as mg/L
FG2
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

ANALYTE	GOD_SB1	GOD_SB2	GOD_SB3	GOD_SB4	GOD_SB5
TKN	1.4	2.5	2.2	6.1	8.1
NH3	0.36	0.57	0.11	2.0	2.8
NO3-N	110	110	57	73	94
NO2-N	0.43	0.25	0.73	0.24	0.052
TDS	2,000	3,000	2,800	3,600	3,700



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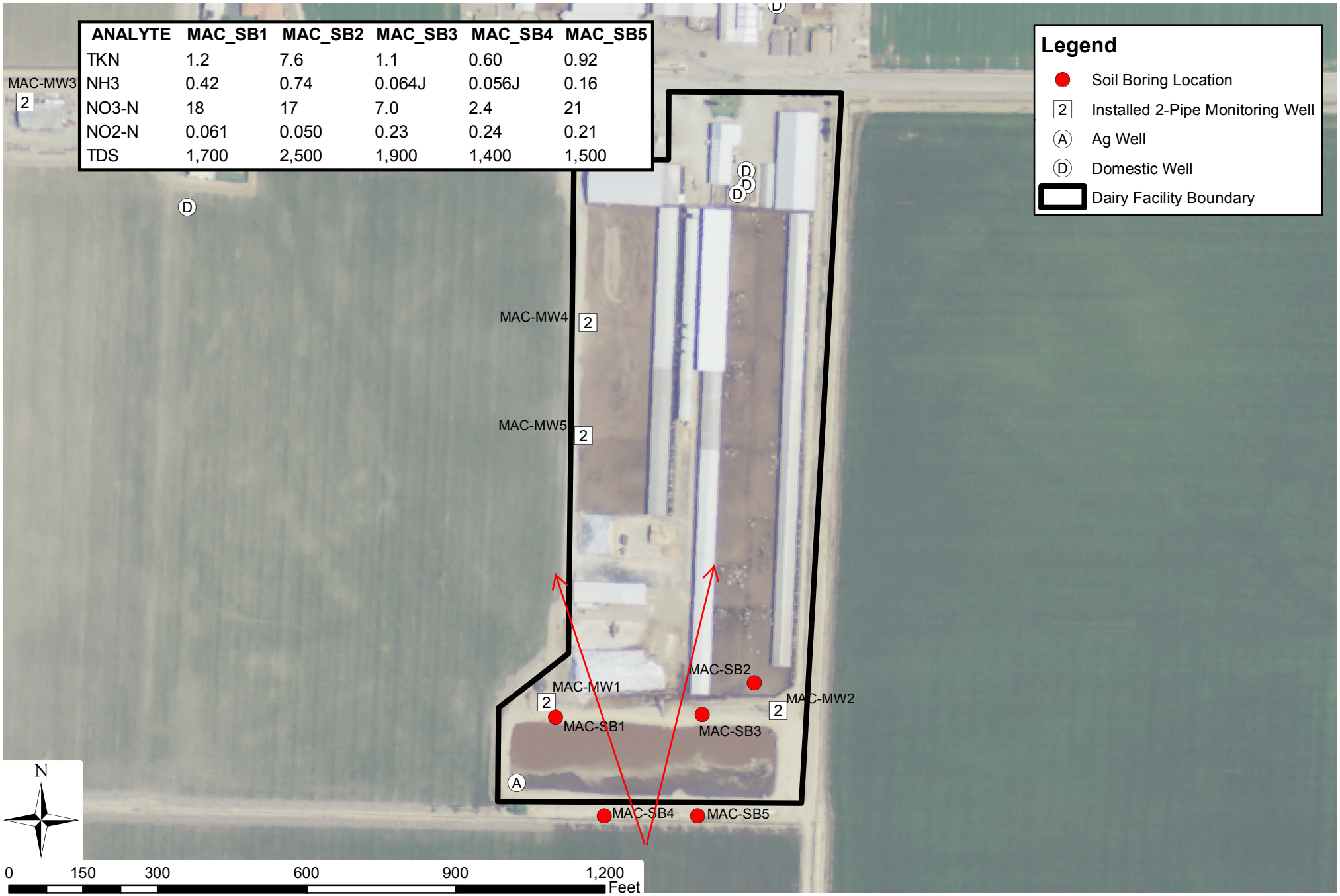
Soil Boring Locations and Select Analytical Results as mg/L
GOD
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

ANALYTE	MAC_SB1	MAC_SB2	MAC_SB3	MAC_SB4	MAC_SB5
TKN	1.2	7.6	1.1	0.60	0.92
NH3	0.42	0.74	0.064J	0.056J	0.16
NO3-N	18	17	7.0	2.4	21
NO2-N	0.061	0.050	0.23	0.24	0.21
TDS	1,700	2,500	1,900	1,400	1,500



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Soil Boring Locations and Select Analytical Results as mg/L
MAC
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

ANALYTE	NUN_SB1	NUN_SB2	NUN_SB3	NUN_SB4
TKN	3.0	2.9	20	14
NH3	1.2	1.8	19	13
NO3-N	56	550*	12	12
NO2-N	0.086	0.51	0.011J	0.068
TDS	9,500	6,400	5,400	16,000

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Soil Boring Locations and Select Analytical Results as mg/L
NUN
2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

Attachment B

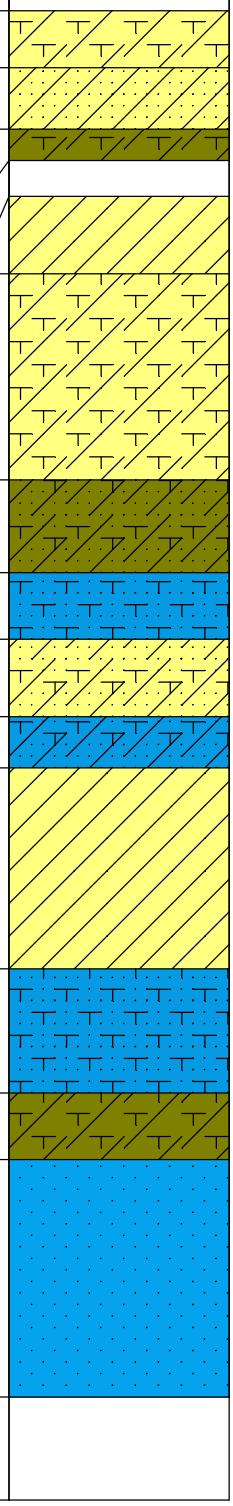
Lithologic Log Plots

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Anchor J. Dairy- 24507 First Avenue, Stevinson, CA 95374, Merced Co.
Well Name:	ANC-SB1	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.336111/-120.9375*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/22/2014
Site Geologist:	Jeanette Hummel	Boring Depth (ft):	28

Color	USCS	Lithologic Description
NR	NR	No Return
2.5 Y 5/2	CL	Silty Clay- low plastic, ~15% silt, dry
10 YR 4/4	CL	Sandy Clay- low plastic, fine to medium, damp
10 YR 4/6	ML	Clayey Silt- low plastic, damp
NR	NR	No Return
10 YR 4/3	CL	Clay- low to medium plastic, ~10% silt, damp
2.5 Y 3/1	CL	Silty Clay- low plastic, ~15% silt, damp
2.5 Y 5/4	CL	
2.5 Y 3/1	CL	
10 YR 4/4	CL	
10 YR 3/1	ML	Clayey Sandy Silt- fine sand, low plastic clay, damp
2.5 Y 4/2	SM	Silty Sand- fine, poorly graded, damp
5 Y 3/1	CL	Sandy Silty Clay- low plastic, fine, damp
5 Y 3/1	NR	Clayey Silty Sand- fine, poorly graded, low plastic, moist
2.5 Y 4/1	CL	Clay- medium plastic, mottled w/ oxidation, moist
5 Y 5/1	SM	Silty Sand- fine, poorly graded, moist
5 Y 4/2	ML	Clayey Silt- low plastic, moist
2.5 Y 5/2	SP	Sand- fine to medium, poorly graded, wet

Graphic Log



0 5 10 15 20 25 30

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

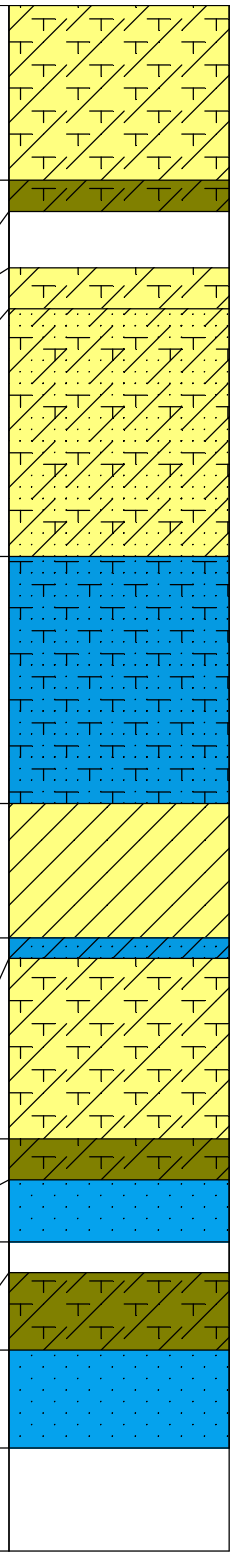
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Anchor J. Dairy- 24507 First Avenue, Stevinson, CA 95374, Merced Co.
Well Name:	ANC-SB2	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.336944/-120.9375*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/22/2014
Site Geologist:	Jeanette Hummel	Boring Depth (ft):	28

Color	USCS	Lithologic Description
10 YR 5/3	CL	Silty Clay- low plastic, mottled w/ oxidation, ~20% silt, dry
10 YR 5/6	ML	Clayey Silt- low plastic, damp
NR	NR	No Return
10 YR 5/4	CL	Silty Clay- low plastic, mottled w/ oxidation, damp
10 YR 5/4	CL	Sandy Silty Clay- low plastic, mottled, fine to medium, damp
2.5 Y 3/2	SM	Silty Sand- fine, damp
2.5 Y 4/3	SM	
5 Y 5/2	CL	Clay- low to medium plastic, mottled w/ oxidation, ~10% silt, damp
5 Y 5/2	SC	Clayey Sand- fine to medium, low plastic
2.5 Y 5/3	CL	Clay- low to medium plastic, soft, mottled w/ oxidation, ~10% silt, moist
10 YR 4/4	ML	Clayey Silt- low plastic
2.5 Y 4/3	SP	Sand- fine to medium, poorly graded, damp
2.5 Y 4/3	SP	
NR	NR	No Return
5 Y 5/2	ML	Clayey Silt- low plastic, mottled w/ oxidation, soft, wet
5 Y 5/1	SP	Sand- fine to medium, poorly graded, wet

Graphic Log



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LUHDORFF & SCALMANINI CONSULTING ENGINEERS

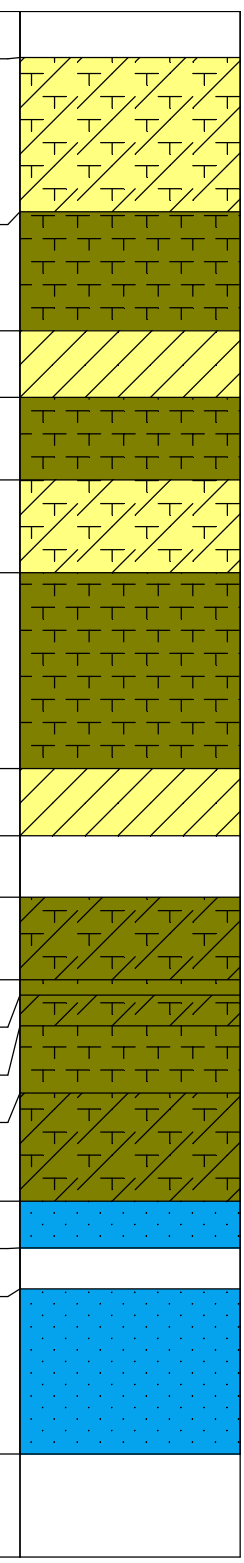
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Anchor J. Dairy- 24507 First Avenue, Stevinson, CA 95374, Merced Co.
Well Name:	ANC-SB3	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.338056/-120.9375*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/22/2014
Site Geologist:	Jeanette Hummel	Boring Depth (ft):	28

Color	USCS	Lithologic Description
NR	NR	No Return
10 YR 5/4	CL	Silty Clay- low plastic, mottled w/ oxidation, ~15% silt, dry
2.5 Y 4/4	CL	
10 YR 4/4	ML	damp
		Silt- ~10% low plastic clay
5 Y 4/2	CL	Clay- medium plastic, mottled w/ oxidation, damp
10 YR 4/4	ML	Silt- ~10% low plastic clay, ~5% fine sand, damp
2.5 Y 4/2	CL	Silty Clay- low plastic, mottled w/ oxidation, ~15% silt, ~5% fine sand, damp
2.5 Y 4/1	ML	Silt- ~10% fine sand, damp
2.5 Y 4/1	ML	
10 YR 4/4	ML	
5 Y 5/2	CL	Clay- low to medium plastic, mottled w/ oxidation, damp
NR	NR	No Return
5 Y 4/2	ML	Clayey Silt- mottled w/ oxidation, ~15% clay, low plastic, soft, damp
5 Y 5/2	ML	
5 Y 4/2	ML	Silt- damp
5 Y 4/2	ML	
5 Y 5/2	ML	Clayey Silt- mottled w/ oxidation, damp
2.5 Y 4/4	ML	Silt- mottled w/ oxidation, damp
		Clayey Silt- mottled w/ oxidation, soft, wet
2.5 Y 4/4	SP	Sand- fine, poorly graded, moist
NR	NR	No Return
2.5 Y 5/2	SP	Sand- fine to medium, poorly graded, wet

Graphic Log



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LUHDORFF & SCALMANINI CONSULTING ENGINEERS

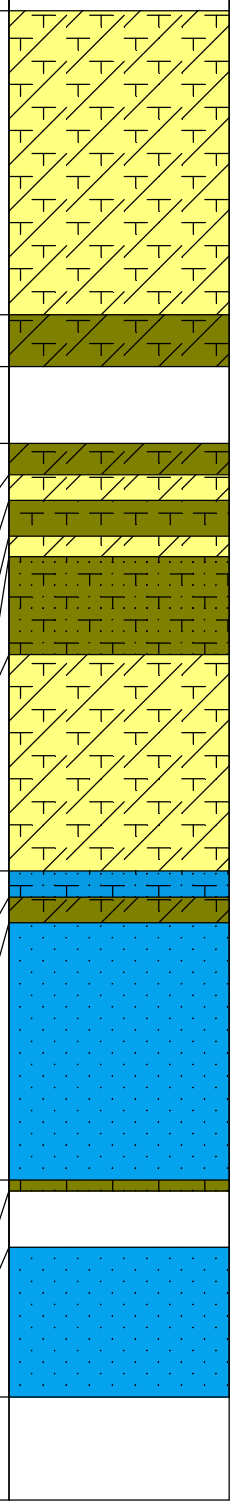
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Anchor J. Dairy- 24507 First Avenue, Stevinson, CA 95374, Merced Co.
Well Name: ANC-SB4 Drilling Method: Geoprobe Direct Push
Lat./Long.: 37.338056/-120.938056* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"
Driller: Josh Zwemke Drilling Date: 10/22/2014
Site Geologist: Jeanette Hummel Boring Depth (ft): 28

Color	USCS	Lithologic Description
	NR	No Return
10 YR 4/4	CL	Silty Clay- low plastic, ~15% silt, dry to damp
2.5 Y 4/1	CL	damp
2.5 Y 4/4	CL	mottled w/ oxidation
2.5 Y 4/3	ML	Clayey Silt- low plastic, damp
	NR	No Return
5 Y 3/1	ML	Clayey Silt- low plastic, damp
2.5 Y 4/3	CL	
2.5 Y 4/2	ML	Silty Clay- low plastic, ~15% silt, damp
2.5 Y 4/2	CL	
5 Y 3/2	ML	Silt- ~10% fine sand, damp
		Silty Clay- low plastic, ~15% silt, damp
10 YR 3/4	CL	Sandy Silt- ~15% fine sand, damp
		Silty Clay- low to medium plastic, mottled w/ oxidation, damp
5 Y 5/3	SM	Silty Sand- fine, damp
5 Y 5/2	ML	
2.5 Y 5/4	SP	Clayey Silt- low plastic, mottled w/ oxidation, soft, damp
		Sand- fine to medium, poorly graded, damp
5 Y 6/2	SP	
5 Y 4/1	ML	Sandy Silt- fine, moist
	NR	No Return
2.5 Y 4/4	SP	
2.5 Y 5/2	SP	Sand- fine to medium, poorly graded, moist to wet

Graphic Log



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LUHDORFF & SCALMANINI CONSULTING ENGINEERS

*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Anchor J. Dairy- 24507 First Avenue, Stevinson, CA 95374, Merced Co.

Well Name: ANC-SB5 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.337222/-120.938056* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

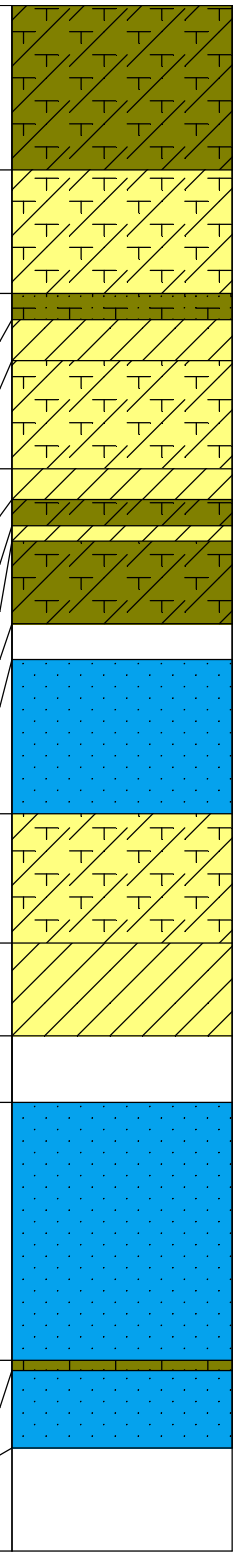
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/22/2014

Site Geologist: Jeanette Hummel Boring Depth (ft): 28

Color	USCS	Lithologic Description
2.5 Y 5/2	ML	Clayey Silt- low plastic, dry to damp
10 YR 4/3	Cl	Silty Clay- low to medium plastic, mottled w/ oxidation, ~15% silt, damp
2.5 Y 4/3	ML	
2.5 Y 4/4	CL	Sandy Silt- ~20% fine sand, ~10% low plastic clay, damp
2.5 Y 4/1	CL	Clay- low to medium plastic, mottled w/ oxidation, ~10% silt, damp
2.5 Y 4/3	CL	
2.5 Y 3/1	CL	Silty Clay- low plastic, ~15-20% silt, damp
2.5 Y 4/3	CL	
2.5 Y 3/2	ML	Clay- low to medium plastic, mottled w/ oxidation, hard, ~10% silt, damp
2.5 Y 4/3	CL	
5 Y 3/1	ML	Clayey Silt- low plastic, damp
		Clay- low to medium plastic, mottled w/ oxidation, hard, ~10% silt, damp
NR	NR	Clayey Silt- low to medium plastic streaks, damp
5 Y 3/2	SP	No Return
		Sand- fine to medium, poorly graded, moist to wet
5 Y 3/2	CL	Silty Clay- low to medium plastic, mottled w/ oxidation, ~20% silt, damp
2.5 Y 4/3	CL	Clay- medium plastic, soft, slightly sticky, moist
NR	NR	No Return
2.5 Y 5/2	SP	Sand- fine to medium, poorly graded, moist
		wet
2.5 Y 4/3	ML	
2.5 Y 4/4	SP	Sandy Silt- fine to medium
		Sand- fine to medium, poorly graded, wet

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Anchor J. Dairy- 24507 First Avenue, Stevinson, CA 95374, Merced Co.

Well Name: ANC-SB6 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.336389/-120.938056* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

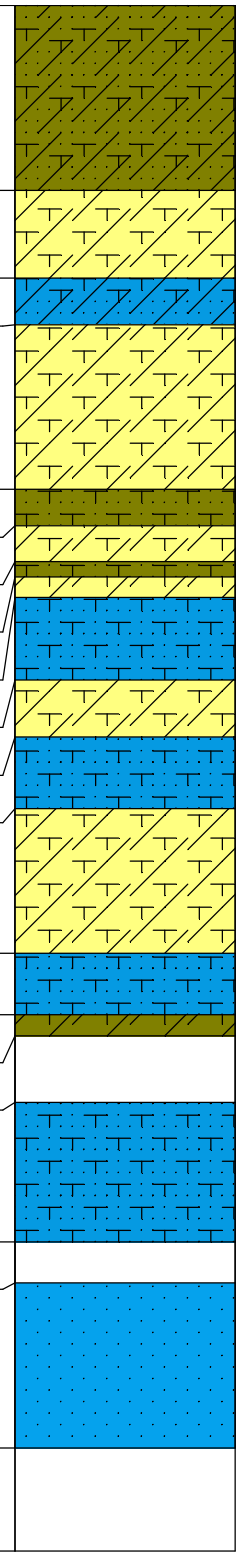
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/22/2014

Site Geologist: Jeanette Hummel Boring Depth (ft): 28

Color	USCS	Lithologic Description
2.5 Y 5/3	ML	Clayey Sandy Silt- fine sand, low plastic clay, dry to damp
2.5 Y 5/3	CL	Silty Clay- low to medium plastic, mottled black w/ oxidation, ~15% silt, damp
2.5 Y 4/4	SM/SC	Clayey Silty Sand- fine, low plastic, damp
2.5 Y 5/2	CL	Silty Clay- low to medium plastic, mottled w/ oxidation, slightly hard, ~15-20% silt. damp
2.5 Y 4/2	CL	
2.5 Y 4/2	ML	Sandy Silt- ~20% fine sand, damp
5 Y 3/1	CL	Silty Clay- low to medium plastic, ~15% silt, damp
10 YR 4/2	CL	Silty Sand- fine, ~20% silt, damp
2.5 Y 5/2	SM	Silty Clay- low to medium plastic, ~15% silt, damp
10 YR 4/2	CL	Silty Sand- fine, ~20% silt, damp
5 Y 3/2	SM	Silty Clay- low plastic, hard, ~15% silt, damp
2.5 Y 5/2	CL	Silty Sand- fine, ~20% silt, damp
5 Y 4/2	SM	Silty Clay- low to medium plastic, ~15% silt, damp
Gley 5/5 GY	CL	Silty Sand- fine, ~15% silt, damp
2.5 Y 6/2	SM	Clayey Silt- mottled w/ oxidation, low plastic, soft, moist
2.5 Y 6/2	ML	No Return
NR	NR	Silty Sand- fine, ~20% silt, damp
2.5 Y 6/2	SM	No Return
NR	NR	Sand- fine to medium, poorly graded, wet
2.5 Y 4/2	SP	

Graphic Log



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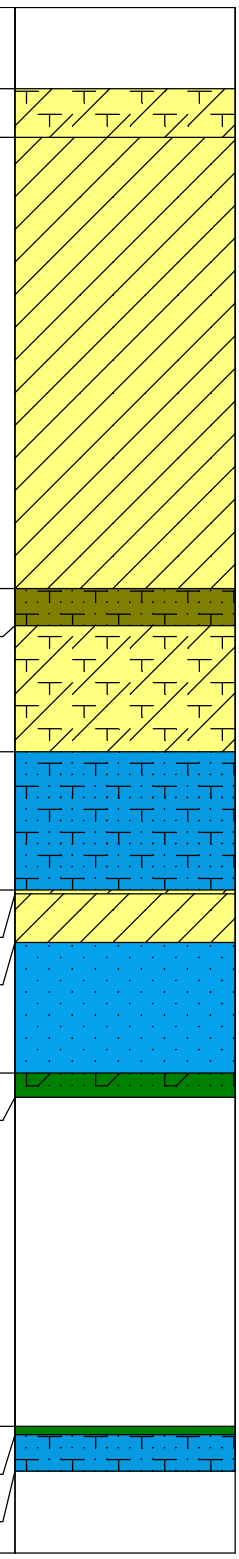
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Antone L. Gomes & Sons Dairy- 515 E. Stuhr Rd., Newman, CA 95360, Stanislaus Co.
Well Name:	ANT-SB1	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.33559/-121.02145*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/23/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	36

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, dry
7.5 YR 3/3	CL	Clay- medium plastic, moist
7.5 YR 4/3	CL	
5 YR 5/1	CL	Sandy Silt- ~15% fine sand, moist
5 YR 5/1	ML	Silty Clay- medium plastic, ~30% silt, moist
5 YR 4/1	CL	Silty Sand- fine, ~30% silt
5 YR 4/1	SM	
10 YR 4/1	CL	Silty Clay- ~20% silt, moist
10 YR 5/1	CL	Clay- medium plastic, moist
		Sand- fine to medium, poorly graded, sub-round, moist
7.5 YR 4/1	SP	
7.5 YR 4/3	GW	Sandy Gravel- gravel up to 1", fine to coarse sand, well graded, moist to wet
		No Return
NR	NR	
7.5 YR 3/3	SM	Sandy Gravel- gravel up to 1", fine to coarse sand, well graded, sub-round, wet
7.5 YR 4/3	GW	Silty Sand- fine, ~20% silt

Graphic Log



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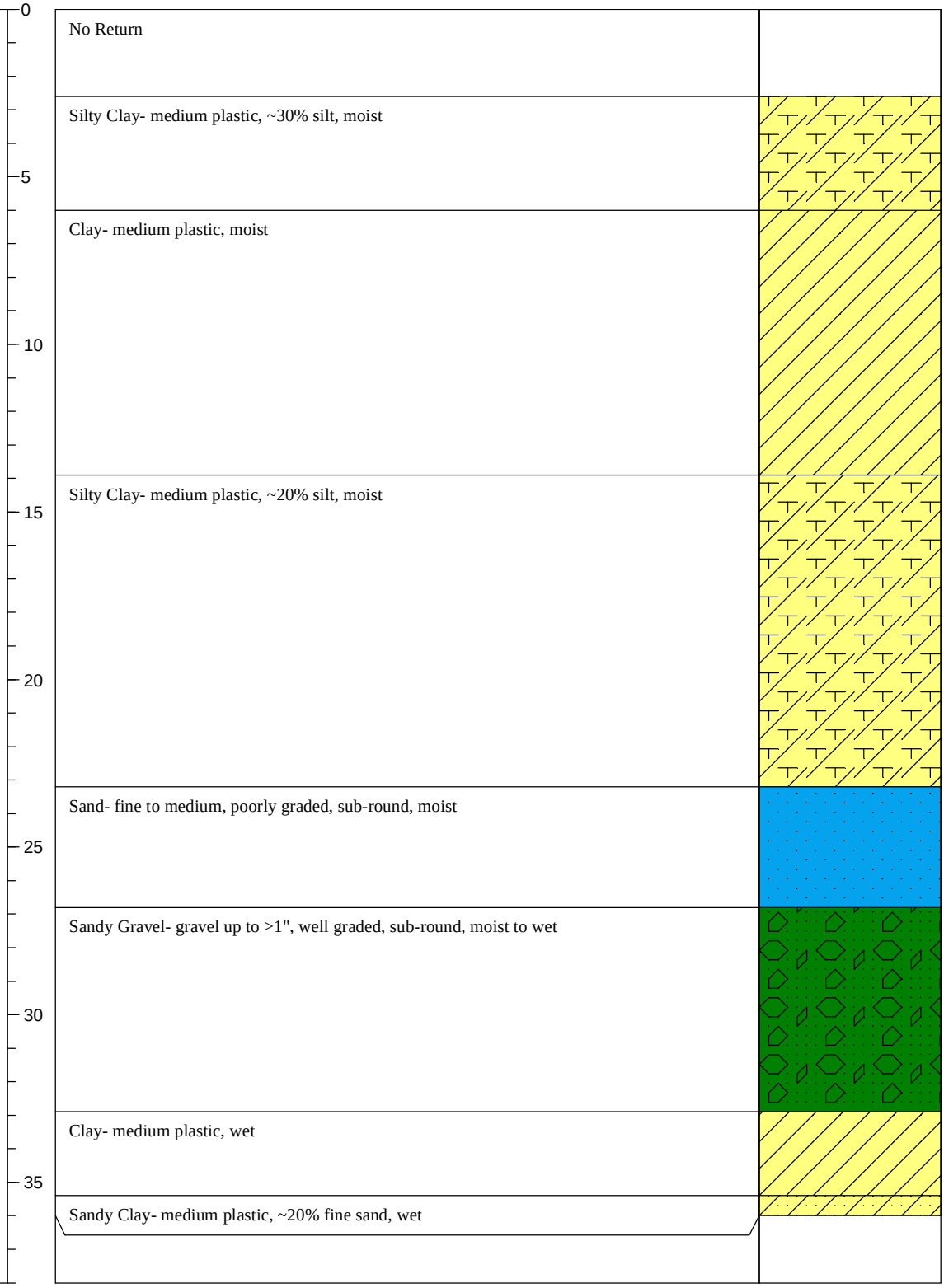
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Antone L. Gomes & Sons Dairy- 515 E. Stuhr Rd., Newman, CA 95360, Stanislaus Co.
Well Name:	ANT-SB2	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.33555/-121.02113*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/23/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	36

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR4/3	CL	Silty Clay- medium plastic, ~30% silt, moist
7.5 YR4/3	CL	Clay- medium plastic, moist
7.5 YR 4/1	CL	Silty Clay- medium plastic, ~20% silt, moist
10 YR 3/1	SP	Sand- fine to medium, poorly graded, sub-round, moist
7.5 YR 4/3	GW	Sandy Gravel- gravel up to >1", well graded, sub-round, moist to wet
7.5 YR 4/3	CL	Clay- medium plastic, wet
7.5 YR 4/3	CL	Sandy Clay- medium plastic, ~20% fine sand, wet

Graphic Log



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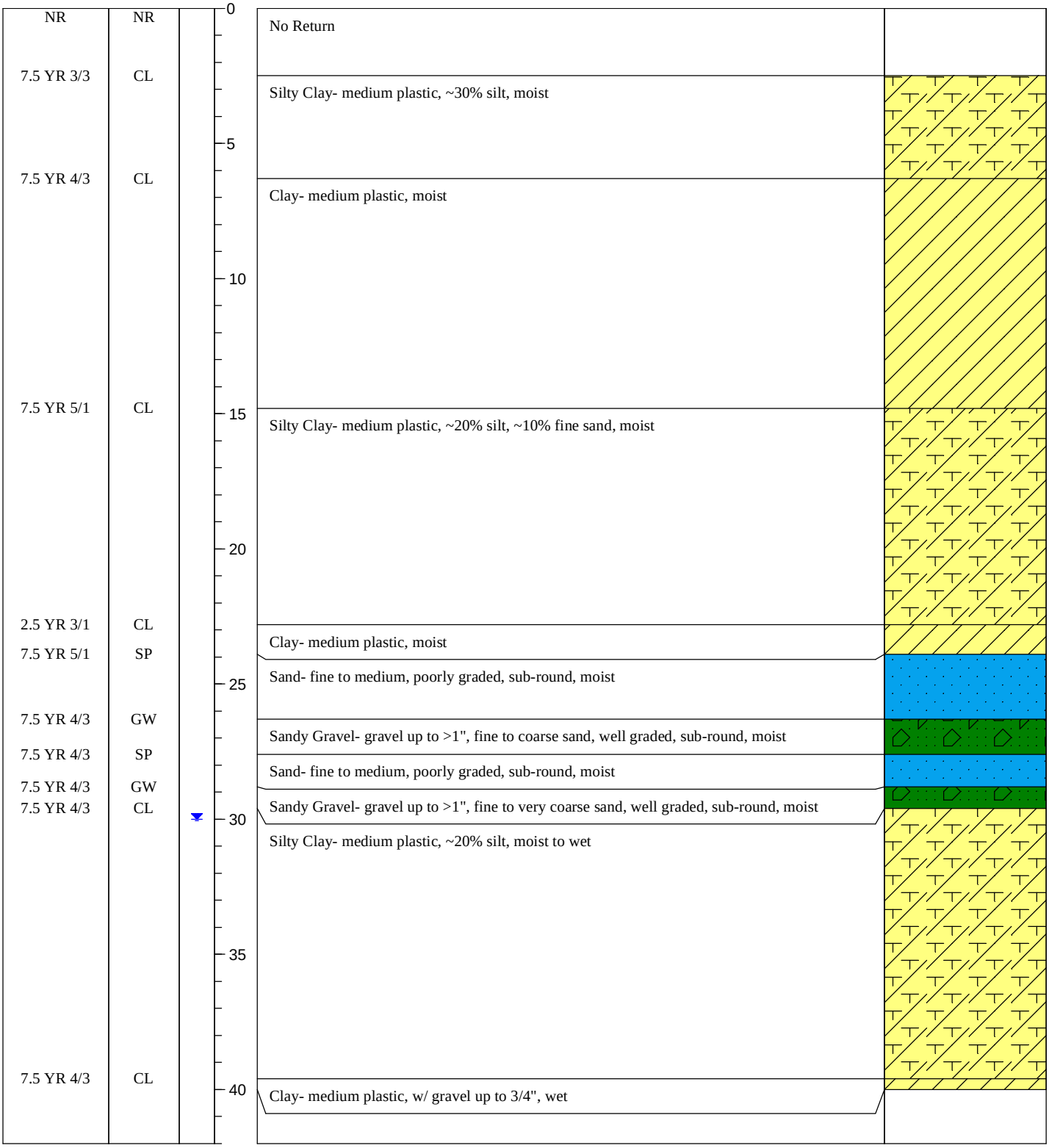
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Antone L. Gomes & Sons Dairy- 515 E. Stuhr Rd., Newman, CA 95360, Stanislaus Co.
Well Name:	ANT-SB3	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.33555/-121.02009*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/23/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	40

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 3/3	CL	Silty Clay- medium plastic, ~30% silt, moist
7.5 YR 4/3	CL	Clay- medium plastic, moist
7.5 YR 5/1	CL	Silty Clay- medium plastic, ~20% silt, ~10% fine sand, moist
2.5 YR 3/1	CL	Clay- medium plastic, moist
7.5 YR 5/1	SP	Sand- fine to medium, poorly graded, sub-round, moist
7.5 YR 4/3	GW	Sandy Gravel- gravel up to >1", fine to coarse sand, well graded, sub-round, moist
7.5 YR 4/3	SP	Sand- fine to medium, poorly graded, sub-round, moist
7.5 YR 4/3	GW	Sandy Gravel- gravel up to >1", fine to very coarse sand, well graded, sub-round, moist
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, moist to wet
7.5 YR 4/3	CL	Clay- medium plastic, w/ gravel up to 3/4", wet

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Bettencourt and Marson Dairy- 18128 American Ave., Hilmar, CA 95374, Merced Co.

Well Name: BET- SB1 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.416823/-120.816482* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/17/2014

Site Geologist: Charlie Jenkins Boring Depth (ft): 24

Color	USCS	Lithologic Description	Graphic Log
10 YR 6/4	SP	Sand- very fine to fine, ~10% fines, dry	
10 YR 7/2	ML	Silt- mottled, moist	
7.5 YR 7/2	SP	Sand- very fine to fine, ~10% fines, moist fine to medium wet	
10 YR 5/3	CL	Clay- medium plastic, moist	

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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Bettencourt and Marson Dairy- 18128 American Ave., Hilmar, CA 95374, Merced Co.

Well Name: BET- SB2 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.416860/-120.817597* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

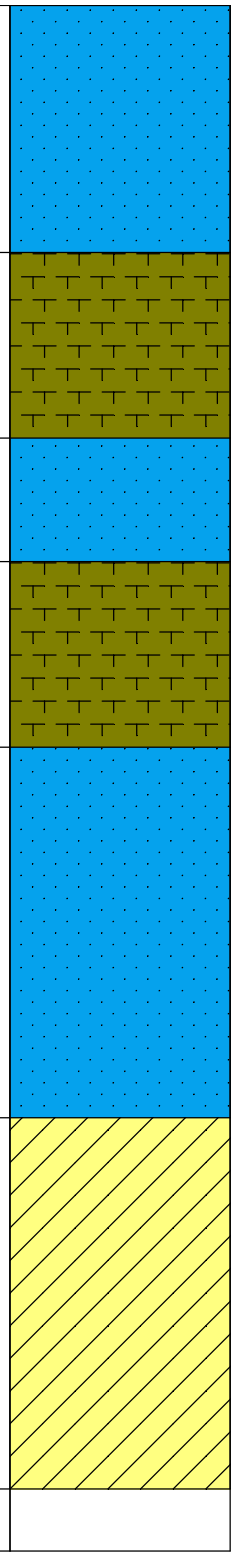
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/17/2014

Site Geologist: Charlie Jenkins Boring Depth (ft): 24

Color	USCS	Lithologic Description
10 YR 6/4	SP	Sand- very fine to fine, ~10% fines, dry
10 YR 7/2	ML	Silt- low plastic, moist
7.5 YR 7/2	SP	Sand- very fine to fine, ~10% fines, moist
10 YR 5/4	ML	Silt- low plastic, moist
7.5 YR 5/3	SP	Sand- fine to medium, moist wet
10 YR 6/3	CL	Clay- medium plastic, moist

Graphic Log



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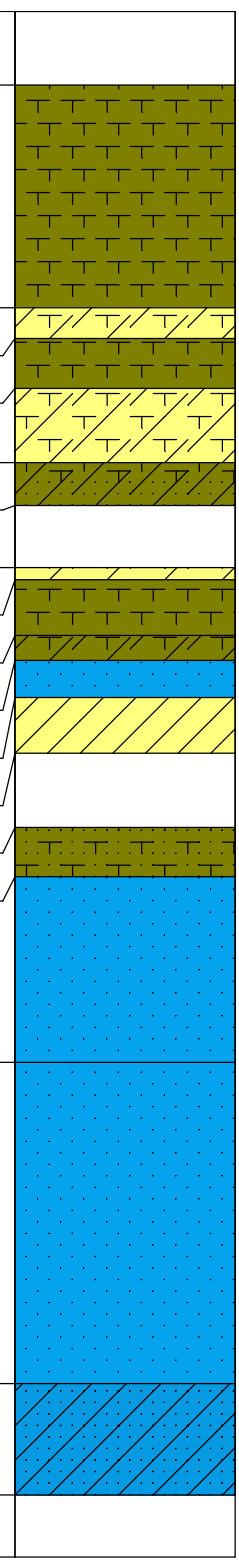
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Bettencourt and Marson Dairy- 18128 American Ave., Hilmar, CA 95374, Merced Co.
Well Name: BET- SB3 Drilling Method: Geoprobe Direct Push
Lat./Long.: 37.416389/-120.817778* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"
Driller: Josh Zwemke Drilling Date: 10/21/2014
Site Geologist: Jeanette Hummel Boring Depth (ft): 24

Color	USCS	Lithologic Description
NR	NR	No Return
10 YR 4/4	ML	Silt- dry
10 YR 5/3	OH	Silty Clay- medium plastic, oraganic material, ~25% silt, moist
10 YR 5/4	ML	Silt- dry
10 YR 4/4	CL	Silty Clay- medium plastic, mottled w/ oxidation, ~30% silt, dry
10 YR 5/4	ML	Sandy Clayey Silt- mottled w/ oxidation, ~25% medium plastic clay, ~10% fine sand, moist
NR	NR	No Return
10 YR 5/4	CL	Silty Clay- medium plastic, moist
10 YR 7/1	ML	Silt- mottled w/ oxidation, moist
10 YR 4/4	ML	Clayey Silt- mottled w/ oxidation, ~25% medium plastic clay, moist
10 YR 7/2 & 10 YR 3/6	SP	Sand- fine sand, poorly graded, sub-round to sub-angular, micaceous, moist
10 YR 4/6	CL	Clay- medium plastic, hard, mottled w/ oxidation
NR	NR	No Return
2.5 Y 5/2	ML	Sandy Silt- fine sand, moist
2.5 Y 7/2	SP	Sand- fine, poorly graded, wet
2.5 Y 7/2	SP	Sand- medium, poorly graded, wet
2.5 Y 6/1 & 2.5 Y 4/4	SC	Clayey Sand- medium, low plastic, wet

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Bettencourt and Marson Dairy- 18128 American Ave., Hilmar, CA 95374, Merced Co.

Well Name: BET- SB4 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.415556/-120.817778* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

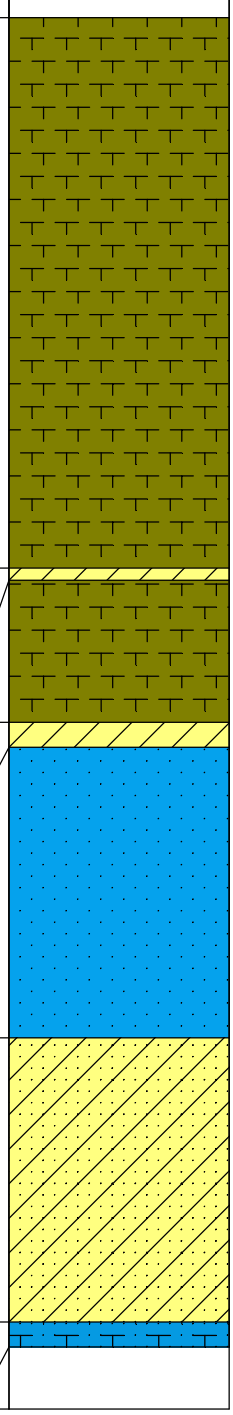
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/21/2014

Site Geologist: Jeanette Hummel Boring Depth (ft): 24

Color	USCS	Lithologic Description
NR	NR	No Return
10 YR 5/4	ML	Silt- increasing fine sand w/ depth, dry
10 YR 5/4	CL	Clay- medium plastic, soft, mottled w/ oxidation, damp
10 YR 5/6	ML	Silt- mottled w/ oxidation, moist
10 YR 5/3	CL	Clay- medium plastic, mottled w/ oxidation, moist
10 YR 7/3	SP	Sand- fine to medium, sub-angular to sub-round, moist
10 YR 5/4	CH	Sandy Clay- high plastic, mottled w/ oxidation, ~10% fine sand, wet
2.5 YR 5/4	SM	Silty Sand- fine to medium, ~20% silt, wet

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Bettencourt and Marson Dairy- 18128 American Ave., Hilmar, CA 95374, Merced Co.

Well Name: BET- SB5 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.415278/-120.817222* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

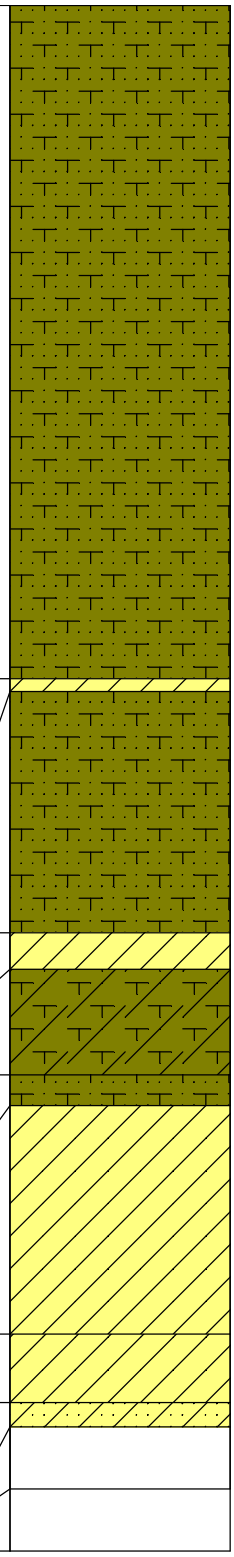
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/21/2014

Site Geologist: Jeanette Hummel Boring Depth (ft): 23

Color	USCS	Lithologic Description
10 YR 5/4	ML	Sandy Silt- ~25% very fine sand, dry
10 YR 6/3	CL	Clay- medium plastic, hard, moist
10 YR 5/4	ML	Sandy Silt- ~25% very fine sand, moist
2.5 Y 6/2	CL	Clay- medium plastic, hard, mottled w/ oxidation, moist
2.5 Y 5/3	ML	Clayey Silt- low plastic, wet
10 YR 5/3	ML	Sandy Silt- fine sand, wet
2.5 Y 5/2 & 10 YR 3/6	CL	Clay- medium plastic, mottled w/ oxidation, moist
2.5 Y 5/2	CH	Clay- high plastic, soft, moist
10 YR 5/3	CL	Sandy Clay- low to medium plastic, mottled w/ oxidation, fine to medium sand, wet
		Refusal at 23 ft

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Bettencourt and Marson Dairy- 18128 American Ave., Hilmar, CA 95374, Merced Co.

Well Name: BET- SB6 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.415278/-120.816389* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

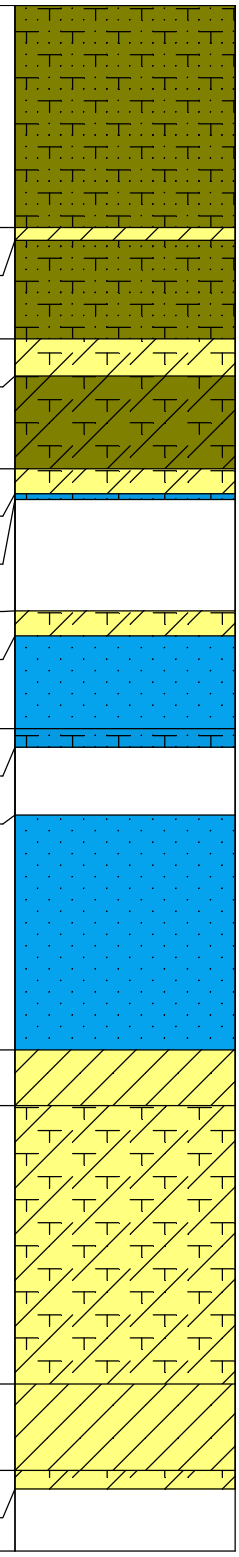
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/21/2014

Site Geologist: Jeanette Hummel Boring Depth (ft): 24

Color	USCS	Lithologic Description
10 YR 5/4	ML	Sandy Silt- ~25% very fine sand, dry
10 YR 5/4	CL	Clay- medium plastic, hard, dry
10 YR 5/4	ML	Sandy Silt- ~25% very fine sand, dry
10 YR 5/4	CL	Silty Clay- low plastic, dry
2.5 Y 5/4	ML	Clayey Silt- low plastic, dry
10 YR 5/4	CL	Silty Clay- low plastic, mottled w/ black streaks, dry
10 YR 5/4	SM	Silty Sand- very fine, dry
NR	NR	No Return
10 YR 4/4	CL	Silty Clay- low plastic, dry
10 YR 6/3	SP	Sand- fine to medium, poorly graded, mottled w/ oxidation, dry
10 YR 5/6	SM	Silty Sand- fine to medium, some low plastic clay streaks, dry
NR	NR	No Return
2.5 Y 7/3	SP	Sand- fine, poorly graded, moist
2.5 Y 5/3	CL	Clay- medium plastic, moist
10 YR 6/3	CL	Silty Clay- low plastic, mottled w/ oxidation, wet
2.5 Y 5/3	CH	Clay- high plastic, hard, mottled w/ oxidation, wet
10 YR 4/4	CL	Silty Clay- medium plastic, hard, mottled w/ oxidation, wet

Graphic Log



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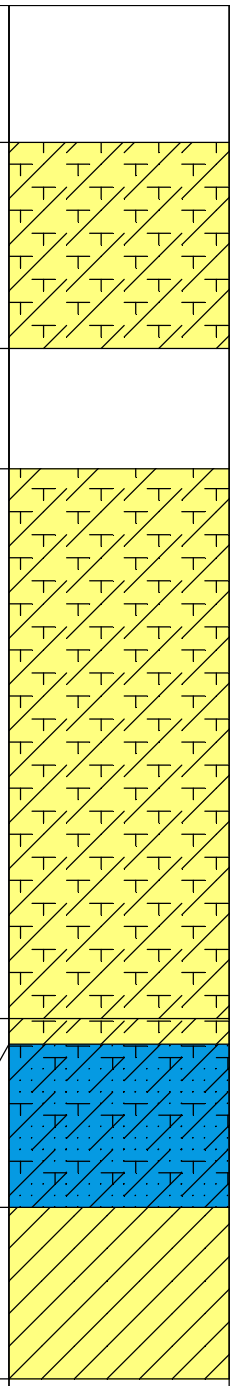
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Correia Family Dairy Farms- 26380 W. Fahey Rd., Gustine, CA 95322, Merced Co.
Well Name:	COR-SB1	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.12647/-120.96472*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/23/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	16

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, damp
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, moist
7.5 YR 4/3	CL	Silty Clay- ~20% silt, ~10% fine sand, moist to wet
7.5 YR 4/3	SC/SM	Clayey Silty Sand- fine, ~30% silt, ~20% clay, wet
7.5 YR 4/3	CL	Clay- medium plastic, wet

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 | Site: Correia Family Dairy Farms- 26380 W. Fahey Rd., Gustine, CA 95322, Merced Co.

Well Name: COR-SB2 | Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.12743/-120.96466* | Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

Drilled By: EnProbe Drilling | Borehole Diameter: 2.25"

Driller: Josh Zwemke | Drilling Date: 10/24/2014

Site Geologist: Wesley Andrews | Boring Depth (ft): 16

Color	USCS	Lithologic Description	Graphic Log
NR	NR	No Return	
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~40% silt, damp to moist	
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, ~10% sand, moist	
7.5 YR 4/3	SM	Silty Sand- ~40% silt, moist	
7.5 YR 4/3	SP	Sand- fine, ~10% silt, moist	
	SW	Sand- fine to coarse, well graded, sub-round, w/ small gravel, wet	
	SW	Sand- fine to coarse, well graded, sub-round	
7.5 YR 4/3	CL	Clay- medium plastic	

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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Correia Family Dairy Farms- 26380 W. Fahey Rd., Gustine, CA 95322, Merced Co.
Well Name:	COR-SB3	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.12853/-120.96459*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/24/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	16

Color	USCS	Lithologic Description	Graphic Log
NR	NR	No Return	
7.5 YR 3/3	CL	Silty Clay- medium plastic, ~30% silt, moist	
7/5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, moist	
7/5 YR 4/3	CL	Clay- medium plastic, hard, crumbly, damp	
7/5 YR 4/3	SM	Silty Sand- fine, sub-round, ~40% silt, moist to wet	
7/5 YR 4/3	ML	Silt- ~10% clay, wet	

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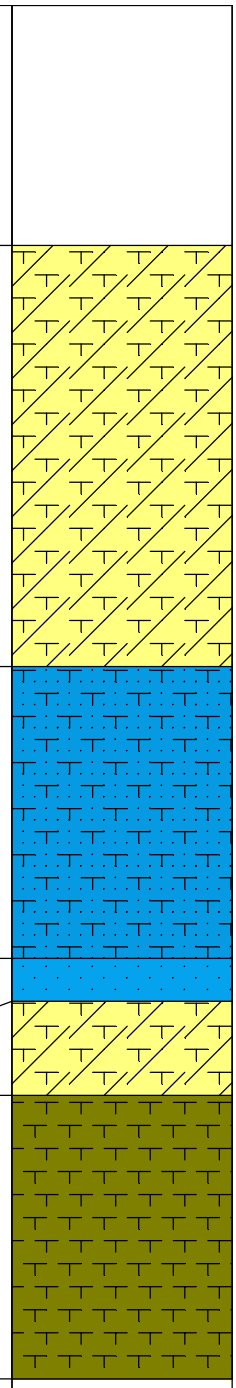
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Correia Family Dairy Farms- 26380 W. Fahey Rd., Gustine, CA 95322, Merced Co.
Well Name:	COR-SB4	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.12938/-120.96552*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/24/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	16

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/2	CL	Silty Clay- medium plastic, ~20% silt, moist
7/5 YR 4/3	SM	Silty Sand- fine, ~30% silt, moist
	SP	Sand- fine to medium, poorly graded, sub-round, moist to wet
7/5 YR 4/3	CL	Silty Clay- low plastic, ~30% silt, wet
7/5 YR 4/3	ML	Silt- ~10% clay, ~10% sand, wet

Graphic Log



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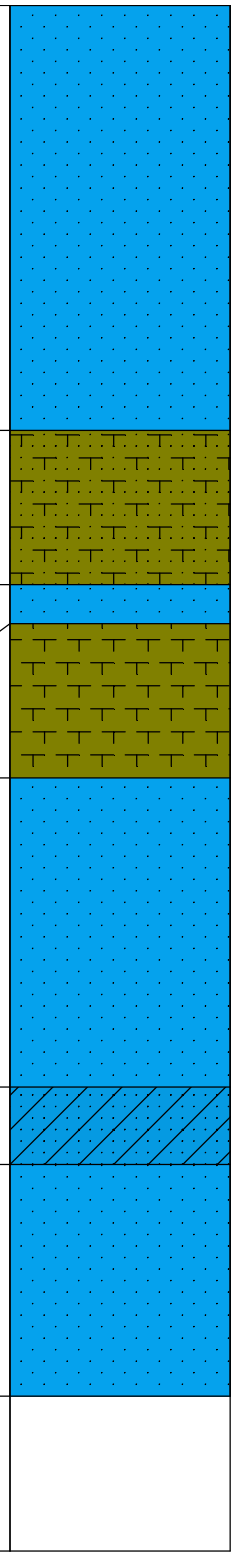
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Cottonwood Dairy- 10561 Highway 140, Atwater, CA 95301, Merced Co.
Well Name:	COT-SB1	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.293291/-120.672555*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/16/2014
Site Geologist:	Charlie Jenkins	Boring Depth (ft):	36

Color	USCS	Lithologic Description
7.5 YR 5/2	SP	Sand- very fine to fine, ~10% fines, dry
7.5 YR 6/3	ML	Sandy Silt- micaceous, ~30% very fine sand, moist
5 YR 7/1	SP	Sand- fine to medium, micaceous, poorly graded, moist
7.5 YR 6/4	ML	Silt- light brown w/ brown mottling, micaceous, moist
7.5 YR 7/1	SW	Sand- very fine to medium, micaceous, moderately graded, ~10 % fines, moist
10 YR 5/3	SC	Clayey Sand- very fine to fine, micaceous, ~20% fines, wet
7.5 YR 5/3	SW	Sand- very fine to medium, micaceous, moderately graded, ~10% fines, wet

Graphic Log



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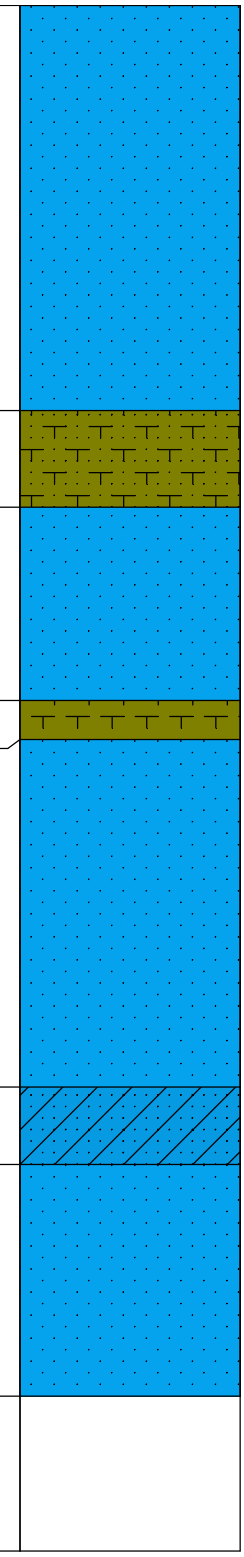
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Cottonwood Dairy- 10561 Highway 140, Atwater, CA 95301, Merced Co.
Well Name:	COT-SB2	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.293177/-120.671348*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/17/2014
Site Geologist:	Charlie Jenkins	Boring Depth (ft):	36

Color	USCS	Lithologic Description
7.5 YR 5/2	SP	Sand- very fine to fine, poorly graded, ~10% fines, dry moist
7.5 YR 6/3	ML	Sandy Silt- ~30% very fine sand, moist
7.5 YR 7/1	SW	Sand- very fine to medium, micaceous, moderately graded, moist
7.5 YR 5/2	ML	Silt- micaceous, moist
7.5 YR 7/1	SW	Sand- very fine to medium, micaceous, moderately graded, ~10% fines, moist
7.5 YR 5/3	SC	Clayey Sand- very fine to fine, micaceous, ~20% fines, wet
7.5 YR 4/4	SW	Sand- very fine to medium, micaceous, moderately graded, ~10% fines, wet

Graphic Log



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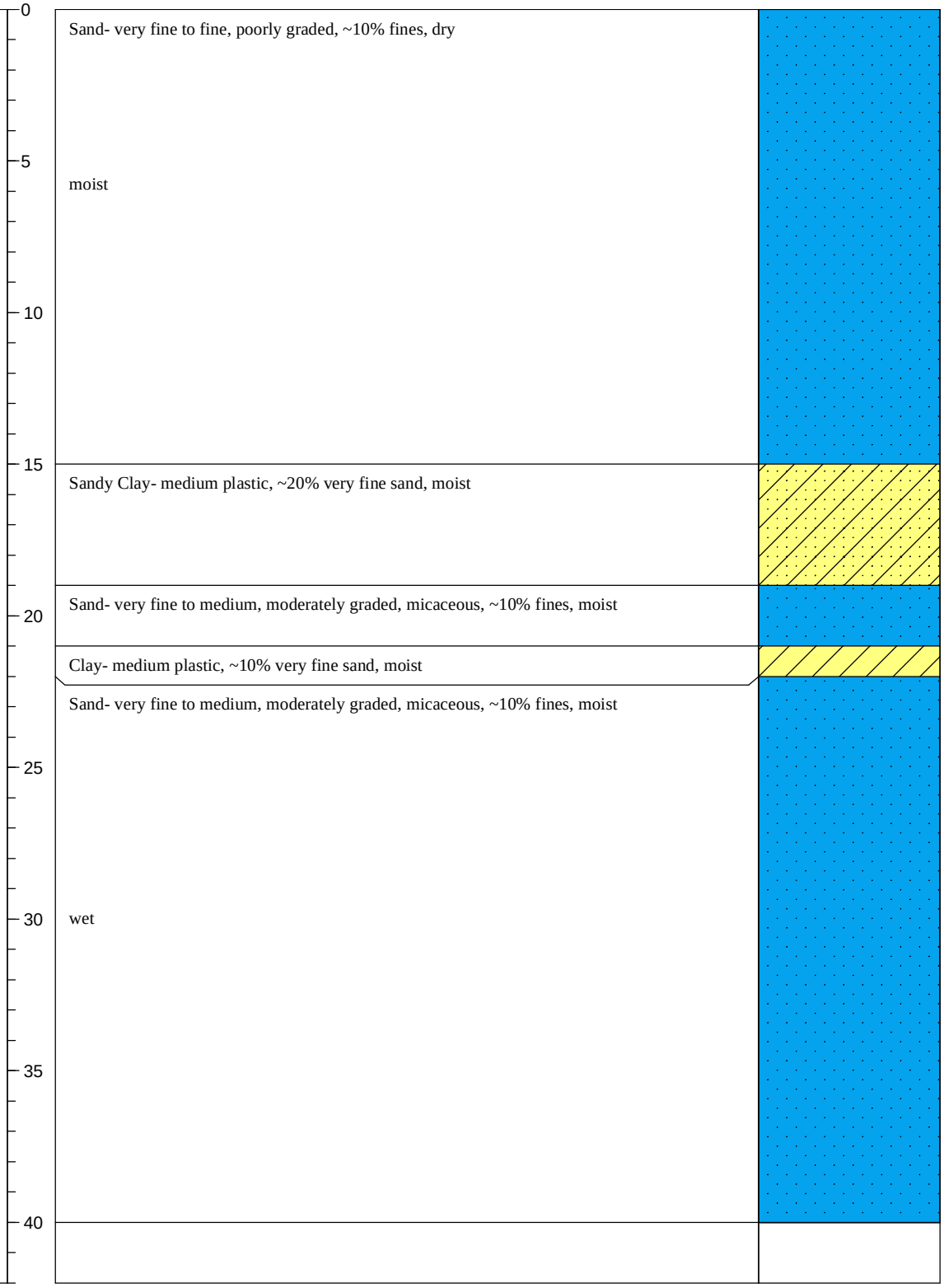
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Cottonwood Dairy- 10561 Highway 140, Atwater, CA 95301, Merced Co.
Well Name:	COT-SB3	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.292666/-120.671508*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/17/2014
Site Geologist:	Charlie Jenkins	Boring Depth (ft):	40

Color	USCS	Lithologic Description
7.5 YR 5/2	SP	Sand- very fine to fine, poorly graded, ~10% fines, dry moist
7.5 YR 5/3	CL	Sandy Clay- medium plastic, ~20% very fine sand, moist
7.5 YR 6/2	SW	Sand- very fine to medium, moderately graded, micaceous, ~10% fines, moist
10 YR 4/4	CL	Clay- medium plastic, ~10% very fine sand, moist
7.5 YR 7/1	SW	Sand- very fine to medium, moderately graded, micaceous, ~10% fines, moist wet
10 YR 4/4	SW	



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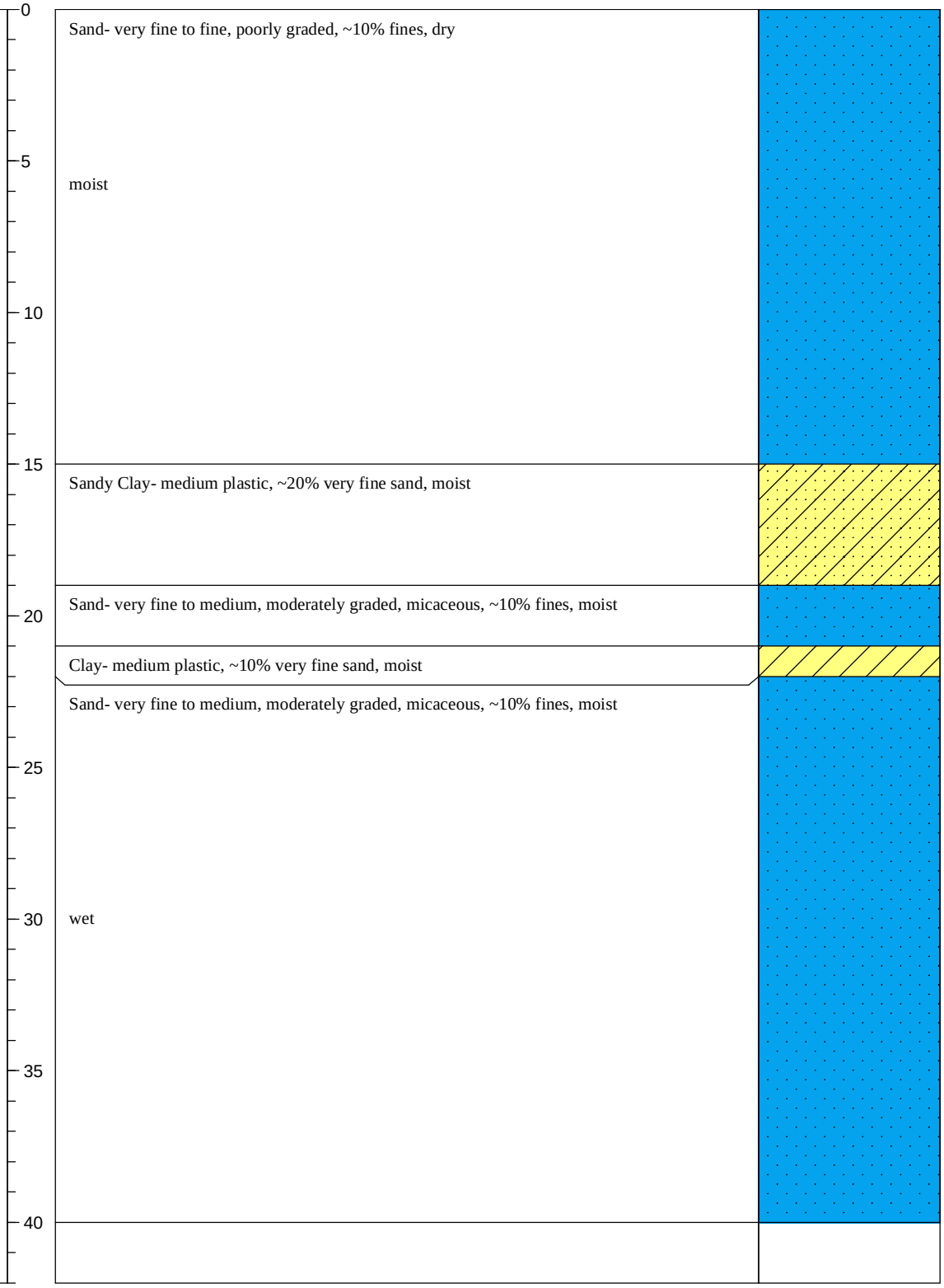
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Cottonwood Dairy- 10561 Highway 140, Atwater, CA 95301, Merced Co.
Well Name:	COT-SB4	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.292566/-120.672998*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/17/2014
Site Geologist:	Charlie Jenkins	Boring Depth (ft):	40

Color	USCS	Lithologic Description
7.5 YR 5/2	SP	Sand- very fine to fine, poorly graded, ~10% fines, dry moist
7.5 YR 5/3	CL	Sandy Clay- medium plastic, ~20% very fine sand, moist
7.5 YR 6/2	SW	Sand- very fine to medium, moderately graded, micaceous, ~10% fines, moist
10 YR 5/3	CL	Clay- medium plastic, ~10% very fine sand, moist
7.5 YR 7/1	SW	Sand- very fine to medium, moderately graded, micaceous, ~10% fines, moist wet
10 YR 4/4	SW	



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Frank J. Gomes Dairy #1- 5301 N. DeAngelis Rd., Stevinson, CA 95374, Merced Co.

Well Name: FG1-SB1 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.360833/-120.933889* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/21/2014

Site Geologist: Jeanette Hummel Boring Depth (ft): 20

Color	USCS	Lithologic Description	Graphic Log
NR	NR	No Return	
10 YR 4/3	OL	Clay- low plastic, organic material, damp	
10 YR 4/4	CL	Silty Clay- low plastic, ~15% silt, damp	
10 YR 6/3	CL	Silty Clay- low plastic, crumbly, damp	
10 YR 4/4	OL	Silty Clay- low plastic, organic material, ~15% silt, damp	
2.5 Y 6/2	CL	Clay- low to medium plastic, hard, mottled w/ oxidation, ~10% silt, damp	
NR	NR	No Return	
2.5 Y 6/2	SP	Sand- fine to medium, poorly graded, wet	

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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Frank J. Gomes Dairy #1- 5301 N. DeAngelis Rd., Stevinson, CA 95374, Merced Co.

Well Name: FG1-SB2 Drilling Method: Geoprobe Direct Push

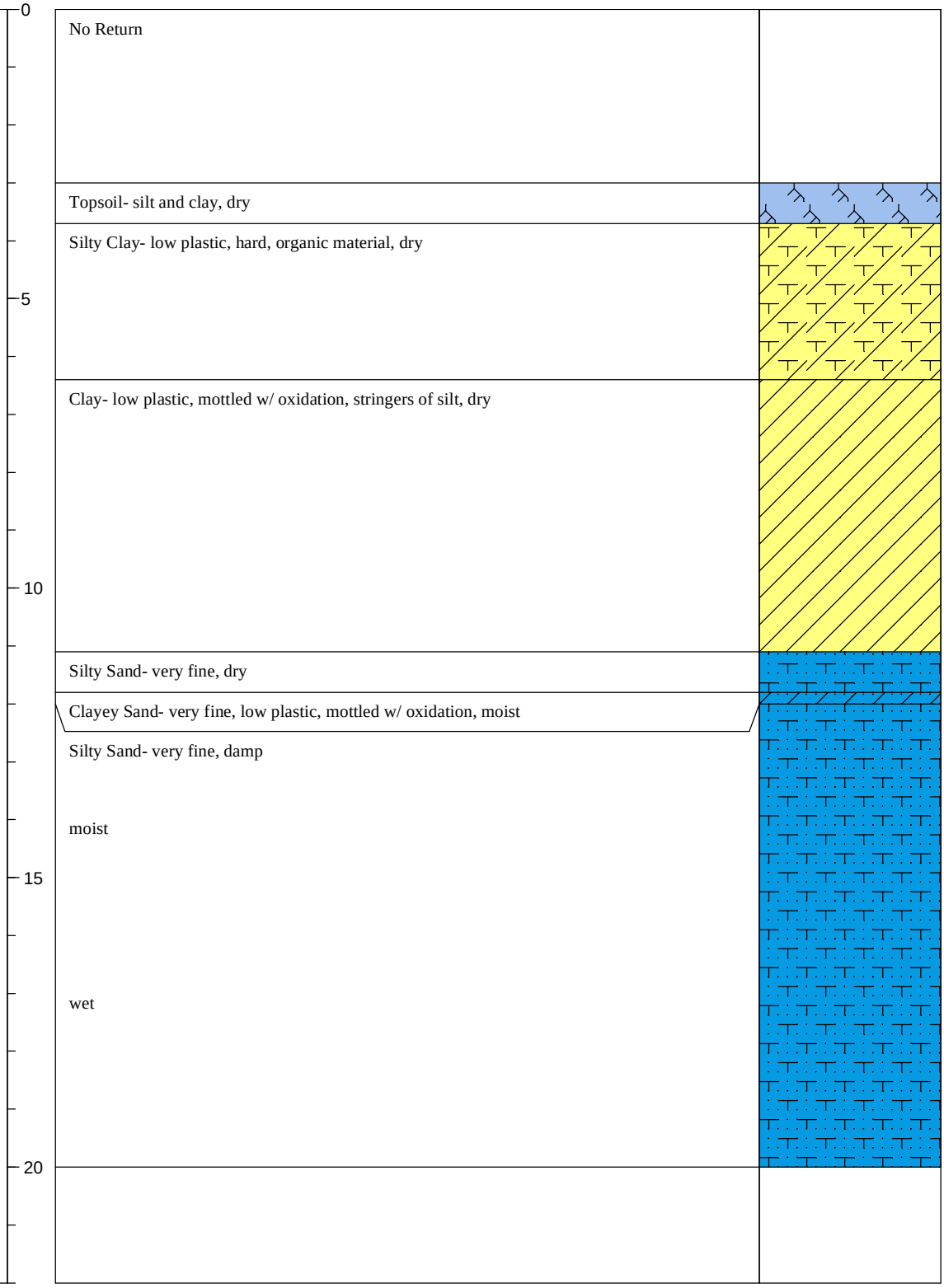
Lat./Long.: 37.360833/-120.934722* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/21/2014

Site Geologist: Jeanette Hummel Boring Depth (ft): 20

Color	USCS	Lithologic Description
NR	NR	No Return
2.5 Y 6/2		Topsoil- silt and clay, dry
7.5 YR 4/4	OL	Silty Clay- low plastic, hard, organic material, dry
2.5 Y 6/2	CL	Clay- low plastic, mottled w/ oxidation, stringers of silt, dry
2.5 Y 6/3	SM	Silty Sand- very fine, dry
2.5 Y 5/3	SC	Clayey Sand- very fine, low plastic, mottled w/ oxidation, moist
2.5 Y 6/3	SM	Silty Sand- very fine, damp
		moist
		wet



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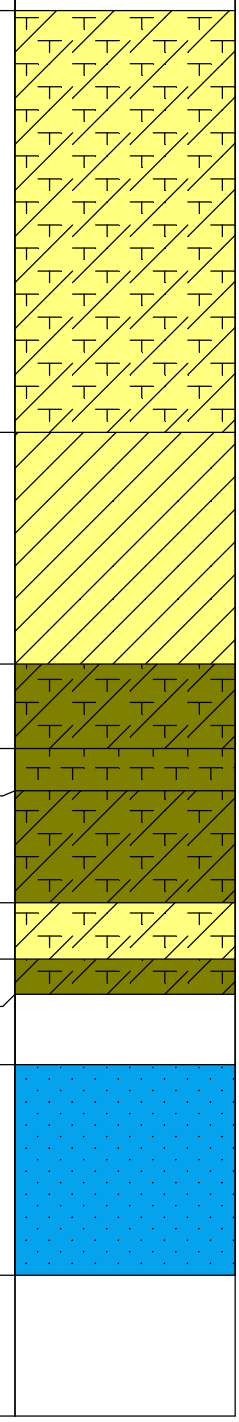
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Frank J. Gomes Dairy #1- 5301 N. DeAngelis Rd., Stevinson, CA 95374, Merced Co.
Well Name:	FG1-SB3	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.361111/-120.935*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/22/2014
Site Geologist:	Jeanette Hummel	Boring Depth (ft):	20

Color	USCS	Lithologic Description
NR	NR	No Return
2.5 Y 5/3	CL	Silty Clay- low plastic, mottled w/ oxidation, ~15% silt, dry
10 YR 3/3	CL	~20% silt, damp
2.5 Y 4/4	CL	
5 Y 5/2	CL	Clay- low plastic, mottled w/ oxidation, ~10% silt, damp
2.5 Y 5/3	ML	Clayey Silt- low plastic, moist
2.5 Y 5/3	ML	Silt- moist
5 Y 4/2	ML	Clayey Silt- low plastic, soft, mottled w/ oxidation, moist
5 Y 5/2	CL	Silty Clay- low plastic, hard, mottled w/ oxidation, ~15% silt, moist
Gley1 5/5 GY	ML	Clayey Silt- low plastic, ~15%, damp
NR	NR	No Return
2.5 Y 5/1	SP	Sand- fine to medium, poorly graded, wet

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Frank J. Gomes Dairy #1- 5301 N. DeAngelis Rd., Stevinson, CA 95374, Merced Co.

Well Name: FG1-SB4 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.361667/-120.934722* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

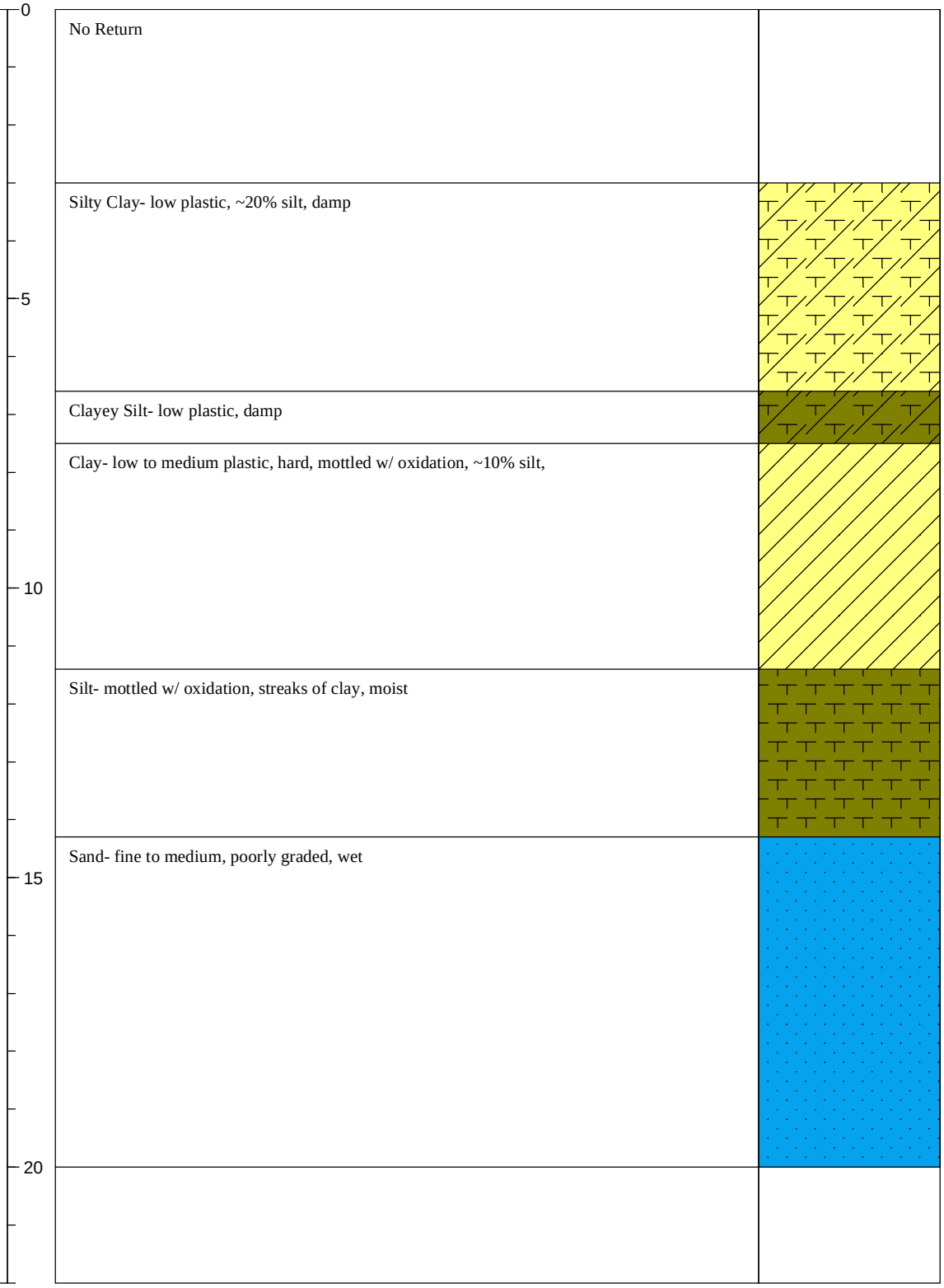
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/22/2014

Site Geologist: Jeanette Hummel Boring Depth (ft): 20

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/4	CL	Silty Clay- low plastic, ~20% silt, damp
2.5 Y 5/4	CL	
10 YR 4/4	ML	Clayey Silt- low plastic, damp
2.5 Y 6/2	CL	Clay- low to medium plastic, hard, mottled w/ oxidation, ~10% silt,
2.5 Y 5/3	ML	Silt- mottled w/ oxidation, streaks of clay, moist
5 Y 5/1	SP	Sand- fine to medium, poorly graded, wet

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Frank J. Gomes Dairy #1- 5301 N. DeAngelis Rd., Stevinson, CA 95374, Merced Co.

Well Name: FG1-SB5 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.361667/-120.934167* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

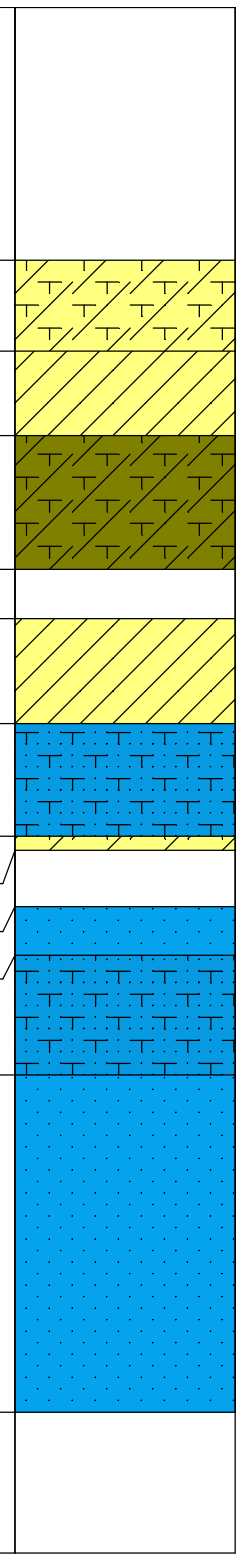
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/22/2014

Site Geologist: Jeanette Hummel Boring Depth (ft): 20

Color	USCS	Lithologic Description
NR	NR	No Return
10 YR 5/3	OL	Silty Clay- low plastic, organic material, dry
Gley1 3/10 Y	CL	Clay- low plastic, ~10% silt, damp
Gley1 3/10 GY	ML	Clayey Silt- low plastic, damp
NR	NR	No Return
Gley1 5/5 GY	CL	Clay- low to medium plastic, mottled w/ black, damp
Gley1 5/10 Y	SM	Silty Sand- fine to medium
Gley1 5/10 Y	CL	Silty Clay- low plastic, ~25% silt, damp
NR	NR	No Return
Gley1 6/10 Y	SP	Sand- fine to medium, poorly graded, damp
Gley1 4/5 GY	SM	Silty Sand- fine to medium, ~25% silt, wet
Gley1 5/10 Y	SP	Sand- fine to medium, poorly graded, wet

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Frank J. Gomes Dairy #2- 890 Kniebes Rd., Gustine, CA 95322, Merced Co.
Well Name:	FG2-SB1	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.27690/-120.97938*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/23/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	20

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/2	CL	Silty Clay- medium plastic, ~30 % silt, moist
NR	NR	No Return
7.5 YR 2.5/1	CL	Silty Clay- ~20% silt, moist
7.5 YR 4/3	CL	moist to wet
7.5 YR 4/3	CL	Silty Clay- ~20% silt, ~10% sand, wet
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, wet
7.5 YR 4/3	SP	Sand- fine to medium, poorly graded, sub-round, wet
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, wet

Graphic Log

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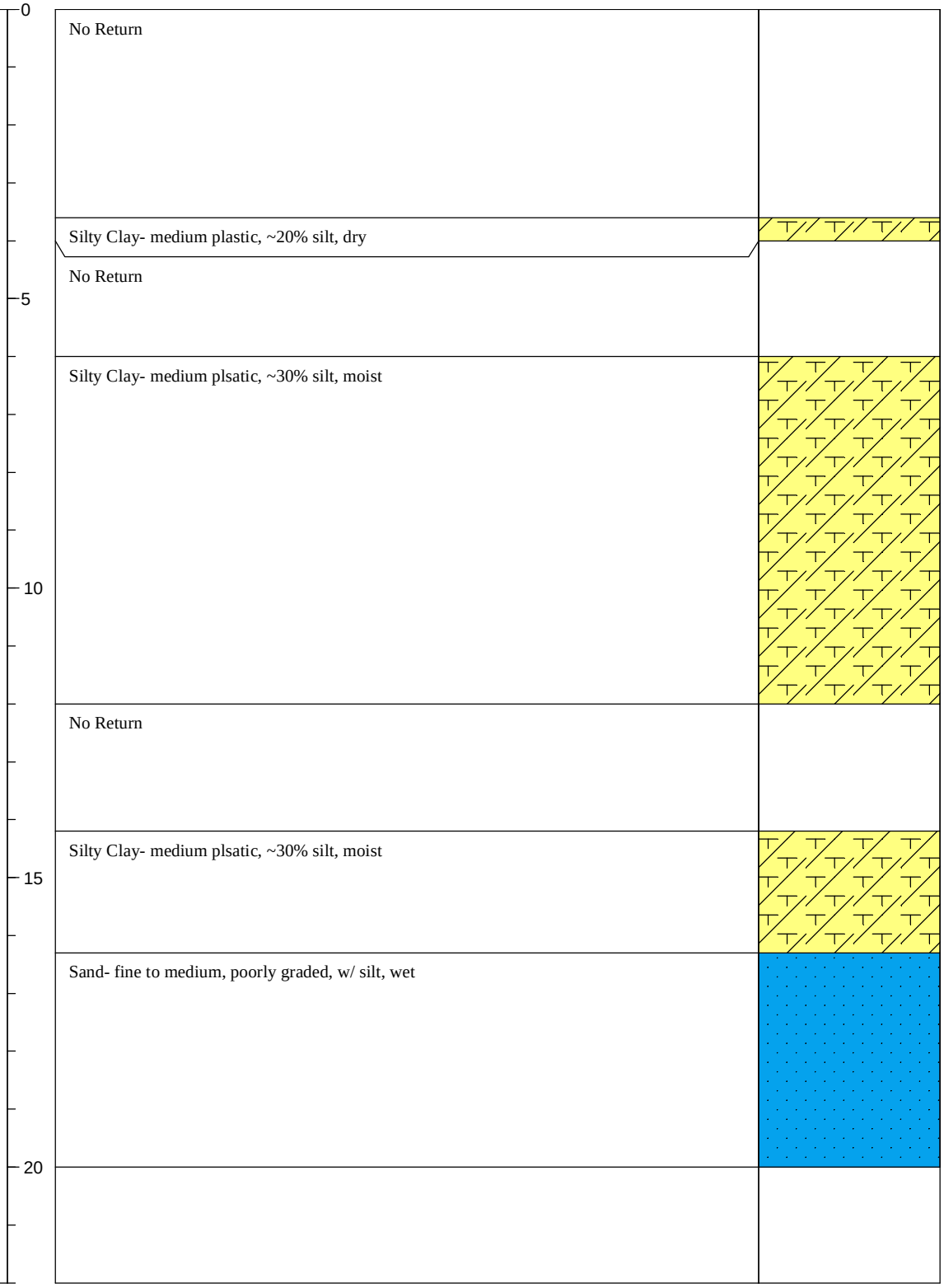
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Frank J. Gomes Dairy #2- 890 Kniebes Rd., Gustine, CA 95322, Merced Co.
Well Name:	FG2-SB2	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.27757/-120.97770*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/23/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	20

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 5/4	CL	Silty Clay- medium plastic, ~20% silt, dry
NR	NR	No Return
7.5 YR 5/4	CL	Silty Clay- medium plsatic, ~30% silt, moist
7.5 YR 2.5/1	CL	
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- medium plsatic, ~30% silt, moist
	SP	Sand- fine to medium, poorly graded, w/ silt, wet

Graphic Log



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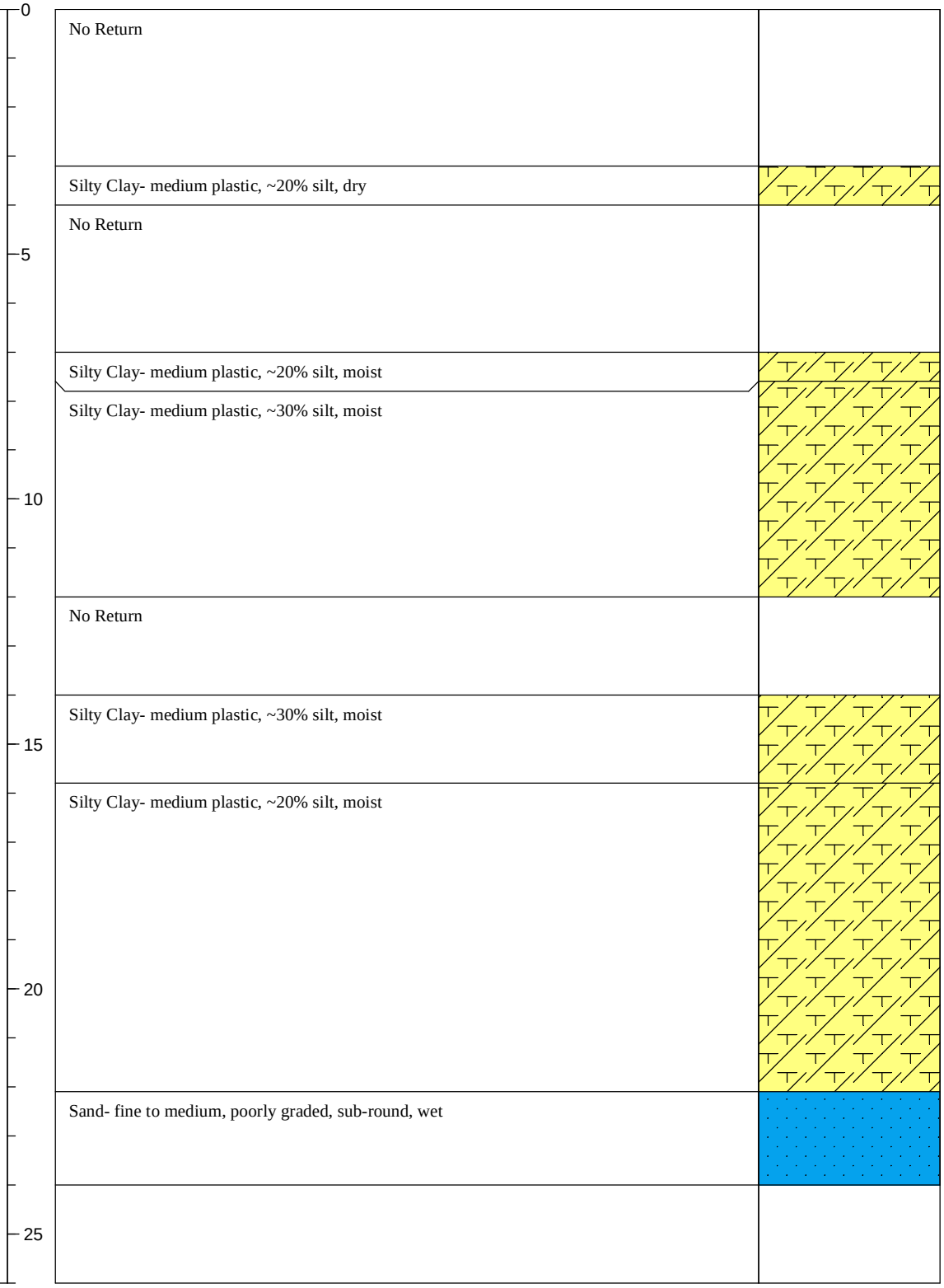
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Frank J. Gomes Dairy #2- 890 Kniebes Rd., Gustine, CA 95322, Merced Co.
Well Name:	FG2-SB3	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.27892/-120.97823*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/23/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	24

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, dry
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, moist
7.5 YR 2.5/1	CL	Silty Clay- medium plastic, ~30% silt, moist
NR	NR	No Return
7.5 YR 2.5/1	CL	Silty Clay- medium plastic, ~30% silt, moist
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, moist
7.5 YR 4/3	SP	Sand- fine to medium, poorly graded, sub-round, wet

Graphic Log



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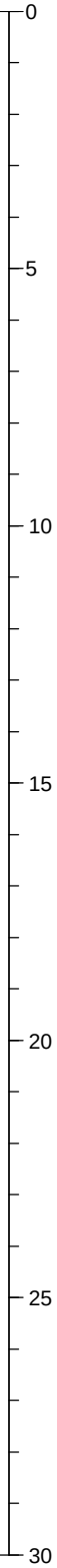
*Measurement from Handheld GPS Unit

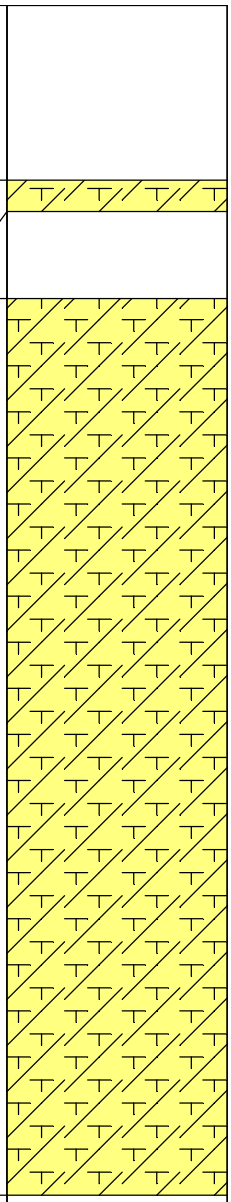
Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Frank J. Gomes Dairy #2- 890 Kniebes Rd., Gustine, CA 95322, Merced Co.
Well Name:	FG2-SB4	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.27972/-120.97880*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/23/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	28

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~30% silt, dry
NR	NR	No Return
7.5 YR 4/4	CL	Silty Clay- medium plastic, ~20-30% silt, moist
7.5 YR 2.5/1	CL	
7.5 YR 4/3	CL	
7.5 YR 4/3	CL	Silty Sandy Clay- medium plastic, ~20% sand, ~20% silt, moist to wet
7.5 YR 4/3	SP	Sand- fine to medium, poorly graded, sub-round, wet
7.5 YR 4/3	SW	Sand- fine to coarse, well graded, sub-round, w/ gravel up to 3/4", wet

Graphic Log





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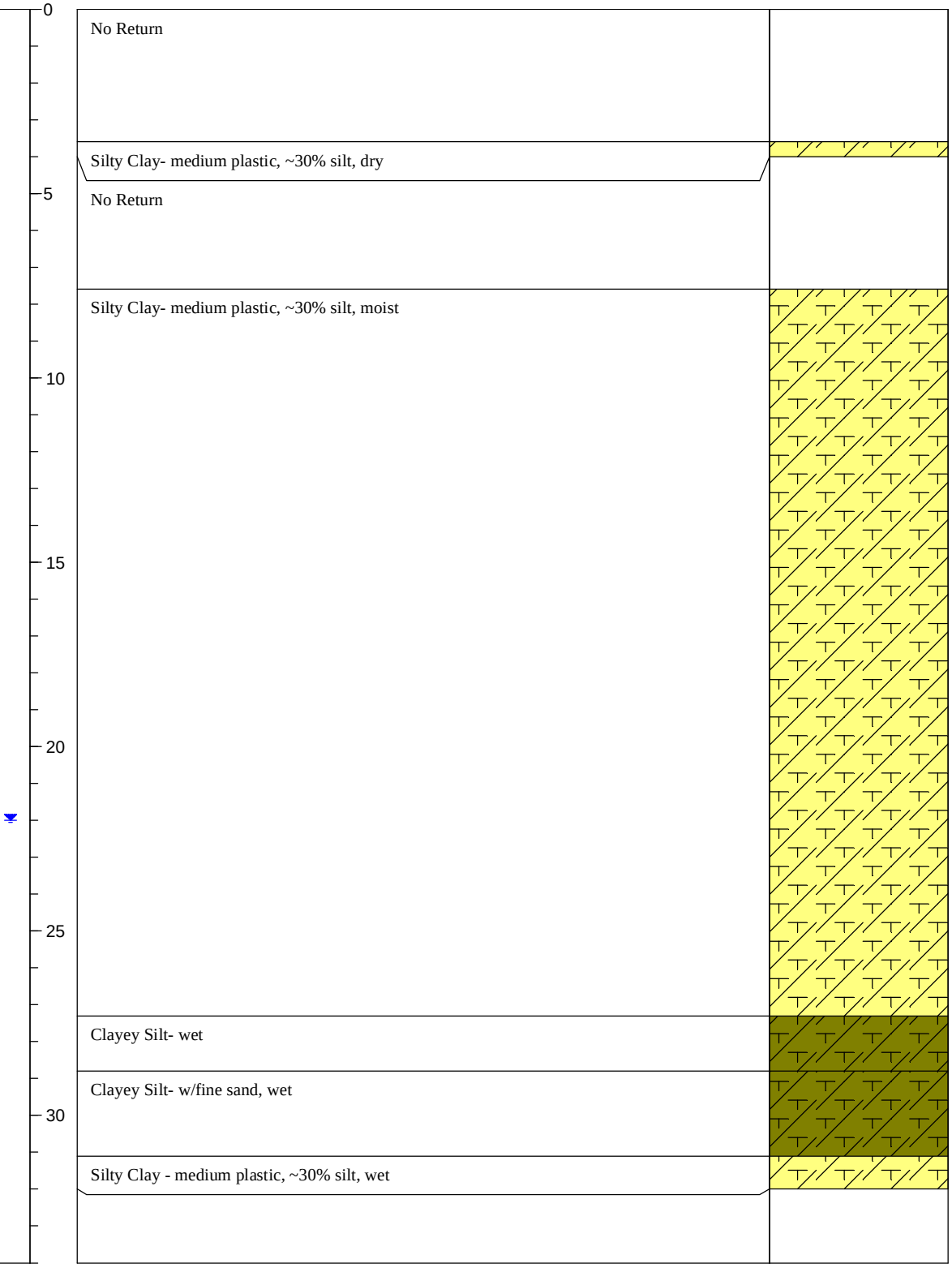
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Frank J. Gomes Dairy #2- 890 Kniebes Rd., Gustine, CA 95322, Merced Co.
Well Name:	FG2-SB5	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.28059/-120.98038*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/23/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	32

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~30% silt, dry
NR	NR	No Return
7.5 YR 2.5/1	CL	Silty Clay- medium plastic, ~30% silt, moist
7.5 YR 3/3	CL	
7.5 YR 4/4	ML	Clayey Silt- wet
7.5 YR 4/4	ML	Clayey Silt- w/fine sand, wet
7.5 YR 3/4	CL	Silty Clay - medium plastic, ~30% silt, wet

Graphic Log



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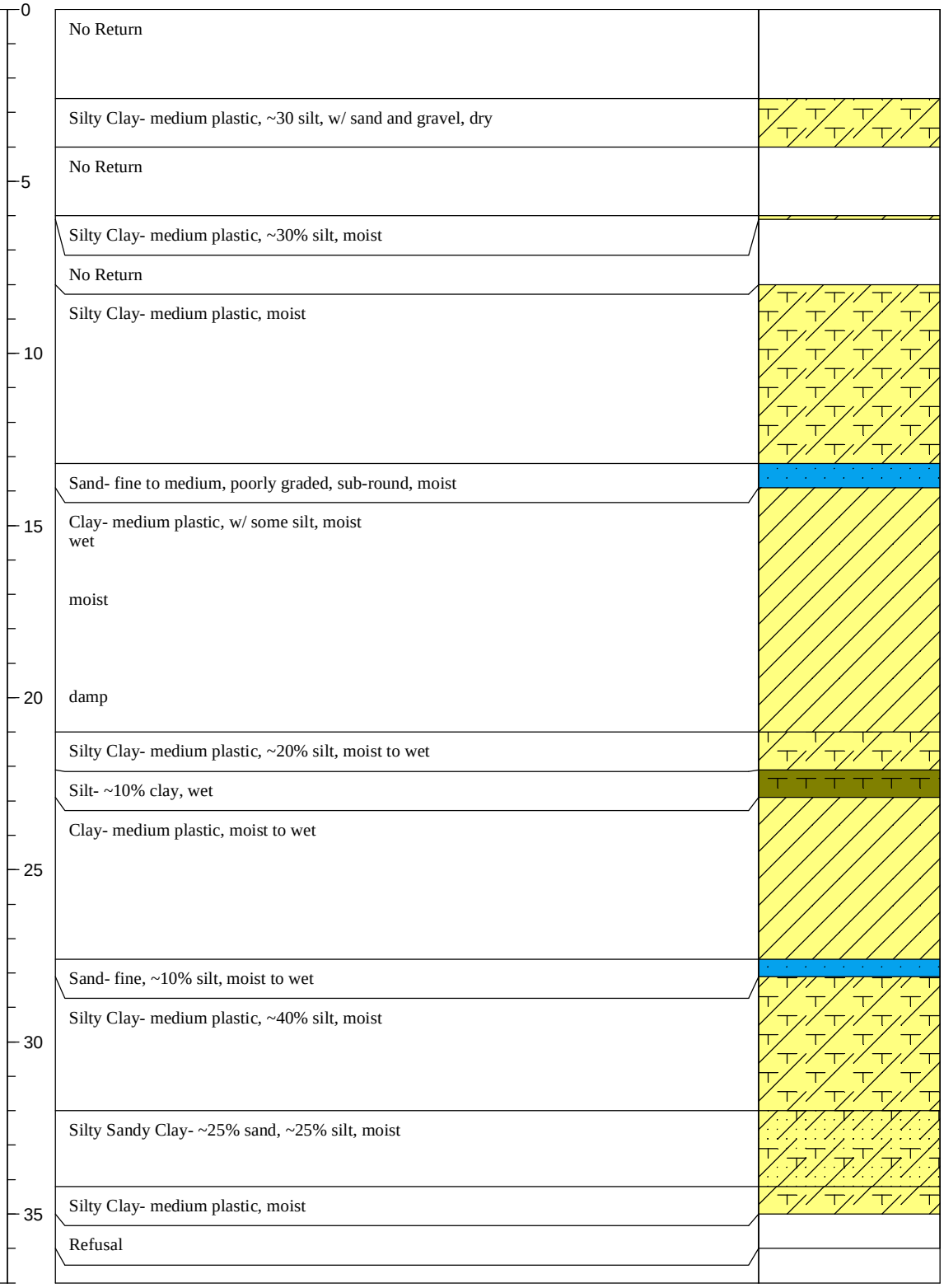
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Godinho Dairy- 12710 S. Wilson Rd., Los Banos, CA 93635, Merced Co.
Well Name:	GOD-SB1	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.10841/-120.86620*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/24/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	35

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 5/2	CL	Silty Clay- medium plastic, ~30 silt, w/ sand and gravel, dry
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~30% silt, moist
NR	NR	No Return
7.5 YR 2.5/1	CL	Silty Clay- medium plastic, moist
7.5 YR 2.5/1	SP	Sand- fine to medium, poorly graded, sub-round, moist
7.5 YR 2.5/1	CL	Clay- medium plastic, w/ some silt, moist
		wet
7.5 YR 4/3	CL	moist
		damp
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~20% silt, moist to wet
7.5 YR 4/3	ML	Silt- ~10% clay, wet
7.5 YR 4/3	CL	Clay- medium plastic, moist to wet
7.5 YR 4/3	CL	
7.5 YR 4/3	SP	Sand- fine, ~10% silt, moist to wet
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~40% silt, moist
7.5 YR 4/3	CL	Silty Sandy Clay- ~25% sand, ~25% silt, moist
7.5 YR 4/3	CL	Silty Clay- medium plastic, moist
		Refusal

Graphic Log



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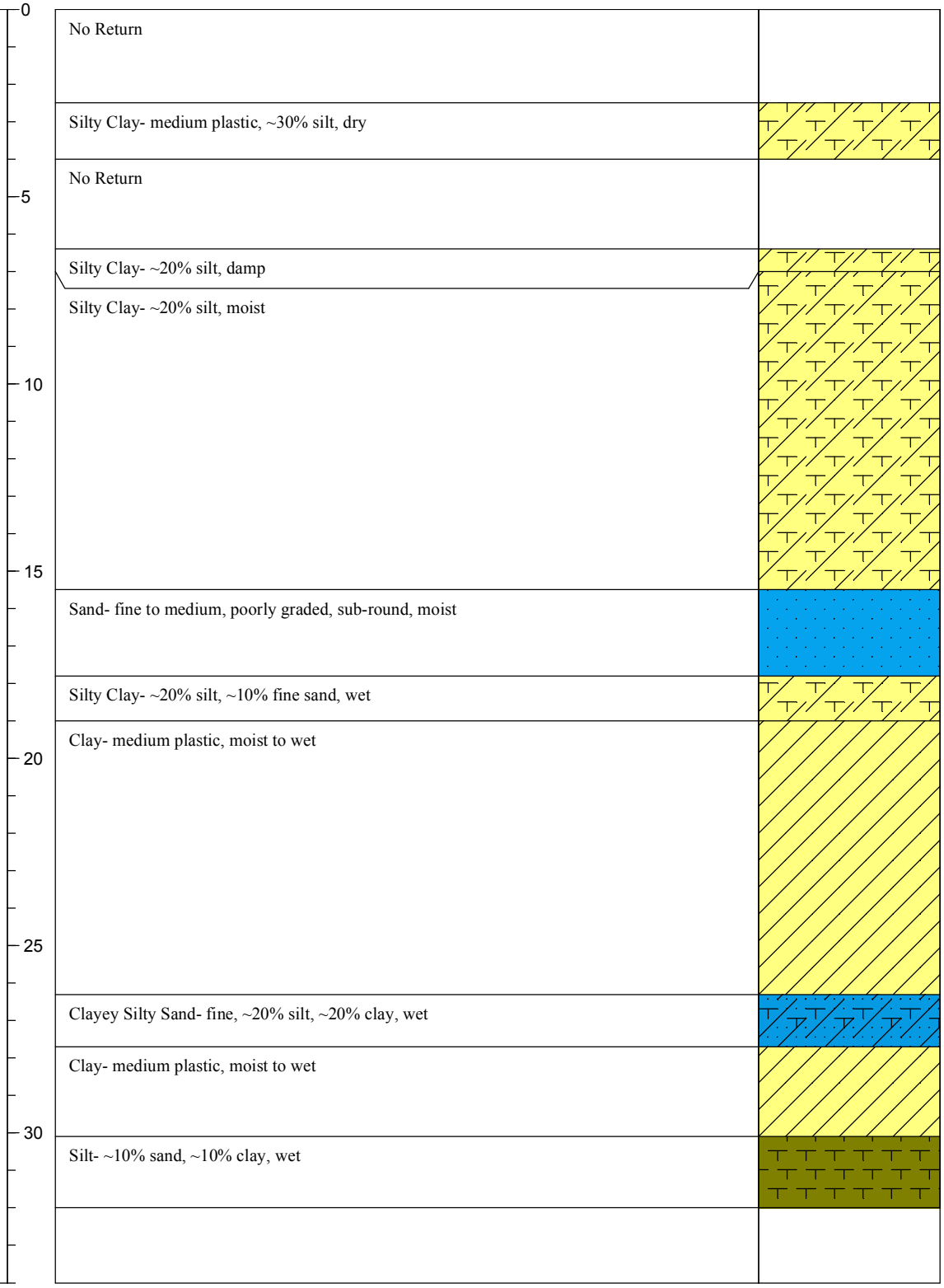
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Godinho Dairy- 12710 S. Wilson Rd., Los Banos, CA 93635, Merced Co.
Well Name:	GOD-SB2	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.10839/-120.86480*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/24/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	32

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/2	CL	Silty Clay- medium plastic, ~30% silt, dry
NR	NR	No Return
7.5 YR 3/3	CL	Silty Clay- ~20% silt, damp
7.5 YR 2.5/1	CL	Silty Clay- ~20% silt, moist
7.5 YR 2.5/1	SP	Sand- fine to medium, poorly graded, sub-round, moist
7.5 YR 3/1	CL	Silty Clay- ~20% silt, ~10% fine sand, wet
7.5 YR 4/6	CL	Clay- medium plastic, moist to wet
7.5 YR 4/4	SM/SC	Clayey Silty Sand- fine, ~20% silt, ~20% clay, wet
7.5 YR 4/6	CL	Clay- medium plastic, moist to wet
	ML	Silt- ~10% sand, ~10% clay, wet

Graphic Log



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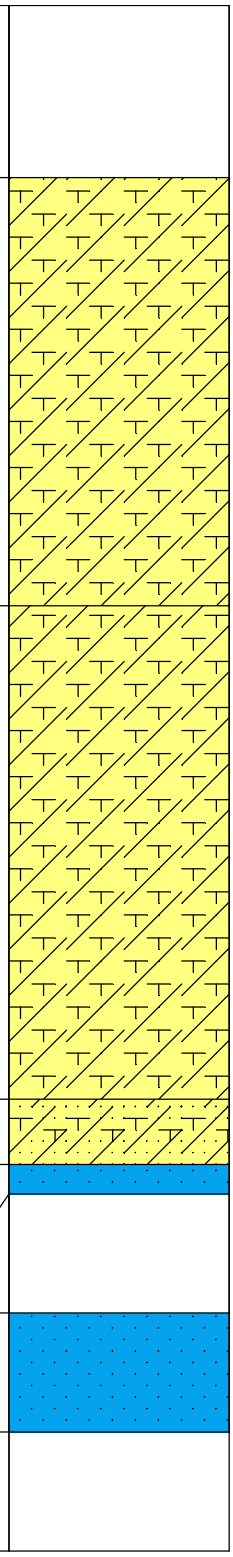
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Godinho Dairy- 12710 S. Wilson Rd., Los Banos, CA 93635, Merced Co.
Well Name:	GOD-SB3	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.10836/-120.86285*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/24/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	24

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- medium plastic, ~30% silt, dry
7.5 YR 4/3	CL	moist
7.5 YR 2.5/1	CL	Silty Clay- medium plastic, ~20% silt, moist
	CL	Silty Sandy Clay- medium plastic, ~20% sand, ~20% silt, moist to wet
7.5 YR 4/3	SW	Sand- fine to coarse, well graded, sub-round
NR	NR	No Return
7.5 YR 4/3	SW	Sand- fine to coarse, well graded, sub-round

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Godinho Dairy- 12710 S. Wilson Rd., Los Banos, CA 93635, Merced Co.
Well Name:	GOD-SB4	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.10769/-120.86301*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/24/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	24

Color	USCS	Lithologic Description	Graphic Log
NR	NR	No Return	
7.5 YR 3/4	CL	Silty Clay- medium plastic, ~30% silt, damp	
NR	NR	No Return	
7.5 YR 3/4	CL	Silty Clay- medium plastic, ~30% silt, moist	
NR	NR	No Return	
7.5 YR 2.5/1	CL	Silty Clay- medium plastic, ~20% silt, moist	
7.5 YR 3/2	CL	Silty Clay- medium plastic, ~40% silt, moist	
7.5 YR 4/4	CL	Clay- medium plastic, moist	
7.5 YR 4/3	SM	Silty Sand- fine, ~30% silt, wet	

0 5 10 15 20 25

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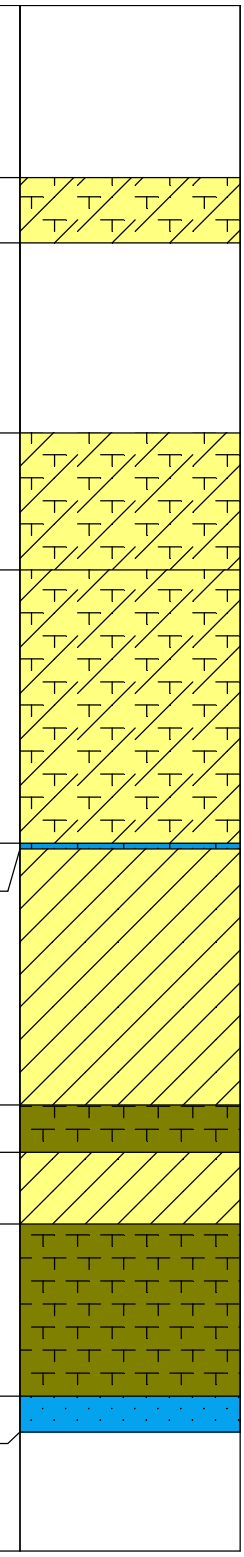
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Godinho Dairy- 12710 S. Wilson Rd., Los Banos, CA 93635, Merced Co.
Well Name:	GOD-SB5	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.10773/-120.86429*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/24/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	24

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 3/4	CL	Silty Clay- ~30% silt, damp
NR	NR	No Return
7.5 YR 4/6	CL	Silty Clay- ~20% silt, moist
7.5 YR 2.5/1	CL	Silty Clay- ~30% silt, moist
7.5 YR 2.5/1	SM	Silty Sand- fine to medium, ~20% silt, moist
7.5 YR 4/6	CL	Clay- medium plastic, moist
7.5 YR 4/3	ML	Silt- moist to wet
7.5 YR 4/6	CL	Clay- medium plastic, moist
7.5 YR 4/3	ML	Silt- wet
7.5 YR 4/3	SP	Sand- fine to medium, ~10% silt, wet

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Godinho Dairy- 12710 S. Wilson Rd., Los Banos, CA 93635, Merced Co.
Well Name:	GOD-SB6	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.10771/-120.86626*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/24/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	27

Color	USCS	Depth (ft)	Lithologic Description
NR	NR	0	No Return
7.5 YR 4/3	CL		Silty Clay- medium plastic, ~30% silt, damp
NR	NR		No Return
		5	
7.5 YR 4/3	CL		Silty Clay- medium plastic, ~30% silt, moist
NR	NR		No Return
7.5 YR 2.5/1	CL	10	Silty Clay- ~20% silt, moist
7.5 YR 2.5/1	SP		Sand- fine to medium, poorly graded, sub-round, moist
7.5 YR 6/4	CL	15	Clay- medium plastic, moist
7.5 YR 4/3	CL		Silty Clay- medium plastic, ~40% silt, crumbly, dry
7.5 YR 4/3	CL		Clay- medium plastic, moist wet
		20	
		25	
7.5 YR 4/3	CL		Silty Clay- ~20% silt, w/ fine sand, wet
			Refusal

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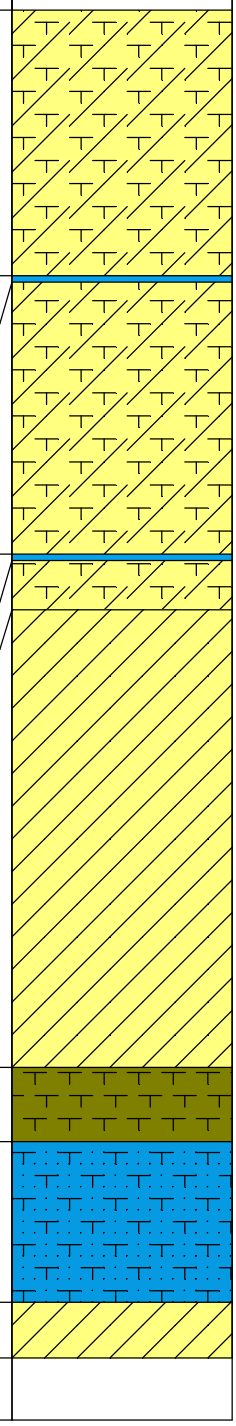
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	John Machado Dairy- 22495 W. China Camp Rd., Los Banos, CA 93635, Merced Co.
Well Name:	MAC-SB1	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.11106/-120.89527*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/24/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	24

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	CL	Silty Clay- ~20% silt
7.5 YR 4/3	SP	Sand- fine to medium, poorly graded, sub-round, moist
7.5 YR 3/3	CL	Silty Clay- ~20% silt, moist
5 YR 2.5/1	CL	
7.5 YR 2.5/2	SP	Sand- fine to medium, poorly graded, sub-round, moist
	CL	Silty Clay- medium plastic, ~40% silt, moist to wet
7.5 YR 2.5/2	CL	Clay- medium plastic, moist
7.5 YR 4/3	ML	Silt- moist
7.5 YR 4/3	SM	Silty Sand- fine, ~30% silt, wet
7.5 YR 4/3	CL	Clay- medium plastic

Graphic Log



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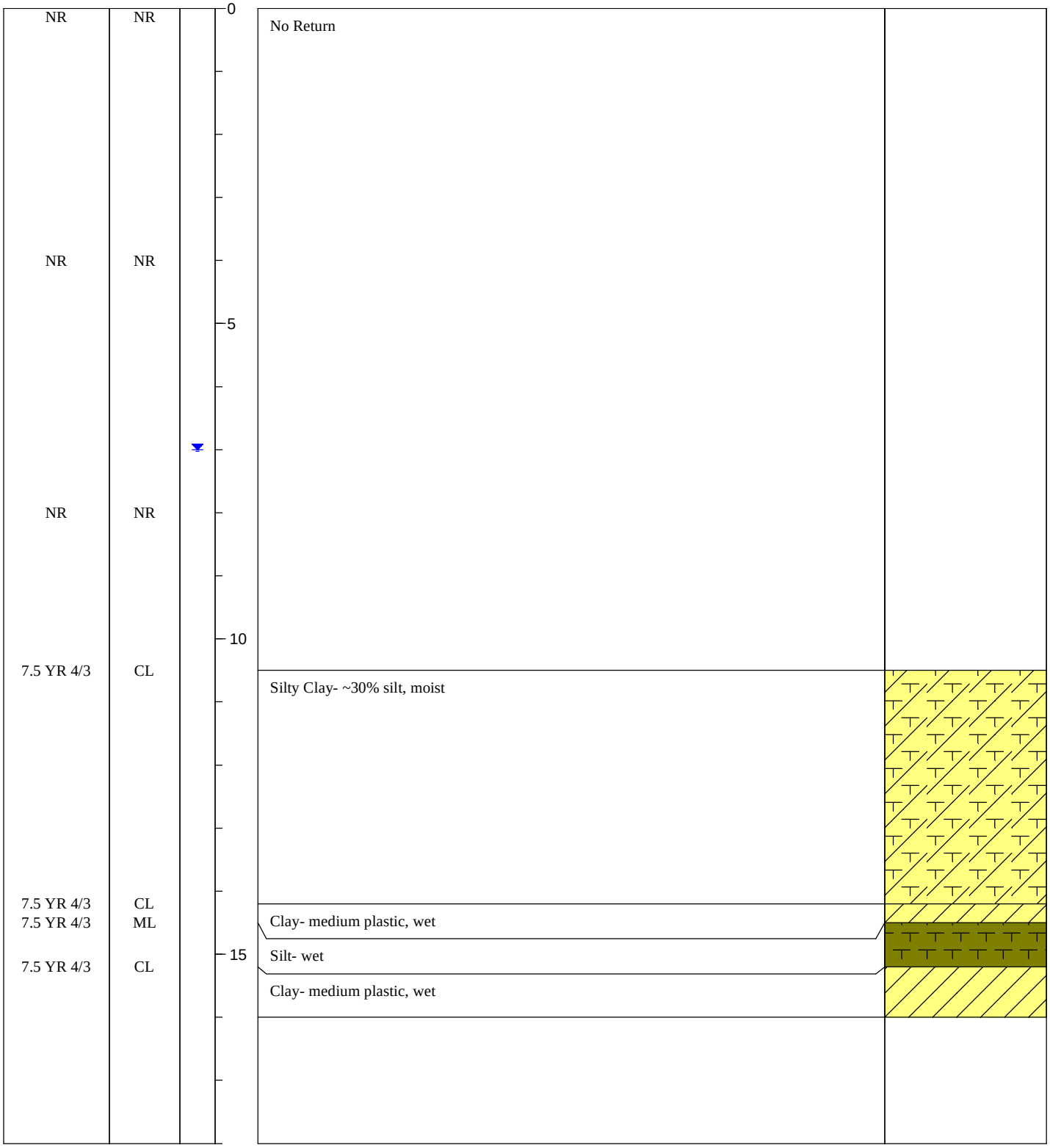
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	John Machado Dairy- 22495 W. China Camp Rd., Los Banos, CA 93635, Merced Co.
Well Name:	MAC-SB2	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.11126/-120.89390*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/24/2014
Site Geologist:	Wesley Andrews	Boring Depth (ft):	16

Color	USCS	Lithologic Description
NR	NR	No Return
NR	NR	
NR	NR	
7.5 YR 4/3	CL	Silty Clay- ~30% silt, moist
7.5 YR 4/3	CL	
7.5 YR 4/3	ML	Clay- medium plastic, wet
7.5 YR 4/3	CL	Silt- wet
		Clay- medium plastic, wet



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: John Machado Dairy- 22495 W. China Camp Rd., Los Banos, CA 93635, Merced Co.

Well Name: MAC-SB3 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.111081/-120.894256* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

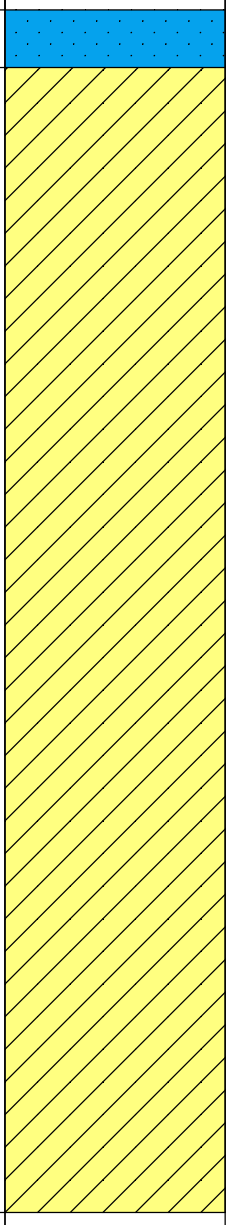
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/30/2014

Site Geologist: Charlie Jenkins Boring Depth (ft): 25

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	SP	Sand- very fine to fine, ~10% fines, moist
7.5 YR 3/3	CL	Clay- medium plastic, moist
		very moist
7.5 YR 4/3	CL	
7.5 YR 4/3	CL	dry to slightly moist

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: John Machado Dairy- 22495 W. China Camp Rd., Los Banos, CA 93635, Merced Co.

Well Name: MAC-SB4 Drilling Method: Geoprobe Direct Push

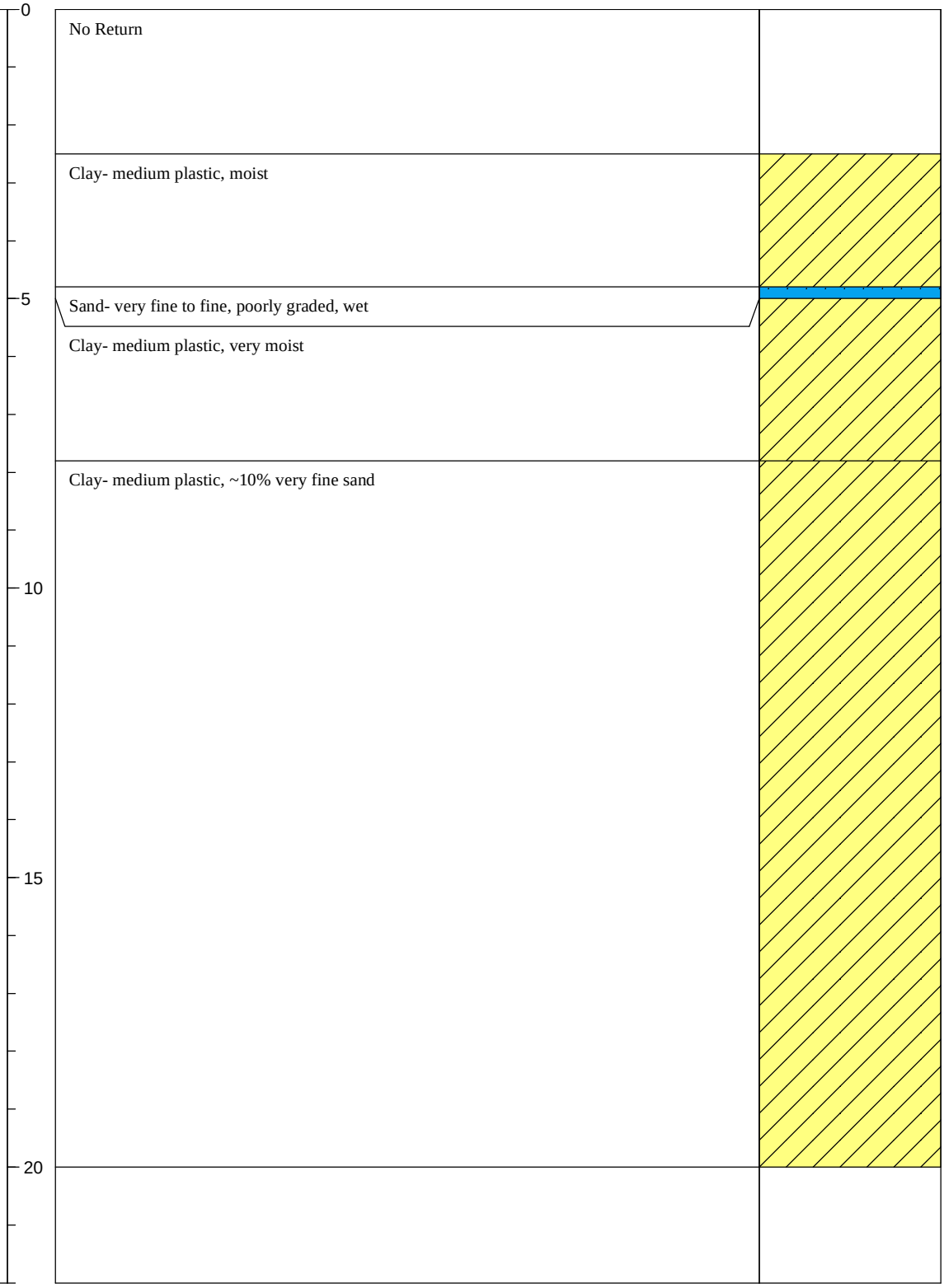
Lat./Long.: 37.110517/-120.894927* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/30/2014

Site Geologist: Charlie Jenkins Boring Depth (ft): 20

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	CL	Clay- medium plastic, moist
7.5 YR 4/3	SP	Sand- very fine to fine, poorly graded, wet
7.5 YR 2.5/2	CL	Clay- medium plastic, very moist
7.5 YR 3/3	CL	Clay- medium plastic, ~10% very fine sand
7.5 YR 4/3	CL	



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: John Machado Dairy- 22495 W. China Camp Rd., Los Banos, CA 93635, Merced Co.

Well Name: MAC-SB5 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.110523/-120.894283* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

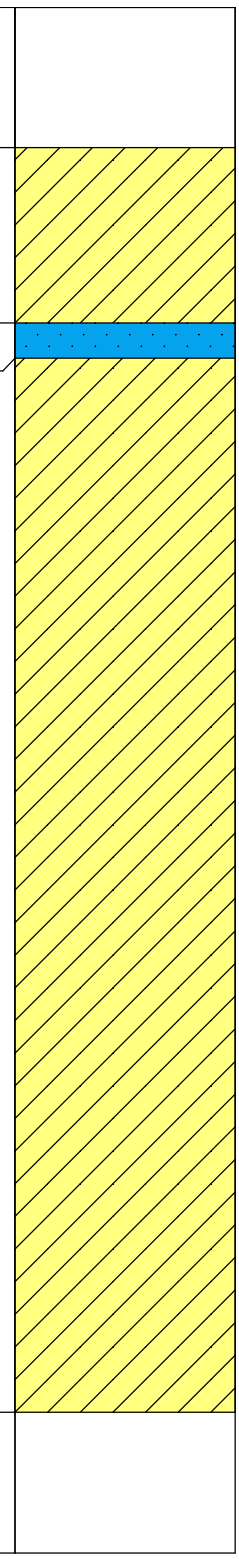
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/30/2014

Site Geologist: Charlie Jenkins Boring Depth (ft): 20

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	CL	Clay- medium plastic, moist
7.5 YR 4/3	SP	Sand- very fine to fine, poorly graded, wet
7.5 YR 2.5/2	CL	Clay- medium plastic, very moist
7.5 YR 3/3	CL	
7.5 YR 4/3	CL	

Graphic Log



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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Jose Nunes Dairy- 22484 W. China Camp Rd., Los Banos, CA 93635, Merced Co.

Well Name: NUN-SB1 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.118124/-120.893574* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/30/2014

Site Geologist: Charlie Jenkins Boring Depth (ft): 20

Color	USCS	Lithologic Description	Graphic Log
NR	NR	No Return	
7.5 YR 4/3	CL	Sandy Clay- medium plastic, ~20% very fine sand, moist	
7.5 YR 2.5/2	CL	Clay- medium plastic, very moist	
7.5 YR 4/3	CL	Sandy Clay- medium plastic, ~40% very fine to fine sand, very moist	
7.5 YR 4/3	CL	Clay- medium plastic, moist	

0, 5, 10, 15, 20

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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Jose Nunes Dairy- 22484 W. China Camp Rd., Los Banos, CA 93635, Merced Co.

Well Name: NUN-SB2 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.118168/-120.894230* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/30/2014

Site Geologist: Charlie Jenkins Boring Depth (ft): 20

Color	USCS	Lithologic Description	Graphic Log
NR	NR	No Return	
7.5 YR 4/3	CL	Sandy Clay- medium plastic, ~20% very fine sand, moist	
7.5 YR 2.5/2	CL	Clay- medium plastic, very moist	
7.5 YR 4/3	CL	Sandy Clay- medium plastic, ~40% very fine to fine sand, very moist wet	
7.5 YR 4/3	CL	Clay- medium plastic, moist	

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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Jose Nunes Dairy- 22484 W. China Camp Rd., Los Banos, CA 93635, Merced Co.

Well Name: NUN-SB3 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.117904/-120.894421* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/30/2014

Site Geologist: Charlie Jenkins Boring Depth (ft): 20

Color	USCS	Lithologic Description	Graphic Log
NR	NR	No Return	
7.5 YR 4/3	CL	Sandy Clay, medium plastic, ~20% very fine sand, moist	
7.5 YR 5/2	CL	Clay- medium plastic, moist	
	SP	Sand- fine to medium, poorly graded, wet	
7.5 YR 2.5/2	CL	Clay- medium plastic, moist	
7.5 YR 4/3	CL		

0, 5, 10, 15, 20

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*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No. 13-7-099 Site: Jose Nunes Dairy- 22484 W. China Camp Rd., Los Banos, CA 93635, Merced Co.

Well Name: NUN-SB4 Drilling Method: Geoprobe Direct Push

Lat./Long.: 37.117847/-120.893559* Sampling Method: Dual Tube- 2.25" diameter/ Continuous Core

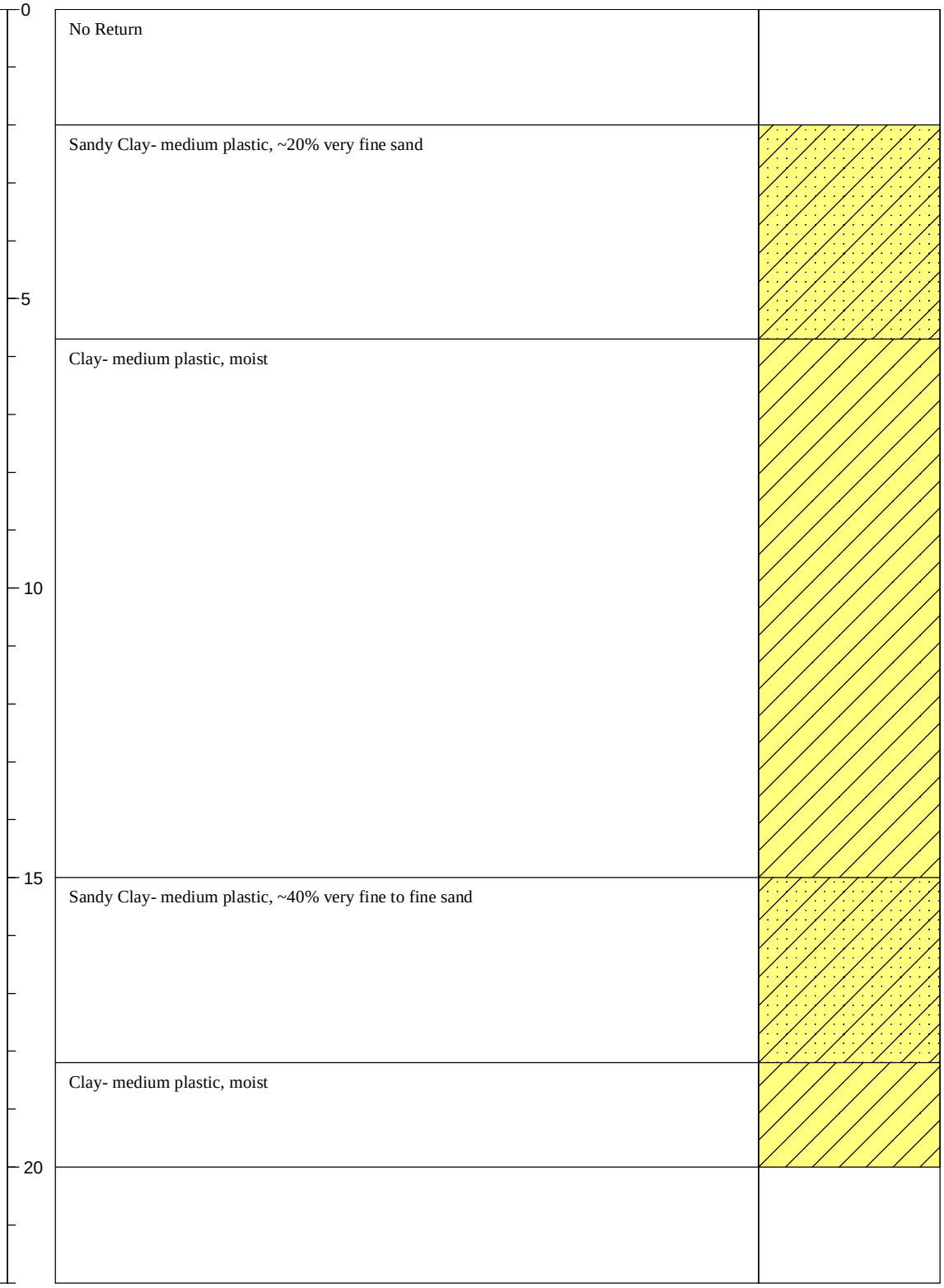
Drilled By: EnProbe Drilling Borehole Diameter: 2.25"

Driller: Josh Zwemke Drilling Date: 10/30/2014

Site Geologist: Charlie Jenkins Boring Depth (ft): 20

Color	USCS	Lithologic Description
NR	NR	No Return
7.5 YR 4/3	CL	Sandy Clay- medium plastic, ~20% very fine sand
7.5 YR 5/2	CL	Clay- medium plastic, moist
7.5 YR 4/3	CL	
7.5 YR 4/3	CL	Sandy Clay- medium plastic, ~40% very fine to fine sand
7.5 YR 4/3	CL	Clay- medium plastic, moist

Graphic Log



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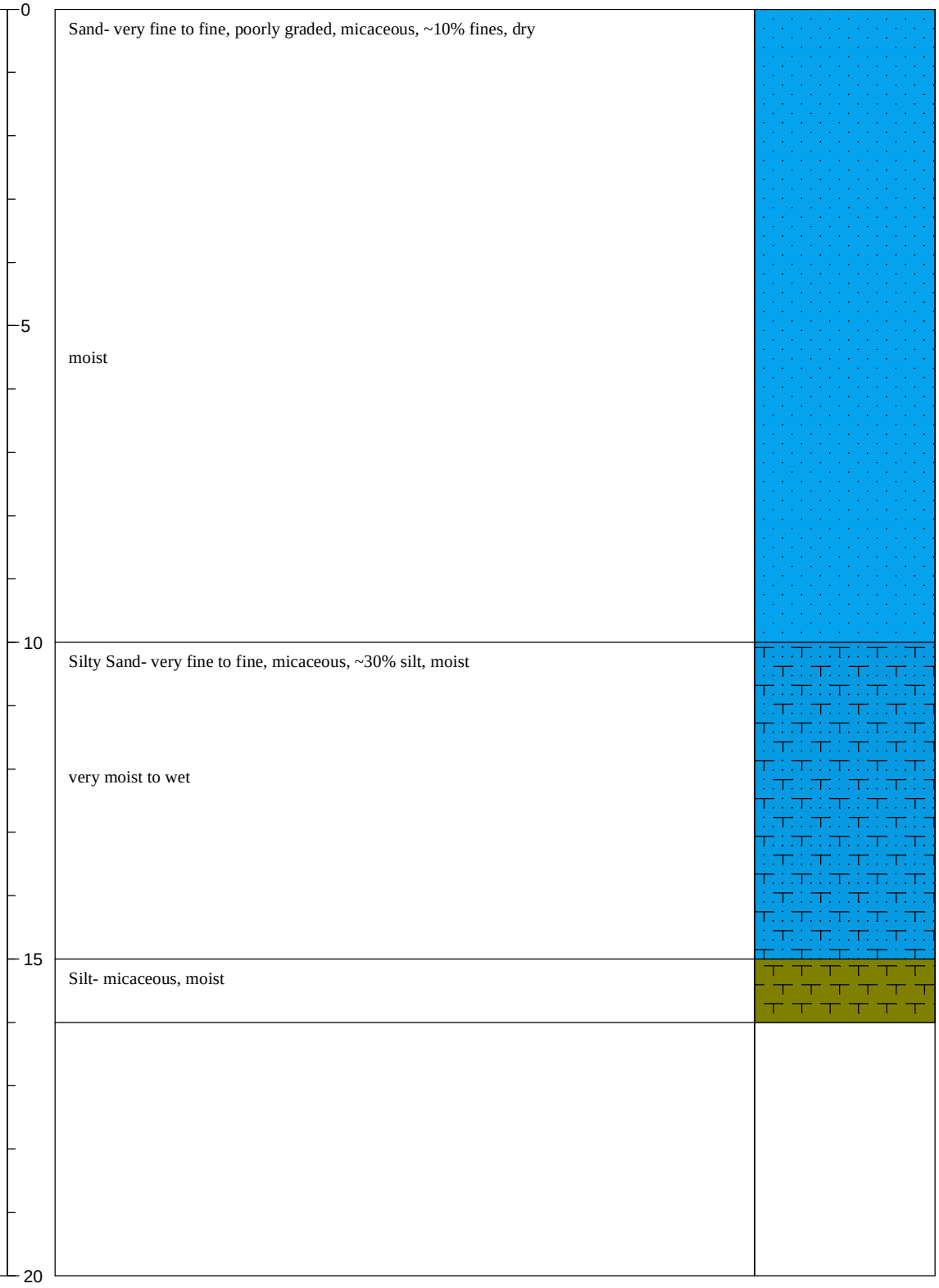
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	P. & L. Souza Dairy- 20633 Crane Ave., Hilmar, CA 95324, Merced Co.
Well Name:	PLS-SB1	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.379120/-120.863495*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/17/2014
Site Geologist:	Charlie Jenkins	Boring Depth (ft):	16

Color	USCS	Lithologic Description
7.5 YR 6/3	SP	Sand- very fine to fine, poorly graded, micaceous, ~10% fines, dry moist
10 YR 6/4	SM	Silty Sand- very fine to fine, micaceous, ~30% silt, moist very moist to wet
7.5 YR 6/6	ML	Silt- micaceous, moist



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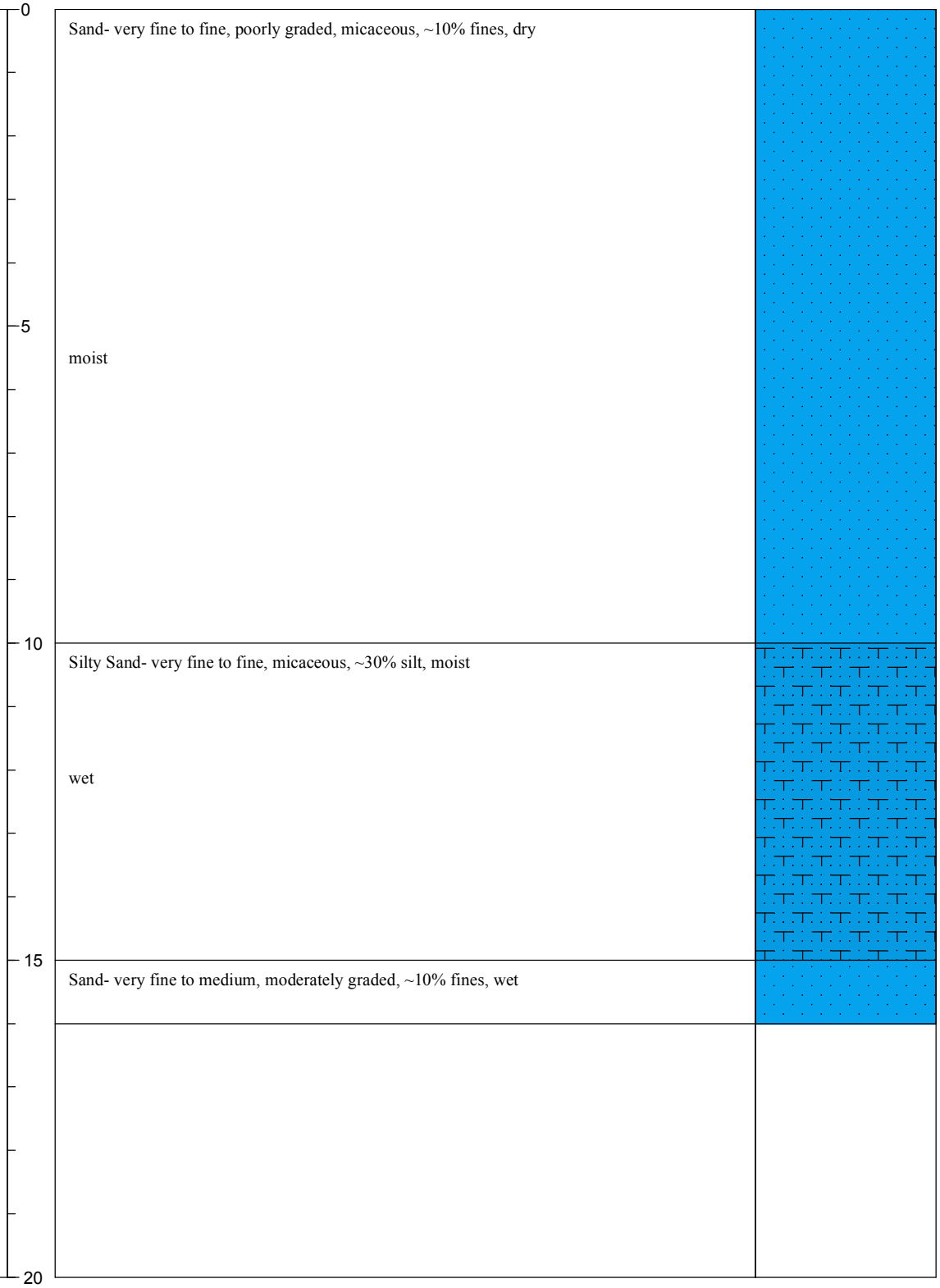
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	P. & L. Souza Dairy- 20633 Crane Ave., Hilmar, CA 95324, Merced Co.
Well Name:	PLS-SB2	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.379347/-120.863458*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/17/2014
Site Geologist:	Charlie Jenkins	Boring Depth (ft):	16

Color	USCS	Lithologic Description
7.5 YR 6/3	SP	Sand- very fine to fine, poorly graded, micaceous, ~10% fines, dry moist
10 YR 6/4	SM	Silty Sand- very fine to fine, micaceous, ~30% silt, moist wet
10 YR 5/4	SW	Sand- very fine to medium, moderately graded, ~10% fines, wet



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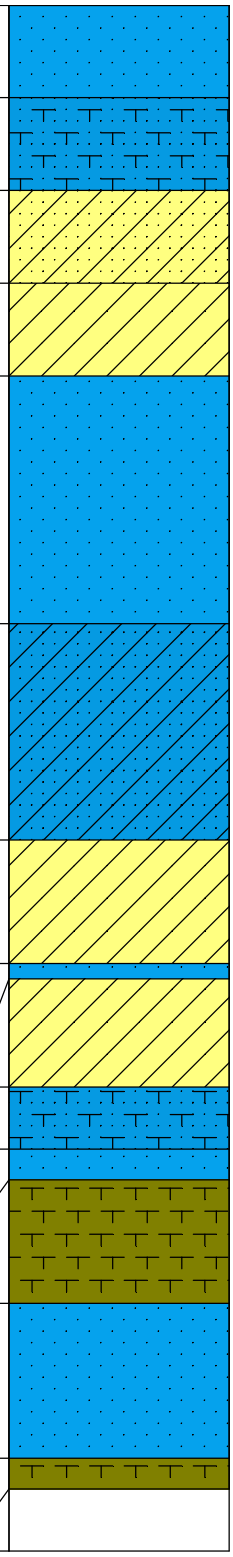
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Santa Rita Dairy- 91 S. Bert Crane, Atwater, CA 95301, Merced Co.
Well Name:	SAN-SB1	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.284159/-120.641338*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/16/2014
Site Geologist:	Charlie Jenkins	Boring Depth (ft):	48

Color	USCS	Lithologic Description
7.5 YR 7/2	SW	Sand- very fine to medium, moderately graded, dry
7.5 YR 7/3	SM	Silty Sand- fine to medium sand, ~30% silt, slightly moist
7.5 YR 6/4	CL	Sandy Clay- medium plastic, ~20% very fine sand, slightly moist
10 YR 4/4	CL	Clay- brown w/ light brown mottling, ~10% very fine sand
7.5 YR 5/3	SP	Sand- fine to medium, poorly graded, ~10% fines, moist
7.5 YR 4/3	SC	Clayey Sand- fine to medium, ~30% low plastic clay
7.5 YR 6/1	CL	Clay- tan w/ light brown mottling, medium plastic, moist
7.5 YR 7/1	SW	Sand- very fine to medium, moderately graded, micaceous, moist
7.5 YR 6/3	CL	Clay- medium plastic, moist
7.5 YR 4/4	ML	Silty Sand- very fine to fine, micaceous, ~40% silt, moist
7.5 YR 4/4	SP	Sand- fine to medium, poorly graded, micaceous, ~10% fines, wet
7.5 YR 5/3	ML	Silt- micaceous, ~10% very fine sand, moist
10 YR 4/4	SW	Sand- very fine to medium, moderately graded, micaceous, ~10% fines, wet very wet
7.5 YR 6/3	ML	Silt- brown w/ light brown mottling, micaceous, wet

Graphic Log



LUHDORFF & SCALMANINI CONSULTING ENGINEERS

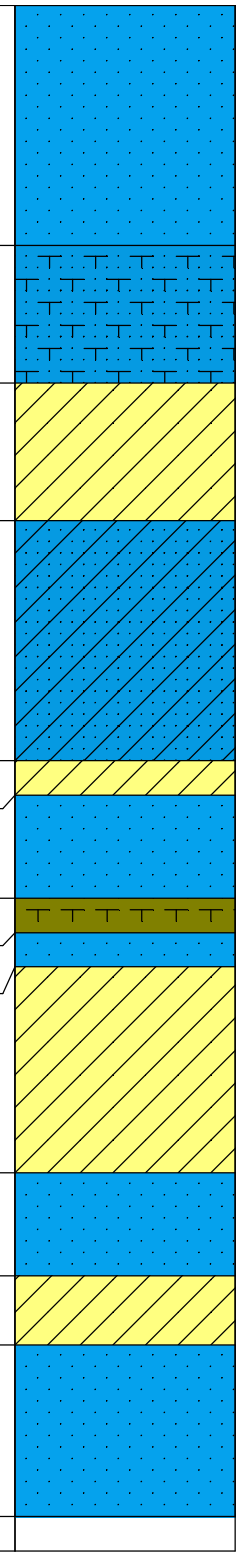
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Santa Rita Dairy- 91 S. Bert Crane, Atwater, CA 95301, Merced Co.
Well Name:	SAN-SB2	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.283615/-120.640950*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/16/2014
Site Geologist:	Charlie Jenkins	Boring Depth (ft):	44

Color	USCS	Lithologic Description
7.5 YR 7/2	SP	Sand- very fine to medium, moderately graded, ~10% fines, dry
7.5 YR 7/3	SM	Silty Sand- fine to medium, ~20% silt, moist
7.5 YR 4/2	CL	Clay- medium plastic, trace sand, moist
7.5 YR 4/4	SC	Clayey Sand- fine to medium, ~15% fines, moist
7.5 YR 6/6	CL	Clay- tan w/ light brown mottling, micaceous, moist
7.5 YR 4/4	SP	Sand- very fine to fine, poorly graded, ~10 % fines, moist
10 YR 5/4	ML	Silt- tan w/ light brown mottling, micaceous, moist
10 YR 6/4	SP	Sand- fine to medium, poorly graded, micaceous, moist
7.5 YR 6/3	SW	Clay- medium plastic, moist
7.5 YR 5/2	SP	Sand- very fine to fine, poorly graded, ~10% fines, moist
7.5 YR 6/2	CL	Clay- grey w/ reddish brown mottling, medium plastic, moist
7.5 YR 4/4	SW	Sand- fine to coarse, well graded, micaceous, wet

Graphic Log



0 5 10 15 20 25 30 35 40 45

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

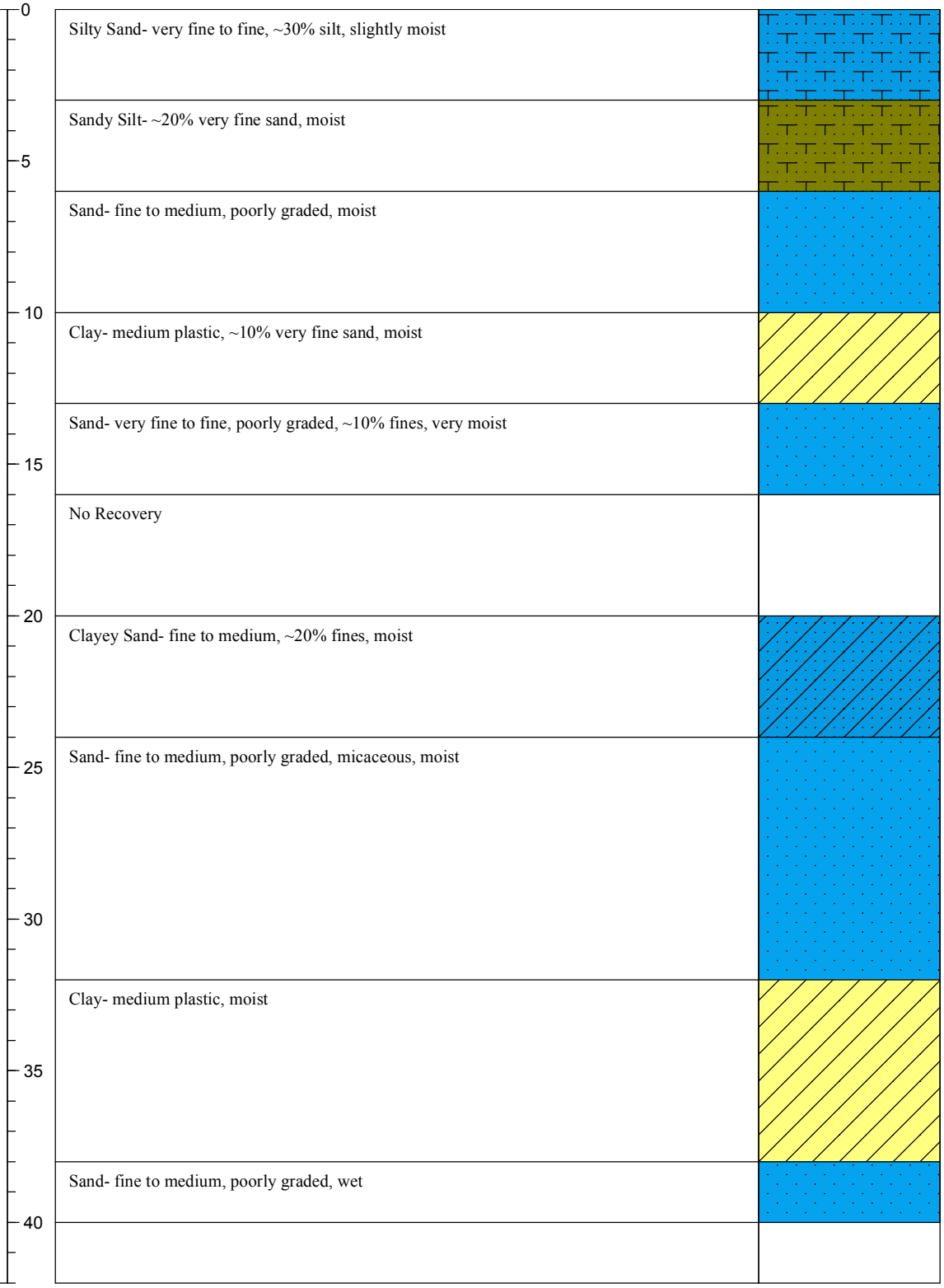
*Measurement from Handheld GPS Unit

Central Valley Dairy Representative Monitoring Program

LSCE Project No.	13-7-099	Site:	Santa Rita Dairy- 91 S. Bert Crane, Atwater, CA 95301, Merced Co.
Well Name:	SAN-SB3	Drilling Method:	Geoprobe Direct Push
Lat./Long.:	37.282778/-120.640644*	Sampling Method:	Dual Tube- 2.25" diameter/ Continuous Core
Drilled By:	EnProbe Drilling	Borehole Diameter:	2.25"
Driller:	Josh Zwemke	Drilling Date:	10/16/2014
Site Geologist:	Charlie Jenkins	Boring Depth (ft):	40

Color	USCS	Lithologic Description
7.5 YR 6/3	SM	Silty Sand- very fine to fine, ~30% silt, slightly moist
7.5 YR 7/2	ML	Sandy Silt- ~20% very fine sand, moist
7.5 YR 6/4	SP	Sand- fine to medium, poorly graded, moist
7.5 YR 5/6	CL	Clay- medium plastic, ~10% very fine sand, moist
7.5 YR 4/6	SP	Sand- very fine to fine, poorly graded, ~10% fines, very moist
NR	NR	No Recovery
7.5 YR 5/4	SC	Clayey Sand- fine to medium, ~20% fines, moist
7.5 YR 6/4	SP	Sand- fine to medium, poorly graded, micaceous, moist
7.5 YR 6/3	CL	Clay- medium plastic, moist
7.5 YR 5/2	SP	Sand- fine to medium, poorly graded, wet

Graphic Log



LUHDORFF & SCALMANINI CONSULTING ENGINEERS

*Measurement from Handheld GPS Unit

Attachment C

Test Hole Groundwater Quality

Attachment C
Test Hole Groundwater Quality - 2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	Q
		-------Field Measurements-------																			-Alkalinity as CaCO3-					
Central Area-East Side																										
ANC-SB1	10/22/2014	22.3	6.94					3,360	1,700	0.67	<0.050	97	100	430	160	87	100	360	120	78	1,200	<8.2	<8.2	1,200	1.07	
ANC-SB2	10/22/2014	24.1	6.91					4,040	1,800	17	0.13	110	120	430	200	68	61	370	130	87	1,100	<8.2	<8.2	1,100	1.03	
ANC-SB3	10/22/2014	24.1	6.85					3,900	1,700	4.1	0.14	110	120	390	170	100	140	360	93	60	1,400	<8.2	<8.2	1,400	1.05	
ANC-SB4	10/22/2014	23.9	6.91					1,699	1,000	0.57	<0.050	15	19	240	29	43	92	180	120	56	560	<8.2	<8.2	560	0.99	
ANC-SB5	10/22/2014	24.6	6.87					2,710	1,300	13	0.14	1.0	4.6	350	9.4	81	160	300	110	51	830	<8.2	<8.2	830	1.01	
ANC-SB6	10/22/2014	25.8	6.74					5,190	2,400	1.6	<0.050	160	190	570	150	220	170	570	84	72	2,200	<8.2	<8.2	2,200	1.04	
BET-SB1	10/17/2014	NM	NM					NM	670	36	0.14	0.18	1.5	53	6.9	33	130	68	36	0.13J	260	<8.2	<8.2	260	1.12	
BET-SB2	10/17/2014	NM	NM					NM	1,200	38	0.28	5.4	8.4	93	15	84	270	150	29	<0.75	780	<8.2	<8.2	780	1.09	
BET-SB3	10/21/2014	19.9	6.78					634	390	25	0.37	1.2	2.1	42	10	16	48	31	19	3.2	130	<4.1	<4.1	130	1.02	
BET-SB4	10/21/2014	20.8	7.05					600	420	28	0.084	0.21	0.59	30	8.1	19	57	43	18	5.2	93	<4.1	<4.1	93	1.06	
BET-SB5	10/21/2014	23.0	6.75					984	600	17	0.057	0.12	0.80	51	3.5	40	120	66	25	2.2	340	<8.2	<8.2	340	1.11	
BET-SB6	10/21/2014	24.6	6.65					2,790	1,600	12	0.13	0.17	4.6	180	9.0	110	370	310	40	1.2	1,200	<8.2	<8.2	1,200	1.03	
FG1-SB1	10/21/2014	24.6	7.02					1,604	940	0.30	0.031J	0.24	1.1	220	8.7	48	85	160	83	33	550	<8.2	<8.2	550	0.98	
FG1-SB2	10/21/2014	23.6	6.99					1,547	900	9.2	0.28	0.18	0.61	180	5.3	48	120	140	110	0.71	490	<8.2	<8.2	490	1.07	
FG1-SB3	10/22/2014	20.4	6.93					1,690	1,000	43	0.068	1.6	3.7	230	7.2	46	110	120	110	10	470	<8.2	<8.2	470	1.06	
FG1-SB4	10/22/2014	22.1	7.18					3,690	1,900	<0.50	<0.050	70	73	440	330	70	120	450	140	58	1,200	<8.2	<8.2	1,200	1.07	
FG1-SB5	10/22/2014	22.7	7.18					2,980	1,700	<0.50	<0.050	33	33	550	80	65	76	330	100	37	1,100	<8.2	<8.2	1,100	1.08	
COT-SB1	10/16/2014	NM	NM					NM	1,300	87	0.32	0.16	1.3	170	38	56	170	160	64	9.0	400	<8.2	<8.2	400	1.05	
COT-SB2	10/17/2014	NM	NM					NM	1,200	69	0.38	0.44	0.22	170	30	54	160	180	68	1.5	380	<8.2	<8.2	380	1.08	
COT-SB3	10/17/2014	NM	NM					NM	1,100	30	0.17	17	20	120	43	81	170	110	44	<0.75	760	<8.2	<8.2	760	1.06	
COT-SB4	10/17/2014	NM	NM					NM	860	0.073J	<0.050	58	59	110	74	48	150	99	3.1	<0.75	840	<8.2	<8.2	840	1.13	
SAN-SB1	10/16/2014	NM	NM					NM	1,200	25	0.11	0.21	1.4	380	7.4	49	150	110	76	<0.15	990	<8.2	<8.2	990	1.08	
SAN-SB2	10/16/2014	NM	NM					NM	1,100	17	0.21	0.63	1.4	340	12	47	140	130	75	<0.15	890	<8.2	<8.2	890	1.07	
SAN-SB3	10/16/2014	NM	NM					NM	1,600	19	0.11	0.094J	1.3	580	7.7	48	140	140	67	<0.15	1,300	<8.2	<8.2	1,300	1.11	
PLS-SB1	10/17/2014	NM	NM					NM	1,800	98	0.42	0.16	2.5	340	4.0	120	260	410	220	0.14J	600	<8.2	<8.2	600	1.07	
PLS-SB2	10/17/2014	NM	NM					NM	1,700	69	1.1	0.59	2.8	300	15	110	230	370	180	0.12J	660	<8.2	<8.2	660	1.05	
Central Area-West Side																										
ANT-SB1	10/23/2014	21.8	7.23					1,706	880	25	0.013J	2.2	3.3	130	13	110	120	160	160	0.79	480	<8.2	<8.2	480	1.10	
ANT-SB2	10/23/2014	23.8	6.98					1,958	1,100	17	<0.050	3.2	5.2	140	21	150	120	210	120	4.7	670	<8.2	<8.2	670	1.09	

Attachment C
Test Hole Groundwater Quality - 2014 Lagoon Perimeter Subsurface Hydrogeologic Investigation

		-------Field Measurements-------																					-Alkalinity as CaCO3-				
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	Q
COR-SB1	10/23/2014	26.0	6.92					4,060	2,400	0.82	<0.050	0.088J	1.3	730	5.0	140	140	770	270	0.33	1,100	<8.2	<8.2	1,100	1.02	
COR-SB2	10/24/2014	22.4	7.48					2,350	1,800	2.9	0.056	0.14	1.5	450	16	76	56	390	200	0.68	660	<8.2	<8.2	660	1.02	
COR-SB3	10/24/2014	24.4	6.79					5,840	4,200	27	0.14	0.47	3.1	1,200	60	270	230	1,500	330	4.6	1,600	<8.2	<8.2	1,600	1.05	
COR-SB4	10/24/2014	22.2	7.85					2,870	1,900	97	0.24	0.41	5.5	590	65	48	49	380	230	12	490	<8.2	<8.2	490	1.03	
FG2-SB1	10/23/2014	25.1	6.62					5,330	3,700	95	0.023J	4.5	7.9	520	11	510	620	500	2,400	1.4	1,300	<8.2	<8.2	1,300	0.99	
FG2-SB2	10/23/2014	26.2	7.08					3,700	3,000	44	0.022J	1.5	7.9	360	6.8	240	420	460	1,300	6.3	620	<8.2	<8.2	620	1.02	
FG2-SB3	10/23/2014	24.8	6.86					2,650	1,700	0.92	<0.050	0.56	1.3	260	3.1	150	240	270	640	0.20	640	<8.2	<8.2	640	1.06	
FG2-SB4	10/23/2014	25.4	7.08					3,190	2,600	24	0.037J	0.96	2.1	380	11	160	340	470	980	0.96	560	<8.2	<8.2	560	1.01	
FG2-SB5	10/23/2014	25.7	7.37					10,500	8,000	1.1	<0.050	0.13	0.60	2,200	6.7	560	440	920	6,400	0.21	290	8.5	<8.2	298.5	0.99	
GOD-SB1	10/24/2014	23.1	7.80					3,090	2,000	110	0.43	0.36	1.4	750	9.5	43	55	350	280	2.1	700	<8.2	<8.2	700	1.04	
GOD-SB2	10/24/2014	24.6	7.45					3,860	3,000	110	0.25	0.57	2.5	850	16	92	100	460	390	1.6	930	<8.2	<8.2	930	1.05	
GOD-SB3	10/24/2014	25.7	7.07					3,650	2,800	57	0.73	0.11	2.2	770	2.9	140	100	420	370	0.16	1,200	<8.2	<8.2	1,200	1.05	
GOD-SB4	10/24/2014	24.1	6.71					4,420	3,600	73	0.24	2.0	6.1	640	16	280	320	620	210	1.0	1,800	<8.2	<8.2	1,800	1.07	
GOD-SB5	10/24/2014	25.0	6.89					5,010	3,700	94	0.052	2.8	8.1	910	47	260	190	770	240	3.6	1,800	<8.2	<8.2	1,800	1.03	
MAC-SB1	10/24/2014	28.1	7.62					2,400	1,700	18	0.061	0.42	1.2	520	5.6	55	56	260	240	0.83	680	<8.2	<8.2	680	1.11	
MAC-SB2	10/24/2014	NM	7.77					2,750	2,500	17	0.050	0.74	7.6	670	160	32	34	440	160	20	920	<8.2	<8.2	920	1.05	
MAC-SB3	10/30/2014	20.0	7.11					2,659	1,900	7.0	0.23	0.064J	1.1	560	13	110	87	310	150	1.7	1,200	<8.2	<8.2	1,200	1.05	
MAC-SB4	10/30/2014	20.8	7.08					1,793	1,400	2.4	0.24	0.056J	0.60	400	7.8	30	43	190	210	0.95	600	<8.2	<8.2	600	1.01	
MAC-SB5	10/30/2014	21.0	7.13					2,315	1,500	21	0.21	0.16	0.92	370	3.1	99	86	280	250	0.52	610	<8.2	<8.2	610	1.07	
NUN-SB1	10/30/2014	20.7	7.25					4,563	9,500	56	0.086	1.2	3.0	1,800	16	500	540	1,200	4,500	1.4	460	<8.2	<8.2	460	1.04	
NUN-SB2	10/30/2014	20.5	7.38					7,271	6,400	550*	0.51	1.8	2.9	960	8.6	330	670	530	1,700	1.1	560	<8.2	<8.2	560	1.02	H
NUN-SB3	10/30/2014	20.5	7.46					5,004	5,400	12	0.011J	19	20	700	40	290	600	810	2,000	<0.75	930	<8.2	<8.2	930	1.03	
NUN-SB4	10/30/2014	20.3	7.26					7,402	16,000	12	0.068	13	14	3,600	18	820	470	2,200	8,900	1.6	380	<8.2	<8.2	380	0.97	

Values in mg/L except temperature (T) in degrees Celsius, pH in standard pH-units, dissolved oxygen percent (DO %) in percent saturation, oxygen reduction potential (ORP) in millivolts, turbidity (Turb) in nephelometric turbidity units, specific conductance (SC) in microsiemens per centimeter. Nitrate, nitrite, ammoniacal-N, and total kjeldahl nitrogen are reported as nitrogen. Sulfate is reported as sulfate; total phosphate is reported as phosphate.

CAB, Cation-Anion Balance

Q, qualifiers (H) sample holding time was exceeded where indicated with an *

NM, No Measurement

QM, Questionable Measurement

Attachment D

Monitoring Well Groundwater Quality

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
		-------Field Measurements-------																			----Alkalinity as CaCO3----						
Central Area-East Side																											
ANC-MW1	2/12/2012	19.0	7.00	1.7		164	12	1,518	990	6.6		<0.05														13	
ANC-MW1	5/11/2012	20.7	6.63	0.9		201	4.0	1,792	1,100	6.8	0.22*	<0.05	0.39*	250	3.7	39	88	210	100	0.41*	520*	<8.2*	<8.2*	520	0.98	11	H
ANC-MW1	8/16/2012	20.9	6.82	0.4		213	11	1,975	1,300	8.0	0.43	0.026J	0.54	270	4.2	47	100	260	130	0.31	570	<8.2	<8.2	570	0.94	12	
ANC-MW1	12/6/2012	20.6	7.52	1.0		49	3.0	1,986	1,200	8.7		<0.050														11	
ANC-MW1	3/21/2013	19.4	7.41	5.3	58	108	2.0	2,016	1,400	8.8		0.042J														10	
ANC-MW1	5/30/2013	21.7	7.24	5.2	58	144	1.0	1,999	1,300	9.4		0.034J														11	
ANC-MW1	8/27/2013	22.2	7.07	0.4	5	156	2.0	1,594	1,000	6.3	0.22	0.071	0.41	240	3.5	37	76	200	130	0.44	420	<8.2	<8.2	420	1.01	11	
ANC-MW1	11/14/2013	20.3	6.82	0.4	5	149	6.0	1,661	1,000	4.2		0.026J														11	
ANC-MW1	2/20/2014	20.5	6.39	1.0	11	252	3.0	1,878	1,100	5.3		0.030J														10	
ANC-MW1	5/22/2014	20.9	6.96	0.6	7	135	7.0	1,748	1,200	7.4		<0.10														10	
ANC-MW1	8/22/2014	23.0	7.27	0.6	7	153	4.0	1,800	1,000	8.6	0.15	<0.10	0.36	230	3.4	43	86	210	130	0.34	450	<8.2	<8.2	450	0.98	9	
ANC-MW1	11/7/2014	21.8	7.17	3.5	41	88	2.0	1,842	1,100	14		<0.10														9	
ANC-MW2	2/12/2012	19.7	6.84	0.9		85	3.0	2,424	1,600	20		0.025J														17	
ANC-MW2	5/11/2012	22.4	6.64	0.5		157	86	2,490	1,600	23	0.048J*	0.033J	0.99*	330	5.9	50	150	380	220	0.55*	440*	<8.2*	<8.2*	440	1.01	14	H
ANC-MW2	8/16/2012	20.3	6.80	0.6		221	5.0	2,511	1,600	26	0.47	0.027J	0.92	330	6.2	51	150	410	240	0.56	450	<8.2	<8.2	450	0.95	14	
ANC-MW2	12/6/2012	20.6	7.44	1.0		-17	3.0	2,381	1,400	20		<0.050														14	
ANC-MW2	3/21/2013	19.6	7.55	6.0	70	97	40	2,182	1,600	17		0.054														14	
ANC-MW2	5/30/2013	21.1	7.38	0.6	7	139	2.0	2,223	1,400	15		0.043J														14	
ANC-MW2	8/27/2013	22.0	6.86	0.5	6	158	2.0	2,421	1,500	25	0.64	0.054	1.1	350	7.1	50	150	340	180	1.9	550	<8.2	<8.2	550	1.03	13	
ANC-MW2	11/14/2013	20.5	6.47	0.3	3	128	4.0	2,429	1,600	27		0.045J														13	
ANC-MW2	2/20/2014	20.2	6.36	1.0	11	254	2.0	2,453	1,500	21		0.040J														13	
ANC-MW2	5/22/2014	20.9	6.93	0.3	4	133	4.0	2,451	1,600	21		0.045J														13	
ANC-MW2	8/22/2014	21.2	7.06	0.6	6	161	4.0	2,903	1,900	28	0.46	0.036J	1.6	390	7.7	59	160	330	180	3.8	750	<8.2	<8.2	750	0.99	12	
ANC-MW2	11/7/2014	23.7	7.14	3.9	44	43	64	2,697	1,700	17		0.058J														12	
ANC-MW3	2/12/2012	20.1	7.24	0.4		35	2.0	1,789	1,200	47		<0.05														14	
ANC-MW3	5/11/2012	21.0	6.97	0.8		146	3.0	1,850	1,200	48	0.036J*	<0.05	0.092J*	230	6.4	31	130	210	130	0.45*	400*	<8.2*	<8.2*	400	0.96	13	H
ANC-MW3	8/16/2012	21.7	6.98	0.2		213	4.0	1,963	1,300	55	0.031J	<0.05	0.24	260	6.9	31	130	230	150	0.43	380	<8.2	<8.2	380	0.97	14	
ANC-MW3	12/6/2012	21.6	7.55	0.7		57	4.0	2,112	1,300	59		<0.050														14	
ANC-MW3	3/21/2013	19.8	7.56	5.5	53	71	2.0	1,860	1,300	58		0.035J														13	
ANC-MW3	5/30/2013	21.6	7.56	0.7	8	142	1.0	1,950	1,300	54		0.021J														13	
ANC-MW3	8/27/2013	24.2	7.27	0.7	9	150	2.0	1,950	1,200	48	0.032J	0.022J	0.23	250	6.8	38	150	240	140	0.55	380	<8.2	<8.2	380	1.05	13	
ANC-MW3	11/14/2013	21.3	7.10	0.7	8	138	5.0	2,025	1,300	57		0.026J														13	
ANC-MW3	2/20/2014	20.6	6.57	0.6	7	257	2.0	2,070	1,300	55		0.028J														12	
ANC-MW3	5/22/2014	20.7	7.23	1.0	12	127	2.0	1,947	1,400	51		0.039J														12	
ANC-MW3	8/21/2014	23.6	7.20	0.4	4	133	3.0	1,780	1,100	42	0.027J	0.034J	<0.20	210	5.8	33	120	170	110	0.57	350	<8.2	<8.2	350	1.05	11	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
ANC-MW3	11/7/2014	22.3	7.33	2.9	34	119	2.0	1,899	1,200	43		0.038J														11	
ANC-MW4	2/12/2012	19.5	6.74	1.2		130	15	1,669	1,100	8.0		<0.05														14	
ANC-MW4	5/11/2012	20.6	6.44	1.1		220	16	1,560	1,000	33	<0.05*	<0.05	0.15J*	120	8.6	48	130	140	110	1.5*	360*	<8.2*	<8.2*	360	1.00	14	H
ANC-MW4	8/16/2012	21.0	6.93	0.4		217	62	1,266	820	36	<0.05	<0.05	0.15J	140	6.5	33	90	150	110	1.1	230	<8.2	<8.2	230	0.98	14	
ANC-MW4	12/6/2012	20.4	7.98	1.7		52	92	890	550	29		<0.050														13	
ANC-MW4	3/21/2013	18.0	7.82	5.5	60	101	35	681	520	23		0.027J														13	
ANC-MW4	5/30/2013	21.0	7.60	1.4	15	134	2.0	781	500	26		0.020J														13	
ANC-MW4	8/27/2013	21.1	7.12	1.2	13	166	1.0	1,121	800	39	0.0041J	0.022J	0.099J	140	5.7	26	71	98	75	1.3	200	<8.2	<8.2	200	1.07	13	
ANC-MW4	11/14/2013	20.6	6.78	1.5	17	148	7.0	1,644	1,100	50		0.024J														13	
ANC-MW4	2/20/2014	19.9	6.48	1.2	14	252	3.0	1,201	710	43		0.027J														12	
ANC-MW4	5/22/2014	20.2	7.25	1.2	13	130	4.0	976	670	36		<0.10														12	
ANC-MW4	8/22/2014	22.4	7.36	1.6	17	150	4.0	1,301	900	41	<0.050	<0.10	<0.20	140	5.6	30	77	130	85	1.1	200	<8.2	<8.2	200	1.01	11	
ANC-MW4	11/7/2014	21.4	7.25	4.2	45	112	2.0	1,017	610	32		<0.10														11	
ANC-MW5s	2/12/2012	19.5	7.92	1.5		178	>1,000	3,330	2,100	18		0.029J														12	
ANC-MW5s	5/11/2012	19.9	7.52	0.6		181	328	3,590	2,300	16	<0.05*	0.029J	0.74*	770	3.8	16	28	450	270	1.8*	920*	<8.2*	<8.2*	920	0.96	7	H
ANC-MW5s	8/16/2012	20.5	7.29	0.7		232	129	3,550	2,200	11	0.53	0.026J	0.79	840	3.5	15	24	450	300	1.3	980	<8.2	<8.2	980	0.99	9	
ANC-MW5s	12/6/2012	20.1	8.10	1.1		52	91	3,618	2,200	11		<0.050														11	
ANC-MW5s	3/21/2013	19.0	8.24	6.5	63	73	15	3,334	2,400	13		0.050														9	
ANC-MW5s	5/30/2013	21.8	7.92	3.0	34	130	95	3,316	2,200	11		0.045J														10	
ANC-MW5s	8/27/2013	21.2	7.71	0.5	6	147	112	3,278	2,200	9.5	0.42	0.042J	0.68	760	2.9	14	22	410	220	2.8	950	<8.2	<8.2	950	0.98	10	
ANC-MW5s	11/14/2013	20.5	7.50	1.1	14	127	59	3,415	2,300	11		0.040J														10	
ANC-MW5s	2/20/2014	18.5	7.05	1.4	14	238	65	3,486	2,100	11		0.033J														9	
ANC-MW5s	5/22/2014	19.7	8.00	0.8	9	123	30	3,362	2,200	8.8		<0.10														9	
ANC-MW5s	8/22/2014	21.5	8.06	0.3	4	139	29	3,428	2,200	8.7	0.18	<0.10	0.58	730	2.5	15	21	390	210	2.1	930	<8.2	<8.2	930	0.98	7	
ANC-MW5s	11/7/2014	20.5	7.76	4.2	47	99	50	3,555	LE	9.4		LE														8	
ANC-MW6s	2/12/2012	20.0	6.89	2.0		189	4.0	2,047	1,400	33		0.035J														13	
ANC-MW6s	5/11/2012	21.0	6.64	1.0		183	4.0	1,984	1,300	38	0.080*	0.046J	1.2*	260	11	36	100	250	140	22*	350*	<8.2*	<8.2*	350	0.96	12	H
ANC-MW6s	8/16/2012	22.0	6.80	0.5		217	2.0	1,950	1,300	38	0.74	0.052	1.3	280	11	36	100	270	130	25	410	<8.2	<8.2	410	0.92	12	
ANC-MW6s	12/6/2012	23.2	7.43	0.8		63	3.0	1,782	1,100	28		<0.050														12	
ANC-MW6s	3/21/2013	20.4	7.24	5.9	61	90	2.0	1,923	1,400	51		0.072														12	
ANC-MW6s	5/30/2013	22.8	7.30	2.7	33	140	2.0	1,714	1,200	32		0.049J														12	
ANC-MW6s	8/27/2013	24.7	7.08	0.4	5	161	2.0	1,378	970	20	0.83	0.048J	1.4	190	7.8	25	72	150	85	28	340	<8.2	<8.2	340	0.93	12	
ANC-MW6s	11/14/2013	23.4	6.83	0.7	8	146	6.0	1,337	940	20		0.043J														11	
ANC-MW6s	2/20/2014	22.6	6.50	0.8	10	256	2.0	1,332	860	19		0.042J														11	
ANC-MW6s	5/22/2014	22.8	7.06	0.6	7	127	2.0	1,229	860	19		0.035J														11	
ANC-MW6s	8/21/2014	26.0	7.11	0.2	3	137	3.0	1,247	800	20	0.67	0.054J	0.49	170	6.3	21	60	120	74	22	240	<8.2	<8.2	240	1.03	10	
ANC-MW6s	11/7/2014	25.9	6.87	2.8	34	116	2.0	1,486	940	25		0.036J														10	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																					----Alkalinity as CaCO3----				
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
ANC-MW7s	2/12/2012	19.5	7.24	1.6		164	9.0	1,381	920	36		<0.05														13	
ANC-MW7s	5/11/2012	21.4	7.05	1.8		151	6.0	1,364	870	44	<0.05*	<0.05	<0.2*	140	2.8	28	100	130	67	0.47*	260*	<8.2*	<8.2*	260	1.00	11	H
ANC-MW7s	8/16/2012	21.2	7.02	1.5		204	9.0	1,288	820	37	<0.05	<0.05	0.070J	140	2.7	27	95	170	68	0.50	260	<8.2	<8.2	260	0.93	14	
ANC-MW7s	12/6/2012	21.1	7.90	1.9		67	18	1,287	780	27		<0.050														12	
ANC-MW7s	3/21/2013	18.8	7.83	5.4	60	65	10	1,122	800	19		0.026J														12	
ANC-MW7s	5/30/2013	20.8	7.78	5.4	63	133	3.0	1,482	980	37		<0.050														12	
ANC-MW7s	8/27/2013	22.9	7.49	1.8	22	151	2.0	1,563	960	34	0.0059J	0.025J	0.17J	160	2.6	35	120	200	85	0.78	300	<8.2	<8.2	300	1.00	13	
ANC-MW7s	11/14/2013	20.9	6.99	1.2	14	151	5.0	1,447	940	22		0.023J														12	
ANC-MW7s	2/20/2014	20.8	6.80	1.0	11	257	3.0	1,307	760	19		<0.050														11	
ANC-MW7s	5/22/2014	20.7	7.24	1.3	14	129	3.0	1,276	780	18		<0.10														12	
ANC-MW7s	8/21/2014	22.9	7.70	1.3	15	135	3.0	1,396	810	32	<0.050	0.045J	<0.20	150	2.2	29	100	160	59	0.58	240	<8.2	<8.2	240	1.09	9	
ANC-MW7s	11/7/2014	21.8	7.36	3.9	42	119	4.0	1,367	820	18		<0.10														10	
BET-MW1s	2/8/2012	19.0	6.21	2.9		309	20	610	490	36		0.055														12	
BET-MW1s	5/10/2012	19.4	6.15	1.5		183	30	760	690	57	<0.05*	0.055	0.29*	30	22	21	64	30	22	3.1*	53*	<4.1*	<4.1*	53	1.04	8	H
BET-MW1s	8/14/2012	19.7	6.72	1.2		64	8.0	522	410	31	0.014J	<0.05	0.66	23	12	14	43	30	18	3.3	52	<4.1	<4.1	52	1.01	6	
BET-MW1s	12/7/2012	21.3	6.12	1.1		97	4.0	501	370	23		0.038J														9	
BET-MW1s	3/21/2013	19.7	6.96	2.1	22	179	2.6	386	350	21		0.032J														8	
BET-MW1s	5/30/2013	22.3	6.32	1.7	18	177	2.0	457	370	28		0.047J														7	
BET-MW1s	8/26/2013	22.6	6.73	2.4	26	192	2.0	663	530	37	<0.050	0.044J	0.71	39	6.8	18	55	49	23	5.0	69	<4.1	<4.1	69	1.01	4	
BET-MW1s	11/15/2013	21.4	6.19	1.2	13	288	1.0	577	400	26		0.043J														5	
BET-MW1s	2/24/2014	21.2	7.38	1.4	15	183	2.0	625	410	24		0.046J														4	
BET-MW1d	5/23/2014	19.9	6.61	0.9	10	165	3.0	566	440	25		0.12														12	
BET-MW1d	8/25/2014	21.5	6.80	1.3	14	136	4.0	554	410	27	<0.050	0.047J	0.69	29	6.5	13	47	42	21	1.5	59	<4.1	<4.1	59	1.01	11	
BET-MW1d	11/11/2014	20.7	6.73	4.7	53	148	1.0	553	480	27		0.059J														16	
BET-MW2s	2/8/2012	18.2	6.25	2.6		305	15	820	700	44		<0.05														5	
BET-MW2s	5/10/2012	19.3	6.37	1.2		161	12	755	630	39	0.010J*	0.026J	0.35*	48	20	18	59	51	28	6.6*	100*	<4.1*	<4.1*	100	1.00	2	H
BET-MW2s	8/14/2012	21.0	6.74	1.1		50	12	610	480	29	<0.05	<0.05	0.54	35	5.3	16	52	35	18	6.5	110	<4.1	<4.1	110	0.95	4	
BET-MW2s	12/7/2012	21.9	6.36	2.8		69	12	722	560	28		<0.050														2	
BET-MW2d	3/21/2013	20.0	6.93	2.4	25	186	2.2	548	480	30		0.028J														17	
BET-MW2d	5/30/2013	21.8	6.34	0.7	8	151	11	524	450	28		0.032J														15	
BET-MW2d	8/26/2013	21.7	6.54	1.4	15	196	1.0	508	450	23	<0.050	0.032J	0.74	30	3.9	13	52	43	22	1.8	76	<4.1	<4.1	76	1.04	15	
BET-MW2d	11/15/2013	20.2	5.86	1.8	19	305	1.0	653	560	37		0.022J														13	
BET-MW2d	2/24/2014	20.9	6.76	2.0	23	207	1.0	721	600	39		0.019J														12	
BET-MW2d	5/23/2014	19.9	6.49	1.2	14	170	2.0	593	450	28		<0.10														10	
BET-MW2d	8/25/2014	20.8	7.02	1.7	19	133	3.0	573	440	22	<0.050	<0.10	0.84	31	5.0	13	50	50	23	1.3	74	<4.1	<4.1	74	1.01	10	
BET-MW2d	11/11/2014	20.9	6.73	4.9	58	159	1.0	877	740	49		0.038J														11	
BET-MW3s	2/8/2012	18.7	6.12	2.5		308	14	1,022	710	82		<0.05														6	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
BET-MW3s	5/10/2012	19.3	5.94	2.1		186	23	1,200	1,100	98	0.010J*	0.025J	0.45*	30	37	38	110	52	61	4.2*	56*	<8.2*	<8.2*	56	0.99	4	H
BET-MW3s	8/14/2012	21.0	6.45	2.1		75	17	799	670	63*	<0.05	<0.05	0.62	24	24	22	67	24	33	4.9	68	<4.1	<4.1	68	0.92	6	H
BET-MW3s	12/7/2012	21.8	6.31	1.8		75	6.0	807	640	53*		<0.050														4	H
BET-MW3s	3/21/2013	18.9	6.80	2.0	22	198	49.5	805	740	64		0.029J														4	
BET-MW3s	5/30/2013	23.1	6.07	1.4	17	167	3.0	884	720	63		0.022J														3	
BET-MW3s	8/26/2013	24.0	6.34	1.5	20	206	5.0	795	680	52	<0.050	0.040J	0.46	23	22	25	77	44	26	5.4	92	<4.1	<4.1	92	0.99	3	
BET-MW3d	11/15/2013	19.0	5.94	0.5	6	304	1.0	561	460	23		0.025J														14	
BET-MW3d	2/24/2014	23.8	6.70	2.3	27	212	2.0	599	480	25		0.028J														13	
BET-MW3d	5/23/2014	20.0	6.39	1.1	13	162	2.0	663	480	28		<0.10														11	
BET-MW3d	8/25/2014	23.2	7.45	0.9	10	127	2.0	696	540	28	<0.050	<0.10	1.0	36	4.8	18	61	63	27	0.93	86	<4.1	<4.1	86	1.02	11	
BET-MW3d	11/11/2014	20.0	6.58	5.1	56	170	1.0	717	600	31		<0.10														12	
BET-MW4s	2/8/2012	19.3	6.64	2.6		311	209	1,572	820	31		<0.05														13	
BET-MW4s	5/10/2012	19.9	6.67	1.0		180	75	2,402	1,900	54	0.022J*	<0.05	1.1*	110	270	56	140	200	110	7.1*	580*	<8.2*	<8.2*	580	0.99	8	H
BET-MW4s	8/14/2012	20.6	6.92	1.0		43	8.0	2,176	1,400	52	0.12	<0.05	1.4	100	270	41	100	200	110	6.6	500	<8.2	<8.2	500	0.90	9	
BET-MW4s	12/7/2012	21.5	6.74	0.7		66	23	1,586	1,000	42		<0.050														12	
BET-MW4s	3/21/2013	19.2	7.08	0.9	10	190	33.4	2,252	1,500	51		0.053														8	
BET-MW4s	5/30/2013	20.7	6.56	0.8	9	194	7.0	1,807	1,200	49		0.027J														9	
BET-MW4s	8/26/2013	21.9	6.81	0.6	8	193	24	1,972	1,200	46	0.23	0.059	1.0	110	230	40	91	170	84	5.3	400	<8.2	<8.2	400	1.03	7	
BET-MW4s	11/15/2013	22.6	6.19	0.8	9	291	2.0	1,602	1,100	44		0.032J														9	
BET-MW4s	2/24/2014	21.7	6.85	2.0	24	216	2.0	1,404	920	38		0.030J														7	
BET-MW4d	5/23/2014	19.9	6.71	1.0	11	167	3.0	890	640	29		0.033J														18	
BET-MW4d	8/25/2014	22.0	6.59	0.4	4	140	2.0	1,221	1,100	28	0.099	<0.10	1.1	89	25	36	74	170	40	2.7	180	<8.2	<8.2	180	0.99	17	
BET-MW4s	11/11/2014	21.6	6.81	4.3	50	153	7.0	1,147	850	32		<0.10														6	
BET-MW5s	2/9/2012	21.0	6.84	1.3		162	26	838	700	51		<0.05														16	
BET-MW5s	5/10/2012	18.8	6.57	2.1		155	16	890	790	58	0.013J*	<0.05	0.40*	31	3.2	34	88	43	44	0.48*	110*	<4.1*	<4.1*	110	1.02	15	H
BET-MW5s	8/14/2012	20.3	6.95	1.5		32	5.0	868	680	47	0.015J	<0.05	0.43	33	2.9	29	79	50	36	0.43	120	<4.1	<4.1	120	0.99	19	
BET-MW5s	12/7/2012	21.3	6.79	1.0		71	28	996	840	67*		<0.050														15	H
BET-MW5s	3/21/2013	19.1	6.81	0.7	8	179	1.8	931.6	840	67		0.038J														15	
BET-MW5s	5/30/2013	21.7	6.45	0.6	7	144	2.0	930	740	62		0.021J														14	
BET-MW5s	8/26/2013	22.3	6.72	0.4	4	188	1.0	804	650	48	0.0047J	0.032J	0.49	34	3.1	31	84	57	34	0.63	120	<4.1	<4.1	120	1.02	19	
BET-MW5s	11/15/2013	20.7	6.10	0.7	9	299	1.0	941	780	62		0.018J														14	
BET-MW5s	2/24/2014	23.2	6.74	1.1	12	247	2.0	1,106	860	68*		0.019J														12	H
BET-MW5s	5/23/2014	20.8	6.80	1.1	12	161	4.0	1,158	660	60		<0.10														10	
BET-MW5s	8/25/2014	23.6	7.02	1.0	12	136	3.0	811	640	41	<0.050	<0.10	0.99	39	2.3	26	69	46	39	0.60	97	<4.1	<4.1	97	1.05	16	
BET-MW5s	11/11/2014	21.2	7.12	4.5	53	139	2.0	987	820	63		<0.10														12	
BET-MW6s	2/9/2012	20.1	6.40	1.1		152	17.5	510	410	18		<0.05														15	
BET-MW6s	5/10/2012	19.4	6.28	1.7		156	12	506	410	19	<0.05*	<0.05	0.45*	26	13	13	46	27	14	4.3*	110*	<4.1*	<4.1*	110	1.02	14	H

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
BET-MW6s	8/14/2012	20.6	7.30	1.4		64	8.0	496	370	21	0.010J	<0.05	1.0	26	22	11	39	24	17	6.0	98	<4.1	<4.1	98	0.97	19	
BET-MW6s	12/7/2012	20.7	6.27	1.5		92	18	679	560	33		<0.050														14	
BET-MW6s	3/21/2013	19.2	7.05	0.7	7	176	3.9	583.2	510	33		0.023J														14	
BET-MW6s	5/30/2013	20.9	6.32	0.3	3	145	2.0	536	430	26		0.024J														14	
BET-MW6s	8/26/2013	22.6	6.58	1.7	19	200	1.0	570	480	37	<0.050	0.048J	1.2	33	22	13	43	27	25	11	61	<4.1	<4.1	61	0.95	19	
BET-MW6s	11/15/2013	19.0	6.36	2.2	24	288	1.0	539	440	28		0.021J														14	
BET-MW6s	2/24/2014	20.9	6.60	2.1	20	212	1.0	591	450	27		0.026J														11	
BET-MW6s	5/23/2014	20.7	6.60	1.1	12	163	3.0	562	410	21		<0.10														9	
BET-MW6s	8/25/2014	21.2	6.68	2.0	22	148	5.0	505	390	24	<0.050	<0.10	1.0	28	15	11	39	30	16	4.9	67	<4.1	<4.1	67	1.01	15	
BET-MW6s	11/11/2014	20.7	6.96	5.4	62	151	1.0	534	450	28		<0.10														11	
BET-MW7s	2/8/2012	18.9	5.81	2.6		323	4.0	473	380	28		<0.05														15	
BET-MW7s	5/10/2012	19.6	5.67	1.9		210	8.0	437	450	25	<0.05*	<0.05	0.57*	30	4.9	9.4	36	28	22	2.9*	38*	<4.1*	<4.1*	38	1.03	14	H
BET-MW7s	8/14/2012	21.4	7.04	1.5		22	7.0	450	350	24	<0.05	<0.05	1.2	30	18	7.5	29	25	18	6.0	45	<4.1	<4.1	45	0.99	19	
BET-MW7s	12/7/2012	20.9	6.17	1.3		85	20	593	520	35		<0.050														14	
BET-MW7s	3/21/2013	19.0	6.82	1.9	23	183	3.0	553.6	470	35		0.034J														14	
BET-MW7s	5/30/2013	21.5	5.68	0.4	4	162	4.0	411	350	27		0.028J														13	
BET-MW7s	8/26/2013	22.2	6.45	1.9	22	204	1.0	453	370	27	<0.050	0.039J	0.69	29	17	9.5	35	27	18	9.1	53	<4.1	<4.1	53	0.96	18	
BET-MW7s	11/15/2013	19.8	5.85	1.1	12	303	2.0	590	490	39		<0.050														14	
BET-MW7s	2/24/2014	20.8	6.18	1.4	15	235	2.0	582	430	30		0.024J														11	
BET-MW7s	5/23/2014	20.1	6.28	1.5	16	169	3.0	348	300	18		<0.10														9	
BET-MW7s	8/25/2014	22.5	6.53	1.4	16	144	6.0	443	340	23	<0.050	<0.10	1.3	28	8.4	9.8	32	30	19	8.5	44	<4.1	<4.1	44	0.95	14	
BET-MW7s	11/11/2014	20.8	6.47	4.9	55	160	4.0	538	470	29		<0.10														10	
BET-MW8s	2/9/2012	19.2	6.62	1.5		156	26	491	440	25		0.026J														14	
BET-MW8s	5/10/2012	18.7	6.37	1.5		155	12	500	470	27	<0.05*	<0.05	0.55*	26	3.5	12	51	27	18	6.0*	75*	<4.1*	<4.1*	75	1.00	13	H
BET-MW8s	8/14/2012	20.9	7.30	1.0		70	12	485	400	30	<0.05	<0.05	0.90	27	18	9.1	40	28	16	6.9	66	<4.1	<4.1	66	0.91	19	
BET-MW8s	12/7/2012	21.2	6.53	2.5		84	17	584	480	30		<0.050														13	
BET-MW8s	3/21/2013	19.8	7.05	0.9	9	176	4.3	454.8	430	26		0.036J														13	
BET-MW8s	5/30/2013	21.0	6.25	0.7	7	146	3.0	519	470	28		0.024J														13	
BET-MW8s	8/26/2013	21.7	7.15	2.4	27	194	1.0	558	440	28	<0.050	0.046J	0.80	27	21	9.9	43	34	19	7.8	60	<4.1	<4.1	60	0.97	18	
BET-MW8s	11/15/2013	18.6	6.62	2.5	26	270	5.0	629	530	33		0.018J														13	
BET-MW8s	2/24/2014	21.2	6.80	1.6	17	206	2.0	586	460	30		0.028J														10	
BET-MW8s	5/23/2014	19.9	6.57	0.9	11	162	12	462	390	22		<0.10														8	
BET-MW8s	8/25/2014	21.8	6.71	1.8	21	148	6.0	495	420	29	<0.050	<0.10	1.1	30	7.3	10	47	24	20	9.0	70	<4.1	<4.1	70	0.96	14	
BET-MW8s	11/11/2014	21.4	6.78	5.4	59	155	3.0	535	460	31		0.048J														10	
FG1-MW1d	2/12/2012	19.3	7.12	1.2		105	4.0	1,409	1,000	8.6		0.026J														14	
FG1-MW1s	5/14/2012	18.7	6.84	3.6		192	309	1,430	920	23	<0.05*	0.026J	<0.2*	160	3.3	34	100	100	75	1.3*	440*	<8.2*	<8.2*	440	1.00	1	H
FG1-MW1d	8/15/2012	19.8	7.55	2.6		95	7.0	1,272	850	2.7	0.023J	0.025J	0.15J	170	5.1	39	87	120	110	0.14J	460	<8.2	<8.2	460	1.00	14	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
FG1-MW1s	12/11/2012	20.1	6.59	3.3		246	22	1,216	780	14		<0.050														0	
FG1-MW1d	3/21/2013	19.5	7.55	5.8	60	70	3.0	1,175	820	1.7		0.041J														13	
FG1-MW1d	5/30/2013	20.9	7.47	0.5	6	128	2.0	1,250	800	1.1		0.034J														13	
FG1-MW1d	8/23/2013	20.1	6.47	0.3	3	138	9.0	1,247	830	1.3	0.0032J	0.090	0.26	140	4.8	40	88	86	150	0.16	440	<8.2	<8.2	440	0.96	12	
FG1-MW1d	11/14/2013	20.1	6.78	0.5	6	101	9.0	1,301	860	0.42		0.13														13	
FG1-MW1d	2/20/2014	19.0	6.65	0.7	7	264	4.0	1,402	840	1.9		0.15														12	
FG1-MW1d	5/21/2014	20.6	7.39	1.0	12	175	3.0	1,432	880	2.0		0.17														12	
FG1-MW1d	8/22/2014	21.5	7.60	0.7	8	147	3.0	1,504	840	0.68	<0.050	0.27	0.42	160	5.8	46	99	130	140	<0.15	450	<8.2	<8.2	450	1.01	12	
FG1-MW1d	11/10/2014	20.0	7.12	3.7	42	34	1.0	1,673	980	0.89		0.29														12	
FG1-MW2d	2/12/2012	21.2	6.87	1.5		169	420	1,203	810	40		<0.05														9	
FG1-MW2d	5/14/2012	21.1	6.63	2.8		186	10	1,320	840	37	0.092*	0.029J	0.20*	80	7.9	51	110	130	66	2.3*	270*	<8.2*	<8.2*	270	1.02	11	H
FG1-MW2d	8/15/2012	21.2	7.04	2.1		120	15	1,167	780	35	0.13	0.027J	0.27	74	8.1	46	100	120	62	2.4	270	<8.2	<8.2	270	0.96	10	
FG1-MW2d	12/11/2012	21.0	6.54	0.9		240	2.0	1,369	890	46		<0.050														9	
FG1-MW2d	3/21/2013	21.0	7.77	5.5	64	113	15	1,331	1,000	49		0.042J														9	
FG1-MW2d	5/30/2013	22.4	7.10	0.5	6	152	1.0	1,371	900	48		<0.050														9	
FG1-MW2d	8/23/2013	23.7	6.37	0.4	4	140	12	1,181	800	39	0.10	0.042J	0.62	72	5.6	48	100	110	61	1.9	270	<8.2	<8.2	270	0.97	9	
FG1-MW2d	11/14/2013	22.0	6.65	0.6	6	122	12	1,095	740	32		0.022J														10	
FG1-MW2d	2/20/2014	19.7	6.29	0.5	6	277	5.0	1,153	760	32		0.027J														9	
FG1-MW2d	5/21/2014	22.0	6.94	0.9	11	191	8.0	1,152	730	29		<0.10														8	
FG1-MW2d	8/22/2014	23.3	7.13	0.4	5	147	3.0	1,099	810	47	0.022J	0.059J	0.77	76	9.9	32	79	92	68	9.5	130	<8.2	<8.2	130	0.99	9	
FG1-MW2d	11/10/2014	21.6	6.93	4.0	47	95	1.0	1,335	820	37		0.035J														10	
FG1-MW3d	2/12/2012	21.5	7.15	1.5		173	>1,000	2,072	1,300	7.2		<0.05														11	
FG1-MW3d	5/14/2012	21.3	6.97	3.3		173	143	1,783	1,100	3.4	<0.05*	<0.05	<0.2*	180	10	57	150	170	59	0.56*	650*	<8.2*	<8.2*	650	1.05	8	H
FG1-MW3d	8/15/2012	21.8	7.20	2.5		95	70	1,867	1,200	7.2	0.016J	0.026J	0.28	210	10	71	170	230	68	0.37	740	<8.2	<8.2	740	1.02	12	
FG1-MW3d	12/11/2012	21.0	6.45	1.1		249	43	1,966	1,100	8.3		0.026J														11	
FG1-MW3d	3/21/2013	20.6	7.47	5.6	60	94	51	1,840	1,100	7.7		0.044J														8	
FG1-MW3d	5/30/2013	21.8	7.39	0.4	5	142	73	2,050	1,300	11		<0.050														11	
FG1-MW3d	8/23/2013	22.9	6.43	0.3	4	140	81	2,235	1,400	23	0.015J	0.034J	0.43	250	9.2	76	170	240	77	1.2	820	<8.2	<8.2	820	0.98	8	
FG1-MW3d	11/14/2013	21.8	6.92	1.0	11	116	68	2,166	1,000	19		0.023J														11	
FG1-MW3d	2/20/2014	19.5	6.48	0.9	10	274	125	2,267	1,300	20		0.024J														10	
FG1-MW3d	5/21/2014	21.2	7.39	1.0	12	187	16	2,448	1,400	22		<0.10														10	
FG1-MW3d	8/22/2014	22.9	7.48	0.9	9	148	7.0	2,195	1,200	15	<0.050	0.097J	0.52	230	9.0	68	160	210	71	0.33	740	<8.2	<8.2	740	1.02	11	
FG1-MW3d	11/10/2014	21.4	7.22	3.5	42	77	3.0	2,146	1,200	13		0.047J														11	
FG1-MW4s	2/12/2012	21.4	6.23	2.4		201	370	679	530	33		<0.05														6	
FG1-MW4s	5/14/2012	20.9	6.00	2.4		204	57	632	480	26	<0.05*	0.036J	3.1*	35	13	19	53	32	30	8.9*	120*	<4.1*	<4.1*	120	1.00	6	H
FG1-MW4s	8/15/2012	22.0	6.50	2.0		112	10	635	510	29	0.065	0.041J	1.6	38	15	22	59	57	35	11	120	<4.1	<4.1	120	0.95	10	
FG1-MW4s	12/11/2012	23.4	6.18	1.8		243	19	593	420	19		0.026J														5	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
FG1-MW4s	3/21/2013	21.5	7.29	5.6	59	132	21	509	410	13		0.052														5	
FG1-MW4s	5/30/2013	23.0	6.59	0.5	6	147	27	756	580	0.16		0.033J														7	
FG1-MW4s	8/23/2013	24.4	5.99	0.3	3	153	12	776	570	23	0.14	0.051	1.5	54	19	21	58	90	43	11	130	<4.1	<4.1	130	0.93	5	
FG1-MW4s	11/14/2013	26.1	6.05	0.5	6	128	10	654	390	17		0.038J														6	
FG1-MW4s	2/20/2014	23.1	5.84	0.6	7	280	12	807	550	18		0.025J														4	
FG1-MW4s	5/21/2014	22.7	6.05	0.6	6	205	10	970	670	41		0.033J														5	
FG1-MW4s	8/22/2014	23.8	6.46	0.6	7	157	5.0	988	680	36	0.17	<0.10	1.5	69	20	23	63	110	42	8.1	98	<4.1	<4.1	98	0.97	7	
FG1-MW4s	11/10/2014	24.8	6.28	3.5	39	121	14	821	610	34		<0.10														6	
FG1-MW5s	2/12/2012	20.2	6.81	1.4		163	8.5	607	390	11		0.026J														6	
FG1-MW5s	5/14/2012	20.7	6.68	2.7		162	11	743	490	17	<0.05*	0.037J	0.20*	66	5.7	23	54	53	26	<0.15*	210*	<4.1*	<4.1*	210	1.02	8	H
FG1-MW5s	8/15/2012	19.1	6.75	2.6		107	8.0	906	620	47	0.075	0.033J	0.68	62	25	30	76	61	34	<0.15	190	<4.1	<4.1	190	1.00	6	
FG1-MW5s	12/11/2012	19.7	6.26	0.6		240	5.5	825	530	27		<0.050														7	
FG1-MW5s	3/21/2013	19.0	7.56	6.6	62	102	2.0	645	440	23		0.046J														6	
FG1-MW5s	5/30/2013	22.4	7.37	0.5	5	112	3.0	742	500	25		<0.050														6	
FG1-MW5s	8/23/2013	23.3	6.14	0.3	3	168	6.0	856	610	19	0.045J	0.040J	0.82	81	31	20	48	100	33	0.27	180	<4.1	<4.1	180	0.99	5	
FG1-MW5s	11/14/2013	21.4	6.50	0.3	3	150	5.0	977	640	22		0.020J														6	
FG1-MW5s	2/20/2014	21.1	6.34	0.8	9	266	8.0	881	530	16		0.032J														6	
FG1-MW5s	5/21/2014	20.3	7.28	1.4	16	200	4.0	1,082	650	19		<0.10														5	
FG1-MW5d	8/22/2014	22.2	7.15	0.5	6	137	3.0	1,244	700	20	0.034J	<0.10	0.31	110	2.2	42	83	110	59	<0.15	320	<8.2	<8.2	320	1.02	23	
FG1-MW5s	11/10/2014	21.7	6.88	4.2	44	126	2.0	942	570	15		0.037J														7	
FG1-MW6s	2/12/2012	22.3	6.62	1.7		192	11	404	290	14		<0.05														3	
FG1-MW6s	5/14/2012	23.2	6.36	3.3		181	10	464	340	13	<0.05*	0.033J	0.28*	39	2.9	17	29	28	12	2.1*	120*	<4.1*	<4.1*	120	1.04	4	H
FG1-MW6s	8/15/2012	26.0	6.45	2.3		122	15	428	300	14	0.012J	0.027J	0.62	32	4.9	18	31	44	17	3.1	91	<4.1	<4.1	91	1.01	8	
FG1-MW6s	12/11/2012	24.6	6.39	1.0		230	6.5	327	220	11		<0.050														3	
FG1-MW6d	3/21/2013	23.2	7.19	5.5	61	90	4.0	688	530	30		0.037J														21	
FG1-MW6s	5/30/2013	24.6	6.98	0.5	6	118	2.0	440	330	18		<0.050														4	
FG1-MW6s	8/23/2013	27.1	6.21	0.3	4	158	3.0	461	320	5.0	0.011J	0.038J	0.52	40	6.1	14	29	53	24	3.2	100	<4.1	<4.1	100	1.01	2	
FG1-MW6d	11/14/2013	24.7	6.13	0.3	4	140	5.0	630	450	17		0.031J														21	
FG1-MW6d	2/20/2014	22.7	6.26	0.6	7	264	5.0	748	480	18		0.026J														20	
FG1-MW6d	5/21/2014	22.9	6.82	0.7	8	188	2.0	595	380	14		<0.10														21	
FG1-MW6d	8/22/2014	24.5	6.79	0.4	6	152	3.0	866	590	36	0.11	<0.10	1.1	69	5.5	28	51	80	26	2.8	120	<4.1	<4.1	120	1.02	21	
FG1-MW6d	11/10/2014	23.7	6.50	3.6	43	125	2.0	607	410	17		<0.10														21	
FG1-MW7s	2/12/2012	21.9	6.47	2.2		189	39	621	470	26		0.031J														8	
FG1-MW7s	5/14/2012	22.2	6.22	2.4		190	29	819	630	39	0.025J*	0.035J	0.49*	45	3.9	29	70	45	41	5.2*	140*	<4.1*	<4.1*	140	1.01	8	H
FG1-MW7s	8/15/2012	24.1	6.29	2.1		121	8.0	512	410	21	0.027J	0.030J	1.1	31	8.9	17	45	36	32	7.6	110	<4.1	<4.1	110	0.93	13	
FG1-MW7s	12/11/2012	22.8	5.97	1.5		245	55	509	400	21		<0.050														8	
FG1-MW7s	3/21/2013	21.8	7.02	5.6	60	141	12	538	460	20		0.039J														8	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
FG1-MW7s	5/30/2013	23.2	6.64	2.2	26	145	3.0	578	480	24		<0.050														9	
FG1-MW7s	8/23/2013	27.3	5.98	0.3	5	161	11	587	440	14	0.025J	0.040J	1.2	46	7.6	15	46	55	40	8.4	110	<4.1	<4.1	110	0.98	8	
FG1-MW7s	11/14/2013	25.9	5.89	0.6	7	147	8.0	811	640	38		0.071														8	
FG1-MW7s	2/20/2014	22.7	5.99	0.9	11	271	28	705	520	28		0.034J														7	
FG1-MW7s	5/21/2014	23.7	6.17	1.4	16	204	5.0	794	590	33		<0.10														9	
FG1-MW7s	8/22/2014	25.1	6.61	0.4	5	157	4.0	777	570	34	0.027J	<0.10	1.5	51	8.1	23	61	47	49	4.8	120	<4.1	<4.1	120	1.00	9	
FG1-MW7s	11/10/2014	24.2	6.44	4.1	47	134	4.0	740	550	26		0.044J														8	
FG1-MW8s	2/12/2012	19.2	6.51	1.4		111	12	1,061	680	<0.1		0.22														3	
FG1-MW8s	5/14/2012	20.5	6.29	2.6		147	102	1,014	620	0.077J	<0.05*	0.18	<0.2*	110	2.4	34	62	78	81	0.29*	340*	<8.2*	<8.2*	340	1.00	5	H
FG1-MW8s	8/15/2012	19.6	6.53	2.4		60	22	1,045	680	0.094J	0.012J	0.25	0.35	110	2.3	45	73	86	93	<0.15	390	<8.2	<8.2	390	1.00	3	
FG1-MW8s	12/11/2012	20.4	5.82	2.7		251	13	1,033	600	0.049J		0.11														3	
FG1-MW8s	3/21/2013	19.3	6.85	5.8	59	32	16	943	640	0.076J		0.17														2	
FG1-MW8s	5/30/2013	21.2	6.81	0.5	6	119	8.0	1,012	620	<0.10		0.14														3	
FG1-MW8d	8/23/2013	21.0	6.16	0.3	3	165	7.0	960	640	15	0.11	0.034J	0.40	83	2.5	38	78	50	31	0.078J	370	<4.1	<4.1	370	1.02	19	
FG1-MW8d	11/14/2013	19.5	6.30	0.4	5	152	7.0	1,029	660	17		0.023J														21	
FG1-MW8s	2/20/2014	19.0	6.54	1.0	10	265	67	1,045	610	0.25		0.070														2	
FG1-MW8s	5/21/2014	19.4	7.32	0.8	9	192	6.0	989	550	<0.10		0.060J														2	
FG1-MW8d	8/22/2014	20.8	7.07	0.7	8	150	3.0	1,165	660	19	0.098	<0.10	0.40	76	2.8	47	93	88	37	<0.15	360	<8.2	<8.2	360	1.01	20	
FG1-MW8s	11/10/2014	21.1	6.56	3.8	44	132	6.0	1,170	710	2.1		0.047J														4	
FG1-MW9s	2/12/2012	18.5	7.20	1.2		127	740	694	470	0.16		0.026J														4	
FG1-MW9s	5/14/2012	16.4	6.99	2.3		227	>1,000	677	420	0.54	<0.05*	0.042J	0.51*	84	1.0	20	42	13	20	6.5*	320*	<4.1*	<4.1*	320	1.00	3	H
FG1-MW9s	8/15/2012	17.6	7.02	2.3		78	80	388	270	<0.2	0.010J	0.026J	0.26	35	0.60J	18	32	16	11	0.78	190	<4.1	<4.1	190	1.03	6	
FG1-MW9s	12/11/2012	18.5	6.53	1.2		227	349	382	240	<0.10		<0.050														4	
FG1-MW9s	3/21/2013	17.1	8.10	6.2	64	102	95	438	340	0.047J		0.044J														4	
FG1-MW9s	5/30/2013	18.1	6.71	4.8	55	208	9.0	537	360	<0.10		<0.050														5	
FG1-MW9s	8/23/2013	20.4	6.80	0.6	7	125	47	570	390	0.16	0.0041J	0.042J	0.23	32	0.76J	26	55	25	22	0.97	240	<4.1	<4.1	240	1.05	2	
FG1-MW9s	11/14/2013	18.4	6.95	4.2	45	116	79	482	330	0.20		0.020J														4	
FG1-MW9s	2/20/2014	19.1	6.63	0.9	10	251	10	619	330	0.025J		0.026J														3	
FG1-MW9s	5/21/2014	19.0	5.82	1.0	12	181	60	526	340	0.061J		<0.10														3	
FG1-MW9s	8/22/2014	23.4	7.56	1.4	16	142	5.0	1,233	900	24	<0.050	<0.10	0.55	56	1.2	57	120	71	57	0.78	390	<8.2	<8.2	390	1.03	4	
FG1-MW9s	11/10/2014	18.5	6.78	4.4	50	112	459	1,208	780	18		0.035J														4	
COT-MW1	2/16/2012	*Well Dry*																									
COT-MW1	5/15/2012	*Well Dry*																									
COT-MW1	8/16/2012	*Well Dry*																									
COT-MW1	12/9/2012	16.5	7.44	1.6		155	880	2,001	1,400	51		<0.050															P
COT-MW1	3/24/2013	*Well Dry*																									
COT-MW1	6/2/2013	*Well Dry*																									

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																					----Alkalinity as CaCO3----				
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
COT-MW1	8/28/2013	*Well Dry*																									
COT-MW1	11/15/2013	*Well Dry*																									
COT-MW1	2/20/2014	*Well Dry*																									
COT-MW1	5/27/2014	*Well Dry*																									
COT-MW1	8/26/2014	*Well Dry*																									
COT-MW1d	11/13/2014	17.4	7.85	5.4	57	126	151	1,095	880	36		0.034J														13	
COT-MW2	2/16/2012	17.8	7.26	2.0		271	250	2,596	1,800	75		0.025J														12	
COT-MW2	5/15/2012	25.1	7.22	2.0		170	70	2,483	1,800	82	<0.05*	0.046J	1.0*	320	7.1	58	160	100	230	1.1*	650*	<8.2*	<8.2*	650	1.01	10	H
COT-MW2	8/16/2012	*Well Dry*																									
COT-MW2	12/9/2012	17.4	7.79	6.2		143	105	2,416	1,700	76		<0.050															P
COT-MW2	3/24/2013	18.5	6.97	6.6	73	242	9.9	2,326	1,800	87		0.027J														7	P
COT-MW2	6/2/2013	23.8	7.59	5.9	61	140	12	2,430	1,800	86		0.032J														5	
COT-MW2	8/23/2013	*Well Dry*																									
COT-MW2	11/15/2013	*Well Dry*																									
COT-MW2	2/20/2014	*Well Dry*																									
COT-MW2	5/27/2014	*Well Dry*																									
COT-MW2	8/26/2014	*Well Dry*																									
COT-MW2	11/12/2014	*Well Dry*																									
COT-MW3	2/16/2012	17.8	7.30	2.6		261	>1,000	2,693	1,800	71		0.030J														13	
COT-MW3	5/15/2012	20.9	7.16	1.6		180	>1,000	2,570	1,800	80	<0.05*	0.039J	0.92*	480	4.2	21	72	110	180	14*	740*	<8.2*	<8.2*	740	0.95	11	H
COT-MW3	8/17/2012	23.2	7.83	3.0		156	>1,000	2,270	1,800	83	<0.05	<0.05	0.37	490	4.1	21	72	110	160	0.18	720	<8.2	<8.2	720	1.00	12	
COT-MW3	12/9/2012	21.8	7.62	3.3		102	617	2,540	1,700	62		<0.050														10	
COT-MW3	3/24/2013	21.3	7.16	1.7	19	213		2,530	1,700	64		0.026J														11	P
COT-MW3	6/2/2013	27.3	7.61	3.2	38	124	7.0	2,497	1,700	62		0.019J														9	
COT-MW3	8/28/2013	21.4	7.05	2.6	32	168	164	2,416	1,700	56	0.0080J	0.026J	0.57	530	4.2	15	51	100	120	2.6	870	<8.2	<8.2	870	1.01	6	
COT-MW3	11/15/2013	*Well Dry*																									
COT-MW3	2/20/2014	*Well Dry*																									
COT-MW3	5/27/2014	*Well Dry*																									
COT-MW3	8/26/2014	*Well Dry*																									
COT-MW3	11/12/2014	*Well Not Accessible*																									
COT-MW4	2/16/2012	18.9	7.09	2.7		268	280	1,791	1,200	26		0.030J														9	
COT-MW4	5/15/2012	20.7	7.02	2.1		198	29	1,694	1,100	20	<0.05*	0.036J	0.26*	280	6.7	23	72	100	95	0.21*	590*	<8.2*	<8.2*	590	0.99	8	H
COT-MW4	8/17/2012	24.4	7.41	3.2		91	400	1,607	1,200	8.6	<0.05	<0.05	0.33	310	6.4	23	73	100	84	0.096J	700	<8.2	<8.2	700	1.00	8	
COT-MW4	12/9/2012	20.9	7.47	4.3		151	70	1,912	1,200	25		<0.050														8	
COT-MW4	3/24/2013	21.9	7.24	2.5	26	221	8.7	2,219	1,300	49		0.022J														0	P
COT-MW4	6/2/2013	*Well Dry*																									
COT-MW4	8/28/2013	*Well Dry*																									

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
COT-MW4	11/15/2013	*Well Dry*																									
COT-MW4	2/20/2014	*Well Dry*																									
COT-MW4	5/27/2014	*Well Dry*																									
COT-MW4	8/26/2014	*Well Dry*																									
COT-MW4	11/12/2014	*Well Dry*																									
COT-MW5	2/16/2012	18.3	7.09	2.5		263	418	2,666	1,900	97		0.031J														6	
COT-MW5	5/15/2012	20.5	6.99	1.5		210	40	2,451	1,700	95	<0.05*	0.036J	0.52*	210	8.1	79	210	150	190	0.62*	610*	<8.2*	<8.2*	610	0.97	4	H
COT-MW5	8/16/2012	20.9	7.17	1.5		100	37	2,362	1,800	100	<0.05	<0.05	0.54	220	7.8	82	220	140	210	0.40	620	<8.2	<8.2	620	0.99	8	
COT-MW5	12/9/2012	21.0	7.40	3.3		114	60	2,694	1,900	94		<0.050														7	
COT-MW5	3/24/2013	20.3	6.93	4.5	50	222	14.7	2,674	1,900	100		0.031J														5	P
COT-MW5	6/2/2013	25.8	7.35	4.4	49	140	54	2,620	1,800	94		0.018J														4	
COT-MW5	8/28/2013	*Well Dry*																									
COT-MW5	11/15/2013	*Well Dry*																									
COT-MW5	2/20/2014	*Well Dry*																									
COT-MW5	5/27/2014	*Well Dry*																									
COT-MW5	8/26/2014	*Well Dry*																									
COT-MW5	11/12/2014	*Well Dry*																									
COT-MW6	2/16/2012	18.4	6.89	2.0		242	640	3,095	2,100	120		0.037J														7	
COT-MW6	5/15/2012	19.8	6.76	1.4		239	326	3,022	2,000	120	<0.05*	0.040J	0.52*	230	14	100	240	350	190	2.1*	460*	<8.2*	<8.2*	460	0.97	6	H
COT-MW6	8/17/2012	20.5	6.90	2.2		220	124	3,040	2,000	120	<0.05	<0.05	0.29	240	14	98	260	340	230	0.65	500	<8.2	<8.2	500	0.97	7	
COT-MW6	12/9/2012	20.8	7.28	3.1		110	61	3,066	2,000	110		<0.050														8	
COT-MW6	3/24/2013	20.4	6.71	2.6	29	231	154	3,141	2,100	110		0.024J														7	
COT-MW6	6/2/2013	22.5	7.08	2.2	28	140	282	3,068	2,000	110		<0.050														5	
COT-MW6	8/28/2013	*Well Dry*																									
COT-MW6	11/15/2013	*Well Dry*																									
COT-MW6	2/20/2014	*Well Dry*																									
COT-MW6	5/27/2014	*Well Dry*																									
COT-MW6	8/26/2014	*Well Dry*																									
COT-MW6	11/12/2014	*Well Dry*																									
COT-MW7	2/16/2012	19.7	6.88	2.6		238	88	2,170	1,500	87		0.091														14	
COT-MW7	5/15/2012	25.2	7.30	2.1		178	146	2,327	1,100	44	<0.05*	0.11	0.96*	120	49	42	110	120	120	17*	330*	<8.2*	<8.2*	330	0.95	11	H
COT-MW7	8/16/2012	25.8	7.24	2.1		95	130	1,425	1,100	45	<0.05	<0.05	1.1	120	52	41	110	110	100	16	360	<8.2	<8.2	360	0.96	6	
COT-MW7	12/9/2012	21.8	7.28	3.2		110	13	1,617	1,100	53		<0.050														16	
COT-MW7	3/24/2013	20.3	6.73	2.1	23	206	17.82	1,838	1,300	77		0.029J														13	
COT-MW7	6/2/2013	20.9	6.80	2.4	26	190	10	1,702	1,100	54		0.019J														13	
COT-MW7	8/28/2013	23.4	7.42	3.4	40	205	13	1,679	1,200	57	0.0070J	0.043J	0.31	140	58	47	120	120	96	14	350	<8.2	<8.2	350	1.03	8	
COT-MW7	11/15/2013	18.3	7.21	3.1	34	219	9.0	1,685	1,200	68		0.026J														10	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																					----Alkalinity as CaCO3----				
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
COT-MW7	2/20/2014	20.5	7.05	2.0	23	124	8.0	1,710	1,200	66		0.032J														10	
COT-MW7	5/27/2014	*Well Dry*																									
COT-MW7	8/26/2014	*Well Dry*																									
COT-MW7	11/13/2014	20.5	7.61	2.4	27	155	16	1,697	1,400	70		<0.10														9	
COT-MW8	2/16/2012	21.1	7.04	1.8		247	361	1,874	1,400	96		0.033J														8	
COT-MW8	5/15/2012	19.0	7.00	1.5		169	59	1,936	1,300	100	<0.05*	0.042J	0.64*	100	3.0	83	160	120	98	5.5*	320*	<8.2*	<8.2*	320	1.01	7	H
COT-MW8	8/17/2012	24.3	7.70	1.4		104	18	1,257	950	64	<0.05	<0.05	0.88	90	3.2	59	110	80	72	5.8	300	<8.2	<8.2	300	0.99	14	
COT-MW8	12/9/2012	23.9	7.54	3.0		100	17	1,168	800	42		0.026J														10	
COT-MW8	3/24/2013	20.4	6.97	2.6	29	210	13.57	1,044	750	38		0.030J														10	
COT-MW8	6/2/2013	22.1	7.24	2.7	31	153	8.0	1,395	930	42		<0.050														11	
COT-MW8	8/28/2013	24.2	7.52	2.8	31	197	1.0	1,296	860	36	0.0057J	0.036J	0.49	83	3.5	56	100	100	43	9.0	310	<8.2	<8.2	310	1.04	9	
COT-MW8	11/15/2013	18.6	QM	3.6	40	171	NM	1,559	820	35		0.029J														7	P
COT-MW8	2/20/2014	22.0	7.29	2.0	23	117	10	1,203	860	37		0.020J														6	
COT-MW8	5/27/2014	22.1	7.69	3.3	38	117	14	1,187	710	33		0.048J														6	P
COT-MW8	8/26/2014	*Well Dry*																									
COT-MW8	11/12/2014	21.8	7.46	2.7	30	156	73	1,254	800	33		<0.10														4	P
COT-MW9	2/16/2012	20.2	6.89	2.2		233	10	1,802	1,200	43		0.037J														17	
COT-MW9	5/15/2012	19.5	6.82	2.1		186	8.0	1,657	1,200	38	<0.05*	0.036J	0.42*	140	3.4	44	160	95	130	0.96*	470*	<8.2*	<8.2*	470	1.01	14	H
COT-MW9	8/16/2012	19.9	7.66	2.0		93	23	1,522	1,200	46	<0.05	<0.05	0.52	150	2.9	41	150	110	130	1.2	440	<8.2	<8.2	440	0.97	13	
COT-MW9	12/9/2012	21.1	7.24	2.5		114	12	1,581	1,000	23		<0.050														12	
COT-MW9	3/24/2013	20.0	6.75	1.8	21	198	1.7	1,561	1,000	28		0.029J														13	
COT-MW9	6/2/2013	21.9	7.09	1.8	20	143	3.0	1,624	1,100	34		0.018J														16	
COT-MW9	8/28/2013	22.2	6.52	1.9	22	167	5.0	1,593	1,000	29	<0.050	0.025J	0.44	150	4.1	47	180	91	120	0.71	520	<8.2	<8.2	520	1.11	10	
COT-MW9	11/15/2013	18.9	7.19	0.9	10	214	7.0	1,757	1,100	27		0.018J														10	
COT-MW9	2/20/2014	18.6	7.23	0.9	10	117	6.0	1,769	1,200	25		0.018J														8	
COT-MW9	5/27/2014	20.5	7.09	0.9	10	130	4.0	1,733	1,200	21		0.034J														9	
COT-MW9	8/26/2014	21.4	7.49	0.5	6	152	3.0	1,876	1,300	23	0.023J	0.034J	0.23	140	4.7	52	190	120	190	1.1	550	<8.2	<8.2	550	1.00	7	
COT-MW9	11/12/2014	20.9	7.04	0.5	6	138	38	1,865	820	23		<0.10														8	
COT-MW10	2/16/2012	20.0	7.14	2.3		217	10	1,045	640	7.4		0.034J														16	
COT-MW10	5/15/2012	19.3	6.94	2.1		176	8.0	1,302	860	17	<0.05*	0.036J	0.19J*	130	1.8	37	95	140	81	6.0*	330*	<8.2*	<8.2*	330	0.99	11	H
COT-MW10	8/16/2012	22.5	7.62	1.6		100	18	1,169	870	17	<0.05	<0.05	0.44	110	1.9	39	100	91	93	8.4	380	<8.2	<8.2	380	0.96	13	
COT-MW10	12/9/2012	22.1	7.40	1.0		100	7.0	1,050	670	9.5		<0.050														13	
COT-MW10	3/24/2013	19.4	6.88	1.1	11	198	8.2	1,203	810	16		0.031J														12	
COT-MW10	6/2/2013	20.7	7.07	1.2	14	155	4.0	1,527	1,000	31		<0.050														11	
COT-MW10	8/28/2013	23.4	6.51	1.2	15	162	10	1,781	1,300	24	0.0031J	0.032J	0.60	190	2.8	62	150	140	200	9.0	510	<8.2	<8.2	510	1.03	8	
COT-MW10	11/15/2013	21.9	7.32	1.4	17	193	14	1,552	1,100	21		0.031J														7	
COT-MW10	2/20/2014	20.6	7.12	1.0	11	118	12	1,549	1,000	19		0.024J														9	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
COT-MW10	5/27/2014	21.7	7.27	1.4	16	125	3.0	1,687	1,200	20		<0.10														7	
COT-MW10	8/26/2014	22.7	7.64	1.2	14	148	7.0	2,127	1,200	32	<0.050	<0.10	0.34	210	2.7	60	160	170	230	5.0	510	<8.2	<8.2	510	1.00	7	
COT-MW10	11/12/2014	21.5	7.26	1.2	13	149	34	2,168	1,400	36		<0.10														6	
COT-MW11d	2/13/2012	19.7	7.03	2.1		237	9.0	1,660	1,200	65		0.038J														16	
COT-MW11d	5/15/2012	21.0	6.51	2.0		201	8.0	1,828	1,300	82	<0.05*	0.043J	0.71*	120	29	58	160	130	46	24*	390*	<8.2*	<8.2*	390	0.98	14	H
COT-MW11s	8/16/2012	22.7	6.94	1.7		88	415	1,395	1,100	47	<0.05	0.034J	1.8	140	79	32	110	85	32	100	410	<8.2	<8.2	410	0.91	5	
COT-MW11s	12/9/2012	22.3	6.80	1.3		230	529	1,978	1,400	63		<0.050														8	
COT-MW11s	3/24/2013	18.0	6.41	4.7	49	244	308	1,704	1,200	86		0.045J														5	
COT-MW11s	6/2/2013	22.3	7.00	4.8	53	169	281	1,499	1,100	55		0.023J														9	
COT-MW11d	8/28/2013	21.7	6.92	2.9	34	200	4.0	1,763	1,200	75	0.047J	0.056	1.2	140	41	43	160	120	42	58	380	<8.2	<8.2	380	0.98	13	
COT-MW11d	11/15/2013	18.1	6.97	1.1	12	190	9.0	1,541	1,100	74		0.028J														12	
COT-MW11d	2/20/2014	18.8	6.38	1.0	11	145	9.0	1,509	1,100	25		0.022J														10	
COT-MW11d	5/27/2014	20.2	6.88	2.4	26	140	4.0	1,780	1,300	73		0.040J														10	
COT-MW11d	8/26/2014	20.6	7.01	1.9	21	161	5.0	2,480	1,700	100	0.61	0.060J	0.68	160	57	60	230	200	59	46	510	<8.2	<8.2	510	0.97	12	
COT-MW11d	11/13/2014	18.9	7.18	2.1	23	131	6.0	1,751	1,400	77		0.035J														10	
COT-MW12s	2/13/2012	19.8	7.10	1.7		223	4.5	1,379	980	41		0.030J														8	
COT-MW12s	5/15/2012	21.1	6.76	1.6		192	73	1,400	960	35	<0.05*	<0.05	0.60*	110	8.2	38	140	67	41	2.4*	460*	<8.2*	<8.2*	460	1.04	6	H
COT-MW12s	8/16/2012	22.2	7.67	1.6		87	74	1,394	1,100	70	<0.05	<0.05	0.74	79	10	46	180	100	45	2.6	340	<8.2	<8.2	340	1.05	8	
COT-MW12s	12/9/2012	21.1	7.30	3.0		92	40	1,372	880	49		0.038J														13	
COT-MW12s	3/24/2013	20.3	6.63	5.1	56	236	91.4	1,333	940	67		0.036J														7	
COT-MW12s	6/2/2013	23.8	7.31	2.7	31	137	6.0	1,185	860	110		<0.050														6	
COT-MW12d	8/28/2013	22.3	7.34	6.3	71	206	52	1,182	820	46	0.0032J	0.030J	<0.20	91	6.1	31	120	73	37	11	280	<8.2	<8.2	280	1.05	21	
COT-MW12s	11/15/2013	19.3	7.16	4.8	54	186	65	1,380	980	66		0.022J														3	
COT-MW12d	2/20/2014	19.6	6.67	4.6	50	140	15	1,311	900	50		<0.050														19	
COT-MW12d	5/27/2014	20.3	7.25	5.4	59	134	14	1,498	1,000	57		<0.10														19	
COT-MW12d	8/26/2014	20.3	7.44	5.3	59	159	18	1,613	1,100	62	<0.050	<0.10	0.30	97	7.6	40	160	96	49	8.3	370	<8.2	<8.2	370	0.99	20	
COT-MW12d	11/13/2014	18.9	7.68	2.9	32	131	27	1,387	1,100	61		<0.10														19	
COT-MW13s	2/13/2012	21.0	6.87	1.7		222	13	1,385	1,500	12		0.68														7	
COT-MW13s	5/15/2012	23.5	6.76	1.5		225	12	2,358	1,500	3.8	0.020J*	0.82	0.85*	130	7.6	77	260	340	91	2.0*	620*	<8.2*	<8.2*	620	1.04	4	H
COT-MW13s	8/16/2012	22.0	6.83	1.1		84	330	2,010	1,400	38	20	0.98	1.7	120	8.3	68	240	240	82	2.0	490	<8.2	<8.2	490	1.03	6	
COT-MW13s	12/9/2012	22.4	7.13	1.1		98	32	1,600	1,100	49		0.65														11	
COT-MW13s	3/24/2013	21.2	6.46	0.9	11	236	22.8	1,780	1,200	49		0.57														6	
COT-MW13s	6/2/2013	24.0	6.78	0.6	7	151	8.0	2,028	1,500	97		0.42														6	
COT-MW13d	8/28/2013	23.1	7.10	2.7	31	179	3.0	1,757	1,400	95	0.011J	0.040J	0.67	110	7.1	52	190	130	90	9.2	250	<8.2	<8.2	250	1.06	19	
COT-MW13s	11/15/2013	20.5	7.10	1.0	11	181	77	1,830	1,400	81		0.034J														3	
COT-MW13d	2/20/2014	19.2	6.61	3.6	39	138	8.0	2,116	1,600	130		0.018J														18	
COT-MW13d	5/27/2014	21.4	6.93	2.6	29	132	3.0	2,108	1,800	120		<0.10														16	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
COT-MW13d	8/26/2014	20.9	7.27	2.9	31	162	2.0	1,840	1,300	85	<0.050	<0.10	0.26	130	6.8	47	170	110	120	8.8	290	<8.2	<8.2	290	1.02	16	
COT-MW13d	11/13/2014	19.8	7.43	2.9	32	145	4.0	1,536	1,300	82		<0.10														17	
COT-MW14s	2/13/2012	21.0	6.87	1.7		222	13	1,385	930	30		0.032J														7	
COT-MW14s	5/15/2012	23.1	6.58	1.2		284	>1,000	1,150	770	23	<0.05*	0.026J	0.89*	75	6.1	38	110	68	23	12*	390*	<8.2*	<8.2*	390	0.99	5	H
COT-MW14s	8/16/2012	22.5	6.94	1.2		107	440	1,316	920	36	0.038J	<0.05	0.27	83	6.7	45	140	120	36	0.18	420	<8.2	<8.2	420	0.96	5	
COT-MW14s	12/9/2012	22.0	7.02	1.7		108	51	892	580	3.9		<0.050														10	
COT-MW14s	3/24/2013	20.8	6.34	2.8	32	238	78.5	1,124	750	20		0.040J														6	
COT-MW14s	6/2/2013	24.7	6.91	2.0	24	147	4.0	1,185	820	25		<0.050														4	
COT-MW14d	8/28/2013	22.1	7.23	2.4	28	197	3.0	1,789	1,200	69	0.025J	0.034J	0.15J	120	8.8	57	190	130	57	0.11J	420	<8.2	<8.2	420	1.08	19	
COT-MW14d	11/15/2013	18.7	6.95	0.9	10	187	11	1,721	1,200	69		0.020J														20	
COT-MW14d	2/20/2014	20.8	6.78	0.9	10	123	6.0	1,788	1,200	73		<0.050														19	
COT-MW14d	5/27/2014	21.3	7.09	1.2	13	117	3.0	1,932	1,300	71		<0.10														17	
COT-MW14d	8/26/2014	22.0	7.61	1.5	16	152	3.0	1,822	1,200	69	0.022J	<0.10	<0.20	130	8.6	50	170	120	58	0.38	420	<8.2	<8.2	420	1.03	16	
COT-MW14d	11/13/2014	20.0	7.65	1.4	16	129	3.0	1,619	1,200	69		<0.10														17	
SAN-MW1d	2/13/2012	17.8	7.13	1.0		138	146	2,914	2,000	38		0.031J														21	
SAN-MW1d	5/15/2012	17.8	7.13	1.0		138	146	2,914	1,800	35	<0.05*	<0.05	0.41*	470	5.2	28	46	140	140	0.46*	840*	<8.2*	<8.2*	840	0.96	21	H
SAN-MW1d	8/17/2012	21.3	7.10	1.0		191	189	2,587	1,700	41	<0.05	0.026J	0.46	480	4.7	30	96	140	150	0.052J	910	<8.2	<8.2	910	1.00	14	
SAN-MW1d	12/9/2012	18.5	7.32	2.4		127	123	2,623	1,700	43		<0.050														15	
SAN-MW1d	3/24/2013	21.5	6.89	1.5	16	196	9.6	2,587	1,600	43		0.038J														19	
SAN-MW1d	6/2/2013	20.4	7.40	2.4	27	155	18	2,520	1,800	48		<0.050														16	
SAN-MW1d	8/28/2013	20.2	6.43	1.5	17	169	10	2,072	1,400	45	0.0051J	0.034J	0.50	400	4.3	22	75	99	140	0.25	700	<8.2	<8.2	700	1.01	11	
SAN-MW1d	11/18/2013	18.6	7.49	2.3	25	251	72	2,221	1,400	49		<0.050														13	
SAN-MW1d	2/25/2014	20.9	7.80	2.9	31	121	21	2,520	1,700	53		0.019J														14	
SAN-MW1d	5/27/2014	19.7	7.51	3.0	32	124	13	2,350	1,500	47		0.035J														10	
SAN-MW1d	8/27/2014	20.1	7.63	1.7	18	171	10	2,048	1,400	47	<0.050	0.043J	0.30	360	4.0	22	74	88	150	0.25	530	<8.2	<8.2	530	1.09	5	
SAN-MW1d	11/12/2014	19.0	7.58	1.8	20	132	16	1,947	1,200	47		<0.10														7	
SAN-MW2d	2/13/2012	16.6	7.15	2.0		217	>1,000	2,004	1,200	32		0.026J														15	
SAN-MW2d	5/15/2012	19.2	7.00	4.0		230	650	1,939	1,200	25	<0.05*	<0.05	0.45*	180	4.9	46	130	120	79	3.3*	570*	<8.2*	<8.2*	570	1.00	13	H
SAN-MW2d	8/17/2012	22.8	6.97	3.9		201	781	1,719	1,200	37	<0.05	0.026J	0.45	150	4.4	43	150	110	110	<0.15	540	<8.2	<8.2	540	0.94	3	
SAN-MW2d	12/9/2012	17.8	7.16	4.1		150	520	1,671	1,100	42		<0.050														9	
SAN-MW2d	3/24/2013	19.3	6.97	4.1	43	243	13.97	1,976	1,200	42		0.020J														9	
SAN-MW2d	6/2/2013	19.4	7.23	3.3	36	171	36	1,633	1,200	43		<0.050														6	
SAN-MW2d	8/28/2013	*Well Dry*																									
SAN-MW2d	11/18/2013	18.3	7.29	5.2	55	260	54	1,718	1,100	52		<0.050														3	
SAN-MW2d	2/25/2014	19.1	7.34	3.6	38	147	13	1,649	1,100	56		<0.050														6	
SAN-MW2d	5/27/2014	19.5	7.53	3.8	40	133	30	1,754	1,200	53		0.15														3	
SAN-MW2d	8/27/2014	*Well Dry*																									

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																					----Alkalinity as CaCO3----				
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
SAN-MW2d	11/12/2014	*Well Dry*																									
SAN-MW3d	2/13/2012	18.8	6.92	2.5		227	80	1,861	1,100	74		0.027J														14	
SAN-MW3d	5/15/2012	21.1	7.00	2.2		205	56	1,872	1,200	74	<0.05*	<0.05	0.33*	130	4.4	52	170	88	120	2.4*	400*	<8.2*	<8.2*	400	1.01	12	H
SAN-MW3d	8/17/2012	23.2	6.97	2.1		211	226	1,817	1,200	71	<0.05	0.056	0.31	110	4.2	55	180	100	120	<0.15	420	<8.2	<8.2	420	0.98	3	
SAN-MW3d	12/9/2012	19.8	7.27	3.7		129	200	1,725	1,200	72		<0.050														8	
SAN-MW3d	3/24/2013	21.4	6.84	2.7	29	235	7.6	1,722	1,200	67		0.018J														9	
SAN-MW3d	6/2/2013	21.2	7.28	2.4	26	153	20	1,591	1,200	72		<0.050														6	
SAN-MW3d	8/28/2013	*Well Dry*																									
SAN-MW3d	11/18/2013	19.5	7.12	3.2	35	260	7.0	1,724	1,200	70		0.020J														3	
SAN-MW3d	2/25/2014	20.2	7.41	2.7	31	141	9.0	1,644	1,200	68		<0.050														6	
SAN-MW3d	5/27/2014	20.3	7.43	3.5	39	137	7.0	1,646	1,100	68		<0.10														3	
SAN-MW3d	8/27/2014	*Well Dry*																									
SAN-MW3d	11/12/2014	*Well Dry*																									
SAN-MW4d	2/13/2012	17.7	6.83	2.7		251	383	1,740	1,200	74		0.028J														24	
SAN-MW4d	5/15/2012	20.5	6.88	3.0		215	53	1,969	1,300	80	<0.05*	<0.05	0.78*	110	19	63	170	100	85	7.2*	420*	<8.2*	<8.2*	420	1.00	23	H
SAN-MW4d	8/17/2012	21.7	6.98	0.9		195	212	1,695	1,200	76	<0.05	0.044J	0.60	130	5.2	49	160	73	94	0.78	400	<8.2	<8.2	400	1.02	12	
SAN-MW4d	12/9/2012	18.7	7.18	1.1		134	74	1,713	1,200	72		<0.050														18	
SAN-MW4d	3/24/2013	20.4	6.67	1.2	14	226	14.18	1,762	1,200	74		0.021J														20	
SAN-MW4d	6/2/2013	20.1	7.12	1.8	20	100	23	1,630	1,200	81		<0.050														16	
SAN-MW4d	8/28/2013	21.6	7.17	1.0	13	21	23	1,743	1,200	79	0.0082J	0.038J	0.66	140	4.7	55	180	84	98	0.81	430	<8.2	<8.2	430	1.06	10	
SAN-MW4d	11/18/2013	18.5	7.13	2.8	30	263	6.0	1,815	1,200	82		0.021J														15	
SAN-MW4d	2/25/2014	19.8	7.38	2.0	22	138	11	1,767	1,300	79		<0.050														17	
SAN-MW4d	5/27/2014	19.8	7.26	1.9	22	140	18	1,833	1,200	75		<0.10														12	
SAN-MW4d	8/27/2014	19.4	7.10	3.2	34	210	39	1,753	1,200	68	<0.050	0.042J	0.97	120	3.8	51	170	86	86	3.7	410	<8.2	<8.2	410	1.04	5	
SAN-MW4d	11/12/2014	20.0	7.13	2.0	22	137	205	1,844	1,100	72		<0.10														8	
SAN-MW5s	2/16/2012	16.7	7.03	2.8		247	>1,000	1,828	1,200	20		0.031J														6	
SAN-MW5s	5/15/2012	20.5	7.04	3.0		207	>1,000	1,937	1,200	26	<0.05*	<0.05	1.5*	170	6.9	61	150	120	170	4.9*	560*	<8.2*	<8.2*	560	1.00	4	H
SAN-MW5d	8/17/2012	20.6	6.92	5.3		209	115	2,133	1,500	84	<0.05	0.036J	0.17J	160	5.2	68	210	140	200	<0.15	440	<8.2	<8.2	440	1.01	16	
SAN-MW5d	12/9/2012	18.1	7.17	5.4		129	104	1,956	1,400	69		0.025J														24	
SAN-MW5d	3/24/2013	20.3	6.77	4.2	44	221	29.9	2,158	1,400	45		0.032J														26	
SAN-MW5d	6/2/2013	19.7	7.79	5.4	60	167	12	1,896	1,400	81		<0.050														22	
SAN-MW5d	8/28/2013	20.4	6.75	4.9	54	158	24	1,655	1,100	54	0.0038J	0.028J	0.65	160	4.6	53	160	85	170	0.63	440	<8.2	<8.2	440	1.04	14	
SAN-MW5d	11/18/2013	18.1	7.37	6.5	68	261	21	1,714	1,100	46		0.018J														17	
SAN-MW5d	2/25/2014	19.5	7.49	4.8	53	148	15	1,779	1,300	59		<0.050														21	
SAN-MW5d	5/27/2014	19.3	7.87	5.7	61	126	20	1,796	1,200	58		0.038J														18	
SAN-MW5d	8/27/2014	18.2	6.77	5.3	56	215	16	1,823	1,200	51	<0.050	0.049J	0.40	160	4.8	51	150	99	150	0.32	370	<8.2	<8.2	370	1.11	10	
SAN-MW5d	11/12/2014	18.6	7.20	4.6	50	164	49	2,154	1,300	48		<0.10														10	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
SAN-MW6s	2/16/2012	22.0	7.01	2.5		235	225	1,844	1,200	34		0.031J														13	
SAN-MW6s	5/15/2012	21.5	6.90	2.7		172	153	1,859	1,300	38	<0.05*	0.033J	0.45*	160	8.3	55	170	130	160	2.2*	500*	<8.2*	<8.2*	500	1.02	11	H
SAN-MW6d	8/17/2012	21.7	7.27	2.8		107	238	1,813	1,300	46	<0.05	0.030J	0.48	160	11	57	190	160	190	1.4	470	<8.2	<8.2	470	1.01	30	
SAN-MW6s	12/9/2012	21.0	7.20	1.8		138	202	1,780	1,200	38		<0.050														10	
SAN-MW6s	3/24/2013	21.8	6.79	2.3	26	196	44.3	1,844	1,300	41		0.024J														13	
SAN-MW6s	6/2/2013	20.9	7.47	2.0	20	134	35	1,841	1,300	42		<0.050														8	
SAN-MW6s	8/28/2013	24.0	7.38	2.4	26	200	3.0	1,826	1,300	45	0.0057J	0.039J	0.49	160	7.9	56	170	150	190	1.8	430	<8.2	<8.2	430	1.01	7	
SAN-MW6s	11/18/2013	20.1	7.39	4.7	52	256	459	1,907	1,400	51		0.018J														5	
SAN-MW6s	2/25/2014	21.9	7.49	4.1	45	119	226	1,846	1,400	48		<0.050														6	
SAN-MW6s	5/27/2014	21.7	7.27	2.1	23	130	30	2,005	1,300	44		<0.10														4	
SAN-MW6s	8/27/2014	20.1	7.50	4.5	47	177	16	2,277	1,600	40	<0.050	<0.10	0.19J	250	4.3	56	180	160	250	0.21	450	<8.2	<8.2	450	1.14	2	
SAN-MW6s	11/12/2014	20.6	7.32	4.4	49	142	387	1,826	1,100	34		<0.10														3	
SAN-MW7s	2/16/2012	20.3	6.91	2.4		251	643	1,719	1,200	37		0.041J														16	
SAN-MW7s	5/15/2012	20.2	6.79	2.6		167	494	1,823	1,300	34	<0.05*	0.029J	0.93*	140	1.6	71	180	110	120	4.4*	610*	<8.2*	<8.2*	610	1.03	15	H
SAN-MW7d	8/17/2012	18.9	7.12	2.1		124	26	1,638	1,200	43	<0.05	0.025J	0.49	150	3.5	47	160	81	120	<0.15	570	<8.2	<8.2	570	0.96	25	
SAN-MW7s	12/9/2012	17.9	7.11	0.9		138	30	1,759	1,200	37		<0.050														9	
SAN-MW7s	3/24/2013	21.5	6.67	1.0	11	203	10.7	1,809	1,200	37		0.029J														14	
SAN-MW7s	6/2/2013	22.1	7.24	2.6	27	153	25	1,778	1,200	40		<0.050														7	
SAN-MW7d	8/28/2013	18.6	6.28	0.8	8	185	6.0	1,755	1,200	45	0.0042J	0.031J	0.57	160	4.1	51	180	90	110	0.092J	600	<8.2	<8.2	600	1.01	29	
SAN-MW7s	11/18/2013	18.1	7.22	3.7	41	257	16	1,775	1,200	30		0.017J														3	
SAN-MW7d	2/25/2014	20.3	7.19	1.2	13	105	20	1,797	1,200	39		<0.050														26	
SAN-MW7d	5/27/2014	18.5	7.09	1.8	19	134	5.0	1,946	1,200	40		<0.10														25	
SAN-MW7d	8/27/2014	18.2	7.29	2.0	20	181	9.0	1,899	1,300	38	<0.050	<0.10	0.50	170	4.5	50	180	92	110	<0.15	550	<8.2	<8.2	550	1.11	20	
SAN-MW7d	11/12/2014	19.6	7.14	2.3	24	122	9.0	1,751	980	29		0.038J														24	
SAN-MW8s	2/16/2012	19.3	6.91	2.0		242	603	1,673	1,100	40		0.038J														10	
SAN-MW8s	5/15/2012	20.8	6.70	1.7		220	>1,000	1,660	1,200	34	<0.05*	<0.05	0.83*	140	1.9	52	160	100	100	10*	540*	<8.2*	<8.2*	540	1.00	5	H
SAN-MW8d	8/17/2012	19.3	7.18	1.4		184	21	1,475	1,000	15	<0.05	0.028J	0.35	210	2.3	30	100	71	100	<0.15	610	<8.2	<8.2	610	0.96	15	
SAN-MW8s	12/9/2012	18.3	7.64	2.3		112	50	1,505	980	12		<0.050														2	
SAN-MW8d	3/24/2013	20.2	6.89	1.5	15	210	13.64	1,756	1,100	21		0.020J														24	
SAN-MW8d	6/2/2013	20.6	7.06	1.4	18	160	7.0	1,737	1,200	32		0.024J														19	
SAN-MW8d	8/28/2013	20.1	7.00	1.5	17	46	25	1,724	1,100	34	0.0040J	0.038J	0.58	150	2.6	49	170	110	130	3.7	570	<8.2	<8.2	570	0.97	20	
SAN-MW8d	11/18/2013	16.8	7.02	3.6	37	261	117	1,623	990	29		0.019J														20	
SAN-MW8d	2/25/2014	19.7	7.25	2.1	24	97	20	1,565	1,100	28		0.022J														17	
SAN-MW8d	5/27/2014	19.0	7.07	2.6	27	134	24	1,570	950	24		<0.10														13	
SAN-MW8d	8/27/2014	18.9	7.27	2.8	30	177	34	1,651	1,100	27	<0.050	<0.10	0.43	140	2.5	45	160	75	110	0.36	450	<8.2	<8.2	450	1.16	11	
SAN-MW8d	11/12/2014	18.7	7.10	2.9	31	121	48	1,366	800	15		<0.10														12	
PLS-MW1s	2/8/2012	19.2	7.02	1.5		164	79	2,817	2,000	120		0.040J														6	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
PLS-MW1d	5/10/2012	17.7	6.62	0.2		194	32	2,041	1,400	62	<0.05*	<0.05	1.0*	190	3.6	75	150	180	130	0.44*	440*	<8.2*	<8.2*	440	1.05	19	H
PLS-MW1s	8/15/2012	20.8	7.04	0.9		110	10	2,064	1,500	68	0.27	0.035J	1.1	210	4.3	78	180	210	180	0.17	490	<8.2	<8.2	490	1.01	7	
PLS-MW1s	12/11/2012	17.9	6.62	1.1		235	164	2,355	1,600	83		0.037J														4	
PLS-MW1d	3/21/2013	17.1	7.20	0.5	5	200	1.5	1,972	1,400	61		0.045J														16	
PLS-MW1d	5/29/2013	18.5	6.99	2.6	28	184	1.0	2,078	1,400	64		0.022J														16	
PLS-MW1s	8/26/2013	21.2	6.92	0.8	9	171	17	1,956	1,300	57	0.17	0.055	1.2	190	3.4	73	160	180	150	0.41	470	<8.2	<8.2	470	1.03	6	
PLS-MW1s	11/15/2013	20.4	6.76	0.9	10	241	12	2,209	1,400	63		0.029J														4	
PLS-MW1d	2/24/2014	19.3	7.03	0.6	6	155	2.0	1,952	1,200	51		0.022J														14	
PLS-MW1d	5/22/2014	19.8	7.15	1.0	8	137	2.0	1,792	1,200	48		0.038J														13	
PLS-MW1d	8/26/2014	19.3	7.16	0.5	5	178	4.0	1,756	1,000	47	0.22	0.039J	1.2	180	3.1	58	120	120	96	0.36	410	<8.2	<8.2	410	1.10	15	
PLS-MW1d	11/10/2014	19.7	7.07	4.1	44	136	1.0	1,774	1,200	47		0.041J														14	
PLS-MW2s	2/8/2012	17.5	6.90	1.8		170	766	2,365	1,600	66		<0.05														7	
PLS-MW2s	5/10/2012	17.7	6.99	6.5		223	190	2,413	1,600	67	0.024J*	<0.05	1.2*	200	2.5	94	210	240	160	2.3*	550*	<8.2*	<8.2*	550	1.04	6	H
PLS-MW2s	8/15/2012	20.3	7.06	4.1		113	480	2,324	1,700	71	0.17	0.049J	1.1	210	2.2	97	210	270	190	0.16	570	<8.2	<8.2	570	0.99	8	
PLS-MW2s	12/11/2012	18.9	6.49	0.8		235	469	2,353	1,600	68		0.029J														5	
PLS-MW2d	3/21/2013	18.3	6.99	0.7	7	211	2.0	2,061	1,600	75		0.045J														17	
PLS-MW2s	5/29/2013	18.6	6.94	0.7	7	187	9.0	2,548	1,700	64		<0.050														4	
PLS-MW2s	8/26/2013	22.1	6.87	0.7	8	170	7.0	2,196	1,400	60	0.063	0.050	1.2	170	1.8	91	210	220	180	0.64	510	<8.2	<8.2	510	1.04	7	
PLS-MW2s	11/15/2013	20.6	6.55	0.9	10	253	8.0	2,023	1,400	57		0.021J														5	
PLS-MW2d	2/24/2014	20.2	7.03	1.2	13	130	2.0	2,026	1,300	58		0.022J														15	
PLS-MW2d	5/22/2014	20.0	7.02	1.5	16	141	2.0	1,951	1,400	59		0.040J														14	
PLS-MW2d	8/26/2014	18.4	7.14	0.8	9	184	8.0	2,110	1,400	55	0.27	0.063J	1.6	220	3.7	71	140	160	130	0.85	490	<8.2	<8.2	490	1.07	16	
PLS-MW2s	11/10/2014	20.2	6.95	2.5	27	145	955	2,104	1,400	39		0.039J														2	
PLS-MW3s	2/8/2012	18.8	7.01	1.1		126	20	1,353	920	34		0.040J														6	
PLS-MW3s	5/10/2012	17.8	6.85	3.2		234	160	1,389	940	38	<0.05*	<0.05	1.4*	66	3.3	46	190	57	65	0.98*	440*	<8.2*	<8.2*	440	1.12	4	H
PLS-MW3s	8/15/2012	20.3	7.18	2.6		102	123	1,219	910	40*	0.025J	0.044J	1.4	63	3.2	43	160	55	63	0.27	430	<8.2	<8.2	430	1.00	6	H
PLS-MW3s	12/11/2012	19.9	6.06	1.0		276	14	1,322	890	41		0.030J														4	
PLS-MW3d	3/21/2013	17.6	7.18	0.8	9	213	3.2	1,328	980	49		0.048J														16	
PLS-MW3s	5/29/2013	19.4	6.91	0.7	8	193	5.0	1,506	990	2.7		0.033J														3	
PLS-MW3s	8/26/2013	21.3	6.94	0.5	5	181	2.0	1,435	880	52	0.020J	0.056	1.6	57	3.3	48	200	55	72	0.30	450	<8.2	<8.2	450	1.05	5	
PLS-MW3s	11/15/2013	21.3	6.54	1.0	11	263	1.0	1,495	920	54		0.031J														4	
PLS-MW3d	2/24/2014	20.0	6.91	1.3	14	185	1.0	1,698	1,000	56		0.030J														14	
PLS-MW3d	5/22/2014	20.6	7.12	0.6	6	142	2.0	1,610	1,100	57		0.036J														13	
PLS-MW3d	8/26/2014	19.7	6.67	0.3	4	196	4.0	1,685	1,100	58	0.018J	<0.10	1.9	68	4.0	54	210	75	79	<0.15	440	<8.2	<8.2	440	1.08	15	
PLS-MW3d	11/10/2014	21.0	6.98	4.5	52	154	1.0	1,783	1,200	61		0.050J														14	
PLS-MW4s	2/8/2012	19.0	7.02	1.7		151	17	5,230	3,800	120		11														12	
PLS-MW4s	5/10/2012	18.6	6.62	1.4		192	32	5,612	3,900	140	12*	12	14*	410	500	150	310	700	310	0.36J*	960*	<8.2*	<8.2*	960	1.05	12	H

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																					----Alkalinity as CaCO3----					
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
PLS-MW4s	8/15/2012	20.9	7.01	1.0		114	22	5,055	4,000	140*	<0.05	9.6	12	410	470	140	310	690	320	0.23	1,100	<8.2	<8.2	1,100	0.99	14	H
PLS-MW4s	12/11/2012	19.8	6.30	0.7		254	24	5,346	3,800	150		8.5														11	
PLS-MW4s	3/21/2013	18.0	7.04	0.6	6	234	25.2	4,569	3,400	120		9.1														9	
PLS-MW4s	5/29/2013	20.8	7.21	0.5	5	186	4.0	4,872	3,200	95		8.4														9	
PLS-MW4s	8/26/2013	21.0	6.86	0.5	6	176	3.0	4,414	2,800	88	0.0079J	4.4	7.4	360	290	120	300	600	270	0.38	1,000	<8.2	<8.2	1,000	0.99	12	
PLS-MW4s	11/15/2013	20.5	6.85	0.4	5	95	22	4,212	2,900	80		7.7														10	
PLS-MW4s	2/24/2014	23.0	7.01	0.5	5	138	8.0	4,221	2,700	73		6.0														7	
PLS-MW4s	5/22/2014	21.0	7.02	0.9	11	148	4.0	4,465	3,100	85		5.1														7	
PLS-MW4s	8/26/2014	24.1	7.02	0.7	8	178	5.0	4,413	2,700	73	<0.050	2.2	4.7	360	230	120	300	570	250	0.26	970	<8.2	<8.2	970	1.01	8	
PLS-MW4s	11/10/2014	22.3	6.99	3.6	43	142	7.0	4,267	2,700	74		2.5														8	
PLS-MW5s	2/8/2012	20.1	6.98	1.5		161	>1,000	1,931	1,300	76		0.047J														6	
PLS-MW5s	5/10/2012	19.0	6.90	6.4		241	743	1,814	1,200	69	<0.05*	0.058	1.5*	130	5.7	60	170	150	51	6.0*	400*	<8.2*	<8.2*	400	1.04	5	H
PLS-MW5s	8/15/2012	20.6	7.09	5.0		106	76	1,642	1,200	74*	0.40	0.038J	1.6	130	4.8	55	160	150	54	0.27	380	<8.2	<8.2	380	1.00	7	H
PLS-MW5s	12/11/2012	20.7	6.55	0.5		233	564	1,991	1,300	55		0.042J														4	
PLS-MW5d	3/21/2013	19.1	6.99	0.5	6	214	1.6	1,542	1,200	89		0.12														16	
PLS-MW5s	5/29/2013	20.2	7.07	0.3	4	186	28	2,012	1,300	63		0.035J														2	
PLS-MW5s	8/26/2013	21.7	6.52	0.6	6	240	5.0	1,887	1,300	80	0.47	0.066	1.6	130	4.7	60	180	200	84	0.35	170	<8.2	<8.2	170	1.19	5	
PLS-MW5s	11/15/2013	21.3	6.79	0.4	4	107	46	2,020	1,400	78		0.033J														3	
PLS-MW5d	2/24/2014	21.6	6.95	1.0	12	170	1.0	2,159	1,400	72		0.043J														13	
PLS-MW5d	5/22/2014	21.6	7.18	0.6	8	142	2.0	2,052	1,500	68		0.039J														13	
PLS-MW5d	8/26/2014	21.0	6.99	0.7	7	190	4.0	1,985	1,300	75	0.75	0.039J	1.0	99	5.4	69	210	160	62	0.51	420	<8.2	<8.2	420	1.05	14	
PLS-MW5d	11/10/2014	21.3	7.04	3.9	45	147	1.0	2,025	1,400	69		0.17														14	
PLS-MW6s	2/8/2012	18.8	7.65	1.2		130	52	2,251	1,600	52		<0.05														14	
PLS-MW6s	5/10/2012	18.1	7.22	2.2		165	21	2,300	1,500	52	<0.05*	<0.05	0.84*	420	4.2	47	98	150	120	0.72*	680*	<8.2*	<8.2*	680	1.13	13	H
PLS-MW6s	8/15/2012	20.6	6.88	1.9		93	12	2,017	1,500	54	0.70	0.031J	0.90	340	4.2	46	100	160	130	0.31	650	<8.2	<8.2	650	0.98	16	
PLS-MW6s	12/11/2012	20.6	6.60	0.7		249	81	2,393	1,600	52		0.039J														13	
PLS-MW6s	3/21/2013	17.6	7.31	0.6	4	244	16.7	2,085	1,500	55		0.050														12	
PLS-MW6s	5/29/2013	21.0	7.45	0.4	4	167	4.0	2,614	1,800	51		0.030J														12	
PLS-MW6s	8/26/2013	21.6	7.31	0.6	7	171	3.0	2,170	1,300	59	0.67	0.064	1.3	260	4.1	61	140	150	130	0.32	630	<8.2	<8.2	630	0.98	15	
PLS-MW6s	11/15/2013	21.3	7.20	0.4	5	76	8.0	2,163	1,500	65		0.033J														13	
PLS-MW6s	2/24/2014	20.1	7.23	0.3	4	183	15	2,249	1,400	58		<0.050														11	
PLS-MW6s	5/22/2014	21.6	7.52	1.2	14	135	8.0	2,142	1,600	55		<0.10														9	
PLS-MW6s	8/26/2014	22.9	7.44	0.4	4	160	3.0	2,218	1,500	54	0.55	<0.10	1.1	240	4.4	64	150	140	130	4.8	590	<8.2	<8.2	590	1.04	12	
PLS-MW6s	11/10/2014	22.6	7.26	3.4	41	133	6.0	2,243	1,400	51		0.058J														10	
PLS-MW7s	2/8/2012	17.6	7.04	1.8		157	21	2,312	1,600	81		0.034J														12	
PLS-MW7s	5/10/2012	17.4	6.80	3.1		180	10	2,222	1,500	69	<0.05*	<0.05	1.6*	210	3.8	75	190	160	160	0.40*	560*	<8.2*	<8.2*	560	1.04	12	H
PLS-MW7s	8/15/2012	18.6	7.10	2.2		110	15	2,064	1,600	69	0.29	0.033J	1.7	220	3.6	71	190	180	190	0.29	560	<8.2	<8.2	560	0.99	14	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
PLS-MW7s	12/11/2012	18.9	6.52	0.7		231	24	2,128	1,500	63		0.030J														11	
PLS-MW7s	3/21/2013	17.1	7.20	0.5	5	235	65.2	2,043	1,500	62		0.053														9	
PLS-MW7s	5/29/2013	20.0	7.14	0.4	3	168	7.0	2,336	1,600	70*		0.031J														10	H
PLS-MW7s	8/26/2013	20.2	7.09	0.8	10	173	11	2,279	1,360	72	0.26	0.080	2.1	200	3.3	75	190	180	200	0.50	520	<8.2	<8.2	520	0.99	13	
PLS-MW7s	11/15/2013	19.1	7.04	0.3	3	77	11	2,109	1,500	77		0.036J														11	
PLS-MW7s	2/24/2014	20.3	6.89	0.9	10	197	11	2,294	1,600	69		0.031J														8	
PLS-MW7s	5/22/2014	19.7	7.31	1.2	12	139	22	2,072	1,500	68		0.045J														7	
PLS-MW7s	8/26/2014	20.4	7.29	0.4	4	161	6.0	2,004	1,500	64	0.29	0.067J	1.4	170	3.1	65	160	130	130	8.6	450	<8.2	<8.2	450	1.03	9	
PLS-MW7s	11/10/2014	21.2	7.14	4.1	48	130	7.0	2,011	1,300	65		0.061J														0	
Central Area-West Side																											
ANT-MW1d	2/9/2012	20.1	6.87	1.6		174	289	2,136	1,400	28		<0.05														14	
ANT-MW1d	5/10/2012	19.4	6.93	2.1		222	23	2,236	1,300	27	0.019J*	0.026J	0.82*	150	5.1	100	85	190	120	0.085J*	490*	<8.2*	<8.2*	490	0.98	15	H
ANT-MW1s	8/15/2012	21.0	6.72	3.0		224	1.5	1,888	1,100	24	0.015J	0.031J	0.89	130	4.0	85	130	170	130	<0.15	530	<8.2	<8.2	530	0.97	6	
ANT-MW1d	12/10/2012	19.4	7.24	1.5		89	173	1,532	970	17		<0.050														13	
ANT-MW1s	3/22/2013	19.1	7.68	6.0	63	133	75	1,721	1,100	33		0.031J														2	
ANT-MW1d	5/30/2013	19.2	7.04	1.9	31	201	8.0	1,669	1,100	30		0.032J														15	
ANT-MW1s	8/27/2013	21.7	6.93	0.7	8	211	19	1,683	940	27	0.0025J	0.040J	0.66	110	4.8	83	130	150	130	0.37	460	<8.2	<8.2	460	1.01	6	
ANT-MW1d	11/14/2013	22.6	7.23	1.1	13	194	10	1,813	1,100	26		0.026J														12	
ANT-MW1d	2/19/2014	18.1	7.45	1.3	15	223	484	1,873	1,100	26		<0.050														5	
ANT-MW1d	5/22/2014	20.1	7.27	5.8	60	142	518	1,765	1,200	25		<0.10														1	
ANT-MW1d	8/21/2014	20.7	7.09	0.9	10	144	207	1,889	1,000	26	<0.050	0.049J	0.88	130	4.4	100	130	170	130	1.6	540	<8.2	<8.2	540	1.01	5	
ANT-MW1d	11/7/2014	20.0	6.99	1.6	13	109	245	2,144	1,300	39		<0.10														4	
ANT-MW2s	2/9/2012	21.1	7.03	1.8		180	170	2,803	1,800	61		<0.05														10	
ANT-MW2s	5/10/2012	21.1	6.99	1.4		240	97	3,263	1,700	64	0.011J*	<0.05	0.13J*	210	3.8	180	120	400	210	0.39*	500*	<8.2*	<8.2*	500	0.99	11	H
ANT-MW2s	8/15/2012	21.5	6.97	1.4		216	14	2,756	1,600	53	0.011J	<0.05	<0.2	180	3.6	160	150	320	210	<0.15	580	<8.2	<8.2	580	0.99	11	
ANT-MW2s	12/10/2012	23.3	7.20	1.6		108	80	3,450	2,100	81		<0.050														7	
ANT-MW2s	3/22/2013	18.5	7.59	2.5	28	195	215	1,878	1,200	33		0.020J														10	
ANT-MW2s	5/30/2013	20.3	7.45	1.0	10	151	6.0	2,351	1,400	44		0.029J														10	
ANT-MW2s	8/27/2013	22.6	7.21	0.8	8	157	9.0	2,842	1,500	54	<0.050	0.031J	0.18J	190	3.7	180	150	320	180	0.16	600	<8.2	<8.2	600	1.07	8	
ANT-MW2s	11/14/2013	20.4	7.15	2.1	23	225	94	3,476	2,100	71		0.024J														4	
ANT-MW2d	2/19/2014	18.5	7.59	2.6	30	222	80	1,747	1,000	18		<0.050														19	
ANT-MW2d	5/22/2014	20.1	7.46	3.0	35	134	37	1,606	1,100	17		<0.10														16	
ANT-MW2d	8/21/2014	20.8	7.33	2.9	33	144	23	1,660	1,400	17	<0.050	<0.10	0.26	110	2.8	84	110	140	130	0.21	450	<8.2	<8.2	450	1.02	17	
ANT-MW2d	11/7/2014	19.7	7.22	2.5	28	128	76	1,699	1,000	17		<0.10														15	
ANT-MW3s	2/9/2012	19.9	6.99	1.6		180	152	1,652	1,100	25		<0.05														10	
ANT-MW3s	5/10/2012	19.9	7.01	1.7		228	59	1,600	960	19	0.011J*	<0.05	0.12J*	110	4.7	71	92	150	120	0.23*	360*	<8.2*	<8.2*	360	1.00	11	H

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																					----Alkalinity as CaCO3----				
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
ANT-MW3s	8/15/2012	20.3	6.88	2.0		199	40	2,023	1,200	38	<0.05	<0.05	0.37	130	6.9	100	130	190	150	<0.15	500	<8.2	<8.2	500	0.97	15	
ANT-MW3s	12/10/2012	21.2	7.29	1.7		92	239	1,739	1,100	30		<0.050														9	
ANT-MW3s	3/22/2013	17.5	7.78	3.0	34	146	222	1,506	1,000	23		0.025J														11	
ANT-MW3s	5/30/2013	18.8	7.64	1.1	13	139	8.0	1,529	1,000	20		0.018J														11	
ANT-MW3s	8/27/2013	21.1	7.07	3.2	33	199	80	1,447	840	18	<0.050	0.034J	<0.20	110	6.2	71	110	140	130	0.21	370	<8.2	<8.2	370	1.06	12	
ANT-MW3s	11/14/2013	19.7	7.20	2.7	28	190	85	1,718	1,100	24		0.020J														6	
ANT-MW3s	2/19/2014	18.3	7.57	3.4	37	223	89	1,821	1,100	26		<0.050														2	
ANT-MW3d	5/22/2014	19.5	7.43	3.2	36	144	55	1,775	1,200	29		<0.10														16	
ANT-MW3d	8/21/2014	20.3	7.30	2.4	26	147	17	1,772	1,000	23	<0.050	<0.10	0.29	120	2.6	89	120	150	130	0.095J	450	<8.2	<8.2	450	1.06	18	
ANT-MW3d	11/7/2014	18.7	7.29	2.9	31	135	60	1,776	1,100	24		<0.10														17	
ANT-MW4s	2/9/2012	20.5	6.94	1.9		194	990	2,290	1,600	34		<0.05														10	
ANT-MW4s	5/10/2012	20.7	6.96	1.8		235	267	2,361	1,400	27	<0.05*	<0.05	0.13J*	150	2.7	160	98	190	150	0.60*	710*	<8.2*	<8.2*	710	1.00	11	H
ANT-MW4s	8/15/2012	22.1	6.85	1.5		211	95	2,321	1,400	28	<0.05	<0.05	0.079J	130	2.4	180	95	210	160	<0.15	720	<8.2	<8.2	720	0.99	11	
ANT-MW4s	12/10/2012	22.4	7.30	2.0		83	196	2,020	1,500	24		<0.050														7	
ANT-MW4s	3/22/2013	17.9	7.86	2.7	29	167	85	1,654	1,100	21		0.033J														9	
ANT-MW4s	5/30/2013	20.3	7.10	0.8	10	200	9.0	1,777	1,000	21		0.023J														8	
ANT-MW4s	8/27/2013	22.6	7.29	1.1	13	165	16	2,004	1,100	24	0.0078J	0.020J	<0.20	170	2.8	120	120	170	140	0.17	630	<8.2	<8.2	630	1.06	9	
ANT-MW4s	11/14/2013	20.1	7.14	2.7	31	216	361	2,099	1,200	23		<0.050														4	
ANT-MW4s	2/19/2014	18.9	7.47	2.6	28	226	73	2,064	1,200	22		0.024J														1	
ANT-MW4d	5/22/2014	21.9	7.37	3.6	39	120	304	1,558	1,000	14		<0.10														16	
ANT-MW4d	8/21/2014	21.8	7.29	3.9	43	147	184	1,579	920	12	<0.050	<0.10	0.46	120	2.3	77	110	120	130	1.5	440	<8.2	<8.2	440	1.08	17	
ANT-MW4d	11/7/2014	19.2	7.44	3.6	40	139	926	1,658	1,000	13		<0.10														16	
ANT-MW5s	2/9/2012	20.5	6.99	1.4		170	350	1,395	950	18		<0.05														8	
ANT-MW5s	5/10/2012	19.6	7.02	1.2		223	55	1,927	1,200	26	0.019J*	<0.05	0.67*	120	3.7	100	120	150	100	0.27*	570*	<8.2*	<8.2*	570	1.00	9	H
ANT-MW5s	8/15/2012	21.0	6.89	1.3		251	13	1,557	920	18	<0.05	0.029J	0.89	110	3.1	85	88	130	110	<0.15	430	<8.2	<8.2	430	1.03	14	
ANT-MW5s	12/10/2012	21.8	7.31	1.2		83	567	1,524	900	22		<0.050														7	
ANT-MW5s	3/22/2013	18.9	7.80	0.9	11	132	300	1,689	1,100	31		0.033J														9	
ANT-MW5s	5/30/2013	19.2	7.48	4.3	45	125	9.0	1,781	1,300	30		0.026J														9	
ANT-MW5s	8/27/2013	20.9	6.92	0.7	8	238	2.0	1,589	940	16	0.015J	0.038J	0.77	110	3.4	96	110	160	120	0.14J	460	<8.2	<8.2	460	1.05	16	
ANT-MW5s	11/14/2013	20.6	7.21	1.3	14	225	92	1,746	1,100	19		0.020J														6	
ANT-MW5d	2/19/2014	18.0	7.62	1.7	18	217	16	1,674	930	21		0.019J														23	
ANT-MW5d	5/22/2014	19.8	7.29	1.4	14	140	16	1,442	910	7.7		<0.10														20	
ANT-MW5d	8/21/2014	20.2	7.22	1.8	21	142	5.0	1,834	1,100	24	<0.050	<0.10	0.39	110	5.4	100	130	160	120	<0.15	500	<8.2	<8.2	500	1.05	21	
ANT-MW5d	11/7/2014	18.7	6.96	1.2	13	159	11	2,205	1,400	39		0.033J														24	
ANT-MW6s	2/9/2012	19.2	7.21	1.3		170	152	1,434	980	18		0.030J														13	
ANT-MW6s	5/10/2012	19.6	7.29	1.8		229	211	1,779	1,100	31	<0.05*	<0.05	0.28*	100	90	88	52	130	120	0.31*	380*	<8.2*	<8.2*	380	1.03	14	H
ANT-MW6s	8/15/2012	19.5	7.06	1.8		229	3.0	1,960	1,200	29	<0.05	<0.05	0.40	120	94	100	73	170	140	<0.15	520	<8.2	<8.2	520	0.97	20	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
ANT-MW6s	12/10/2012	20.9	7.38	1.5		86	11	1,894	1,200	27		<0.050														13	
ANT-MW6s	3/22/2013	19.1	7.98	6.0	69	139	21	1,718	1,100	24		0.025J														15	
ANT-MW6s	5/30/2013	18.0	7.08	0.9	11	204	7.0	1,521	1,000	18		0.028J														20	
ANT-MW6s	8/27/2013	19.8	7.24	1.3	15	196	1.0	1,586	1,000	21	<0.050	0.031J	0.32	110	110	96	71	150	130	0.11J	470	<8.2	<8.2	470	1.07	21	
ANT-MW6s	11/14/2013	21.3	7.38	1.8	20	202	3.0	1,845	1,200	24		<0.050														12	
ANT-MW6s	2/19/2014	18.4	7.84	4.5	49	216	507	1,741	1,100	18		0.037J														7	
ANT-MW6s	5/22/2014	18.2	7.18	5.1	53	196	230	1,598	1,100	14		<0.10														5	
ANT-MW6s	8/21/2014	20.1	7.33	3.8	45	149	59	1,697	1,000	14	<0.050	<0.10	0.53	110	79	83	69	150	150	0.31	400	<8.2	<8.2	400	1.04	8	
ANT-MW6s	11/7/2014	19.2	7.36	3.8	40	145	91	1,778	1,100	16		<0.10														8	
COR-MW1s	2/10/2012	19.0	7.26	1.5		170	68	3,408	2,200	2.7		0.035J														10	
COR-MW1s	5/11/2012	19.2	7.08	0.4		229	8.0	3,572	2,100	1.7	<0.05*	<0.05	0.82*	560	2.9	82	79	560	210	1.7*	720*	<8.2*	<8.2*	720	1.01	9	H
COR-MW1s	8/17/2012	20.6	6.98	0.5		216	59	3,751	2,300	1.9	<0.05	0.026J	0.63	560	2.7	92	100	690	250	0.26	800	<8.2	<8.2	800	0.91	9	
COR-MW1s	12/7/2012	20.5	7.29	0.5		130	48	3,679	2,300	1.7		<0.050														9	
COR-MW1s	3/18/2013	20.0	7.22	1.5	16	63	20	3,360	2,200	1.2		0.022J														9	
COR-MW1s	5/29/2013	20.2	7.71	5.4	60	117	6.0	3,185	2,100	1.0		0.031J														9	
COR-MW1s	8/22/2013	22.9	6.46	0.4	5	112	4.0	3,662	2,300	1.4	0.0030J	0.027J	0.79	630	3.0	100	110	660	270	0.32	840	<8.2	<8.2	840	1.00	8	
COR-MW1s	11/12/2013	21.3	7.48	0.3	3	123	7.0	3,531	2,300	0.78		0.020J														8	
COR-MW1s	2/18/2014	19.9	8.05	0.6	7	75	7.0	3,629	2,300	1.2		<0.050														8	
COR-MW1s	5/22/2014	20.0	7.15	0.1	1	57	3.0	3,557	2,100	1.5		<0.10														7	
COR-MW1s	8/28/2014	22.5	7.97	0.2	3	118	4.0	2,964	1,700	1.1	<0.050	<0.10	0.60	550	3.0	58	61	380	210	0.23	690	<8.2	<8.2	690	1.10	6	
COR-MW1s	11/11/2014	25.1	7.47	0.6	8	131	9.0	2,642	1,600	1.0		<0.10														6	
COR-MW2s	2/10/2012	17.9	7.33	1.5		162	8.0	1,640	1,000	6.5		<0.05														12	
COR-MW2s	5/11/2012	17.9	7.20	0.8		210	10	1,774	1,000	5.7	<0.05*	<0.05	<0.2*	160	2.9	62	120	210	180	0.093J*	360*	<8.2*	<8.2*	360	1.05	9	H
COR-MW2s	8/17/2012	21.2	7.14	0.5		212	36	1,497	920	6.4	<0.05	<0.05	0.081J	160	2.9	56	110	200	170	<0.15	330	<8.2	<8.2	330	1.06	8	
COR-MW2s	12/7/2012	19.8	7.55	0.7		126	31	1,773	1,100	4.0		<0.050														10	
COR-MW2s	3/18/2013	19.4	7.28	1.3	15	49	2.0	1,495	970	6.1		<0.050														11	
COR-MW2s	5/29/2013	19.2	7.97	1.6	19	103	3.0	1,401	940	6.1		0.021J														9	
COR-MW2s	8/22/2013	22.9	6.70	0.3	4	119	4.0	1,448	900	5.8	<0.050	0.027J	0.097J	150	2.7	52	98	180	170	0.19	350	<8.2	<8.2	350	0.98	8	
COR-MW2s	11/12/2013	20.6	7.50	0.5	5	126	6.0	1,569	1,000	26		<0.050														8	
COR-MW2s	2/18/2014	18.4	7.99	0.4	4	80	6.0	1,570	880	3.6		0.019J														9	
COR-MW2s	5/22/2014	18.7	7.21	0.1	1	56	3.0	1,600	920	3.8		<0.10														7	
COR-MW2s	8/28/2014	23.2	7.76	0.3	4	106	2.0	1,647	1,000	3.6	<0.050	<0.10	0.068J	170	3.3	59	110	170	140	0.10J	410	<8.2	<8.2	410	1.10	5	
COR-MW2s	11/11/2014	21.9	7.26	2.0	24	134	4.0	1,573	840	3.2		<0.10														7	
COR-MW3s	2/10/2012	19.6	7.47	1.3		144	3.5	1,498	940	2.0		<0.05														10	
COR-MW3s	5/11/2012	18.4	7.32	0.4		194	26	1,622	920	1.3	<0.05*	<0.05	<0.2*	180	2.1	49	82	190	150	0.11J*	340*	<8.2*	<8.2*	340	1.04	8	H
COR-MW3s	8/17/2012	21.1	7.23	0.6		229	95	1,824	1,100	0.66	<0.05	<0.05	0.076J	210	2.7	66	120	280	200	<0.15	400	<8.2	<8.2	400	1.03	7	
COR-MW3s	12/7/2012	20.2	7.57	0.7		101	16	2,234	1,400	0.38		<0.050														9	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																								----Alkalinity as CaCO3----		
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
COR-MW3s	3/18/2013	19.0	6.96	0.7	7	62	4.0	1,865	1,200	0.56		0.021J														9	
COR-MW3s	5/29/2013	18.5	7.95	5.9	64	104	13	1,717	1,000	0.65		0.027J														8	
COR-MW3s	8/22/2013	22.5	6.61	0.4	4	115	6.0	1,716	1,100	0.64	0.0019J	0.027J	0.15J	180	2.5	64	120	220	170	0.18	480	<8.2	<8.2	480	0.99	7	
COR-MW3s	11/12/2013	20.7	7.43	0.3	3	126	6.0	1,647	1,000	0.70*		<0.050														7	H
COR-MW3s	2/18/2014	19.5	7.96	0.7	8	75	6.0	1,566	1,000	0.97		<0.050														7	
COR-MW3s	5/22/2014	19.1	7.30	0.1	1	48	5.0	1,623	990	1.5		<0.10														6	
COR-MW3s	8/28/2014	24.0	7.65	0.3	4	108	6.0	1,655	980	1.2	<0.050	<0.10	<0.20	170	2.3	51	93	170	130	0.15	420	<8.2	<8.2	420	1.02	4	
COR-MW3s	11/11/2014	22.9	7.39	0.9	11	145	5.0	1,514	860	1.6		<0.10														6	
COR-MW4s	2/10/2012	19.4	7.29	1.5		147	5.5	2,009	1,200	4.6		<0.05														11	
COR-MW4s	5/11/2012	19.6	7.28	0.6		208	98	2,088	1,200	4.1	0.017J*	0.028J	<0.2*	240	2.1	67	84	260	190	<0.15*	400*	<8.2*	<8.2*	400	1.03	9	H
COR-MW4s	8/17/2012	22.1	7.19	0.6		212	33	1,863	1,100	4.1	0.042J	<0.05	0.11J	240	2.3	65	110	260	200	0.053J	430	<8.2	<8.2	430	1.05	8	
COR-MW4s	12/7/2012	21.0	7.70	0.4		93	8.0	1,840	1,100	2.7		<0.050														9	
COR-MW4s	3/18/2013	19.3	7.43	2.1	23	69	1.5	1,799	1,100	1.8		0.024J														10	
COR-MW4s	5/29/2013	20.7	7.81	0.6	7	94	9.0	1,716	1,100	1.5		0.031J														9	
COR-MW4s	8/22/2013	24.4	6.72	0.3	4	115	4.0	1,803	1,100	1.4	<0.050	0.025J	<0.20	210	1.9	61	100	250	180	0.18	460	<8.2	<8.2	460	0.95	7	
COR-MW4s	11/12/2013	23.0	7.50	0.3	4	115	5.0	1,831	1,200	11		0.024J														8	
COR-MW4s	2/18/2014	20.6	7.85	0.7	8	74	7.0	1,815	1,100	2.2		<0.050														8	
COR-MW4s	5/22/2014	20.1	7.29	0.1	2	57	3.0	1,880	1,100	2.5		<0.10														7	
COR-MW4s	8/28/2014	25.9	7.70	0.3	4	101	3.0	1,941	1,200	2.6	<0.050	<0.10	<0.20	210	2.3	61	99	230	160	<0.15	450	<8.2	<8.2	450	1.01	5	
COR-MW4s	11/11/2014	19.7	7.98	0.7	8	135	6.0	1,911	1,000	2.4		<0.10														6	
COR-MW5s	2/10/2012	20.2	7.36	1.9		149	26.5	1,577	1,000	2.9		0.066														11	
COR-MW5s	5/11/2012	20.5	7.30	0.9		204	370	1,878	1,100	2.2	<0.05*	0.058	0.67*	220	16	52	99	220	170	1.7*	410*	<8.2*	<8.2*	410	1.06	9	H
COR-MW5s	8/17/2012	22.2	7.15	0.5		211	126	1,677	1,000	2.4	0.014J	0.055	0.20	240	10	54	110	240	170	0.088J	400	<8.2	<8.2	400	1.12	8	
COR-MW5s	12/7/2012	21.3	7.47	0.5		101	33	2,488	1,600	7.8		0.24														9	
COR-MW5s	3/18/2013	20.1	7.38	3.0	33	74	8.0	1,688	1,100	2.2		0.027J														9	
COR-MW5s	5/29/2013	20.8	7.85	0.6	7	107	11	1,662	1,100	2.1		0.073														9	
COR-MW5s	8/22/2013	22.8	6.60	0.5	6	116	4.0	1,683	1,000	2.1	0.022J	0.025J	0.31	200	4.3	50	100	230	150	0.21	440	<8.2	<8.2	440	0.96	7	
COR-MW5s	11/12/2013	22.1	7.43	0.6	7	116	11	1,772	1,100	20		0.036J														8	
COR-MW5s	2/18/2014	20.8	8.03	0.7	7	76	8.0	1,812	1,200	1.8		0.049J														8	
COR-MW5s	5/22/2014	20.5	7.26	0.1	2	38	4.0	1,843	1,100	1.6		<0.10														7	
COR-MW5s	8/28/2014	24.1	7.75	0.3	4	111	6.0	1,938	1,100	1.2	0.032J	<0.10	<0.20	200	5.2	55	110	240	140	<0.15	460	<8.2	<8.2	460	0.99	5	
COR-MW5s	11/11/2014	21.6	7.21	0.6	7	33	12	3,136	1,700	0.21		1.0														6	
FG2-MW1s	2/10/2012	19.4	7.07	2.2		209	9.0	6,248	4,000	2.7		0.029J														16	
FG2-MW1s	5/10/2012	19.5	7.08	1.9		198	150	5,538	4,500	1.3	<0.05*	<0.05	0.31*	620	3.5	240	350	470	2,100	0.71*	410*	<8.2*	<8.2*	410	0.98	17	H
FG2-MW1s	8/15/2012	22.1	6.92	1.4		130	120	4,902	3,700	2.0	0.048J	0.030J	0.53	530	3.7	190	340	470	1,800	0.17	480	<8.2	<8.2	480	0.92	12	
FG2-MW1s	12/6/2012	20.4	7.26	1.0		125	140	6,507	5,700	2.7		<0.050														17	
FG2-MW1s	3/22/2013	17.4	7.75	6.0	67	148	3.0	5,007	4,400	2.9		0.029J														15	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																					----Alkalinity as CaCO3----					
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
FG2-MW1s	5/31/2013	20.3	7.11	0.3	4	126	4.0	5,291	4,800	0.64J		0.020J														16	
FG2-MW1s	8/23/2013	22.3	6.41	0.3	4	136	3.0	4,127	3,200	7.4	0.014J	0.047J	0.56	510	3.6	160	340	470	1,400	<0.15	550	<8.2	<8.2	550	0.97	17	
FG2-MW1s	11/13/2013	22.4	6.80	0.3	4	153	5.0	4,448	3,500	8.0		<0.050														16	
FG2-MW1s	2/19/2014	19.2	7.12	0.9	11	112	6.0	5,846	5,200	5.2		<0.050														16	
FG2-MW1s	5/23/2014	21.7	7.09	0.4	5	149	3.0	4,335	2,600	6.8		<0.10														15	
FG2-MW1s	8/27/2014	23.9	7.37	3.9	47	151	6.0	4,544	3,200	10	0.020J	0.045J	0.71	520	4.2	140	350	470	1,200	<0.15	510	<8.2	<8.2	510	1.05	16	
FG2-MW1s	11/13/2014	20.8	7.07	0.5	5	118	6.4	7,132	6,000	4.8		<0.10														11	
FG2-MW2s	2/10/2012	18.9	7.17	2.8		253	216	3,587	2,700	5.7		<0.05														13	
FG2-MW2s	5/10/2012	19.0	7.18	1.3		218	573	3,792	2,900	5.2	<0.05*	0.025J	0.30*	400	8.8	200	180	260	1,200	1.5*	490*	<8.2*	<8.2*	490	1.01	14	H
FG2-MW2s	8/15/2012	22.1	7.02	0.8		197	356	3,510	2,500	9.2	0.027J	0.025J	0.48	350	13	180	170	300	1,000	0.44	550	<8.2	<8.2	550	0.95	13	
FG2-MW2s	12/6/2012	21.0	7.30	1.0		128	17	3,306	2,400	7.0		<0.050														14	
FG2-MW2s	3/22/2013	18.2	7.77	7.0	71	145	4.0	3,235	2,600	7.3		0.028J														13	
FG2-MW2s	5/31/2013	20.2	7.30	0.4	5	147	9.0	3,220	2,600	7.0		0.026J														13	
FG2-MW2s	8/23/2013	22.2	6.48	0.2	3	141	4.0	3,090	2,300	8.8	0.031J	0.059	0.50	360	11	190	170	290	880	0.30	590	<8.2	<8.2	590	1.03	15	
FG2-MW2s	11/13/2013	22.9	6.95	0.3	4	142	8.0	3,168	2,400	8.1		<0.050														13	
FG2-MW2s	2/19/2014	18.7	7.36	0.4	4	128	7.0	3,313	2,500	8.9		<0.050														12	
FG2-MW2s	5/23/2014	22.1	7.30	0.8	10	148	2.0	3,537	3,300	13		<0.10														14	
FG2-MW2s	8/27/2014	24.6	7.50	0.1	2	157	3.0	3,397	2,300	10	0.032J	0.042J	0.67	340	13	180	170	290	780	0.25	570	<8.2	<8.2	570	1.05	16	
FG2-MW2s	11/13/2014	22.4	7.47	1.7	19	192	4.0	2,925	2,500	11		0.041J														14	
FG2-MW3s	2/10/2012	20.3	7.12	2.2		234	3.0	5,327	4,300	15		0.036J														17	
FG2-MW3s	5/10/2012	21.0	7.09	1.6		227	4.0	2,736	4,700	13	0.017J*	<0.05	0.22*	660	2.3	360	200	600	1,800	<0.15*	610*	<8.2*	<8.2*	610	1.01	17	H
FG2-MW3s	8/15/2012	21.6	6.97	0.5		188	5.0	5,807	4,400	13	0.023J	0.027J	0.40	630	2.5	370	210	630	1,900	0.22	640	<8.2	<8.2	640	0.96	17	
FG2-MW3s	12/6/2012	19.9	7.44	1.0		120	32	5,374	4,300	13		<0.050														17	
FG2-MW3s	3/22/2013	19.4	7.92	6.0	67	147	6.0	5,196	4,500	9.9		0.044J														17	
FG2-MW3s	5/31/2013	20.6	7.19	0.3	4	140	5.0	5,288	4,500	8.3		0.019J														16	
FG2-MW3s	8/23/2013	20.3	6.41	0.3	4	120	3.0	5,449	4,700	8.8	0.025J	0.045J	0.49	690	2.2	420	240	650	2,000	0.11J	650	<8.2	<8.2	650	1.04	18	
FG2-MW3s	11/13/2013	21.5	6.94	0.5	5	151	6.0	5,459	4,600	11		<0.050														17	
FG2-MW3s	2/19/2014	19.0	7.12	0.5	6	129	7.0	5,503	4,700	8.3		0.019J														17	
FG2-MW3s	5/23/2014	21.5	7.17	0.4	5	150	2.0	5,851	5,100	6.0		<0.10														18	
FG2-MW3s	8/27/2014	23.8	7.32	0.3	4	152	2.0	5,853	4,600	11	0.059	0.038J	0.65	640	3.2	350	230	610	2,000	<0.15	660	<8.2	<8.2	660	0.94	18	
FG2-MW3s	11/13/2014	21.0	7.42	1.2	14	140	3.0	4,961	4,700	10		0.043J														17	
FG2-MW4s	2/10/2012	20.7	7.19	2.6		250	4.0	4,518	3,600	16		<0.05														17	
FG2-MW4s	5/10/2012	20.2	7.31	1.8		213	51	4,512	3,300	18	0.023J*	0.027J	0.26*	590	2.8	190	170	440	1,200	0.23*	560*	<8.2*	<8.2*	560	1.00	16	H
FG2-MW4s	8/15/2012	22.6	7.01	0.7		172	24	4,308	2,900	29	0.027J	<0.05	0.46	510	1.5	180	160	470	1,000	0.11J	630	<8.2	<8.2	630	0.92	17	
FG2-MW4s	12/6/2012	21.3	7.60	0.6		108	43	4,165	2,900	33		<0.050														19	
FG2-MW4s	3/22/2013	19.5	7.98	6.0	71	139	5.0	4,168	3,300	26		0.024J														16	
FG2-MW4s	5/31/2013	20.9	7.34	0.1	2	144	3.0	3,817	2,900	31		<0.050														16	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
FG2-MW4s	8/23/2013	23.4	6.59	0.4	5	140	4.0	3,840	2,800	33	0.025J	0.047J	0.64	590	1.2	180	160	470	870	0.060J	690	<8.2	<8.2	690	1.02	20	
FG2-MW4s	11/13/2013	23.0	7.21	0.5	6	142	5.0	4,011	3,000	29		<0.050														17	
FG2-MW4s	2/19/2014	17.6	7.06	0.3	3	112	6.0	4,028	2,500	25		0.028J														16	
FG2-MW4s	5/23/2014	21.8	7.21	0.8	9	142	2.0	4,069	2,800	24		<0.10														16	
FG2-MW4s	8/27/2014	24.6	7.45	0.2	3	137	3.0	4,134	2,800	21	0.018J	<0.10	0.88	540	1.3	170	150	410	860	<0.15	690	12	<8.2	702	1.00	19	
FG2-MW4s	11/13/2014	23.3	7.11	0.8	9	225	7.2	4,049	2,900	18		<0.10														16	
FG2-MW5s	2/10/2012	19.7	7.23	2.8		251	18	4,403	3,400	23		<0.05														14	
FG2-MW5s	5/10/2012	18.9	7.14	1.8		222	11	4,265	3,000	27	<0.05*	0.030J	0.64*	490	1.4	210	140	430	950	0.092J*	660*	<8.2*	<8.2*	660	0.97	13	H
FG2-MW5s	8/15/2012	18.9	7.03	0.5		202	37	3,908	2,300	18	0.67	0.034J	1.1	380	0.93J	180	130	380	620	0.23	750	<8.2	<8.2	750	0.95	15	
FG2-MW5s	12/6/2012	19.6	7.16	0.6		137	9.0	4,258	3,100	19		<0.050														14	
FG2-MW5s	3/22/2013	18.7	7.74	6.0	65	145	3.0	3,667	2,900	16		0.030J														13	
FG2-MW5s	5/31/2013	19.0	7.21	0.5	6	160	5.0	3,570	2,800	16		0.023J														13	
FG2-MW5s	8/23/2013	19.5	6.57	0.4	4	132	10	3,142	2,300	16	0.042J	0.061	0.91	420	1.0	190	130	330	560	0.13J	830	<8.2	<8.2	830	1.04	15	
FG2-MW5s	11/13/2013	19.8	7.08	0.3	4	157	6.0	3,749	2,800	14		<0.050														14	
FG2-MW5s	2/19/2014	19.6	7.11	1.1	12	128	5.0	3,606	2,600	13		0.018J														13	
FG2-MW5s	5/23/2014	18.8	7.13	0.1	1	27	4.0	4,027	3,000	11		<0.10														14	
FG2-MW5s	8/27/2014	21.6	7.46	0.3	4	137	3.0	3,208	2,100	12	0.016J	0.038J	0.92	400	1.2	180	130	270	470	0.16	780	<8.2	<8.2	780	1.14	15	
FG2-MW5s	11/13/2014	20.2	7.15	0.2	2	265	11.2	3,757	2,600	11		0.035J														14	
GOD-MW1s	2/9/2012	20.4	7.43	1.3		155	7.0	3,114	2,100	2.9		0.081														13	
GOD-MW1s	5/9/2012	19.6	7.40	1.8		63	15	3,025	2,200	1.6	<0.05*	<0.05	0.45*	570	2.0	80	65	310	340	0.45*	910*	<8.2*	<8.2*	910	1.02	14	H
GOD-MW1s	8/20/2012	20.6	7.56	0.5		28	12	2,727	1,900	1.5	0.012J	0.043J	0.53	560	1.8	69	56	340	320	0.38	880	<8.2	<8.2	880	0.97	16	
GOD-MW1s	12/3/2012	20.8	7.00	1.0		92	6.0	2,923	1,900	0.89		<0.050														12	
GOD-MW1s	3/19/2013	19.0	7.14	3.9	42	152	5.0	2,773	2,000	1.3		0.041J														14	
GOD-MW1s	5/29/2013	18.8	7.07	0.5	6	151	8.0	2,800	2,200	0.83		0.018J														14	
GOD-MW1s	8/21/2013	22.0	6.83	0.4	5	156	5.0	2,904	2,000	0.99	0.0065J	0.040J	0.46	530	1.5	73	60	320	360	0.39	840	<8.2	<8.2	840	0.96	14	
GOD-MW1s	11/11/2013	21.1	7.47	0.3	3	125	7.0	2,924	2,100	0.67		0.020J														12	
GOD-MW1s	2/17/2014	19.3	7.75	0.3	3	101	6.0	2,949	2,000	0.54		<0.050														11	
GOD-MW1s	5/21/2014	20.8	7.30	0.2	2	32	12	2,977	2,000	0.71		0.053J														14	
GOD-MW1s	8/29/2014	22.5	7.74	0.3	3	130	6.0	3,052	1,900	0.94J	<0.050	<0.10	0.35	580	1.4	69	56	330	300	0.40	850	<8.2	<8.2	850	1.03	14	
GOD-MW1s	11/10/2014	25.0	7.39	1.0	12	97	7.7	2,915	1,900	1.1		<0.10														12	
GOD-MW2s	2/9/2012	22.5	7.75	1.1		137	2.0	3,320	2,300	19		<0.05														15	
GOD-MW2s	5/9/2012	20.6	7.59	2.0		111	5.0	3,160	2,400	18	0.019J*	<0.05	0.25*	490	1.4	110	100	440	630	0.39*	440*	<8.2*	<8.2*	440	0.99	16	H
GOD-MW2s	8/20/2012	21.2	7.85	0.2		34	12	2,305	2,200	17	0.020J	0.034J	0.31	480	1.0	100	96	460	680	0.49	410	<8.2	<8.2	410	0.93	16	
GOD-MW2s	12/3/2012	21.9	7.25	0.8		109	7.0	3,038	2,100	16		<0.050														14	
GOD-MW2s	3/19/2013	21.3	7.84	4.6	51	104	3.0	2,829	2,000	16		0.029J														15	
GOD-MW2s	5/29/2013	20.2	7.51	0.5	5	131	7.0	3,070	2,200	20		<0.050														15	
GOD-MW2s	8/21/2013	22.5	6.67	0.4	5	135	4.0	3,308	2,400	23	0.026J	0.035J	0.43	560	1.2	110	95	470	660	0.49	470	<8.2	<8.2	470	1.00	15	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																					----Alkalinity as CaCO3----				
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
GOD-MW2s	11/11/2013	21.7	7.80	0.3	4	133	7.0	3,407	2,400	26		<0.050														14	
GOD-MW2s	2/17/2014	21.2	8.24	0.3	4	72	8.0	3,312	2,300	27		0.025J														12	
GOD-MW2s	5/21/2014	21.5	7.50	0.1	1	-44	5.0	3,368	2,400	27		<0.10														13	
GOD-MW2s	8/29/2014	23.0	7.76	0.3	4	127	3.0	3,368	2,300	25	0.014J	<0.10	0.37	500	1.6	120	99	430	600	0.38	460	<8.2	<8.2	460	1.03	13	
GOD-MW2s	11/10/2014	25.7	7.71	2.1	26	100	4.5	3,000	2,100	19		0.040J														13	
GOD-MW3s	2/9/2012	21.3	7.45	1.3		147	5.0	1,549	1,000	11		<0.05														10	
GOD-MW3s	5/9/2012	19.6	7.32	2.1		122	5.0	1,620	1,100	17	<0.05*	<0.05	0.52*	180	2.3	60	110	180	160	0.42*	390*	<8.2*	<8.2*	390	1.05	11	H
GOD-MW3s	8/20/2012	20.7	7.55	0.6		62	11	1,407	1,000	33	<0.05	0.042J	0.61	170	1.9	49	91	110	150	0.42	390	<8.2	<8.2	390	0.98	10	
GOD-MW3s	12/3/2012	21.8	7.21	1.0		117	15	1,396	940	30		<0.050														9	
GOD-MW3s	3/19/2013	20.7	7.64	4.6	52	113	3.0	1,280	940	30		0.033J														9	
GOD-MW3s	5/29/2013	19.2	7.20	0.5	6	140	3.0	1,337	960	34		<0.050														10	
GOD-MW3s	8/21/2013	23.6	6.72	0.3	3	138	4.0	1,441	1,100	33	0.0078J	0.046J	0.72	150	2.0	56	99	92	150	0.46	380	<8.2	<8.2	380	1.03	9	
GOD-MW3s	11/11/2013	21.1	7.54	0.4	5	136	10	1,411	1,000	28		<0.050														9	
GOD-MW3s	2/17/2014	20.9	8.14	0.3	4	78	8.0	1,367	960	29		<0.050														7	
GOD-MW3s	5/21/2014	20.3	7.37	0.1	1	-14	4.0	1,330	930	19		<0.10														9	
GOD-MW3s	8/29/2014	23.8	7.82	0.2	3	125	7.0	1,459	800	14	<0.050	<0.10	0.58	140	1.9	43	77	100	110	0.30	320	<8.2	<8.2	320	1.08	6	
GOD-MW3s	11/10/2014	24.3	7.65	1.3	16	97	5.0	1,185	820	15		0.038J														7	
GOD-MW4s	2/9/2012	21.1	7.65	1.5		147	10	3,276	2,200	19		<0.05														11	
GOD-MW4s	5/9/2012	20.2	7.56	1.6		89	7.0	3,244	2,400	20	0.011J*	<0.05	0.27*	680	2.0	44	44	320	480	0.77*	770*	<8.2*	<8.2*	770	0.99	11	H
GOD-MW4s	8/20/2012	22.3	7.71	0.3		39	33	2,961	2,200	25	0.044J	0.042J	0.40	630	1.2	35	35	340	490	0.79	720	<8.2	<8.2	720	0.89	10	
GOD-MW4s	12/3/2012	22.8	7.22	0.9		101	22	3,056	2,000	20		<0.050														8	
GOD-MW4s	3/19/2013	20.4	7.73	4.3	49	133	5.0	3,018	2,100	22		0.031J														9	
GOD-MW4s	5/29/2013	19.1	7.56	0.3	4	145	2.0	3,037	2,100	21		<0.050														10	
GOD-MW4s	8/21/2013	23.2	6.84	0.3	3	138	5.0	3,024	2,100	21	0.060	0.041J	0.39	630	1.8	47	49	300	390	0.75	790	<8.2	<8.2	790	1.00	9	
GOD-MW4s	11/11/2013	22.6	7.74	0.5	5	124	28	3,120	2,200	20		<0.050														8	
GOD-MW4s	2/17/2014	21.2	8.19	0.6	7	81	9.0	3,290	2,300	21		<0.050														8	
GOD-MW4s	5/21/2014	21.4	7.39	0.2	2	-8	3.0	3,296	2,100	21		<0.10														10	
GOD-MW4s	8/29/2014	24.3	7.69	0.3	4	130	2.0	3,500	2,300	23	0.027J	<0.10	0.41	660	2.2	71	75	310	380	0.39	880	<8.2	<8.2	880	1.07	8	
GOD-MW4s	11/10/2014	26.7	7.47	1.3	18	103	4.6	3,446	2,200	21		0.038J														8	
GOD-MW5s	2/9/2012	19.6	7.48	1.5		168	2.0	2,135	1,400	5.5		<0.05														20	
GOD-MW5s	5/9/2012	19.2	7.41	1.8		123	7.0	2,012	1,400	4.6	<0.05*	<0.05	<0.2*	180	1.5	110	120	290	300	0.21*	370*	<8.2*	<8.2*	370	1.03	18	H
GOD-MW5s	8/20/2012	21.1	7.95	0.5		30	8.0	1,741	1,300	5.4	0.014J	0.031J	0.13J	150	1.5	100	110	310	290	0.14J	320	<8.2	<8.2	320	0.94	20	
GOD-MW5s	12/3/2012	22.0	7.59	0.7		82	3.0	2,007	1,400	4.8		<0.050														17	
GOD-MW5s	3/19/2013	20.8	7.82	4.8	54	102	3.0	1,906	1,400	7.4		<0.050														18	
GOD-MW5s	5/29/2013	19.9	7.67	0.3	4	119	13	2,010	1,400	7.9		<0.050														18	
GOD-MW5s	8/21/2013	23.4	6.67	0.4	4	133	4.0	1,914	1,300	5.3	0.0090J	0.036J	0.27	180	1.3	99	110	290	310	0.18	330	<8.2	<8.2	330	0.99	19	
GOD-MW5s	11/11/2013	21.2	7.80	0.4	5	145	6.0	1,991	1,400	6.6		<0.050														17	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
GOD-MW5s	2/17/2014	19.4	8.23	0.4	4	82	6.0	2,128	1,500	9.0		<0.050														16	
GOD-MW5s	5/21/2014	20.5	7.40	0.2	2	-43	4.0	1,887	1,300	5.8		<0.10														17	
GOD-MW5s	8/29/2014	23.1	7.81	0.3	4	119	3.0	1,872	1,200	5.0	<0.050	<0.10	0.22	180	1.3	86	96	260	260	<0.15	300	<8.2	<8.2	300	1.03	18	
GOD-MW5s	11/10/2014	20.3	7.84	1.2	14	90	3.0	1,758	1,200	5.4		0.038J														17	
GOD-MW6s	2/9/2012	21.4	7.50	1.4		147	2.0	4,008	2,900	14		0.025J														18	
GOD-MW6s	5/9/2012	20.0	7.40	2.0		106	103	3,910	3,000	16	0.010J*	<0.05	0.24*	610	1.8	140	130	610	860	0.52*	450*	<8.2*	<8.2*	450	0.98	16	H
GOD-MW6s	8/20/2012	21.7	7.66	0.2		39	7.0	3,763	2,800	16	0.013J	0.029J	0.41	640	1.4	140	130	640	920	0.32	460	<8.2	<8.2	460	0.96	18	
GOD-MW6s	12/3/2012	21.9	7.16	0.9		110	87	3,969	2,700	15		<0.050														14	
GOD-MW6s	3/19/2013	20.7	7.74	5.5	61	105	4.0	3,724	2,900	16		<0.050														16	
GOD-MW6s	5/30/2013	20.9	7.50	3.8	42	199	18	3,850	2,600	15		<0.050														16	
GOD-MW6s	8/21/2013	22.2	6.67	0.4	4	133	4.0	3,885	2,800	16	0.0063J	0.050	0.47	600	1.8	140	130	620	860	0.36	460	<8.2	<8.2	460	0.97	19	
GOD-MW6s	11/11/2013	20.8	7.69	0.4	4	144	6.0	3,904	2,800	17		<0.050														15	
GOD-MW6s	2/17/2014	20.2	8.23	0.5	5	76	8.0	3,916	2,800	15		0.024J														13	
GOD-MW6s	5/21/2014	20.6	7.36	0.1	1	4	3.0	4,094	2,900	14		<0.10														14	
GOD-MW6s	8/29/2014	23.3	7.66	0.6	7	125	5.0	4,139	2,900	15	<0.050	<0.10	0.27	640	1.3	130	130	600	830	0.25	460	<8.2	<8.2	460	1.01	16	
GOD-MW6s	11/10/2014	23.1	7.81	2.3	27	119	3.8	3,937	2,700	15		0.035J														14	
GOD-MW7s	2/9/2012	21.2	7.53	1.3		151	1.0	4,194	3,000	2.5		<0.05														19	
GOD-MW7s	5/9/2012	19.9	7.66	1.7		109	83	4,230	3,400	2.9	<0.05*	<0.05	0.11J*	650	1.4	160	120	640	1,100	0.53*	430*	<8.2*	<8.2*	430	0.95	15	H
GOD-MW7s	8/20/2012	21.7	7.75	0.4		25	17	4,010	3,200	2.5	0.057	0.053	0.26	670	1.1	170	130	670	1,200	0.27	430	<8.2	<8.2	430	0.94	19	
GOD-MW7s	12/3/2012	21.8	7.21	0.7		106	6.0	4,141	2,900	1.8		<0.050														15	
GOD-MW7s	3/19/2013	20.8	7.72	5.2	59	95	4.0	3,927	3,000	2.1		<0.050														16	
GOD-MW7s	5/30/2013	21.7	7.61	4.9	54	170	6.0	3,542	2,700	2.0		<0.050														16	
GOD-MW7s	8/21/2013	22.0	6.64	0.3	4	132	4.0	3,469	2,500	2.1	0.019J	0.029J	0.25	500	1.4	140	100	490	880	0.26	400	<8.2	<8.2	400	0.95	17	
GOD-MW7s	11/11/2013	20.3	7.73	0.4	4	143	7.0	3,174	2,400	2.5		<0.050														15	
GOD-MW7s	2/17/2014	19.5	8.37	0.7	9	77	9.0	3,411	2,500	1.3		0.022J														14	
GOD-MW7s	5/21/2014	20.2	7.44	0.1	1	9	5.0	3,557	2,500	0.98		<0.10														15	
GOD-MW7s	8/29/2014	24.4	7.69	0.9	10	121	3.0	3,602	2,400	0.38J	0.071	0.038J	0.95	550	1.3	140	100	440	710	1.0	640	<8.2	<8.2	640	1.01	17	
GOD-MW7s	11/10/2014	21.8	7.60	1.8	21	58	3.5	3,268	2,100	0.10		0.047J														15	
MAC-MW1s	2/9/2012	19.2	7.31	1.2		123	3.0	2,516	1,600	14		<0.05														9	
MAC-MW1s	5/11/2012	19.2	7.32	0.5		209	18	2,509	1,500	15	<0.05*	<0.05	0.44*	370	2.7	55	71	250	220	0.81*	570*	<8.2*	<8.2*	570	1.00	11	H
MAC-MW1s	8/17/2012	22.1	7.18	0.6		215	26	2,423	1,600	17	0.10	0.049J	0.50	400	3.1	54	96	280	250	0.59	630	<8.2	<8.2	630	0.99	10	
MAC-MW1s	12/3/2012	20.6	6.96	0.8		75	1.5	2,461	1,600	20		<0.050														11	
MAC-MW1s	3/18/2013	18.8	7.30	3.8	40	88	3.0	2,462	1,700	22		0.094														9	
MAC-MW1s	5/30/2013	20.0	7.47	3.4	37	141	8.0	2,430	1,800	23		0.028J														9	
MAC-MW1s	8/21/2013	23.5	6.55	0.3	4	138	3.0	2,379	1,600	18	0.13	0.034J	0.41	370	2.3	53	99	260	250	0.53	640	<8.2	<8.2	640	0.96	11	
MAC-MW1s	11/12/2013	21.2	7.50	0.3	3	119	5.0	2,409	1,700	17		<0.050														9	
MAC-MW1s	2/18/2014	19.1	8.16	0.9	10	57	8.0	2,325	1,600	14		<0.050														10	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																					----Alkalinity as CaCO3----					
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
MAC-MW1s	5/22/2014	20.0	7.21	0.1	1	21	5.0	2,407	1,700	14		<0.10														10	
MAC-MW1s	8/29/2014	22.5	7.56	0.7	9	153	4.0	2,597	1,600	13	0.066	<0.10	0.61	400	2.2	63	110	290	250	0.52	630	<8.2	<8.2	630	1.04	8	
MAC-MW1s	11/11/2014	21.6	7.69	1.5	19	115	4.0	2,558	1,600	16		<0.10														11	
MAC-MW2s	2/9/2012	19.9	7.25	0.9		116	5.5	2,987	2,000	26		0.026J														10	
MAC-MW2s	5/11/2012	20.2	7.05	0.8		222	12	2,976	1,800	14	0.012J*	<0.05	0.36*	490	1.6	72	53	250	140	0.34*	940*	<8.2*	<8.2*	940	1.01	11	H
MAC-MW2s	8/17/2012	20.9	7.01	0.6		218	28	2,619	1,600	17	0.021J	<0.05	0.45	500	1.7	79	75	270	160	0.34	880	<8.2	<8.2	880	1.08	11	
MAC-MW2s	12/3/2012	20.9	7.06	0.9		64	2.0	2,641	1,700	18		<0.050														10	
MAC-MW2s	3/18/2013	20.9	7.25	3.7	41	89	2.0	2,583	1,700	14		0.052														11	
MAC-MW2s	5/30/2013	20.1	7.27	3.0	31	153	8.0	2,383	1,600	18		0.017J														10	
MAC-MW2s	8/21/2013	22.9	6.47	0.3	4	137	4.0	2,517	1,700	15	0.016J	0.025J	0.40	450	1.5	77	73	240	160	0.37	870	<8.2	<8.2	870	1.04	12	
MAC-MW2s	11/12/2013	21.1	7.39	0.6	7	134	6.0	2,697	1,900	26		<0.050														10	
MAC-MW2s	2/18/2014	19.2	8.05	0.6	7	60	8.0	2,704	1,900	23		<0.050														12	
MAC-MW2s	5/22/2014	21.3	7.13	0.1	1	27	8.0	2,733	1,800	20		<0.10														10	
MAC-MW2s	8/29/2014	22.8	7.18	0.3	4	157	4.0	2,832	1,800	36	0.017J	<0.10	0.18J	520	1.7	60	59	270	200	0.58	720	<8.2	<8.2	720	1.06	9	
MAC-MW2s	11/11/2014	22.9	6.98	1.2	15	125	2.7	2,752	1,600	19		<0.10														12	
MAC-MW3s	2/9/2012	18.3	7.16	1.5		159	105	9,911	11,000	32		0.065														21	
MAC-MW3s	5/11/2012	18.5	7.10	1.0		225	480	12,150	12,000	33	0.048J*	<0.05	1.1*	2,100	5.8	460	500	720	5,600	3.1*	470*	<8.2*	<8.2*	470	1.04	21	H
MAC-MW3s	8/17/2012	21.5	7.08	0.7		133	193	9,029	8,200	50	0.15	0.034J	1.1	1,500	7.5	340	540	480	4,800	0.40	400	<8.2	<8.2	400	0.96	21	
MAC-MW3s	12/3/2012	19.7	6.97	0.9		100	4.0	8,316	7,800	48		<0.050														22	
MAC-MW3s	3/18/2013	17.8	7.36	3.9	42	65	42	8,040	8,000	53		0.042J														18	
MAC-MW3s	5/30/2013	19.5	7.46	3.7	41	100	49	8,895	8,500	52		0.038J														20	
MAC-MW3s	8/21/2013	26.9	6.48	0.6	7	139	8.0	8,156	9,000	52	0.13	0.039J	1.0	1,500	8.5	380	550	500	4,800	0.62	440	<8.2	<8.2	440	0.98	19	
MAC-MW3s	11/12/2013	20.6	7.25	0.6	6	123	23	10,450	10,000	49		0.020J														20	
MAC-MW3s	2/18/2014	19.3	7.88	0.7	7	69	10	10,930	11,000	40		0.019J														21	
MAC-MW3s	5/22/2014	20.3	7.18	0.4	5	62	42	11,300	8,900	39		<0.10														20	
MAC-MW3s	8/29/2014	22.6	7.42	0.5	7	143	32	6,959	6,700	82	0.20	<0.10	1.5	940	8.3	280	570	290	3,600	0.35	390	<8.2	<8.2	390	0.96	21	
MAC-MW3s	11/11/2014	21.9	7.28	1.8	18	161	4.8	9,911	7,200	130		0.042J														22	
MAC-MW4s	2/9/2012	20.0	7.44	1.5		140	4.0	3,911	2,600	7.7		9.2														20	
MAC-MW4s	5/11/2012	19.7	7.27	0.5		191	17	4,532	3,000	8.8	0.027J*	10	9.9*	750	37	84	66	550	600	3.7*	810*	<8.2*	<8.2*	810	0.99	21	H
MAC-MW4s	8/17/2012	22.7	7.17	0.6		181	7.0	4,340	2,900	7.3	<0.05	12	13	880	48	98	80	600	620	5.4	920	<8.2	<8.2	920	1.07	21	
MAC-MW4s	12/3/2012	21.1	6.96	1.2		91	35	4,042	2,700	7.9		3.9														22	
MAC-MW4s	3/18/2013	19.5	7.34	3.4	37	90	2.0	4,297	3,000	10		3.7														21	
MAC-MW4s	5/30/2013	20.4	7.47	3.6	40	157	10	3,685	2,500	10		1.5														20	
MAC-MW4s	8/21/2013	22.8	6.46	0.4	5	132	4.0	3,849	2,800	10	0.0042J	0.90	1.5	670	9.7	110	83	510	600	1.4	810	<8.2	<8.2	810	0.97	21	
MAC-MW4s	11/12/2013	21.1	7.39	0.5	5	114	7.0	3,810	2,700	11		0.68														20	
MAC-MW4s	2/18/2014	20.4	7.82	0.4	4	53	7.0	3,860	2,700	11		0.54														21	
MAC-MW4s	5/22/2014	20.6	7.30	0.1	1	25	7.0	4,100	2,900	10		0.42														21	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
MAC-MW4s	8/29/2014	23.2	7.68	0.6	6	139	5.0	4,174	2,800	10	<0.050	0.28	0.86	710	10	99	79	510	610	1.7	810	<8.2	<8.2	810	0.98	20	
MAC-MW4s	11/11/2014	22.6	7.56	1.2	15	130	2.7	4,004	2,800	13		0.31														22	
MAC-MW5s	2/9/2012	19.9	7.61	1.2		127	10	4,505	3,100	17		7.0														20	
MAC-MW5s	5/11/2012	19.7	7.57	0.5		180	26	4,297	2,900	17	0.53*	0.61	0.65*	810	3.1	61	47	490	580	0.95*	850*	<8.2*	<8.2*	850	0.97	21	H
MAC-MW5s	8/17/2012	22.2	7.33	0.4		195	672	4,082	2,700	20	<0.05	0.35	1.3	880	3.2	54	45	510	580	0.83	870	<8.2	<8.2	870	0.99	21	
MAC-MW5s	12/3/2012	21.4	7.05	0.8		84	6.0	4,280	2,900	22		0.13														22	
MAC-MW5s	3/18/2013	19.1	7.54	3.3	36	82	3.0	4,257	3,000	22		0.15														20	
MAC-MW5s	5/30/2013	20.5	7.78	3.0	32	154	9.0	4,090	3,000	20		0.20														20	
MAC-MW5s	8/21/2013	23.5	6.67	0.3	4	129	3.0	4,067	3,000	19	0.0075J	0.19	0.85	810	3.2	66	52	510	610	0.82	860	<8.2	<8.2	860	0.95	22	
MAC-MW5s	11/12/2013	21.2	7.71	0.2	3	108	5.0	4,134	2,800	20		0.17														20	
MAC-MW5s	2/18/2014	20.5	8.17	0.5	5	48	7.0	4,298	3,000	21		0.057														21	
MAC-MW5s	5/22/2014	20.5	7.42	0.1	1	16	4.0	4,373	3,200	21		0.083J														21	
MAC-MW5s	8/29/2014	22.3	7.80	0.3	4	144	3.0	4,608	3,000	21	<0.050	0.14	0.93	930	3.3	64	51	540	640	0.96	910	<8.2	<8.2	910	1.00	20	
MAC-MW5s	11/11/2014	21.7	7.89	1.3	15	127	3.2	4,191	3,000	17		0.067J														22	
NUN-MW1s	2/9/2012	20.4	7.36	1.1		132	6.5	6,638	5,100	2.8		0.032J														9	
NUN-MW1s	5/11/2012	20.0	7.25	0.7		201	22	7,200	5,100	1.3	0.015J*	<0.05	0.59*	1,300	2.1	180	130	780	2,000	0.34*	770*	<8.2*	<8.2*	770	0.98	9	H
NUN-MW1s	8/17/2012	21.4	7.16	0.5		165	7.0	6,470	4,700	1.2	<0.05	<0.05	0.50	1,300	2.8	170	120	800	1,900	0.28	790	<8.2	<8.2	790	0.98	9	
NUN-MW1s	12/4/2012	20.1	7.45	1.1		120	5.0	6,514	4,700	2.2		<0.050														9	
NUN-MW1s	3/18/2013	18.4	7.27	3.9	42	86	2.0	6,329	4,900	1.5		0.033J														9	
NUN-MW1s	5/30/2013	20.0	7.52	3.5	39	142	6.0	6,161	4,800	1.1		0.046J														9	
NUN-MW1s	8/21/2013	22.9	6.59	0.3	4	131	4.0	6,297	4,900	1.1	0.011J	0.029J	0.59	1,200	1.9J	170	120	760	1,800	0.33	780	<8.2	<8.2	780	0.97	10	
NUN-MW1s	11/12/2013	21.8	7.47	0.4	5	110	6.0	6,296	4,700	0.94		<0.050														9	
NUN-MW1s	2/17/2014	19.8	8.12	0.9	9	70	6.0	6,236	5,000	1.4		<0.050														8	
NUN-MW1s	5/21/2014	20.3	7.32	0.2	2	-40	5.0	6,700	5,000	1.1		<0.10														10	
NUN-MW1s	8/28/2014	24.0	7.71	0.2	3	101	3.0	6,533	4,700	0.88J	<0.050	<0.10	0.53	1,300	2.3	160	110	730	1,700	0.15	790	<8.2	<8.2	790	1.05	9	
NUN-MW1s	11/7/2014	21.8	7.93	0.8	10	24	4.0	6,477	4,900	1.0		<0.10														11	
NUN-MW2s	2/9/2012	18.9	7.45	1.1		130	1.0	3,833	2,900	5.8		0.033J														19	
NUN-MW2s	5/11/2012	18.6	7.30	0.7		193	22	3,987	2,800	4.3	0.031J*	<0.05	0.55*	610	1.7	110	98	380	1,000	0.29*	540*	<8.2*	<8.2*	540	0.95	19	H
NUN-MW2s	8/17/2012	21.6	7.23	0.4		152	8.0	3,892	2,800	3.7	0.015J	0.025J	0.63	690	2.1	130	120	420	1,100	0.30	520	<8.2	<8.2	520	1.03	19	
NUN-MW2s	12/4/2012	21.5	7.29	1.6		137	7.0	4,132	3,000	1.6		<0.050														20	
NUN-MW2s	3/18/2013	18.0	7.41	4.3	44	94	0.9	3,805	2,900	1.1		0.021J														19	
NUN-MW2s	5/30/2013	19.0	7.48	4.1	43	149	9.0	3,445	2,600	1.5		0.035J														19	
NUN-MW2s	8/21/2013	22.3	6.56	0.4	4	138	5.0	3,515	2,800	1.5	0.041J	0.033J	0.91	560	1.0	120	130	330	1,000	0.26	570	<8.2	<8.2	570	0.98	19	
NUN-MW2s	11/12/2013	21.2	7.49	0.3	3	117	7.0	3,837	2,900	2.1		0.019J														19	
NUN-MW2s	2/17/2014	19.0	7.93	0.5	5	55	9.0	3,769	2,900	2.2		<0.050														18	
NUN-MW2s	5/21/2014	19.0	7.27	0.2	2	20	7.0	3,810	2,900	3.6		<0.10														20	
NUN-MW2s	8/28/2014	23.4	7.71	0.4	5	98	5.0	3,734	2,600	1.6	0.018J	<0.10	0.92	570	1.5	130	140	310	950	0.15	570	<8.2	<8.2	570	1.06	19	

Attachment D
Groundwater Quality from Monitoring Wells (2012-2014)

		-------Field Measurements-------																						----Alkalinity as CaCO3----			
Well	Date	T	pH	DO	DO %	ORP	Turb	SC	TDS	NO3	NO2	NH3+ NH4	TKN	Na	K	Mg	Ca	Cl	SO4	PO4	HCO3	CO3	OH	Total	CAB	HI	Q
NUN-MW2s	11/7/2014	22.8	7.63	1.2	15	89	3.4	3,584	2,600	1.9		<0.10														21	
NUN-MW3s	2/9/2012	21.2	7.21	0.9		132	27.5	6,850	5,400	8.4		0.036J														9	
NUN-MW3s	5/11/2012	19.7	7.11	0.8		210	25	7,533	5,400	12	0.010J*	<0.05	1.0*	1,300	1.9J	130	180	860	2,100	1.5*	670*	<8.2*	<8.2*	670	0.93	9	H
NUN-MW3s	8/17/2012	23.7	7.02	0.7		143	77	6,817	5,100	41	0.064	0.047J	1.3	1,400	3.1	140	220	780	2,000	0.21	710	<8.2	<8.2	710	1.03	9	
NUN-MW3s	12/4/2012	20.9	7.13	1.0		129	6.0	6,852	5,100	19		<0.050														9	
NUN-MW3s	3/18/2013	18.4	7.05	3.8	42	108	6.0	6,541	5,100	14		0.022J														9	
NUN-MW3s	5/30/2013	19.7	7.31	3.7	39	148	7.0	6,346	4,900	14		0.038J														9	
NUN-MW3s	8/21/2013	23.7	6.38	0.3	3	136	4.0	6,256	5,000	13	0.057	0.029J	1.0	1,200	1.7J	120	210	690	2,000	0.16	720	<8.2	<8.2	720	0.95	9	
NUN-MW3s	11/12/2013	22.1	7.27	1.0	11	121	6.0	6,409	5,000	12		<0.050														10	
NUN-MW3s	2/17/2014	19.2	7.77	0.6	6	78	8.0	6,461	5,100	8.5		<0.050														8	
NUN-MW3s	5/21/2014	19.7	7.09	0.2	3	31	7.0	6,705	5,200	7.0		<0.10														10	
NUN-MW3s	8/28/2014	24.8	7.36	0.5	6	104	4.0	6,391	4,800	7.8	0.033J	<0.10	0.98	1,200	2.2	120	200	650	1,800	0.11J	750	<8.2	<8.2	750	1.01	10	
NUN-MW3s	11/7/2014	20.3	8.07	1.0	12	-51	2.8	5,994	4,600	5.0		<0.10														11	
NUN-MW4s	2/9/2012	20.2	7.21	1.5		137	243	8,715	11,000	1.6J		<0.05														8	
NUN-MW4s	5/11/2012	19.6	7.07	0.7		210	305	12,100	10,000	0.76J	<0.05*	<0.05	0.91*	2,200	3.1J	270	400	870	5,300	2.3*	560*	<8.2*	<8.2*	560	0.94	8	H
NUN-MW4s	8/17/2012	23.8	7.08	0.6		165	262	11,820	10,000	6.2	0.084	<0.05	0.69	2,500	4.5J	320	470	880	5,700	0.32	570	<8.2	<8.2	570	1.02	8	
NUN-MW4s	12/4/2012	19.8	7.27	0.5		130	202	9,990	8,600	1.9		<0.050														8	
NUN-MW4s	3/18/2013	18.8	7.26	4.2	45	190	96	11,110	10,000	0.83J		0.023J														9	
NUN-MW4s	5/30/2013	19.3	7.30	4.0	43	159	120	11,930	11,000	0.96J		0.044J														8	
NUN-MW4s	8/21/2013	23.1	6.40	1.4	16	136	12	11,880	11,000	1.2J	0.033J	0.021J	0.51	2,400	2.3J	300	430	900	5,900	0.51	560	<8.2	<8.2	560	0.94	8	
NUN-MW4s	11/12/2013	21.8	7.47	1.1	12	114	60	13,230	13,000	<2.0		0.11														8	
NUN-MW4s	2/17/2014	19.2	7.82	0.7	7	81	14	8,031	7,000	1.3		<0.050														7	
NUN-MW4s	5/21/2014	20.9	7.15	0.5	6	31	14	11,400	10,000	1.8J		<0.10														9	
NUN-MW4s	8/28/2014	22.3	7.36	0.3	4	102	16	11,590	9,600	1.0J	0.030J	<0.10	0.47	2,300	2.9J	250	400	860	5,100	0.18	590	<8.2	<8.2	590	0.99	8	
NUN-MW4s	11/7/2014	20.9	7.73	0.9	10	-43	95	11,890	10,000	0.84		0.073J														8	
NUN-MW5s	11/7/2014	23.5	7.87	1.6	19	106	41.5	8,209	6,900	<0.50		0.040J														10	

Values in mg/L except temperature (T) in degrees Celsius, pH in standard pH-units, dissolved oxygen percent (DO %) in percent saturation, oxygen reduction potential (ORP) in millivolts, turbidity (Turb) in nephelometric turbidity units, specific conductance (SC) in microsiemens per centimeter. Nitrate, nitrite, ammoniacal-N, and total kjeldahl nitrogen are reported as nitrogen. Sulfate is reported as sulfate; total phosphate is reported as phosphate.
CAB, Cation-Anion Balance
HI, hydraulic information prior to purging: wet screen length in feet;
Q, qualifiers (H) sample holding time was exceeded where indicated with an *; (P) complete purge was not attained.
LE, Lab Error
NM, No Measurement
QM, Questionable Measurement

Attachment E

Laboratory Analytical Reports

Date of Report: 11/04/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	[none]
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1424623
Invoice ID:	B187794

Enclosed are the results of analyses for samples received by the laboratory on 10/16/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1424623

Samples were filtered through a 0.45 micron filter for requested analyses.

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BC Laboratories, Inc.

14.24623

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

Expanded Constituent Suite
Project: Lagoon Perimeter Subsurface Investigation
Site: SAN
Samplers Name: Charlie Jenkins
Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, * Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	SAN-SB1	10/16/14	9:10	water	x	x	x	x
2	SAN-SB2	↓	10:45	↓	↓	↓	↓	↓
3	SAN-SB3	↓	14:20	↓	↓	↓	↓	↓
4								
5								
6								
7								
8								
9								
10								
11								
12								

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

CHK BY DISTRIBUTION
SUB-OUT

Comments
1) Where indicated, samples shall be filtered (0.45um) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC.
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email:
teangermann@lsce.com

Relinquished by: (Signature)	Received By:	Date & Time
Charlie Jenkins	Ross Dickey	10-16-14 1655
Ross Dickey 10-16-14 1830	[illegible]	10-16-14 18:30
[illegible]	[illegible]	10/16/14 2255

(A)= Analysis (C)= Container (P)= Preservative

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Chain of Custody and Cooler Receipt Form for 1424623 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14.24623

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: PE Thermometer ID: 207 Date/Time 10-16-14 2225
Temperature: (A) 2.1 °C / (C) 1.7 °C Analyst Init M

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A	A							
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PIA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:_____
Sample Numbering Completed By: M Date/Time: 10-17-14 0050 (S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC)
A = Actual / C = Corrected

Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/04/2014 17:12 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1424623-01	**COC Number:**	---	**Receive Date:**	10/16/2014 22:55
	Project Number:	---	**Sampling Date:**	10/16/2014 09:10
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	SAN-SB1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1424623-02	**COC Number:**	---	**Receive Date:**	10/16/2014 22:55
	Project Number:	---	**Sampling Date:**	10/16/2014 10:45
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	SAN-SB2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1424623-03	**COC Number:**	---	**Receive Date:**	10/16/2014 22:55
	Project Number:	---	**Sampling Date:**	10/16/2014 14:20
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	SAN-SB3	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424623-01 | **Client Sample Name:** SAN-SB1, 10/16/2014 9:10:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**150**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**49**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**380**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.17		1
Dissolved Potassium	**7.4**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**990**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**110**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.54	**A01**	3
Nitrate as N	**25**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**76**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1200**	**mg/L**	**50**	**50**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**1.4**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		5
Ammonia as N	**0.21**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.11**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	ND	mg/L	0.15	0.092	EPA-365.4	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/17/14	10/26/14 21:20	JRG	PE-OP2	1	BXJ2331
2	SM-2320B	10/20/14	10/20/14 13:26	RML	MET-1	2	BXJ1747
3	EPA-300.0	10/17/14	10/17/14 14:43	BMW	IC2	5	BXJ1739
4	SM-2540C	10/20/14	10/20/14 13:45	CAD	MANUAL	5	BXJ1795
5	EPA-351.2	10/28/14	10/29/14 11:16	JP1	SC-1	1	BXJ2544
6	EPA-350.1	10/24/14	10/24/14 14:27	JP1	SC-1	1	BXJ2232
7	EPA-353.2	10/17/14	10/17/14 07:17	TDC	KONE-1	1	BXJ1725
8	EPA-365.4	10/28/14	10/29/14 10:01	JP1	SC-1	1	BXJ2545

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424623-02 | **Client Sample Name:** SAN-SB2, 10/16/2014 10:45:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**140**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**47**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**340**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.17		1
Dissolved Potassium	**12**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**890**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**130**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.22	**A01**	3
Nitrate as N	**17**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	3
Sulfate	**75**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1100**	**mg/L**	**50**	**50**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**1.4**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		5
Ammonia as N	**0.63**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.21**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	ND	mg/L	0.15	0.092	EPA-365.4	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/17/14	10/26/14 21:23	JRG	PE-OP2	1	BXJ2331
2	SM-2320B	10/20/14	10/20/14 13:33	RML	MET-1	2	BXJ1747
3	EPA-300.0	10/17/14	10/17/14 15:35	BMW	IC2	2	BXJ1739
4	SM-2540C	10/20/14	10/20/14 13:45	CAD	MANUAL	5	BXJ1795
5	EPA-351.2	10/28/14	10/29/14 11:18	JP1	SC-1	1	BXJ2544
6	EPA-350.1	10/24/14	10/24/14 14:27	JP1	SC-1	1	BXJ2232
7	EPA-353.2	10/17/14	10/17/14 07:17	TDC	KONE-1	1	BXJ1725
8	EPA-365.4	10/28/14	10/29/14 10:02	JP1	SC-1	1	BXJ2545

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424623-03 | **Client Sample Name:** SAN-SB3, 10/16/2014 2:20:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**140**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**48**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**580**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.17		1
Dissolved Potassium	**7.7**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**1300**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**140**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.54	**A01**	3
Nitrate as N	**19**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**67**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1600**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**1.3**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		5
Ammonia as N	**0.094**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND	**J**	6
Nitrite as N	**0.11**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	ND	mg/L	0.15	0.092	EPA-365.4	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/17/14	10/26/14 21:25	JRG	PE-OP2	1	BXJ2331
2	SM-2320B	10/20/14	10/20/14 13:39	RML	MET-1	2	BXJ1747
3	EPA-300.0	10/17/14	10/17/14 15:53	BMW	IC2	5	BXJ1739
4	SM-2540C	10/20/14	10/20/14 13:45	CAD	MANUAL	10	BXJ1795
5	EPA-351.2	10/28/14	10/29/14 11:18	JP1	SC-1	1	BXJ2544
6	EPA-350.1	10/24/14	10/24/14 14:29	JP1	SC-1	1	BXJ2232
7	EPA-353.2	10/17/14	10/17/14 07:17	TDC	KONE-1	1	BXJ1725
8	EPA-365.4	10/28/14	10/29/14 10:03	JP1	SC-1	1	BXJ2545

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ1725						
Nitrite as N	BXJ1725-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ1739						
Chloride	**BXJ1739-BLK1**	**0.10900**	**mg/L**	**0.50**	**0.067**	**J**
Nitrate as N	BXJ1739-BLK1	ND	mg/L	0.10	0.025	
Sulfate	BXJ1739-BLK1	ND	mg/L	1.0	0.18	
QC Batch ID: BXJ1747						
Bicarbonate Alkalinity as CaCO3	BXJ1747-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ1747-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ1747-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ1795						
Total Dissolved Solids @ 180 C	BXJ1795-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2232						
Ammonia as N	BXJ2232-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXJ2331						
Dissolved Calcium	BXJ2331-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXJ2331-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	**BXJ2331-BLK1**	**0.17093**	**mg/L**	**0.50**	**0.051**	**J**
Dissolved Potassium	BXJ2331-BLK1	ND	mg/L	1.0	0.10	
QC Batch ID: BXJ2544						
Total Kjeldahl Nitrogen	BXJ2544-BLK1	ND	mg/L	0.20	0.053	
QC Batch ID: BXJ2545						
Total Phosphate	BXJ2545-BLK1	ND	mg/L	0.15	0.092	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ1725										
Nitrite as N	BXJ1725-BS1	LCS	0.50642	0.50000	mg/L	101		90 - 110		
QC Batch ID: BXJ1739										
Chloride	BXJ1739-BS1	LCS	53.912	50.000	mg/L	108		90 - 110		
Nitrate as N	BXJ1739-BS1	LCS	5.3980	5.0000	mg/L	108		90 - 110		
Sulfate	BXJ1739-BS1	LCS	106.47	100.00	mg/L	106		90 - 110		
QC Batch ID: BXJ1795										
Total Dissolved Solids @ 180 C	BXJ1795-BS1	LCS	570.00	586.00	mg/L	97.3		90 - 110		
QC Batch ID: BXJ2232										
Ammonia as N	BXJ2232-BS1	LCS	0.96820	1.0000	mg/L	96.8		90 - 110		
QC Batch ID: BXJ2331										
Dissolved Calcium	BXJ2331-BS1	LCS	10.124	10.000	mg/L	101		85 - 115		
Dissolved Magnesium	BXJ2331-BS1	LCS	10.731	10.000	mg/L	107		85 - 115		
Dissolved Sodium	BXJ2331-BS1	LCS	10.292	10.000	mg/L	103		85 - 115		
Dissolved Potassium	BXJ2331-BS1	LCS	9.7283	10.000	mg/L	97.3		85 - 115		
QC Batch ID: BXJ2544										
Total Kjeldahl Nitrogen	BXJ2544-BS1	LCS	2.0342	2.0000	mg/L	102		90 - 110		
QC Batch ID: BXJ2545										
Total Phosphate	BXJ2545-BS1	LCS	3.1110	3.0660	mg/L	101		85 - 115		

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ1725	Used client sample: Y - Description: SAN-SB1, 10/16/2014 09:10										
Nitrite as N	DUP	1424623-01	0.10779	0.10811		mg/L	0.3		10		
	MS	1424623-01	0.10779	0.65217	0.52632	mg/L		103		90 - 110	
	MSD	1424623-01	0.10779	0.64939	0.52632	mg/L	0.4	103	10	90 - 110	
QC Batch ID: BXJ1739	Used client sample: N										
Chloride	DUP	424757-21RE´	62.871	62.949		mg/L	0.1		10		
	MS	424757-21RE´	62.871	116.71	50.505	mg/L		107		80 - 120	
	MSD	424757-21RE´	62.871	116.69	50.505	mg/L	0.0	107	10	80 - 120	
Nitrate as N	DUP	424757-21RE´	ND	ND		mg/L			10		
	MS	424757-21RE´	ND	5.2293	5.0505	mg/L		104		80 - 120	
	MSD	424757-21RE´	ND	5.2576	5.0505	mg/L	0.5	104	10	80 - 120	
Sulfate	DUP	424757-21RE´	233.10	232.96		mg/L	0.1		10		
	MS	424757-21RE´	233.10	332.26	101.01	mg/L		98.2		80 - 120	
	MSD	424757-21RE´	233.10	332.44	101.01	mg/L	0.1	98.3	10	80 - 120	
QC Batch ID: BXJ1747	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1424613-02	250.41	252.24		mg/L	0.7		10		
Carbonate Alkalinity as CaCO3	DUP	1424613-02	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1424613-02	ND	ND		mg/L			10		
QC Batch ID: BXJ1795	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1424603-01	174000	169000		mg/L	2.9		10		
QC Batch ID: BXJ2232	Used client sample: N										
Ammonia as N	DUP	1424613-01	ND	ND		mg/L			10		
	MS	1424613-01	ND	1.1146	1.1111	mg/L		100		90 - 110	
	MSD	1424613-01	ND	1.1444	1.1111	mg/L	2.6	103	10	90 - 110	
QC Batch ID: BXJ2331	Used client sample: N										
Dissolved Calcium	DUP	1424484-01	17.302	17.283		mg/L	0.1		20		
	MS	1424484-01	17.302	26.869	10.204	mg/L		93.8		85 - 115	
	MSD	1424484-01	17.302	26.965	10.204	mg/L	0.4	94.7	20	85 - 115	
Dissolved Magnesium	DUP	1424484-01	17.225	17.204		mg/L	0.1		20		
	MS	1424484-01	17.225	27.347	10.204	mg/L		99.2		85 - 115	
	MSD	1424484-01	17.225	27.281	10.204	mg/L	0.2	98.5	20	85 - 115	
Dissolved Sodium	DUP	**1424484-01**	**233.41**	**227.96**		**mg/L**	**2.4**		**20**		
	MS	**1424484-01**	**233.41**	**233.15**	**10.204**	**mg/L**		**-2.5**		**85 - 115**	**A03**
	MSD	**1424484-01**	**233.41**	**230.71**	**10.204**	**mg/L**	**1.1**	**-26.5**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1424484-01	1.5466	1.5408		mg/L	0.4		20		
	MS	1424484-01	1.5466	12.101	10.204	mg/L		103		85 - 115	
	MSD	1424484-01	1.5466	12.016	10.204	mg/L	0.7	103	20	85 - 115	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2544	Used client sample: N										
Total Kjeldahl Nitrogen	DUP	1424375-01	1.0911	1.0289		mg/L	5.9		20		
	MS	1424375-01	1.0911	2.8974	2.0000	mg/L		90.3		90 - 110	
	MSD	1424375-01	1.0911	3.1485	2.0000	mg/L	8.3	103	20	90 - 110	
QC Batch ID: BXJ2545	Used client sample: N										
Total Phosphate	DUP	1424375-01	10.103	9.9096		mg/L	1.9		20		
	MS	1424375-01	10.103	13.348	3.0660	mg/L		106		80 - 120	
	MSD	1424375-01	10.103	12.937	3.0660	mg/L	3.1	92.4	20	80 - 120	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/04/2014 17:12 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A03	The sample concentration is more than 4 times the spike level.

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Date of Report: 11/04/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	[none]
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1424624
Invoice ID:	B187799

Enclosed are the results of analyses for samples received by the laboratory on 10/16/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1424624

Samples were filtered through a 0.45 micron filter for requested analyses.

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BC Laboratories, Inc.

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

14-24624

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

Expanded Constituent Suite
Project: Lagoon Perimeter Subsurface Investigation
Site: COT
Samplers Name: Charlie Jenkins
Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	COT-SB1	10/16/14	16:05	water	x	x	x	x
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

CHK BY
DISTRIBUTION
SUB-OUT

Comments
1) Where indicated, samples shall be filtered (0.45um) in the lab to remove turbidity.
2) Lab reports shall identify sampled wells exactly as shown on this CoC.
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email:
teangermann@lsce.com

(A)= Analysis (C)= Container (P)= Preservative

Relinquished by: (Signature)	Received By:	Date & Time
[signature]	Ross Dickey	10-16-14 1655
Ross Dickey	[signature]	10-16-14 1830
[signature]	[signature]	10-16-14 2255

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Chain of Custody and Cooler Receipt Form for 1424624 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14-24624

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: PE Thermometer ID: 207 Date/Time 10-16-14 0755

Temperature: (A) 2.1 °C / (C) 1.7 °C Analyst Init M

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A									
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:
Sample Numbering Completed By: M Date/Time: 10-17-14 0051 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/04/2014 17:12 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1424624-01	**COC Number:**	---	**Receive Date:**	10/16/2014 22:55
	Project Number:	---	**Sampling Date:**	10/16/2014 16:05
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	COT-SB1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424624-01 | **Client Sample Name:** COT-SB1, 10/16/2014 4:05:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**170**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**56**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**170**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.31		1
Dissolved Potassium	**38**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**400**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**160**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	ND	**A01**	3
Nitrate as N	**87**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	4
Sulfate	**64**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1300**	**mg/L**	**50**	**50**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**1.3**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		6
Ammonia as N	**0.16**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		7
Nitrite as N	**0.32**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**9.0**	**mg/L**	**0.75**	**0.46**	**EPA-365.4**	ND	**A01**	9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/17/14	10/29/14 23:33	SRM	PE-OP2	1	BXJ2716
2	SM-2320B	10/20/14	10/20/14 13:46	RML	MET-1	2	BXJ1747
3	EPA-300.0	10/17/14	10/17/14 16:11	BMW	IC2	2	BXJ1691
4	EPA-300.0	10/17/14	10/18/14 06:16	LD1	IC2	5	BXJ1691
5	SM-2540C	10/20/14	10/20/14 13:45	CAD	MANUAL	5	BXJ1795
6	EPA-351.2	10/28/14	10/29/14 11:19	JP1	SC-1	1	BXJ2544
7	EPA-350.1	10/24/14	10/24/14 14:31	JP1	SC-1	1	BXJ2232
8	EPA-353.2	10/17/14	10/17/14 07:17	TDC	KONE-1	1	BXJ1725
9	EPA-365.4	10/28/14	10/29/14 10:20	JP1	SC-1	5	BXJ2545

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ1691						
Chloride	BXJ1691-BLK1	ND	mg/L	0.50	0.067	
Nitrate as N	BXJ1691-BLK1	ND	mg/L	0.10	0.025	
Sulfate	BXJ1691-BLK1	ND	mg/L	1.0	0.18	
QC Batch ID: BXJ1725						
Nitrite as N	BXJ1725-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ1747						
Bicarbonate Alkalinity as CaCO3	BXJ1747-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ1747-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ1747-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ1795						
Total Dissolved Solids @ 180 C	BXJ1795-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2232						
Ammonia as N	BXJ2232-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXJ2544						
Total Kjeldahl Nitrogen	BXJ2544-BLK1	ND	mg/L	0.20	0.053	
QC Batch ID: BXJ2545						
Total Phosphate	BXJ2545-BLK1	ND	mg/L	0.15	0.092	
QC Batch ID: BXJ2716						
Dissolved Calcium	BXJ2716-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXJ2716-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	**BXJ2716-BLK1**	**0.31161**	**mg/L**	**0.50**	**0.051**	**J**
Dissolved Potassium	BXJ2716-BLK1	ND	mg/L	1.0	0.10	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ1691										
Chloride	BXJ1691-BS1	LCS	52.679	50.000	mg/L	105		90 - 110		
Nitrate as N	BXJ1691-BS1	LCS	5.2980	5.0000	mg/L	106		90 - 110		
Sulfate	BXJ1691-BS1	LCS	105.18	100.00	mg/L	105		90 - 110		
QC Batch ID: BXJ1725										
Nitrite as N	BXJ1725-BS1	LCS	0.50642	0.50000	mg/L	101		90 - 110		
QC Batch ID: BXJ1795										
Total Dissolved Solids @ 180 C	BXJ1795-BS1	LCS	570.00	586.00	mg/L	97.3		90 - 110		
QC Batch ID: BXJ2232										
Ammonia as N	BXJ2232-BS1	LCS	0.96820	1.0000	mg/L	96.8		90 - 110		
QC Batch ID: BXJ2544										
Total Kjeldahl Nitrogen	BXJ2544-BS1	LCS	2.0342	2.0000	mg/L	102		90 - 110		
QC Batch ID: BXJ2545										
Total Phosphate	BXJ2545-BS1	LCS	3.1110	3.0660	mg/L	101		85 - 115		
QC Batch ID: BXJ2716										
Dissolved Calcium	BXJ2716-BS1	LCS	9.7659	10.000	mg/L	97.7		85 - 115		
Dissolved Magnesium	BXJ2716-BS1	LCS	10.483	10.000	mg/L	105		85 - 115		
Dissolved Sodium	BXJ2716-BS1	LCS	10.516	10.000	mg/L	105		85 - 115		
Dissolved Potassium	BXJ2716-BS1	LCS	9.6816	10.000	mg/L	96.8		85 - 115		

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ1691	Used client sample: N										
Chloride	DUP	1424650-01	36.857	37.062		mg/L	0.6		10		
	MS	1424650-01	36.857	94.748	50.505	mg/L		115		80 - 120	
	MSD	1424650-01	36.857	95.018	50.505	mg/L	0.3	115	10	80 - 120	
Nitrate as N	DUP	1424650-01	1.0760	1.0870		mg/L	1.0		10		
	MS	1424650-01	1.0760	6.8192	5.0505	mg/L		114		80 - 120	
	MSD	1424650-01	1.0760	6.8717	5.0505	mg/L	0.8	115	10	80 - 120	
Sulfate	DUP	1424650-01	47.457	47.311		mg/L	0.3		10		
	MS	1424650-01	47.457	162.77	101.01	mg/L		114		80 - 120	
	MSD	1424650-01	47.457	163.25	101.01	mg/L	0.3	115	10	80 - 120	
QC Batch ID: BXJ1725	Used client sample: Y - Description: SAN-SB1, 10/16/2014 09:10										
Nitrite as N	DUP	1424623-01	0.10779	0.10811		mg/L	0.3		10		
	MS	1424623-01	0.10779	0.65217	0.52632	mg/L		103		90 - 110	
	MSD	1424623-01	0.10779	0.64939	0.52632	mg/L	0.4	103	10	90 - 110	
QC Batch ID: BXJ1747	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1424613-02	250.41	252.24		mg/L	0.7		10		
Carbonate Alkalinity as CaCO3	DUP	1424613-02	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1424613-02	ND	ND		mg/L			10		
QC Batch ID: BXJ1795	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1424603-01	174000	169000		mg/L	2.9		10		
QC Batch ID: BXJ2232	Used client sample: N										
Ammonia as N	DUP	1424613-01	ND	ND		mg/L			10		
	MS	1424613-01	ND	1.1146	1.1111	mg/L		100		90 - 110	
	MSD	1424613-01	ND	1.1444	1.1111	mg/L	2.6	103	10	90 - 110	
QC Batch ID: BXJ2544	Used client sample: N										
Total Kjeldahl Nitrogen	DUP	1424375-01	1.0911	1.0289		mg/L	5.9		20		
	MS	1424375-01	1.0911	2.8974	2.0000	mg/L		90.3		90 - 110	
	MSD	1424375-01	1.0911	3.1485	2.0000	mg/L	8.3	103	20	90 - 110	
QC Batch ID: BXJ2545	Used client sample: N										
Total Phosphate	DUP	1424375-01	10.103	9.9096		mg/L	1.9		20		
	MS	1424375-01	10.103	13.348	3.0660	mg/L		106		80 - 120	
	MSD	1424375-01	10.103	12.937	3.0660	mg/L	3.1	92.4	20	80 - 120	
QC Batch ID: BXJ2716	Used client sample: N										
Dissolved Calcium	DUP	**1425521-01**	**28.469**	**28.228**		**mg/L**	**0.9**		**20**		
	MS	**1425521-01**	**28.469**	**37.264**	**10.204**	**mg/L**		**86.2**		**85 - 115**	
	MSD	**1425521-01**	**28.469**	**36.559**	**10.204**	**mg/L**	**1.9**	**79.3**	**20**	**85 - 115**	**Q03**

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/04/2014 17:12
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2716	Used client sample: N										
Dissolved Magnesium	DUP	1425521-01	5.9741	5.8884		mg/L	1.4		20		
	MS	1425521-01	5.9741	16.497	10.204	mg/L		103		85 - 115	
	MSD	1425521-01	5.9741	16.621	10.204	mg/L	0.7	104	20	85 - 115	
Dissolved Sodium	DUP	**1425521-01**	**55.637**	**55.543**		**mg/L**	**0.2**		**20**		
	MS	**1425521-01**	**55.637**	**64.629**	**10.204**	**mg/L**		**88.1**		**85 - 115**	
	MSD	**1425521-01**	**55.637**	**63.277**	**10.204**	**mg/L**	**2.1**	**74.9**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1425521-01	3.1841	3.1663		mg/L	0.6		20		
	MS	1425521-01	3.1841	13.575	10.204	mg/L		102		85 - 115	
	MSD	1425521-01	3.1841	13.575	10.204	mg/L	0.0	102	20	85 - 115	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/04/2014 17:12 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A03	The sample concentration is more than 4 times the spike level.
Q03	Matrix spike recovery(s) is(are) not within the control limits.

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Date of Report: 11/05/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	PLS
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1424760
Invoice ID:	B187861

Enclosed are the results of analyses for samples received by the laboratory on 10/17/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1424760

Samples were filtered through a 0.45 micron filter for requested analyses.

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BC Laboratories, Inc.

14-247760

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

	Expanded Constituent Suite
Project:	Lagoon Perimeter Subsurface Investigation
Site:	PLS
Samplers Name:	Charlie Jenkins
Global ID -	

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	*From Filtered Sample:* Ammonia-N, NO3-N, NO2-N	*From Filtered Sample:* Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	*From Unfiltered Sample:* Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	PLS-SB1	10/17/14	13:50	water	x	x	x	x
2	PLS-SB2	↓	14:20	↓	x	x	x	x
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

CHK BY DISTRIBUTION
SUB-OUT

Comments:
1) Where indicated, samples shall be filtered (0.45µm) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC.
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email:
teangermann@lsce.com

Relinquished by: (Signature)	Received By:	Date & Time
Charlie Jenkins		10-17-14 17:20
Relinquished by: (Signature)	Received by:	Date & Time
		10-17-14 2210
Relinquished by: (Signature)	Received By:	Date & Time

(A)= Analysis (C)= Container (P)= Preservative

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Chain of Custody and Cooler Receipt Form for 1424760 Page 2 of 2

BC LABORATORIES INC. **COOLER RECEIPT FORM** Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14-24760

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: PE Thermometer ID: 207 Date/Time 10.17.14 2210
Temperature: (A) 0.7 °C / (C) 0.3 °C Analyst Init M

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A								
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:_____
Sample Numbering Completed By: M Date/Time: 10.17.14 2215 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/05/2014 9:50 Project: Lagoon Perimeter Subsurface Investigation Project Number: PLS Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1424760-01	**COC Number:**	---	**Receive Date:**	10/17/2014 22:10
	Project Number:	---	**Sampling Date:**	10/17/2014 13:50
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	PLS-SB1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1424760-02	**COC Number:**	---	**Receive Date:**	10/17/2014 22:10
	Project Number:	---	**Sampling Date:**	10/17/2014 14:20
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	PLS-SB2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:50
Project: Lagoon Perimeter Subsurface Investigation
Project Number: PLS
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424760-01 | **Client Sample Name:** PLS-SB1, 10/17/2014 1:50:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**260**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**120**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**340**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.31		1
Dissolved Potassium	**4.0**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**600**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**410**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	1.1	**A01**	3
Nitrate as N	**98**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**220**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	2.1	**A01**	3
Total Dissolved Solids @ 180 C	**1800**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**2.5**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.094		5
Ammonia as N	**0.16**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.42**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**0.14**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND	**J**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/20/14	10/29/14 23:41	SRM	PE-OP2	1	BXJ2716
2	SM-2320B	10/20/14	10/20/14 20:50	RML	MET-1	2	BXJ1866
3	EPA-300.0	10/17/14	10/18/14 05:28	LD1	IC5	5	BXJ1743
4	SM-2540C	10/21/14	10/21/14 12:00	CAD	MANUAL	10	BXJ1949
5	EPA-351.2	10/31/14	11/03/14 16:13	JP1	SC-1	1	BXJ2905
6	EPA-350.1	10/27/14	10/29/14 15:24	JP1	SC-1	1	BXJ2383
7	EPA-353.2	10/18/14	10/18/14 00:01	BMW	KONE-1	1	BXJ1726
8	EPA-365.4	10/31/14	11/03/14 14:35	JP1	SC-1	1	BXJ2908

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:50
Project: Lagoon Perimeter Subsurface Investigation
Project Number: PLS
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424760-02 | **Client Sample Name:** PLS-SB2, 10/17/2014 2:20:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**230**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**110**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**300**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.31		1
Dissolved Potassium	**15**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**660**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**370**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	1.1	**A01**	3
Nitrate as N	**69**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**180**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	2.1	**A01**	3
Total Dissolved Solids @ 180 C	**1700**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**2.8**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.094		5
Ammonia as N	**0.59**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**1.1**	**mg/L**	**0.25**	**0.050**	**EPA-353.2**	ND	**A01**	7
Total Phosphate	**0.12**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND	**J**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/20/14	10/29/14 23:43	SRM	PE-OP2	1	BXJ2716
2	SM-2320B	10/20/14	10/20/14 20:57	RML	MET-1	2	BXJ1866
3	EPA-300.0	10/17/14	10/18/14 07:12	LD1	IC5	5	BXJ1743
4	SM-2540C	10/21/14	10/21/14 12:00	CAD	MANUAL	10	BXJ1949
5	EPA-351.2	10/31/14	11/03/14 16:17	JP1	SC-1	1	BXJ2905
6	EPA-350.1	10/27/14	10/29/14 15:26	JP1	SC-1	1	BXJ2383
7	EPA-353.2	10/18/14	10/18/14 00:09	BMW	KONE-1	5	BXJ1726
8	EPA-365.4	10/31/14	11/03/14 14:37	JP1	SC-1	1	BXJ2908

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:50
Project: Lagoon Perimeter Subsurface Investigation
Project Number: PLS
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ1726						
Nitrite as N	BXJ1726-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ1743						
Chloride	**BXJ1743-BLK1**	**0.22200**	**mg/L**	**0.50**	**0.067**	**J**
Nitrate as N	BXJ1743-BLK1	ND	mg/L	0.10	0.025	
Sulfate	**BXJ1743-BLK1**	**0.42000**	**mg/L**	**1.0**	**0.18**	**J**
QC Batch ID: BXJ1866						
Bicarbonate Alkalinity as CaCO3	BXJ1866-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ1866-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ1866-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ1949						
Total Dissolved Solids @ 180 C	BXJ1949-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2383						
Ammonia as N	BXJ2383-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXJ2716						
Dissolved Calcium	BXJ2716-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXJ2716-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	**BXJ2716-BLK1**	**0.31161**	**mg/L**	**0.50**	**0.051**	**J**
Dissolved Potassium	BXJ2716-BLK1	ND	mg/L	1.0	0.10	
QC Batch ID: BXJ2905						
Total Kjeldahl Nitrogen	**BXJ2905-BLK1**	**0.094300**	**mg/L**	**0.20**	**0.053**	**J**
QC Batch ID: BXJ2908						
Total Phosphate	BXJ2908-BLK1	ND	mg/L	0.15	0.092	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:50
Project: Lagoon Perimeter Subsurface Investigation
Project Number: PLS
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ1726										
Nitrite as N	BXJ1726-BS1	LCS	0.51421	0.50000	mg/L	103		90 - 110		
QC Batch ID: BXJ1743										
Chloride	BXJ1743-BS1	LCS	52.925	50.000	mg/L	106		90 - 110		
Nitrate as N	BXJ1743-BS1	LCS	5.3470	5.0000	mg/L	107		90 - 110		
Sulfate	BXJ1743-BS1	LCS	104.73	100.00	mg/L	105		90 - 110		
QC Batch ID: BXJ1949										
Total Dissolved Solids @ 180 C	BXJ1949-BS1	LCS	550.00	586.00	mg/L	93.9		90 - 110		
QC Batch ID: BXJ2383										
Ammonia as N	BXJ2383-BS1	LCS	1.0245	1.0000	mg/L	102		90 - 110		
QC Batch ID: BXJ2716										
Dissolved Calcium	BXJ2716-BS1	LCS	9.7659	10.000	mg/L	97.7		85 - 115		
Dissolved Magnesium	BXJ2716-BS1	LCS	10.483	10.000	mg/L	105		85 - 115		
Dissolved Sodium	BXJ2716-BS1	LCS	10.516	10.000	mg/L	105		85 - 115		
Dissolved Potassium	BXJ2716-BS1	LCS	9.6816	10.000	mg/L	96.8		85 - 115		
QC Batch ID: BXJ2905										
Total Kjeldahl Nitrogen	BXJ2905-BS1	LCS	1.8752	2.0000	mg/L	93.8		90 - 110		
QC Batch ID: BXJ2908										
Total Phosphate	BXJ2908-BS1	LCS	3.1146	3.0660	mg/L	102		85 - 115		

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:50
Project: Lagoon Perimeter Subsurface Investigation
Project Number: PLS
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ1726	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Nitrite as N	DUP	1424760-01	0.42182	0.42293		mg/L	0.3		10		
	MS	1424760-01	0.42182	0.96542	0.52632	mg/L		103		90 - 110	
	MSD	1424760-01	0.42182	0.96663	0.52632	mg/L	0.1	104	10	90 - 110	
QC Batch ID: BXJ1743	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Chloride	DUP	424760-01RE´	390.84	390.12		mg/L	0.2		10		
	MS	424760-01RE´	390.84	942.03	505.05	mg/L		109		80 - 120	
	MSD	424760-01RE´	390.84	945.03	505.05	mg/L	0.3	110	10	80 - 120	
Nitrate as N	DUP	424760-01RE´	98.620	98.460		mg/L	0.2		10		
	MS	424760-01RE´	98.620	149.97	50.505	mg/L		102		80 - 120	
	MSD	424760-01RE´	98.620	151.27	50.505	mg/L	0.9	104	10	80 - 120	
Sulfate	DUP	424760-01RE´	205.68	205.24		mg/L	0.2		10		
	MS	424760-01RE´	205.68	1284.1	1010.1	mg/L		107		80 - 120	
	MSD	424760-01RE´	205.68	1286.0	1010.1	mg/L	0.2	107	10	80 - 120	
QC Batch ID: BXJ1866	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1424759-01	213.29	215.72		mg/L	1.1		10		
Carbonate Alkalinity as CaCO3	DUP	1424759-01	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1424759-01	ND	ND		mg/L			10		
QC Batch ID: BXJ1949	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1424643-11	1440.0	1430.0		mg/L	0.7		10		
QC Batch ID: BXJ2383	Used client sample: N										
Ammonia as N	DUP	1424759-01	0.53490	0.53280		mg/L	0.4		10		
	MS	1424759-01	0.53490	1.6399	1.1111	mg/L		99.4		90 - 110	
	MSD	1424759-01	0.53490	1.6456	1.1111	mg/L	0.3	100	10	90 - 110	
QC Batch ID: BXJ2716	Used client sample: N										
Dissolved Calcium	DUP	**1425521-01**	**28.469**	**28.228**		**mg/L**	**0.9**		**20**		
	MS	**1425521-01**	**28.469**	**37.264**	**10.204**	**mg/L**		**86.2**		**85 - 115**	
	MSD	**1425521-01**	**28.469**	**36.559**	**10.204**	**mg/L**	**1.9**	**79.3**	**20**	**85 - 115**	**Q03**
Dissolved Magnesium	DUP	1425521-01	5.9741	5.8884		mg/L	1.4		20		
	MS	1425521-01	5.9741	16.497	10.204	mg/L		103		85 - 115	
	MSD	1425521-01	5.9741	16.621	10.204	mg/L	0.7	104	20	85 - 115	
Dissolved Sodium	DUP	**1425521-01**	**55.637**	**55.543**		**mg/L**	**0.2**		**20**		
	MS	**1425521-01**	**55.637**	**64.629**	**10.204**	**mg/L**		**88.1**		**85 - 115**	
	MSD	**1425521-01**	**55.637**	**63.277**	**10.204**	**mg/L**	**2.1**	**74.9**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1425521-01	3.1841	3.1663		mg/L	0.6		20		
	MS	1425521-01	3.1841	13.575	10.204	mg/L		102		85 - 115	
	MSD	1425521-01	3.1841	13.575	10.204	mg/L	0.0	102	20	85 - 115	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:50
Project: Lagoon Perimeter Subsurface Investigation
Project Number: PLS
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2905	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Total Kjeldahl Nitrogen	DUP	1424760-01	2.5288	2.5624		mg/L	1.3		20		
	MS	1424760-01	2.5288	4.3394	2.0000	mg/L		90.5		90 - 110	
	MSD	1424760-01	2.5288	4.3834	2.0000	mg/L	1.0	92.7	20	90 - 110	
QC Batch ID: BXJ2908	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Total Phosphate	DUP	**1424760-01**	**0.14074**	**0.11161**		**mg/L**	**23.1**		**20**		**J,A02**
	MS	**1424760-01**	**0.14074**	**3.2606**	**3.0660**	**mg/L**		**102**		**80 - 120**	
	MSD	**1424760-01**	**0.14074**	**3.2284**	**3.0660**	**mg/L**	**1.0**	**101**	**20**	**80 - 120**	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/05/2014 9:50 Project: Lagoon Perimeter Subsurface Investigation Project Number: PLS Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A02	The difference between duplicate readings is less than the PQL.
A03	The sample concentration is more than 4 times the spike level.
Q03	Matrix spike recovery(s) is(are) not within the control limits.

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Date of Report: 11/05/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	BET
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1424761
Invoice ID:	B187862

Enclosed are the results of analyses for samples received by the laboratory on 10/17/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1424761

Samples were filtered through a 0.45 micron filter for requested analyses.

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BC Laboratories, Inc.

14-24761

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

Expanded Constituent Suite

Project: Lagoon Perimeter Subsurface Investigation

Site: BET

Samplers Name: Charlie Jenkins

Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	BET-SB1	10/17/14	15:30	water	x	x	x	x
2	BET-SB2	↓	16:20	↓	↓	x	x	x
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

CHK BY DISTRIBUTION
SUB-OUT

Comments:
1) Where indicated, samples shall be filtered (0.45µm) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email
tleangermann@lsce.com

Relinquished by: (Signature)	Received By:	Date & Time
Charlie Jenkins	[signature]	10-17-14 17:20
Relinquished by: (Signature)	Received by:	Date & Time
[signature]	[signature]	10-17-14 2210
Relinquished by: (Signature)	Received By:	Date & Time
[signature]		

(A)= Analysis (C)= Container (P)= Preservative

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Chain of Custody and Cooler Receipt Form for 1424761 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14-24761

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: PE Thermometer ID: 207 Date/Time 10.17.14 2210

Temperature: (A) 0.7 °C / (C) 0.3 °C Analyst Init M

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A								
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:_____
Sample Numbering Completed By: M Date/Time 10.17.14 2316 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/05/2014 9:51 Project: Lagoon Perimeter Subsurface Investigation Project Number: BET Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1424761-01	**COC Number:**	---	**Receive Date:**	10/17/2014 22:10
	Project Number:	---	**Sampling Date:**	10/17/2014 15:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	BET-SB1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1424761-02	**COC Number:**	---	**Receive Date:**	10/17/2014 22:10
	Project Number:	---	**Sampling Date:**	10/17/2014 16:20
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	BET-SB2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:51
Project: Lagoon Perimeter Subsurface Investigation
Project Number: BET
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424761-01 | **Client Sample Name:** BET-SB1, 10/17/2014 3:30:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**130**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**33**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**53**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.31		1
Dissolved Potassium	**6.9**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**260**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**68**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.44	**A01**	3
Nitrate as N	**36**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	3
Sulfate	**36**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	0.84	**A01**	3
Total Dissolved Solids @ 180 C	**670**	**mg/L**	**33**	**33**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**1.5**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.094		5
Ammonia as N	**0.18**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.14**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**0.13**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND	**J**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/20/14	10/29/14 23:46	SRM	PE-OP2	1	BXJ2716
2	SM-2320B	10/20/14	10/20/14 21:03	RML	MET-1	2	BXJ1866
3	EPA-300.0	10/17/14	10/18/14 07:29	LD1	IC5	2	BXJ1743
4	SM-2540C	10/21/14	10/21/14 13:00	CAD	MANUAL	3.333	BXJ1950
5	EPA-351.2	10/31/14	11/03/14 16:18	JP1	SC-1	1	BXJ2905
6	EPA-350.1	10/27/14	10/29/14 15:32	JP1	SC-1	1	BXJ2386
7	EPA-353.2	10/18/14	10/18/14 00:01	BMW	KONE-1	1	BXJ1726
8	EPA-365.4	10/31/14	11/03/14 14:38	JP1	SC-1	1	BXJ2908

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:51
Project: Lagoon Perimeter Subsurface Investigation
Project Number: BET
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424761-02 | **Client Sample Name:** BET-SB2, 10/17/2014 4:20:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**270**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**84**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**93**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.31		1
Dissolved Potassium	**15**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**780**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**150**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.44	**A01**	3
Nitrate as N	**38**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	3
Sulfate	**29**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	0.84	**A01**	3
Total Dissolved Solids @ 180 C	**1200**	**mg/L**	**50**	**50**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**8.4**	**mg/L**	**1.0**	**0.26**	**EPA-351.2**	0.47	**A01**	5
Ammonia as N	**5.4**	**mg/L**	**0.50**	**0.16**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	**0.28**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	ND	mg/L	0.75	0.46	EPA-365.4	ND	A01	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/20/14	10/29/14 23:48	SRM	PE-OP2	1	BXJ2716
2	SM-2320B	10/20/14	10/20/14 21:08	RML	MET-1	2	BXJ1866
3	EPA-300.0	10/17/14	10/18/14 07:47	LD1	IC5	2	BXJ1743
4	SM-2540C	10/21/14	10/21/14 13:00	CAD	MANUAL	5	BXJ1950
5	EPA-351.2	10/31/14	11/03/14 16:19	JP1	SC-1	5	BXJ2905
6	EPA-350.1	10/27/14	10/29/14 15:33	JP1	SC-1	5	BXJ2386
7	EPA-353.2	10/18/14	10/18/14 00:01	BMW	KONE-1	1	BXJ1726
8	EPA-365.4	10/31/14	11/03/14 14:39	JP1	SC-1	5	BXJ2908

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:51
Project: Lagoon Perimeter Subsurface Investigation
Project Number: BET
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ1726						
Nitrite as N	BXJ1726-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ1743						
Chloride	**BXJ1743-BLK1**	**0.22200**	**mg/L**	**0.50**	**0.067**	**J**
Nitrate as N	BXJ1743-BLK1	ND	mg/L	0.10	0.025	
Sulfate	**BXJ1743-BLK1**	**0.42000**	**mg/L**	**1.0**	**0.18**	**J**
QC Batch ID: BXJ1866						
Bicarbonate Alkalinity as CaCO3	BXJ1866-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ1866-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ1866-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ1950						
Total Dissolved Solids @ 180 C	BXJ1950-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2386						
Ammonia as N	BXJ2386-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXJ2716						
Dissolved Calcium	BXJ2716-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXJ2716-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	**BXJ2716-BLK1**	**0.31161**	**mg/L**	**0.50**	**0.051**	**J**
Dissolved Potassium	BXJ2716-BLK1	ND	mg/L	1.0	0.10	
QC Batch ID: BXJ2905						
Total Kjeldahl Nitrogen	**BXJ2905-BLK1**	**0.094300**	**mg/L**	**0.20**	**0.053**	**J**
QC Batch ID: BXJ2908						
Total Phosphate	BXJ2908-BLK1	ND	mg/L	0.15	0.092	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:51
Project: Lagoon Perimeter Subsurface Investigation
Project Number: BET
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ1726										
Nitrite as N	BXJ1726-BS1	LCS	0.51421	0.50000	mg/L	103		90 - 110		
QC Batch ID: BXJ1743										
Chloride	BXJ1743-BS1	LCS	52.925	50.000	mg/L	106		90 - 110		
Nitrate as N	BXJ1743-BS1	LCS	5.3470	5.0000	mg/L	107		90 - 110		
Sulfate	BXJ1743-BS1	LCS	104.73	100.00	mg/L	105		90 - 110		
QC Batch ID: BXJ1950										
Total Dissolved Solids @ 180 C	BXJ1950-BS1	LCS	565.00	586.00	mg/L	96.4		90 - 110		
QC Batch ID: BXJ2386										
Ammonia as N	BXJ2386-BS1	LCS	0.97540	1.0000	mg/L	97.5		90 - 110		
QC Batch ID: BXJ2716										
Dissolved Calcium	BXJ2716-BS1	LCS	9.7659	10.000	mg/L	97.7		85 - 115		
Dissolved Magnesium	BXJ2716-BS1	LCS	10.483	10.000	mg/L	105		85 - 115		
Dissolved Sodium	BXJ2716-BS1	LCS	10.516	10.000	mg/L	105		85 - 115		
Dissolved Potassium	BXJ2716-BS1	LCS	9.6816	10.000	mg/L	96.8		85 - 115		
QC Batch ID: BXJ2905										
Total Kjeldahl Nitrogen	BXJ2905-BS1	LCS	1.8752	2.0000	mg/L	93.8		90 - 110		
QC Batch ID: BXJ2908										
Total Phosphate	BXJ2908-BS1	LCS	3.1146	3.0660	mg/L	102		85 - 115		

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:51
Project: Lagoon Perimeter Subsurface Investigation
Project Number: BET
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ1726	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Nitrite as N	DUP	1424760-01	0.42182	0.42293		mg/L	0.3		10		
	MS	1424760-01	0.42182	0.96542	0.52632	mg/L		103		90 - 110	
	MSD	1424760-01	0.42182	0.96663	0.52632	mg/L	0.1	104	10	90 - 110	
QC Batch ID: BXJ1743	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Chloride	DUP	424760-01RE´	390.84	390.12		mg/L	0.2		10		
	MS	424760-01RE´	390.84	942.03	505.05	mg/L		109		80 - 120	
	MSD	424760-01RE´	390.84	945.03	505.05	mg/L	0.3	110	10	80 - 120	
Nitrate as N	DUP	424760-01RE´	98.620	98.460		mg/L	0.2		10		
	MS	424760-01RE´	98.620	149.97	50.505	mg/L		102		80 - 120	
	MSD	424760-01RE´	98.620	151.27	50.505	mg/L	0.9	104	10	80 - 120	
Sulfate	DUP	424760-01RE´	205.68	205.24		mg/L	0.2		10		
	MS	424760-01RE´	205.68	1284.1	1010.1	mg/L		107		80 - 120	
	MSD	424760-01RE´	205.68	1286.0	1010.1	mg/L	0.2	107	10	80 - 120	
QC Batch ID: BXJ1866	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1424759-01	213.29	215.72		mg/L	1.1		10		
Carbonate Alkalinity as CaCO3	DUP	1424759-01	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1424759-01	ND	ND		mg/L			10		
QC Batch ID: BXJ1950	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1424557-01	5650.0	5900.0		mg/L	4.3		10		
QC Batch ID: BXJ2386	Used client sample: N										
Ammonia as N	DUP	1424791-03	0.038100	ND		mg/L			10		
	MS	1424791-03	0.038100	1.1269	1.1111	mg/L		98.0		90 - 110	
	MSD	1424791-03	0.038100	1.1257	1.1111	mg/L	0.1	97.9	10	90 - 110	
QC Batch ID: BXJ2716	Used client sample: N										
Dissolved Calcium	DUP	**1425521-01**	**28.469**	**28.228**		**mg/L**	**0.9**		**20**		
	MS	**1425521-01**	**28.469**	**37.264**	**10.204**	**mg/L**		**86.2**		**85 - 115**	
	MSD	**1425521-01**	**28.469**	**36.559**	**10.204**	**mg/L**	**1.9**	**79.3**	**20**	**85 - 115**	**Q03**
Dissolved Magnesium	DUP	1425521-01	5.9741	5.8884		mg/L	1.4		20		
	MS	1425521-01	5.9741	16.497	10.204	mg/L		103		85 - 115	
	MSD	1425521-01	5.9741	16.621	10.204	mg/L	0.7	104	20	85 - 115	
Dissolved Sodium	DUP	**1425521-01**	**55.637**	**55.543**		**mg/L**	**0.2**		**20**		
	MS	**1425521-01**	**55.637**	**64.629**	**10.204**	**mg/L**		**88.1**		**85 - 115**	
	MSD	**1425521-01**	**55.637**	**63.277**	**10.204**	**mg/L**	**2.1**	**74.9**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1425521-01	3.1841	3.1663		mg/L	0.6		20		
	MS	1425521-01	3.1841	13.575	10.204	mg/L		102		85 - 115	
	MSD	1425521-01	3.1841	13.575	10.204	mg/L	0.0	102	20	85 - 115	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 9:51
Project: Lagoon Perimeter Subsurface Investigation
Project Number: BET
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2905	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Total Kjeldahl Nitrogen	DUP	1424760-01	2.5288	2.5624		mg/L	1.3		20		
	MS	1424760-01	2.5288	4.3394	2.0000	mg/L		90.5		90 - 110	
	MSD	1424760-01	2.5288	4.3834	2.0000	mg/L	1.0	92.7	20	90 - 110	
QC Batch ID: BXJ2908	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Total Phosphate	DUP	**1424760-01**	**0.14074**	**0.11161**		**mg/L**	**23.1**		**20**		**J,A02**
	MS	**1424760-01**	**0.14074**	**3.2606**	**3.0660**	**mg/L**		**102**		**80 - 120**	
	MSD	**1424760-01**	**0.14074**	**3.2284**	**3.0660**	**mg/L**	**1.0**	**101**	**20**	**80 - 120**	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/05/2014 9:51 Project: Lagoon Perimeter Subsurface Investigation Project Number: BET Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A02	The difference between duplicate readings is less than the PQL.
A03	The sample concentration is more than 4 times the spike level.
Q03	Matrix spike recovery(s) is(are) not within the control limits.

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Date of Report: 11/05/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	COT
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1424762
Invoice ID:	B187867

Enclosed are the results of analyses for samples received by the laboratory on 10/17/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1424762

Samples were filtered through a 0.45 micron filter for requested analyses.

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BC Laboratories, Inc.

14-24762

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

Expanded Constituent Suite
Project: Lagoon Perimeter Subsurface Investigation
Site: COT
Samplers Name: Charlie Jenkins
Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	COT-SB2	10/17/14	8:05	water	x	x	x	x
2	COT-SB3	↓	10:35	↓	↓	↓	↓	↓
3	COT-SB4	↓	11:40	↓	↓	↓	↓	↓
4	~~PLS-SB1~~ CJ		~~13:50~~ CJ					
5								
6								
7								
8								
9								
10								
11								
12								

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

CHK BY DISTRIBUTION
SUB-OUT

Comments
1) Where indicated, samples shall be filtered (0.45µm) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email:
feangermann@lsce.com

Relinquished by: (Signature)	Received By:	Date & Time
Charlie Jenkins	[signature]	10-17-14 17:20
Relinquished by: (Signature)	Received by:	Date & Time
[signature]	[signature]	10-17-14 2210
Relinquished by: (Signature)	Received By:	Date & Time
[signature]		

(A)= Analysis (C)= Container (P)= Preservative

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Chain of Custody and Cooler Receipt Form for 1424762 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14-74762

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: PE Thermometer ID: 207 Date/Time 10.17.14 2240
Temperature: (A) 0.7 °C / (C) 0.3 °C Analyst Init M

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A	A							
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:_____
Sample Numbering Completed By: M Date/Time: 10.17.14 2318 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/05/2014 10:24 Project: Lagoon Perimeter Subsurface Investigation Project Number: COT Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1424762-01	**COC Number:**	---	**Receive Date:**	10/17/2014 22:10
	Project Number:	---	**Sampling Date:**	10/17/2014 08:05
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	COT-SB2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1424762-02	**COC Number:**	---	**Receive Date:**	10/17/2014 22:10
	Project Number:	---	**Sampling Date:**	10/17/2014 10:35
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	COT-SB3	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1424762-03	**COC Number:**	---	**Receive Date:**	10/17/2014 22:10
	Project Number:	---	**Sampling Date:**	10/17/2014 11:40
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	COT-SB4	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/05/2014 10:24
Project: Lagoon Perimeter Subsurface Investigation
Project Number: COT
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424762-01 | **Client Sample Name:** COT-SB2, 10/17/2014 8:05:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**160**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**54**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**170**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.31		1
Dissolved Potassium	**30**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**380**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**180**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.44	**A01**	3
Nitrate as N	**69**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	4
Sulfate	**68**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	0.84	**A01**	3
Total Dissolved Solids @ 180 C	**1200**	**mg/L**	**50**	**50**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**0.22**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.094		6
Ammonia as N	**0.44**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		7
Nitrite as N	**0.38**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**1.5**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/20/14	10/29/14 23:50	SRM	PE-OP2	1	BXJ2716
2	SM-2320B	10/20/14	10/20/14 21:14	RML	MET-1	2	BXJ1866
3	EPA-300.0	10/17/14	10/18/14 08:04	LD1	IC5	2	BXJ1743
4	EPA-300.0	10/17/14	10/18/14 15:12	BMW	IC5	5	BXJ1743
5	SM-2540C	10/21/14	10/21/14 13:00	CAD	MANUAL	5	BXJ1950
6	EPA-351.2	10/31/14	11/03/14 16:20	JP1	SC-1	1	BXJ2905
7	EPA-350.1	10/27/14	10/29/14 15:35	JP1	SC-1	1	BXJ2386
8	EPA-353.2	10/18/14	10/18/14 00:01	BMW	KONE-1	1	BXJ1726
9	EPA-365.4	10/31/14	11/03/14 14:39	JP1	SC-1	1	BXJ2908

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Reported: 11/05/2014 10:24
Project: Lagoon Perimeter Subsurface Investigation
Project Number: COT
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424762-02 | **Client Sample Name:** COT-SB3, 10/17/2014 10:35:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**170**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**81**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**120**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.31		1
Dissolved Potassium	**43**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**760**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**110**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.44	**A01**	3
Nitrate as N	**30**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	3
Sulfate	**44**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	0.84	**A01**	3
Total Dissolved Solids @ 180 C	**1100**	**mg/L**	**50**	**50**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**20**	**mg/L**	**1.0**	**0.26**	**EPA-351.2**	0.47	**A01**	5
Ammonia as N	**17**	**mg/L**	**1.0**	**0.33**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	**0.17**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	ND	mg/L	0.75	0.46	EPA-365.4	ND	A01	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/20/14	10/29/14 23:53	SRM	PE-OP2	1	BXJ2716
2	SM-2320B	10/20/14	10/20/14 21:20	RML	MET-1	2	BXJ1866
3	EPA-300.0	10/17/14	10/18/14 08:22	LD1	IC5	2	BXJ1743
4	SM-2540C	10/21/14	10/21/14 13:00	CAD	MANUAL	5	BXJ1950
5	EPA-351.2	10/31/14	11/03/14 16:22	JP1	SC-1	5	BXJ2905
6	EPA-350.1	10/27/14	10/29/14 15:37	JP1	SC-1	10	BXJ2386
7	EPA-353.2	10/18/14	10/18/14 00:03	BMW	KONE-1	1	BXJ1726
8	EPA-365.4	10/31/14	11/03/14 14:41	JP1	SC-1	5	BXJ2908

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Woodland, CA 95695

Reported: 11/05/2014 10:24
Project: Lagoon Perimeter Subsurface Investigation
Project Number: COT
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1424762-03 | **Client Sample Name:** COT-SB4, 10/17/2014 11:40:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**150**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**48**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**110**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.31		1
Dissolved Potassium	**74**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**840**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**99**	**mg/L**	**0.50**	**0.067**	**EPA-300.0**	0.22		3
Nitrate as N	**0.073**	**mg/L**	**0.10**	**0.025**	**EPA-300.0**	ND	**J**	3
Sulfate	**3.1**	**mg/L**	**1.0**	**0.18**	**EPA-300.0**	0.42		3
Total Dissolved Solids @ 180 C	**860**	**mg/L**	**50**	**50**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**59**	**mg/L**	**5.0**	**1.3**	**EPA-351.2**	2.4	**A01**	5
Ammonia as N	**58**	**mg/L**	**5.0**	**1.6**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	ND	mg/L	0.050	0.010	EPA-353.2	ND		7
Total Phosphate	ND	mg/L	0.75	0.46	EPA-365.4	ND	A01	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/20/14	10/29/14 23:55	SRM	PE-OP2	1	BXJ2716
2	SM-2320B	10/21/14	10/21/14 09:57	RML	MET-1	2	BXJ1867
3	EPA-300.0	10/17/14	10/18/14 15:29	BMW	IC5	1	BXJ1743
4	SM-2540C	10/21/14	10/21/14 13:00	CAD	MANUAL	5	BXJ1950
5	EPA-351.2	10/31/14	11/03/14 17:04	JP1	SC-1	25	BXJ2905
6	EPA-350.1	10/27/14	10/29/14 16:06	JP1	SC-1	50	BXJ2386
7	EPA-353.2	10/18/14	10/18/14 00:03	BMW	KONE-1	1	BXJ1726
8	EPA-365.4	10/31/14	11/03/14 14:41	JP1	SC-1	5	BXJ2908

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Reported: 11/05/2014 10:24
Project: Lagoon Perimeter Subsurface Investigation
Project Number: COT
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ1726						
Nitrite as N	BXJ1726-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ1743						
Chloride	**BXJ1743-BLK1**	**0.22200**	**mg/L**	**0.50**	**0.067**	**J**
Nitrate as N	BXJ1743-BLK1	ND	mg/L	0.10	0.025	
Sulfate	**BXJ1743-BLK1**	**0.42000**	**mg/L**	**1.0**	**0.18**	**J**
QC Batch ID: BXJ1866						
Bicarbonate Alkalinity as CaCO3	BXJ1866-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ1866-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ1866-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ1867						
Bicarbonate Alkalinity as CaCO3	BXJ1867-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ1867-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ1867-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ1950						
Total Dissolved Solids @ 180 C	BXJ1950-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2386						
Ammonia as N	BXJ2386-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXJ2716						
Dissolved Calcium	BXJ2716-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXJ2716-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	**BXJ2716-BLK1**	**0.31161**	**mg/L**	**0.50**	**0.051**	**J**
Dissolved Potassium	BXJ2716-BLK1	ND	mg/L	1.0	0.10	
QC Batch ID: BXJ2905						
Total Kjeldahl Nitrogen	**BXJ2905-BLK1**	**0.094300**	**mg/L**	**0.20**	**0.053**	**J**
QC Batch ID: BXJ2908						
Total Phosphate	BXJ2908-BLK1	ND	mg/L	0.15	0.092	

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Woodland, CA 95695

Reported: 11/05/2014 10:24
Project: Lagoon Perimeter Subsurface Investigation
Project Number: COT
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ1726										
Nitrite as N	BXJ1726-BS1	LCS	0.51421	0.50000	mg/L	103		90 - 110		
QC Batch ID: BXJ1743										
Chloride	BXJ1743-BS1	LCS	52.925	50.000	mg/L	106		90 - 110		
Nitrate as N	BXJ1743-BS1	LCS	5.3470	5.0000	mg/L	107		90 - 110		
Sulfate	BXJ1743-BS1	LCS	104.73	100.00	mg/L	105		90 - 110		
QC Batch ID: BXJ1950										
Total Dissolved Solids @ 180 C	BXJ1950-BS1	LCS	565.00	586.00	mg/L	96.4		90 - 110		
QC Batch ID: BXJ2386										
Ammonia as N	BXJ2386-BS1	LCS	0.97540	1.0000	mg/L	97.5		90 - 110		
QC Batch ID: BXJ2716										
Dissolved Calcium	BXJ2716-BS1	LCS	9.7659	10.000	mg/L	97.7		85 - 115		
Dissolved Magnesium	BXJ2716-BS1	LCS	10.483	10.000	mg/L	105		85 - 115		
Dissolved Sodium	BXJ2716-BS1	LCS	10.516	10.000	mg/L	105		85 - 115		
Dissolved Potassium	BXJ2716-BS1	LCS	9.6816	10.000	mg/L	96.8		85 - 115		
QC Batch ID: BXJ2905										
Total Kjeldahl Nitrogen	BXJ2905-BS1	LCS	1.8752	2.0000	mg/L	93.8		90 - 110		
QC Batch ID: BXJ2908										
Total Phosphate	BXJ2908-BS1	LCS	3.1146	3.0660	mg/L	102		85 - 115		

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Woodland, CA 95695

Reported: 11/05/2014 10:24
Project: Lagoon Perimeter Subsurface Investigation
Project Number: COT
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ1726	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Nitrite as N	DUP	1424760-01	0.42182	0.42293		mg/L	0.3		10		
	MS	1424760-01	0.42182	0.96542	0.52632	mg/L		103		90 - 110	
	MSD	1424760-01	0.42182	0.96663	0.52632	mg/L	0.1	104	10	90 - 110	
QC Batch ID: BXJ1743	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Chloride	DUP	424760-01RE´	390.84	390.12		mg/L	0.2		10		
	MS	424760-01RE´	390.84	942.03	505.05	mg/L		109		80 - 120	
	MSD	424760-01RE´	390.84	945.03	505.05	mg/L	0.3	110	10	80 - 120	
Nitrate as N	DUP	424760-01RE´	98.620	98.460		mg/L	0.2		10		
	MS	424760-01RE´	98.620	149.97	50.505	mg/L		102		80 - 120	
	MSD	424760-01RE´	98.620	151.27	50.505	mg/L	0.9	104	10	80 - 120	
Sulfate	DUP	424760-01RE´	205.68	205.24		mg/L	0.2		10		
	MS	424760-01RE´	205.68	1284.1	1010.1	mg/L		107		80 - 120	
	MSD	424760-01RE´	205.68	1286.0	1010.1	mg/L	0.2	107	10	80 - 120	
QC Batch ID: BXJ1866	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1424759-01	213.29	215.72		mg/L	1.1		10		
Carbonate Alkalinity as CaCO3	DUP	1424759-01	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1424759-01	ND	ND		mg/L			10		
QC Batch ID: BXJ1867	Used client sample: Y - Description: COT-SB4, 10/17/2014 11:40										
Bicarbonate Alkalinity as CaCO3	DUP	1424762-03	838.86	843.73		mg/L	0.6		10		
Carbonate Alkalinity as CaCO3	DUP	1424762-03	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1424762-03	ND	ND		mg/L			10		
QC Batch ID: BXJ1950	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1424557-01	5650.0	5900.0		mg/L	4.3		10		
QC Batch ID: BXJ2386	Used client sample: N										
Ammonia as N	DUP	1424791-03	0.038100	ND		mg/L			10		
	MS	1424791-03	0.038100	1.1269	1.1111	mg/L		98.0		90 - 110	
	MSD	1424791-03	0.038100	1.1257	1.1111	mg/L	0.1	97.9	10	90 - 110	
QC Batch ID: BXJ2716	Used client sample: N										
Dissolved Calcium	DUP	**1425521-01**	**28.469**	**28.228**		**mg/L**	**0.9**		**20**		
	MS	**1425521-01**	**28.469**	**37.264**	**10.204**	**mg/L**		**86.2**		**85 - 115**	
	MSD	**1425521-01**	**28.469**	**36.559**	**10.204**	**mg/L**	**1.9**	**79.3**	**20**	**85 - 115**	**Q03**
Dissolved Magnesium	DUP	1425521-01	5.9741	5.8884		mg/L	1.4		20		
	MS	1425521-01	5.9741	16.497	10.204	mg/L		103		85 - 115	
	MSD	1425521-01	5.9741	16.621	10.204	mg/L	0.7	104	20	85 - 115	

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Reported: 11/05/2014 10:24
Project: Lagoon Perimeter Subsurface Investigation
Project Number: COT
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2716	Used client sample: N										
Dissolved Sodium	DUP	**1425521-01**	**55.637**	**55.543**		**mg/L**	**0.2**		**20**		
	MS	**1425521-01**	**55.637**	**64.629**	**10.204**	**mg/L**		**88.1**		**85 - 115**	
	MSD	**1425521-01**	**55.637**	**63.277**	**10.204**	**mg/L**	**2.1**	**74.9**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1425521-01	3.1841	3.1663		mg/L	0.6		20		
	MS	1425521-01	3.1841	13.575	10.204	mg/L		102		85 - 115	
	MSD	1425521-01	3.1841	13.575	10.204	mg/L	0.0	102	20	85 - 115	
QC Batch ID: BXJ2905	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Total Kjeldahl Nitrogen	DUP	1424760-01	2.5288	2.5624		mg/L	1.3		20		
	MS	1424760-01	2.5288	4.3394	2.0000	mg/L		90.5		90 - 110	
	MSD	1424760-01	2.5288	4.3834	2.0000	mg/L	1.0	92.7	20	90 - 110	
QC Batch ID: BXJ2908	Used client sample: Y - Description: PLS-SB1, 10/17/2014 13:50										
Total Phosphate	DUP	**1424760-01**	**0.14074**	**0.11161**		**mg/L**	**23.1**		**20**		**J,A02**
	MS	**1424760-01**	**0.14074**	**3.2606**	**3.0660**	**mg/L**		**102**		**80 - 120**	
	MSD	**1424760-01**	**0.14074**	**3.2284**	**3.0660**	**mg/L**	**1.0**	**101**	**20**	**80 - 120**	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/05/2014 10:24 Project: Lagoon Perimeter Subsurface Investigation Project Number: COT Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A02	The difference between duplicate readings is less than the PQL.
A03	The sample concentration is more than 4 times the spike level.
Q03	Matrix spike recovery(s) is(are) not within the control limits.

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Date of Report: 11/17/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	[none]
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1425030
Invoice ID:	B188752

Enclosed are the results of analyses for samples received by the laboratory on 10/21/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1425030

Samples were filtered through a 0.45 micron filter for requested analyses.

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BC Laboratories, Inc.

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

14-25030

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

Expanded Constituent Suite
Project: Lagoon Perimeter Subsurface Investigation
Site:
Samplers Name: Charlie Jenkins
Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	FGI SB-1	10/21/14	3:55pm	water	x	x	x	x
2	FGI SB-2	10/21/14	4:45pm	"	x	x	x	x
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

CHK BY DISTRIBUTION
MWI MAMT
SUB-OUT

Comments
1) Where indicated, samples shall be filtered (0.45µm) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC.
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email:
tleangermann@lsce.com

(A)= Analysis (C)= Container (P)= Preservative

Relinquished by: (Signature)	Received By:	Date & Time
Leanne Hummel LSCE	Ross Dickey	10/21/14 5:17pm
Ross Dickey 10.21.14 1820	[signature]	10/21/14 18:20
[signature]	[signature]	10.21.14 2225

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Chain of Custody and Cooler Receipt Form for 1425030 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14-25030

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: DE Thermometer ID: 207 Date/Time 10.21.14 2225

Temperature: (A) 2.6 °C / (C) 2.2 °C Analyst Init M

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A								
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:_____
Sample Numbering Completed By: MW Date/Time: 10/22/14@0735 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/17/2014 9:02 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425030-01	**COC Number:**	---	**Receive Date:**	10/21/2014 22:25
	Project Number:	---	**Sampling Date:**	10/21/2014 15:55
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	FG1 SB-1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425030-02	**COC Number:**	---	**Receive Date:**	10/21/2014 22:25
	Project Number:	---	**Sampling Date:**	10/21/2014 16:45
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	FG1 SB-2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/17/2014 9:02
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425030-01 | **Client Sample Name:** FG1 SB-1, 10/21/2014 3:55:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**85**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**48**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**220**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**8.7**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**550**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**160**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.14	**A01**	3
Nitrate as N	**0.30**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A10**	3
Sulfate	**83**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**940**	**mg/L**	**50**	**50**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**1.1**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		5
Ammonia as N	**0.24**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.031**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND	**J**	7
Total Phosphate	**33**	**mg/L**	**3.0**	**1.8**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/07/14	11/07/14 20:11	JRG	PE-OP2	1	BXK0633
2	SM-2320B	10/22/14	10/22/14 20:40	RML	MET-1	2	BXJ2120
3	EPA-300.0	10/22/14	10/22/14 18:53	BMW	IC1	2	BXJ2110
4	SM-2540C	10/23/14	10/23/14 13:30	CAD	MANUAL	5	BXJ2174
5	EPA-351.2	11/04/14	11/06/14 12:34	JP1	SC-1	1	BXK0238
6	EPA-350.1	10/30/14	10/30/14 12:47	JP1	SC-1	1	BXJ2740
7	EPA-353.2	10/22/14	10/22/14 09:15	TDC	KONE-1	1	BXJ2082
8	EPA-365.4	11/04/14	11/06/14 11:27	JP1	SC-1	20	BXK0239

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/17/2014 9:02
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425030-02 | **Client Sample Name:** FG1 SB-2, 10/21/2014 4:45:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**120**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**48**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**180**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**5.3**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**490**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**140**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.14	**A01**	3
Nitrate as N	**9.2**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	3
Sulfate	**110**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**900**	**mg/L**	**50**	**50**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**0.61**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		5
Ammonia as N	**0.18**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.28**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**0.71**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/07/14	11/07/14 20:23	JRG	PE-OP2	1	BXK0633
2	SM-2320B	10/22/14	10/22/14 20:46	RML	MET-1	2	BXJ2120
3	EPA-300.0	10/22/14	10/22/14 19:37	BMW	IC1	2	BXJ2110
4	SM-2540C	10/23/14	10/23/14 13:30	CAD	MANUAL	5	BXJ2174
5	EPA-351.2	11/04/14	11/06/14 12:36	JP1	SC-1	1	BXK0238
6	EPA-350.1	10/30/14	10/30/14 12:38	JP1	SC-1	1	BXJ2740
7	EPA-353.2	10/22/14	10/22/14 09:15	TDC	KONE-1	1	BXJ2082
8	EPA-365.4	11/04/14	11/06/14 10:59	JP1	SC-1	1	BXK0239

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/17/2014 9:02
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ2082						
Nitrite as N	BXJ2082-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ2110						
Chloride	**BXJ2110-BLK1**	**0.069000**	**mg/L**	**0.50**	**0.067**	**J**
Nitrate as N	BXJ2110-BLK1	ND	mg/L	0.10	0.025	
Sulfate	BXJ2110-BLK1	ND	mg/L	1.0	0.18	
QC Batch ID: BXJ2120						
Bicarbonate Alkalinity as CaCO3	BXJ2120-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ2120-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ2120-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ2174						
Total Dissolved Solids @ 180 C	BXJ2174-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2740						
Ammonia as N	BXJ2740-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXK0238						
Total Kjeldahl Nitrogen	BXK0238-BLK1	ND	mg/L	0.20	0.053	
QC Batch ID: BXK0239						
Total Phosphate	BXK0239-BLK1	ND	mg/L	0.15	0.092	
QC Batch ID: BXK0633						
Dissolved Calcium	BXK0633-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXK0633-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXK0633-BLK1	ND	mg/L	0.50	0.051	
Dissolved Potassium	BXK0633-BLK1	ND	mg/L	1.0	0.10	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/17/2014 9:02
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ2082										
Nitrite as N	BXJ2082-BS1	LCS	0.52278	0.50000	mg/L	105		90 - 110		
QC Batch ID: BXJ2110										
Chloride	BXJ2110-BS1	LCS	51.906	50.000	mg/L	104		90 - 110		
Nitrate as N	BXJ2110-BS1	LCS	5.2240	5.0000	mg/L	104		90 - 110		
Sulfate	BXJ2110-BS1	LCS	103.63	100.00	mg/L	104		90 - 110		
QC Batch ID: BXJ2174										
Total Dissolved Solids @ 180 C	BXJ2174-BS1	LCS	550.00	586.00	mg/L	93.9		90 - 110		
QC Batch ID: BXJ2740										
Ammonia as N	BXJ2740-BS1	LCS	1.0938	1.0000	mg/L	109		90 - 110		
QC Batch ID: BXK0238										
Total Kjeldahl Nitrogen	BXK0238-BS1	LCS	1.9773	2.0000	mg/L	98.9		90 - 110		
QC Batch ID: BXK0239										
Total Phosphate	BXK0239-BS1	LCS	2.8758	3.0660	mg/L	93.8		85 - 115		
QC Batch ID: BXK0633										
Dissolved Calcium	BXK0633-BS1	LCS	9.7261	10.000	mg/L	97.3		85 - 115		
Dissolved Magnesium	BXK0633-BS1	LCS	10.366	10.000	mg/L	104		85 - 115		
Dissolved Sodium	BXK0633-BS1	LCS	9.7971	10.000	mg/L	98.0		85 - 115		
Dissolved Potassium	BXK0633-BS1	LCS	9.3407	10.000	mg/L	93.4		85 - 115		

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/17/2014 9:02
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2082	Used client sample: N										
Nitrite as N	DUP	1424982-01	ND	ND		mg/L			10		
	MS	1424982-01	ND	0.52880	0.52632	mg/L		100		90 - 110	
	MSD	1424982-01	ND	0.53113	0.52632	mg/L	0.4	101	10	90 - 110	
QC Batch ID: BXJ2110	Used client sample: N										
Chloride	DUP	1424960-02	166.13	166.42		mg/L	0.2		10		
	MS	1424960-02	166.13	215.81	50.505	mg/L		98.4		80 - 120	
	MSD	1424960-02	166.13	216.45	50.505	mg/L	0.3	99.6	10	80 - 120	
Nitrate as N	DUP	1424960-02	0.26400	0.26000		mg/L	1.5		10		
	MS	1424960-02	0.26400	5.7111	5.0505	mg/L		108		80 - 120	
	MSD	1424960-02	0.26400	5.7141	5.0505	mg/L	0.1	108	10	80 - 120	
Sulfate	DUP	1424960-02	119.91	119.91		mg/L	0.0		10		
	MS	1424960-02	119.91	235.10	101.01	mg/L		114		80 - 120	
	MSD	1424960-02	119.91	235.18	101.01	mg/L	0.0	114	10	80 - 120	
QC Batch ID: BXJ2120	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1425024-02	799.30	803.56		mg/L	0.5		10		
Carbonate Alkalinity as CaCO3	DUP	1425024-02	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1425024-02	ND	ND		mg/L			10		
QC Batch ID: BXJ2174	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1424934-02	2330.0	2290.0		mg/L	1.7		10		
QC Batch ID: BXJ2740	Used client sample: Y - Description: FG1 SB-2, 10/21/2014 16:45										
Ammonia as N	DUP	**1425030-02**	**0.17700**	**0.15670**		**mg/L**	**12.2**		**10**		**A02**
	MS	**1425030-02**	**0.17700**	**1.2664**	**1.1111**	**mg/L**		**98.0**		**90 - 110**	
	MSD	**1425030-02**	**0.17700**	**1.2414**	**1.1111**	**mg/L**	**2.0**	**95.8**	**10**	**90 - 110**	
QC Batch ID: BXK0238	Used client sample: N										
Total Kjeldahl Nitrogen	DUP	**1425666-01**	**0.43260**	**0.47580**		**mg/L**	**9.5**		**20**		
	MS	**1425666-01**	**0.43260**	**2.1170**	**2.0000**	**mg/L**		**84.2**		**90 - 110**	**Q03**
	MSD	**1425666-01**	**0.43260**	**2.0433**	**2.0000**	**mg/L**	**3.5**	**80.5**	**20**	**90 - 110**	**Q03**
QC Batch ID: BXK0239	Used client sample: N										
Total Phosphate	DUP	1425666-01	ND	ND		mg/L			20		
	MS	1425666-01	ND	2.9485	3.0660	mg/L		96.2		80 - 120	
	MSD	1425666-01	ND	2.8727	3.0660	mg/L	2.6	93.7	20	80 - 120	
QC Batch ID: BXK0633	Used client sample: Y - Description: FG1 SB-1, 10/21/2014 15:55										
Dissolved Calcium	DUP	**I425030-01RE1**	**85.413**	**83.727**		**mg/L**	**2.0**		**20**		
	MS	**I425030-01RE1**	**85.413**	**91.505**	**10.204**	**mg/L**		**59.7**		**85 - 115**	**A03**
	MSD	**I425030-01RE1**	**85.413**	**92.640**	**10.204**	**mg/L**	**1.2**	**70.8**	**20**	**85 - 115**	**A03**

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/17/2014 9:02
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXK0633	Used client sample: Y - Description: FG1 SB-1, 10/21/2014 15:55										
Dissolved Magnesium	DUP	425030-01RE1	47.957	47.974		mg/L	0.0		20		
	MS	425030-01RE1	47.957	56.783	10.204	mg/L		86.5		85 - 115	
	MSD	425030-01RE1	47.957	57.170	10.204	mg/L	0.7	90.3	20	85 - 115	
Dissolved Sodium	DUP	**425030-01RE1**	**220.69**	**216.59**		**mg/L**	**1.9**		**20**		
	MS	**425030-01RE1**	**220.69**	**222.16**	**10.204**	**mg/L**		**14.4**		**85 - 115**	**A03**
	MSD	**425030-01RE1**	**220.69**	**223.95**	**10.204**	**mg/L**	**0.8**	**31.9**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	425030-01RE1	8.6717	8.7072		mg/L	0.4		20		
	MS	425030-01RE1	8.6717	19.105	10.204	mg/L		102		85 - 115	
	MSD	425030-01RE1	8.6717	19.035	10.204	mg/L	0.4	102	20	85 - 115	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/17/2014 9:02 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A02	The difference between duplicate readings is less than the PQL.
A03	The sample concentration is more than 4 times the spike level.
A10	PQL's and MDL's were raised due to matrix interference.
Q03	Matrix spike recovery(s) is(are) not within the control limits.

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Date of Report: 11/11/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	[none]
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1425031
Invoice ID:	B188365

Enclosed are the results of analyses for samples received by the laboratory on 10/21/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1425031

Samples were filtered through a 0.45 micron filter for requested analyses.

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BC Laboratories, Inc.

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

14-25031

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

Expanded Constituent Suite
Project: Lagoon Perimeter Subsurface Investigation
Site: BET
Samplers Name: Charlie Jenkins
Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	BET SB-3	10/21/14	8:30am	water	x	x	x	x
2	BET SB-4	10/21/14	9:55AM	"	x	x	x	x
3	BET SB-5	10/21/14	11:30AM	"	x	x	x	x
4	BET SB-6	10/21/14	1:20pm	"	x	x	x	x
5								
6								
7								
8								
9								
10								
11								
12								

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

CHK BY DISTRIBUTION
MW MA MT I I
SUB-OUT

Comments
1) Where indicated, samples shall be filtered (0.45um) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC.
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email:
tangermann@lsce.com

Relinquished by: (Signature)	Received By:	Date & Time
Jeanette Hummel LSCE	Ross Dickey	10/21/14 5:17pm
Ross Dickey 10.21.14 1820	[signature]	10/21/14 18:20
[signature]	[signature]	10.21.14 2225

(A)= Analysis (C)= Container (P)= Preservative

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Chain of Custody and Cooler Receipt Form for 1425031 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14-25031

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: DE Thermometer ID: 207 Date/Time 10.21.14 2225
Temperature: (A) 2.6 °C / (C) 2.2 °C Analyst Init M

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A	A	A						
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:_____
Sample Numbering Completed By: MW Date/Time: 10/22/14@0735 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/11/2014 15:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425031-01	**COC Number:**	---	**Receive Date:**	10/21/2014 22:25
	Project Number:	---	**Sampling Date:**	10/21/2014 08:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	BET SB-3	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425031-02	**COC Number:**	---	**Receive Date:**	10/21/2014 22:25
	Project Number:	---	**Sampling Date:**	10/21/2014 09:55
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	BET SB-4	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425031-03	**COC Number:**	---	**Receive Date:**	10/21/2014 22:25
	Project Number:	---	**Sampling Date:**	10/21/2014 11:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	BET SB-5	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425031-04	**COC Number:**	---	**Receive Date:**	10/21/2014 22:25
	Project Number:	---	**Sampling Date:**	10/21/2014 13:20
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	BET SB-6	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/11/2014 15:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425031-01 | **Client Sample Name:** BET SB-3, 10/21/2014 8:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**48**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**16**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**42**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**10**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**130**	**mg/L**	**4.1**	**4.1**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	4.1	4.1	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	4.1	4.1	SM-2320B	ND		2
Chloride	**31**	**mg/L**	**0.50**	**0.067**	**EPA-300.0**	ND		3
Nitrate as N	**25**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	4
Sulfate	**19**	**mg/L**	**1.0**	**0.18**	**EPA-300.0**	ND		3
Total Dissolved Solids @ 180 C	**390**	**mg/L**	**20**	**20**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**2.1**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.092		6
Ammonia as N	**1.2**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		7
Nitrite as N	**0.37**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**3.2**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/07/14	11/07/14 20:26	JRG	PE-OP2	1	BXK0633
2	SM-2320B	10/22/14	10/22/14 20:51	RML	MET-1	1	BXJ2120
3	EPA-300.0	10/22/14	10/22/14 12:48	OLH	IC2	1	BXJ2143
4	EPA-300.0	10/22/14	10/22/14 17:12	OLH	IC2	2	BXJ2143
5	SM-2540C	10/23/14	10/23/14 13:30	CAD	MANUAL	2	BXJ2175
6	EPA-351.2	11/03/14	11/05/14 14:30	JP1	SC-1	1	BXK0052
7	EPA-350.1	10/30/14	10/30/14 12:47	JP1	SC-1	1	BXJ2740
8	EPA-353.2	10/22/14	10/22/14 09:15	TDC	KONE-1	1	BXJ2082
9	EPA-365.4	11/03/14	11/04/14 09:05	JP1	SC-1	1	BXK0053

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/11/2014 15:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425031-02 | **Client Sample Name:** BET SB-4, 10/21/2014 9:55:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**57**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**19**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**30**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**8.1**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	0.13		1
Bicarbonate Alkalinity as CaCO3	**93**	**mg/L**	**4.1**	**4.1**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	4.1	4.1	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	4.1	4.1	SM-2320B	ND		2
Chloride	**43**	**mg/L**	**0.50**	**0.067**	**EPA-300.0**	ND		3
Nitrate as N	**28**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	4
Sulfate	**18**	**mg/L**	**1.0**	**0.18**	**EPA-300.0**	ND		3
Total Dissolved Solids @ 180 C	**420**	**mg/L**	**20**	**20**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**0.59**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.092		6
Ammonia as N	**0.21**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		7
Nitrite as N	**0.084**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**5.2**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/23/14	10/31/14 23:42	SRM	PE-OP2	1	BXJ2838
2	SM-2320B	10/22/14	10/22/14 20:58	RML	MET-1	1	BXJ2120
3	EPA-300.0	10/22/14	10/22/14 13:58	OLH	IC2	1	BXJ2143
4	EPA-300.0	10/22/14	10/23/14 02:04	OLH	IC2	2	BXJ2143
5	SM-2540C	10/23/14	10/23/14 13:30	CAD	MANUAL	2	BXJ2175
6	EPA-351.2	11/03/14	11/05/14 14:33	JP1	SC-1	1	BXK0052
7	EPA-350.1	10/30/14	10/30/14 12:48	JP1	SC-1	1	BXJ2740
8	EPA-353.2	10/22/14	10/22/14 09:15	TDC	KONE-1	1	BXJ2082
9	EPA-365.4	11/03/14	11/04/14 09:06	JP1	SC-1	1	BXK0053

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/11/2014 15:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425031-03 | **Client Sample Name:** BET SB-5, 10/21/2014 11:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**120**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**40**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**51**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**3.5**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**340**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**66**	**mg/L**	**0.50**	**0.067**	**EPA-300.0**	ND		3
Nitrate as N	**17**	**mg/L**	**0.10**	**0.025**	**EPA-300.0**	ND		3
Sulfate	**25**	**mg/L**	**1.0**	**0.18**	**EPA-300.0**	ND		3
Total Dissolved Solids @ 180 C	**600**	**mg/L**	**33**	**33**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**0.80**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.092		5
Ammonia as N	**0.12**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.057**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**2.2**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/07/14	11/07/14 20:36	JRG	PE-OP2	1	BXK0633
2	SM-2320B	10/22/14	10/22/14 21:04	RML	MET-1	2	BXJ2120
3	EPA-300.0	10/22/14	10/22/14 14:16	OLH	IC2	1	BXJ2143
4	SM-2540C	10/23/14	10/23/14 13:30	CAD	MANUAL	3.333	BXJ2175
5	EPA-351.2	11/03/14	11/05/14 14:33	JP1	SC-1	1	BXK0052
6	EPA-350.1	10/30/14	10/30/14 12:50	JP1	SC-1	1	BXJ2740
7	EPA-353.2	10/22/14	10/22/14 09:15	TDC	KONE-1	1	BXJ2082
8	EPA-365.4	11/03/14	11/04/14 09:07	JP1	SC-1	1	BXK0053

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/11/2014 15:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425031-04 | **Client Sample Name:** BET SB-6, 10/21/2014 1:20:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**370**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**110**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**180**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**9.0**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**1200**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**310**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	ND	**A01**	3
Nitrate as N	**12**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**40**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1600**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**4.6**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.092		5
Ammonia as N	**0.17**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.13**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**1.2**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/07/14	11/07/14 20:38	JRG	PE-OP2	1	BXK0633
2	SM-2320B	10/22/14	10/22/14 21:09	RML	MET-1	2	BXJ2120
3	EPA-300.0	10/22/14	10/22/14 15:08	OLH	IC2	5	BXJ2143
4	SM-2540C	10/23/14	10/23/14 13:30	CAD	MANUAL	10	BXJ2175
5	EPA-351.2	11/03/14	11/05/14 14:35	JP1	SC-1	1	BXK0052
6	EPA-350.1	10/30/14	10/30/14 12:52	JP1	SC-1	1	BXJ2740
7	EPA-353.2	10/22/14	10/22/14 09:15	TDC	KONE-1	1	BXJ2082
8	EPA-365.4	11/03/14	11/04/14 09:07	JP1	SC-1	1	BXK0053

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/11/2014 15:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ2082						
Nitrite as N	BXJ2082-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ2120						
Bicarbonate Alkalinity as CaCO3	BXJ2120-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ2120-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ2120-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ2143						
Chloride	BXJ2143-BLK1	ND	mg/L	0.50	0.067	
Nitrate as N	BXJ2143-BLK1	ND	mg/L	0.10	0.025	
Sulfate	BXJ2143-BLK1	ND	mg/L	1.0	0.18	
QC Batch ID: BXJ2175						
Total Dissolved Solids @ 180 C	BXJ2175-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2740						
Ammonia as N	BXJ2740-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXJ2838						
Dissolved Calcium	BXJ2838-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXJ2838-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXJ2838-BLK1	ND	mg/L	0.50	0.051	
Dissolved Potassium	**BXJ2838-BLK1**	**0.12824**	**mg/L**	**1.0**	**0.10**	**J**
QC Batch ID: BXK0052						
Total Kjeldahl Nitrogen	**BXK0052-BLK1**	**0.092500**	**mg/L**	**0.20**	**0.053**	**J**
QC Batch ID: BXK0053						
Total Phosphate	BXK0053-BLK1	ND	mg/L	0.15	0.092	
QC Batch ID: BXK0633						
Dissolved Calcium	BXK0633-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXK0633-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXK0633-BLK1	ND	mg/L	0.50	0.051	
Dissolved Potassium	BXK0633-BLK1	ND	mg/L	1.0	0.10	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/11/2014 15:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ2082										
Nitrite as N	BXJ2082-BS1	LCS	0.52278	0.50000	mg/L	105		90 - 110		
QC Batch ID: BXJ2143										
Chloride	BXJ2143-BS1	LCS	52.865	50.000	mg/L	106		90 - 110		
Nitrate as N	BXJ2143-BS1	LCS	5.2850	5.0000	mg/L	106		90 - 110		
Sulfate	BXJ2143-BS1	LCS	104.76	100.00	mg/L	105		90 - 110		
QC Batch ID: BXJ2175										
Total Dissolved Solids @ 180 C	BXJ2175-BS1	LCS	560.00	586.00	mg/L	95.6		90 - 110		
QC Batch ID: BXJ2740										
Ammonia as N	BXJ2740-BS1	LCS	1.0938	1.0000	mg/L	109		90 - 110		
QC Batch ID: BXJ2838										
Dissolved Calcium	BXJ2838-BS1	LCS	10.113	10.000	mg/L	101		85 - 115		
Dissolved Magnesium	BXJ2838-BS1	LCS	10.690	10.000	mg/L	107		85 - 115		
Dissolved Sodium	BXJ2838-BS1	LCS	10.131	10.000	mg/L	101		85 - 115		
Dissolved Potassium	BXJ2838-BS1	LCS	9.4906	10.000	mg/L	94.9		85 - 115		
QC Batch ID: BXK0052										
Total Kjeldahl Nitrogen	BXK0052-BS1	LCS	1.9591	2.0000	mg/L	98.0		90 - 110		
QC Batch ID: BXK0053										
Total Phosphate	BXK0053-BS1	LCS	2.9871	3.0660	mg/L	97.4		85 - 115		
QC Batch ID: BXK0633										
Dissolved Calcium	BXK0633-BS1	LCS	9.7261	10.000	mg/L	97.3		85 - 115		
Dissolved Magnesium	BXK0633-BS1	LCS	10.366	10.000	mg/L	104		85 - 115		
Dissolved Sodium	BXK0633-BS1	LCS	9.7971	10.000	mg/L	98.0		85 - 115		
Dissolved Potassium	BXK0633-BS1	LCS	9.3407	10.000	mg/L	93.4		85 - 115		

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/11/2014 15:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2082	Used client sample: N										
Nitrite as N	DUP	1424982-01	ND	ND		mg/L			10		
	MS	1424982-01	ND	0.52880	0.52632	mg/L		100		90 - 110	
	MSD	1424982-01	ND	0.53113	0.52632	mg/L	0.4	101	10	90 - 110	
QC Batch ID: BXJ2120	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1425024-02	799.30	803.56		mg/L	0.5		10		
Carbonate Alkalinity as CaCO3	DUP	1425024-02	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1425024-02	ND	ND		mg/L			10		
QC Batch ID: BXJ2143	Used client sample: Y - Description: BET SB-3, 10/21/2014 08:30										
Chloride	DUP	425031-01RE´	30.854	29.420		mg/L	4.8		10		
	MS	425031-01RE´	30.854	138.78	101.01	mg/L		107		80 - 120	
	MSD	425031-01RE´	30.854	142.09	101.01	mg/L	2.4	110	10	80 - 120	
Nitrate as N	DUP	425031-01RE´	25.490	25.204		mg/L	1.1		10		
	MS	425031-01RE´	25.490	35.487	10.101	mg/L		99.0		80 - 120	
	MSD	425031-01RE´	25.490	35.418	10.101	mg/L	0.2	98.3	10	80 - 120	
Sulfate	DUP	425031-01RE´	18.698	18.696		mg/L	0.0		10		
	MS	425031-01RE´	18.698	232.05	202.02	mg/L		106		80 - 120	
	MSD	425031-01RE´	18.698	237.25	202.02	mg/L	2.2	108	10	80 - 120	
QC Batch ID: BXJ2175	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1425015-01	3580.0	3640.0		mg/L	1.7		10		
QC Batch ID: BXJ2740	Used client sample: Y - Description: FG1 SB-2, 10/21/2014 16:45										
Ammonia as N	DUP	**1425030-02**	**0.17700**	**0.15670**		**mg/L**	**12.2**		**10**		**A02**
	MS	**1425030-02**	**0.17700**	**1.2664**	**1.1111**	**mg/L**		**98.0**		**90 - 110**	
	MSD	**1425030-02**	**0.17700**	**1.2414**	**1.1111**	**mg/L**	**2.0**	**95.8**	**10**	**90 - 110**	
QC Batch ID: BXJ2838	Used client sample: Y - Description: FG1 SB-3, 10/22/2014 08:00										
Dissolved Calcium	DUP	**1425136-01**	**116.56**	**116.27**		**mg/L**	**0.2**		**20**		
	MS	**1425136-01**	**116.56**	**119.84**	**10.204**	**mg/L**		**32.2**		**85 - 115**	**A03**
	MSD	**1425136-01**	**116.56**	**120.09**	**10.204**	**mg/L**	**0.2**	**34.6**	**20**	**85 - 115**	**A03**
Dissolved Magnesium	DUP	1425136-01	47.231	48.113		mg/L	1.8		20		
	MS	1425136-01	47.231	57.521	10.204	mg/L		101		85 - 115	
	MSD	1425136-01	47.231	57.866	10.204	mg/L	0.6	104	20	85 - 115	
Dissolved Sodium	DUP	**1425136-01**	**236.83**	**238.63**		**mg/L**	**0.8**		**20**		
	MS	**1425136-01**	**236.83**	**234.32**	**10.204**	**mg/L**		**-24.7**		**85 - 115**	**A03**
	MSD	**1425136-01**	**236.83**	**240.04**	**10.204**	**mg/L**	**2.4**	**31.4**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1425136-01	7.2895	7.4446		mg/L	2.1		20		
	MS	1425136-01	7.2895	18.208	10.204	mg/L		107		85 - 115	
	MSD	1425136-01	7.2895	18.306	10.204	mg/L	0.5	108	20	85 - 115	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/11/2014 15:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXK0052	Used client sample: N										
Total Kjeldahl Nitrogen	DUP	**1425098-01**	**0.053000**	**0.094000**		**mg/L**	**55.8**		**20**		**J,A02**
	MS	**1425098-01**	**0.053000**	**2.2154**	**2.0000**	**mg/L**		**108**		**90 - 110**	
	MSD	**1425098-01**	**0.053000**	**2.2093**	**2.0000**	**mg/L**	**0.3**	**108**	**20**	**90 - 110**	
QC Batch ID: BXK0053	Used client sample: N										
Total Phosphate	DUP	1425098-01	ND	ND		mg/L			20		
	MS	1425098-01	ND	2.9650	3.0660	mg/L		96.7		80 - 120	
	MSD	1425098-01	ND	2.9592	3.0660	mg/L	0.2	96.5	20	80 - 120	
QC Batch ID: BXK0633	Used client sample: Y - Description: FG1 SB-1, 10/21/2014 15:55										
Dissolved Calcium	DUP	**I425030-01RE1**	**85.413**	**83.727**		**mg/L**	**2.0**		**20**		
	MS	**I425030-01RE1**	**85.413**	**91.505**	**10.204**	**mg/L**		**59.7**		**85 - 115**	**A03**
	MSD	**I425030-01RE1**	**85.413**	**92.640**	**10.204**	**mg/L**	**1.2**	**70.8**	**20**	**85 - 115**	**A03**
Dissolved Magnesium	DUP	425030-01RE1	47.957	47.974		mg/L	0.0		20		
	MS	425030-01RE1	47.957	56.783	10.204	mg/L		86.5		85 - 115	
	MSD	425030-01RE1	47.957	57.170	10.204	mg/L	0.7	90.3	20	85 - 115	
Dissolved Sodium	DUP	**I425030-01RE1**	**220.69**	**216.59**		**mg/L**	**1.9**		**20**		
	MS	**I425030-01RE1**	**220.69**	**222.16**	**10.204**	**mg/L**		**14.4**		**85 - 115**	**A03**
	MSD	**I425030-01RE1**	**220.69**	**223.95**	**10.204**	**mg/L**	**0.8**	**31.9**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	425030-01RE1	8.6717	8.7072		mg/L	0.4		20		
	MS	425030-01RE1	8.6717	19.105	10.204	mg/L		102		85 - 115	
	MSD	425030-01RE1	8.6717	19.035	10.204	mg/L	0.4	102	20	85 - 115	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/11/2014 15:10 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A02	The difference between duplicate readings is less than the PQL.
A03	The sample concentration is more than 4 times the spike level.

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Date of Report: 11/10/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	[none]
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1425136
Invoice ID:	B188256

Enclosed are the results of analyses for samples received by the laboratory on 10/22/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1425136

Samples were filtered through a 0.45 micron filter for requested analyses.

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BC Laboratories, Inc.

14-25136

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

Expanded Constituent Suite

Project: Lagoon Perimeter Subsurface Investigation

Site:

Samplers Name: Charlie Jenkins

Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	FGI SB-3	10/22/14	8:00am	water	x	x	x	x
2	FGI SB-4	10/22/14	8:30am	"	x	x	x	x
3	FGI SB-5	10/22/14	9:15am	"	x	x	x	x
4								
5								
6								
7								
8								
9								
10								
11								
12								

CHK BY DISTRIBUTION
SUB-OUT

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

Comments:
1) Where indicated, samples shall be filtered (0.45um) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email:
teangermann@lsce.com

Relinquished by: (Signature)	Received By:	Date & Time
[signature]	[signature]	10/22/14 4:05pm
Relinquished by: (Signature)	Received by:	Date & Time
[signature]	[signature]	10/22/14 21:40
Relinquished by: (Signature)	Received By:	Date & Time

(A)= Analysis (C)= Container (P)= Preservative

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Chain of Custody and Cooler Receipt Form for 1425136 Page 2 of 2

BC LABORATORIES INC. — COOLER RECEIPT FORM — Rev. No. 18 09/04/14 — Page 1 Of 1

Submission #: 14-25136

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals: Ice Chest ☐ Intact? Yes ☐ No ☐ — Containers ☐ Intact? Yes ☐ No ☐ — None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: PE Thermometer ID: 207 Date/Time 10-22-14 2:40

Temperature: (A) 0.7 °C / (C) 0.3 °C Analyst Init M

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A	A							
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:
Sample Numbering Completed By: [illegible] Date/Time: 10/23/14 0900 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/10/2014 14:56 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425136-01	**COC Number:**	---	**Receive Date:**	10/22/2014 21:40
	Project Number:	---	**Sampling Date:**	10/22/2014 08:00
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	FG1 SB-3	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425136-02	**COC Number:**	---	**Receive Date:**	10/22/2014 21:40
	Project Number:	---	**Sampling Date:**	10/22/2014 08:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	FG1 SB-4	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425136-03	**COC Number:**	---	**Receive Date:**	10/22/2014 21:40
	Project Number:	---	**Sampling Date:**	10/22/2014 09:15
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	FG1 SB-5	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/10/2014 14:56
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425136-01 | **Client Sample Name:** FG1 SB-3, 10/22/2014 8:00:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**110**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**46**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**230**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**7.2**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**470**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**120**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.25	**A01**	3
Nitrate as N	**43**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	4
Sulfate	**110**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1000**	**mg/L**	**50**	**50**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**3.7**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		6
Ammonia as N	**1.6**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		7
Nitrite as N	**0.068**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**10**	**mg/L**	**0.75**	**0.46**	**EPA-365.4**	ND	**A01**	9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/07/14	11/07/14 20:41	JRG	PE-OP2	1	BXK0633
2	SM-2320B	10/24/14	10/24/14 15:19	RML	MET-1	2	BXJ2243
3	EPA-300.0	10/23/14	10/23/14 16:00	OLH	IC5	2	BXJ2249
4	EPA-300.0	10/23/14	10/24/14 00:25	OLH	IC5	5	BXJ2249
5	SM-2540C	10/24/14	10/24/14 14:00	CAD	MANUAL	5	BXJ2307
6	EPA-351.2	11/03/14	11/05/14 14:46	JP1	SC-1	1	BXK0057
7	EPA-350.1	10/30/14	10/30/14 14:37	JP1	SC-1	1	BXJ2741
8	EPA-353.2	10/23/14	10/23/14 13:50	TDC	KONE-1	1	BXJ2300
9	EPA-365.4	11/03/14	11/04/14 09:37	JP1	SC-1	5	BXK0059

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/10/2014 14:56
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425136-02 | **Client Sample Name:** FG1 SB-4, 10/22/2014 8:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**120**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**70**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**440**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**330**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	0.13		1
Bicarbonate Alkalinity as CaCO3	**1200**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**450**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.62	**A01**	3
Nitrate as N	ND	mg/L	0.50	0.12	EPA-300.0	ND	A10	3
Sulfate	**140**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1900**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**73**	**mg/L**	**5.0**	**1.3**	**EPA-351.2**	ND	**A01**	5
Ammonia as N	**70**	**mg/L**	**5.0**	**1.6**	**EPA-350.1**	1.6	**A01**	6
Nitrite as N	ND	mg/L	0.050	0.010	EPA-353.2	ND		7
Total Phosphate	**58**	**mg/L**	**3.8**	**2.3**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/27/14	10/31/14 23:34	SRM	PE-OP2	1	BXJ2838
2	SM-2320B	10/24/14	10/24/14 15:25	RML	MET-1	2	BXJ2243
3	EPA-300.0	10/23/14	10/23/14 16:18	OLH	IC5	5	BXJ2249
4	SM-2540C	10/24/14	10/24/14 14:00	CAD	MANUAL	10	BXJ2307
5	EPA-351.2	11/03/14	11/06/14 08:05	JP1	SC-1	25	BXK0057
6	EPA-350.1	10/30/14	10/30/14 14:32	JP1	SC-1	50	BXJ2741
7	EPA-353.2	10/23/14	10/23/14 13:50	TDC	KONE-1	1	BXJ2300
8	EPA-365.4	11/03/14	11/04/14 09:39	JP1	SC-1	25	BXK0059

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Reported: 11/10/2014 14:56
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425136-03 | **Client Sample Name:** FG1 SB-5, 10/22/2014 9:15:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**76**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**65**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**550**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**80**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	0.13		1
Bicarbonate Alkalinity as CaCO3	**1100**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**330**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.62	**A01**	3
Nitrate as N	ND	mg/L	0.50	0.12	EPA-300.0	ND	A10	3
Sulfate	**100**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1700**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**33**	**mg/L**	**5.0**	**1.3**	**EPA-351.2**	ND	**A01**	5
Ammonia as N	**33**	**mg/L**	**2.0**	**0.66**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	ND	mg/L	0.050	0.010	EPA-353.2	ND		7
Total Phosphate	**37**	**mg/L**	**3.8**	**2.3**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/27/14	10/31/14 23:37	SRM	PE-OP2	1	BXJ2838
2	SM-2320B	10/24/14	10/24/14 15:32	RML	MET-1	2	BXJ2243
3	EPA-300.0	10/23/14	10/23/14 16:35	OLH	IC5	5	BXJ2249
4	SM-2540C	10/24/14	10/24/14 14:00	CAD	MANUAL	10	BXJ2307
5	EPA-351.2	11/03/14	11/06/14 08:07	JP1	SC-1	25	BXK0057
6	EPA-350.1	10/30/14	10/30/14 14:33	JP1	SC-1	20	BXJ2741
7	EPA-353.2	10/23/14	10/23/14 14:10	TDC	KONE-1	1	BXJ2300
8	EPA-365.4	11/03/14	11/04/14 09:41	JP1	SC-1	25	BXK0059

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Reported: 11/10/2014 14:56
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ2243						
Bicarbonate Alkalinity as CaCO3	BXJ2243-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ2243-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ2243-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ2249						
Chloride	**BXJ2249-BLK1**	**0.12500**	**mg/L**	**0.50**	**0.067**	**J**
Nitrate as N	BXJ2249-BLK1	ND	mg/L	0.10	0.025	
Sulfate	BXJ2249-BLK1	ND	mg/L	1.0	0.18	
QC Batch ID: BXJ2300						
Nitrite as N	BXJ2300-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ2307						
Total Dissolved Solids @ 180 C	BXJ2307-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2741						
Ammonia as N	BXJ2741-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXJ2838						
Dissolved Calcium	BXJ2838-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXJ2838-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXJ2838-BLK1	ND	mg/L	0.50	0.051	
Dissolved Potassium	**BXJ2838-BLK1**	**0.12824**	**mg/L**	**1.0**	**0.10**	**J**
QC Batch ID: BXK0057						
Total Kjeldahl Nitrogen	BXK0057-BLK1	ND	mg/L	0.20	0.053	
QC Batch ID: BXK0059						
Total Phosphate	BXK0059-BLK1	ND	mg/L	0.15	0.092	
QC Batch ID: BXK0633						
Dissolved Calcium	BXK0633-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXK0633-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXK0633-BLK1	ND	mg/L	0.50	0.051	
Dissolved Potassium	BXK0633-BLK1	ND	mg/L	1.0	0.10	

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Reported: 11/10/2014 14:56
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ2249										
Chloride	BXJ2249-BS1	LCS	50.540	50.000	mg/L	101		90 - 110		
Nitrate as N	BXJ2249-BS1	LCS	5.0810	5.0000	mg/L	102		90 - 110		
Sulfate	BXJ2249-BS1	LCS	100.68	100.00	mg/L	101		90 - 110		
QC Batch ID: BXJ2300										
Nitrite as N	BXJ2300-BS1	LCS	0.50626	0.50000	mg/L	101		90 - 110		
QC Batch ID: BXJ2307										
Total Dissolved Solids @ 180 C	BXJ2307-BS1	LCS	545.00	586.00	mg/L	93.0		90 - 110		
QC Batch ID: BXJ2741										
Ammonia as N	BXJ2741-BS1	LCS	1.0842	1.0000	mg/L	108		90 - 110		
QC Batch ID: BXJ2838										
Dissolved Calcium	BXJ2838-BS1	LCS	10.113	10.000	mg/L	101		85 - 115		
Dissolved Magnesium	BXJ2838-BS1	LCS	10.690	10.000	mg/L	107		85 - 115		
Dissolved Sodium	BXJ2838-BS1	LCS	10.131	10.000	mg/L	101		85 - 115		
Dissolved Potassium	BXJ2838-BS1	LCS	9.4906	10.000	mg/L	94.9		85 - 115		
QC Batch ID: BXK0057										
Total Kjeldahl Nitrogen	BXK0057-BS1	LCS	2.0910	2.0000	mg/L	105		90 - 110		
QC Batch ID: BXK0059										
Total Phosphate	BXK0059-BS1	LCS	3.0475	3.0660	mg/L	99.4		85 - 115		
QC Batch ID: BXK0633										
Dissolved Calcium	BXK0633-BS1	LCS	9.7261	10.000	mg/L	97.3		85 - 115		
Dissolved Magnesium	BXK0633-BS1	LCS	10.366	10.000	mg/L	104		85 - 115		
Dissolved Sodium	BXK0633-BS1	LCS	9.7971	10.000	mg/L	98.0		85 - 115		
Dissolved Potassium	BXK0633-BS1	LCS	9.3407	10.000	mg/L	93.4		85 - 115		

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Reported: 11/10/2014 14:56
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2243	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1425134-01	232.91	233.37		mg/L	0.2		10		
Carbonate Alkalinity as CaCO3	DUP	1425134-01	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1425134-01	ND	ND		mg/L			10		
QC Batch ID: BXJ2249	Used client sample: N										
Chloride	DUP	1425134-01	19.947	20.151		mg/L	1.0		10		
	MS	1425134-01	19.947	75.184	50.505	mg/L		109		80 - 120	
	MSD	1425134-01	19.947	75.645	50.505	mg/L	0.6	110	10	80 - 120	
Nitrate as N	DUP	**1425134-01**	**0.067000**	**0.059000**		**mg/L**	**12.7**		**10**		**J,A02**
	MS	**1425134-01**	**0.067000**	**5.2606**	**5.0505**	**mg/L**		**103**		**80 - 120**	
	MSD	**1425134-01**	**0.067000**	**5.2596**	**5.0505**	**mg/L**	**0.0**	**103**	**10**	**80 - 120**	
Sulfate	DUP	1425134-01	61.963	61.692		mg/L	0.4		10		
	MS	1425134-01	61.963	171.95	101.01	mg/L		109		80 - 120	
	MSD	1425134-01	61.963	172.18	101.01	mg/L	0.1	109	10	80 - 120	
QC Batch ID: BXJ2300	Used client sample: N										
Nitrite as N	DUP	1425110-02	ND	ND		mg/L			10		
	MS	1425110-02	ND	0.53810	0.52632	mg/L		102		90 - 110	
	MSD	1425110-02	ND	0.54145	0.52632	mg/L	0.6	103	10	90 - 110	
QC Batch ID: BXJ2307	Used client sample: Y - Description: FG1 SB-4, 10/22/2014 08:30										
Total Dissolved Solids @ 180 C	DUP	1425136-02	1930.0	1940.0		mg/L	0.5		10		
QC Batch ID: BXJ2741	Used client sample: N										
Ammonia as N	DUP	**1425060-02**	**0.11710**	**0.10320**		**mg/L**	**12.6**		**10**		**A02**
	MS	**1425060-02**	**0.11710**	**1.2178**	**1.1111**	**mg/L**		**99.1**		**90 - 110**	
	MSD	**1425060-02**	**0.11710**	**1.2450**	**1.1111**	**mg/L**	**2.2**	**102**	**10**	**90 - 110**	
QC Batch ID: BXJ2838	Used client sample: Y - Description: FG1 SB-3, 10/22/2014 08:00										
Dissolved Calcium	DUP	**1425136-01**	**116.56**	**116.27**		**mg/L**	**0.2**		**20**		
	MS	**1425136-01**	**116.56**	**119.84**	**10.204**	**mg/L**		**32.2**		**85 - 115**	**A03**
	MSD	**1425136-01**	**116.56**	**120.09**	**10.204**	**mg/L**	**0.2**	**34.6**	**20**	**85 - 115**	**A03**
Dissolved Magnesium	DUP	1425136-01	47.231	48.113		mg/L	1.8		20		
	MS	1425136-01	47.231	57.521	10.204	mg/L		101		85 - 115	
	MSD	1425136-01	47.231	57.866	10.204	mg/L	0.6	104	20	85 - 115	
Dissolved Sodium	DUP	**1425136-01**	**236.83**	**238.63**		**mg/L**	**0.8**		**20**		
	MS	**1425136-01**	**236.83**	**234.32**	**10.204**	**mg/L**		**-24.7**		**85 - 115**	**A03**
	MSD	**1425136-01**	**236.83**	**240.04**	**10.204**	**mg/L**	**2.4**	**31.4**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1425136-01	7.2895	7.4446		mg/L	2.1		20		
	MS	1425136-01	7.2895	18.208	10.204	mg/L		107		85 - 115	
	MSD	1425136-01	7.2895	18.306	10.204	mg/L	0.5	108	20	85 - 115	

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500 First Street
Woodland, CA 95695

Reported: 11/10/2014 14:56
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXK0057	Used client sample: N										
Total Kjeldahl Nitrogen	DUP	**1425178-02**	**0.42150**	**0.52310**		**mg/L**	**21.5**		**20**		**A02**
	MS	**1425178-02**	**0.42150**	**2.2366**	**2.0000**	**mg/L**		**90.8**		**90 - 110**	
	MSD	**1425178-02**	**0.42150**	**2.2457**	**2.0000**	**mg/L**	**0.4**	**91.2**	**20**	**90 - 110**	
QC Batch ID: BXK0059	Used client sample: N										
Total Phosphate	DUP	**1425178-02**	**10.489**	**10.710**		**mg/L**	**2.1**		**20**		
	MS	**1425178-02**	**10.489**	**14.355**	**3.0660**	**mg/L**		**126**		**80 - 120**	**Q03**
	MSD	**1425178-02**	**10.489**	**13.517**	**3.0660**	**mg/L**	**6.0**	**98.8**	**20**	**80 - 120**	
QC Batch ID: BXK0633	Used client sample: Y - Description: FG1 SB-1, 10/21/2014 15:55										
Dissolved Calcium	DUP	**I425030-01RE1**	**85.413**	**83.727**		**mg/L**	**2.0**		**20**		
	MS	**I425030-01RE1**	**85.413**	**91.505**	**10.204**	**mg/L**		**59.7**		**85 - 115**	**A03**
	MSD	**I425030-01RE1**	**85.413**	**92.640**	**10.204**	**mg/L**	**1.2**	**70.8**	**20**	**85 - 115**	**A03**
Dissolved Magnesium	DUP	425030-01RE1	47.957	47.974		mg/L	0.0		20		
	MS	425030-01RE1	47.957	56.783	10.204	mg/L		86.5		85 - 115	
	MSD	425030-01RE1	47.957	57.170	10.204	mg/L	0.7	90.3	20	85 - 115	
Dissolved Sodium	DUP	**I425030-01RE1**	**220.69**	**216.59**		**mg/L**	**1.9**		**20**		
	MS	**I425030-01RE1**	**220.69**	**222.16**	**10.204**	**mg/L**		**14.4**		**85 - 115**	**A03**
	MSD	**I425030-01RE1**	**220.69**	**223.95**	**10.204**	**mg/L**	**0.8**	**31.9**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	425030-01RE1	8.6717	8.7072		mg/L	0.4		20		
	MS	425030-01RE1	8.6717	19.105	10.204	mg/L		102		85 - 115	
	MSD	425030-01RE1	8.6717	19.035	10.204	mg/L	0.4	102	20	85 - 115	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/10/2014 14:56 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A02	The difference between duplicate readings is less than the PQL.
A03	The sample concentration is more than 4 times the spike level.
A10	PQL's and MDL's were raised due to matrix interference.
Q03	Matrix spike recovery(s) is(are) not within the control limits.

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Date of Report: 11/14/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	[none]
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1425137
Invoice ID:	B188681

Enclosed are the results of analyses for samples received by the laboratory on 10/22/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1425137

Samples were filtered through a 0.45 micron filter for requested analyses.

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14-25137

BC Laboratories, Inc.

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

Expanded Constituent Suite
Project: Lagoon Perimeter Subsurface Investigation
Site:
Samplers Name: Charlie Jenkins
Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	ANC SB-1	10/22/14	10:35am	water	x	x	x	x
2	ANC SB-2	10/22/14	11:30am	"	X	X	X	X
3	ANC SB-3	10/22/14	12:20pm	"	X	X	X	X
4	ANC SB-4	10/22/14	1:35pm	"	X	X	X	X
5	ANC SB-5	10/22/14	2:35pm	"	X	X	X	X
6	ANC SB-6	10/22/14	3:20pm	"	X	X	X	X
7								
8								
9								
10								
11								
12								

CHK BY
DISTRIBUTION
SUB OUT

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

Comments:
1) Where indicated, samples shall be filtered (0.45um) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email:
teangermann@lsce.com

Relinquished by: (Signature)	Received By:	Date & Time
Jeanette Hummel		10/22/14 4:05pm
Relinquished by: (Signature)	Received by:	Date & Time
		10/22/14 2:40
Relinquished by: (Signature)	Received By:	Date & Time

(A)= Analysis (C)= Container (P)= Preservative

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Chain of Custody and Cooler Receipt Form for 1425137 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14-25137

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: PE Thermometer ID: 207 Date/Time 10-22-14 2140

Temperature: (A) 0.7 °C / (C) 0.3 °C Analyst Init

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A	A	A	A	A				
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:
Sample Numbering Completed By: Date/Time: 10/23/14 0900 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425137-01	**COC Number:**	---	**Receive Date:**	10/22/2014 21:40
	Project Number:	---	**Sampling Date:**	10/22/2014 10:35
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	ANC SB-1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425137-02	**COC Number:**	---	**Receive Date:**	10/22/2014 21:40
	Project Number:	---	**Sampling Date:**	10/22/2014 11:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	ANC SB-2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425137-03	**COC Number:**	---	**Receive Date:**	10/22/2014 21:40
	Project Number:	---	**Sampling Date:**	10/22/2014 12:20
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	ANC SB-3	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425137-04	**COC Number:**	---	**Receive Date:**	10/22/2014 21:40
	Project Number:	---	**Sampling Date:**	10/22/2014 13:35
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	ANC SB-4	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425137-05	**COC Number:**	---	**Receive Date:**	10/22/2014 21:40
	Project Number:	---	**Sampling Date:**	10/22/2014 14:35
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	ANC SB-5	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/14/2014 12:29 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425137-06	**COC Number:**	---	**Receive Date:**	10/22/2014 21:40
	Project Number:	---	**Sampling Date:**	10/22/2014 15:20
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	ANC SB-6	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425137-01 | **Client Sample Name:** ANC SB-1, 10/22/2014 10:35:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**100**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**87**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**430**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		2
Dissolved Potassium	**160**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		2
Bicarbonate Alkalinity as CaCO3	**1200**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		3
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		3
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		3
Chloride	**360**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.25	**A01**	4
Nitrate as N	**0.67**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A10**	4
Sulfate	**120**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	ND	**A01**	4
Total Dissolved Solids @ 180 C	**1700**	**mg/L**	**100**	**100**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**100**	**mg/L**	**10**	**2.6**	**EPA-351.2**	ND	**A01**	6
Ammonia as N	**97**	**mg/L**	**10**	**3.3**	**EPA-350.1**	ND	**A01**	7
Nitrite as N	ND	mg/L	0.050	0.010	EPA-353.2	ND		8
Total Phosphate	**78**	**mg/L**	**3.8**	**2.3**	**EPA-365.4**	ND	**A01**	9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/27/14	11/01/14 01:29	JRG	PE-OP2	1	BXJ2840
2	EPA-200.7	10/30/14	11/01/14 01:29	JRG	PE-OP2	1	BXJ2840
3	SM-2320B	10/24/14	10/24/14 15:39	RML	MET-1	2	BXJ2243
4	EPA-300.0	10/23/14	10/24/14 09:14	OLH	IC5	2	BXJ2249
5	SM-2540C	10/24/14	10/24/14 14:00	CAD	MANUAL	10	BXJ2307
6	EPA-351.2	11/03/14	11/06/14 08:07	JP1	SC-1	50	BXK0057
7	EPA-350.1	10/30/14	10/30/14 13:49	JP1	SC-1	100	BXJ2741
8	EPA-353.2	10/23/14	10/23/14 14:23	TDC	KONE-1	1	BXJ2301
9	EPA-365.4	11/03/14	11/04/14 09:42	JP1	SC-1	25	BXK0059

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425137-02 | **Client Sample Name:** ANC SB-2, 10/22/2014 11:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**61**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**68**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**430**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**200**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**1100**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**370**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.62	**A01**	3
Nitrate as N	**17**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**130**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1800**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**120**	**mg/L**	**5.0**	**1.3**	**EPA-351.2**	4.0	**A01**	5
Ammonia as N	**110**	**mg/L**	**10**	**3.3**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	**0.13**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**87**	**mg/L**	**3.8**	**2.3**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/07/14	11/07/14 20:43	JRG	PE-OP2	1	BXK0633
2	SM-2320B	10/24/14	10/24/14 15:47	RML	MET-1	2	BXJ2243
3	EPA-300.0	10/23/14	10/23/14 17:45	OLH	IC5	5	BXJ2249
4	SM-2540C	10/24/14	10/24/14 14:00	CAD	MANUAL	10	BXJ2307
5	EPA-351.2	11/10/14	11/11/14 13:07	JP1	SC-1	25	BXK0700
6	EPA-350.1	11/10/14	11/11/14 15:20	JP1	SC-1	100	BXK0783
7	EPA-353.2	10/23/14	10/23/14 13:57	TDC	KONE-1	1	BXJ2301
8	EPA-365.4	11/03/14	11/11/14 11:10	JP1	SC-1	25	BXK0764

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425137-03 | **Client Sample Name:** ANC SB-3, 10/22/2014 12:20:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**140**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**100**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**390**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**170**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**1400**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**360**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.25	**A01**	3
Nitrate as N	**4.1**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	3
Sulfate	**93**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1700**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**120**	**mg/L**	**5.0**	**1.3**	**EPA-351.2**	4.0	**A01**	5
Ammonia as N	**110**	**mg/L**	**10**	**3.3**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	**0.14**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**60**	**mg/L**	**3.8**	**2.3**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/27/14	11/01/14 01:41	JRG	PE-OP2	1	BXJ2840
2	SM-2320B	10/24/14	10/24/14 15:54	RML	MET-1	2	BXJ2243
3	EPA-300.0	10/23/14	10/24/14 09:31	OLH	IC5	2	BXJ2249
4	SM-2540C	10/24/14	10/24/14 14:00	CAD	MANUAL	10	BXJ2307
5	EPA-351.2	11/10/14	11/11/14 13:09	JP1	SC-1	25	BXK0700
6	EPA-350.1	11/10/14	11/11/14 15:23	JP1	SC-1	100	BXK0783
7	EPA-353.2	10/23/14	10/23/14 14:24	TDC	KONE-1	1	BXJ2301
8	EPA-365.4	11/03/14	11/11/14 11:11	JP1	SC-1	25	BXK0764

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425137-04 | **Client Sample Name:** ANC SB-4, 10/22/2014 1:35:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**92**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**43**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**240**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**29**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**560**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**180**	**mg/L**	**0.50**	**0.067**	**EPA-300.0**	0.12		3
Nitrate as N	**0.57**	**mg/L**	**0.10**	**0.025**	**EPA-300.0**	ND		3
Sulfate	**120**	**mg/L**	**1.0**	**0.18**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1000**	**mg/L**	**50**	**50**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**19**	**mg/L**	**1.0**	**0.26**	**EPA-351.2**	ND	**A01**	5
Ammonia as N	**15**	**mg/L**	**1.0**	**0.33**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	ND	mg/L	0.050	0.010	EPA-353.2	ND		7
Total Phosphate	**56**	**mg/L**	**3.8**	**2.3**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/27/14	11/01/14 01:44	JRG	PE-OP2	1	BXJ2840
2	SM-2320B	10/24/14	10/24/14 16:02	RML	MET-1	2	BXJ2243
3	EPA-300.0	10/23/14	10/24/14 09:49	OLH	IC5	1	BXJ2249
4	SM-2540C	10/24/14	10/24/14 14:00	CAD	MANUAL	5	BXJ2307
5	EPA-351.2	11/03/14	11/05/14 14:51	JP1	SC-1	5	BXK0057
6	EPA-350.1	10/30/14	10/30/14 14:34	JP1	SC-1	10	BXJ2741
7	EPA-353.2	10/23/14	10/23/14 13:57	TDC	KONE-1	1	BXJ2301
8	EPA-365.4	11/03/14	11/04/14 09:46	JP1	SC-1	25	BXK0059

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425137-05 | **Client Sample Name:** ANC SB-5, 10/22/2014 2:35:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**160**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**81**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**350**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**9.4**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**830**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**300**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.62	**A01**	3
Nitrate as N	**13**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**110**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1300**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**4.6**	**mg/L**	**0.50**	**0.13**	**EPA-351.2**	ND	**A01**	5
Ammonia as N	**1.0**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.14**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**51**	**mg/L**	**1.9**	**1.2**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/27/14	11/01/14 01:46	JRG	PE-OP2	1	BXJ2840
2	SM-2320B	10/24/14	10/24/14 16:25	RML	MET-1	2	BXJ2244
3	EPA-300.0	10/23/14	10/23/14 18:37	OLH	IC5	5	BXJ2249
4	SM-2540C	10/24/14	10/24/14 14:00	CAD	MANUAL	10	BXJ2307
5	EPA-351.2	11/03/14	11/05/14 14:51	JP1	SC-1	2.500	BXK0057
6	EPA-350.1	10/30/14	10/30/14 13:53	JP1	SC-1	1	BXJ2741
7	EPA-353.2	10/23/14	10/23/14 13:57	TDC	KONE-1	1	BXJ2301
8	EPA-365.4	11/03/14	11/04/14 09:47	JP1	SC-1	12.500	BXK0059

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Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425137-06 | **Client Sample Name:** ANC SB-6, 10/22/2014 3:20:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**170**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**220**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**570**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**150**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**2200**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**570**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.62	**A01**	3
Nitrate as N	**1.6**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A10**	3
Sulfate	**84**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**2400**	**mg/L**	**200**	**200**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**190**	**mg/L**	**10**	**2.6**	**EPA-351.2**	8.1	**A01**	5
Ammonia as N	**160**	**mg/L**	**10**	**3.3**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	ND	mg/L	0.050	0.010	EPA-353.2	ND		7
Total Phosphate	**72**	**mg/L**	**7.5**	**4.6**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/27/14	11/01/14 01:49	JRG	PE-OP2	1	BXJ2840
2	SM-2320B	10/24/14	10/24/14 16:39	RML	MET-1	2	BXJ2244
3	EPA-300.0	10/23/14	10/24/14 10:06	OLH	IC5	5	BXJ2249
4	SM-2540C	10/24/14	10/24/14 14:00	CAD	MANUAL	20	BXJ2307
5	EPA-351.2	11/10/14	11/11/14 13:09	JP1	SC-1	50	BXK0700
6	EPA-350.1	11/10/14	11/11/14 15:25	JP1	SC-1	100	BXK0783
7	EPA-353.2	10/23/14	10/23/14 14:39	TDC	KONE-1	1	BXJ2301
8	EPA-365.4	11/03/14	11/11/14 11:11	JP1	SC-1	50	BXK0764

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Woodland, CA 95695

Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ2243						
Bicarbonate Alkalinity as CaCO3	BXJ2243-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ2243-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ2243-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ2244						
Bicarbonate Alkalinity as CaCO3	BXJ2244-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ2244-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ2244-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ2249						
Chloride	**BXJ2249-BLK1**	**0.12500**	**mg/L**	**0.50**	**0.067**	**J**
Nitrate as N	BXJ2249-BLK1	ND	mg/L	0.10	0.025	
Sulfate	BXJ2249-BLK1	ND	mg/L	1.0	0.18	
QC Batch ID: BXJ2301						
Nitrite as N	BXJ2301-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ2307						
Total Dissolved Solids @ 180 C	BXJ2307-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2741						
Ammonia as N	BXJ2741-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXJ2840						
Dissolved Calcium	BXJ2840-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXJ2840-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXJ2840-BLK1	ND	mg/L	0.50	0.051	
Dissolved Potassium	BXJ2840-BLK1	ND	mg/L	1.0	0.10	
QC Batch ID: BXK0057						
Total Kjeldahl Nitrogen	BXK0057-BLK1	ND	mg/L	0.20	0.053	
QC Batch ID: BXK0059						
Total Phosphate	BXK0059-BLK1	ND	mg/L	0.15	0.092	
QC Batch ID: BXK0633						
Dissolved Calcium	BXK0633-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXK0633-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXK0633-BLK1	ND	mg/L	0.50	0.051	

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Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXK0633						
Dissolved Potassium	BXK0633-BLK1	ND	mg/L	1.0	0.10	
QC Batch ID: BXK0700						
Total Kjeldahl Nitrogen	**BXK0700-BLK1**	**0.16140**	**mg/L**	**0.20**	**0.053**	**J**
QC Batch ID: BXK0764						
Total Phosphate	BXK0764-BLK1	ND	mg/L	0.15	0.092	
QC Batch ID: BXK0783						
Ammonia as N	BXK0783-BLK1	ND	mg/L	0.10	0.033	

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Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ2249										
Chloride	BXJ2249-BS1	LCS	50.540	50.000	mg/L	101		90 - 110		
Nitrate as N	BXJ2249-BS1	LCS	5.0810	5.0000	mg/L	102		90 - 110		
Sulfate	BXJ2249-BS1	LCS	100.68	100.00	mg/L	101		90 - 110		
QC Batch ID: BXJ2301										
Nitrite as N	BXJ2301-BS1	LCS	0.50098	0.50000	mg/L	100		90 - 110		
QC Batch ID: BXJ2307										
Total Dissolved Solids @ 180 C	BXJ2307-BS1	LCS	545.00	586.00	mg/L	93.0		90 - 110		
QC Batch ID: BXJ2741										
Ammonia as N	BXJ2741-BS1	LCS	1.0842	1.0000	mg/L	108		90 - 110		
QC Batch ID: BXJ2840										
Dissolved Calcium	BXJ2840-BS1	LCS	10.093	10.000	mg/L	101		85 - 115		
Dissolved Magnesium	BXJ2840-BS1	LCS	10.345	10.000	mg/L	103		85 - 115		
Dissolved Sodium	BXJ2840-BS1	LCS	9.8493	10.000	mg/L	98.5		85 - 115		
Dissolved Potassium	BXJ2840-BS1	LCS	9.2342	10.000	mg/L	92.3		85 - 115		
QC Batch ID: BXK0057										
Total Kjeldahl Nitrogen	BXK0057-BS1	LCS	2.0910	2.0000	mg/L	105		90 - 110		
QC Batch ID: BXK0059										
Total Phosphate	BXK0059-BS1	LCS	3.0475	3.0660	mg/L	99.4		85 - 115		
QC Batch ID: BXK0633										
Dissolved Calcium	BXK0633-BS1	LCS	9.7261	10.000	mg/L	97.3		85 - 115		
Dissolved Magnesium	BXK0633-BS1	LCS	10.366	10.000	mg/L	104		85 - 115		
Dissolved Sodium	BXK0633-BS1	LCS	9.7971	10.000	mg/L	98.0		85 - 115		
Dissolved Potassium	BXK0633-BS1	LCS	9.3407	10.000	mg/L	93.4		85 - 115		
QC Batch ID: BXK0700										
Total Kjeldahl Nitrogen	BXK0700-BS1	LCS	2.1128	2.0000	mg/L	106		90 - 110		
QC Batch ID: BXK0764										
Total Phosphate	BXK0764-BS1	LCS	2.9905	3.0660	mg/L	97.5		85 - 115		
QC Batch ID: BXK0783										
Ammonia as N	BXK0783-BS1	LCS	1.0689	1.0000	mg/L	107		90 - 110		

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Woodland, CA 95695

Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2243	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1425134-01	232.91	233.37		mg/L	0.2		10		
Carbonate Alkalinity as CaCO3	DUP	1425134-01	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1425134-01	ND	ND		mg/L			10		
QC Batch ID: BXJ2244	Used client sample: Y - Description: ANC SB-5, 10/22/2014 14:35										
Bicarbonate Alkalinity as CaCO3	DUP	1425137-05	831.86	837.95		mg/L	0.7		10		
Carbonate Alkalinity as CaCO3	DUP	1425137-05	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1425137-05	ND	ND		mg/L			10		
QC Batch ID: BXJ2249	Used client sample: N										
Chloride	DUP	1425134-01	19.947	20.151		mg/L	1.0		10		
	MS	1425134-01	19.947	75.184	50.505	mg/L		109		80 - 120	
	MSD	1425134-01	19.947	75.645	50.505	mg/L	0.6	110	10	80 - 120	
Nitrate as N	DUP	**1425134-01**	**0.067000**	**0.059000**		**mg/L**	**12.7**		**10**		**J,A02**
	MS	**1425134-01**	**0.067000**	**5.2606**	**5.0505**	**mg/L**		**103**		**80 - 120**	
	MSD	**1425134-01**	**0.067000**	**5.2596**	**5.0505**	**mg/L**	**0.0**	**103**	**10**	**80 - 120**	
Sulfate	DUP	1425134-01	61.963	61.692		mg/L	0.4		10		
	MS	1425134-01	61.963	171.95	101.01	mg/L		109		80 - 120	
	MSD	1425134-01	61.963	172.18	101.01	mg/L	0.1	109	10	80 - 120	
QC Batch ID: BXJ2301	Used client sample: Y - Description: ANC SB-1, 10/22/2014 10:35										
Nitrite as N	DUP	1425137-01	ND	ND		mg/L			10		
	MS	1425137-01	ND	0.52477	0.52632	mg/L		99.7		90 - 110	
	MSD	1425137-01	ND	0.52248	0.52632	mg/L	0.4	99.3	10	90 - 110	
QC Batch ID: BXJ2307	Used client sample: Y - Description: FG1 SB-4, 10/22/2014 08:30										
Total Dissolved Solids @ 180 C	DUP	1425136-02	1930.0	1940.0		mg/L	0.5		10		
QC Batch ID: BXJ2741	Used client sample: N										
Ammonia as N	DUP	**1425060-02**	**0.11710**	**0.10320**		**mg/L**	**12.6**		**10**		**A02**
	MS	**1425060-02**	**0.11710**	**1.2178**	**1.1111**	**mg/L**		**99.1**		**90 - 110**	
	MSD	**1425060-02**	**0.11710**	**1.2450**	**1.1111**	**mg/L**	**2.2**	**102**	**10**	**90 - 110**	
QC Batch ID: BXJ2840	Used client sample: N										
Dissolved Calcium	DUP	**1425181-03**	**41.647**	**41.420**		**mg/L**	**0.5**		**20**		
	MS	**1425181-03**	**41.647**	**50.786**	**10.204**	**mg/L**		**89.6**		**85 - 115**	
	MSD	**1425181-03**	**41.647**	**49.031**	**10.204**	**mg/L**	**3.5**	**72.4**	**20**	**85 - 115**	**A03**
Dissolved Magnesium	DUP	**1425181-03**	**66.923**	**66.501**		**mg/L**	**0.6**		**20**		
	MS	**1425181-03**	**66.923**	**75.020**	**10.204**	**mg/L**		**79.3**		**85 - 115**	**A03**
	MSD	**1425181-03**	**66.923**	**74.022**	**10.204**	**mg/L**	**1.3**	**69.6**	**20**	**85 - 115**	**A03**

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Woodland, CA 95695

Reported: 11/14/2014 12:29
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2840	Used client sample: N										
Dissolved Sodium	DUP	1425181-03	26.141	25.973		mg/L	0.6		20		
	MS	1425181-03	26.141	36.241	10.204	mg/L		99.0		85 - 115	
	MSD	1425181-03	26.141	35.013	10.204	mg/L	3.4	86.9	20	85 - 115	
Dissolved Potassium	DUP	1425181-03	0.69794	0.71679		mg/L	2.7		20		J
	MS	1425181-03	0.69794	11.261	10.204	mg/L		104		85 - 115	
	MSD	1425181-03	0.69794	11.206	10.204	mg/L	0.5	103	20	85 - 115	
QC Batch ID: BXK0057	Used client sample: N										
Total Kjeldahl Nitrogen	DUP	**1425178-02**	**0.42150**	**0.52310**		**mg/L**	**21.5**		**20**		**A02**
	MS	**1425178-02**	**0.42150**	**2.2366**	**2.0000**	**mg/L**		**90.8**		**90 - 110**	
	MSD	**1425178-02**	**0.42150**	**2.2457**	**2.0000**	**mg/L**	**0.4**	**91.2**	**20**	**90 - 110**	
QC Batch ID: BXK0059	Used client sample: N										
Total Phosphate	DUP	**1425178-02**	**10.489**	**10.710**		**mg/L**	**2.1**		**20**		
	MS	**1425178-02**	**10.489**	**14.355**	**3.0660**	**mg/L**		**126**		**80 - 120**	**Q03**
	MSD	**1425178-02**	**10.489**	**13.517**	**3.0660**	**mg/L**	**6.0**	**98.8**	**20**	**80 - 120**	
QC Batch ID: BXK0633	Used client sample: Y - Description: FG1 SB-1, 10/21/2014 15:55										
Dissolved Calcium	DUP	**1425030-01RE1**	**85.413**	**83.727**		**mg/L**	**2.0**		**20**		
	MS	**1425030-01RE1**	**85.413**	**91.505**	**10.204**	**mg/L**		**59.7**		**85 - 115**	**A03**
	MSD	**1425030-01RE1**	**85.413**	**92.640**	**10.204**	**mg/L**	**1.2**	**70.8**	**20**	**85 - 115**	**A03**
Dissolved Magnesium	DUP	425030-01RE1	47.957	47.974		mg/L	0.0		20		
	MS	425030-01RE1	47.957	56.783	10.204	mg/L		86.5		85 - 115	
	MSD	425030-01RE1	47.957	57.170	10.204	mg/L	0.7	90.3	20	85 - 115	
Dissolved Sodium	DUP	**1425030-01RE1**	**220.69**	**216.59**		**mg/L**	**1.9**		**20**		
	MS	**1425030-01RE1**	**220.69**	**222.16**	**10.204**	**mg/L**		**14.4**		**85 - 115**	**A03**
	MSD	**1425030-01RE1**	**220.69**	**223.95**	**10.204**	**mg/L**	**0.8**	**31.9**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	425030-01RE1	8.6717	8.7072		mg/L	0.4		20		
	MS	425030-01RE1	8.6717	19.105	10.204	mg/L		102		85 - 115	
	MSD	425030-01RE1	8.6717	19.035	10.204	mg/L	0.4	102	20	85 - 115	
QC Batch ID: BXK0700	Used client sample: Y - Description: COR SB2, 10/24/2014 07:30										
Total Kjeldahl Nitrogen	DUP	**1425363-01**	**1.5069**	**1.4729**		**mg/L**	**2.3**		**20**		
	MS	**1425363-01**	**1.5069**	**3.1948**	**2.0000**	**mg/L**		**84.4**		**90 - 110**	**Q03**
	MSD	**1425363-01**	**1.5069**	**3.4778**	**2.0000**	**mg/L**	**8.5**	**98.5**	**20**	**90 - 110**	
QC Batch ID: BXK0764	Used client sample: Y - Description: COR SB2, 10/24/2014 07:30										
Total Phosphate	DUP	1425363-01	0.68100	0.67947		mg/L	0.2		20		
	MS	1425363-01	0.68100	3.6273	3.0660	mg/L		96.1		80 - 120	
	MSD	1425363-01	0.68100	3.6564	3.0660	mg/L	0.8	97.0	20	80 - 120	
QC Batch ID: BXK0783	Used client sample: Y - Description: ANC SB-2, 10/22/2014 11:30										

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/14/2014 12:29 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXK0783	Used client sample: Y - Description: ANC SB-2, 10/22/2014 11:30										
Ammonia as N	DUP	425137-02RE´	105.68	107.65		mg/L	1.8		10		
	MS	425137-02RE´	105.68	221.74	111.11	mg/L		104		90 - 110	
	MSD	425137-02RE´	105.68	217.29	111.11	mg/L	2.0	100	10	90 - 110	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/14/2014 12:29 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A02	The difference between duplicate readings is less than the PQL.
A03	The sample concentration is more than 4 times the spike level.
A10	PQL's and MDL's were raised due to matrix interference.
Q03	Matrix spike recovery(s) is(are) not within the control limits.

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Date of Report: 11/12/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	[none]
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1425280
Invoice ID:	B188464

Enclosed are the results of analyses for samples received by the laboratory on 10/23/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1425280

Samples were filtered through a 0.45 micron filter for requested analyses.

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14-25280

BC Laboratories, Inc.

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

Report to:

Name: Luhdorff & Scalmanini C.E.
Address: 500 First Street
City: Woodland
State: CA
Attn: Till Angermann

Expanded Constituent Suite
Project: Lagoon Perimeter Subsurface Investigation
Site:
Samplers Name: Charlie Jenkins
Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	-1 ANT SB1	23 Oct 14	0900	water	x	x	x	x
2	-2 ANT SB2	23 Oct 14	10:00	x	x	x	x	x
3	~~ANT SB3~~ WA	~~23 Oct 14~~	~~11:15~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~
4	-3 FG2 SB1	23 oct 14	12 45	x	x	x	x	x
5	-4 FG2 SB2	23 oct 14	13 15	x	x	x	x	x
6	-5 FG2 SB3	23 oct 14	13 45	x	x	x	x	x
7	-6 FG2 SB4	23 oct 14	1415	x	x	x	x	x
8	-7 FG2 SB5	23 Oct 14	1500	x	x	x	x	x
9	-8 COR SB1	23 Oct 14	1645	x	x	x	x	x
10								
11								
12								

CHK BY
DISTRIBUTION
SUB-OUT

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl BOD MBAS COT

Comments:
1) Where indicated, samples shall be filtered (0.45um) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC.
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email
tleangermann@lsce.com

Relinquished by: (Signature)	Received By:	Date & Time
Wally Andrey	[signature]	10/23/14 17:08
Relinquished by: (Signature) [signature]	Received by: [signature]	10/23/14 2135
Relinquished by: (Signature)	Received By:	Date & Time

(A)= Analysis (C)= Container (P)= Preservative

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Chain of Custody and Cooler Receipt Form for 1425280 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14-25280

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: PE Thermometer ID: 207 Date/Time 10-23-14 1635
Temperature: (A) 1.0 °C / (C) 0.6 °C Analyst Init D

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A	A	A	A	A	A	A		
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments: - 7 received less than 1/2 full
Sample Numbering Completed By: OA Date/Time: 10/24/14 0925 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425280-01	**COC Number:**	---	**Receive Date:**	10/23/2014 21:35
	Project Number:	---	**Sampling Date:**	10/23/2014 09:00
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	ANT SB1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425280-02	**COC Number:**	---	**Receive Date:**	10/23/2014 21:35
	Project Number:	---	**Sampling Date:**	10/23/2014 10:00
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	ANT SB2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425280-03	**COC Number:**	---	**Receive Date:**	10/23/2014 21:35
	Project Number:	---	**Sampling Date:**	10/23/2014 12:45
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	FG2 SB1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425280-04	**COC Number:**	---	**Receive Date:**	10/23/2014 21:35
	Project Number:	---	**Sampling Date:**	10/23/2014 13:15
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	FG2 SB2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425280-05	**COC Number:**	---	**Receive Date:**	10/23/2014 21:35
	Project Number:	---	**Sampling Date:**	10/23/2014 13:45
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	FG2 SB3	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/12/2014 14:10 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425280-06	**COC Number:**	---	**Receive Date:**	10/23/2014 21:35
	Project Number:	---	**Sampling Date:**	10/23/2014 14:15
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	FG2 SB4	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425280-07	**COC Number:**	---	**Receive Date:**	10/23/2014 21:35
	Project Number:	---	**Sampling Date:**	10/23/2014 15:00
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	FG2 SB5	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425280-08	**COC Number:**	---	**Receive Date:**	10/23/2014 21:35
	Project Number:	---	**Sampling Date:**	10/23/2014 16:45
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	COR SB1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425280-01 | **Client Sample Name:** ANT SB1, 10/23/2014 9:00:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**120**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**110**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**130**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**13**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**480**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**160**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.13	**A01**	3
Nitrate as N	**25**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	3
Sulfate	**160**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**880**	**mg/L**	**50**	**50**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**3.3**	**mg/L**	**0.50**	**0.13**	**EPA-351.2**	0.16	**A01**	5
Ammonia as N	**2.2**	**mg/L**	**0.20**	**0.066**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	**0.013**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND	**J**	7
Total Phosphate	**0.79**	**mg/L**	**0.38**	**0.23**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/28/14	11/04/14 13:42	JRG	PE-OP2	1	BXJ2843
2	SM-2320B	10/27/14	10/27/14 16:13	RML	MET-1	2	BXJ2388
3	EPA-300.0	10/24/14	10/24/14 19:03	BMW	IC1	2	BXJ2347
4	SM-2540C	10/27/14	10/27/14 10:30	CAD	MANUAL	5	BXJ2345
5	EPA-351.2	11/10/14	11/11/14 12:40	JP1	SC-1	2.500	BXK0695
6	EPA-350.1	10/31/14	10/31/14 15:02	JP1	SC-1	2	BXJ2880
7	EPA-353.2	10/24/14	10/24/14 11:52	TDC	KONE-1	1	BXJ2303
8	EPA-365.4	11/10/14	11/11/14 10:52	JP1	SC-1	2.500	BXK0699

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425280-02 | **Client Sample Name:** ANT SB2, 10/23/2014 10:00:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**120**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**150**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**140**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**21**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**670**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**210**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.13	**A01**	3
Nitrate as N	**17**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	3
Sulfate	**120**	**mg/L**	**2.0**	**0.36**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1100**	**mg/L**	**50**	**50**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**5.2**	**mg/L**	**0.50**	**0.13**	**EPA-351.2**	0.16	**A01**	5
Ammonia as N	**3.2**	**mg/L**	**0.20**	**0.066**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	ND	mg/L	0.050	0.010	EPA-353.2	ND		7
Total Phosphate	**4.7**	**mg/L**	**0.38**	**0.23**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/28/14	11/04/14 13:53	JRG	PE-OP2	1	BXJ2843
2	SM-2320B	10/27/14	10/27/14 16:19	RML	MET-1	2	BXJ2388
3	EPA-300.0	10/24/14	10/24/14 19:17	BMW	IC1	2	BXJ2347
4	SM-2540C	10/27/14	10/27/14 10:30	CAD	MANUAL	5	BXJ2345
5	EPA-351.2	11/10/14	11/11/14 12:42	JP1	SC-1	2.500	BXK0695
6	EPA-350.1	10/31/14	10/31/14 15:02	JP1	SC-1	2	BXJ2880
7	EPA-353.2	10/24/14	10/24/14 11:52	TDC	KONE-1	1	BXJ2303
8	EPA-365.4	11/10/14	11/11/14 10:52	JP1	SC-1	2.500	BXK0699

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425280-03 | **Client Sample Name:** FG2 SB1, 10/23/2014 12:45:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**620**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**510**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**520**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**11**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**1300**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**500**	**mg/L**	**5.0**	**0.67**	**EPA-300.0**	ND	**A01**	3
Nitrate as N	**95**	**mg/L**	**1.0**	**0.25**	**EPA-300.0**	ND	**A01**	3
Sulfate	**2400**	**mg/L**	**10**	**1.8**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**3700**	**mg/L**	**200**	**200**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**7.9**	**mg/L**	**0.50**	**0.13**	**EPA-351.2**	0.16	**A01**	5
Ammonia as N	**4.5**	**mg/L**	**1.0**	**0.33**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	**0.023**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND	**J**	7
Total Phosphate	**1.4**	**mg/L**	**0.38**	**0.23**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/28/14	11/04/14 13:55	JRG	PE-OP2	1	BXJ2843
2	SM-2320B	10/27/14	10/27/14 16:26	RML	MET-1	2	BXJ2388
3	EPA-300.0	10/24/14	10/24/14 19:32	BMW	IC1	10	BXJ2347
4	SM-2540C	10/27/14	10/27/14 10:30	CAD	MANUAL	20	BXJ2345
5	EPA-351.2	11/10/14	11/11/14 12:44	JP1	SC-1	2.500	BXK0695
6	EPA-350.1	10/31/14	10/31/14 15:42	JP1	SC-1	10	BXJ2880
7	EPA-353.2	10/24/14	10/24/14 11:52	TDC	KONE-1	1	BXJ2303
8	EPA-365.4	11/10/14	11/11/14 10:54	JP1	SC-1	2.500	BXK0699

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500 First Street
Woodland, CA 95695

Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425280-04 | **Client Sample Name:** FG2 SB2, 10/23/2014 1:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**420**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**240**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**360**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**6.8**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**620**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**460**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	ND	**A01**	3
Nitrate as N	**44**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**1300**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**3000**	**mg/L**	**200**	**200**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**7.9**	**mg/L**	**0.50**	**0.13**	**EPA-351.2**	0.16	**A01**	5
Ammonia as N	**1.5**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.022**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND	**J**	7
Total Phosphate	**6.3**	**mg/L**	**0.38**	**0.23**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/28/14	11/04/14 13:57	JRG	PE-OP2	1	BXJ2843
2	SM-2320B	10/27/14	10/27/14 16:33	RML	MET-1	2	BXJ2388
3	EPA-300.0	10/24/14	10/24/14 20:17	BMW	IC1	5	BXJ2347
4	SM-2540C	10/27/14	10/27/14 10:30	CAD	MANUAL	20	BXJ2345
5	EPA-351.2	11/10/14	11/11/14 12:45	JP1	SC-1	2.500	BXK0695
6	EPA-350.1	10/31/14	11/07/14 12:39	JP1	SC-1	1	BXJ2881
7	EPA-353.2	10/24/14	10/24/14 11:52	TDC	KONE-1	1	BXJ2303
8	EPA-365.4	11/10/14	11/11/14 10:55	JP1	SC-1	2.500	BXK0699

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Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425280-05 | **Client Sample Name:** FG2 SB3, 10/23/2014 1:45:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**240**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**150**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**260**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**3.1**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**640**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**270**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	ND	**A01**	3
Nitrate as N	**0.92**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A10**	3
Sulfate	**640**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1700**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**1.3**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.063		5
Ammonia as N	**0.56**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	ND	mg/L	0.050	0.010	EPA-353.2	ND		7
Total Phosphate	**0.20**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/28/14	11/04/14 14:00	JRG	PE-OP2	1	BXJ2843
2	SM-2320B	10/27/14	10/27/14 16:40	RML	MET-1	2	BXJ2388
3	EPA-300.0	10/24/14	10/24/14 20:32	BMW	IC1	5	BXJ2347
4	SM-2540C	10/27/14	10/27/14 10:30	CAD	MANUAL	10	BXJ2345
5	EPA-351.2	11/10/14	11/11/14 12:45	JP1	SC-1	1	BXK0695
6	EPA-350.1	10/31/14	11/07/14 12:35	JP1	SC-1	1	BXJ2881
7	EPA-353.2	10/24/14	10/24/14 11:52	TDC	KONE-1	1	BXJ2303
8	EPA-365.4	11/10/14	11/11/14 10:55	JP1	SC-1	1	BXK0699

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Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425280-06 | **Client Sample Name:** FG2 SB4, 10/23/2014 2:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**340**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**160**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**380**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**11**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**560**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**470**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	ND	**A01**	3
Nitrate as N	**24**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**980**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**2600**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**2.1**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.063		5
Ammonia as N	**0.96**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.037**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND	**J**	7
Total Phosphate	**0.96**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/28/14	11/04/14 14:02	JRG	PE-OP2	1	BXJ2843
2	SM-2320B	10/27/14	10/27/14 16:46	RML	MET-1	2	BXJ2388
3	EPA-300.0	10/24/14	10/24/14 20:46	BMW	IC1	5	BXJ2347
4	SM-2540C	10/27/14	10/27/14 10:30	CAD	MANUAL	10	BXJ2345
5	EPA-351.2	11/10/14	11/11/14 12:47	JP1	SC-1	1	BXK0695
6	EPA-350.1	10/31/14	11/07/14 12:41	JP1	SC-1	1	BXJ2881
7	EPA-353.2	10/24/14	10/24/14 11:52	TDC	KONE-1	1	BXJ2303
8	EPA-365.4	11/10/14	11/11/14 10:56	JP1	SC-1	1	BXK0699

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Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425280-07 | **Client Sample Name:** FG2 SB5, 10/23/2014 3:00:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**440**	**mg/L**	**0.50**	**0.080**	**EPA-200.7**	ND	**A10**	1
Dissolved Magnesium	**560**	**mg/L**	**0.25**	**0.095**	**EPA-200.7**	ND	**A10**	1
Dissolved Sodium	**2200**	**mg/L**	**2.5**	**0.26**	**EPA-200.7**	ND	**A01**	1
Dissolved Potassium	**6.7**	**mg/L**	**5.0**	**0.50**	**EPA-200.7**	ND	**A10**	1
Bicarbonate Alkalinity as CaCO3	**290**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	**8.5**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**920**	**mg/L**	**5.0**	**0.67**	**EPA-300.0**	ND	**A01**	3
Nitrate as N	**1.1**	**mg/L**	**1.0**	**0.25**	**EPA-300.0**	ND	**A10**	3
Sulfate	**6400**	**mg/L**	**20**	**3.6**	**EPA-300.0**	6.2	**A01**	4
Total Dissolved Solids @ 180 C	**8000**	**mg/L**	**500**	**500**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**0.60**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.063		6
Ammonia as N	**0.13**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		7
Nitrite as N	ND	mg/L	0.050	0.010	EPA-353.2	ND		8
Total Phosphate	**0.21**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/28/14	11/04/14 14:11	JRG	PE-OP2	5	BXJ2843
2	SM-2320B	10/27/14	10/27/14 17:21	RML	MET-1	2	BXJ2389
3	EPA-300.0	10/24/14	10/24/14 21:01	BMW	IC1	10	BXJ2347
4	EPA-300.0	10/28/14	10/28/14 19:39	BMW	IC5	20	BXJ2667
5	SM-2540C	10/27/14	10/27/14 10:30	CAD	MANUAL	50	BXJ2345
6	EPA-351.2	11/10/14	11/11/14 12:47	JP1	SC-1	1	BXK0695
7	EPA-350.1	10/31/14	11/07/14 14:48	JP1	SC-1	1	BXJ2881
8	EPA-353.2	10/24/14	10/24/14 11:52	TDC	KONE-1	1	BXJ2303
9	EPA-365.4	11/10/14	11/11/14 10:56	JP1	SC-1	1	BXK0699

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Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425280-08 | **Client Sample Name:** COR SB1, 10/23/2014 4:45:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**140**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**140**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**730**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**5.0**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**1100**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**770**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	ND	**A01**	3
Nitrate as N	**0.82**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A10**	3
Sulfate	**270**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**2400**	**mg/L**	**200**	**200**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**1.3**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.063		5
Ammonia as N	**0.088**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND	**J**	6
Nitrite as N	ND	mg/L	0.050	0.010	EPA-353.2	ND		7
Total Phosphate	**0.33**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/28/14	11/04/14 14:07	JRG	PE-OP2	1	BXJ2843
2	SM-2320B	10/27/14	10/27/14 17:26	RML	MET-1	2	BXJ2389
3	EPA-300.0	10/24/14	10/24/14 21:16	BMW	IC1	5	BXJ2347
4	SM-2540C	10/27/14	10/27/14 10:30	CAD	MANUAL	20	BXJ2345
5	EPA-351.2	11/10/14	11/11/14 12:36	JP1	SC-1	1	BXK0695
6	EPA-350.1	10/31/14	11/07/14 14:49	JP1	SC-1	1	BXJ2881
7	EPA-353.2	10/24/14	10/24/14 11:52	TDC	KONE-1	1	BXJ2303
8	EPA-365.4	11/10/14	11/11/14 10:49	JP1	SC-1	1	BXK0699

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Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ2303						
Nitrite as N	BXJ2303-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ2345						
Total Dissolved Solids @ 180 C	BXJ2345-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2347						
Chloride	BXJ2347-BLK1	ND	mg/L	0.50	0.067	
Nitrate as N	BXJ2347-BLK1	ND	mg/L	0.10	0.025	
Sulfate	BXJ2347-BLK1	ND	mg/L	1.0	0.18	
QC Batch ID: BXJ2388						
Bicarbonate Alkalinity as CaCO3	BXJ2388-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ2388-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ2388-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ2389						
Bicarbonate Alkalinity as CaCO3	BXJ2389-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ2389-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ2389-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ2667						
Sulfate	**BXJ2667-BLK1**	**0.30900**	**mg/L**	**1.0**	**0.18**	**J**
QC Batch ID: BXJ2843						
Dissolved Calcium	BXJ2843-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXJ2843-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXJ2843-BLK1	ND	mg/L	0.50	0.051	
Dissolved Potassium	BXJ2843-BLK1	ND	mg/L	1.0	0.10	
QC Batch ID: BXJ2880						
Ammonia as N	BXJ2880-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXJ2881						
Ammonia as N	BXJ2881-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXK0695						
Total Kjeldahl Nitrogen	**BXK0695-BLK1**	**0.063000**	**mg/L**	**0.20**	**0.053**	**J**
QC Batch ID: BXK0699						
Total Phosphate	BXK0699-BLK1	ND	mg/L	0.15	0.092	

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Woodland, CA 95695

Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ2303										
Nitrite as N	BXJ2303-BS1	LCS	0.52432	0.50000	mg/L	105		90 - 110		
QC Batch ID: BXJ2345										
Total Dissolved Solids @ 180 C	BXJ2345-BS1	LCS	550.00	586.00	mg/L	93.9		90 - 110		
QC Batch ID: BXJ2347										
Chloride	BXJ2347-BS1	LCS	51.057	50.000	mg/L	102		90 - 110		
Nitrate as N	BXJ2347-BS1	LCS	5.1360	5.0000	mg/L	103		90 - 110		
Sulfate	BXJ2347-BS1	LCS	101.76	100.00	mg/L	102		90 - 110		
QC Batch ID: BXJ2667										
Sulfate	BXJ2667-BS1	LCS	101.91	100.00	mg/L	102		90 - 110		
QC Batch ID: BXJ2843										
Dissolved Calcium	BXJ2843-BS1	LCS	10.527	10.000	mg/L	105		85 - 115		
Dissolved Magnesium	BXJ2843-BS1	LCS	11.042	10.000	mg/L	110		85 - 115		
Dissolved Sodium	BXJ2843-BS1	LCS	10.523	10.000	mg/L	105		85 - 115		
Dissolved Potassium	BXJ2843-BS1	LCS	10.204	10.000	mg/L	102		85 - 115		
QC Batch ID: BXJ2880										
Ammonia as N	BXJ2880-BS1	LCS	1.0366	1.0000	mg/L	104		90 - 110		
QC Batch ID: BXJ2881										
Ammonia as N	BXJ2881-BS1	LCS	0.99030	1.0000	mg/L	99.0		90 - 110		
QC Batch ID: BXK0695										
Total Kjeldahl Nitrogen	BXK0695-BS1	LCS	2.1602	2.0000	mg/L	108		90 - 110		
QC Batch ID: BXK0699										
Total Phosphate	BXK0699-BS1	LCS	2.9672	3.0660	mg/L	96.8		85 - 115		

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2303	Used client sample: N										
Nitrite as N	DUP	1425226-01	ND	ND		mg/L			10		
	MS	1425226-01	ND	0.52919	0.52632	mg/L		101		90 - 110	
	MSD	1425226-01	ND	0.53034	0.52632	mg/L	0.2	101	10	90 - 110	
QC Batch ID: BXJ2345	Used client sample: Y - Description: FG2 SB1, 10/23/2014 12:45										
Total Dissolved Solids @ 180 C	DUP	1425280-03	3700.0	3680.0		mg/L	0.5		10		
QC Batch ID: BXJ2347	Used client sample: N										
Chloride	DUP	1425287-01	5.1660	5.0110		mg/L	3.0		10		
	MS	1425287-01	5.1660	64.228	50.505	mg/L		117		80 - 120	
	MSD	1425287-01	5.1660	64.390	50.505	mg/L	0.3	117	10	80 - 120	
Nitrate as N	DUP	1425287-01	0.43100	0.42200		mg/L	2.1		10		
	MS	1425287-01	0.43100	6.1455	5.0505	mg/L		113		80 - 120	
	MSD	1425287-01	0.43100	6.1949	5.0505	mg/L	0.8	114	10	80 - 120	
Sulfate	DUP	1425287-01	14.940	15.007		mg/L	0.4		10		
	MS	1425287-01	14.940	132.36	101.01	mg/L		116		80 - 120	
	MSD	1425287-01	14.940	132.31	101.01	mg/L	0.0	116	10	80 - 120	
QC Batch ID: BXJ2388	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1425264-01	142.40	143.00		mg/L	0.4		10		
Carbonate Alkalinity as CaCO3	DUP	1425264-01	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1425264-01	ND	ND		mg/L			10		
QC Batch ID: BXJ2389	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1425282-01	235.81	237.94		mg/L	0.9		10		
Carbonate Alkalinity as CaCO3	DUP	1425282-01	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1425282-01	ND	ND		mg/L			10		
QC Batch ID: BXJ2667	Used client sample: N										
Sulfate	DUP	425450-01RE´	131.71	131.38		mg/L	0.3		10		
	MS	425450-01RE´	131.71	665.64	505.05	mg/L		106		80 - 120	
	MSD	425450-01RE´	131.71	664.52	505.05	mg/L	0.2	105	10	80 - 120	
QC Batch ID: BXJ2843	Used client sample: N										
Dissolved Calcium	DUP	**1425560-01**	**60.903**	**60.873**		**mg/L**	**0.0**		**20**		
	MS	**1425560-01**	**60.903**	**68.435**	**10.204**	**mg/L**		**73.8**		**85 - 115**	**A03**
	MSD	**1425560-01**	**60.903**	**67.272**	**10.204**	**mg/L**	**1.7**	**62.4**	**20**	**85 - 115**	**A03**
Dissolved Magnesium	DUP	1425560-01	24.262	24.132		mg/L	0.5		20		
	MS	1425560-01	24.262	34.135	10.204	mg/L		96.8		85 - 115	
	MSD	1425560-01	24.262	33.909	10.204	mg/L	0.7	94.5	20	85 - 115	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/12/2014 14:10
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2843	Used client sample: N										
Dissolved Sodium	DUP	**1425560-01**	**189.34**	**185.00**		**mg/L**	**2.3**		**20**		
	MS	**1425560-01**	**189.34**	**191.11**	**10.204**	**mg/L**		**17.4**		**85 - 115**	**A03**
	MSD	**1425560-01**	**189.34**	**187.53**	**10.204**	**mg/L**	**1.9**	**-17.7**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1425560-01	5.9217	5.9153		mg/L	0.1		20		
	MS	1425560-01	5.9217	16.697	10.204	mg/L		106		85 - 115	
	MSD	1425560-01	5.9217	16.653	10.204	mg/L	0.3	105	20	85 - 115	
QC Batch ID: BXJ2880	Used client sample: N										
Ammonia as N	DUP	1425183-02	ND	ND		mg/L			10		
	MS	1425183-02	ND	1.0976	1.1111	mg/L		98.8		90 - 110	
	MSD	1425183-02	ND	1.0699	1.1111	mg/L	2.6	96.3	10	90 - 110	
QC Batch ID: BXJ2881	Used client sample: Y - Description: FG2 SB3, 10/23/2014 13:45										
Ammonia as N	DUP	1425280-05	0.55920	0.55700		mg/L	0.4		10		
	MS	1425280-05	0.55920	1.6628	1.1111	mg/L		99.3		90 - 110	
	MSD	1425280-05	0.55920	1.6901	1.1111	mg/L	1.6	102	10	90 - 110	
QC Batch ID: BXK0695	Used client sample: Y - Description: COR SB1, 10/23/2014 16:45										
Total Kjeldahl Nitrogen	DUP	1425280-08	1.2519	1.2191		mg/L	2.7		20		
	MS	1425280-08	1.2519	3.3223	2.0000	mg/L		104		90 - 110	
	MSD	1425280-08	1.2519	3.1147	2.0000	mg/L	6.5	93.1	20	90 - 110	
QC Batch ID: BXK0699	Used client sample: Y - Description: COR SB1, 10/23/2014 16:45										
Total Phosphate	DUP	1425280-08	0.32900	0.31429		mg/L	4.6		20		
	MS	1425280-08	0.32900	3.2796	3.0660	mg/L		96.2		80 - 120	
	MSD	1425280-08	0.32900	3.3103	3.0660	mg/L	0.9	97.2	20	80 - 120	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/12/2014 14:10 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A03	The sample concentration is more than 4 times the spike level.
A10	PQL's and MDL's were raised due to matrix interference.

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Date of Report: 11/13/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	[none]
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1425363
Invoice ID:	B188592

Enclosed are the results of analyses for samples received by the laboratory on 10/24/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1425363

Samples were filtered through a 0.45 micron filter for requested analyses.

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BC Laboratories, Inc.

14-25363

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State:	CA
Attn:	Till Angermann

Expanded Constituent Suite	
Project:	Lagoon Perimeter Subsurface Investigation
Site:	
Samplers Name:	Charlie Jenkins
Global ID -	

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	COR SB2	24 oct 14	0730	water	x	x	x	x
2	COR SB3	24 oct 14	0735					
3	COR SB4	24 oct 14	0830					
4	GOD SB1	24 oct 14	10:30					
5	GOD SB2	24 oct 14	1120					
6	GOD SB3	24 oct 14	1210					
7	GOD SB4	24 oct 14	1235					
8	GOD SB5	24 oct 14	1315					
9	MAC SB1	24 oct 14	1530					
10	MAC SB2	24 oct 14	1610					
11								
12								

MAC
MAC

SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

CHK BY DISTRIBUTION
SUB OUT

Comments
1) Where indicated, samples shall be filtered (0.45µm) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email
teangermann@lsce.com

Relinquished by: (Signature)	Received By:	Date & Time
Wesley Andy	[illegible]	10-24-14 17:25
[illegible]	[illegible]	10-24-14 2100

(A)= Analysis (C)= Container (P)= Preservative

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Chain of Custody and Cooler Receipt Form for 1425363 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14-25363

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: RE Thermometer ID: 207 Date/Time 102414 1200
Temperature: (A) 1.3 °C / (C) 0.9 °C Analyst Init M

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A	A	A	A	A	A	A	A	A
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
~~SOIL SLEEVE~~										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:_____
Sample Numbering Completed By: M Date/Time: 10-24-14 1200 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/13/2014 13:04 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425363-01	**COC Number:**	---	**Receive Date:**	10/24/2014 21:00
	Project Number:	---	**Sampling Date:**	10/24/2014 07:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	COR SB2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425363-02	**COC Number:**	---	**Receive Date:**	10/24/2014 21:00
	Project Number:	---	**Sampling Date:**	10/24/2014 07:35
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	COR SB3	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425363-03	**COC Number:**	---	**Receive Date:**	10/24/2014 21:00
	Project Number:	---	**Sampling Date:**	10/24/2014 08:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	COR SB4	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425363-04	**COC Number:**	---	**Receive Date:**	10/24/2014 21:00
	Project Number:	---	**Sampling Date:**	10/24/2014 10:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	GOD SB1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425363-05	**COC Number:**	---	**Receive Date:**	10/24/2014 21:00
	Project Number:	---	**Sampling Date:**	10/24/2014 11:20
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	GOD SB2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425363-06	**COC Number:**	---	**Receive Date:**	10/24/2014 21:00
	Project Number:	---	**Sampling Date:**	10/24/2014 12:10
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	GOD SB3	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425363-07	**COC Number:**	---	**Receive Date:**	10/24/2014 21:00
	Project Number:	---	**Sampling Date:**	10/24/2014 12:35
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	GOD SB4	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425363-08	**COC Number:**	---	**Receive Date:**	10/24/2014 21:00
	Project Number:	---	**Sampling Date:**	10/24/2014 13:15
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	GOD SB5	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425363-09	**COC Number:**	---	**Receive Date:**	10/24/2014 21:00
	Project Number:	---	**Sampling Date:**	10/24/2014 15:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	MAC SB1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425363-10	**COC Number:**	---	**Receive Date:**	10/24/2014 21:00
	Project Number:	---	**Sampling Date:**	10/24/2014 16:10
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	MAC SB2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425363-01 | **Client Sample Name:** COR SB2, 10/24/2014 7:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**56**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**76**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**450**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**16**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**660**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**390**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.72	**A01**	3
Nitrate as N	**2.9**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**200**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1800**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**1.5**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.16		5
Ammonia as N	**0.14**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.056**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**0.68**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/12/14	11/13/14 00:55	SRM	PE-OP2	1	BXK1035
2	SM-2320B	10/28/14	10/28/14 12:33	RLP	MET-1	2	BXJ2497
3	EPA-300.0	10/24/14	10/25/14 03:23	OLH	IC1	5	BXJ2349
4	SM-2540C	10/28/14	10/28/14 11:30	CAD	MANUAL	10	BXJ2533
5	EPA-351.2	11/10/14	11/11/14 12:56	JP1	SC-1	1	BXK0700
6	EPA-350.1	10/31/14	11/07/14 14:54	JP1	SC-1	1	BXJ2881
7	EPA-353.2	10/25/14	10/25/14 02:31	BMW	KONE-1	1	BXJ2376
8	EPA-365.4	11/10/14	11/11/14 11:02	JP1	SC-1	1	BXK0764

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425363-02 | **Client Sample Name:** COR SB3, 10/24/2014 7:35:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**230**	**mg/L**	**0.50**	**0.080**	**EPA-200.7**	ND	**A10**	1
Dissolved Magnesium	**270**	**mg/L**	**0.25**	**0.095**	**EPA-200.7**	ND	**A10**	1
Dissolved Sodium	**1200**	**mg/L**	**2.5**	**0.26**	**EPA-200.7**	0.76	**A01**	1
Dissolved Potassium	**60**	**mg/L**	**5.0**	**0.50**	**EPA-200.7**	0.61	**A10**	1
Bicarbonate Alkalinity as CaCO3	**1600**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**1500**	**mg/L**	**5.0**	**0.67**	**EPA-300.0**	1.4	**A01**	3
Nitrate as N	**27**	**mg/L**	**1.0**	**0.25**	**EPA-300.0**	ND	**A01**	3
Sulfate	**330**	**mg/L**	**10**	**1.8**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**4200**	**mg/L**	**500**	**500**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**3.1**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.16		5
Ammonia as N	**0.47**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.14**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**4.6**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/29/14	11/04/14 17:52	JRG	PE-OP2	5	BXJ2844
2	SM-2320B	10/28/14	10/28/14 12:46	RLP	MET-1	2	BXJ2497
3	EPA-300.0	10/24/14	10/25/14 04:23	OLH	IC1	10	BXJ2349
4	SM-2540C	10/28/14	10/28/14 11:30	CAD	MANUAL	50	BXJ2533
5	EPA-351.2	11/10/14	11/11/14 13:00	JP1	SC-1	1	BXK0700
6	EPA-350.1	10/31/14	11/07/14 15:02	JP1	SC-1	1	BXJ2882
7	EPA-353.2	10/25/14	10/25/14 01:45	BMW	KONE-1	1	BXJ2376
8	EPA-365.4	11/10/14	11/11/14 11:05	JP1	SC-1	1	BXK0764

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500 First Street
Woodland, CA 95695

Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425363-03 | **Client Sample Name:** COR SB4, 10/24/2014 8:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**49**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**48**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**590**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.15		1
Dissolved Potassium	**65**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	0.12		1
Bicarbonate Alkalinity as CaCO3	**490**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**380**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.72	**A01**	3
Nitrate as N	**97**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**230**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1900**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**5.5**	**mg/L**	**1.0**	**0.26**	**EPA-351.2**	0.81	**A01**	5
Ammonia as N	**0.41**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.24**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**12**	**mg/L**	**0.75**	**0.46**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/29/14	11/04/14 15:10	JRG	PE-OP2	1	BXJ2844
2	SM-2320B	10/28/14	10/28/14 12:54	RLP	MET-1	2	BXJ2497
3	EPA-300.0	10/24/14	10/25/14 04:37	OLH	IC1	5	BXJ2349
4	SM-2540C	10/28/14	10/28/14 11:30	CAD	MANUAL	10	BXJ2533
5	EPA-351.2	11/10/14	11/11/14 13:27	JP1	SC-1	5	BXK0700
6	EPA-350.1	10/31/14	11/07/14 15:03	JP1	SC-1	1	BXJ2882
7	EPA-353.2	10/25/14	10/25/14 01:45	BMW	KONE-1	1	BXJ2376
8	EPA-365.4	11/10/14	11/11/14 11:23	JP1	SC-1	5	BXK0764

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Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425363-04 | **Client Sample Name:** GOD SB1, 10/24/2014 10:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**55**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**43**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**750**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.15		1
Dissolved Potassium	**9.5**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	0.12		1
Bicarbonate Alkalinity as CaCO3	**700**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**350**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.72	**A01**	3
Nitrate as N	**110**	**mg/L**	**1.0**	**0.25**	**EPA-300.0**	ND	**A01**	4
Sulfate	**280**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**2000**	**mg/L**	**100**	**100**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**1.4**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.16		6
Ammonia as N	**0.36**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		7
Nitrite as N	**0.43**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**2.1**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/29/14	11/04/14 15:12	JRG	PE-OP2	1	BXJ2844
2	SM-2320B	10/28/14	10/28/14 13:00	RLP	MET-1	2	BXJ2497
3	EPA-300.0	10/24/14	10/25/14 04:52	OLH	IC1	5	BXJ2349
4	EPA-300.0	10/24/14	10/25/14 12:01	OLH	IC1	10	BXJ2349
5	SM-2540C	10/28/14	10/28/14 11:30	CAD	MANUAL	10	BXJ2533
6	EPA-351.2	11/10/14	11/11/14 13:02	JP1	SC-1	1	BXK0700
7	EPA-350.1	10/31/14	11/07/14 14:57	JP1	SC-1	1	BXJ2882
8	EPA-353.2	10/25/14	10/25/14 01:45	BMW	KONE-1	1	BXJ2376
9	EPA-365.4	11/10/14	11/11/14 11:06	JP1	SC-1	1	BXK0764

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Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425363-05 | **Client Sample Name:** GOD SB2, 10/24/2014 11:20:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**100**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**92**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**850**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.15		1
Dissolved Potassium	**16**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	0.12		1
Bicarbonate Alkalinity as CaCO3	**930**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**460**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.72	**A01**	3
Nitrate as N	**110**	**mg/L**	**1.0**	**0.25**	**EPA-300.0**	ND	**A01**	4
Sulfate	**390**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**3000**	**mg/L**	**200**	**200**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**2.5**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.16		6
Ammonia as N	**0.57**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		7
Nitrite as N	**0.25**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**1.6**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/29/14	11/04/14 15:14	JRG	PE-OP2	1	BXJ2844
2	SM-2320B	10/28/14	10/28/14 13:06	RLP	MET-1	2	BXJ2497
3	EPA-300.0	10/24/14	10/25/14 05:07	OLH	IC1	5	BXJ2349
4	EPA-300.0	10/24/14	10/25/14 12:16	OLH	IC1	10	BXJ2349
5	SM-2540C	10/28/14	10/28/14 11:30	CAD	MANUAL	20	BXJ2533
6	EPA-351.2	11/10/14	11/11/14 13:03	JP1	SC-1	1	BXK0700
7	EPA-350.1	10/31/14	11/07/14 15:04	JP1	SC-1	1	BXJ2882
8	EPA-353.2	10/25/14	10/25/14 01:46	BMW	KONE-1	1	BXJ2376
9	EPA-365.4	11/10/14	11/11/14 11:07	JP1	SC-1	1	BXK0764

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Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425363-06 | **Client Sample Name:** GOD SB3, 10/24/2014 12:10:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**100**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**140**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**770**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.15		1
Dissolved Potassium	**2.9**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	0.12		1
Bicarbonate Alkalinity as CaCO3	**1200**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**420**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.72	**A01**	3
Nitrate as N	**57**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**370**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**2800**	**mg/L**	**200**	**200**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**2.2**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	0.16		5
Ammonia as N	**0.11**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.73**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**0.16**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/29/14	11/04/14 15:17	JRG	PE-OP2	1	BXJ2844
2	SM-2320B	10/28/14	10/28/14 13:13	RLP	MET-1	2	BXJ2497
3	EPA-300.0	10/24/14	10/25/14 05:52	OLH	IC1	5	BXJ2349
4	SM-2540C	10/28/14	10/28/14 11:30	CAD	MANUAL	20	BXJ2533
5	EPA-351.2	11/10/14	11/11/14 13:05	JP1	SC-1	1	BXK0700
6	EPA-350.1	10/31/14	11/07/14 15:05	JP1	SC-1	1	BXJ2882
7	EPA-353.2	10/25/14	10/25/14 01:51	BMW	KONE-1	1	BXJ2376
8	EPA-365.4	11/10/14	11/11/14 11:08	JP1	SC-1	1	BXK0764

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Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425363-07 | **Client Sample Name:** GOD SB4, 10/24/2014 12:35:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**320**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**280**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**640**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.15		1
Dissolved Potassium	**16**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	0.12		1
Bicarbonate Alkalinity as CaCO3	**1800**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**620**	**mg/L**	**5.0**	**0.67**	**EPA-300.0**	1.4	**A01**	3
Nitrate as N	**73**	**mg/L**	**1.0**	**0.25**	**EPA-300.0**	ND	**A01**	3
Sulfate	**210**	**mg/L**	**10**	**1.8**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**3600**	**mg/L**	**200**	**200**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**6.1**	**mg/L**	**0.50**	**0.13**	**EPA-351.2**	0.13	**A01**	5
Ammonia as N	**2.0**	**mg/L**	**0.20**	**0.066**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	**0.24**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**1.0**	**mg/L**	**0.38**	**0.23**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/29/14	11/04/14 15:19	JRG	PE-OP2	1	BXJ2844
2	SM-2320B	10/28/14	10/28/14 13:36	RLP	MET-1	2	BXJ2497
3	EPA-300.0	10/24/14	10/25/14 06:06	OLH	IC1	10	BXJ2349
4	SM-2540C	10/28/14	10/28/14 11:30	CAD	MANUAL	20	BXJ2533
5	EPA-351.2	11/11/14	11/12/14 09:22	JP1	SC-1	2.500	BXK0870
6	EPA-350.1	10/31/14	11/07/14 14:49	JP1	SC-1	2	BXJ2882
7	EPA-353.2	10/25/14	10/25/14 01:51	BMW	KONE-1	1	BXJ2376
8	EPA-365.4	11/11/14	11/12/14 08:18	JP1	SC-1	2.500	BXK0879

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Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425363-08 | **Client Sample Name:** GOD SB5, 10/24/2014 1:15:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**190**	**mg/L**	**0.50**	**0.080**	**EPA-200.7**	ND	**A10**	1
Dissolved Magnesium	**260**	**mg/L**	**0.25**	**0.095**	**EPA-200.7**	ND	**A10**	1
Dissolved Sodium	**910**	**mg/L**	**2.5**	**0.26**	**EPA-200.7**	0.76	**A01**	1
Dissolved Potassium	**47**	**mg/L**	**5.0**	**0.50**	**EPA-200.7**	0.61	**A10**	1
Bicarbonate Alkalinity as CaCO3	**1800**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**770**	**mg/L**	**5.0**	**0.67**	**EPA-300.0**	1.4	**A01**	3
Nitrate as N	**94**	**mg/L**	**1.0**	**0.25**	**EPA-300.0**	ND	**A01**	3
Sulfate	**240**	**mg/L**	**10**	**1.8**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**3700**	**mg/L**	**200**	**200**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**8.1**	**mg/L**	**0.50**	**0.13**	**EPA-351.2**	0.13	**A01**	5
Ammonia as N	**2.8**	**mg/L**	**0.20**	**0.066**	**EPA-350.1**	ND	**A01**	6
Nitrite as N	**0.052**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**3.6**	**mg/L**	**0.38**	**0.23**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/29/14	11/04/14 17:55	JRG	PE-OP2	5	BXJ2844
2	SM-2320B	10/28/14	10/28/14 13:45	RLP	MET-1	2	BXJ2497
3	EPA-300.0	10/24/14	10/25/14 06:21	OLH	IC1	10	BXJ2349
4	SM-2540C	10/28/14	10/28/14 11:30	CAD	MANUAL	20	BXJ2533
5	EPA-351.2	11/11/14	11/12/14 09:24	JP1	SC-1	2.500	BXK0870
6	EPA-350.1	10/31/14	11/07/14 14:16	JP1	SC-1	2	BXJ2882
7	EPA-353.2	10/25/14	10/25/14 01:51	BMW	KONE-1	1	BXJ2376
8	EPA-365.4	11/11/14	11/12/14 08:19	JP1	SC-1	2.500	BXK0879

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425363-09 | **Client Sample Name:** MAC SB1, 10/24/2014 3:30:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**56**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**55**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**520**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.15		1
Dissolved Potassium	**5.6**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	0.12		1
Bicarbonate Alkalinity as CaCO3	**680**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**260**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.72	**A01**	3
Nitrate as N	**18**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**240**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**1700**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**1.2**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		5
Ammonia as N	**0.42**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.061**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**0.83**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/29/14	11/04/14 14:45	JRG	PE-OP2	1	BXJ2844
2	SM-2320B	10/28/14	10/28/14 13:53	RLP	MET-1	2	BXJ2497
3	EPA-300.0	10/24/14	10/25/14 06:36	OLH	IC1	5	BXJ2349
4	SM-2540C	10/28/14	10/28/14 11:30	CAD	MANUAL	10	BXJ2533
5	EPA-351.2	11/11/14	11/12/14 09:19	JP1	SC-1	1	BXK0870
6	EPA-350.1	10/31/14	11/07/14 15:08	JP1	SC-1	1	BXJ2882
7	EPA-353.2	10/25/14	10/25/14 01:51	BMW	KONE-1	1	BXJ2376
8	EPA-365.4	11/11/14	11/12/14 08:16	JP1	SC-1	1	BXK0879

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Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425363-10 | **Client Sample Name:** MAC SB2, 10/24/2014 4:10:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**34**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**32**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**670**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	0.15		1
Dissolved Potassium	**160**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	0.12		1
Bicarbonate Alkalinity as CaCO3	**920**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**440**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	0.72	**A01**	3
Nitrate as N	**17**	**mg/L**	**0.50**	**0.12**	**EPA-300.0**	ND	**A01**	3
Sulfate	**160**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	ND	**A01**	3
Total Dissolved Solids @ 180 C	**2500**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**7.6**	**mg/L**	**0.50**	**0.13**	**EPA-351.2**	0.13	**A01**	5
Ammonia as N	**0.74**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		6
Nitrite as N	**0.050**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**20**	**mg/L**	**1.9**	**1.2**	**EPA-365.4**	ND	**A01**	8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	10/29/14	11/04/14 15:24	JRG	PE-OP2	1	BXJ2844
2	SM-2320B	10/28/14	10/28/14 14:00	RLP	MET-1	2	BXJ2497
3	EPA-300.0	10/24/14	10/25/14 06:51	OLH	IC1	5	BXJ2349
4	SM-2540C	10/28/14	10/28/14 11:30	CAD	MANUAL	10	BXJ2533
5	EPA-351.2	11/11/14	11/12/14 09:26	JP1	SC-1	2.500	BXK0870
6	EPA-350.1	10/31/14	11/07/14 13:04	JP1	SC-1	1	BXJ2882
7	EPA-353.2	10/25/14	10/25/14 01:51	BMW	KONE-1	1	BXJ2377
8	EPA-365.4	11/11/14	11/12/14 08:32	JP1	SC-1	12.500	BXK0879

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Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXJ2349						
Chloride	**BXJ2349-BLK1**	**0.14500**	**mg/L**	**0.50**	**0.067**	**J**
Nitrate as N	BXJ2349-BLK1	ND	mg/L	0.10	0.025	
Sulfate	BXJ2349-BLK1	ND	mg/L	1.0	0.18	
QC Batch ID: BXJ2376						
Nitrite as N	BXJ2376-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ2377						
Nitrite as N	BXJ2377-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXJ2497						
Bicarbonate Alkalinity as CaCO3	BXJ2497-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXJ2497-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXJ2497-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXJ2533						
Total Dissolved Solids @ 180 C	BXJ2533-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXJ2844						
Dissolved Calcium	BXJ2844-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXJ2844-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	**BXJ2844-BLK1**	**0.15128**	**mg/L**	**0.50**	**0.051**	**J**
Dissolved Potassium	**BXJ2844-BLK1**	**0.12184**	**mg/L**	**1.0**	**0.10**	**J**
QC Batch ID: BXJ2881						
Ammonia as N	BXJ2881-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXJ2882						
Ammonia as N	BXJ2882-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXK0700						
Total Kjeldahl Nitrogen	**BXK0700-BLK1**	**0.16140**	**mg/L**	**0.20**	**0.053**	**J**
QC Batch ID: BXK0764						
Total Phosphate	BXK0764-BLK1	ND	mg/L	0.15	0.092	
QC Batch ID: BXK0870						
Total Kjeldahl Nitrogen	BXK0870-BLK1	ND	mg/L	0.20	0.053	
QC Batch ID: BXK0879						
Total Phosphate	BXK0879-BLK1	ND	mg/L	0.15	0.092	

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Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXK1035						
Dissolved Calcium	BXK1035-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXK1035-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXK1035-BLK1	ND	mg/L	0.50	0.051	
Dissolved Potassium	BXK1035-BLK1	ND	mg/L	1.0	0.10	

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Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXJ2349										
Chloride	BXJ2349-BS1	LCS	50.773	50.000	mg/L	102		90 - 110		
Nitrate as N	BXJ2349-BS1	LCS	5.1540	5.0000	mg/L	103		90 - 110		
Sulfate	BXJ2349-BS1	LCS	100.96	100.00	mg/L	101		90 - 110		
QC Batch ID: BXJ2376										
Nitrite as N	BXJ2376-BS1	LCS	0.52161	0.50000	mg/L	104		90 - 110		
QC Batch ID: BXJ2377										
Nitrite as N	BXJ2377-BS1	LCS	0.52819	0.50000	mg/L	106		90 - 110		
QC Batch ID: BXJ2533										
Total Dissolved Solids @ 180 C	BXJ2533-BS1	LCS	550.00	586.00	mg/L	93.9		90 - 110		
QC Batch ID: BXJ2844										
Dissolved Calcium	BXJ2844-BS1	LCS	10.475	10.000	mg/L	105		85 - 115		
Dissolved Magnesium	BXJ2844-BS1	LCS	11.033	10.000	mg/L	110		85 - 115		
Dissolved Sodium	BXJ2844-BS1	LCS	10.612	10.000	mg/L	106		85 - 115		
Dissolved Potassium	BXJ2844-BS1	LCS	10.322	10.000	mg/L	103		85 - 115		
QC Batch ID: BXJ2881										
Ammonia as N	BXJ2881-BS1	LCS	0.99030	1.0000	mg/L	99.0		90 - 110		
QC Batch ID: BXJ2882										
Ammonia as N	BXJ2882-BS1	LCS	1.0562	1.0000	mg/L	106		90 - 110		
QC Batch ID: BXK0700										
Total Kjeldahl Nitrogen	BXK0700-BS1	LCS	2.1128	2.0000	mg/L	106		90 - 110		
QC Batch ID: BXK0764										
Total Phosphate	BXK0764-BS1	LCS	2.9905	3.0660	mg/L	97.5		85 - 115		
QC Batch ID: BXK0870										
Total Kjeldahl Nitrogen	BXK0870-BS1	LCS	1.9950	2.0000	mg/L	99.8		90 - 110		
QC Batch ID: BXK0879										
Total Phosphate	BXK0879-BS1	LCS	3.0558	3.0660	mg/L	99.7		85 - 115		
QC Batch ID: BXK1035										
Dissolved Calcium	BXK1035-BS1	LCS	9.9772	10.000	mg/L	99.8		85 - 115		
Dissolved Magnesium	BXK1035-BS1	LCS	10.566	10.000	mg/L	106		85 - 115		
Dissolved Sodium	BXK1035-BS1	LCS	10.016	10.000	mg/L	100		85 - 115		
Dissolved Potassium	BXK1035-BS1	LCS	9.4341	10.000	mg/L	94.3		85 - 115		

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Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2349	Used client sample: Y - Description: COR SB2, 10/24/2014 07:30										
Chloride	DUP	1425363-01	385.80	385.80		mg/L	0		10		
	MS	1425363-01	385.80	653.36	252.53	mg/L		106		80 - 120	
	MSD	1425363-01	385.80	653.87	252.53	mg/L	0.1	106	10	80 - 120	
Nitrate as N	DUP	1425363-01	2.8850	2.6850		mg/L	7.2		10		
	MS	1425363-01	2.8850	29.207	25.253	mg/L		104		80 - 120	
	MSD	1425363-01	2.8850	29.288	25.253	mg/L	0.3	105	10	80 - 120	
Sulfate	DUP	1425363-01	202.74	203.02		mg/L	0.1		10		
	MS	1425363-01	202.74	745.99	505.05	mg/L		108		80 - 120	
	MSD	1425363-01	202.74	747.19	505.05	mg/L	0.2	108	10	80 - 120	
QC Batch ID: BXJ2376	Used client sample: Y - Description: COR SB2, 10/24/2014 07:30										
Nitrite as N	DUP	1425363-01	0.056382	0.056904		mg/L	0.9		10		
	MS	1425363-01	0.056382	0.61892	0.52632	mg/L		107		90 - 110	
	MSD	1425363-01	0.056382	0.61495	0.52632	mg/L	0.6	106	10	90 - 110	
QC Batch ID: BXJ2377	Used client sample: Y - Description: MAC SB2, 10/24/2014 16:10										
Nitrite as N	DUP	1425363-10	0.050146	0.051464		mg/L	2.6		10		
	MS	1425363-10	0.050146	0.61931	0.52632	mg/L		108		90 - 110	
	MSD	1425363-10	0.050146	0.62282	0.52632	mg/L	0.6	109	10	90 - 110	
QC Batch ID: BXJ2497	Used client sample: Y - Description: COR SB2, 10/24/2014 07:30										
Bicarbonate Alkalinity as CaCO3	DUP	1425363-01	661.47	664.51		mg/L	0.5		10		
Carbonate Alkalinity as CaCO3	DUP	1425363-01	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1425363-01	ND	ND		mg/L			10		
QC Batch ID: BXJ2533	Used client sample: Y - Description: COR SB2, 10/24/2014 07:30										
Total Dissolved Solids @ 180 C	DUP	1425363-01	1830.0	1860.0		mg/L	1.6		10		
QC Batch ID: BXJ2844	Used client sample: Y - Description: MAC SB1, 10/24/2014 15:30										
Dissolved Calcium	DUP	**1425363-09**	**55.576**	**55.030**		**mg/L**	**1.0**		**20**		
	MS	**1425363-09**	**55.576**	**63.105**	**10.204**	**mg/L**		**73.8**		**85 - 115**	**A03**
	MSD	**1425363-09**	**55.576**	**63.254**	**10.204**	**mg/L**	**0.2**	**75.2**	**20**	**85 - 115**	**A03**
Dissolved Magnesium	DUP	**1425363-09**	**54.537**	**54.106**		**mg/L**	**0.8**		**20**		
	MS	**1425363-09**	**54.537**	**63.423**	**10.204**	**mg/L**		**87.1**		**85 - 115**	
	MSD	**1425363-09**	**54.537**	**62.909**	**10.204**	**mg/L**	**0.8**	**82.0**	**20**	**85 - 115**	**A03**
Dissolved Sodium	DUP	**1425363-09**	**518.44**	**517.29**		**mg/L**	**0.2**		**20**		
	MS	**1425363-09**	**518.44**	**505.81**	**10.204**	**mg/L**		**-124**		**85 - 115**	**A03**
	MSD	**1425363-09**	**518.44**	**503.04**	**10.204**	**mg/L**	**0.5**	**-151**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1425363-09	5.5880	5.6339		mg/L	0.8		20		
	MS	1425363-09	5.5880	17.212	10.204	mg/L		114		85 - 115	
	MSD	1425363-09	5.5880	17.282	10.204	mg/L	0.4	115	20	85 - 115	

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Reported: 11/13/2014 13:04
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXJ2881	Used client sample: Y - Description: FG2 SB3, 10/23/2014 13:45										
Ammonia as N	DUP	1425280-05	0.55920	0.55700		mg/L	0.4		10		
	MS	1425280-05	0.55920	1.6628	1.1111	mg/L		99.3		90 - 110	
	MSD	1425280-05	0.55920	1.6901	1.1111	mg/L	1.6	102	10	90 - 110	
QC Batch ID: BXJ2882	Used client sample: Y - Description: GOD SB1, 10/24/2014 10:30										
Ammonia as N	DUP	1425363-04	0.36230	0.34070		mg/L	6.1		10		
	MS	1425363-04	0.36230	1.4713	1.1111	mg/L		99.8		90 - 110	
	MSD	1425363-04	0.36230	1.4920	1.1111	mg/L	1.4	102	10	90 - 110	
QC Batch ID: BXK0700	Used client sample: Y - Description: COR SB2, 10/24/2014 07:30										
Total Kjeldahl Nitrogen	DUP	**1425363-01**	**1.5069**	**1.4729**		**mg/L**	**2.3**		**20**		
	MS	**1425363-01**	**1.5069**	**3.1948**	**2.0000**	**mg/L**		**84.4**		**90 - 110**	**Q03**
	MSD	**1425363-01**	**1.5069**	**3.4778**	**2.0000**	**mg/L**	**8.5**	**98.5**	**20**	**90 - 110**	
QC Batch ID: BXK0764	Used client sample: Y - Description: COR SB2, 10/24/2014 07:30										
Total Phosphate	DUP	1425363-01	0.68100	0.67947		mg/L	0.2		20		
	MS	1425363-01	0.68100	3.6273	3.0660	mg/L		96.1		80 - 120	
	MSD	1425363-01	0.68100	3.6564	3.0660	mg/L	0.8	97.0	20	80 - 120	
QC Batch ID: BXK0870	Used client sample: Y - Description: MAC SB1, 10/24/2014 15:30										
Total Kjeldahl Nitrogen	DUP	1425363-09	1.2225	1.1951		mg/L	2.3		20		
	MS	1425363-09	1.2225	3.1649	2.0000	mg/L		97.1		90 - 110	
	MSD	1425363-09	1.2225	3.0889	2.0000	mg/L	2.4	93.3	20	90 - 110	
QC Batch ID: BXK0879	Used client sample: Y - Description: MAC SB1, 10/24/2014 15:30										
Total Phosphate	DUP	1425363-09	0.82910	0.78832		mg/L	5.0		20		
	MS	1425363-09	0.82910	3.8809	3.0660	mg/L		99.5		80 - 120	
	MSD	1425363-09	0.82910	3.8432	3.0660	mg/L	1.0	98.3	20	80 - 120	
QC Batch ID: BXK1035	Used client sample: N										
Dissolved Calcium	DUP	1424944-14	ND	ND		mg/L			20		
	MS	1424944-14	ND	10.720	10.204	mg/L		105		85 - 115	
	MSD	1424944-14	ND	10.617	10.204	mg/L	1.0	104	20	85 - 115	
Dissolved Magnesium	DUP	1424944-14	11.170	11.040		mg/L	1.2		20		
	MS	1424944-14	11.170	21.773	10.204	mg/L		104		85 - 115	
	MSD	1424944-14	11.170	21.342	10.204	mg/L	2.0	99.7	20	85 - 115	
Dissolved Sodium	DUP	1424944-14	ND	ND		mg/L			20		
	MS	1424944-14	ND	10.773	10.204	mg/L		106		85 - 115	
	MSD	1424944-14	ND	10.641	10.204	mg/L	1.2	104	20	85 - 115	
Dissolved Potassium	DUP	1424944-14	ND	ND		mg/L			20		
	MS	1424944-14	ND	10.326	10.204	mg/L		101		85 - 115	
	MSD	1424944-14	ND	10.175	10.204	mg/L	1.5	99.7	20	85 - 115	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/13/2014 13:04 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A03	The sample concentration is more than 4 times the spike level.
A10	PQL's and MDL's were raised due to matrix interference.
Q03	Matrix spike recovery(s) is(are) not within the control limits.

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Date of Report: 11/24/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	[none]
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1425788
Invoice ID:	B189432

Enclosed are the results of analyses for samples received by the laboratory on 10/30/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1425788

Samples were filtered through a 0.45 micron filter for requested analyses.

BC Laboratories, Inc.

14-25788

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

Expanded Constituent Suite
Project: Lagoon Perimeter Subsurface Investigation
Site: MAC
Samplers Name: Charlie Jenkins
Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	MAC-SB3	10/30/14	8:35	water	x	x	x	x
2	MAC-SB4	↓	9:30	↓	↓	↓	↓	↓
3	MAC-SB5	↓	14:35	↓	↓	↓	↓	↓
4								
5								
6								
7								
8								
9								
10								
11								
12								

CHK BY DISTRIBUTION
SUB-OUT
SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

Comments
1) Where indicated, samples shall be filtered (0.45µm) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this COC.
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email:
teangermann@lsce.com

(A)= Analysis (C)= Container (P)= Preservative

Relinquished by: (Signature)	Received By:	Date & Time
Charlie Jenkins	Ross Dickey	10·30·14 1615
Ross Dickey 10·30·14	[illegible]	10·30·14 19:40
[illegible]	[illegible]	10·30·14 2005

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Chain of Custody and Cooler Receipt Form for 1425788 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14-25788

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: P5 Thermometer ID: 207 Date/Time 10/30/14 0845

Temperature: (A) 0.8 °C / (C) 0.4 °C Analyst Init NJ

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A	A							
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:_____
Sample Numbering Completed By: [signature] Date/Time: 10/31/14 0855 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/24/2014 13:33 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425788-01	**COC Number:**	---	**Receive Date:**	10/30/2014 22:45
	Project Number:	---	**Sampling Date:**	10/30/2014 08:35
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	MAC-SB3	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425788-02	**COC Number:**	---	**Receive Date:**	10/30/2014 22:45
	Project Number:	---	**Sampling Date:**	10/30/2014 09:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	MAC-SB4	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425788-03	**COC Number:**	---	**Receive Date:**	10/30/2014 22:45
	Project Number:	---	**Sampling Date:**	10/30/2014 14:35
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	MAC-SB5	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425788-01 | **Client Sample Name:** MAC-SB3, 10/30/2014 8:35:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**87**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**110**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**560**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**13**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**1200**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**310**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.43	**A01**	3
Nitrate as N	**7.0**	**mg/L**	**0.10**	**0.025**	**EPA-300.0**	ND		4
Sulfate	**150**	**mg/L**	**1.0**	**0.18**	**EPA-300.0**	0.29		4
Total Dissolved Solids @ 180 C	**1900**	**mg/L**	**100**	**100**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**1.1**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		6
Ammonia as N	**0.064**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND	**J**	7
Nitrite as N	**0.23**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**1.7**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/15/14	11/21/14 00:34	JRG	PE-OP2	1	BXK1306
2	SM-2320B	11/03/14	11/03/14 16:29	RML	MET-1	2	BXK0100
3	EPA-300.0	10/31/14	11/01/14 16:21	BMW	IC5	2	BXK0055
4	EPA-300.0	10/31/14	11/01/14 00:13	BMW	IC5	1	BXK0055
5	SM-2540C	11/04/14	11/04/14 11:30	CAD	MANUAL	10	BXK0205
6	EPA-351.2	11/14/14	11/17/14 23:43	JP1	SC-1	1	BXK1203
7	EPA-350.1	11/05/14	11/05/14 09:40	JP1	SC-1	1	BXK0275
8	EPA-353.2	10/31/14	10/31/14 12:01	TDC	KONE-1	1	BXK0107
9	EPA-365.4	11/14/14	11/17/14 22:21	JP1	SC-1	1	BXK1211

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425788-02 | **Client Sample Name:** MAC-SB4, 10/30/2014 9:30:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**43**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**30**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**400**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**7.8**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**600**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**190**	**mg/L**	**0.50**	**0.067**	**EPA-300.0**	0.21		3
Nitrate as N	**2.4**	**mg/L**	**0.10**	**0.025**	**EPA-300.0**	ND		3
Sulfate	**210**	**mg/L**	**1.0**	**0.18**	**EPA-300.0**	0.29		3
Total Dissolved Solids @ 180 C	**1400**	**mg/L**	**100**	**100**	**SM-2540C**	ND		4
Total Kjeldahl Nitrogen	**0.60**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		5
Ammonia as N	**0.056**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND	**J**	6
Nitrite as N	**0.24**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		7
Total Phosphate	**0.95**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		8

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/15/14	11/21/14 00:36	JRG	PE-OP2	1	BXK1306
2	SM-2320B	11/03/14	11/03/14 17:17	RML	MET-1	2	BXK0101
3	EPA-300.0	10/31/14	11/01/14 00:30	BMW	IC5	1	BXK0055
4	SM-2540C	11/04/14	11/04/14 11:30	CAD	MANUAL	10	BXK0205
5	EPA-351.2	11/14/14	11/17/14 23:44	JP1	SC-1	1	BXK1203
6	EPA-350.1	11/05/14	11/05/14 09:40	JP1	SC-1	1	BXK0275
7	EPA-353.2	10/31/14	10/31/14 12:01	TDC	KONE-1	1	BXK0107
8	EPA-365.4	11/14/14	11/17/14 22:21	JP1	SC-1	1	BXK1211

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425788-03 | **Client Sample Name:** MAC-SB5, 10/30/2014 2:35:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**86**	**mg/L**	**0.10**	**0.016**	**EPA-200.7**	ND		1
Dissolved Magnesium	**99**	**mg/L**	**0.050**	**0.019**	**EPA-200.7**	ND		1
Dissolved Sodium	**370**	**mg/L**	**0.50**	**0.051**	**EPA-200.7**	ND		1
Dissolved Potassium	**3.1**	**mg/L**	**1.0**	**0.10**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**610**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**280**	**mg/L**	**1.0**	**0.13**	**EPA-300.0**	0.43	**A01**	3
Nitrate as N	**21**	**mg/L**	**0.10**	**0.025**	**EPA-300.0**	ND	**S01**	4
Sulfate	**250**	**mg/L**	**1.0**	**0.18**	**EPA-300.0**	0.29		4
Total Dissolved Solids @ 180 C	**1500**	**mg/L**	**100**	**100**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**0.92**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		6
Ammonia as N	**0.16**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	ND		7
Nitrite as N	**0.21**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**0.52**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/15/14	11/15/14 20:31	SRM	PE-OP2	1	BXK1306
2	SM-2320B	11/03/14	11/03/14 17:25	RML	MET-1	2	BXK0101
3	EPA-300.0	10/31/14	11/01/14 17:13	BMW	IC5	2	BXK0055
4	EPA-300.0	10/31/14	11/01/14 00:48	BMW	IC5	1	BXK0055
5	SM-2540C	11/04/14	11/04/14 11:30	CAD	MANUAL	10	BXK0205
6	EPA-351.2	11/14/14	11/17/14 23:40	JP1	SC-1	1	BXK1203
7	EPA-350.1	11/05/14	11/05/14 09:42	JP1	SC-1	1	BXK0275
8	EPA-353.2	10/31/14	10/31/14 12:01	TDC	KONE-1	1	BXK0107
9	EPA-365.4	11/14/14	11/17/14 22:18	JP1	SC-1	1	BXK1211

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXK0055						
Chloride	**BXK0055-BLK1**	**0.21400**	**mg/L**	**0.50**	**0.067**	**J**
Nitrate as N	BXK0055-BLK1	ND	mg/L	0.10	0.025	
Sulfate	**BXK0055-BLK1**	**0.28800**	**mg/L**	**1.0**	**0.18**	**J**
QC Batch ID: BXK0100						
Bicarbonate Alkalinity as CaCO3	BXK0100-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXK0100-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXK0100-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXK0101						
Bicarbonate Alkalinity as CaCO3	BXK0101-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXK0101-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXK0101-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXK0107						
Nitrite as N	BXK0107-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXK0205						
Total Dissolved Solids @ 180 C	BXK0205-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXK0275						
Ammonia as N	BXK0275-BLK1	ND	mg/L	0.10	0.033	
QC Batch ID: BXK1203						
Total Kjeldahl Nitrogen	BXK1203-BLK1	ND	mg/L	0.20	0.053	
QC Batch ID: BXK1211						
Total Phosphate	BXK1211-BLK1	ND	mg/L	0.15	0.092	
QC Batch ID: BXK1306						
Dissolved Calcium	BXK1306-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXK1306-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXK1306-BLK1	ND	mg/L	0.50	0.051	
Dissolved Potassium	BXK1306-BLK1	ND	mg/L	1.0	0.10	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXK0055										
Chloride	BXK0055-BS1	LCS	51.604	50.000	mg/L	103		90 - 110		
Nitrate as N	BXK0055-BS1	LCS	5.1200	5.0000	mg/L	102		90 - 110		
Sulfate	BXK0055-BS1	LCS	102.54	100.00	mg/L	103		90 - 110		
QC Batch ID: BXK0107										
Nitrite as N	BXK0107-BS1	LCS	0.51680	0.50000	mg/L	103		90 - 110		
QC Batch ID: BXK0205										
Total Dissolved Solids @ 180 C	BXK0205-BS1	LCS	590.00	586.00	mg/L	101		90 - 110		
QC Batch ID: BXK0275										
Ammonia as N	BXK0275-BS1	LCS	0.96780	1.0000	mg/L	96.8		90 - 110		
QC Batch ID: BXK1203										
Total Kjeldahl Nitrogen	BXK1203-BS1	LCS	2.1759	2.0000	mg/L	109		90 - 110		
QC Batch ID: BXK1211										
Total Phosphate	BXK1211-BS1	LCS	3.1085	3.0660	mg/L	101		85 - 115		
QC Batch ID: BXK1306										
Dissolved Calcium	BXK1306-BS1	LCS	10.113	10.000	mg/L	101		85 - 115		
Dissolved Magnesium	BXK1306-BS1	LCS	10.587	10.000	mg/L	106		85 - 115		
Dissolved Sodium	BXK1306-BS1	LCS	10.085	10.000	mg/L	101		85 - 115		
Dissolved Potassium	BXK1306-BS1	LCS	9.7518	10.000	mg/L	97.5		85 - 115		

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXK0055	Used client sample: N										
Chloride	DUP	1425772-02	19.257	19.237		mg/L	0.1		10		
	MS	1425772-02	19.257	71.984	50.505	mg/L		104		80 - 120	
	MSD	1425772-02	19.257	72.674	50.505	mg/L	1.0	106	10	80 - 120	
Nitrate as N	DUP	1425772-02	5.2490	5.2450		mg/L	0.1		10		
	MS	1425772-02	5.2490	10.301	5.0505	mg/L		100		80 - 120	
	MSD	1425772-02	5.2490	10.359	5.0505	mg/L	0.6	101	10	80 - 120	
Sulfate	DUP	1425772-02	19.749	19.767		mg/L	0.1		10		
	MS	1425772-02	19.749	121.82	101.01	mg/L		101		80 - 120	
	MSD	1425772-02	19.749	122.94	101.01	mg/L	0.9	102	10	80 - 120	
QC Batch ID: BXK0100	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1425784-02	75.910	71.500		mg/L	6.0		10		
Carbonate Alkalinity as CaCO3	DUP	1425784-02	20.390	20.690		mg/L	1.5		10		
Hydroxide Alkalinity as CaCO3	DUP	1425784-02	ND	ND		mg/L			10		
QC Batch ID: BXK0101	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1425792-01	69.680	69.370		mg/L	0.4		10		
Carbonate Alkalinity as CaCO3	DUP	1425792-01	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1425792-01	ND	ND		mg/L			10		
QC Batch ID: BXK0107	Used client sample: Y - Description: MAC-SB3, 10/30/2014 08:35										
Nitrite as N	DUP	1425788-01	0.22639	0.22635		mg/L	0.0		10		
	MS	1425788-01	0.22639	0.77401	0.52632	mg/L		104		90 - 110	
	MSD	1425788-01	0.22639	0.77433	0.52632	mg/L	0.0	104	10	90 - 110	
QC Batch ID: BXK0205	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1425756-01	6100.0	6250.0		mg/L	2.4		10		
QC Batch ID: BXK0275	Used client sample: N										
Ammonia as N	DUP	1426111-01	0.95730	0.91630		mg/L	4.4		10		
	MS	1426111-01	0.95730	2.0580	1.1111	mg/L		99.1		90 - 110	
	MSD	1426111-01	0.95730	2.0263	1.1111	mg/L	1.6	96.2	10	90 - 110	
QC Batch ID: BXK1203	Used client sample: Y - Description: MAC-SB5, 10/30/2014 14:35										
Total Kjeldahl Nitrogen	DUP	**1425788-03**	**0.91680**	**1.1519**		**mg/L**	**22.7**		**20**		**Q01**
	MS	**1425788-03**	**0.91680**	**3.2483**	**2.0000**	**mg/L**		**117**		**90 - 110**	**Q03**
	MSD	**1425788-03**	**0.91680**	**3.1005**	**2.0000**	**mg/L**	**4.7**	**109**	**20**	**90 - 110**	
QC Batch ID: BXK1211	Used client sample: Y - Description: MAC-SB5, 10/30/2014 14:35										
Total Phosphate	DUP	1425788-03	0.52217	0.47434		mg/L	9.6		20		
	MS	1425788-03	0.52217	3.5917	3.0660	mg/L		100		80 - 120	
	MSD	1425788-03	0.52217	3.6445	3.0660	mg/L	1.5	102	20	80 - 120	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXK1306	Used client sample: N										
Dissolved Calcium	DUP	1425805-02	23.844	23.806		mg/L	0.2		20		
	MS	1425805-02	23.844	33.353	10.204	mg/L		93.2		85 - 115	
	MSD	1425805-02	23.844	33.414	10.204	mg/L	0.2	93.8	20	85 - 115	
Dissolved Magnesium	DUP	1425805-02	7.3034	7.3272		mg/L	0.3		20		
	MS	1425805-02	7.3034	17.848	10.204	mg/L		103		85 - 115	
	MSD	1425805-02	7.3034	18.029	10.204	mg/L	1.0	105	20	85 - 115	
Dissolved Sodium	DUP	**1425805-02**	**44.426**	**44.464**		**mg/L**	**0.1**		**20**		
	MS	**1425805-02**	**44.426**	**52.930**	**10.204**	**mg/L**		**83.3**		**85 - 115**	**A03**
	MSD	**1425805-02**	**44.426**	**52.869**	**10.204**	**mg/L**	**0.1**	**82.7**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1425805-02	5.9844	6.0140		mg/L	0.5		20		
	MS	1425805-02	5.9844	16.172	10.204	mg/L		99.8		85 - 115	
	MSD	1425805-02	5.9844	16.263	10.204	mg/L	0.6	101	20	85 - 115	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/24/2014 13:33 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A03	The sample concentration is more than 4 times the spike level.
Q01	Sample precision is not within the control limits.
Q03	Matrix spike recovery(s) is(are) not within the control limits.
S01	Sample result is not within the quantitation range of the method.

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Date of Report: 11/24/2014

Till Angermann

Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Client Project:	[none]
BCL Project:	Lagoon Perimeter Subsurface Investigation
BCL Work Order:	1425789
Invoice ID:	B189420

Enclosed are the results of analyses for samples received by the laboratory on 10/30/2014. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Contact Person: Tina Green
Client Services Manager

Authorized Signature

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Case Narratives

Case Narrative for Work Order 1425789

Samples were filtered through a 0.45 micron filter for requested analyses.

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BC Laboratories, Inc.

14-25789

4100 Atlas Ct.
Bakersfield, CA 93308
(661) 327-4911

Chain of Custody

Report to:

Name:	Luhdorff & Scalmanini C.E.
Address:	500 First Street
City:	Woodland
State: CA	CA
Attn:	Till Angermann

Expanded Constituent Suite
Project: Lagoon Perimeter Subsurface Investigation
Site: NUN
Samplers Name: Charlie Jenkins
Global ID -

Analysis Requested

Lab #	Sample ID	Date Sampled	Time Sampled	Matrix	Qt Pe Unpreserved	From Filtered Sample: Ammonia-N, NO3-N, NO2-N	From Filtered Sample: Na, K, Mg, Ca, Cl, SO4 (as SO4), Total Dissolved Solids	From Unfiltered Sample: Total Kjeldahl Nitrogen, Total Phosphate (as PO4), Alkalinity (HCO3, CO3 & OH) as CaCO3
1	NUN-SB1	10/20/14	11:50	water	x	x	x	x
2	NUN-SB2	↓	12:30	↓	↓	↓	↓	↓
3	NUN-SB3		13:00					
4	NUN-SB4		13:50					
5								
6								
7								
8								
9								
10								
11								
12								

CHK BY DISTRIBUTION
SUB-OUT
SHORT HOLDING TIME
Cr^{+6} NO_2 NO_3 OP SS
DO Cl_2 BOD MBAS COT

Comments
1) Where indicated, samples shall be filtered (0.45µm) in the lab to remove turbidity
2) Lab reports shall identify sampled wells exactly as shown on this CoC
3) Send lab reports to Luhdorff and Scalmanini Consulting Engineers via email
tleangermann@lsce.com

Relinquished by: (Signature)	Received By:	Date & Time
Charlie Jenkins	Ross Dickey	10-30-14 16:15
Relinquished by: (Signature) Ross Dickey 10-30-14	Received by:	10-30-14 19:40
Relinquished by: (Signature)	Received By:	10-30-14 2045

(A)= Analysis (C)= Container (P)= Preservative

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Chain of Custody and Cooler Receipt Form for 1425789 Page 2 of 2

BC LABORATORIES INC. COOLER RECEIPT FORM Rev. No. 18 09/04/14 Page 1 Of 1

Submission #: 14 - 25789

SHIPPING INFORMATION
Federal Express ☐ UPS ☐ Hand Delivery ☐
BC Lab Field Service ☒ Other ☐ (Specify)_____

SHIPPING CONTAINER
Ice Chest ☒ None ☐ Box ☐
Other ☐ (Specify)_____

FREE LIQUID
YES ☐ NO ☐

Refrigerant: Ice ☒ Blue Ice ☐ None ☐ Other ☐ Comments:

Custody Seals Ice Chest ☐ Intact? Yes ☐ No ☐ Containers ☐ Intact? Yes ☐ No ☐ None ☒ Comments:

All samples received? Yes ☒ No ☐ All samples containers intact? Yes ☒ No ☐ Description(s) match COC? Yes ☒ No ☐

COC Received ☒ YES ☐ NO

Emissivity: 0.98 Container: PE Thermometer ID: 207 Date/Time 10/30/14 0845

Temperature: (A) 0.8 °C / (C) 0.4 °C Analyst Init SJ

SAMPLE CONTAINERS	SAMPLE NUMBERS 1	2	3	4	5	6	7	8	9	10
QT GENERAL MINERAL/ GENERAL	A	A	A	A						
PT PE UNPRESERVED										
QT INORGANIC CHEMICAL METALS										
PT INORGANIC CHEMICAL METALS										
PT CYANIDE										
PT NITROGEN FORMS										
PT TOTAL SULFIDE										
2oz. NITRATE / NITRITE										
PT TOTAL ORGANIC CARBON										
PT TOX										
PT CHEMICAL OXYGEN DEMAND										
PtA PHENOLICS										
40ml VOA VIAL TRAVEL BLANK										
40ml VOA VIAL										
QT EPA 413.1, 413.2, 418.1										
PT ODOR										
RADIOLOGICAL										
BACTERIOLOGICAL										
40 ml VOA VIAL- 504										
QT EPA 508/608/8080										
QT EPA 515.1/8150										
QT EPA 525										
QT EPA 525 TRAVEL BLANK										
40ml EPA 547										
40ml EPA 531.1										
8oz Amber EPA 548										
QT EPA 549										
QT EPA 632										
QT EPA 8015M										
QT AMBER										
8 OZ. JAR										
32 OZ. JAR										
SOIL SLEEVE										
PCB VIAL										
PLASTIC BAG										
FERROUS IRON										
ENCORE										
SMART KIT										
Summa Canister										

Comments:_____
Sample Numbering Completed By:_____ Date/Time: 10/31/14 0855 [S:\WPDoc\WordPerfect\LAB_DOCS\FORMS\SAMREC]
A = Actual / C = Corrected

Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/24/2014 13:33 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Laboratory / Client Sample Cross Reference

Laboratory	Client Sample Information			
1425789-01	**COC Number:**	---	**Receive Date:**	10/30/2014 22:45
	Project Number:	---	**Sampling Date:**	10/30/2014 11:50
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	NUN-SB1	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425789-02	**COC Number:**	---	**Receive Date:**	10/30/2014 22:45
	Project Number:	---	**Sampling Date:**	10/30/2014 12:30
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	NUN-SB2	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425789-03	**COC Number:**	---	**Receive Date:**	10/30/2014 22:45
	Project Number:	---	**Sampling Date:**	10/30/2014 13:00
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	NUN-SB3	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	
1425789-04	**COC Number:**	---	**Receive Date:**	10/30/2014 22:45
	Project Number:	---	**Sampling Date:**	10/30/2014 13:50
	Sampling Location:	---	**Sample Depth:**	---
	Sampling Point:	NUN-SB4	**Lab Matrix:**	Water
	Sampled By:	---	**Sample Type:**	Water
			Metal Analysis: 2-Lab Filtered and Acidified past 15 minute holding time	

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425789-01 | **Client Sample Name:** NUN-SB1, 10/30/2014 11:50:00AM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**540**	**mg/L**	**0.50**	**0.080**	**EPA-200.7**	ND		1
Dissolved Magnesium	**500**	**mg/L**	**0.25**	**0.095**	**EPA-200.7**	ND		1
Dissolved Sodium	**1800**	**mg/L**	**2.5**	**0.26**	**EPA-200.7**	ND		1
Dissolved Potassium	**16**	**mg/L**	**5.0**	**0.50**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**460**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**1200**	**mg/L**	**10**	**1.3**	**EPA-300.0**	4.3	**A01**	3
Nitrate as N	**56**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01,S01**	4
Sulfate	**4500**	**mg/L**	**20**	**3.6**	**EPA-300.0**	5.8	**A01**	3
Total Dissolved Solids @ 180 C	**9500**	**mg/L**	**500**	**500**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**3.0**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		6
Ammonia as N	**1.2**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	0.036		7
Nitrite as N	**0.086**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**1.4**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/15/14	11/15/14 20:40	SRM	PE-OP2	5	BXK1306
2	SM-2320B	11/03/14	11/03/14 17:33	RML	MET-1	2	BXK0101
3	EPA-300.0	10/31/14	11/02/14 18:05	OLH	IC5	20	BXK0055
4	EPA-300.0	10/31/14	11/01/14 01:05	BMW	IC5	2	BXK0055
5	SM-2540C	11/05/14	11/05/14 12:30	CAD	MANUAL	50	BXK0324
6	EPA-351.2	11/14/14	11/17/14 23:47	JP1	SC-1	1	BXK1203
7	EPA-350.1	11/07/14	11/07/14 13:44	JP1	SC-1	1	BXK0568
8	EPA-353.2	10/31/14	10/31/14 12:01	TDC	KONE-1	1	BXK0107
9	EPA-365.4	11/14/14	11/17/14 22:23	JP1	SC-1	1	BXK1211

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425789-02 | **Client Sample Name:** NUN-SB2, 10/30/2014 12:30:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**670**	**mg/L**	**0.50**	**0.080**	**EPA-200.7**	ND		1
Dissolved Magnesium	**330**	**mg/L**	**0.25**	**0.095**	**EPA-200.7**	ND		1
Dissolved Sodium	**960**	**mg/L**	**2.5**	**0.26**	**EPA-200.7**	ND		1
Dissolved Potassium	**8.6**	**mg/L**	**5.0**	**0.50**	**EPA-200.7**	ND		1
Bicarbonate Alkalinity as CaCO3	**560**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**530**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	1.1	**A01**	3
Nitrate as N	**550**	**mg/L**	**5.0**	**1.2**	**EPA-300.0**	ND	**A01,S05,Z1**	4
Sulfate	**1700**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	1.4	**A01**	3
Total Dissolved Solids @ 180 C	**6400**	**mg/L**	**500**	**500**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**2.9**	**mg/L**	**0.20**	**0.053**	**EPA-351.2**	ND		6
Ammonia as N	**1.8**	**mg/L**	**0.10**	**0.033**	**EPA-350.1**	0.036		7
Nitrite as N	**0.51**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		8
Total Phosphate	**1.1**	**mg/L**	**0.15**	**0.092**	**EPA-365.4**	ND		9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/15/14	11/15/14 20:43	SRM	PE-OP2	5	BXK1306
2	SM-2320B	11/03/14	11/03/14 17:42	RML	MET-1	2	BXK0101
3	EPA-300.0	10/31/14	11/01/14 01:22	BMW	IC5	5	BXK0055
4	EPA-300.0	11/04/14	11/04/14 21:39	OLH	IC1	50	BXK0177
5	SM-2540C	11/05/14	11/05/14 12:30	CAD	MANUAL	50	BXK0324
6	EPA-351.2	11/14/14	11/17/14 23:47	JP1	SC-1	1	BXK1203
7	EPA-350.1	11/07/14	11/07/14 13:45	JP1	SC-1	1	BXK0568
8	EPA-353.2	10/31/14	10/31/14 12:01	TDC	KONE-1	1	BXK0107
9	EPA-365.4	11/14/14	11/17/14 22:24	JP1	SC-1	1	BXK1211

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425789-03 | **Client Sample Name:** NUN-SB3, 10/30/2014 1:00:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**600**	**mg/L**	**0.50**	**0.080**	**EPA-200.7**	ND	**A10**	1
Dissolved Magnesium	**290**	**mg/L**	**0.25**	**0.095**	**EPA-200.7**	ND	**A10**	1
Dissolved Sodium	**700**	**mg/L**	**2.5**	**0.26**	**EPA-200.7**	ND	**A10**	1
Dissolved Potassium	**40**	**mg/L**	**5.0**	**0.50**	**EPA-200.7**	ND	**A10**	1
Bicarbonate Alkalinity as CaCO3	**930**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**810**	**mg/L**	**2.5**	**0.34**	**EPA-300.0**	1.1	**A01**	3
Nitrate as N	**12**	**mg/L**	**0.20**	**0.050**	**EPA-300.0**	ND	**A01**	4
Sulfate	**2000**	**mg/L**	**5.0**	**0.90**	**EPA-300.0**	1.4	**A01**	3
Total Dissolved Solids @ 180 C	**5400**	**mg/L**	**200**	**200**	**SM-2540C**	ND		5
Total Kjeldahl Nitrogen	**20**	**mg/L**	**1.0**	**0.26**	**EPA-351.2**	ND	**A01**	6
Ammonia as N	**19**	**mg/L**	**1.0**	**0.33**	**EPA-350.1**	0.36	**A01**	7
Nitrite as N	**0.011**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND	**J**	8
Total Phosphate	ND	mg/L	0.75	0.46	EPA-365.4	ND	A01	9

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/15/14	11/15/14 20:45	SRM	PE-OP2	5	BXK1306
2	SM-2320B	11/03/14	11/03/14 17:50	RML	MET-1	2	BXK0101
3	EPA-300.0	10/31/14	11/01/14 17:48	BMW	IC5	5	BXK0055
4	EPA-300.0	10/31/14	11/01/14 01:40	BMW	IC5	2	BXK0055
5	SM-2540C	11/05/14	11/05/14 12:30	CAD	MANUAL	20	BXK0324
6	EPA-351.2	11/20/14	11/21/14 11:39	JP1	SC-1	5	BXK1849
7	EPA-350.1	11/07/14	11/07/14 13:47	JP1	SC-1	10	BXK0568
8	EPA-353.2	10/31/14	10/31/14 12:03	TDC	KONE-1	1	BXK0107
9	EPA-365.4	11/14/14	11/17/14 22:24	JP1	SC-1	5	BXK1211

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

BCL Sample ID: 1425789-04 | **Client Sample Name:** NUN-SB4, 10/30/2014 1:50:00PM

Constituent	Result	Units	PQL	MDL	Method	MB Bias	Lab Quals	Run #
Dissolved Calcium	**470**	**mg/L**	**1.0**	**0.16**	**EPA-200.7**	ND	**A10**	1
Dissolved Magnesium	**820**	**mg/L**	**0.50**	**0.19**	**EPA-200.7**	ND	**A10**	1
Dissolved Sodium	**3600**	**mg/L**	**5.0**	**0.51**	**EPA-200.7**	ND	**A10**	1
Dissolved Potassium	**18**	**mg/L**	**10**	**1.0**	**EPA-200.7**	ND	**A10**	1
Bicarbonate Alkalinity as CaCO3	**380**	**mg/L**	**8.2**	**8.2**	**SM-2320B**	ND		2
Carbonate Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Hydroxide Alkalinity as CaCO3	ND	mg/L	8.2	8.2	SM-2320B	ND		2
Chloride	**2200**	**mg/L**	**10**	**1.3**	**EPA-300.0**	4.3	**A01**	3
Nitrate as N	**12**	**mg/L**	**1.0**	**0.25**	**EPA-300.0**	ND	**A01**	4
Sulfate	**8900**	**mg/L**	**50**	**9.0**	**EPA-300.0**	14	**A01**	5
Total Dissolved Solids @ 180 C	**16000**	**mg/L**	**500**	**500**	**SM-2540C**	ND		6
Total Kjeldahl Nitrogen	**14**	**mg/L**	**1.0**	**0.26**	**EPA-351.2**	ND	**A01**	7
Ammonia as N	**13**	**mg/L**	**1.0**	**0.33**	**EPA-350.1**	0.36	**A01**	8
Nitrite as N	**0.068**	**mg/L**	**0.050**	**0.010**	**EPA-353.2**	ND		9
Total Phosphate	**1.6**	**mg/L**	**0.75**	**0.46**	**EPA-365.4**	ND	**A01**	10

Run #	Method	Prep Date	Run Date/Time	Analyst	Instrument	Dilution	QC Batch ID
1	EPA-200.7	11/15/14	11/15/14 20:54	SRM	PE-OP2	10	BXK1306
2	SM-2320B	11/03/14	11/03/14 18:00	RML	MET-1	2	BXK0101
3	EPA-300.0	10/31/14	11/01/14 18:05	BMW	IC5	20	BXK0055
4	EPA-300.0	10/31/14	11/01/14 01:57	BMW	IC5	10	BXK0055
5	EPA-300.0	10/31/14	11/02/14 18:23	OLH	IC5	50	BXK0055
6	SM-2540C	11/05/14	11/05/14 12:30	CAD	MANUAL	50	BXK0324
7	EPA-351.2	11/14/14	11/17/14 23:49	JP1	SC-1	5	BXK1203
8	EPA-350.1	11/07/14	11/07/14 14:18	JP1	SC-1	10	BXK0568
9	EPA-353.2	10/31/14	10/31/14 12:03	TDC	KONE-1	1	BXK0107
10	EPA-365.4	11/14/14	11/17/14 22:25	JP1	SC-1	5	BXK1211

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Luhdorf & Scalmanini
500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Method Blank Analysis

Constituent	QC Sample ID	MB Result	Units	PQL	MDL	Lab Quals
QC Batch ID: BXK0055						
Chloride	**BXK0055-BLK1**	**0.21400**	**mg/L**	**0.50**	**0.067**	**J**
Nitrate as N	BXK0055-BLK1	ND	mg/L	0.10	0.025	
Sulfate	**BXK0055-BLK1**	**0.28800**	**mg/L**	**1.0**	**0.18**	**J**
QC Batch ID: BXK0101						
Bicarbonate Alkalinity as CaCO3	BXK0101-BLK1	ND	mg/L	4.1	4.1	
Carbonate Alkalinity as CaCO3	BXK0101-BLK1	ND	mg/L	4.1	4.1	
Hydroxide Alkalinity as CaCO3	BXK0101-BLK1	ND	mg/L	4.1	4.1	
QC Batch ID: BXK0107						
Nitrite as N	BXK0107-BLK1	ND	mg/L	0.050	0.010	
QC Batch ID: BXK0177						
Nitrate as N	BXK0177-BLK1	ND	mg/L	0.10	0.025	
QC Batch ID: BXK0324						
Total Dissolved Solids @ 180 C	BXK0324-BLK1	ND	mg/L	6.7	6.7	
QC Batch ID: BXK0568						
Ammonia as N	**BXK0568-BLK1**	**0.035800**	**mg/L**	**0.10**	**0.033**	**J**
QC Batch ID: BXK1203						
Total Kjeldahl Nitrogen	BXK1203-BLK1	ND	mg/L	0.20	0.053	
QC Batch ID: BXK1211						
Total Phosphate	BXK1211-BLK1	ND	mg/L	0.15	0.092	
QC Batch ID: BXK1306						
Dissolved Calcium	BXK1306-BLK1	ND	mg/L	0.10	0.016	
Dissolved Magnesium	BXK1306-BLK1	ND	mg/L	0.050	0.019	
Dissolved Sodium	BXK1306-BLK1	ND	mg/L	0.50	0.051	
Dissolved Potassium	BXK1306-BLK1	ND	mg/L	1.0	0.10	
QC Batch ID: BXK1849						
Total Kjeldahl Nitrogen	BXK1849-BLK1	ND	mg/L	0.20	0.053	

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Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Laboratory Control Sample

Constituent	QC Sample ID	Type	Result	Spike Level	Units	Percent Recovery	RPD	Control Limits Percent Recovery	Control Limits RPD	Lab Quals
QC Batch ID: BXK0055										
Chloride	BXK0055-BS1	LCS	51.604	50.000	mg/L	103		90 - 110		
Nitrate as N	BXK0055-BS1	LCS	5.1200	5.0000	mg/L	102		90 - 110		
Sulfate	BXK0055-BS1	LCS	102.54	100.00	mg/L	103		90 - 110		
QC Batch ID: BXK0107										
Nitrite as N	BXK0107-BS1	LCS	0.51680	0.50000	mg/L	103		90 - 110		
QC Batch ID: BXK0177										
Nitrate as N	BXK0177-BS1	LCS	5.2450	5.0000	mg/L	105		90 - 110		
QC Batch ID: BXK0324										
Total Dissolved Solids @ 180 C	BXK0324-BS1	LCS	570.00	586.00	mg/L	97.3		90 - 110		
QC Batch ID: BXK0568										
Ammonia as N	BXK0568-BS1	LCS	1.0178	1.0000	mg/L	102		90 - 110		
QC Batch ID: BXK1203										
Total Kjeldahl Nitrogen	BXK1203-BS1	LCS	2.1759	2.0000	mg/L	109		90 - 110		
QC Batch ID: BXK1211										
Total Phosphate	BXK1211-BS1	LCS	3.1085	3.0660	mg/L	101		85 - 115		
QC Batch ID: BXK1306										
Dissolved Calcium	BXK1306-BS1	LCS	10.113	10.000	mg/L	101		85 - 115		
Dissolved Magnesium	BXK1306-BS1	LCS	10.587	10.000	mg/L	106		85 - 115		
Dissolved Sodium	BXK1306-BS1	LCS	10.085	10.000	mg/L	101		85 - 115		
Dissolved Potassium	BXK1306-BS1	LCS	9.7518	10.000	mg/L	97.5		85 - 115		
QC Batch ID: BXK1849										
Total Kjeldahl Nitrogen	BXK1849-BS1	LCS	1.8431	2.0000	mg/L	92.2		90 - 110		

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Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXK0055	Used client sample: N										
Chloride	DUP	1425772-02	19.257	19.237		mg/L	0.1		10		
	MS	1425772-02	19.257	71.984	50.505	mg/L		104		80 - 120	
	MSD	1425772-02	19.257	72.674	50.505	mg/L	1.0	106	10	80 - 120	
Nitrate as N	DUP	1425772-02	5.2490	5.2450		mg/L	0.1		10		
	MS	1425772-02	5.2490	10.301	5.0505	mg/L		100		80 - 120	
	MSD	1425772-02	5.2490	10.359	5.0505	mg/L	0.6	101	10	80 - 120	
Sulfate	DUP	1425772-02	19.749	19.767		mg/L	0.1		10		
	MS	1425772-02	19.749	121.82	101.01	mg/L		101		80 - 120	
	MSD	1425772-02	19.749	122.94	101.01	mg/L	0.9	102	10	80 - 120	
QC Batch ID: BXK0101	Used client sample: N										
Bicarbonate Alkalinity as CaCO3	DUP	1425792-01	69.680	69.370		mg/L	0.4		10		
Carbonate Alkalinity as CaCO3	DUP	1425792-01	ND	ND		mg/L			10		
Hydroxide Alkalinity as CaCO3	DUP	1425792-01	ND	ND		mg/L			10		
QC Batch ID: BXK0107	Used client sample: Y - Description: MAC-SB3, 10/30/2014 08:35										
Nitrite as N	DUP	1425788-01	0.22639	0.22635		mg/L	0.0		10		
	MS	1425788-01	0.22639	0.77401	0.52632	mg/L		104		90 - 110	
	MSD	1425788-01	0.22639	0.77433	0.52632	mg/L	0.0	104	10	90 - 110	
QC Batch ID: BXK0177	Used client sample: N										
Nitrate as N	DUP	1425166-01	ND	ND		mg/L			10		
	MS	1425166-01	ND	5.4010	5.0505	mg/L		107		80 - 120	
	MSD	1425166-01	ND	5.3646	5.0505	mg/L	0.7	106	10	80 - 120	
QC Batch ID: BXK0324	Used client sample: N										
Total Dissolved Solids @ 180 C	DUP	1425786-05	2930.0	2930.0		mg/L	0		10		
QC Batch ID: BXK0568	Used client sample: N										
Ammonia as N	DUP	1425852-02	0.034300	ND		mg/L			10		
	MS	1425852-02	0.034300	1.0788	1.1111	mg/L		94.0		90 - 110	
	MSD	1425852-02	0.034300	1.1003	1.1111	mg/L	2.0	95.9	10	90 - 110	
QC Batch ID: BXK1203	Used client sample: Y - Description: MAC-SB5, 10/30/2014 14:35										
Total Kjeldahl Nitrogen	DUP	**1425788-03**	**0.91680**	**1.1519**		**mg/L**	**22.7**		**20**		**Q01**
	MS	**1425788-03**	**0.91680**	**3.2483**	**2.0000**	**mg/L**		**117**		**90 - 110**	**Q03**
	MSD	**1425788-03**	**0.91680**	**3.1005**	**2.0000**	**mg/L**	**4.7**	**109**	**20**	**90 - 110**	
QC Batch ID: BXK1211	Used client sample: Y - Description: MAC-SB5, 10/30/2014 14:35										
Total Phosphate	DUP	1425788-03	0.52217	0.47434		mg/L	9.6		20		
	MS	1425788-03	0.52217	3.5917	3.0660	mg/L		100		80 - 120	
	MSD	1425788-03	0.52217	3.6445	3.0660	mg/L	1.5	102	20	80 - 120	
QC Batch ID: BXK1306	Used client sample: N										

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500 First Street
Woodland, CA 95695

Reported: 11/24/2014 13:33
Project: Lagoon Perimeter Subsurface Investigation
Project Number: [none]
Project Manager: Till Angermann

Water Analysis (General Chemistry)

Quality Control Report - Precision & Accuracy

Constituent	Type	Source Sample ID	Source Result	Result	Spike Added	Units	RPD	Percent Recovery	Control Limits RPD	Control Limits Percent Recovery	Lab Quals
QC Batch ID: BXK1306	Used client sample: N										
Dissolved Calcium	DUP	1425805-02	23.844	23.806		mg/L	0.2		20		
	MS	1425805-02	23.844	33.353	10.204	mg/L		93.2		85 - 115	
	MSD	1425805-02	23.844	33.414	10.204	mg/L	0.2	93.8	20	85 - 115	
Dissolved Magnesium	DUP	1425805-02	7.3034	7.3272		mg/L	0.3		20		
	MS	1425805-02	7.3034	17.848	10.204	mg/L		103		85 - 115	
	MSD	1425805-02	7.3034	18.029	10.204	mg/L	1.0	105	20	85 - 115	
Dissolved Sodium	DUP	**1425805-02**	**44.426**	**44.464**		**mg/L**	**0.1**		**20**		
	MS	**1425805-02**	**44.426**	**52.930**	**10.204**	**mg/L**		**83.3**		**85 - 115**	**A03**
	MSD	**1425805-02**	**44.426**	**52.869**	**10.204**	**mg/L**	**0.1**	**82.7**	**20**	**85 - 115**	**A03**
Dissolved Potassium	DUP	1425805-02	5.9844	6.0140		mg/L	0.5		20		
	MS	1425805-02	5.9844	16.172	10.204	mg/L		99.8		85 - 115	
	MSD	1425805-02	5.9844	16.263	10.204	mg/L	0.6	101	20	85 - 115	
QC Batch ID: BXK1849	Used client sample: N										
Total Kjeldahl Nitrogen	DUP	1427060-02	0.48450	0.44590		mg/L	8.3		20		
	MS	1427060-02	0.48450	2.3862	2.0000	mg/L		95.1		90 - 110	
	MSD	1427060-02	0.48450	2.2976	2.0000	mg/L	3.8	90.7	20	90 - 110	

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Luhdorf & Scalmanini 500 First Street Woodland, CA 95695	**Reported:** 11/24/2014 13:33 Project: Lagoon Perimeter Subsurface Investigation Project Number: [none] Project Manager: Till Angermann

Notes And Definitions

J	Estimated Value (CLP Flag)
MDL	Method Detection Limit
ND	Analyte Not Detected at or above the reporting limit
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
A01	PQL's and MDL's are raised due to sample dilution.
A03	The sample concentration is more than 4 times the spike level.
A10	PQL's and MDL's were raised due to matrix interference.
Q01	Sample precision is not within the control limits.
Q03	Matrix spike recovery(s) is(are) not within the control limits.
S01	Sample result is not within the quantitation range of the method.
S05	The sample holding time was exceeded.
Z1	Sample was analyzed within holding time, but that result was above quantitation range and not accurate.

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