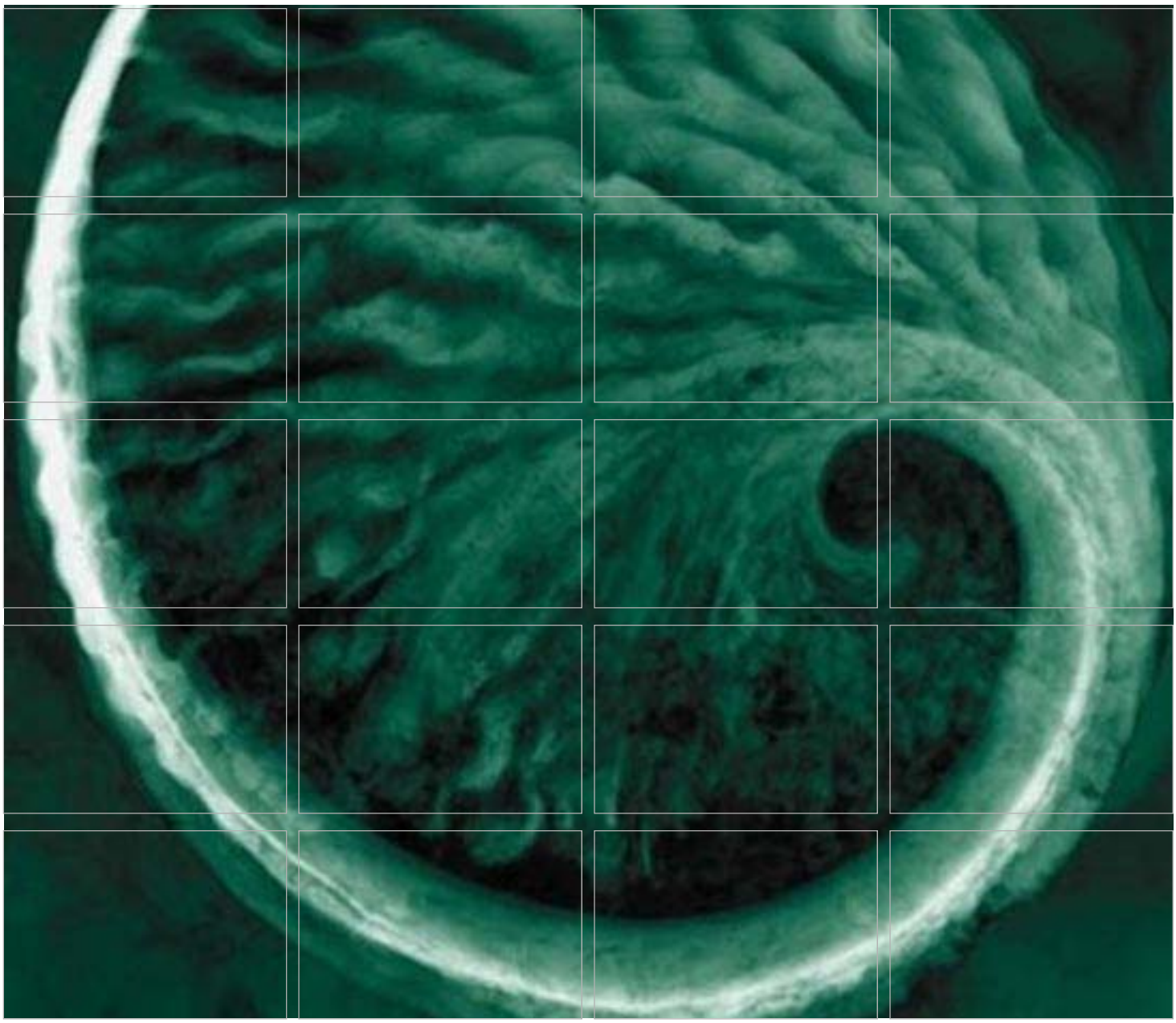

Annual Groundwater Monitoring and Corrective Action Report

CPS Energy
Calaveras Power Station – Evaporation Pond
San Antonio, Texas

January 2018

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Calaveras Power Station – Evaporation Pond

Annual Groundwater Monitoring and Corrective Action Report

January 2018

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1. INTRODUCTION

CPS Energy owns and operates the Calaveras Power Station which consists of two power plants (J.T Deely and J.K. Spruce) that are subject to regulation under Title 40, Code of Federal Regulations, Part 257 (40 CFR §257) (a.k.a. the CCR Rule). The Power Station is located in unincorporated Bexar County, Texas, approximately 13 miles southeast of San Antonio. Currently, CPS Energy operates four CCR units at the Power Station: Evaporation Pond, Bottom Ash Ponds, Fly Ash Landfill, and the Sludge Recycle Holding Pond. This Annual Groundwater Monitoring and Corrective Action Report (Report) addresses the Evaporation Pond. The other units listed above are discussed in separate reports.

This Report was produced by Environmental Resource Management (ERM), on behalf of CPS Energy, and summarizes the groundwater monitoring activities for the Evaporation Pond and provides a statistical summary of the findings for samples collected on or before October 17, 2017 as required by §257.90. Consistent with the requirements of the CCR Rule, this Report will be posted to the facility's operating record and notification will be made to the State of Texas. Additionally, this Report will be placed on the publically accessible internet site no later than January 31, 2018 (§257.105(h), §257.106(h), §257.107(h)). Unless otherwise mentioned, the analyses in this Report follow the Groundwater Sampling and Analysis Program (SAP) (ERM, 2017) posted on the internet site. The table below cross references the reporting requirements under the CCR Rule with the contents of this Report.

Regulatory Requirement Cross-Reference

Regulatory Citation	Requirement (paraphrased)	Where Addressed in this Report
§257.90(e)	Status of the groundwater monitoring and corrective action program	Section 2
§257.90(e)	Summarize key actions completed	Section 2
§257.90(e)	Describe any problems encountered and actions to resolve problems	Section 2
§257.90(e)	Key activities for upcoming year	Section 4
§257.90(e)(1)	Map or aerial image of CCR unit and monitoring wells	Figure 1
§257.90(e)(2)	Identification of new monitoring wells installed or decommissioned during the preceding year	Section 2
§257.90(e)(3)	Summary of groundwater data, monitoring wells and dates sampled, and whether sample was required under detection or assessment monitoring	Sections 2 and 3, Tables 1 through 3, and Figure 2
§257.90(e)(4)	Narrative discussion of any transition between monitoring programs	Section 4

The Evaporation Pond is located northeast of the Power Station generating units and is south of the Fly Ash Landfill. The Evaporation Pond currently receives boiler chemical cleaning waste and other authorized liquid wastes. The Evaporation Pond was originally constructed as a fly ash landfill, but was converted from a landfill to an impoundment in 1996. The CCR unit location is shown on Figure 1.

2. *PROGRAM STATUS*

Since December 2016, groundwater samples were collected as part of background wamplingfrom the groundwater monitoring well network certified for use in determining compliance with the CCR Rule.

The groundwater monitoring well network consists of three upgradient monitoring wells (JKS-47, JKS-63, and JKS-64) and three downgradient monitoring wells (JKS-36, JKS-61, and JKS-62). All monitoring wells are screened within the uppermost groundwater bearing unit (GWBU). The uppermost GWBU is approximately 20 feet thick and is comprised of clayey/silty sand to well-sorted sand. The uppermost GWBU is located below unconfining units (i.e., sands, silts, and low to medium plasticity clays), and above a high plasticity clay (lower confining unit).

The monitoring well locations are shown in Figure 1. No problems were encountered in the data collection or in well performance with the exception of JKS-63. A groundwater sample was not collected from JKS-63 during the June 2017 sampling event due to well performance (well went dry). No action was required to resolve any issues. No new monitoring wells were installed or decommissioned after the certification of the well network.

2.1. *GROUNDWATER FLOW RATE AND DIRECTION*

Depth to groundwater surface measurements were made at each monitoring well prior to each sampling event. Groundwater elevations were calculated by subtracting the depth to groundwater from the surveyed reference elevation for each well.

Groundwater elevations for all eight sampling events are summarized in Table 1. Groundwater elevations and the potentiometric surface for the last sampling event (October 2017) are shown on Figure 2. Groundwater in the vicinity of the Evaporation Pond appears to flow towards Lake Calaveras (southeast). The horizontal gradient is approximately 0.003 feet/foot.

2.2. *SAMPLING SUMMARY*

A summary of the total number of samples collected from each monitoring well is provided in Table 2. Groundwater analytical results (Appendix III and Appendix IV constituents) for all eight sampling events are summarized in Table 3. Laboratory data packages are provided in Appendix A.

The Evaporation Pond monitoring wells were sampled using low flow sampling techniques during the eight sampling events from December 2016 to October 2017. CPS Energy completed each of the sampling events (ERM assisted during the first and second events). Although each monitoring well was sampled, with the exception of JKS-63 (as noted above), the following data gap has been identified:

- Boron was not analyzed from the sample collected at monitoring well JKS-63 during the March 2017 sampling event due to an error by the laboratory.

2.3. *DATA QUALITY*

ERM reviewed field and laboratory documentation to assess the validity, reliability and usability of the analytical results. Samples were sent to Xenco Laboratories, located in San

Antonio, Texas for analysis. Xenco Laboratories subcontracted Gel Laboratories, LLC located in Charleston, South Carolina for the analysis of Radium-226 and Radium-228. Data quality information reviewed for these results included field sampling forms, chain-of-custody documentation, holding times, lab methods, cooler temperatures, laboratory method blanks, laboratory control sample recoveries, field duplicate samples, matrix spikes / matrix spike duplicates, quantitation limits, and equipment blanks. A summary of the data qualifiers are included in Table 3. The data quality review found the results to be valid, reliable, and useable for decision making purposes with the listed qualifiers. No analytical results were rejected.

3. STATISTICAL ANALYSIS AND RESULTS

Consistent with the CCR Rule and the SAP, a prediction limit approach [40 CFR §257.93(f)] was used to identify potential impacts to groundwater. Tables and figures generated as part of the statistical analysis are provided in Appendix B. The steps outlined in the decision framework in the SAP include:

- Interwell versus intrawell comparisons;
- Establishment of upgradient dataset;
- Calculation of prediction limits; and
- Conclusions.

3.1. INTERWELL VS INTRAWELL COMPARISONS

When multiple upgradient wells were available within the same unit, concentrations were compared among these wells to determine if they could be pooled to create a single, interwell, upgradient dataset. For each analyte, Boxplots (Appendix B, Figure 1) and Kruskal-Wallis test results (Appendix B, Table 1) are provided for upgradient wells. The statistical test shows that:

- One Appendix III analyte [fluoride] will follow interwell analysis, with no significant difference present in upgradient data; and
- The remaining six Appendix III analytes [boron, calcium, chloride, pH, sulfate, and total dissolved solids (TDS)] will follow intrawell analysis, with significant difference present in upgradient data.

Interwell analytes will use a pooled upgradient dataset for subsequent report sections. Conversely, intrawell analytes will have each individual upgradient dataset used for subsequent report sections.

3.2. ESTABLISHMENT OF UPGRADIENT DATASET

When evaluating the concentrations of analytes in groundwater, USEPA Unified Guidance (2009) recommends performing a careful quality check of the data to identify any anomalies. In addition to the data validation that was performed, descriptive statistics, outlier testing, and temporal stationarity checks were completed to finalize the upgradient dataset.

3.2.1. Descriptive Statistics

Descriptive statistics were calculated for the upgradient wells and analytes at the Evaporation Pond (Appendix B, Table 2). The descriptive statistics highlight a number of relevant characteristics about the upgradient datasets including:

- There are a total of 19 well-analyte combinations for the upgradient dataset;
- 19 well-analyte combinations have detection rates greater than or equal to 50 percent;
- 17 well-analyte combinations have 100 percent detects;
- 13 well-analyte combinations follow a normal distribution (using Shapiro-Wilks Normality Test);
- Two well-analyte combinations follow a log-normal distribution; and
- Four well-analyte combinations have no discernible distribution.

3.2.2. Outlier Determination

Both statistical and visual outlier tests were performed on the upgradient datasets. Data points identified as both a statistical and visual outlier (Appendix B, Table 3 and Appendix B, Figure 2) were reviewed before they were excluded from the dataset. A total of two outliers were initially flagged in the upgradient datasets. The outlier values were likely the result of seasonal fluctuations and were within the range of values found in nearby upgradient wells. No analytical or sampling issues were identified during data review, therefore these outlier values were considered valid and were retained in the dataset.

3.2.3. Check for Temporal Stability

A trend test was performed for all values in the upgradient wells that had at least five detected data points and at least 50 percent detection rate. Time series figures of upgradient wells are provided in Appendix B, Figure 3. Additionally, the Mann Kendall trend test results is provided in Appendix B, Table 4. The following summarizes the results of the trend analysis:

- There are a total of 19 well-analyte combinations in the upgradient dataset;
- 19 well-analyte combinations meet the data requirements of the trend test of which:
    - No well-analyte combinations had a significant increasing trend;
    - Two well-analyte combinations had a significant decreasing trend; and
    - 17 well-analyte combinations had no significant trend (i.e., concentrations were stable over time).

3.3. CALCULATION OF PREDICTION LIMITS

A multi-part assessment of the monitoring wells was performed to determine what type of upper prediction limit (UPL) to calculate as a compliance point. Different decision framework will be applied for each upgradient well based on inter/intrawell analysis, data availability, and presence of temporal trends.

A total of two well-analyte combinations were found to have either increasing or decreasing trends. For these well-analyte pairs, a bootstrapped UPL calculated around a Theil Sen trend was used to derive a more accurate UPL. The remaining 17 well-analyte combinations were found to have no significant trend. Sanitas was used to calculate static UPLs using an annual site-wide false positive rate of 0.1 with a 1-of-2 re-testing approach.

A final UPL was selected for each analyte and compared to the most recent sample in the downgradient wells. A final lower prediction limit (LPL) was also selected for pH. For the one analyte following interwell analysis, the upgradient dataset was pooled prior to UPL

calculations, resulting in a single UPL value per analyte. For the six analytes following intrawell analysis, a UPL value was calculated for each of the upgradient wells. For these wells and analytes, the maximum UPL was selected as the representative UPL for each analyte. A similar approach was used to determine the LPL for pH, however, the minimum LPL was selected in the case of intrawell analysis. All final UPL and LPL values are shown in the table below. Full upgradient well calculations are provided in Appendix B, Table 5.

Final UPL and LPL Values

Analysis Type	Analyte	LPL	UPL	Unit
Intrawell	Boron	--	1.53	mg/L
Intrawell	Calcium	--	1,380	mg/L
Intrawell	Chloride	--	2,180	mg/L
Interwell	Fluoride	--	0.465	mg/L
Intrawell	pH	5.68	6.75	SU
Intrawell	Sulfate	--	1,970	mg/L
Intrawell	TDS	--	6,640	mg/L

3.4. CONCLUSIONS

The downgradient samples collected during the October 2017 sampling event were used for compliance comparisons. All downgradient wells were below the UPLs and above the LPLs with the following exceptions shown in the table below. Full downgradient results are provided in Appendix B, Table 6.

Downgradient Results Exceedances

Analyte	Well	LPL	UPL	Sample Date	Value	Unit
Fluoride	JKS-36	--	0.465	2017-10-11	1.32	mg/L
pH	JKS-36	5.68	6.75	2017-10-11	3.24	SU

All initial exceedances of the UPL and LPL will be confirmed with re-testing of the downgradient wells per the 1-of-2 re-testing scheme. If the initial exceedance is confirmed with re-testing results from the same well, the well-analyte pair will be declared a statistically significant increase (SSI) above background. Any wells with re-testing results at or below the UPL, or at or above the LPL, will be considered in compliance and will not require further action. These resampling results will be reported in the next Annual Groundwater Monitoring and Corrective Action Report.

All downgradient wells with initial exceedances were examined for trends to assess the stability of concentrations. A summary of these trend test results are provided in Appendix B, Figure 4. None of the downgradient datasets with potential SSIs have significant trends.

4. RECOMMENDATIONS

Currently, there are no plans to transition between detection monitoring and assessment monitoring. Consistent with the 1-of-2 re-testing approach described in the Unified Guidance

and the SAP, initial exceedances will be re-tested within 90 days. Based on these re-testing results, if an SSI is found, a notification or written demonstration will be prepared within 90 days. Based on the findings of the written demonstration, detection monitoring and/or assessment monitoring will be initiated as appropriate under §257.94 and §257.95.

5. REFERENCES

ERM, 2017. *Groundwater Sampling and Analysis Program.* Austin, Texas.

USEPA, 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities.* Unified Guidance. USEPA/530/R/09/007. Office of Resource Conservation and Recovery. Washington, D.C.

Tables

TABLE 1
Groundwater Elevations Summary
CPS Energy - Calaveras Power Station
Evaporation Pond

		JKS-47 Background		JKS-63 Background		JKS-64 Background	
		TOC Elevation	513.63	TOC Elevation	526.862	TOC Elevation	507.84
Sampling Event	Sampling Event Dates	Depth to Water (feet btoc)	Water Level (msl)	Depth to Water (feet btoc)	Water Level (msl)	Depth to Water (feet btoc)	Water Level (msl)
1	12/6/16 to 12/8/16	30.98	482.65	44.45	482.41	24.98	482.86
2	2/21/17 to 2/23/17 (1)	30.64	482.99	44.25	482.61	24.24	483.60
3	3/28/17 to 3/30/17	30.47	483.16	44.12	482.74	24.21	483.63
4	5/2/17 to 5/4/17	30.29	483.34	43.89	482.97	24.46	483.38
5	6/20/17 to 6/21/17	30.40	483.23	43.85	483.01	24.40	483.44
6	7/25/17 to 7/26/17	30.62	483.01	44.00	482.86	24.78	483.06
7	8/29/17 to 8/30/17	30.50	483.13	43.90	482.96	25.70	482.14
8	10/10/17 to 10/11/17	30.71	482.92	44.05	482.81	24.95	482.89

		JKS-36 Downgradient		JKS-61 Downgradient		JKS-62 Downgradient	
		TOC Elevation	508.41	TOC Elevation	505.51	TOC Elevation	509.84
Sampling Event	Sampling Event Dates	Depth to Water (feet btoc)	Water Level (msl)	Depth to Water (feet btoc)	Water Level (msl)	Depth to Water (feet btoc)	Water Level (msl)
1	12/6/16 to 12/8/16	25.99	482.42	23.95	481.56	28.63	481.21
2	2/21/17 to 2/23/17 (1)	25.78	482.63	23.31	482.20	28.30	481.54
3	3/28/17 to 3/30/17	25.37	483.04	23.10	482.41	28.42	481.42
4	5/2/17 to 5/4/17	43.89	464.52	22.85	482.66	28.00	481.84
5	6/20/17 to 6/21/17	25.40	483.01	22.05	483.46	28.05	481.79
6	7/25/17 to 7/26/17	25.62	482.79	23.50	482.01	28.12	481.72
7	8/29/17 to 8/30/17	25.70	482.71	23.60	481.91	28.12	481.72
8	10/10/17 to 10/11/17	25.91	482.50	23.97	481.54	28.00	481.84

NOTES:
btoc = below top of casing
msl = mean sea level
(1) JKS-47 was re-sampled on 2/28/2017.

TABLE 2
Groundwater Sampling Summary
CPS Energy - Calaveras Power Station
Evaporation Pond

CCR Unit	Well ID	Well Function	Number of Samples Collected in 2016 - 2017	2016 - 2017 Sample Dates								Monitoring Program
				12/6/16 to 12/8/16	2/21/17 to 2/23/17 (1)	3/28/17 to 3/30/17	5/2/17 to 5/4/17	6/20/17 to 6/21/17	7/25/17 to 7/26/17	8/29/17 to 8/30/17	10/10/17 to 10/11/17	
Evaporation Pond	JKS-36	Downgradient Monitoring	8	X	X	X	X	X	X	X	X	Detection
	JKS-47	Background Monitoring	8	X	X	X	X	X	X	X	X	Detection
	JKS-61	Downgradient Monitoring	8	X	X	X	X	X	X	X	X	Detection
	JKS-62	Downgradient Monitoring	8	X	X	X	X	X	X	X	X	Detection
	JKS-63	Background Monitoring	7	X	X	X	X	(2)	X	X	X	Detection
	JKS-64	Background Monitoring	8	X	X	X	X	X	X	X	X	Detection

NOTES:
X = Indicates that a sample was collected.
(1) JKS-47 was re-sampled on 2/28/2017.
(2) A sample was not collected at JKS-63 during Event 5 (June 2017), due to the well going dry during sampling activities.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Evaporation Pond

		JKS-47 Upgradient							
	Sample Date	**12/8/16**	**2/28/17**	**3/29/17**	**5/3/17**	**6/21/17**	**7/26/17**	**8/30/17**	**10/11/17**
	Task	**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**
Constituents	**Unit**								
Appendix III - Detection Monitoring									
Boron	mg/L	0.824	0.838	0.696	0.817	0.804	0.828 JH	0.760	1.02
Calcium	mg/L	54.0	62.1	168	26.2	71.1	62.7 JH	66.7	36.1
Chloride	mg/L	107	150	232	193	168	148 JH	210	68.5
Fluoride	mg/L	< 0.200	< 0.200 JH	0.315	0.382 JH	0.213 JH	< 2.00	< 0.200	< 0.500
Sulfate	mg/L	213	267	369	299	266	248 JH	284	171
pH - Field Collected	Std	5.82	5.83	5.75	6.00	5.75	5.85	5.90	5.93
Total dissolved solids	mg/L	811	922	1170	1060	979	806 JH	904	677
Appendix IV - Assessment Monitoring									
Antimony	mg/L	< 0.0100	< 0.00200	< 0.00200	< 0.0100	0.000275	< 0.00200	< 0.00200	< 0.00200
Arsenic	mg/L	0.00442	0.00130	< 0.00200	< 0.0100	0.00185	0.00105	0.00124	< 0.00200
Barium	mg/L	0.0475	0.0132	0.0180	0.0118	0.0154	0.00981	0.0104	0.00785
Beryllium	mg/L	0.000813	0.000255	< 0.00200	< 0.0100	0.000352	< 0.00200	0.000172	< 0.00200
Cadmium	mg/L	< 0.0100	0.000637	< 0.00200	< 0.00200	0.000735	0.000611	0.000814	< 0.00200
Chromium	mg/L	0.234	0.00430	< 0.00400	< 0.0200	0.00262	0.000855	0.00130	< 0.00400
Cobalt	mg/L	0.00915	0.00102	< 0.00200	< 0.00200	0.00227	0.000976	0.00107	< 0.00200
Fluoride	mg/L	< 0.200	< 0.200 JH	0.315	0.382 JH	0.213 JH	< 2.00	< 0.200	< 0.500
Lead	mg/L	0.00586	0.000950	< 0.00200	< 0.0100	0.00157	0.000202	0.000449	< 0.00200
Lithium	mg/L	0.0615	0.0478	< 0.100	0.0207	0.0720	0.0644	0.0799	0.0521
Mercury	mg/L	0.0000600	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200
Molybdenum	mg/L	0.0317	0.00126	< 0.00200	< 0.00200	0.000788	0.000581	0.000653	< 0.00200
Selenium	mg/L	0.0493	0.0697	0.0518	0.0564	0.0613	0.0577	0.0525	0.0854
Thallium	mg/L	< 0.0100	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Radium-226	pCi/L	1.20 ± 0.342	0.578 ± 0.275	0.630 ± 0.237	0.538 ± 0.192	0.729 ± 0.278	< 0.304 ± 0.233	1.06 ± 0.361	0.246 ± 0.180
Radium-228	pCi/L	< 1.66 ± 1.15	< 1.34 ± 1.05	< 1.27 ± 0.960	2.17 ± 1.01	< 0.664 ± 0.929	< 0.771 ± 1.48	1.65 ± 1.05	< 0.463 ± 0.866

NOTES:

(1) Constituent list from Appendix III and IV of the USEPA CCR Rule (2015).

mg/L: Milligrams per Liter.
Std.: Standard Units.
pCi/L: Picocuries per Liter.

-- : Laboratory did not analyze sample for indicated constituent.

NS: Indicates sample was not collected.

<0.0360: Analyte Not Detected at the laboratory reporting limit (Sample Detection Limit).

J: Analyte detected above method (sample) detection limit but below method quantitation limit.

H: Bias in sample result likely to be high.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Evaporation Pond

		JKS-63 Upgradient							
	Sample Date	**12/8/16**	**2/22/17**	**3/29/17**	**5/3/17**		**7/26/17**	**8/30/17**	**10/11/17**
	Task	**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**
Constituents	**Unit**								
Appendix III - Detection Monitoring									
Boron	mg/L	0.800	0.866	--	0.981	NS	1.33 JH	1.23	1.10
Calcium	mg/L	783	914	713	1060	NS	835	174	872
Chloride	mg/L	1230	1160	1220	1340	NS	1960 JH	1890	1450
Fluoride	mg/L	0.0573	0.320	0.297	0.364 JH	NS	0.0971 JH	0.182 JH	< 0.500
Sulfate	mg/L	< 0.200	1860	1890	1860	NS	1970	1920	1820
pH - Field Collected	Std	5.61	5.35	5.60	5.85	NS	5.88	5.82	5.63
Total dissolved solids	mg/L	5750	4760	4870	5560	NS	6410	5000	5540
Appendix IV - Assessment Monitoring									
Antimony	mg/L	< 0.0100	0.000459	0.000695	< 0.0100	NS	< 0.00200	0.000424	< 0.00200
Arsenic	mg/L	0.00332	0.00294	0.00128	< 0.0100	NS	0.000893	0.000992	< 0.00200
Barium	mg/L	0.0626	0.0540	0.0336	0.0316	NS	0.0294	0.0258	0.0224
Beryllium	mg/L	< 0.0100	0.000930	0.000442	< 0.0100	NS	0.000196	0.000223	< 0.00200
Cadmium	mg/L	0.00339	0.00405	0.00394	0.00316	NS	0.00282	0.00263	0.00296
Chromium	mg/L	1.49	0.735	0.371	0.114	NS	0.0742	0.0584	0.0130
Cobalt	mg/L	0.0802	0.0762	0.0546	0.0331	NS	0.0137	0.0119	0.0119
Fluoride	mg/L	0.0573	0.320	0.297	0.364 JH	NS	0.0971 JH	0.182 JH	< 0.500
Lead	mg/L	0.00441	0.00599	0.00108	< 0.0100	NS	0.000238	0.000551	< 0.00200
Lithium	mg/L	< 0.0200	0.116	< 0.100	0.654	NS	0.946	1.15	0.791
Mercury	mg/L	0.000236	0.000237	0.000206	0.0000400	NS	0.000260	0.000441	0.000381
Molybdenum	mg/L	0.186	0.00789	0.00966	0.00419	NS	0.00281	0.00180	< 0.00200
Selenium	mg/L	0.0188	0.0210	0.0257	0.0188	NS	0.0288	0.0318	0.0249
Thallium	mg/L	< 0.0100	< 0.00200	< 0.00200	< 0.0100	NS	< 0.00200	< 0.00200	< 0.00200
Radium-226	pCi/L	3.42 ± 0.573	2.76 ± 0.476	5.79 ± 0.790	4.57 ± 0.577	NS	6.70 ± 0.744	7.36 ± 0.874	5.04 ± 0.711
Radium-228	pCi/L	2.44 ± 1.44	4.13 ± 1.21	< 2.04 ± 1.61	3.41 ± 0.968	NS	10.9 ± 2.31	< 1.79 ± 1.27	6.77 ± 1.48

NOTES:

(1) Constituent list from Appendix III and IV of the USEPA CCR Rule (2015).

mg/L: Milligrams per Liter.
Std.: Standard Units.
pCi/L: Picocuries per Liter.

-- : Laboratory did not analyze sample for indicated constituent.

NS: Indicates sample was not collected.

<0.0360: Analyte Not Detected at the laboratory reporting limit (Sample Detection Limit).

J: Analyte detected above method (sample) detection limit but below method quantitation limit.

H: Bias in sample result likely to be high.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Evaporation Pond

		JKS-64 Upgradient							
	Sample Date	**12/8/16**	**2/23/17**	**3/29/17**	**5/4/17**	**6/21/17**	**7/26/17**	**8/30/17**	**10/11/17**
	Task	**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**
Constituents	**Unit**								
Appendix III - Detection Monitoring									
Boron	mg/L	0.839	0.837	1.14	0.962	0.816	0.904 JH	0.835	0.901
Calcium	mg/L	25.1	24.0	32.3	23.8	20.6	21.7 JH	21.6	25.2
Chloride	mg/L	12.8	12.4	11.8	11.0	11.4	11.5	11.5	9.63
Fluoride	mg/L	< 0.200	0.294 JH	< 4.00	0.188	0.231 JH	0.157 JH	0.224 JH	< 0.500
Sulfate	mg/L	171	182	184	174	172	170 JH	172	164
pH - Field Collected	Std	6.46	5.50	6.30	6.33	6.21	6.09	6.20	6.21
Total dissolved solids	mg/L	606	585	611	581	572	555 JH	463	576
Appendix IV - Assessment Monitoring									
Antimony	mg/L	< 0.00200	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Arsenic	mg/L	0.000950	0.000730	0.000556	< 0.0100	0.000476	0.000490	0.000519	< 0.00200
Barium	mg/L	0.00768	0.00451	0.00415	0.00410	0.00320	0.00324	0.00275	< 0.00400
Beryllium	mg/L	< 0.0200	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Cadmium	mg/L	< 0.00200	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Chromium	mg/L	< 0.00400	0.000905	< 0.00400	< 0.0200	0.000867	0.000637	0.000961	< 0.00400
Cobalt	mg/L	0.00100	0.000952	0.000912	0.000859	0.000745	0.000856	0.000889	< 0.00200
Fluoride	mg/L	< 0.200	0.294 JH	< 4.00	0.188	0.231 JH	0.157 JH	0.224 JH	< 0.500
Lead	mg/L	< 0.00200	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Lithium	mg/L	0.0178	0.0146	< 0.100	0.0152	0.0173	0.0181	0.0252	0.0208
Mercury	mg/L	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200	0.0000540	< 0.000200
Molybdenum	mg/L	0.000398	0.000317	< 0.00200	< 0.0100	0.000265	< 0.00200	0.000273	< 0.00200
Selenium	mg/L	< 0.00200	0.000550	0.000538	< 0.0100	0.000468	0.000468	< 0.00200	< 0.00200
Thallium	mg/L	< 0.00200	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Radium-226	pCi/L	0.981 ± 0.400	1.16 ± 0.408	0.530 ± 0.284	< 0.231 ± 0.174	0.258 ± 0.175	< 0.286 ± 0.247	1.05 ± 0.361	0.531 ± 0.276
Radium-228	pCi/L	< 0.429 ± 1.56	2.07 ± 1.22	< -0.102 ± 1.07	< 0.408 ± 0.764	< 0.699 ± 0.761	2.49 ± 1.54	< 0.260 ± 0.639	< 1.00 ±0.834

NOTES:

(1) Constituent list from Appendix III and IV of the USEPA CCR Rule (2015).

mg/L: Milligrams per Liter.
Std.: Standard Units.
pCi/L: Picocuries per Liter.

-- : Laboratory did not analyze sample for indicated constituent.

NS: Indicates sample was not collected.

<0.0360: Analyte Not Detected at the laboratory reporting limit (Sample Detection Limit).

J: Analyte detected above method (sample) detection limit but below method quantitation limit.

H: Bias in sample result likely to be high.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Evaporation Pond

		JKS-36 Downgradient							
	Sample Date	**12/8/16**	**2/23/17**	**3/29/17**	**5/4/17**	**6/21/17**	**7/26/17**	**8/30/17**	**10/11/17**
	Task	**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**
Constituents	**Unit**								
Appendix III - Detection Monitoring									
Boron	mg/L	0.308	0.671	0.748	0.731	0.581	0.625 JH	0.663	0.637
Calcium	mg/L	69.7	165	147	282	250	255 JH	241	289
Chloride	mg/L	14.5	199	37.0	355	364	379 JH	319	328
Fluoride	mg/L	< 0.200	0.439 JH	0.330	1.53	1.33	1.37 JH	1.30	1.32
Sulfate	mg/L	49.2	409	271	726	731	775 JH	707	741
pH - Field Collected	Std	6.71	4.96	6.98	4.04	3.72	3.80	5.20	3.24
Total dissolved solids	mg/L	368	1010	591	1610	1850	1700 JH	1220	1770
Appendix IV - Assessment Monitoring									
Antimony	mg/L	< 0.0100	< 0.00200	0.00123	< 0.0100	< 0.00200	0.00121	< 0.00200	< 0.00200
Arsenic	mg/L	< 0.0100	0.000588	0.00134	0.00324	0.00284	0.00369	0.00341	0.00372
Barium	mg/L	0.0988	0.0967	0.139	0.0270	0.0191	0.0207	0.0372	0.0225
Beryllium	mg/L	< 0.0100	0.00198	< 0.00200	0.0259	0.0226	0.0261	0.0212	0.0259
Cadmium	mg/L	0.00257	0.00510	0.000548	0.0118	0.0104	0.0117	0.0101	0.0113
Chromium	mg/L	< 0.0200	0.00608	0.0409	0.0100	0.00974	0.0156	0.00792	0.0132
Cobalt	mg/L	< 0.00200	0.0871	0.00751	0.220	0.191	0.216	0.195	0.215
Fluoride	mg/L	< 0.200	0.439 JH	0.330	1.53	1.33	1.37 JH	1.30	1.32
Lead	mg/L	< 0.0100	< 0.00200	< 0.00200	< 0.0100	< 0.00200	0.000220	0.000261	< 0.00200
Lithium	mg/L	< 0.0200	0.119	< 0.100	0.326	0.340	0.371	0.372	0.379
Mercury	mg/L	0.000834	0.000289	0.00143	0.00240	0.00244	0.00160	0.00113	0.00226
Molybdenum	mg/L	0.00397	0.00261	0.0686	0.00183	< 0.00200	0.000791	0.00151	< 0.00200
Selenium	mg/L	0.0334	0.0448	0.0313	0.0673	0.0638	0.0697	0.0633	0.0663
Thallium	mg/L	< 0.0100	0.000487	< 0.00200	< 0.0100	< 0.00200	0.00114	0.000889	< 0.00200
Radium-226	pCi/L	< 0.0888 ± 0.151	1.12 ± 0.342	0.453 ± 0.276	4.85 ± 0.656	4.02 ± 0.608	4.32 ± 0.667	6.28 ± 0.845	3.60 ± 0.600
Radium-228	pCi/L	2.14 ± 1.02	2.17 ± 0.979	< 0.166 ± 0.861	4.28 ± 1.19	3.44 ± 1.04	3.95 ± 1.79	2.63 ± 0.928	3.30 ± 1.33

NOTES:

(1) Constituent list from Appendix III and IV of the USEPA CCR Rule (2015).

mg/L: Milligrams per Liter.
Std.: Standard Units.
pCi/L: Picocuries per Liter.

-- : Laboratory did not analyze sample for indicated constituent.

NS: Indicates sample was not collected.

<0.0360: Analyte Not Detected at the laboratory reporting limit (Sample Detection Limit).

J: Analyte detected above method (sample) detection limit but below method quantitation limit.

H: Bias in sample result likely to be high.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Evaporation Pond

		JKS-61 Downgradient							
	Sample Date	**12/7/16**	**2/23/17**	**3/29/17**	**5/3/17**	**6/21/17**	**7/26/17**	**8/30/17**	**10/11/17**
	Task	**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**
Constituents	**Unit**								
Appendix III - Detection Monitoring									
Boron	mg/L	1.07	1.29	1.15	1.18	0.960	1.01 JH	0.994	0.997
Calcium	mg/L	134	99.8	155	113	115	107 JH	105	135
Chloride	mg/L	198	159	162	173	193	190 JH	228	210
Fluoride	mg/L	0.393	0.503	0.522	0.656 JH	0.459 JH	0.479 JH	< 0.200	< 0.500
Sulfate	mg/L	401	387 J	382	392	408	390 JH	391	401
pH - Field Collected	Std	6.72	6.51	6.48	6.68	6.53	6.55	7.40	6.27
Total dissolved solids	mg/L	1400	1180	1190	1320	1430	1290 JH	1240	1280
Appendix IV - Assessment Monitoring									
Antimony	mg/L	< 0.0100	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Arsenic	mg/L	< 0.0100	< 0.00200	0.000709	< 0.0100	0.000563	0.000622	0.000592	< 0.00200
Barium	mg/L	0.0364	0.0190	0.0173	0.0181	0.0148	0.0167	0.0153	0.0162
Beryllium	mg/L	< 0.0100	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Cadmium	mg/L	< 0.0100	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Chromium	mg/L	< 0.0200	0.000911	< 0.00400	< 0.0200	< 0.00400	0.000604	0.000941	< 0.00400
Cobalt	mg/L	0.000719	< 0.00200	0.000769	0.000782	0.000805	0.000765	0.000855	< 0.00200
Fluoride	mg/L	0.393	0.503	0.522	0.656 JH	0.459 JH	0.479 JH	< 0.200	< 0.500
Lead	mg/L	< 0.0100	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Lithium	mg/L	< 0.0200	< 0.0200	< 0.100	0.0120	0.0342	0.0336	0.0443	0.0335
Mercury	mg/L	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200
Molybdenum	mg/L	0.00165	0.00152	0.000984	< 0.0100	0.000776	0.000742	0.000765	< 0.00200
Selenium	mg/L	< 0.0100	< 0.00200	0.00123	< 0.0100	0.00185	0.00154	0.00176	< 0.00200
Thallium	mg/L	< 0.0100	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Radium-226	pCi/L	1.15 ± 0.429	0.723 ± 0.306	< 0.256 ± 0.237	< 0.237 ± 0.193	0.398 ± 0.239	0.511 ± 0.223	0.821 ± 0.324	0.485 ± 0.212
Radium-228	pCi/L	2.79 ± 1.44	< 0.358 ± 1.06	< 0.761 ± 0.688	< -0.064 ± 0.607	2.03 ± 0.997	< 0.491 ± 0.813	< 0.247 ± 0.710	< 1.64 ± 1.08

NOTES:

(1) Constituent list from Appendix III and IV of the USEPA CCR Rule (2015).

mg/L: Milligrams per Liter.
Std.: Standard Units.
pCi/L: Picocuries per Liter.

-- : Laboratory did not analyze sample for indicated constituent.

NS: Indicates sample was not collected.

<0.0360: Analyte Not Detected at the laboratory reporting limit (Sample Detection Limit).

J: Analyte detected above method (sample) detection limit but below method quantitation limit.

H: Bias in sample result likely to be high.

TABLE 3
Groundwater Analytical Results Summary
CPS Energy - Calaveras Power Station
Evaporation Pond

		JKS-62 Downgradient							
	Sample Date	**12/8/16**	**2/23/17**	**3/29/17**	**5/4/17**	**6/21/17**	**7/26/17**	**8/30/17**	**10/11/17**
	Task	**Event 1 Dec 2016**	**Event 2 Feb 2017**	**Event 3 Mar 2017**	**Event 4 May 2017**	**Event 5 Jun 2017**	**Event 6 Jul 2017**	**Event 7 Aug 2017**	**Event 8 Oct 2017**
Constituents	**Unit**								
Appendix III - Detection Monitoring									
Boron	mg/L	0.549	0.481	0.597	0.601	0.501	0.485 JH	0.485	0.549
Calcium	mg/L	155	152	220	156	150	134 JH	150	158
Chloride	mg/L	257	279	279	278	291	260 JH	281	241
Fluoride	mg/L	0.246	0.362 JH	0.418	0.388	0.366 JH	0.342 JH	0.233 JH	< 0.500
Sulfate	mg/L	190	187	193	188	184	181 JH	188	175
pH - Field Collected	Std	6.79	6.67	6.63	6.71	6.68	6.82	7.51	6.52
Total dissolved solids	mg/L	1120	1170	1140	1100	1080	976 JH	1080	1080
Appendix IV - Assessment Monitoring									
Antimony	mg/L	< 0.00200	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Arsenic	mg/L	0.000684	0.000293	< 0.00200	< 0.0100	0.000254	< 0.00200	< 0.00200	< 0.00200
Barium	mg/L	0.0825	0.0786	0.0813	0.0747	0.0734	0.0737	0.0708	0.0793
Beryllium	mg/L	< 0.00200	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Cadmium	mg/L	< 0.00200	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Chromium	mg/L	0.00186	0.00109	< 0.00400	< 0.0200	0.000551	0.000691	0.00107	< 0.00400
Cobalt	mg/L	0.00110	0.000198	0.000744	< 0.0100	0.000278	0.000211	< 0.00200	< 0.00200
Fluoride	mg/L	0.246	0.362 JH	0.418	0.388	0.366 JH	0.342 JH	0.233 JH	< 0.500
Lead	mg/L	0.000588	< 0.00200	< 0.00200	< 0.0100	0.000154	< 0.00200	< 0.00200	< 0.00200
Lithium	mg/L	< 0.0200	0.0129	< 0.100	0.00134	0.0353	0.0305	0.0457	0.0263
Mercury	mg/L	0.0000540	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200	< 0.000200
Molybdenum	mg/L	0.000414	0.000259	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Selenium	mg/L	0.222	0.192	0.196	0.195	0.185	0.181	0.191	0.208
Thallium	mg/L	< 0.00200	< 0.00200	< 0.00200	< 0.0100	< 0.00200	< 0.00200	< 0.00200	< 0.00200
Radium-226	pCi/L	0.485 ± 0.229	0.402 ± 0.220	0.655 ± 0.321	< 0.0997 ± 0.153	0.425 ± 0.233	0.399 ± 0.220	2.02 ± 0.489	0.669 ± 0.279
Radium-228	pCi/L	< 2.15 ± 1.38	< 1.53 ± 1.28	< 0.305 ± 1.10	< -0.138 ± 0.656	< 0.660 ± 0.760	< 1.07 ± 0.949	< 0.673 ± 0.821	< 0.371 ± 0.631

NOTES:

(1) Constituent list from Appendix III and IV of the USEPA CCR Rule (2015).

mg/L: Milligrams per Liter.
Std.: Standard Units.
pCi/L: Picocuries per Liter.

-- : Laboratory did not analyze sample for indicated constituent.

NS: Indicates sample was not collected.

<0.0360: Analyte Not Detected at the laboratory reporting limit (Sample Detection Limit).

J: Analyte detected above method (sample) detection limit but below method quantitation limit.

H: Bias in sample result likely to be high.

Figures

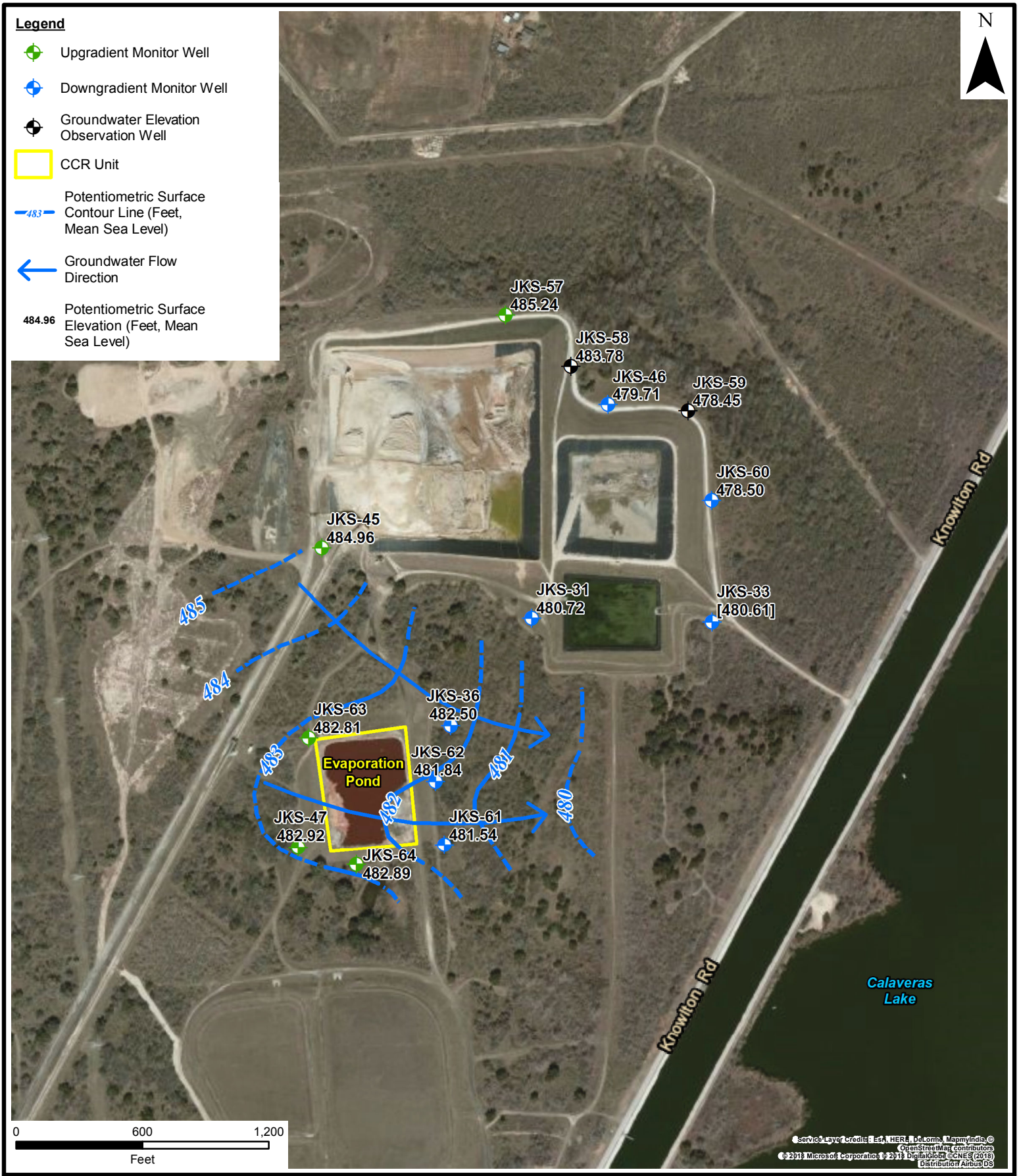
Environmental Resources Management

DESIGN:	NH	DRAWN:	EFC	CHKD.:	WZ
DATE:	1/8/2018	SCALE:	AS SHOWN	REVISION:	0

P:\Projects\0337367 CPS Energy CCR GW Investigation.WZ\Eight Background Sampling Events\GIS\MXD\2017_CAR\0337367_CPSCalv_WellsLocs.mxd

FIGURE 1
CCR WELL NETWORK LOCATION MAP
CPS Energy - Calaveras Power Station
San Antonio, Texas

ERM



Environmental Resources Management

DESIGN:	NH	DRAWN:	EFC	CHKD.:	WZ
DATE:	1/10/2018	SCALE:	AS SHOWN	REVISION:	1

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FIGURE 2
POTENTIOMETRIC SURFACE MAP - OCTOBER 2017
Evaporation Pond CCR Unit
CPS Energy - Calaveras Power Station
San Antonio, Texas

ERM

Laboratory Data Packages

Appendix A

(*Data Packages Available Upon Request*)

Statistical Analysis Tables and Figures

Appendix B

APPENDIX B-TABLE 1
Kruskal-Wallis Test Comparison for Upgradient Wells
CPS Energy - Calaveras Power Station
Evaporation Pond

Analyte	N	Num Detects	Percent Detect	DF	KW Statistic	p-value	Conclusion	UPL Type
Boron	22	22	1	2	6.54	0.0379	Significant Difference	Intrawell
Calcium	23	23	1	2	19.2	<0.001	Significant Difference	Intrawell
Chloride	23	23	1	2	19.6	<0.001	Significant Difference	Intrawell
Fluoride	23	15	0.652173913	2	0.891	0.64	No Significant Difference	Interwell
pH	24	24	1	2	11.1	0.00384	Significant Difference	Intrawell
Sulfate	23	22	0.956521739	2	11	0.00414	Significant Difference	Intrawell
TDS	23	23	1	2	19.6	<0.001	Significant Difference	Intrawell

NOTES:

N: number of data points
DF: degrees of freedom
statistic: Kruskal Wallis test statistic
p-value: P-values below 0.05 indicate that the median concentrations in the upgradient wells are significantly different from each other and the upgradient wells should not be pooled.
p-value: P-values equal or above 0.05 indicate that the median concentrations in the upgradient wells are not significantly different from each other and the upgradient wells can be pooled.
UPL: upper prediction limit

APPENDIX B-TABLE 2
Descriptive Statistics for Upgradient Wells
CPS Energy - Calaveras Power Station
Evaporation Pond

Analyte	Well	Units	N	Num Detects	Percent Detect	Min ND	Max ND	Min Detect	Median	Mean	Max Detect	SD	CV	Distribution
Boron	JKS-47	mg/L	8	8	1			0.696	0.8205	0.823	1.02	0.0922	0.112023318	Normal
Boron	JKS-63	mg/L	6	6	1			0.8	1.02	1.04	1.33	0.206	0.197126437	Normal
Boron	JKS-64	mg/L	8	8	1			0.816	0.87	0.904	1.14	0.107	0.118447246	NDD
Calcium	JKS-47	mg/L	8	8	1			26.2	62.4	68.4	168	43.2	0.631217086	Lognormal
Calcium	JKS-63	mg/L	7	7	1			174	835	764	1060	282	0.369178441	Normal
Calcium	JKS-64	mg/L	8	8	1			20.6	23.9	24	31.4	3.36	0.139600666	Normal
Chloride	JKS-47	mg/L	8	8	1			68.5	159	160	232	53.8	0.337092732	Normal
Chloride	JKS-63	mg/L	7	7	1			1160	1340	1460	1960	330	0.225684932	Normal
Chloride	JKS-64	mg/L	8	8	1			9.63	11.5	11.5	12.7	0.933	0.081218451	Normal
Fluoride	Pooled	mg/L	23	15	0.652173913	0.2	2	0.0573	0.231	0.252	0.382	0.189	0.74752279	Lognormal
pH	JKS-47	SU	8	8	1			5.75	5.84	5.85	6	0.0867	0.014805261	Normal
pH	JKS-63	SU	8	8	1			5.35	5.68	5.68	5.88	0.175	0.030735398	Normal
pH	JKS-64	SU	8	8	1			5.5	6.21	6.16	6.46	0.289	0.046932814	NDD
Sulfate	JKS-47	mg/L	8	8	1			171	266.5	265	369	58.8	0.222071051	Normal
Sulfate	JKS-63	mg/L	7	6	0.857142857	0.2	0.2	1820	1860	1620	1970	715	0.441991342	NDD
Sulfate	JKS-64	mg/L	8	8	1			164	172	174	184	6.5	0.037448157	Normal
TDS	JKS-47	mg/L	8	8	1			677	913	916	1170	156	0.169959611	Normal
TDS	JKS-63	mg/L	7	7	1			4760	5080	5350	6410	592	0.110678885	Normal
TDS	JKS-64	mg/L	8	8	1			463	578.5	567	611	45.1	0.079562687	NDD

NOTES:

Pooled well indicates that the summary statistics were produced for the pooled upgradient wells based on the Kruskal-Wallis test (Table 1).
SU: Standard units
N: number of data points
SD: Standard Deviation
CV: Coefficient of Variation (standard deviation divided by the mean)

APPENDIX B-TABLE 3
Potential Outliers in Upgradient Wells
CPS Energy - Calaveras Power Station
Evaporation Pond

Well	Sample	Date	Analyte	Units	Detect	Concentration	UPL type	Distribution	Statistical Outlier	Visual Outlier	Normal Outlier	Log Statistical Outlier	Log Visual Outlier	Lognormal Outlier	Statistical and Visual Outlier	Notes	Final Outlier Determination
JKS-47	JKS 47565343-007	10/11/17	Boron	mg/L	TRUE	1.02	Intrawell	Normal	X	X	X	X	X	X	0		Outlier retained, falls within range of values from other upgradient wells
JKS-64	JKS-64549681-009	3/29/17	Boron	mg/L	TRUE	1.14	Intrawell	NDD		X			X				Not an outlier
JKS-47	JKS-47549681-004	3/29/17	Calcium	mg/L	TRUE	168	Intrawell	Lognormal	X	X	X		X				Not an outlier
JKS-64	JKS-64549681-009	3/29/17	Calcium	mg/L	TRUE	31.4	Intrawell	Normal	X	X	X		X		0		Outlier retained, falls within range of values from other upgradient wells
JKS-47	JKS-47549681-004	3/29/17	Sulfate	mg/L	TRUE	369	Intrawell	Normal		X							Not an outlier
JKS-64	JKS-64547201-002	2/23/17	Sulfate	mg/L	TRUE	182	Intrawell	Normal		X			X				Not an outlier
JKS-64	JKS-64549681-009	3/29/17	Sulfate	mg/L	TRUE	184	Intrawell	Normal		X							Not an outlier

NOTES:

NDD: No Discernible Distribution
SU: Standard units
Outer tests were performed on detected data only.
Statistical outliers were determined using a Dixon's test for N < 25 and with Rosner's test for N > 25.
Visual outliers were identified if they fall above the confidence envelope on the QQ plot.
Data points were considered potential outliers if they were both statistical and visual outliers.
NDD wells had data points considered as potential outliers if they were either a normal or lognormal outlier.
[Blank] data distribution indicates that the well data did not have enough detected data points for outlier analysis.
Lognormally distributed data was first log-transformed before visual and statistical outlier tests were performed.
Normal data distribution indicates that the well data was directly used for statistical and visual outlier tests.
NDD indicates that both the untransformed and transformed data were examined with statistical and visual outlier tests.
'0' indicates that the data point was a statistical and visual outlier but was retained after review by the hydrogeologist.

APPENDIX B-TABLE 4
Mann Kendall Test for Trends in Upgradient Wells
CPS Energy - Calaveras Power Station
Evaporation Pond

Analyte	UPL Type	Well	N	Num Detects	Percent Detect	p-value	tau	Conclusion
Boron	Intrawell	JKS-47	8	8	1	0.905	0.0714	Stable, No Trend
Boron	Intrawell	JKS-63	6	6	1	0.136	0.6	Stable, No Trend
Boron	Intrawell	JKS-64	8	8	1	0.72	-0.143	Stable, No Trend
Calcium	Intrawell	JKS-47	8	8	1	1	0	Stable, No Trend
Calcium	Intrawell	JKS-63	7	7	1	1	-0.0476	Stable, No Trend
Calcium	Intrawell	JKS-64	8	8	1	0.383	-0.255	Stable, No Trend
Chloride	Intrawell	JKS-47	8	8	1	0.905	-0.0714	Stable, No Trend
Chloride	Intrawell	JKS-63	7	7	1	0.136	0.524	Stable, No Trend
Chloride	Intrawell	JKS-64	8	8	1	0.034	-0.618	Decreasing Trend
Fluoride	Interwell	JKS-47, JKS-63, JKS-64	23	15	0.652173913	0.127	-0.243	Stable, No Trend
pH	Intrawell	JKS-47	8	8	1	0.17	0.4	Stable, No Trend
pH	Intrawell	JKS-63	8	8	1	0.275	0.357	Stable, No Trend
pH	Intrawell	JKS-64	8	8	1	0.383	-0.255	Stable, No Trend
Sulfate	Intrawell	JKS-47	8	8	1	0.548	-0.214	Stable, No Trend
Sulfate	Intrawell	JKS-63	7	6	0.857142857	0.362	0.293	Stable, No Trend
Sulfate	Intrawell	JKS-64	8	8	1	0.105	-0.473	Stable, No Trend
TDS	Intrawell	JKS-47	8	8	1	0.275	-0.357	Stable, No Trend
TDS	Intrawell	JKS-63	7	7	1	0.773	0.143	Stable, No Trend
TDS	Intrawell	JKS-64	8	8	1	0.0312	-0.643	Decreasing Trend

NOTES:

N: number of data points
tau: Kendall's tau statistic
p-value: A two-sided p-value describing the probability of the H0 being true (a=0.05)
Trend tests were performed on all upgradient data, only if the dataset met the minimum data quality criteria (ERM 2017).

APPENDIX B-TABLE 5
Calculated UPLs for Upgradient Datasets
CPS Energy - Calaveras Power Station
Evaporation Pond

Analyte	UPL Type	Trend	Well	N	Num Detects	Percent Detects	LPL	UPL	Units	ND Adjustment	Transformation	Alpha	Method	Final LPL	Final UPL	Notes
Boron	Intrawell	Stable, No Trend	JKS-47	8	8	1		1.01	mg/L	None	No	0.00584	Param Intra 1 of 2			
Boron	Intrawell	Stable, No Trend	JKS-63	6	6	1		1.53	mg/L	None	No	0.00584	Param Intra 1 of 2		X	
Boron	Intrawell	Stable, No Trend	JKS-64	8	8	1		1.12	mg/L	None	No	0.00584	Param Intra 1 of 2			
Calcium	Intrawell	Stable, No Trend	JKS-47	8	8	1		156	mg/L	None	No	0.00584	Param Intra 1 of 2			
Calcium	Intrawell	Stable, No Trend	JKS-63	7	7	1		1380	mg/L	None	No	0.00584	Param Intra 1 of 2		X	
Calcium	Intrawell	Stable, No Trend	JKS-64	8	8	1		30.9	mg/L	None	No	0.00584	Param Intra 1 of 2			
Chloride	Intrawell	Stable, No Trend	JKS-47	8	8	1		269	mg/L	None	No	0.00584	Param Intra 1 of 2			
Chloride	Intrawell	Stable, No Trend	JKS-63	7	7	1		2180	mg/L	None	No	0.00584	Param Intra 1 of 2		X	
Chloride	Intrawell	Decreasing Trend	JKS-64	8	8	1		11.9	mg/L	None	No	0.00584	NP Detrended UPL			
Fluoride	Interwell	Stable, No Trend	JKS-47, JKS-63, JKS-64	23	15	0.65217		0.465	mg/L	Kaplan-Meier	ln(x)	0.00584	Param Inter 1 of 2		X	
pH	Intrawell	Stable, No Trend	JKS-47	8	8	1	5.68	6.03	SU	None	No	0.00292	Param Intra 1 of 2	X		
pH	Intrawell	Stable, No Trend	JKS-63	8	8	1	5.33	6.04	SU	None	No	0.00292	Param Intra 1 of 2			
pH	Intrawell	Stable, No Trend	JKS-64	8	8	1	5.58	6.75	SU	None	No	0.00292	Param Intra 1 of 2		X	
Sulfate	Intrawell	Stable, No Trend	JKS-47	8	8	1		384	mg/L	None	No	0.00584	Param Intra 1 of 2			
Sulfate	Intrawell	Stable, No Trend	JKS-63	7	6	0.85714		1970	mg/L	None	No	0.029	NP Intra (normality) 1 of 2		X	
Sulfate	Intrawell	Stable, No Trend	JKS-64	8	8	1		187	mg/L	None	No	0.00584	Param Intra 1 of 2			
TDS	Intrawell	Stable, No Trend	JKS-47	8	8	1		1230	mg/L	None	No	0.00584	Param Intra 1 of 2			
TDS	Intrawell	Stable, No Trend	JKS-63	7	7	1		6640	mg/L	None	No	0.00584	Param Intra 1 of 2		X	
TDS	Intrawell	Decreasing Trend	JKS-64	8	8	1		618	mg/L	None	No	0.00584	NP Detrended UPL			

NOTES:

UPL: upper prediction limit
LPL: Lower prediction limit. These were only calculated for pH
UPLs were constructed with a site wide false positive rate of 0.1 and a 1 of 2 retesting.
UPLs were calculated using Sanitas Software.
SU: Standard units
NP: non parametric
RL: Reporting Limit
Intra: indicates an intrawell UPL was used
Inter: indicates an interwell UPL was used
In the case where multiple UPLs were calculated for an analyte, the maximum UPL was used as the final UPL.
In the case where multiple LPLs were calculated for an pH the minimum LPL was used as the final LPL.

APPENDIX B-TABLE 6
Comparison of Downgradient Wells to UPLs/LPLs
CPS Energy - Calaveras Power Station
Evaporation Pond

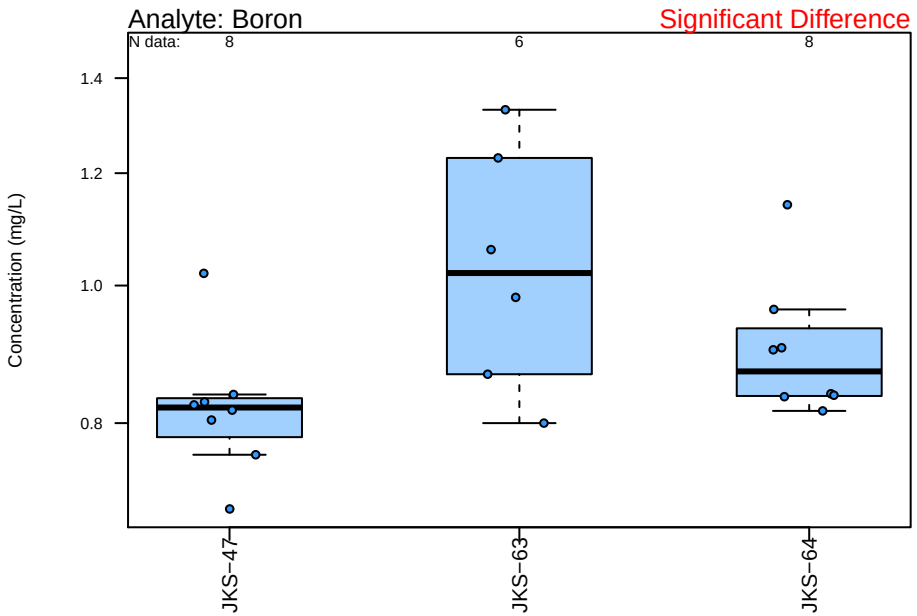
Analyte	Well	LPL	UPL	Units	Recent Date	Observation	Qualifier	Obs > UPL	Notes	Mann Kendall p-value	Mann Kendall tau
Boron	JKS-36		1.53	mg/L	10/11/17	0.637					
Boron	JKS-61		1.53	mg/L	10/11/17	0.997					
Boron	JKS-62		1.53	mg/L	10/11/17	0.549					
Calcium	JKS-36		1380	mg/L	10/11/17	289					
Calcium	JKS-61		1380	mg/L	10/11/17	135					
Calcium	JKS-62		1380	mg/L	10/11/17	158					
Chloride	JKS-36		2180	mg/L	10/11/17	328					
Chloride	JKS-61		2180	mg/L	10/11/17	210					
Chloride	JKS-62		2180	mg/L	10/11/17	241					
Fluoride	JKS-36		0.465	mg/L	10/11/17	1.32		X	Trend Test: Stable, No Trend	0.109	0.5
Fluoride	JKS-61		0.465	mg/L	10/11/17	0.5	ND				
Fluoride	JKS-62		0.465	mg/L	10/11/17	0.5	ND				
pH	JKS-36	5.68	6.75	SU	10/11/17	3.24		X	Trend Test: Stable, No Trend	0.109	-0.5
pH	JKS-61	5.68	6.75	SU	10/11/17	6.27					
pH	JKS-62	5.68	6.75	SU	10/11/17	6.52					
Sulfate	JKS-36		1970	mg/L	10/11/17	741					
Sulfate	JKS-61		1970	mg/L	10/11/17	401					
Sulfate	JKS-62		1970	mg/L	10/11/17	175					
TDS	JKS-36		6640	mg/L	10/11/17	1770					
TDS	JKS-61		6640	mg/L	10/11/17	1280					
TDS	JKS-62		6640	mg/L	10/11/17	1080					

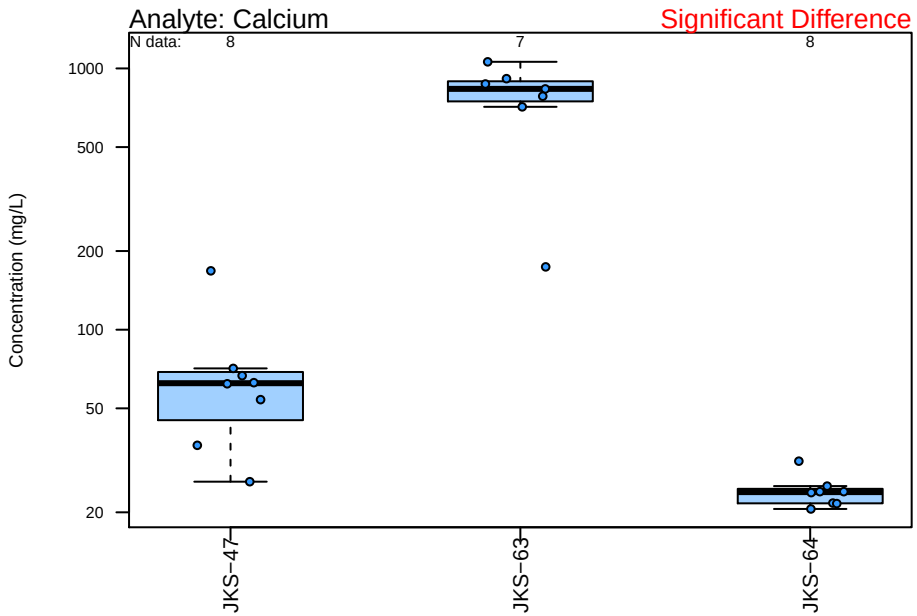
NOTES:

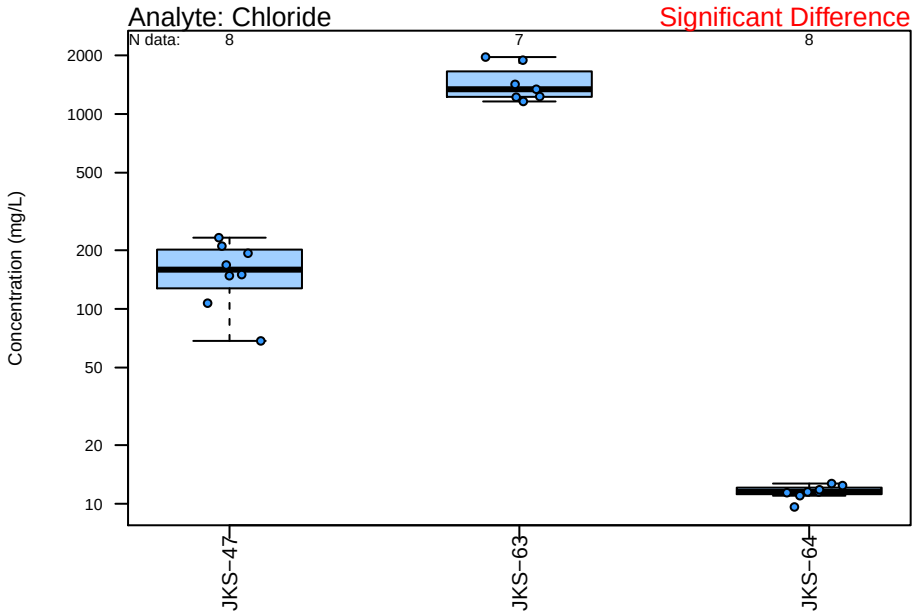
UPL: Upper Prediction Limit
ND: Not detected
SU: Standard units
tau: Kendall's tau statistic
p-value: A two-sided p-value describing the probability of the H0 being true (a=0.05)
Exceed 'X' indicates that the most recent observed value is higher than the UPL (or out of range of the LPL and UPL in the case of pH.)
Exceed 'X0' indicates that the two most recent values are higher than the UPL, but the upgradient well is 100% ND.

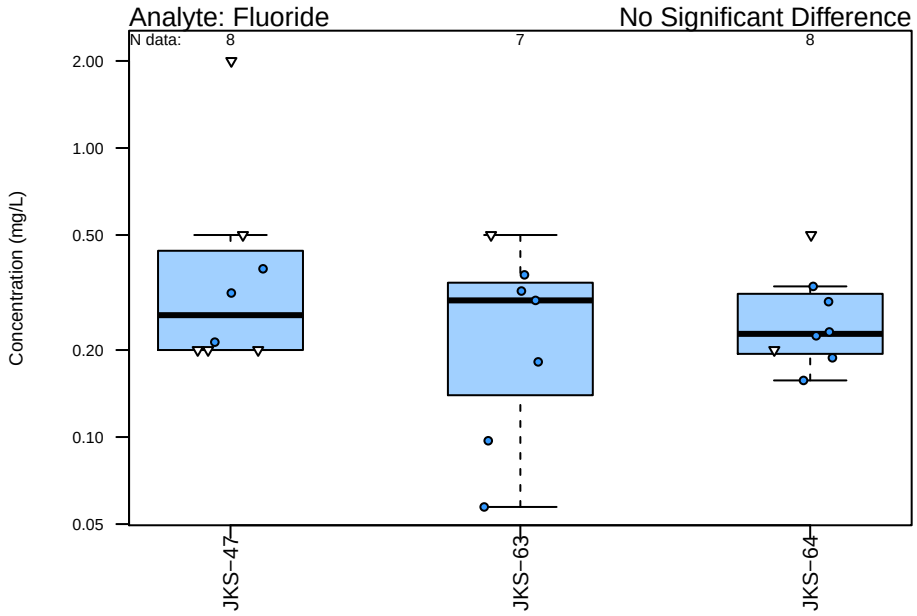
Exceed '0' indicated that the most recent observed value is higher than the UPL, but is not scored as an SSI due to Double Quantification Rule (ERM 2017).

APPENDIX B-FIGURE 1
Unit: Evaporation Pond
Boxplots of Upgradient Wells

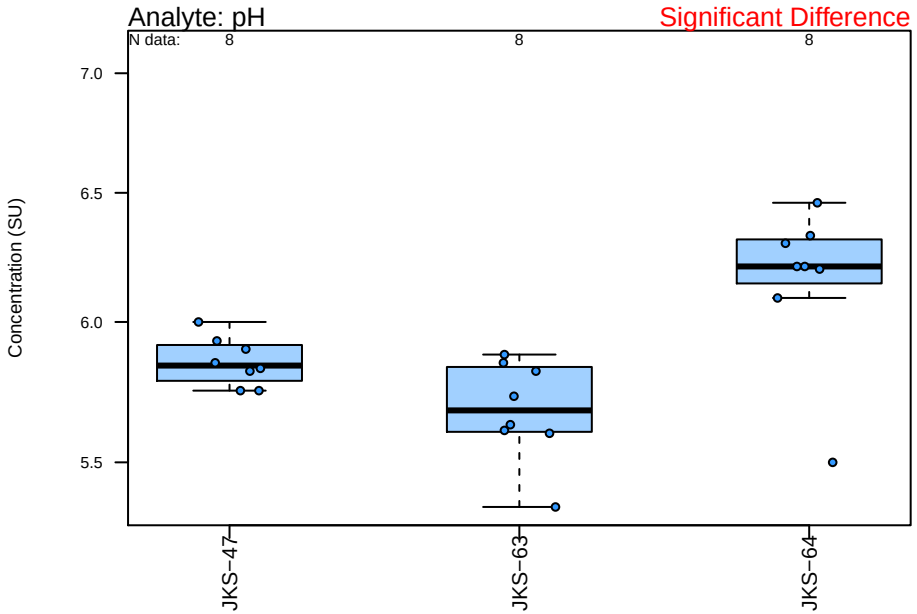


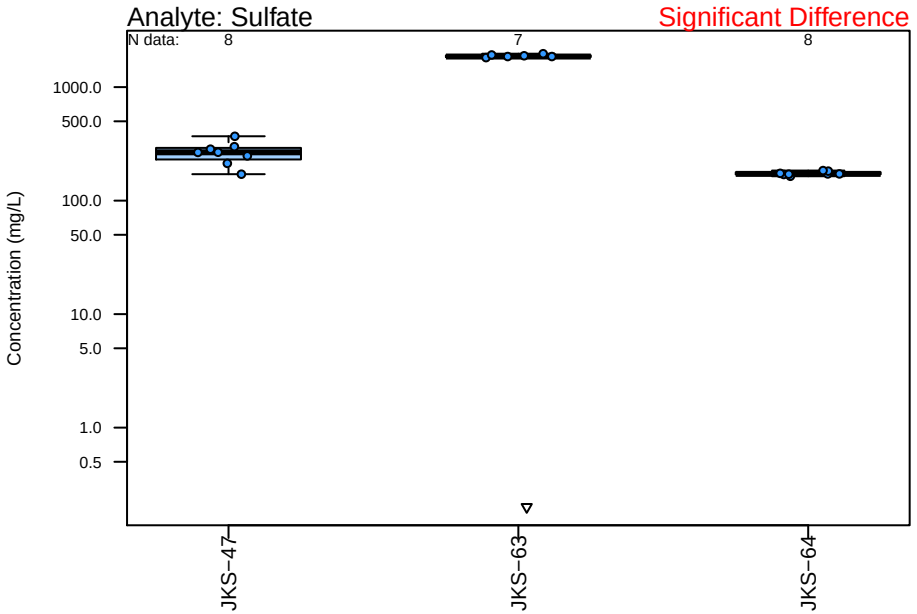


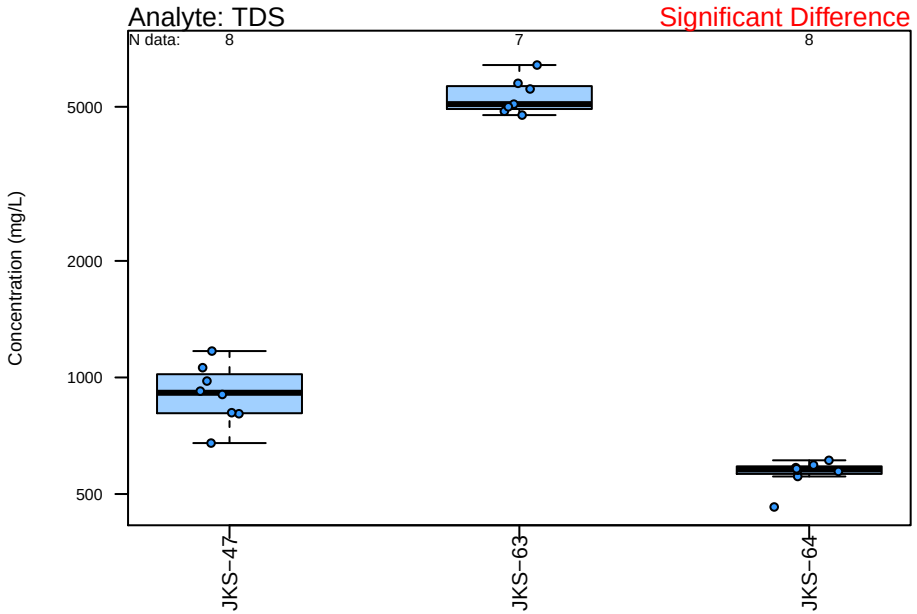




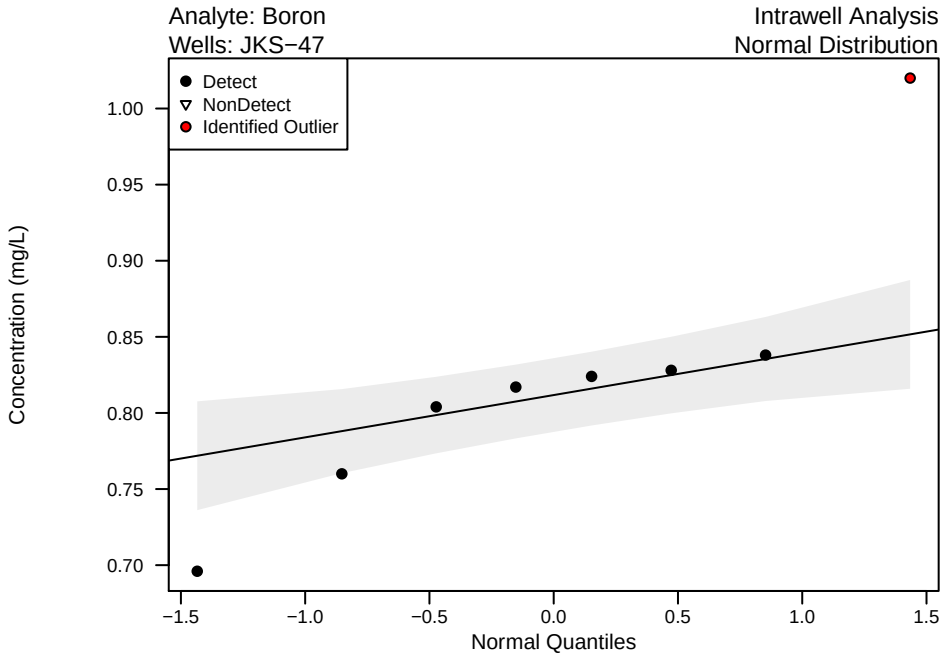
APPENDIX B-FIGURE 1
Unit: Evaporation Pond
Boxplots of Upgradient Wells







APPENDIX B-FIGURE 2
Unit: Evaporation Pond
QQ Plots of Upgradient Wells



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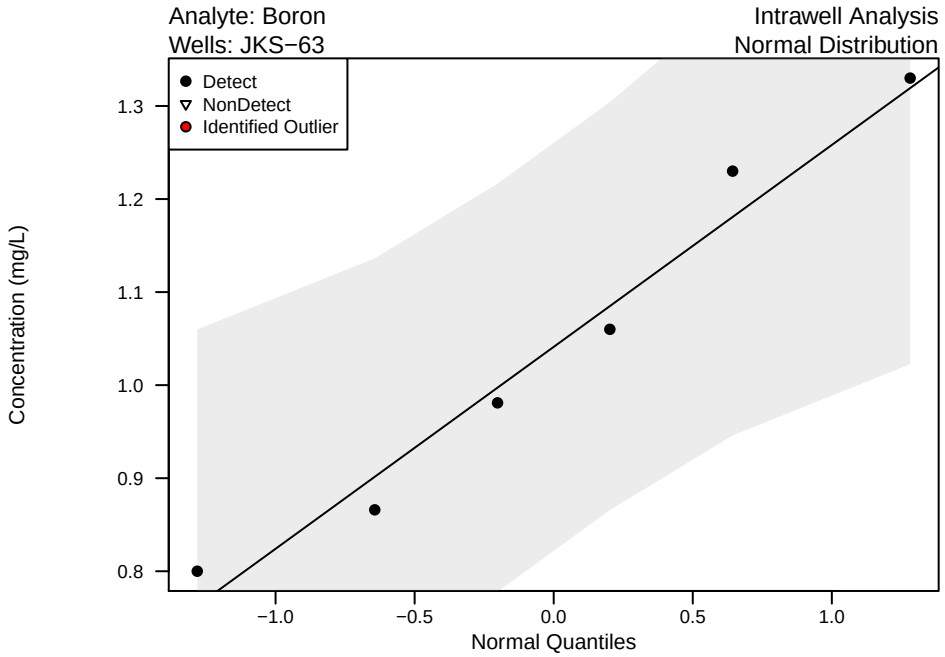

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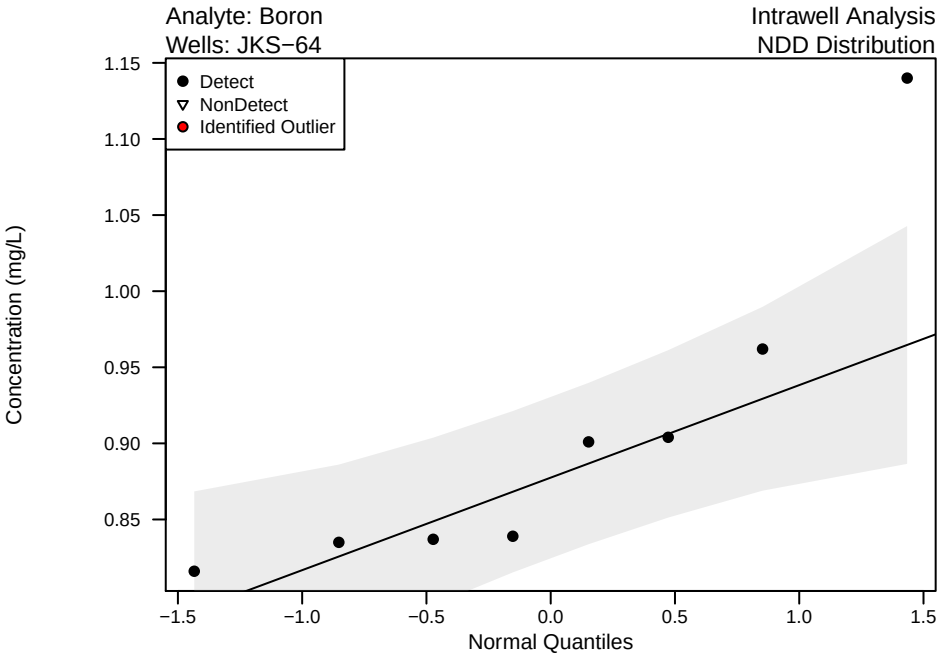
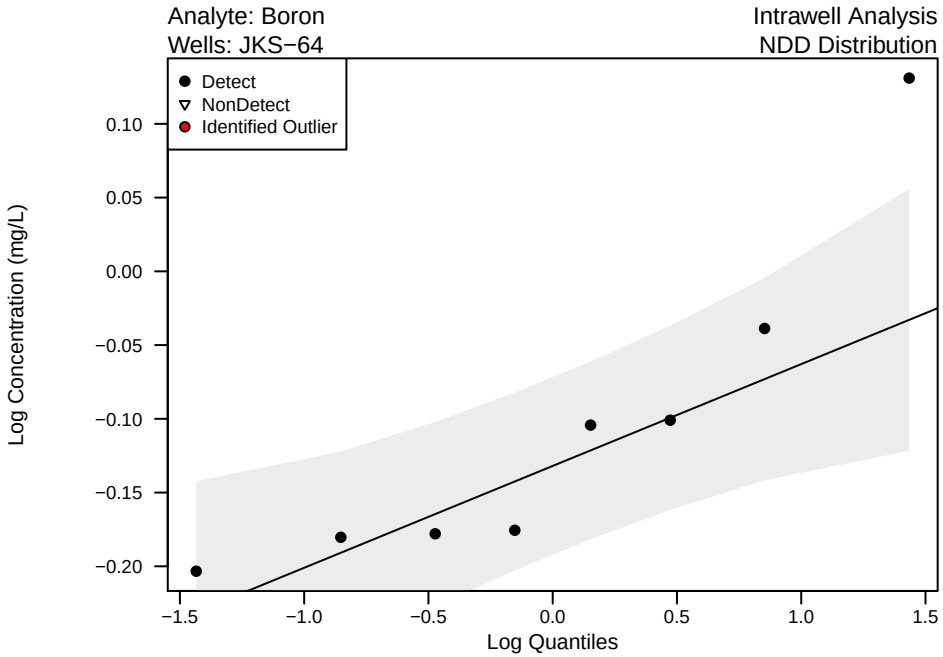
APPENDIX B-FIGURE 2
Unit: Evaporation Pond
QQ Plots of Upgradient Wells





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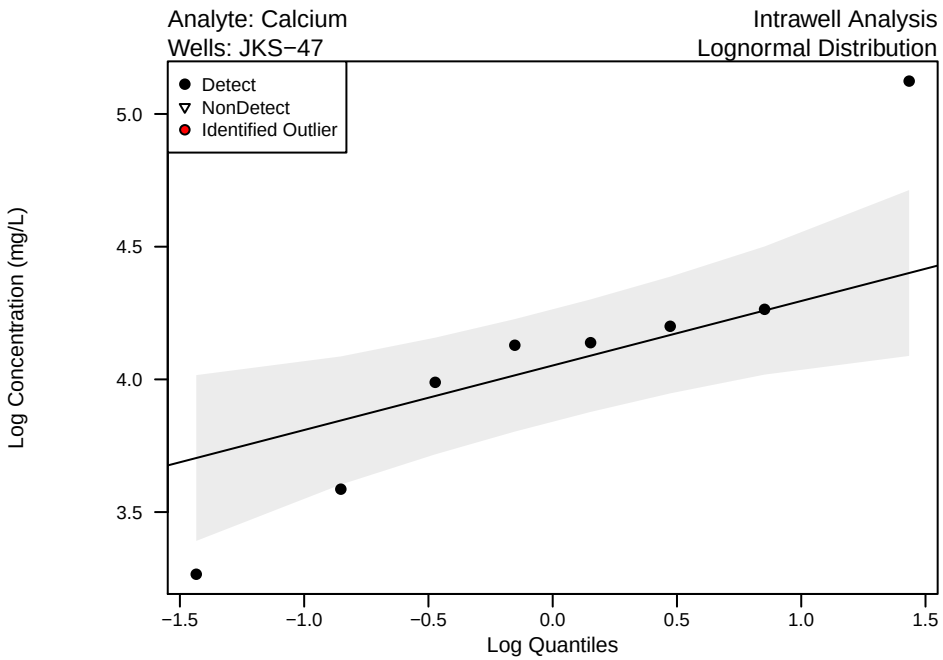
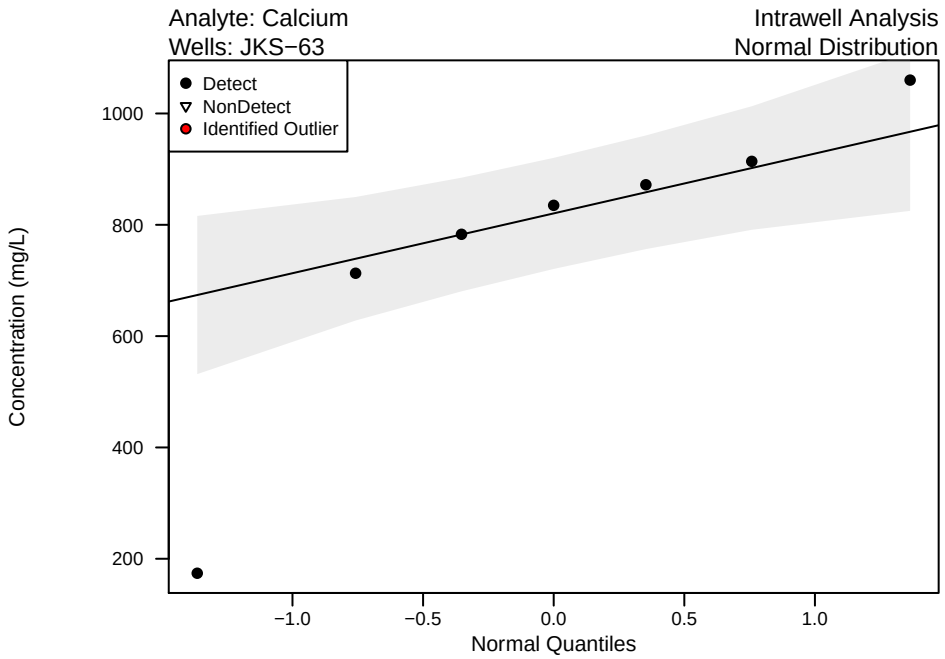


APPENDIX B-FIGURE 2
Unit: Evaporation Pond
QQ Plots of Upgradient Wells



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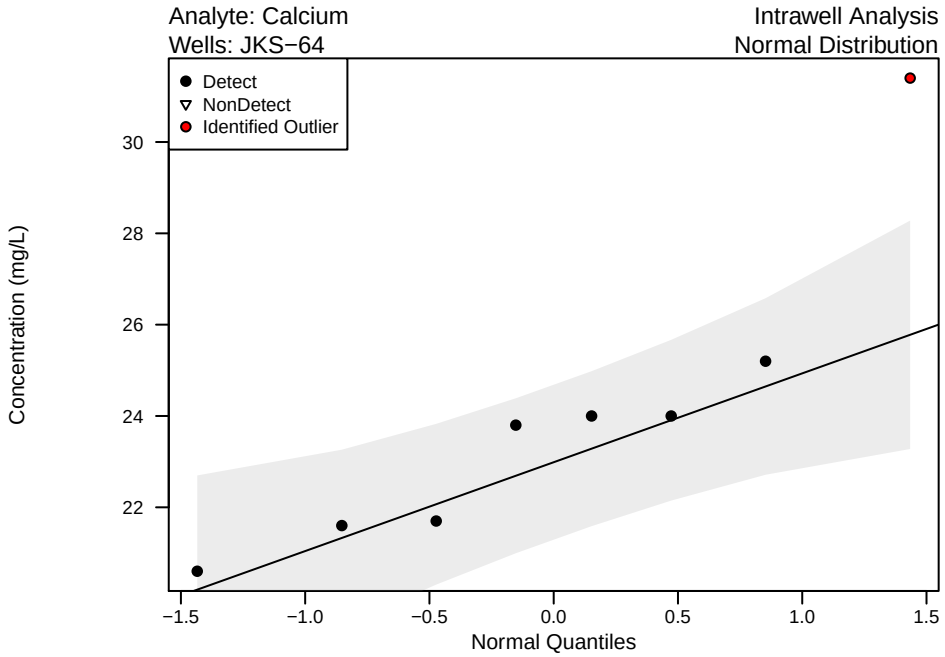

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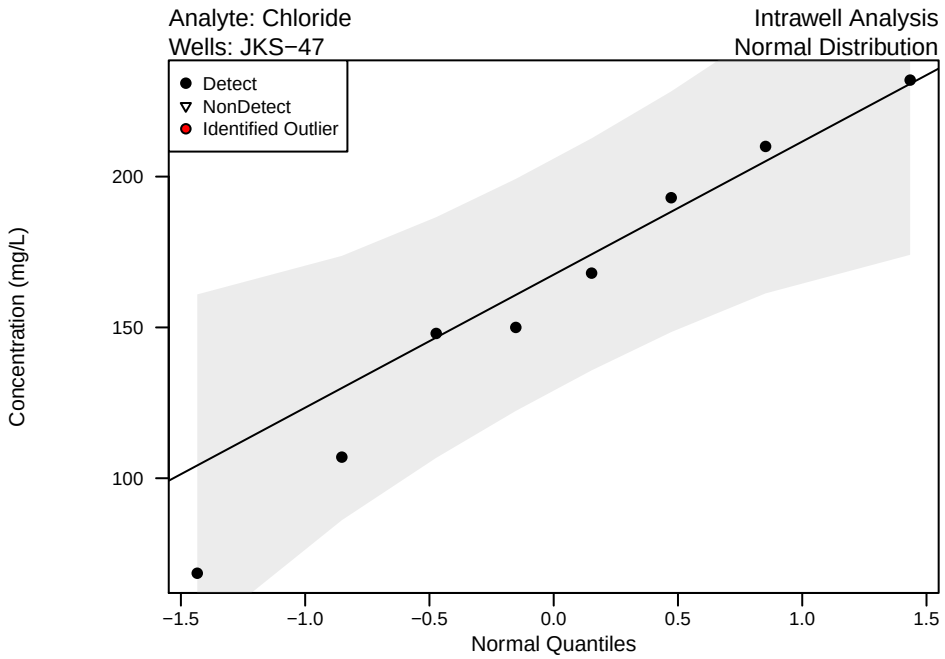
APPENDIX B-FIGURE 2
Unit: Evaporation Pond
QQ Plots of Upgradient Wells



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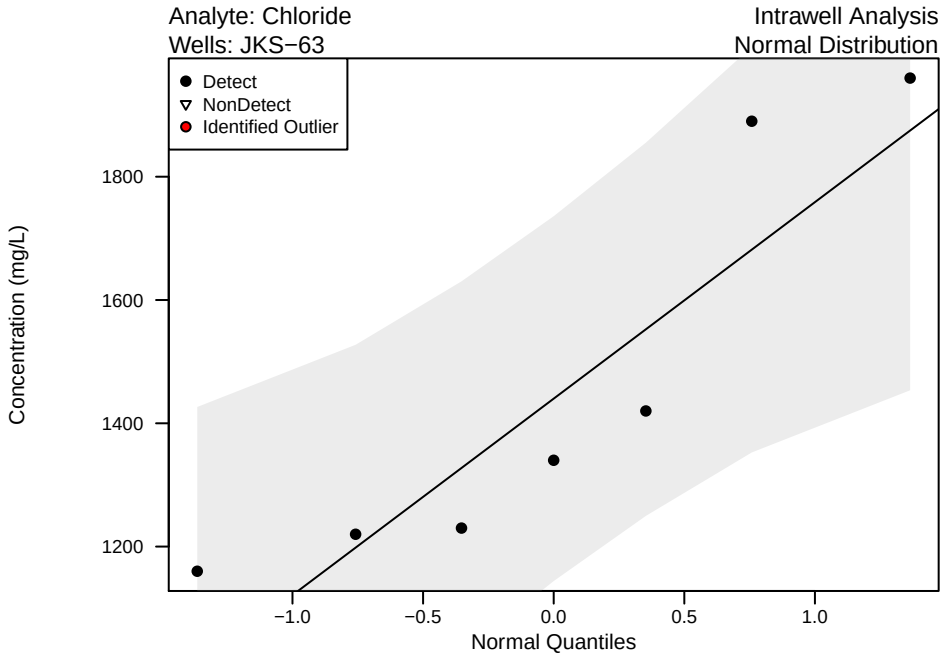

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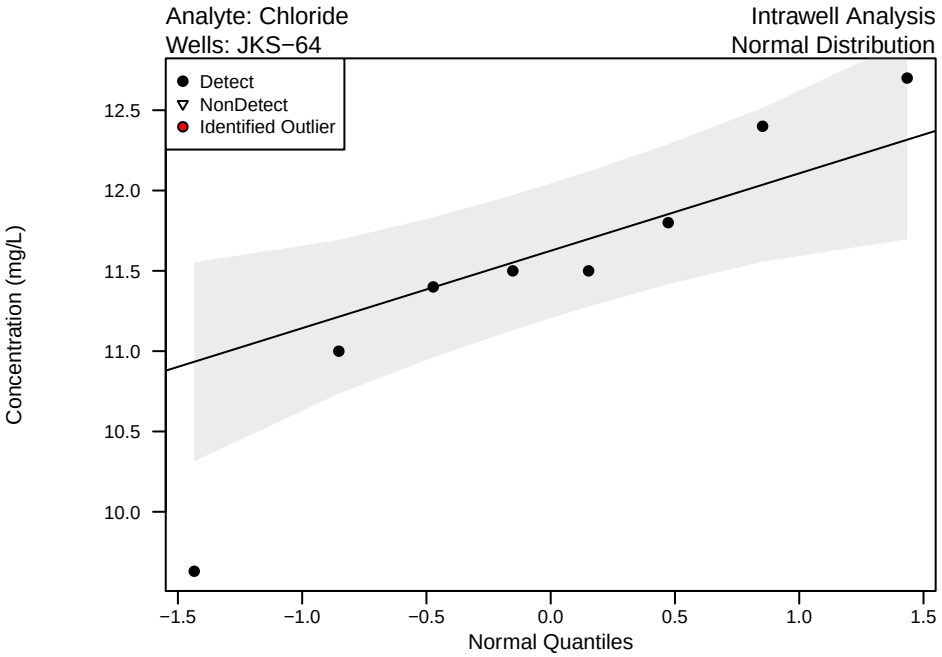
APPENDIX B-FIGURE 2
Unit: Evaporation Pond
QQ Plots of Upgradient Wells



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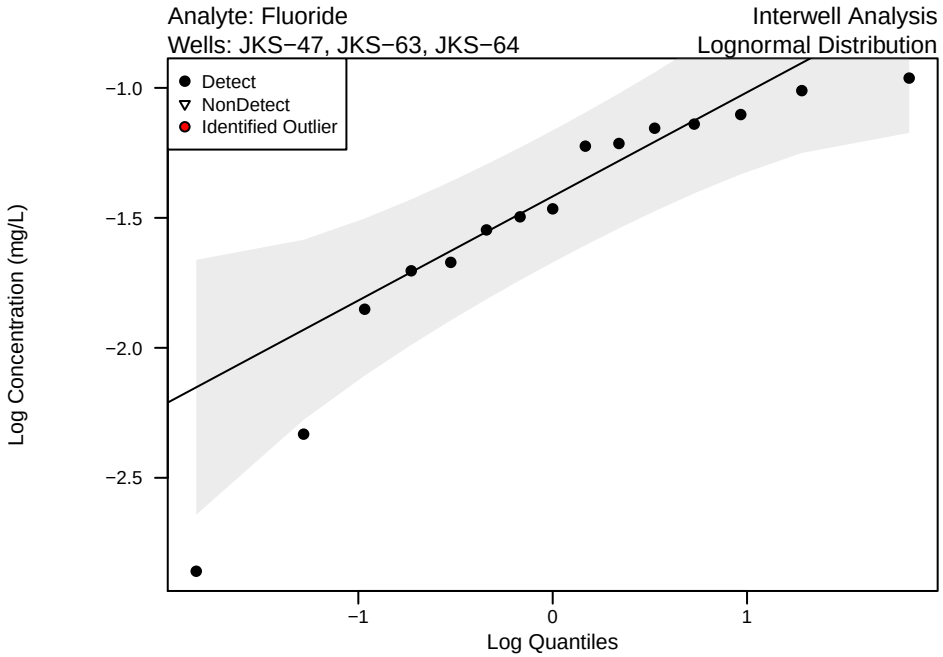
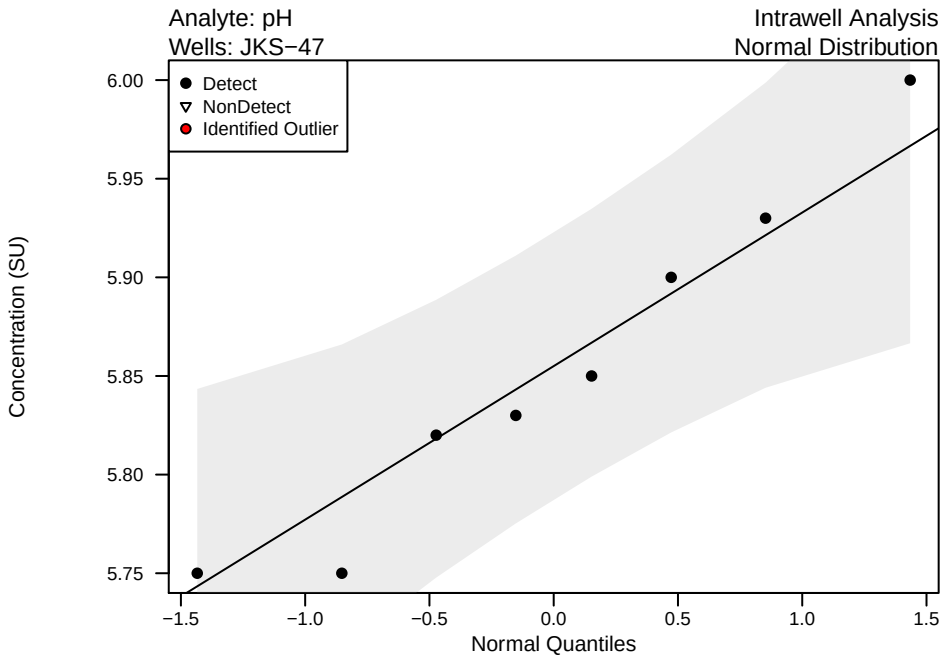


APPENDIX B-FIGURE 2
Unit: Evaporation Pond
QQ Plots of Upgradient Wells



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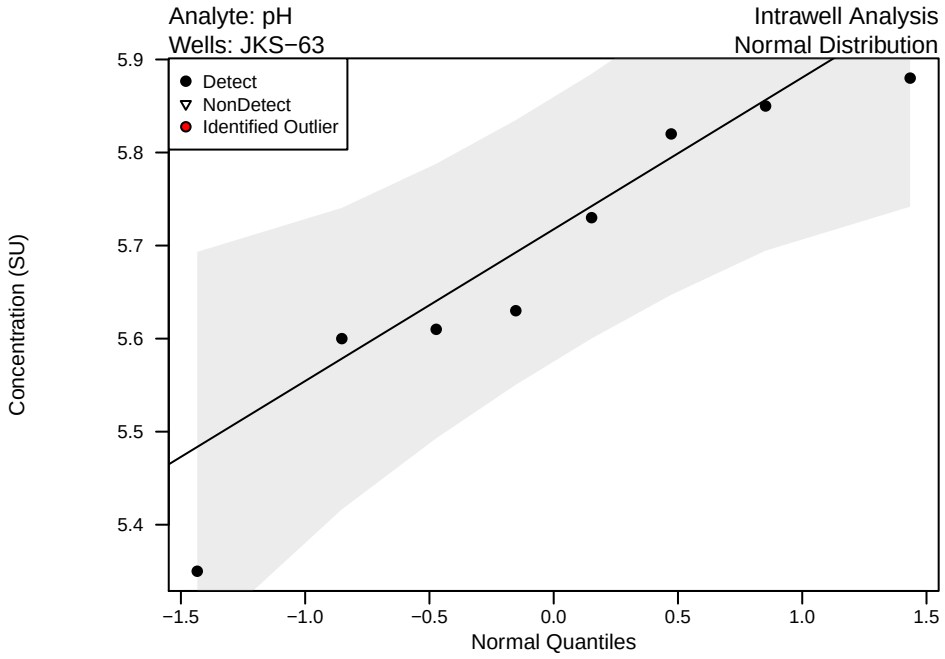

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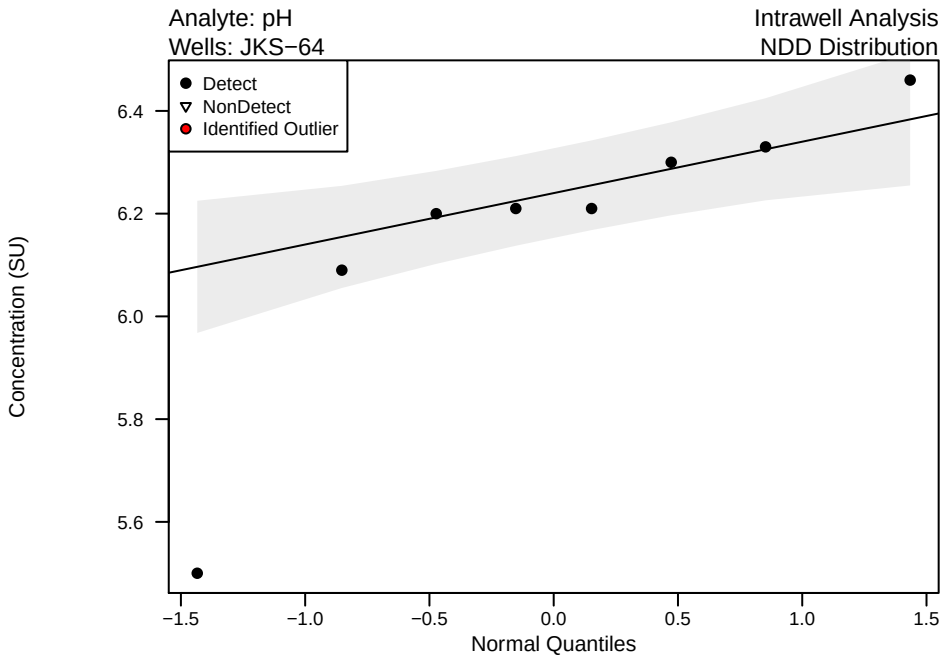
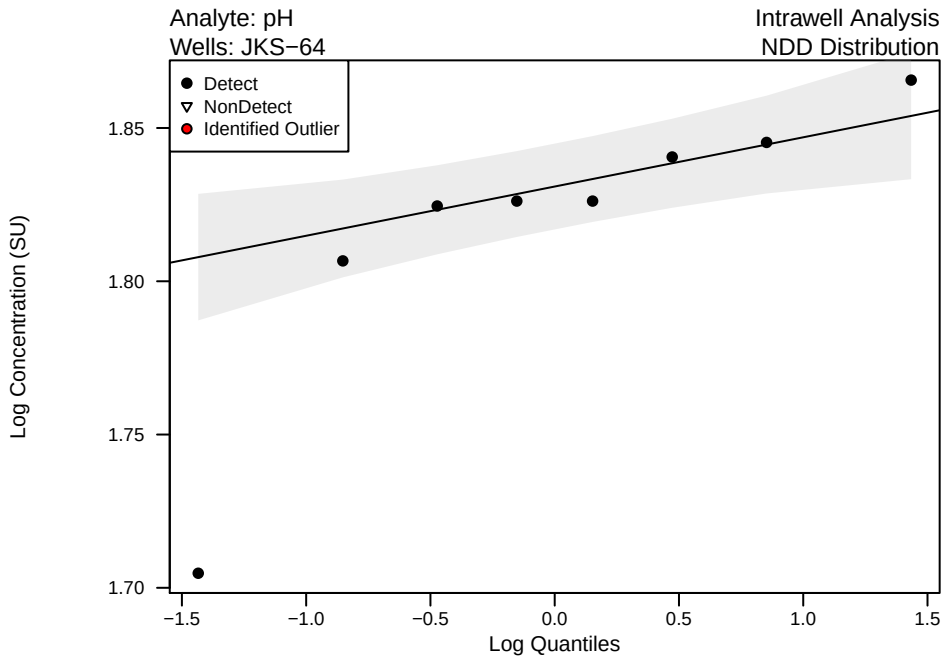
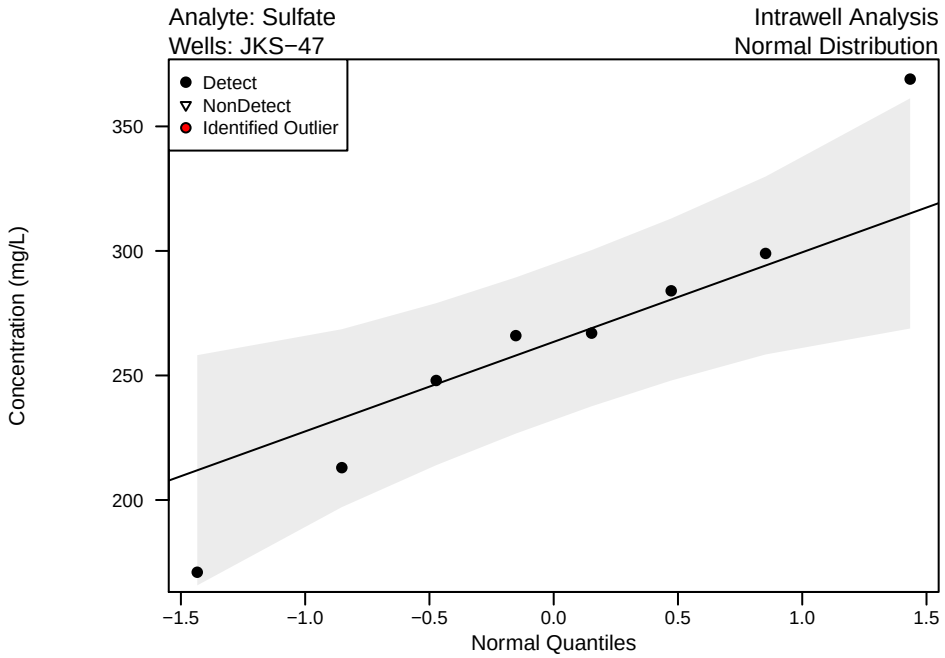
APPENDIX B-FIGURE 2
Unit: Evaporation Pond
QQ Plots of Upgradient Wells







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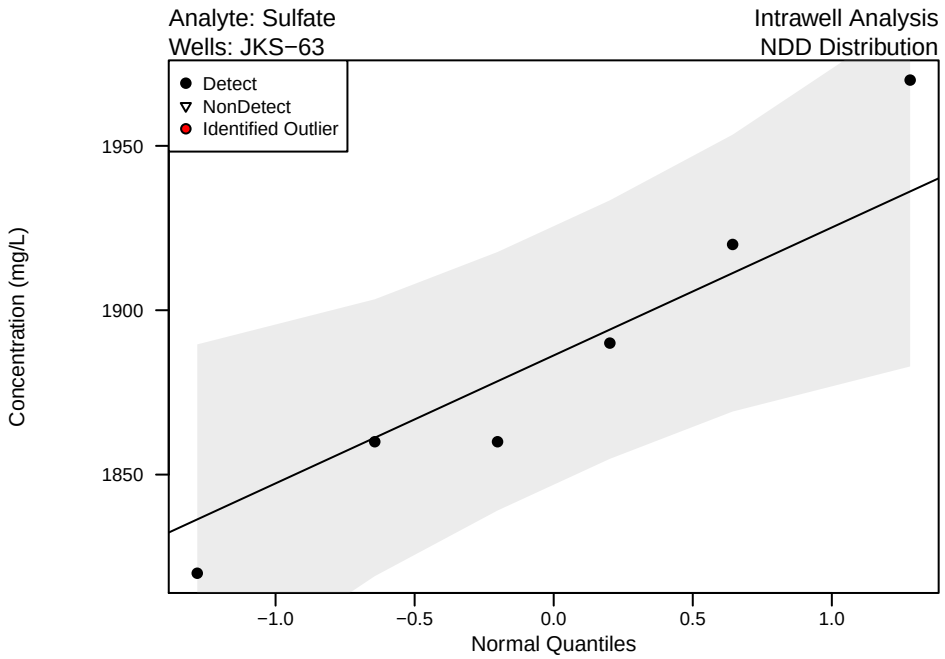
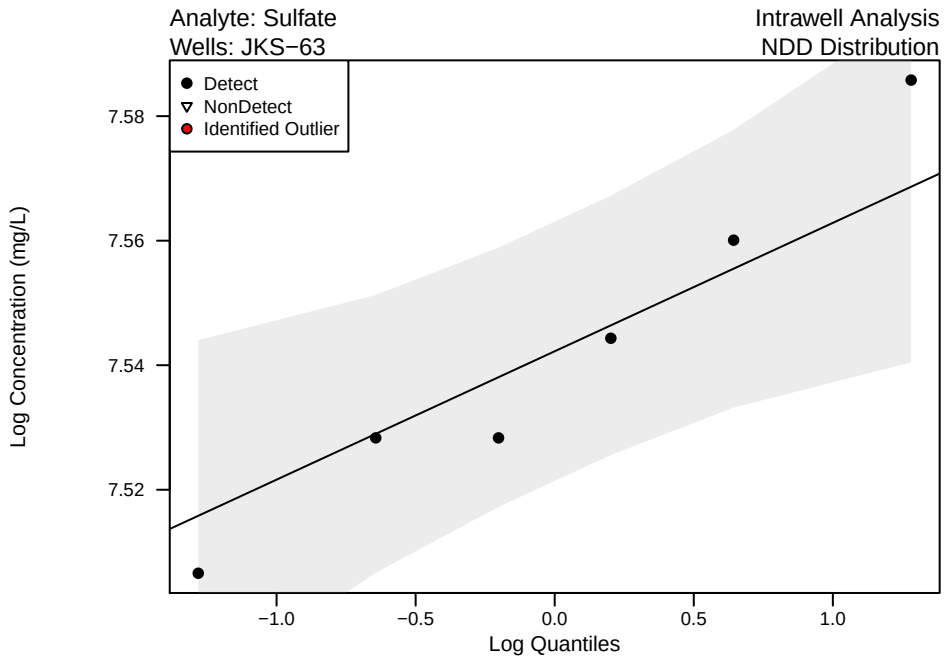
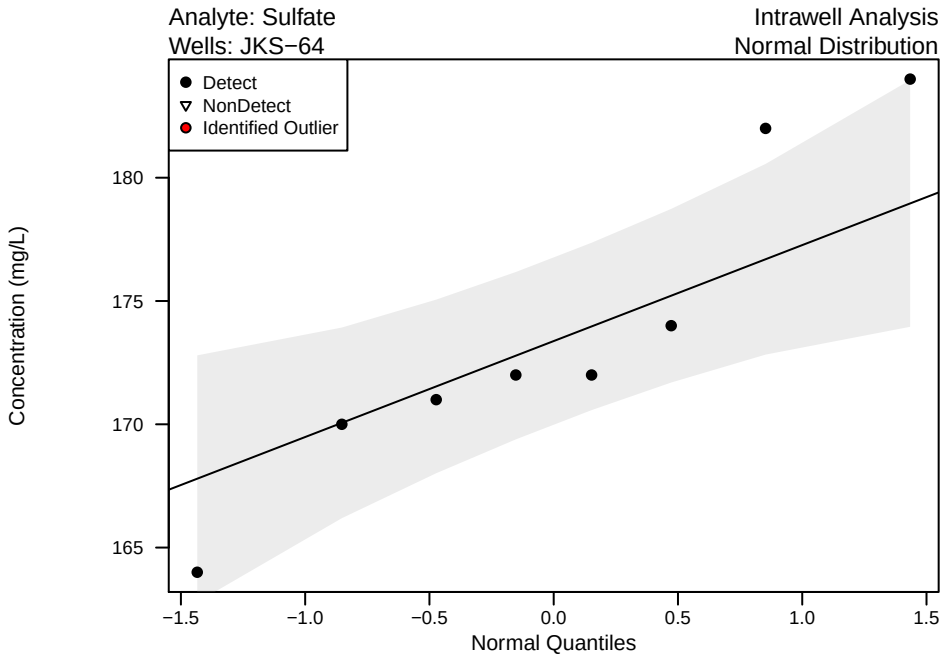
APPENDIX B-FIGURE 2
Unit: Evaporation Pond
QQ Plots of Upgradient Wells







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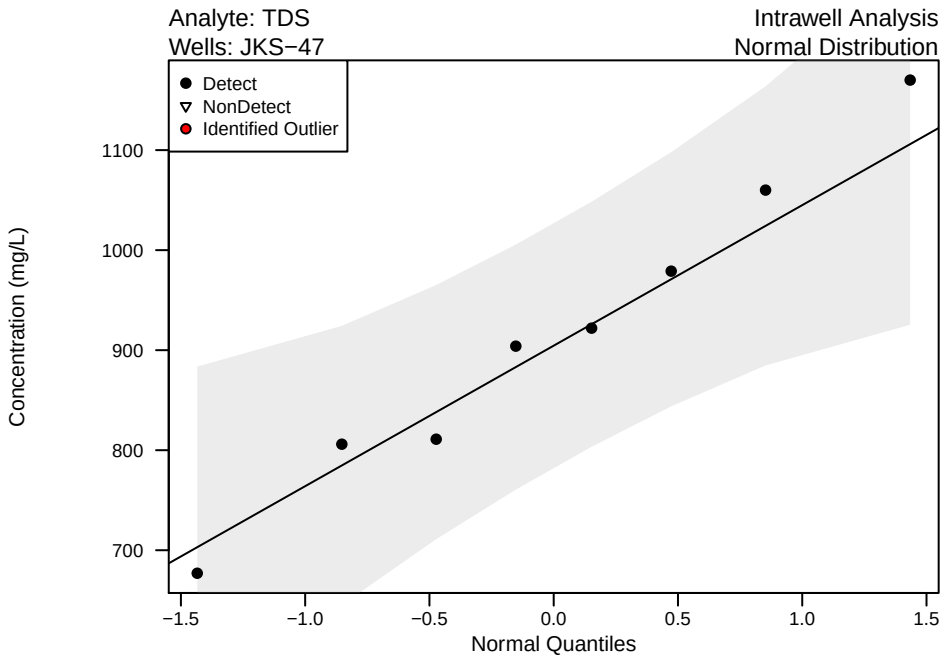
APPENDIX B-FIGURE 2
Unit: Evaporation Pond
QQ Plots of Upgradient Wells



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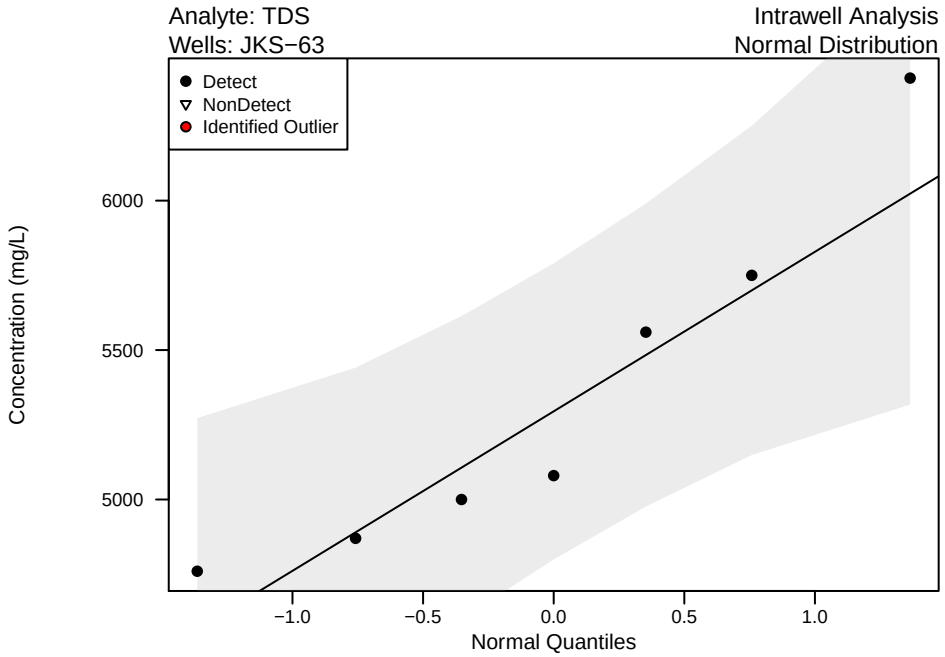

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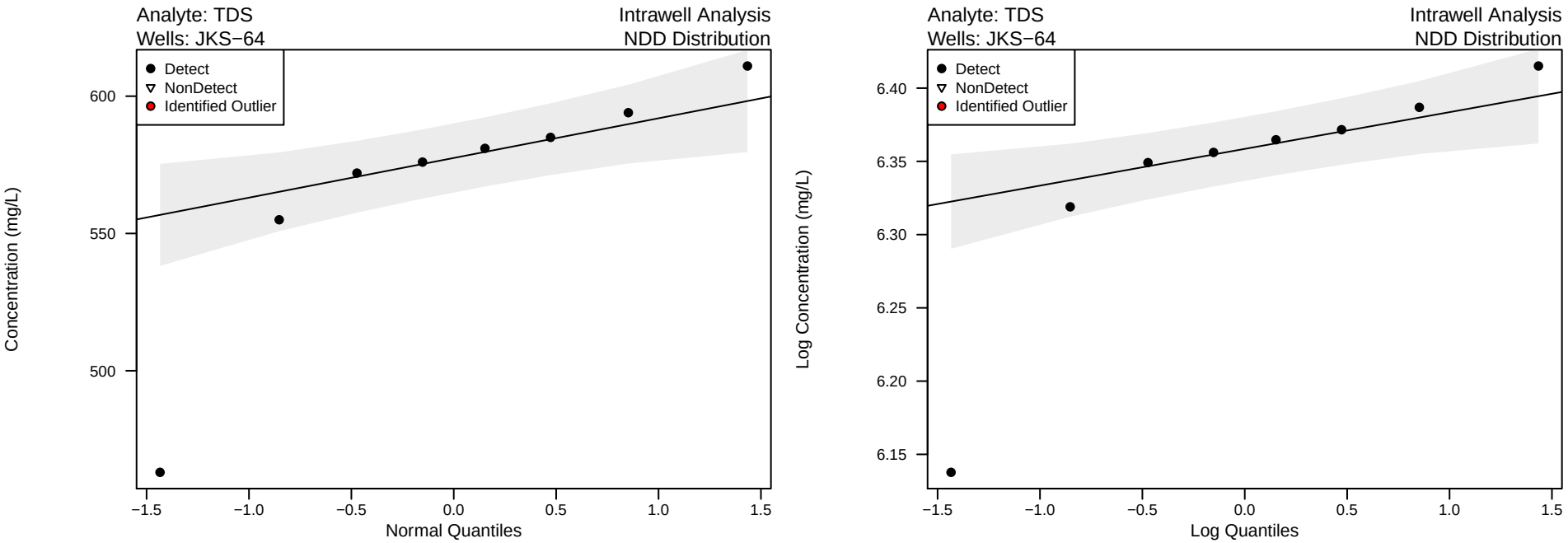
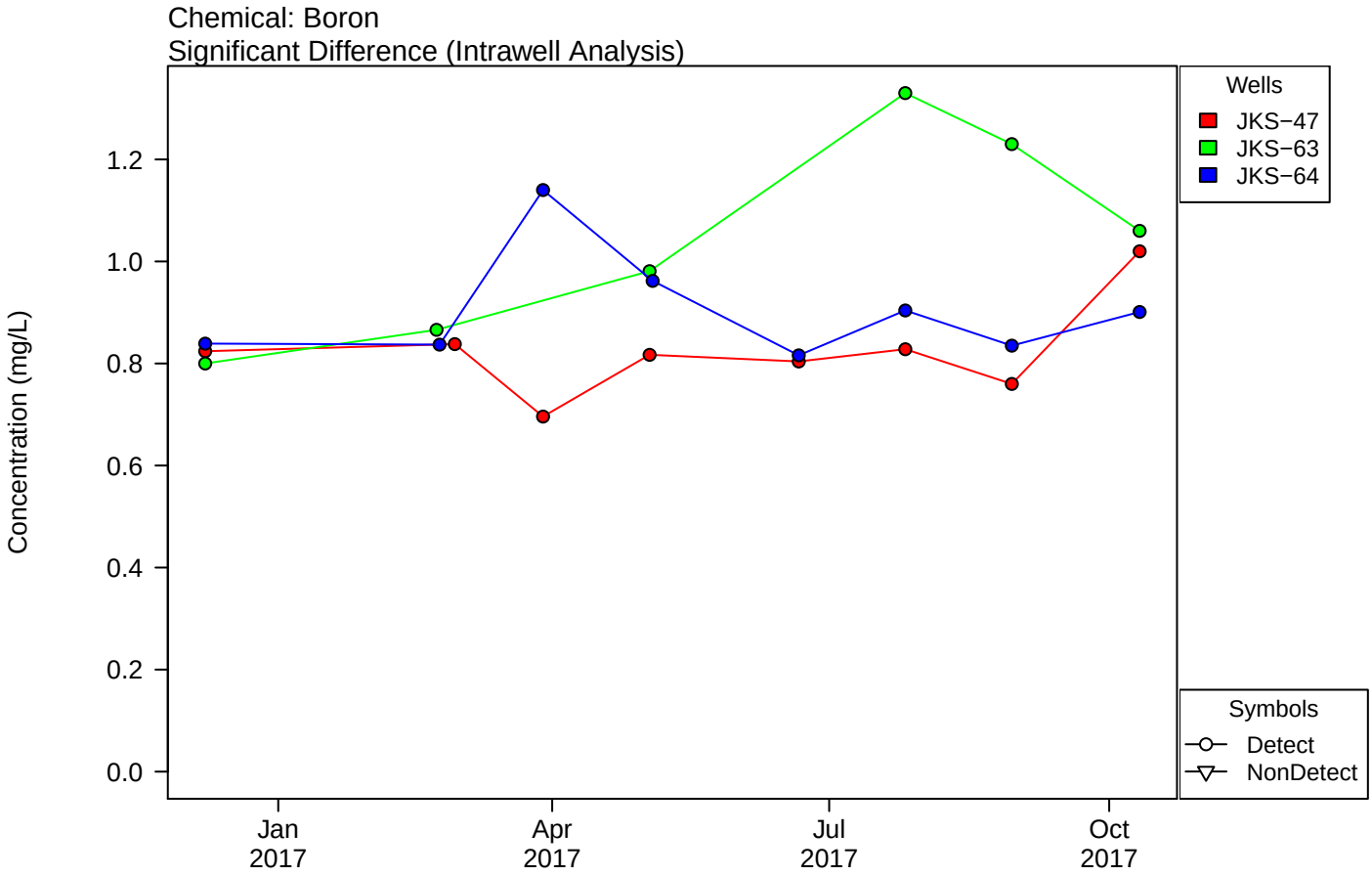
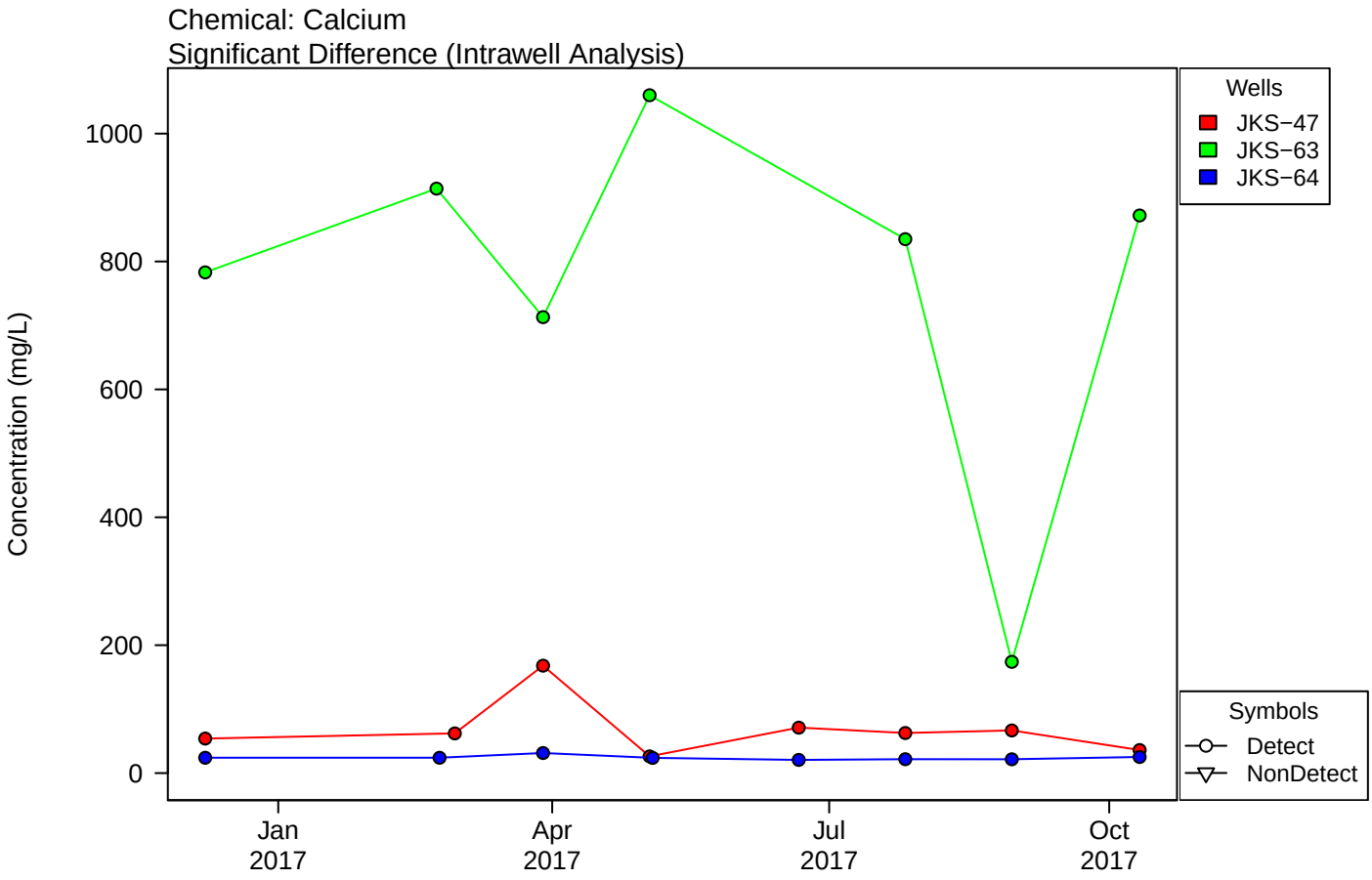
APPENDIX B-FIGURE 2
Unit: Evaporation Pond
QQ Plots of Upgradient Wells

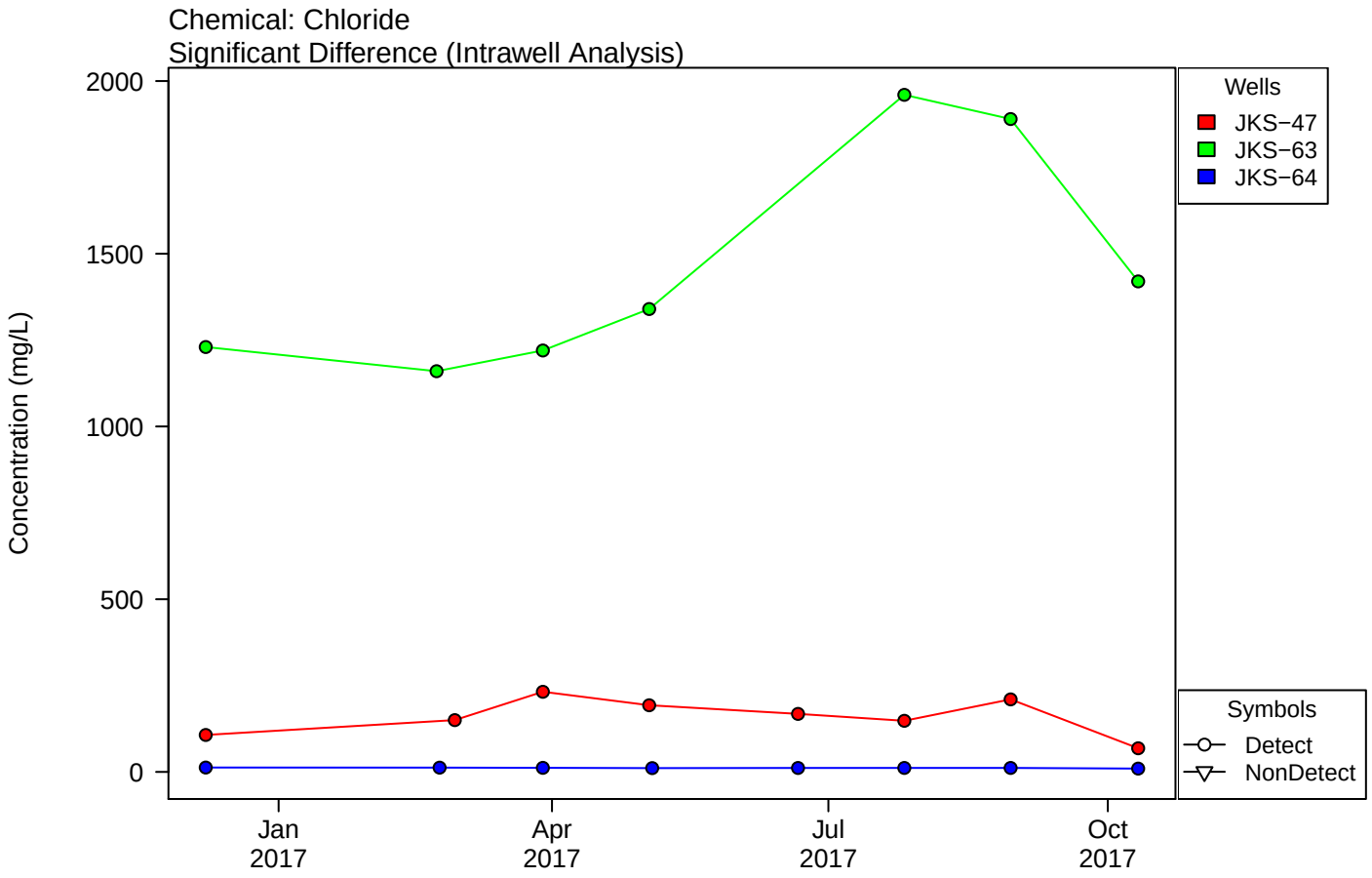


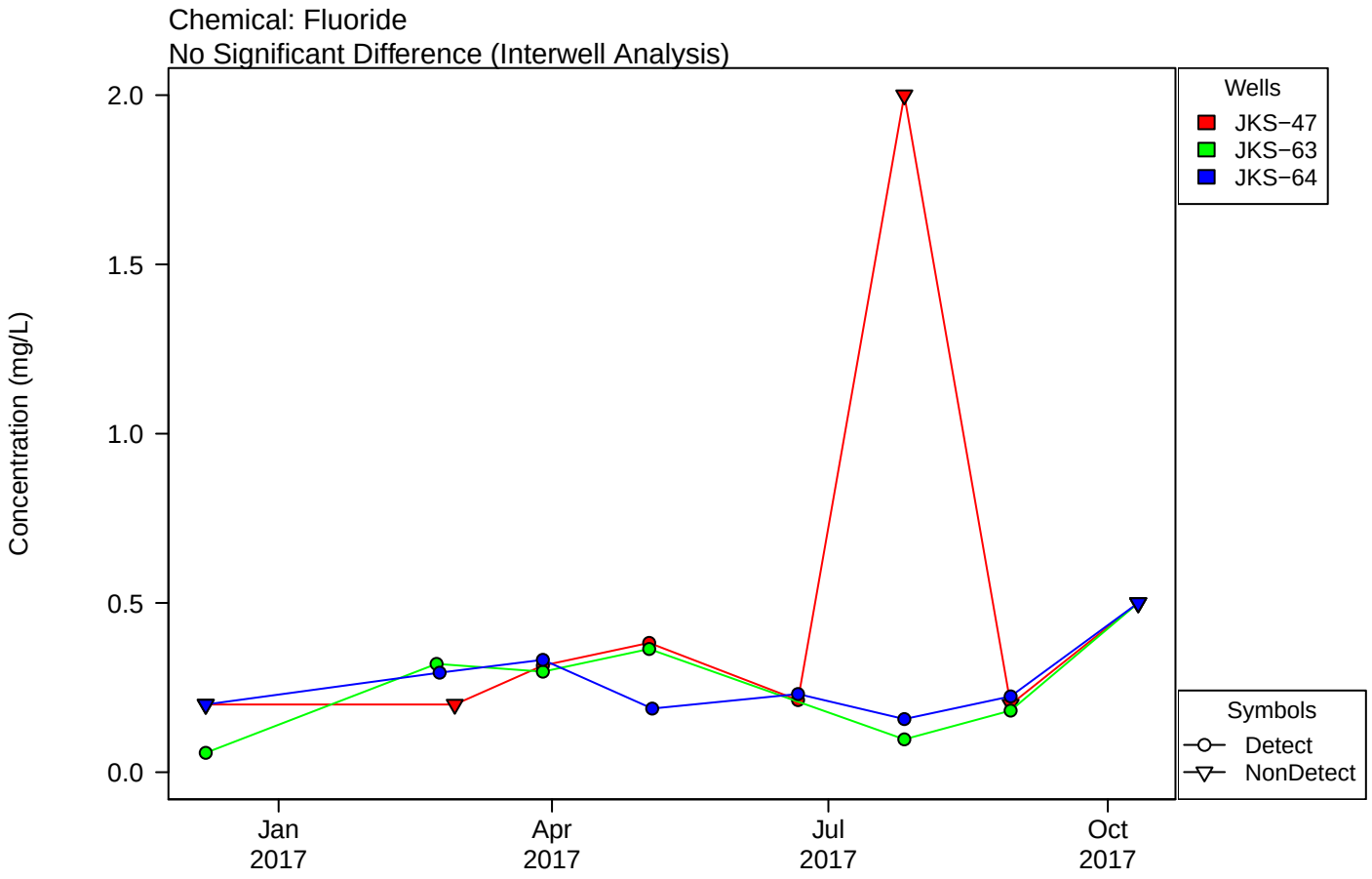
APPENDIX B-FIGURE 3
Unit: Evaporation Pond
Timeseries of Upgradient Wells



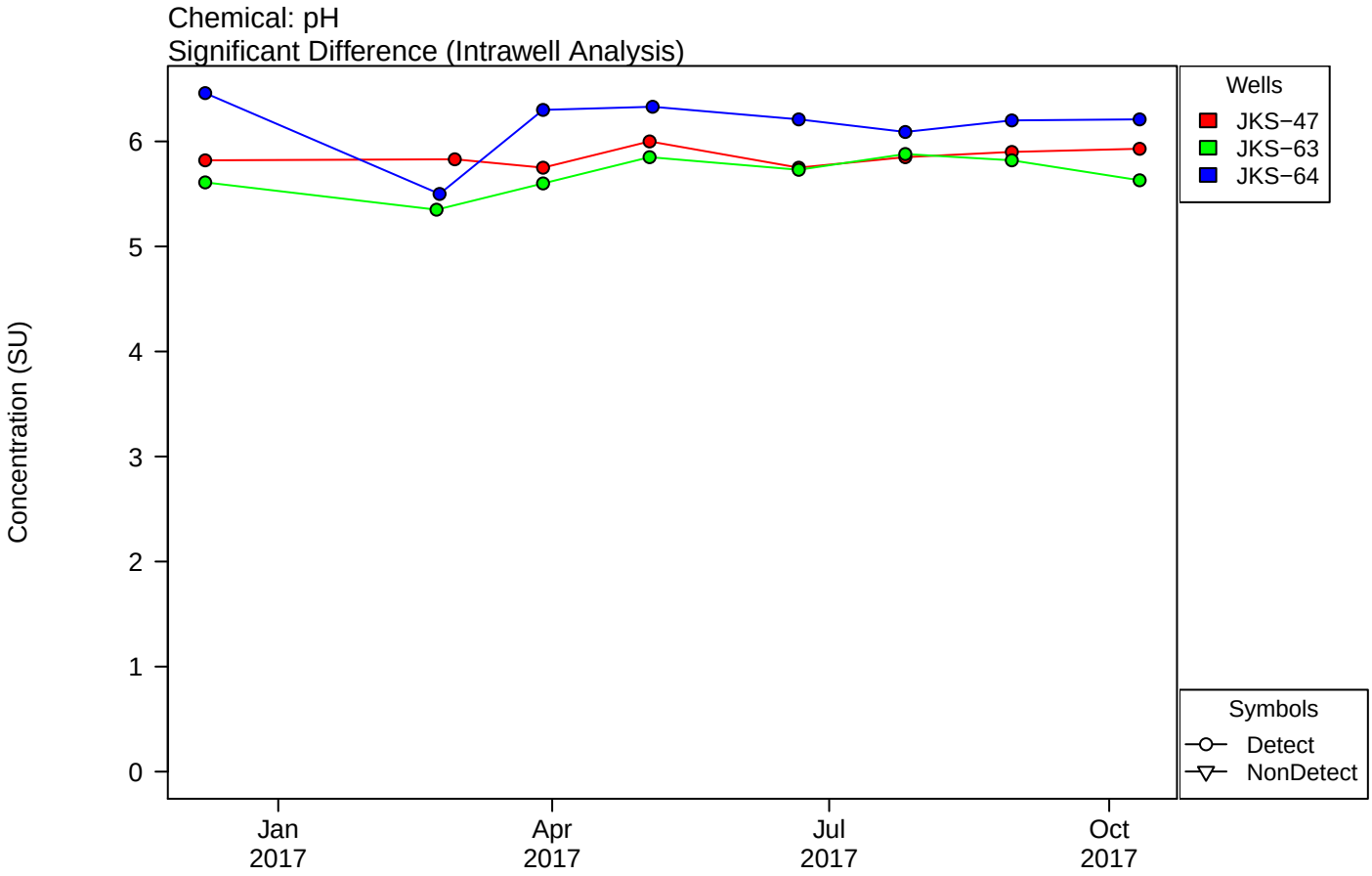


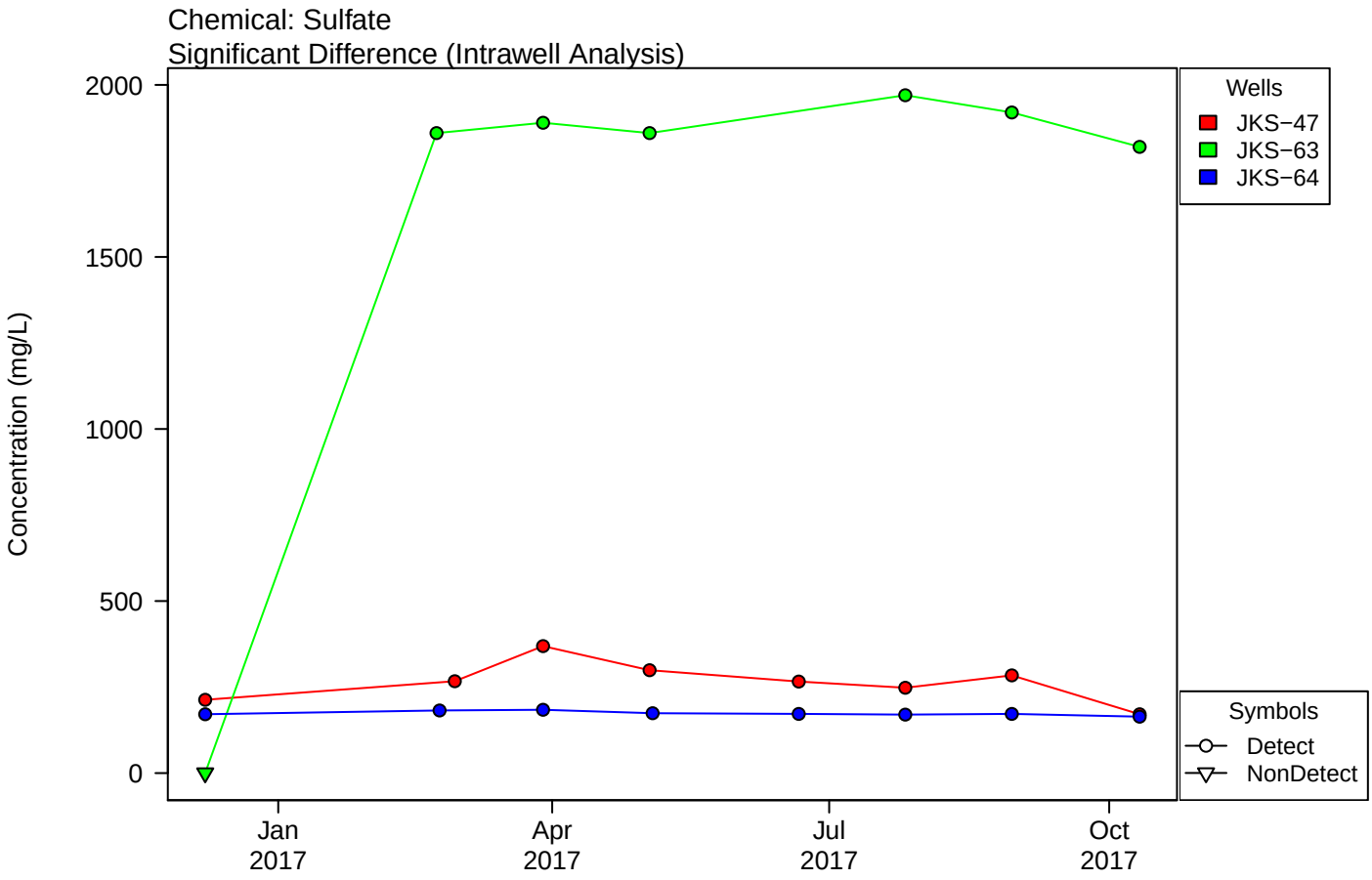
APPENDIX B-FIGURE 3
Unit: Evaporation Pond
Timeseries of Upgradient Wells



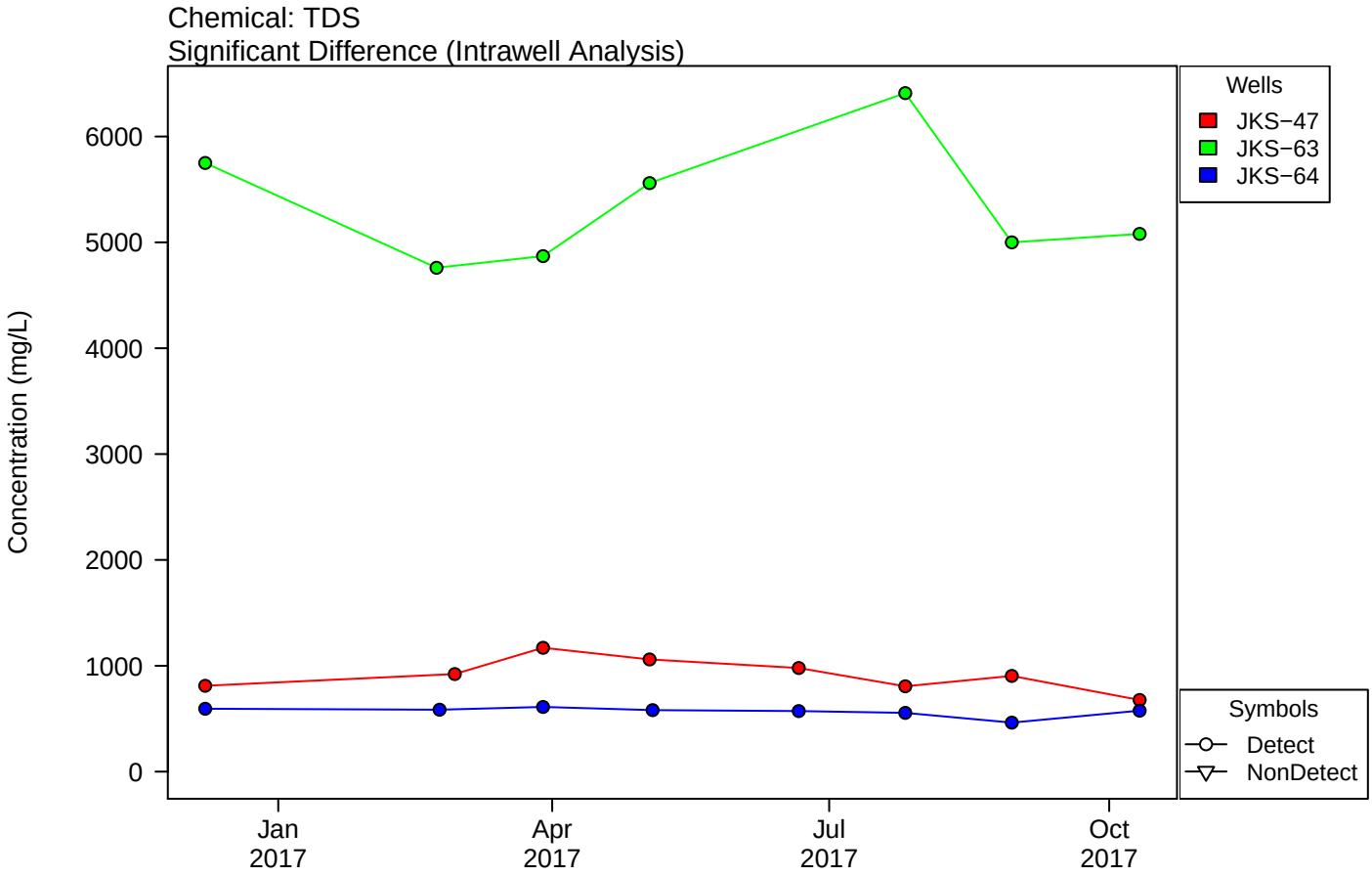


APPENDIX B-FIGURE 3
Unit: Evaporation Pond
Timeseries of Upgradient Wells





APPENDIX B-FIGURE 3
Unit: Evaporation Pond
Timeseries of Upgradient Wells



APPENDIX B-FIGURE 4
Unit: Evaporation Pond
Trend Analysis of Downgradient Wells with Exceedances