



# Technical Memorandum

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Re: 2022 KHSA External Quality Assurance Summary

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## 1. Introduction

The 2022 PacifiCorp Klamath River Baseline Sampling Program (Baseline) and Public Health Monitoring Program (Public Health), part of the Klamath Hydroelectric Settlement Agreement (KHSA) monitoring effort, included general water quality, particulate, and algae constituents (Table 1). The project incorporated external quality assurance (QA) samples for the Baseline general water quality constituents as per the Quality Assurance Project Plan (QAPP) developed by Watercourse Engineering, Inc. (Watercourse), E&S Environmental Chemistry, Inc. (E&S), and PacifiCorp (Vaughn and Deas, 2022a). The Baseline general water quality QA sample sets included duplicate, blank, and spike samples. While the QAPP does not include external QA samples for the other constituent groups in the Baseline program, duplicates and blanks were also collected for some particulate, chlorophyll-*a*, and pheophytin samples. Spikes were not included for particulate or algae constituents because spikes were not available for those constituents. No external QA samples were included in the Public Health program. Additional details on QA samples are addressed below.

In 2022, the KHSA sampling program began in April, continuing the changes made in the 2021 program. Samples were collected from April 25 through December 7, 2022 (Table 2). Field work was performed by E&S. General water quality constituent laboratory analysis was performed by Edge Analytical Laboratories (Edge). As occurred in 2021, analyses conducted by Edge were performed at multiple company locations (Table 3). Particulate and algae-related laboratory analyses were performed by Chesapeake Biological Laboratory (CBL). Environmental Protection Agency Region 9 Laboratory (EPA) performed the analysis for microcystin.

Laboratory oversight and external QA assessment were performed by Watercourse. QA assessment for the Baseline program included water quality constituent samples, particulate samples, chlorophyll-*a* and pheophytin samples, as well as microcystin samples, but excluded the algae speciation samples. QA assessment for the Public Health program included only microcystin data, excluding anatoxin-a and toxic algae species enumeration data. The project

sampling dates ranged from two to three sampling days per month (Table 2). Overall, 2,729 KHSA water samples from 15 sites were planned to be collected in 2022. Samples were collected at eight river sites and two reservoir sites (at multiple depths) for Baseline sampling (Table 4), as well as four reservoir sites and one river site for Public Health (Table 5). E&S planned to collect samples for two programs (Baseline – 2,664 and Public Health - 65) to be used for QA assessment. Of these planned samples, 2,676 samples were collected for the two programs (2,611 for Baseline and 65 for Public Health). Of the collected Baseline general water quality samples, 504 samples were external QA samples (regular/duplicate pairs, blanks, or spikes) collected at Link Dam and at Klamath River below Iron Gate Dam at Hatchery Bridge (Hatchery Bridge; Table 4). The external QA types and laboratories varied by constituent (Table 1). Methods, detection limits, and reporting limits varied by laboratory (Table 6).

This document includes discussion of sampling dates and locations, QA methodology review, QA of this year’s data, and laboratory terminology. The report also includes an appendix containing the QA dataset used during assessment and the production dataset generated during QA assessment for both Baseline and Public Health programs.

**Table 1. 2022 KHSA Baseline and Public Health Monitoring QA assessment constituents and constituent categories.**

Program	Category	Constituent	ID	QA types available*	Laboratories
Baseline	General WQ	Ammonia as Nitrogen	NH3	B, D, S	Edge
Baseline	General WQ	Nitrate + Nitrite as Nitrogen	NO3+NO2	B, D, S	Edge
Baseline	General WQ	Total Nitrogen	TN	B, D, S	Edge
Baseline	General WQ	Phosphate, Ortho as Phosphorus	PO4	B, D, S	Edge
Baseline	General WQ	Total Phosphorus	TP	B, D, S	Edge
Baseline	General WQ	Total Suspended Solids	TSS	B, D, S	Edge
Baseline	General WQ	Alkalinity, Bicarbonate as Calcium Carbonate	ALK	-	Edge
Baseline	General WQ	Dissolved Organic Carbon	DOC	B, D, S	Edge
Baseline	General WQ	Turbidity**	TURB	-	-
Baseline	Particulate	Particulate Carbon	PC	B, D	CBL
Baseline	Particulate	Particulate Nitrogen	PN	B, D	CBL
Baseline	Particulate	Particulate Phosphorus	PP	-	CBL
Baseline	Particulate	Particulate Inorganic Phosphorus	PIP	-	CBL
Baseline	Algae	Chlorophyll-a	CHLA	B, D	CBL
Baseline	Algae	Pheophytin	PHEO	B, D	CBL
Baseline / Public Health	Algae	Microcystin***	MYCN	B, D	EPA

\* QA types: B – Blank; D – Regular/Duplicate pair; S-spike or reference solution

\*\* Turbidity was analyzed by E&S. No samples were sent to a laboratory for this constituent (see Table 6).

\*\*\* Microcystin samples collected for the Public Health program did not include QA samples.

**Table 2. Sampling dates for 2022 KHSA Baseline Monitoring Baseline and Public Health.**

Month	Collection Date(s)																	
Apr	Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	26	-
	Public Health	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	Baseline	-	-	-	9	10	-	-	-	-	-	-	-	-	23	-	-	-
	Public Health	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-
Jun	Baseline	6	7	-	-	-	-	-	-	-	20	21	-	-	-	-	-	-
	Public Health	-	7	-	-	-	-	-	-	-	-	21	-	-	-	-	-	-
Jul	Baseline	-	-	-	-	-	11	12	-	-	-	-	-	-	-	25	26	-
	Public Health	-	-	-	-	-	-	12	-	-	-	-	-	-	-	-	26	-
Aug	Baseline	-	-	8	9	-	-	-	-	-	-	-	-	22	23	-	-	-
	Public Health	-	-	-	9	-	-	-	-	-	-	-	-	-	23	-	-	-
Sep	Baseline	-	-	-	-	-	-	12	13	-	-	-	-	-	-	-	26	27
	Public Health	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	27
Oct	Baseline	-	-	-	-	-	11	12	-	-	-	-	-	-	23	-	-	-
	Public Health	-	-	-	-	-	-	12	-	-	-	-	-	-	-	24	-	-
Nov	Baseline	-	-	-	-	-	-	-	-	14	15	-	-	-	-	-	-	-
	Public Health	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-
Dec	Baseline	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Public Health	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Table 3. Sample delivery and laboratory analysis locations for Edge Analytical samples, by constituent.**

Constituent	Sample Delivered to	Sample Taken to Analysis Location By	Physical Location of Analysis	Constituent Contact
Ammonia	Corvallis, OR	UPS	Burlington, WA	Bryce Jensen
Nitrate + Nitrite	Corvallis, OR	UPS	Burlington, WA	Bryce Jensen
Total Kjeldahl Nitrogen	Corvallis, OR	UPS	Burlington, WA	Bryce Jensen
Total Phosphorus	Corvallis, OR	UPS	Burlington, WA	Bryce Jensen
Orthophosphate	Corvallis, OR	UPS or courier	Wilsonville, OR	Thanh Phan
Total Suspended Solids	Corvallis, OR	UPS	Burlington, WA	Bryce Jensen
Alkalinity	Corvallis, OR	UPS	Burlington, WA	Bryce Jensen
Dissolved Organic Carbon	Corvallis, OR	UPS	Burlington, WA	Bryce Jensen

**Table 4. 2022 KHSA Baseline Monitoring sites. Bolded locations indicate external QA sites.**

Site ID	Site Name	Sample Depth (m)
<b>KR25444</b>	<b>Link Dam (RM 254.44; Baseline)</b>	<b>0.5</b>
KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	0.5
KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	0.5
KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	0.5
KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	0.5
KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	0.5
KR19874	Copco Reservoir (RM 198.74; Baseline) 0.5m	0.5
KR19874	Copco Reservoir (RM 198.74; Baseline) 0-8m Integrated	0-8
KR19874	Copco Reservoir (RM 198.74; Baseline) Thermocline	Thermocline
KR19874	Copco Reservoir (RM 198.74; Baseline) Bottom	1 m above bottom
KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	0.5
KR19019	Iron Gate Reservoir (RM 190.19; Baseline) 0.5m	0.5
KR19019	Iron Gate Reservoir (RM 190.19; Baseline) 0-8m Integrated	0-8
KR19019	Iron Gate Reservoir (RM 190.19; Baseline) Thermocline	Thermocline
KR19019	Iron Gate Reservoir (RM 190.19; Baseline) Bottom	1 m above bottom
<b>KR18973</b>	<b>Klamath River below Iron Gate Dam (RM 189.73; Baseline)</b>	<b>0.5</b>

**Table 5. 2022 KHSA Public Health Monitoring sites.**

Site ID	Site Name	Sample Depth (m)
CRCC	Copco Reservoir at Copco Cove (Public Health)	0.1
CRMC	Copco Reservoir at Mallard Cove (Public Health)	0.1
IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	0.1
IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	0.1
KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	0.1

**Table 6. Laboratory methods, method detection limits (MDL), and reporting limits (RL) for samples analyzed by Edge, CBL, and EPA in 2022.**

Constituent	units	Laboratory	Method	MDL	RL
NH3	mg/l	Edge	EPA 350.1	0.00846 0.0088 <sup>1</sup>	0.01
NO3+NO2	mg/l	Edge	SM4500-NO3 F	0.0063	0.01
TKN	mg/l	Edge	EPA 351.2	0.0585	0.2
TN	mg/l	Edge	Calculated	0.0585	0.2
PO4	mg/l	Edge	SM4500-P F	0.01	0.01
TP	mg/l	Edge	SM4500-P F	0.0021	0.01
TSS	mg/l	Edge	I-3765-85	1.5	1.5
ALK	mg/l	Edge	SM2320 B	2.0	2.0
DOC	mg/l	Edge	SM5310 B	0.045 0.075 <sup>2</sup>	0.5
TURB	mg/l	*	-	-	-
PC	mg/l	CBL	E440.0	0.0633	0.1899
PN	mg/l	CBL	E440.0	0.0263	0.0789
PP	mg/l	CBL	EPA 365.1, ASPILA	0.0010	0.0030
PIP	mg/l	CBL	E365.1	0.0010	0.0030
CHLA	µg/l	CBL	E445.0	0.68	0.68
PHEO	µg/l	CBL	E445.0	0.46	0.46
MYCN	µg/l	EPA	ELISA	0.10	0.15

\* Turbidity was measured by field crews using a calibrated water quality probe. E&S used a Hach 2100Q turbidimeter set to "Signal Average Mode" which averaged 12 readings for a final value.

<sup>1</sup> Data analyzed after June 8, 2022 had a different MDL.

<sup>2</sup> Data analyzed after July 27, 2022 had a different MDL.

## 2. Quality Assurance Review

QA samples provide a method of estimating the bias and variability associated with a set of samples. Each QA type provides information about bias, variability, or both bias and variability. Blank samples provide an estimate of positive bias by estimating contamination. Duplicate samples provide an estimate of variability, while spike samples provide information about both bias and variability of a sample set.

Criteria are used to determine if the estimated bias and variability are acceptable or unacceptable within the scope of the project. The criteria used for determining the acceptability of sample results is dependent on the QA type. Further details of the QA criteria can be found in the 2012 Reclamation QA protocol document "Standard Operating Procedures for Quality Assurance, Revision 2012-07" (Reclamation 2012). The following is a summary of the criteria generally used for the blank, duplicate, and spike QA types employed during the 2022 Baseline program.

Blank sample concentration criteria require that sample concentration is: (1) less than ten percent of the lowest sample concentration, or (2) less than or equal to twice the reporting limit (RL).

Selection of duplicate sample criteria is dependent on the sample concentration and the reporting limit. For sample concentrations greater than or equal to five times the reporting limit, a QA assessment value called Relative Percent Difference (RPD) should be less than 20 percent

(Eq. 1). For sample concentrations less than five times the RL, the difference between the duplicate and regular sample estimated value should be less than the RL. This value is known as the absolute difference (AD).

The selection of the spike sample criteria is dependent on the RL and the certified spike or reference solution concentration. When the spike or reference solution certified value is greater or equal to five times the RL, a QA assessment value called the Recovery should fall between 80 and 120 percent (Eq. 2 and Eq. 3). For spike or reference solution certified values less than five times the RL, the difference between the spike sample and certified value of the spike or reference solution should be less than the RL.

$$\text{Relative Percent Difference (RPD)} = 100 \left( \frac{[\text{Regular}] - [\text{Duplicate}]}{[M]} \right) \quad (1)$$

$$\text{Recovery for Added Spike} = 100 \left( \frac{[\text{Spike}] - [M]}{[\text{Spike Material Added}]} \right) \quad (2)$$

$$\text{Recovery for Reference Solution} = 100 \left( \frac{[\text{Spike}]}{[\text{Reference Solution}]} \right) \quad (3)$$

Where: M = Mean of regular and duplicate concentrations  
 Regular = Concentration of regular sample  
 Duplicate = Concentration of duplicate sample  
 Spike = Concentration of either spiked sample or reference solution

The criteria presented above are used as guidelines in QA processes and assessments. The extent to which the acceptable limits are adjusted is dependent upon several factors, including the laboratory performance of the constituents, the type of QA sample involved, and the adherence to the standard operating procedure (SOP) during the sample collection. For purposes of this project in 2022, the data was deemed acceptable with an RPD value no greater than 28 percent and a recovery value no less than 73 percent or no greater than 120 percent.

Another external QA assessment performed for the Baseline program was completeness. Completeness is the amount of data collected divided by the amount of data intended to be collected. Completeness was calculated for each constituent (Eq. 4).

$$\text{Completeness} = \frac{\text{Number of samples that were actually collected and analyzed}}{\text{Number of samples that were planned to be collected and analyzed}} \quad (4)$$

A third type of QA assessment performed for the Baseline program was a comparison of fraction values for nitrogen and phosphorus. If the total fraction (TN or TP) was less than the partial fraction (NH<sub>3</sub> or NO<sub>2</sub>+NO<sub>3</sub>; PO<sub>4</sub>), then the results were compared to determine if there was a meaningful difference between the two values using the following modified RPD (RPDm) equation (Eq. 5). An RPDm value greater than 20 percent was used to indicate when the partial

fraction was meaningfully larger than the total fraction, an outcome which was not acceptable for the purposes of this project in 2022. This assessment was only performed on production, regular, and duplicate samples that had both total and partial fraction data for either nitrogen or phosphorus.

$$\begin{aligned} & \text{Relative Percent Difference, Modified (RPDm)} \\ & = 100 \left( \frac{[Partial Fraction] - [Total Fraction]}{[Mean of Partial and Total Fractions]} \right) \end{aligned} \quad (5)$$

### 3. 2022 KHSA Baseline and Public Health Water Quality Assessment

For the 2022 Baseline program, there were 504 QA samples included in the general water quality samples (each regular and duplicate pair counting once) to assess the bias and variability of that portion of the data set. No QA samples were collected for turbidity or alkalinity, and so those constituents were assessed only for completeness. A partial QA assessment (duplicates and blanks) was done on some particulate and algae constituents. The Public Health program was assessed only for completeness.

#### 3.1. Quality Assurance Issues

During the 2022 KHSA Baseline Monitoring, there were a few issues that affected the QA program. These issues and corrective actions to resolve them are discussed in this section.

##### 3.1.1. De-Ionized Water Supply Chain Issues

In July 2022, supply chain issues prevented the field crew from procuring de-ionized water to be used for blank external quality assurance samples. Distilled water was procured instead and used for one field visit. However, the distilled water use led to blank samples with higher-than-expected nitrate+nitrate concentrations. As the issue was known, these samples were not reanalyzed.

Corrective Action: E&S will stock a larger volume of de-ionized water in an attempt to anticipate scarcity issues and avoid the use of distilled water for blank samples.

##### 3.1.1. Phosphate Value Larger than Total Phosphorus

In July 2022, a production sample collected at Klamath River below J.C. Boyle Dam (RM 224.60; Baseline; Sample KR22091) was found to have a RPDm value of 141 percent, greater than the QA criteria of 20 percent when comparing phosphate values with total phosphorus values for a single sample. Investigations with the field crew and the laboratory determined no discrepancies that would account for the disproportionate values of phosphate and total phosphorus.

Corrective Action: Continue to follow SOPs and continue to communicate with the laboratory to minimize potential for similar issues in the future..

##### 3.1.2. Laboratory Bottles Not Pre-preserved

In September 2022, bottles were received by the field crew from Edge laboratory that were labeled as containing preservative (the expected bottle order). However, the bottles did not have preservative inside them. As a result, the samples were not preserved prior to analysis

other than being kept on ice. The laboratory notified the field crew at the time of analysis, when the issue was noticed. The issue resulted in a regular / duplicate RPD that exceeded QA criteria. However, reanalysis was not requested because the cause of the issue was known and any reanalysis would have been faced with the same problem of analyzing unpreserved samples.

Corrective Action: No corrective actions.

### **3.1.3. Assumed Laboratory Contamination**

In September 2022, sample KR22138 was collected from the surface of Copco Reservoir and analyzed for phosphate. Its result was extremely high, an order of magnitude higher than expected based on historical data for the site. The phosphate value was an order of magnitude larger than the total phosphorus value. As phosphate has a short hold time, reanalysis was not initially requested from the lab. However, when Watercourse requested a value confirmation, to determine if any transcription errors had occurred, the lab reported that the sample was still in the archive and could be reanalyzed, though it was far outside the hold time. Once the original value was confirmed and no transcription error was found, the sample was reanalyzed, and the reanalysis result was an order of magnitude less than the original result. The laboratory assumed the original aliquot had been contaminated at the laboratory during original analysis. Because the sample was so far outside the hold time, the reanalysis results were not valid. Therefore, the original result was removed from the dataset as an invalid value and was not replaced.

Corrective Action: No corrective actions were possible.

### **3.1.4. Low DOC Spike Value**

In September 2022, the DOC spike result for KR22143 was very similar as the values of the regular and duplicate for that QA set. During reanalysis the DOC original result was confirmed. The field crew confirmed a spike was added to the sample bottle during sampling. There were no discrepancies noted by the field crew of the laboratory to explain the low spike result.

Corrective Action: Continue to follow SOPs and continue to communicate with the laboratory to minimize potential for similar issues in the future.

### **3.1.5. High Total Nitrogen Results**

For all samples collected on September 12, 27, and 26, 2002, both production and external QA, the total nitrogen results were unexpectedly high, excepting blank samples. This was assumed to be a laboratory issue, as samples collected on September 13 were not affected, but were analyzed before samples collected on September 12, due to Sample ID naming conventions. Because of the high concentrations associated with the regular and duplicate QA samples, the spike recoveries for those QA sets were very low. There were no discrepancies noted by the field crew associated with total nitrogen. After informing the laboratory of the persisting issue, the issue ceased.

Corrective Action: No corrective actions were possible.



### **3.1.6. Inconsistent Phosphate Results**

In October 2022, the regular and duplicate sample RPD values for phosphate associated with all field visits in that month did not meet QA criteria. After recognizing this as a persistent issue, and informing the field crew and the laboratory, the issue ceased. It is unclear if this issue originated with the field crew or the laboratory.

Corrective Action: Continue to follow SOPs and continue to communicate with the laboratory to minimize potential for similar issues in the future.

### **3.1.7. Mislabeled Bottles**

In November 2022, one set of spike and blank bottle labels were swapped, resulting in the results of ammonia, nitrate+nitrate, TKN, and total phosphorus spike and blanks being swapped. Once the values were verified with the laboratory to determine that the swapping had not occurred as a transcription error, it was determined that a set of bottle labels had been swapped when the bottle order had been created in the laboratory to be shipped to the field crew. Once this issue was discovered, the data values were swapped in the dataset, so the data values were representative of the correct samples.

Corrective Action: No corrective actions were possible.

### **3.1.1. Unsafe Sampling Conditions**

In November 2022, due to unsafe sampling conditions (unhealthy levels of wildfire smoke), samples were not collected at Klamath River below USGS Gage (RM 219.50; Baseline) and Copco Reservoir (RM 198.74; Baseline).

Corrective Action: No corrective actions were possible.

### **3.1.2. Transcription Error for TSS**

In December 2022, it was determined that the original TSS spike result of 7 mg/l was misreported because of a transcription error. The corrected value of 74 mg/l was reissued in an amended report by the laboratory, and the original value was updated accordingly.

Corrective Action: No corrective actions were possible.

### **3.1.3. Sonde Temperature Sensor Failure**

In September 2022, the field crew discovered that the temperature sensor had failed on their In-Situ AquaTROLL 500. Review of all 2022 data at the end of the year revealed that the temperature sensor had not been working properly beginning in July 2022. Because the temperature sensor is used by the Aqua-TROLL 500 to adjust the other sensors on the sonde for temperature, it was decided that all sonde measurements from July, August, and September 2022 that has been made using the Aqua-TROLL 500 should be removed from the final dataset.

Corrective Action: Routine sonde maintenance will continue to be conducted. A review of sonde data should occur each month to ensure any loss of data is limited in scope.

### 3.1.4. Unmet QA Criteria

Samples collected during the 2022 program that did not meet QA criteria (and were still within sample holding times or where hold time was exceeded by only a few days), underwent laboratory reanalysis for that sample (or both samples in the case of regular/duplicate pairs). TSS and PO4 samples have short hold times (48 hours) that generally preclude reanalysis because the transfer time to the lab, processing, analysis, and QA exceed this short period. Samples that did not meet QA criteria for known issues (such as the use of distilled water instead of de-ionized water), were not reanalyzed because reanalysis would only reproduce the original results and not provide any useful information.

In total, sixteen samples of 504 QA samples were reanalyzed during 2022 (Table 7). Of the original results, eight values were confirmed by the lab while eight results were not. In general, reanalysis results that did not confirm the original results replaced the original results in the dataset and were marked bold and underlined in the datasets (Appendix A).

**Table 7. Quantities of sample reanalysis during 2022 KHSA Baseline Monitoring**

Constituent	Number Reanalyzed (Number of Confirmed Original Results)					Total
	Blank	Regular	Duplicate	Spike	Production	
NH3	-	2 (1)	2 (1)	-	-	4 (2)
NO3+NO2	-	-	-	-	-	-
TN	-	2 (0)	2 (1)	2 (1)	-	6 (2)
PO4	-	-	-	-	1 (0)	1 (0)
TP	-	2 (1)	2 (2)	-	-	4 (3)
TSS	-	-	-	-	-	-
DOC	-	-	-	1 (1)	-	1 (1)
Total	-	6 (2)	6 (4)	3 (2)	1 (0)	16 (8)

Corrective Action: None required; for 2023 sampling, entities should continue to submit QA samples and make reanalysis requests to the labs, when appropriate.

## 3.2. Completeness

The total completeness for the 2022 Public Health by E&S was 100 percent, with 65 microcystin samples collected as planned by the program. The total average completeness for the 2022 Baseline program was 98.2 percent (Table 8). Completeness was calculated for general water quality, particulate, and algae samples.

**Table 8. Individual constituent, group, and total completeness for 2022 KHSA Baseline Monitoring.**

Group	Constituent	Planned Samples	Analyzed Samples	Completeness (percent)	Average Completeness (percent)	Total Average Completeness (percent)
TOTAL	-	2664	2611	98.2	98.2	98.2
Water Quality	NH3	212	208	98.1	98.2	98.2
	NO3+NO2	212	208	98.1		
	TN	212	208	98.1		
	PO4	212	208	98.1		
	TP	212	208	98.1		
	TSS	204	200	98.0		
	ALK	100	98	98.0		
	DOC	204	200	98.0		
	TURB	106	105	99.1		
Particulate	PC	180	176	97.8	98.3	98.2
	PN	180	176	97.8		
	PP	91	90	98.9		
	PIP	91	90	98.9		
Algae	CHLA	182	176	96.7	97.8	98.2
	PHEO	182	176	96.7		
	MYCN	84	84	100.0		

### 3.3. Quality Assurance by Sample Type

Of the 504 general water quality QA samples collected during the 2022 KHSA Baseline Monitoring (regular/duplicate pairs counting only once), there were 168 blanks, 168 regular/duplicate pairs, and 168 spikes collected and analyzed. Blanks had 98.2 of the collected samples meet the QA criteria. Spikes had 97.6 percent of the collected samples meet the QA criteria. Regular/duplicate pairs had 92.3 percent of collected samples meet the QA criteria. In total 4.0 percent (20 samples) of the QA samples failed to meet QA criteria (Table 9).

**Table 9. 2022 general water quality QA samples that did not meet QA criteria by sample type.**

Sample Type	# of QA Samples Analyzed	# of Samples (and percent) that did not meet QA criteria
Blank	168	3 (1.8%)
Regular/Duplicate Pair	168	13 (7.7%)
Spike	168	4 (2.4%)
<b>Total</b>	<b>504</b>	<b>20 (4.0%)</b>

### 3.4. Quality Assurance by Constituent

Of the 504 general water quality QA samples collected during the 2022 KHSA Baseline Monitoring (regular/duplicate pairs counting only once), the number of QA samples collected for each of the constituents varied. Constituents had 93.0 to 98.6 percent of the collected samples meet the QA criteria. In total, 4.0 percent (20 samples) of QA samples failed to meet QA criteria (Table 10).

**Table 10. 2022 general water quality QA samples that did not meet QA criteria by constituent.**

Constituent	# of QA Analyzed Samples	# of Samples (and percent) that did not meet QA criteria
NH3	72	3 (4.2%)
NO3+NO2	72	2 (2.8%)
TN	72	4 (5.6%)
PO4	72	5 (6.9%)
TP	72	3 (4.2%)
TSS	72	2 (2.8%)
DOC	72	1 (1.4%)
<b>TOTAL</b>	<b>504</b>	<b>20 (4.0%)</b>

### 3.5. Overall Quality Assurance

Combining the QA type and constituent quality assurance assessments, the samples that had a higher frequency of not meeting the QA criteria included NH4, PO4, and TSS regular/duplicate pairs (Table 11). Variations in particulate matter in the Klamath River during 2022 may explain the problems that occurred with regular/duplicate pairs and may be the result of high concentrations of particulate matter. Watercourse has contacted Edge to review procedures and ensure samples are adequately homogenized prior to analysis.

**Table 11. 2022 QA samples that did not meet QA criteria by QA type and constituent.**

QA Type	NH4	NO3+NO2	TN	PO4	TP	TSS	DOC	TOTAL
Blank	-	2	-	-	1	-	-	3
Spike	-	-	2	1	-	-	1	4
Regular / Duplicate	3	-	2	4	2	2	-	13
<b>Total</b>	<b>3</b>	<b>2</b>	<b>4</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>20</b>

### 3.6. Nitrogen and Phosphorus Fraction Comparison

As part of the QA assessment throughout 2022, the results for the total and partial fractions of nitrogen and phosphorus were compared. Results of total fractions (TN and TP) should have been equal to or higher than the results of partial fractions (NH3 or NO2+NO3; PO4). Results of total fractions that were less than partial fractions were compared to the partial fraction results using RPDm calculations with a criterion of 20 percent to determine if the difference in the result was meaningful and if such results were acceptable.

There were 794 production, regular, and duplicate samples that had total and partial fraction results available for assessment. Of those samples, none had total nitrogen values less than NH3 or NO2+NO3 values. Seven samples had a phosphate fraction larger than the total phosphorus fraction. However, six of those values had RPDm values of less than 20 percent, and the total phosphorus and phosphate values were considered similar in these six instances.

The single sample with a phosphate fraction larger than the total phosphorus fraction, Sample ID KR22091 was investigated (see Section 3.1.1 above), but no explanation for the issue was found.

### 3.7. Informal and Partial Quality Assurance of Particulate and Algae samples

Particulate and algae blank, regular, and duplicate samples were collected in 2022. While MYCN regular and duplicate samples were collected, unlike previous years, blank MYCN samples were not collected in 2022. As spikes (and blanks, in the case of MYCN samples) were not included in their external QA sample sets, these samples were informally and partially assessed for QA using the same criteria and formulae as the formal QA assessment of the general water quality constituents. This informal QA assessment did not include reanalysis, and QA criteria are reported herein only to provide program performance insight for these constituents and to identify potential improvements if systematic or large-scale problems are identified. Of the 300 QA samples for particulate and algae constituents (regular/duplicate pairs counting only once), 37 (12.3 percent) did not meet the formal QA criteria of the Baseline program as specified in Section 2 (Table 12).

The particulate and algae blank sample performance did not indicate any systematic or large-scale problems with the program in 2022. Regular/duplicate pairs for these constituents illustrated a higher percentage of samples not meeting the formal QA criteria of an RPD less than 23 percent (or an AD less than the reporting limit). However, constituents associated with particulate matter or algae can experience higher variability than dissolved constituents. Overall, reporting informal QA on particulate and algae samples provided information to assist in data interpretation and use.

**Table 12. Total number of QA samples for particulate and algae constituents and number of those samples that did not meet QA criteria by QA type and constituent in 2022.**

Constituent	Total # of QA samples			# of QA samples that did not meet formal criteria		
	Blank	Regular / Duplicate Pair	TOTAL	Blank	Regular / Duplicate Pair	TOTAL
MYCN	0	12	12	-	2	2
PC	24	24	48	1	2	3
PN	24	24	48	0	4	4
CHLA	24	24	48	0	2	2
PHEO	24	24	48	0	8	8
PP	24	24	48	2	8	10
PIP	24	24	48	1	7	8
<b>TOTAL</b>	<b>144</b>	<b>156</b>	<b>300</b>	<b>4</b>	<b>33</b>	<b>37</b>

## 4. Suggestions for Program Improvements

While the inclusion of external QA samples with the 2022 Baseline program was extensive and was successful in providing information to identify program performance and data quality, the program could be modified in the future to improve the external QA element of the Baseline sampling. Specifically:

- De-ionized water should continue to be ordered far enough in advance and in large enough quantities to ameliorate issues with supply chain scarcities.
- Spike vials and reference solutions should continue to be ordered from the manufacturer in smaller batches, to minimize the adverse effects of mistakes in the spike manufacturing or certification process.
- Spikes for different constituents should continue to be separated into different bottles.
- Careful and timely tracking of any QA issues that may occur will assist in making adjustments during the sampling program to improve overall data quality, sample handling, and laboratory performance.

## 5. Summary

From April 25 through December 7, 2022, E&S collected Baseline and Public Health monitoring samples for Interim Measure 15 of the KHSA. General water quality, particulates, and algae constituents were analyzed from the collected samples.

External QA sample sets were included with the Baseline program. General water quality QA sample types included regular, duplicate, blank, and spike samples. There were 1,674 general water quality samples planned for the project, and this portion of the project had a completeness of 98.2 percent. There were 504 general water quality QA samples collected (regular and duplicate pairs only counting once). Of those samples, 4.0 percent (20 samples) did not meet the QA criteria for the project.

Though full QA sample sets were not included for Baseline particulate and algae-related samples or the Public Health samples, completeness was calculated for those sample groups. Overall, 65 of 65 planned Public Health samples were collected (100.0 percent completeness). For the Baseline program, there were 542 planned particulate samples and particulate sampling had 98.3 percent completeness in 2022. There were 448 planned algae-related samples and algae-related sampling had 97.8 percent completeness in 2022. Collectively, the PacifiCorp 2022 KHSA Baseline Monitoring carried out by E&S had 2,664 planned samples, with 98.2 percent completeness.

Corrective actions and suggested program improvements include reviews of sampling procedures (Section 4) and are incorporated into the 2022 sampling program and will be considered for future years of sampling as appropriate.

## 6. Laboratory Terminology

QA types and laboratory terminology used by Reclamation (2012) and EPA (2016). E&S terminology denoted as underlined text where it differs from Reclamation (2012) notation.

**Blank sample (B)** – A quality assurance sample lacking the parameters of interest (Reclamation, 2012). A blank sample result is used to detect contamination during sample handling, preparation, and/or analysis. Examples of a blank sample include de-ionized water or a blank certified standard reference material.

**Minimum detection limit (MDL)** – The MDL is defined as the minimum measured concentration of a substance that can be reported with 99 percent confidence that the measured concentration is distinguishable from method blank results (U.S. EPA 2016). This value is most often determined by analyzing at least seven samples of a parameter at minimal concentration, determining the standard deviation of the replicates, and multiplying the standard deviation by the corresponding Student’s t-value.

**Production sample (P)** – A sample collected as part of a monitoring program and used for assessment purposes (Reclamation 2012). E&S denotes Production Samples as R in their own documentation, but it has been changed herein to P.

**Regular sample (R)** – A sample collected at a specific site selected by either the Quality Assurance Team or the Environmental Monitoring Team to be used as both a production sample and a quality assurance sample. The data from this sample is compared to data from a duplicate and/or spike sample to evaluate the precision and/or accuracy of both field and laboratory work (Reclamation 2012). E&S denotes Regular samples as Q in their own documentation, but it has been changed herein to R.

**Replicate/Duplicate (D)** – A sample that was collected in the same location as a production sample. This sample measures uniformity of the grab or composite sample collected (Reclamation 2012).

**Reporting limit (RL)** – The lowest concentration of the target parameter reported by the laboratory (Reclamation 2012). The value is generally determined by multiplying the MDL by 2 to 5 times and provides increased reliability and reproducibility of reported values.

**Spike (S)** – Measured aliquot of one or more specific parameters at known concentrations added to a sample (Reclamation 2012).

## 7. References

- U.S. Department of Interior, Bureau of Reclamation (Reclamation). Mid-Pacific Regional Office. Environmental Monitoring Branch. 2012. Standard Operating Procedures for Quality Assurance. Prepared for U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region. Revision 2012-07.
- U.S. Environmental Protection Agency (U.S. EPA). 2016. Definition and Procedure for the Determination of the Method Detection Limit, Revision 2. EPA 821-R-16-006. December.
- Vaughn, J., and M. Deas. 2022a. Technical Memorandum Re: KHSA Quality Assurance Project Plan. Prepared for PacifiCorp. March 25. 27 pp.

# Appendix A. 2022 KHSA Quality Assurance Datasets

Table 1-A. 2022 Baseline General Water Quality Assurance Data Used in QA Assessment. This dataset may vary from the final 2022 KHSA dataset.

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophyll-a	Algae, Phytoplankton	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate-Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22014	4/25/2022	16:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	11.4	8.0	107	10.4	17.45	5.14	49.6	3.53	2.23	0.01	0.37	0.31		1.05	<0.01	0.104	0.0396	0.0032	26.5	44			
KR22036	05/09/22	14:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	9.0	7.2	109	10.1	24.38	7.19	50.3	3.11	2.73	<0.01	0.27	0.38		1.26	0.012	0.077	0.034	0.0078	23.9	27			
KR22044	5/23/2022	15:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	16.9	8.8	107	9.9	30.77	5.06	48.9	3.36	2.48	0.04	0.02	0.33		1.09	<0.01	0.07	0.020	0.0024		22			
KR22062	06/06/22	15:50	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	18.1	7.9	109	7.6	4.64	1.95	49.9	3.49	0.94	0.05	0.02	0.13		0.62	0.032	0.082	0.0251	0.0021	10.5	5			
KR22071	6/20/2022	0.64	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	19.84	7.85	106	7.7	8.0988	2.74	52.4	3.7	1.38	<0.01	<0.01	0.22		0.79	0.026	0.104	0.024	0.0079	8.58	6			
KR22090	7/11/2022	14:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R					200.73	1.52	55.3	4.24	9.46	<0.01	<0.01	1.96		2.68	<0.01	0.182	0.127	0.062	26.70	21	0.2		
KR22099	07/25/22	14:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R					169.36	4.11	57.8	5.15	4.80	0.023	<0.01	0.84		3.1	0.024	0.198	0.051	0.017	30	14	0.20		
KR22118	8/8/2022	15:20	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R					75.41	5.00	55.6	6.59	4.91	0.7	<0.01	1.03		3.51	0.055	0.251	0.11	0.03	17.70	31	0.22		
KR22127	8/22/2022	14:25	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R					76.95	2.70	53.5	6.38	3.04		0.08	0.07	0.71		2.67	0.087	0.223	0.0428	0.0121	10.5	14	1.20	
KR22146	9/12/2022	0.66	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R					204.28	2.33	58.2	6.71	8.42		0.064	<0.01	1.63		5.15	0.089	0.364	0.121	0.0511	60	48	0.45	
KR22155	9/26/2022	16:05	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	18.5	9.7	111	13.4	139.74	4.28	57.6	6.55	8.99	0.087	0.01	1.83		3.74	0.025	0.264	0.125	0.066	23.80	48	0.14		
KR22174	10/11/22	14:45	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	17.0	9.6	110	11.2	167.17	0.46	62.5	6.29	6.79	0.05	<0.01	1.36		2.33	0.033	0.169	0.087	0.036	14.8	13	0.17		
KR22182	10/23/2022	16:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	10.6	9.1	93	7.9	119.64	8.25	57.1	5.95	2.87	0.1	0.03	0.43		2.09	0.04	0.201	0.079	0.052	100		<0.15		
KR22200	11/14/2022	14:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	3.6	7.5	133	9.7	13.18	4.00	63	5.43	2.07	0.92	0.19	0.32		2.52	<0.01	0.167	0.0801	0.0569	16.7	15			
KR22222	12/6/2022	0.56	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	2.6	6.8	125	11.1	7.88	2.85	56.3	5.51	1.29	0.76	0.29	0.19		2.27	0.022	0.129	0.0264	0.0111	11	11			
KR22018	4/25/2022	0.74	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	13.2	8.3	115	10.2	25.78	6.12	50.4	3.47	2.42	0.07	0.38	0.334		1.26	<0.01	0.106			27.2	34			
KR22040	5/9/2022	15:20	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	10.8	7.8	117	9.8	26.74	7.91	51.7	3.23	2.28	0.05	0.28	0.32		1.26	0.024	0.11			18.90	20	<0.15		
KR22066	6/6/2022	14:35	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	20.0	7.4	67	8.5	12.50	3.12	51.4	3.6	1.37	0.08	0.02	0.20		0.87	0.089	0.145			10.50	9	<0.15		
KR22094	7/11/2022	16:15	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P					75.91	2.29	54.4	4.36	6.10	<0.01	0.04	1.25		1.64	0.012	0.163			21	17	0.16		
KR22122	08/08/22	16:55	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P					203.78	45.70	56.1	6.67	8.97	0.62	<0.01	1.72		3.89	0.021	0.338			10.8	18	0.22		
KR22150	09/12/22	17:55	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P					263.19	0.46	58.9	6.96	15.30	0.34	0.01	3.39		4.86	0.122	0.369			50.2	31	0.23		
KR22178	10/11/2022	16:10	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	18.1	8.6	122	0.8	232.90	5.67	69.8	7.43	14.20	1.39	<0.01	3.14		4.81	0.104	0.384			11.10	26	0.13		
KR22204	11/14/22	16:05	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	4.1	7.6	147	7.5	26.54	7.19	66	5.56	2.66	1.24	0.24	0.44		2.9	<0.01	0.16			22.10	34			
KR22226	12/6/2022	17:45	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	2.3	7.7	130	11.1	18.29	3.20	58.4	5.69	3.71	0.86	0.39	0.41		2.56	0.058	0.129			11.2	7			



KR22017	4/25/2022	18:25	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	10.7	8.0	115	10.1	24.49	7.41	51.9	3.32	2.05	0.01	0.34	0.30	1.18	<0.01	0.107	0.04	0.01	28.10	39		
KR22039	05/09/22	16:15	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	10.9	8.0	121	10.2	51.39	10.05	54.1	3.50	2.92	0.01	0.28	0.44	1.45	0.025	0.139	0.053	0.0123	21.30	20	<0.15	
KR22065	6/6/2022	17:15	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	17.9	8.0	113	8.3	2.38	1.62	54.9	3.60	0.90	0.07	0.01	0.14	0.68	0.074	0.119	0.01	0.00	6.92	3	<0.15	
KR22072	6/20/2022	17:15	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	19.4	8.4	116	8.3			57.2			0.06	0.02		0.81	0.086	0.138			6.05			
KR22093	07/11/22	17:05	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P					23.01	1.89	55.1	4.36	1.51	0.01	0.17	0.27	0.64	0.054	0.144	0.0352	0.0422	4.24	3	0.21	
KR22100	7/25/2022	0:69	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P							59.2			0.18	<0.01		2.03	0.246	0.365			15.5			
KR22121	8/8/2022	0:74	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P					99.11	19.8	57.3	6.32	5.5	0.81	<0.01	1.13	3.39	0.102	0.293	0.116	0.0564	12.3	9	0.18	
KR22128	8/22/2022	0:71	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P							57.7			0.78	0.007		3.007	0.199	0.32			6.6			
KR22149	9/12/2022	0:78	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P					74.32	3.76	58.1	7.76	4.22	0.7	<0.01	0.899	2.96	0.179	0.256	0.0925	0.0452	10.1	8	0.2	
KR22156	9/26/2022	0:74	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	17.6	8.9	125	8.5			64.5			0.82	0.01		3.31	0.081	0.231			5.74			
KR22177	10/11/2022	0:77	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	17.0	8.4	128	7.3	8.97	2.88	65.4	6.76	1.4	1.08	<0.01	0.243	2.47	0.134	0.232	0.047	0.0207	4.11	3	0.13	
KR22203	11/14/2022	0:7	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	4.1	7.6	143	10.7	9.94	6.46	63	5.27	1.6	0.95	0.22	0.207	2.33	<0.01	0.106	0.0236	0.0084	19.8	16		
KR22225	12/6/2022	16:55	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	2.0	7.6	145	12.3	8.90	4.15	60.8	5.67	1.20	0.96	0.36	0.17	2.84	0.055	0.121	0.0279	0.0113	12.3	7		
KR22015	04/25/22	20:00	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	10.4	7.9	111	9.9	17.85	7.67	49.3	2.26	1.70	0.05	0.42	0.23	1.14	0.033	0.097			23			
KR22037	05/09/22	17:30	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	10.4	8.1	119	10.2	24.78	8.16	52.8	3.44	2.03	0.02	0.35	0.28	1.39	0.043	0.107			17		<0.15	
KR22063	6/6/2022	17:50	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	17.5	8.1	120	8.5	5.46	4.46	53.6	3.67	0.98	0.05	0.13	0.12	0.77	0.111	0.156			5		<0.15	
KR22091	7/11/2022	17:50	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P					4.38	2.15	55.7	4.3	0.62	0.03	0.17	0.10	0.73	0.925	0.16			3		0.12	
KR22119	8/8/2022	18:35	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P					11.95	7.31	50.3	5.91	1.38	0.3	1.04	0.24	2.58	0.205	0.273			3		0.10	
KR22147	9/12/2022	20:15	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P					12.86	7.91	56	7.32	1.60	0.55	0.68	0.29	3.38	0.068	0.276			4		0.2	
KR22175	10/11/2022	17:50	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	16.5	7.7	124	8.3	4.49	4.34	59.3	7.02	0.97	0.23	0.94	0.12	2.16	0.153	0.207			<2.0		0.11	
KR22201	11/14/2022	17:35	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	4.0	7.8	140	11.6	6.92	6.51	60	5.100	1.31	0.38	0.76	0.17	2.06	<0.01	0.105			15			
KR22223	12/6/2022	16:10	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	2.3	7.7	141	12.5	7.27	3.97	57.2	6.09	1.18	0.58	0.8	0.17	2.53	0.063	0.106			8			
KR22016	4/25/2022	19:20	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P	10.4	7.8	114	10.0	16.66	7.07	52.3	3.18	1.64	0.04	0.39	0.22	0.98	0.035	0.098			19.7	21		
KR22038	5/9/2022	18:35	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P	10.6	8.3	120	10.2	22.99	7.53	56.4	2.96	1.64	<0.01	0.33	0.23	1.13	0.043	0.1			16	16	<0.15	
KR22064	6/6/2022	0:77	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P	16.9	8.3	119	8.7	3.6849	3.04	56.2	3.33	0.821	0.05	0.13	0.0951	0.65	0.102	0.141			7.49	7	<0.15	
KR22092	7/11/2022	0:77	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P					2.56	2.06	58	3.58	0.609	0.04	0.036	0.0953	1.276	0.096	0.126			3.99	3	0.12	
KR22120	8/8/2022	0:81	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P					10.07	6.27	50.3	4.88	1.18	0.2	0.97	0.195	2.39	0.181	0.237			2.57	7	0.14	
KR22148	9/12/2022	0:82	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P					9.91	6.94	57.4	6.15	1.35	0.43	0.65	0.232	2.56	0.194	0.243			2.83	2	0.2	
KR22176	10/11/2022	0:72	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P	15.9	7.8	125	8.2	3.92	3.8	60.1	5.92	0.932	0.16	0.86	0.105	1.78	0.14	0.175			2.82	<2.0	<0.15	
KR22224	12/6/2022	0:65	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P	4.3	7.4	142	11.7	6.38	4.38	58.9	4.77	1.15	0.42	0.76	0.142	2.15	0.068	0.107			11.6	7		
KR22202	11/xx/2022	XX:XX	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	NA	NA																					

KR22010	4/26/2022	0.44	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	11.2	7.2	118	10.1	17.92	6.93	52.4	2.87	1.88	0.02	0.41	0.244	1.04	0.033	0.106	0.0283	0.0033	20.3	2	
KR22032	5/10/2022	0.37	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	9.6	7.9	122	10.9	17.97	7.65	56	2.97	1.32	<0.01	0.32	0.177	1.14	0.046	0.091	0.0256	0.001	14.6	10	<0.15
KR22058	6/7/2022	0.32	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	15.6	8	124	9	6.3626	6.02	53.7	3.05	0.916	0.0092	0.14	0.115	0.68	0.101	0.125	0.0216	0.001	7.38	5	<0.15
KR22070	6/21/2022	0.4	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	18.7	8.4	121	9.2						<0.01	0.12		0.6	0.097	0.138					
KR22086	7/12/2022	0.68	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P					5.01	4.21	62.9	2.31	0.779	<0.01	0.1	0.0978	0.89	0.076	0.118	0.0187	0.0088	4.05	7	0.12
KR22098	7/26/2022	0.44	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P										0.019	0.31		1.09	0.184	0.244					
KR22114	8/9/2022	0.74	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P					8.38	5.28	53.4	4.62	1.22	0.032	1	0.178	1.93	0.166	0.211	0.0248	0.0063	3.45	6	<0.15
KR22126	8/23/2022	0.39	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P										0.023	1.29		2.41	0.208	0.26					
KR22142	9/13/2022	0.71	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P					8.47	6.02	54.9	6.04	1.07	0.049	1.06	0.158	2.43	0.175	0.236	0.0271	0.0099	3.87	4	0.14
KR22154	9/27/2022	0.41	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	15.2	8	125	8.9						0.026	1.3		2.42	0.125	0.177					
KR22170	10/12/2022	0.71	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	15.1	9	128	10	2.82	2.7	64.1	3.62	0.53	0.01	0.75	0.0559	1.2	0.114	0.147	0.012	0.0046	1.76	<2.0	0.16
KR22196	11/15/2022	0.34	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	4.5	7.9	141	11.7	1.54	1.55	62	3.86	0.936	0.031	0.9	0.1049	1.63	0.022	0.099	0.0114	0.0033	10.5	7	
KR22218	12/7/2022	0.33	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	2.3	7.9	143	13	4.9	4.13	58	4.71	0.892	0.19	0.98	0.1032	2.21	0.051	0.092	0.0164	0.0081	10.8	5	
KR22007	4/26/2022	0.66	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.8	I					9.69	5.18														
KR22006	4/26/2022	0.65	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	12	7.9	122	10.7	13.11	4.58		2.75	1.55	0.009	0.43	0.21	0.95	0.029	0.084			11		
KR22008	4/26/2022	0.67	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	12.1	7.9	122	10.7	13.21	4.82		2.77	1.34	0.01	0.44	0.193	1.01	0.092	0.087			11		
KR22009	4/26/2022	0.67	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	26	P	8.4	6.7	119	8.6			51.8	2.87	1.21	0.1	0.43	0.144	0.95	0.039	0.082			10		
KR22029	5/10/2022	0.56	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.8	I					7.12	3.88													<0.15	
KR22028	5/10/2022	0.55	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	14.2	8.1	121	9.5	6.07	2.97		2.63	0.843	0.02	0.35	0.106	1.09	0.049	0.077			4	<0.15	
KR22030	5/10/2022	0.58	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	1	P	13.7	8.2	122	9.5	7.9	3.32		2.6	0.933	0.02	0.35	0.121	1.08	0.045	0.074			5		
KR22031	5/10/2022	0.57	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	29	P	8.8	6.6	123	6.4			54.9	2.81	0.99	0.14	0.43	0.109	1.34	0.06	0.094			6		
KR22055	6/7/2022	0.52	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.8	I					16.128	2.08													<0.15	
KR22054	6/7/2022	0.51	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	19.9	8.5	126	10.5	8.4619	1.86		2.74	0.76	<0.01	0.03	0.11	0.49	0.065	0.08			<2	<0.15	
KR22056	6/7/2022	0.54	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	15	P	14.4	6.9	124	5.2	2.2166	2.27		2.76	0.578	0.02	0.19	0.0658	0.59	0.095	0.092			2		
KR22057	6/7/2022	0.53	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	23	P	11.4	6.8	123	2.5			50.3	2.67	0.948	0.02	0.44	0.105	0.8	0.082	0.108			3		
KR22083	7/12/2022	0.47	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.8	I					22.8	2.01													0.88	
KR22082	7/12/2022	0.45	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P					795.58	7.66		4.04	39	<0.01	<0.01	8.48	9.44	0.062	1.1			101	46	
KR22084	7/12/2022	0.48	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	15	P					3.46	1.45		2.95	0.646	0.03	0.17	0.0855	0.52	0.114	0.149			3		
KR22085	7/12/2022	0.48	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	27	P							58.7	2.74	0.788	0.05	0.46	0.103	0.85	0.107	0.168			4		
KR22111	8/9/2022	0.5	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.8	I					58	3.26													2.7	
KR22110	8/9/2022	0.49	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P					57.94	3.2		3.93	3.76	<0.01	<0.01	0.578	1.19	0.09	0.175			12	5	

KR22112	8/9/2022	0.52	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	15	P								6.31	1.74	3.14	0.62	<0.01	0.45	0.094	0.97	0.223	0.217			3			
KR22113	8/9/2022	0.51	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	24	P										61.3	2.74	0.557	0.13	0.23	0.0624	0.71	0.165	0.193			<2.0		
KR22139	9/13/2022	0.48	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0-8	I								29.06	1.14													0.14	
KR22138	9/13/2022	0.47	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P								89.74	0.46	4.79	9.28	<0.01	0.16	1.54	2.52	1.943	0.256			17	0.12		
KR22140	9/13/2022	0.5	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	18	P								2.63	1.75	4.92	0.786	0.12	0.5	0.0935	1.49	0.164	0.213			3			
KR22141	9/13/2022	0.49	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	24	P									65.4	3.05	0.649	0.47	<0.01	0.0695	0.91	0.309	0.332			3			
KR22167	10/12/2022	0.48	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0-8	I																						0.2	
KR22166	10/12/2022	0.47	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	17.4	9.1	54	10.2				30.77	0.9	4.5	3.3	0.02	0.57	0.554	1.14	0.114	0.158			6	0.1		
KR22168	10/12/2022	0.5	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	21	P	15	7.1	136	0.7				8.95	0.84	4.67	0.7	0.21	0.71	0.0851	1.4	0.14	0.172	0.0165	0.0055	3			
KR22169	10/12/2022	0.49	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	26	P	12.3	6.8	155	0				2.77	1.84	72.7	3.36	0.871	0.69	0.14	0.117	1.03	0.471	0.434		5			
KR22215	12/7/2022	0.57	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0-8	I								1.6	1.7														
KR22214	12/7/2022	0.56	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	4.7	7.8	130	10.9				1.53	1.78	4.44	0.503	0.24	0.88	0.0624	1.98	0.077	0.094			2			
KR22216	12/7/2022	0.59	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	1	P	4.7	7.8	129	10.8				1.63	1.81	4.38	0.476	0.24	0.89	0.06	1.88	0.072	0.097					<2.0	
KR22217	12/7/2022	0.58	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	23	P	4.6	7.7	147	10.6						60.2	4.37	0.658	0.24	0.87	0.0864	2.2	0.076	0.103		5			
KR22193	11/XX/2022	XX:XX	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0-8	I																							
KR22194	11/XX/2022	XX:XX	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	NA	NA																							
KR22195	11/XX/2022	XX:XX	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	NA	NA																							
KR22192	11/XX/2022	XX:XX	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P																							
KR22005	4/26/2022	0.72	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	9.9	7.5	122	9.6				7.89	5.19	53.4	2.89	1.31	0.04	0.45	0.161	0.97	0.038	0.08		9			
KR22027	5/10/2022	0.63	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	12.4	8.1	123	9.8				7.19	3.88	55.9	2.73	1.47	0.04	0.36	0.138	1.02	0.047	0.1		8	<0.15		
KR22053	6/7/2022	0.59	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	20.9	8.4	149	9.1				4.7128	1.03	53.6	2.9	0.681	0.04	0.11	0.112	0.62	0.064	0.079		2	<0.15		
KR22081	7/12/2022	0.54	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P								16.21	1.51	61.7	3.23	1.18	<0.01	0.05	0.205	1.11	0.078	0.132		3	0.88		
KR22109	8/9/2022	0.6	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P								95.1	3.43	62.7	3.86	12.9	<0.01	<0.01	1.58	2.44	0.058	0.284		35	4.8		
KR22137	9/13/2022	0.56	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P								5.69	1.04	59.5	4.9	1.1	0.032	0.27	0.144	1.2	0.147	0.187		6	<0.15		
KR22165	10/12/2022	0.57	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	17.7	8.5	127	8.4				3.23	1.17	62.4	4.71	0.634	0.067	0.63	0.0802	1.19	0.124	0.145			<2.0	0.13	
KR22191	11/15/2022	0.54	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	8.5	7.8	117	10.2				1.81	1.54	62	4.32	0.638	0.096	0.97	0.0585	1.77	0.073	0.119		4			
KR22213	12/7/2022	0.52	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	4.7	7.9	141	11.1				2.07	2.38	57.5	4.46	0.913	0.22	0.89	0.0864	2.05	0.071	0.094		6			
KR22002	4/26/2022	0.54	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0-8	I								7.11	3.54														
KR22001	4/26/2022	0.53	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P	13.5	8	104	10.5				9.24	2.97	2.92	0.959	0.01	0.49	0.147	0.97	0.042	0.075		6				
KR22003	4/26/2022	0.58	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	19	P	7.9	6.6	132	7.6				3.87	3.48	2.83	0.721	0.02	0.65	0.083	1.05	0.062	0.079		4				
KR22004	4/26/2022	0.57	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	40	P	5.9	6.5	140	5.8						67.6	2.71	0.501	0.02	0.86	0.0611	1.3	0.062	0.08		<2			



KR22212	12/7/2022	0.44	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	42	P	5.7	7.6	148	9.4			60.7	4.12	0.634	0.24	0.76	0.0744	2.05	0.088	0.109						3	
KR22000	4/26/2022	0.75	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	12.8	8.6	138	10.5	11.13	3.43	60.8	2.91	1.09	<0.01	0.5	0.166	1	0.034	0.078	0.0247	0.001	10.6	6			
KR22022	5/10/2022	0.67	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	12.2	8.4	128	10.9	10.15	3.79	57.3	2.73	0.951	<0.01	0.42	0.133	1	0.034	0.07	0.0188	0.001	10.8	5			
KR22048	6/7/2022	0.63	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	16.1	7.8	127	9.2	3.7693	3.23	54.9	2.55	0.512	0.01	0.2	0.0731	0.58	0.045	0.068	0.0218	0.001	5.66	2			
KR22076	7/12/2022	0.59	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R					4.3	2.34	63.2	2.8	0.641	<0.01	0.08	0.083	0.38	0.074	0.107	0.001	0.001	2.47	<2	<0.15		
KR22104	8/9/2022	0.65	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R					6.54	1.67	75	2.95	0.89	0.0088	0.09	0.111	0.6	0.122	0.138	0.0159	0.011	2.4	5	0.11		
KR22132	9/13/2022	0.63	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R					5.12	1.24	62.2	4.1	1.09	0.034	0.09	0.132	0.86	0.122	0.154	0.0242	0.0098	2.59	4	0.13		
KR22160	10/12/2022	0.63	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	17.5	9	129	9.2	2.2	0.91	64.1	4.29	0.52	0.08	0.42	0.0559	0.82	0.143	0.136		1.59	<2.0		0.12		
KR22186	11/15/2022	0.6	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	11	7.9	145	9.3	2.49	1.2	66	4.19	0.486	0.16	0.67	0.0537	1.57	0.104	0.139	0.0084	0.0071	1.78	<2.0			
KR22208	12/7/2022	0.66	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	6.7	7.6	148	11.1	1.18	1.09	119	4.33	0.396	0.19	0.74	0.0456	2.36	0.096	0.111	0.006	0.0096	2.15	<2.0			

**Table 2-A. 2022 KHSA Monitoring Data during QA Assessment. This dataset may vary from the final 2022 KHSA dataset.**

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophyll a	Algae, Phosphatin	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate-Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22014	4/25/2022	16:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	11.4	8.0	107	10.4	17.45	5.14	49.6	3.53	2.23		0.01	0.37	0.31	1.05	<0.01	0.104	0.039616	0.003206	26.50	44			
KR22019	04/25/22	16:20	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								8.75			0.5	0.85		4.09	0.577	0.545				80			
KR22020	4/25/2022	16:45	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.17	0.06		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.00	0.001	0.19	<2			
KR22021	4/25/2022	16:50	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					17.90	4.77		3.4	2.15		0.02	0.35	0.30	1.23	<0.01	0.103	0.03	0.00	25.40	35			
KR22036	5/9/2022	14:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	9.0	7.2	109	10.1	24.38	7.19	50.3	3.11	2.73		<0.01	0.27	0.38	1.26	0.012	0.077	0.033562	0.007794	23.90	27			
KR22041	5/9/2022	14:25	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								8.88			0.5	0.77		4.01	0.531	0.571				78			
KR22042	5/9/2022	14:45	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.19	0.06		<0.01	<0.01	0.03	<0.2	<0.01	0.0072	0.001	0.0010	0.11	<2			
KR22043	5/9/2022	14:10	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					23.32	6.46		3.08	2.40		<0.01	0.27	0.32	1.25	0.013	0.082	0.035	0.002	23.70	20			
KR22044	05/23/22	15:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	16.9	8.8	107	9.9	30.77	5.06	48.9	3.36	2.48		0.04	0.02	0.33	1.09	<0.01	0.07	0.020086	0.00241		22			
KR22045	05/23/22	15:25	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								9.24			0.47	0.51		3.73	0.514	0.597				77			
KR22046	5/23/2022	15:55	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.18	0.06		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.001	0.002994		<2			
KR22047	5/23/2022	15:15	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					34.83	6.59		3.41	3.06		<0.01	0.02	0.41	0.89	<0.01	0.069	0.033424	0.002396		23			
KR22062	6/6/2022	15:50	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	18.1	7.9	109	7.6	4.64	1.95	49.9	3.49	0.94		0.05	0.02	0.13	0.62	0.032	0.082	0.025094	0.00206	10.50	5			
KR22067	06/06/22	16:10	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								8.87			0.51	0.49		3.56	0.551	0.591				81			
KR22068	6/6/2022	16:30	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					0.68	0.61		0.12	0.06		<0.01	<0.01	0.03	<0.2	0.01	0.0034	0.00	0.00	0.16	<2			
KR22069	6/6/2022	16:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					6.00	2.22		3.44	1.04		0.04	0.02	0.15	0.62	0.036	0.075	0.026653	0.001	10.3	6			
KR22071	6/20/2022	15:20	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	19.8	7.9	106	7.7	8.10	2.74	52.4	3.7	1.38		<0.01	<0.01	0.22	0.79	0.026	0.104	0.02	0.01	8.58	6			
KR22073	6/20/2022	15:45	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								9.38			0.52	0.46		3.73	0.569	0.584				76			
KR22074	6/20/2022	16:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.15	0.07		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.00100	0.00100	0.18	<2			
KR22075	6/20/2022	15:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					8.33	2.65		3.85	1.10		<0.01	0.007	0.15	0.907	0.027	0.083	0.02	0.00	8.36	6			
KR22090	07/11/22	14:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R					200.73	1.52	55.3	4.24	9.46		<0.01	<0.01	1.96	2.68	<0.01	0.182	0.127	0.061908	26.7	21		0.20	
KR22095	7/11/2022	15:10	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								10.24			0.46	0.51		5.64	0.483	0.684				75			
KR22096	7/11/2022	15:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					1.25	0.46		0.09	0.06		<0.01	0.04	0.03	<0.2	<0.01	0.157	0.00	0.00	0.20	<2			
KR22097	7/11/2022	14:50	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					242.53	3.20		4.37	8.12		<0.01	<0.01	1.64	2.83	<0.01	0.179	0.11200	0.05440	35.9	20		0.14	

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophylla	Algae, Pheophytin	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate/Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22099	7/25/2022	14:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R					169.36	4.11	57.8	5.15	4.80		0.023	<0.01	0.84	3.1	0.024	0.198	0.051	0.017	30.00	14		0.20	
KR22101	7/25/2022	15:05	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								11.09			0.51	0.53		6.22	0.393	0.697				78			
KR22102	07/25/22	15:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					1.07	0.46		0.13	0.06		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.00100	0.00100	0.2	<2			
KR22103	7/25/2022	14:50	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					167.97	2.10		5.23	6.08		0.02	<0.01	1.09	3.1	0.02	0.212	0.05	0.01	28.60	14		0.23	
KR22118	8/8/2022	15:20	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R					75.41	5.00	55.6	6.59	4.91		0.7	<0.01	1.03	3.51	0.055	0.251	0.109	0.032658	17.7	31		0.22	
KR22123	8/8/2022	15:50	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								12.18			1.21	0.51		6.31	0.552	0.741				77			
KR22124	08/08/22	16:15	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					1.67	0.57		0.16	0.21		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.00100	0.00191	0.31	<2.0			
KR22125	08/08/22	15:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					64.69	3.40		6.62	5.16		0.7	<0.01	1.06	3.81	0.055	0.253	0.135	0.058998	18.2	18		0.37	
KR22127	8/22/2022	14:25	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R					76.95	2.70	53.5	6.38	3.04		0.08	0.07	0.71	2.67	0.087	0.223	0.042824	0.012108	10.50	14		1.2	
KR22129	08/22/22	15:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								12.11			0.56	0.56		6.14	0.605	0.723				80			
KR22130	08/22/22	15:40	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.15	0.06		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.001	0.001	0.24	<2.0			
KR22131	8/22/2022	14:45	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					87.74	3.17		6.1	3.26		0.3	0.07	0.65	2.82	0.086	0.228	0.047834	0.012698	13.30	16		0.2	
KR22146	9/12/2022	15:50	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R					204.28	2.33	58.2	6.71	8.42		0.064	<0.01	1.63	5.15	0.088	0.364	0.12	0.05	60.00	48		0.5	
KR22151	9/12/2022	16:20	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								12.58			0.58	0.55		6.27	0.592	0.858				76			
KR22152	9/12/2022	17:10	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					2.89	0.46		0.20	0.09		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.00100	0.00100	0.26	<2.0			
KR22153	9/12/2022	16:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					168.59	3.41		6.79	7.48		0.068	0.01	1.38	4.46	0.064	0.387	0.087012	0.055274	60.1	49		0.3	
KR22155	09/26/22	16:05	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	18.5	9.7	111	13.4	139.74	4.28	57.6	6.55	8.99		0.087	0.01	1.83	3.74	0.025	0.264	0.125	0.065678	23.8	48		0.14	
KR22157	9/26/2022	16:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								13.19			0.54	0.52		4.44	0.535	0.766				79			
KR22158	09/26/22	17:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					2.30	0.46		0.14	0.06		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.00100	0.00100	0.21	<2.0			
KR22159	09/26/22	16:20	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					179.28	1.06		6.39	9.06		0.063	0.008	1.84	3.728	0.026	0.276	0.142	0.077956	26.3	50		0.23	
KR22174	10/11/2022	14:45	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	17.0	9.6	110	11.2	167.17	0.46	62.5	6.29	6.79		0.05	<0.01	1.36	2.33	0.033	0.169	0.0865	0.035858	14.8	13		0.17	
KR22179	10/11/2022	15:10	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								12.10			0.54	0.48		5.37	0.537	0.72				79			
KR22180	10/11/2022	15:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.25	0.20		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.001502	0.001	0.22	<2.0			
KR22181	10/11/2022	14:55	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					167.30	0.46		6.3	7.04		0.04	0.008	1.40	2.348	0.012	0.168	0.09	0.04	15.4	13		0.29	
KR22182	10/23/2022	16:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	10.6	9.1	93	7.9	119.64	8.25	57.1	5.95	2.87		0.1	0.03	0.43	2.09	0.04	0.201	0.08	0.05	100			<0.15	
KR22183	10/23/22	16:30	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								11.43			0.58	0.53		5.54	0.549	0.702				81			

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophylla	Algae, Pheophytin	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate/Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22184	10/23/22	17:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.18	0.07		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.01236	0.001406		<2.0			
KR22185	10/23/2022	16:20	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					60.32	8.54		5.95	5.74		0.1	0.04	0.93	2.46	0.015	0.19	0.10	0.04		91		<0.15	
KR22200	11/14/2022	14:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	3.6	7.5	133	9.7	13.18	4.00	63	5.43	2.07		0.92	0.19	0.32	2.52	<0.01	0.167	0.08	0.06	16.70	15			
KR22205	11/14/2022	15:10	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								11.23			1.47	0.7		5.57	0.538	0.632				80			
KR22206	11/14/2022	15:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.19	0.12		<0.01	<0.01	0.03	<0.2	<0.01	<0.01	0.00100	0.00100	0.13	<2.0			
KR22207	11/14/2022	15:00	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					14.64	4.08		5.64	3.54		0.97	0.19	0.63	2.44	<0.01	0.122	0.046	0.064	18.90	17			
KR22222	12/6/2022	13:20	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	R	2.6	6.8	125	11.1	7.88	2.85	56.3	5.51	1.29		0.76	0.29	0.19	2.27	0.022	0.129	0.0264	0.011082	11	11			
KR22227	12/6/2022	13:55	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	S								11.85			1.29	0.76		5.22	0.546	0.512				79			
KR22228	12/6/2022	13:50	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.32	0.40		<0.01	<0.01	0.07	0.06	<0.01	0.0029	0.001	0.002356	0.2	<2.0			
KR22229	12/06/22	13:35	KR25444	Link Dam (RM 254.44; Baseline)	PacifiCorp	0.5	D					7.40	2.64		5.73	1.03		0.79	0.29	0.15	2.4	0.042	0.08	0.057208	0.01144	10.1	11			
KR22018	04/25/22	17:40	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	13.2	8.3	115	10.2	25.78	6.12	50.4	3.47	2.42		0.07	0.38	0.33	1.26	<0.01	0.106			27.2	34			
KR22040	5/9/2022	15:20	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	10.8	7.8	117	9.8	26.74	7.91	51.7	3.23	2.28		0.05	0.28	0.32	1.26	0.024	0.11			18.90	20	<0.15		
KR22066	6/6/2022	14:35	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	20.0	7.4	67	8.5	12.50	3.12	51.4	3.6	1.37		0.08	0.02	0.20	0.87	0.089	0.145			10.50	9	<0.15		
KR22094	7/11/2022	16:15	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P					75.91	2.29	54.4	4.36	6.10		<0.01	0.04	1.25	1.64	0.012	0.163			21.00	17	0.2		
KR22122	8/8/2022	16:55	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P					203.78	45.70	56.1	6.67	8.97		0.62	<0.01	1.72	3.89	0.021	0.338			10.8	18	0.2		
KR22150	09/12/22	17:55	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P					263.19	0.46	58.9	6.96	15.30		0.34	0.01	3.39	4.86	0.122	0.369			50.2	31	0.23		
KR22178	10/11/2022	16:10	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	18.1	8.6	122	0.8	232.90	5.67	69.8	7.43	14.20		1.39	<0.01	3.14	4.81	0.104	0.384			11.1	26	0.13		
KR22204	11/14/2022	16:05	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	4.1	7.6	147	7.5	26.54	7.19	66	5.56	2.66		1.24	0.24	0.44	2.9	<0.01	0.159			22.10	34			
KR22226	12/6/2022	17:45	KR24600	Keno Reservoir at Miller Island (RM 246.0; Baseline)	PacifiCorp	0.5	P	2.3	7.7	130	11.1	18.29	3.20	58.4	5.69	3.71		0.86	0.39	0.41	2.56	0.058	0.129			11.2	7			
KR22017	04/25/22	18:25	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	10.7	8.0	115	10.1	24.49	7.41	51.9	3.32	2.05		0.01	0.34	0.30	1.18	<0.01	0.107	0.038976	0.007746	28.1	39			
KR22039	05/09/22	16:15	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	10.9	8.0	121	10.2	51.39	10.05	54.1	3.50	2.92		0.01	0.28	0.44	1.45	0.025	0.139	0.053042	0.012348	21.3	20	<0.15		
KR22065	6/6/2022	17:15	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	17.9	8.0	113	8.3	2.38	1.62	54.9	3.60	0.90		0.07	0.01	0.14	0.68	0.074	0.119	0.01	0.001	6.92	3	<0.15		
KR22072	6/20/2022	17:15	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	19.4	8.4	116	8.3			57.2				0.06	0.02		0.81	0.086	0.138			6.05				
KR22093	7/11/2022	17:05	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P					23.01	1.89	55.1	4.36	1.51		0.01	0.17	0.27	0.64	0.054	0.144	0.04	0.04	4.24	3	0.2		



Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophyll a	Algae, Pheophytin	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate/Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22100	07/25/22	16:40	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P							59.2				0.18	<0.01			2.03	0.246	0.365			15.5			
KR22121	8/8/2022	17:50	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P					99.11	19.77	57.3	6.32	5.50		0.81	<0.01	1.13		3.39	0.102	0.293	0.116	0.056382	12.30	9	0.18	
KR22128	08/22/22	17:05	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P							57.7				0.78	0.007			3.007	0.199	0.32			6.6			
KR22149	09/12/22	18:40	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P					74.32	3.76	58.1	7.76	4.22		0.7	<0.01	0.90		2.96	0.179	0.256	0.092478	0.04521	10.1	8	0.2	
KR22156	09/26/22	17:50	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	17.6	8.9	125	8.5			64.5				0.82	0.01			3.31	0.081	0.231			5.74			
KR22177	10/11/2022	18:30	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	17.0	8.4	128	7.3	8.97	2.88	65.4	6.76	1.40		1.08	<0.01	0.24		2.47	0.134	0.232	0.04697	0.02073	4.11	3	0.13	
KR22203	11/14/2022	16:50	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	4.1	7.6	143	10.7	9.94	6.46	63	5.27	1.60		0.95	0.22	0.21		2.33	<0.01	0.106	0.023602	0.008368	19.8	16		
KR22225	12/6/2022	16:55	KR23340	Klamath River below Keno Dam near a USGS gage (RM 233.4; Baseline)	PacifiCorp	0.5	P	2.0	7.6	145	12.3	8.90	4.15	60.8	5.67	1.20		0.96	0.36	0.17		2.84	0.055	0.121	0.03	0.01	12.30	7		
KR22015	04/25/22	20:00	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	10.4	7.9	111	9.9	17.85	7.67	49.3	2.26	1.70		0.05	0.42	0.23		1.14	0.033	0.097			23			
KR22037	05/09/22	17:30	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	10.4	8.1	119	10.2	24.78	8.16	52.8	3.44	2.03		0.02	0.35	0.28		1.39	0.043	0.107			17		<0.15	
KR22063	6/6/2022	17:50	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	17.5	8.1	120	8.5	5.46	4.46	53.6	3.67	0.98		0.05	0.13	0.12		0.77	0.111	0.156			5		<0.15	
KR22091	07/11/22	17:50	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P					4.38	2.15	55.7	4.30	0.62		0.03	0.17	0.10		0.73	0.925	0.16			3		0.12	
KR22119	8/8/2022	18:35	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P					11.95	7.31	50.3	5.91	1.38		0.3	1.04	0.24		2.58	0.205	0.273			3		0.1	
KR22147	9/12/2022	20:15	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P					12.86	7.91	56	7.32	1.60		0.55	0.68	0.29		3.38	0.068	0.276			4		0.2	
KR22175	10/11/2022	17:50	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	16.5	7.7	124	8.3	4.49	4.34	59.3	7.02	0.97		0.23	0.94	0.12		2.16	0.153	0.207			<2.0		0.11	
KR22201	11/14/2022	17:35	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	4.0	7.8	140	11.6	6.92	6.51	60	5.10	1.31		0.38	0.76	0.17		2.06	<0.01	0.105			15			
KR22223	12/6/2022	16:10	KR22460	Klamath River below J.C. Boyle Dam (RM 224.60; Baseline)	PacifiCorp	0.5	P	2.3	7.7	141	12.5	7.27	3.97	57.2	6.09	1.18		0.58	0.8	0.17		2.53	0.063	0.106			8			
KR22016	04/25/22	19:20	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P	10.4	7.8	114	10.0	16.66	7.07	52.3	3.18	1.64		0.04	0.39	0.22		0.98	0.035	0.098			19.7	21		
KR22038	05/09/22	18:35	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P	10.6	8.3	120	10.2	22.99	7.53	56.4	2.96	1.64		<0.01	0.33	0.23		1.13	0.043	0.1			16	16	<0.15	
KR22064	06/06/22	18:30	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P	16.8	8.3	119	8.7	3.68	3.04	56.2	3.33	0.82		0.05	0.13	0.10		0.65	0.102	0.141			7.49	7	<0.15	
KR22092	7/11/2022	18:30	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P					2.56	2.06	58	3.58	0.61		0.04	0.036	0.10		1.276	0.096	0.126			3.99	3	0.12	
KR22120	08/08/22	19:20	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P					10.07	6.27	50.3	4.88	1.18		0.2	0.97	0.20		2.39	0.181	0.237			2.57	7	0.14	
KR22148	9/12/2022	19:40	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P					9.91	6.94	57.4	6.15	1.35		0.43	0.65	0.23		2.56	0.194	0.243			2.83	2	0.2	

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophylla	Algae, Pheophytin	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate/Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22176	10/11/2022	17:15	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P	15.9	7.7	125	8.2	3.92	3.80	60.1	5.92	0.93	0.16	0.86	0.11		1.78	0.14	0.175			2.82	<2.0		<0.15	
KR22224	12/6/2022	15:35	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	0.5	P	4.3	7.4	142	11.7	6.38	4.38	58.9	4.77	1.15	0.42	0.76	0.14		2.15	0.068	0.107			11.6	7			
KR22202	11/XX/2022	XX:XX	KR21950	Klamath River below USGS Gage (RM 219.50; Baseline)	PacifiCorp	NA	NA																							
KR22010	4/26/2022	10:30	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	11.2	7.2	118	10.1	17.92	6.93	52.4	2.87	1.88	0.02	0.41	0.24		1.04	0.033	0.106	0.028346	0.003284	20.3	2			
KR22032	5/10/2022	8:50	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	9.6	7.9	122	10.9	17.97	7.65	56	2.97	1.32	<0.01	0.32	0.18		1.14	0.046	0.091	0.026	0.001	14.60	10		<0.15	
KR22058	6/7/2022	7:40	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	15.6	8.0	124	9.0	6.36	6.02	53.7	3.05	0.92	0.0092	0.14	0.12		0.68	0.101	0.125	0.02	0.00	7.38	5		<0.15	
KR22070	6/21/2022	9:40	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	18.7	8.4	121	9.2						<0.01	0.12		0.6	0.097	0.138								
KR22086	7/12/2022	16:20	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P					5.01	4.21	62.9	2.31	0.78	<0.01	0.1	0.10		0.89	0.076	0.118	0.018748	0.008762	4.1	7		0.1	
KR22098	07/26/22	10:35	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P										0.019	0.31		1.09	0.184	0.244								
KR22114	8/9/2022	17:40	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P					8.38	5.28	53.4	4.62	1.22	0.032	1	0.18		1.93	0.166	0.211	0.02481	0.00629	3.45	6		<0.15	
KR22126	8/23/2022	9:20	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P										0.023	1.29		2.41	0.208	0.26								
KR22142	9/13/2022	17:00	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P					8.47	6.02	54.9	6.04	1.07	0.049	1.06	0.16		2.43	0.175	0.236	0.027	0.010	3.87	4		0.14	
KR22154	9/27/2022	9:45	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	15.2	8.0	125	8.9						0.026	1.3		2.42	0.125	0.177								
KR22170	10/12/2022	17:00	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	15.1	9.0	128	10.0	2.82	2.70	64.1	3.62	0.53	0.01	0.75	0.06		1.2	0.114	0.147	0.011952	0.004594	1.76	<2.0		0.2	
KR22196	11/15/2022	8:05	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	4.5	7.9	141	11.7	1.54	1.55	62	3.86	0.94	0.031	0.9	0.10		1.63	0.022	0.099	0.01142	0.00328	10.5	7			
KR22218	12/07/22	7:55	KR20642	Klamath River above Shovel Creek (RM 206.42; Baseline)	PacifiCorp	0.5	P	2.3	7.9	143	13.0	4.90	4.13	58	4.71	0.89	0.19	0.98	0.10		2.21	0.051	0.092	0.01636	0.00814	10.8	5			
KR22006	4/26/2022	15:30	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	12.0	7.9	122	10.7	13.11	4.58		2.75	1.55	0.009	0.43	0.21		0.95	0.029	0.084			11				
KR22007	4/26/2022	15:50	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.8	I					9.69	5.18																	
KR22008	4/26/2022	16:10	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	12.1	7.9	122	10.7	13.21	4.82		2.77	1.34	0.01	0.44	0.19		1.01	0.092	0.087			11				
KR22009	4/26/2022	16:00	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	26.0	P	8.4	6.7	119	8.6			51.8	2.87	1.21	0.1	0.43	0.14		0.95	0.038	0.082			10				
KR22028	5/10/2022	13:05	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	14.2	8.1	121	9.5	6.07	2.97		2.63	0.84	0.02	0.35	0.11		1.09	0.049	0.077			4		<0.15		
KR22029	5/10/2022	13:25	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.8	I					7.12	3.88																	<0.15
KR22030	5/10/2022	13:55	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	1.0	P	13.7	8.2	122	9.5	7.90	3.32		2.60	0.93	0.02	0.35	0.12		1.08	0.045	0.074			5				
KR22031	5/10/2022	13:40	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	29	P	8.8	6.6	123	6.4			54.9	2.81	0.99	0.14	0.43	0.11		1.34	0.06	0.094			6				
KR22054	6/7/2022	12:15	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	19.9	8.5	126	10.5	8.46	1.86		2.74	0.76	<0.01	0.03	0.11		0.49	0.065	0.08			<2		<0.15		
KR22055	6/7/2022	12:35	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.8	I					16.13	2.08																	<0.15

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophylla	Algae, Pheophytin	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate/Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22056	6/7/2022	12:55	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	15.0	P	14.4	6.9	124	5.2	2.22	2.27		2.76	0.58		0.02	0.19	0.07		0.59	0.095	0.092			2			
KR22057	06/07/22	12:45	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	23	P	11.4	6.8	123	2.5			50.3	2.67	0.95		0.02	0.44	0.11		0.8	0.082	0.108			3			
KR22082	07/12/22	10:50	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P					795.58	7.66		4.04	39.00		<0.01	<0.01	8.48		9.44	0.062	1.1			101		46.00	
KR22083	7/12/2022	11:15	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0-8	I					22.80	2.01																0.88	
KR22084	7/12/2022	11:35	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	15.0	P					3.46	1.45		2.95	0.65		0.03	0.17	0.09		0.52	0.114	0.149			3			
KR22085	7/12/2022	11:25	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	27	P							58.7	2.74	0.79		0.05	0.46	0.10		0.85	0.107	0.168			4			
KR22110	8/9/2022	11:45	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P					57.94	3.20		3.93	3.76		<0.01	<0.01	0.58		1.19	0.09	0.175			12		5.00	
KR22111	8/9/2022	12:00	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0-8	I					58.00	3.26																2.70	
KR22112	8/9/2022	12:30	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	15.0	P					6.31	1.74		3.14	0.62		<0.01	0.45	0.09		0.97	0.223	0.217			3			
KR22113	8/9/2022	12:20	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	24.0	P							61.3	2.74	0.56		0.13	0.23	0.06		0.71	0.165	0.193			<2.0			
KR22138	09/13/22	11:10	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P					89.74	0.46		4.79	9.28		<0.01	0.16	1.54		2.52	1.943	0.256			17		0.12	
KR22139	9/13/2022	11:30	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0-8	I					29.06	1.14																0.14	
KR22140	9/13/2022	11:55	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	18	P					2.63	1.75		4.920	0.79		0.12	0.5	0.09		1.49	0.164	0.213			3			
KR22141	9/13/2022	11:40	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	24	P							65.4	3.05	0.65		0.47	<0.01	0.07		0.91	0.309	0.332			3			
KR22166	10/12/2022	11:10	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	17.4	9.1	54	10.2	30.77	0.90		4.5	3.30		0.02	0.57	0.55		1.14	0.114	0.158			6		0.1	
KR22167	10/12/2022	11:30	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0-8	I																						0.2	
KR22168	10/12/2022	12:00	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	21.0	P	15.0	7.1	136	0.7	8.95	0.84		4.67	0.70		0.21	0.71	0.09		1.4	0.14	0.172	0.017	0.0055	3			
KR22169	10/12/2022	11:45	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	26	P	12.3	6.8	155	0.0	2.77	1.84	72.7	3.36	0.87		0.69	0.14	0.12		1.03	0.471	0.434			5			
KR22214	12/7/2022	13:30	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P	4.7	7.8	130	10.9	1.53	1.78		4.44	0.50		0.24	0.88	0.06		1.98	0.077	0.094			2			
KR22215	12/7/2022	13:45	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0-8	I					1.60	1.70																	
KR22216	12/7/2022	14:10	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	1	P	4.7	7.8	129	10.8	1.63	1.81		4.38	0.48		0.24	0.89	0.06		1.88	0.072	0.097			<2.0			
KR22217	12/7/2022	14:00	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	23	P	4.6	7.7	147	10.6			60.2	4.37	0.66		0.24	0.87	0.09		2.2	0.076	0.103			5			
KR22192	11/XX/2022	XX:XX	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0.5	P																							
KR22193	11/XX/2022	XX:XX	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	0-8	I																							
KR22194	11/XX/2022	XX:XX	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	NA	NA																							
KR22195	11/XX/2022	XX:XX	KR19874	Copco Reservoir (RM 198.74; Baseline)	PacifiCorp	NA	NA																							

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophylla	Algae, Pheophytin	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate/Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22005	4/26/2022	17:10	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	9.9	7.5	122	9.6	7.89	5.19	53.4	2.89	1.31		0.04	0.45	0.16		0.97	0.038	0.08			9			
KR22027	5/10/2022	15:00	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	12.4	8.1	123	9.8	7.19	3.88	55.9	2.73	1.47		0.04	0.36	0.14		1.02	0.047	0.1			8		<0.15	
KR22053	6/7/2022	14:05	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	20.9	8.4	149	9.1	4.71	1.03	53.6	2.90	0.68		0.04	0.11	0.11		0.62	0.064	0.079			2		<0.15	
KR22081	07/12/22	12:55	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P					16.21	1.51	61.7	3.23	1.18		<0.01	0.05	0.21		1.11	0.078	0.132			3		0.88	
KR22109	8/9/2022	14:20	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P					95.10	3.43	62.7	3.86	12.90		<0.01	<0.01	1.58		2.44	0.058	0.284			35		4.80	
KR22137	9/13/2022	13:30	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P					5.69	1.04	59.5	4.9	1.10		0.032	0.27	0.14		1.2	0.147	0.187			6		<0.15	
KR22165	10/12/2022	13:40	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	17.7	8.5	127	8.4	3.23	1.17	62.4	4.71	0.63		0.067	0.63	0.08		1.19	0.124	0.145			<2.0		0.13	
KR22191	11/15/2022	13:00	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	8.5	7.8	117	10.2	1.81	1.54	62	4.32	0.64		0.096	0.97	0.06		1.77	0.073	0.119			4			
KR22213	12/7/2022	12:30	KR19645	Klamath River below Copco Dam (RM 196.45; Baseline)	PacifiCorp	0.5	P	4.7	7.9	141	11.1	2.07	2.38	57.5	4.46	0.91		0.22	0.89	0.09		2.05	0.071	0.094			6			
KR22001	4/26/2022	12:50	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P	13.5	8.0	104	10.5	9.24	2.97		2.92	0.96		0.01	0.49	0.15		0.97	0.042	0.075			6			
KR22002	4/26/2022	13:00	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.8	I					7.11	3.54																	
KR22003	4/26/2022	13:50	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	19.0	P	7.9	6.6	132	7.6	3.87	3.48		2.83	0.72		0.02	0.65	0.08		1.05	0.062	0.079			4			
KR22004	4/26/2022	13:40	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	40.0	P	5.9	6.5	140	5.8			67.6	2.71	0.50		0.02	0.86	0.06		1.3	0.062	0.08			<2			
KR22023	5/10/2022	10:35	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P	12.5	7.9	128	9.8	6.50	2.92		2.76	0.88		<0.01	0.41	0.12		0.99	0.033	0.062			4		<0.15	
KR22024	5/10/2022	10:45	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.8	I					9.63	3.85																	<0.15
KR22025	05/10/22	11:05	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P	12.5	7.9	128	9.8	5.06	2.64		1.76	0.76		<0.01	0.41	0.10		0.94	0.03	0.06			5			
KR22026	5/10/2022	11:20	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	38	P	6.1	6.6	153	5.4			67.7	2.68	0.50		<0.01	0.9	0.05		1.45	0.068	0.086			2			
KR22049	06/07/22	9:40	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P	19.5	8.5	119	9.0	2.30	1.15		2.66	0.32		0.05	0.08	0.05		0.52	0.029	0.048			<2		<0.15	
KR22050	6/7/2022	9:50	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.8	I					2.39	1.60																	<0.15
KR22051	6/7/2022	10:20	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	11	P	14.5	6.7	124	6.4	2.43	2.12		2.58	0.64		<0.01	0.2	0.08		0.54	0.056	0.066			<2			
KR22052	6/7/2022	10:10	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	42	P	7.1	6.4	151	1.3			61.7	2.68	0.46		<0.01	0.79	0.06		1.17	0.082	0.099			2			
KR22077	07/12/22	8:15	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P					52.47	2.52		3.08	2.36		<0.01	<0.01	0.47		0.86	<0.01	0.091			5		0.24	
KR22078	07/12/22	8:35	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.8	I					11.46	1.42																	0.2
KR22079	7/12/2022	9:05	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	12	P					2.78	1.33		2.82	0.52		0.01	0.08	0.08		0.38	0.079	0.111			2			
KR22080	7/12/2022	8:55	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	40	P							66	2.73	0.60		<0.01	1.04	0.12		1.48	0.081	0.11			2			
KR22105	8/9/2022	8:25	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P					12.36	0.90		3.23	2.01		<0.01	<0.01	0.24		0.58	0.021	0.052			6		0.26	

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophylla	Algae, Pheophytin	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate/Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22106	8/9/2022	8:55	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0-8	I					7.51	0.70																	0.23
KR22107	8/9/2022	9:35	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	12.0	P					5.71	0.96		3.11	1.00		0.019	0.08	0.14		0.64	0.116	0.134				4		
KR22108	8/9/2022	9:20	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	43.0	P							67.8	2.77	0.33		0.15	0.86	0.04		1.48	0.123	0.138				2		
KR22133	9/13/2022	8:15	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P					10.87	0.95		4.01	1.83		<0.01	<0.01	0.23		0.59	0.041	0.074				4		0.13
KR22134	9/13/2022	8:45	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0-8	I					9.73	0.87																	0.16
KR22135	9/13/2022	9:20	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	16	P					5.09	1.02		4.02	1.06		0.071	0.1	0.14		0.87	0.126	0.162				<2.0		
KR22136	9/13/2022	9:00	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	42	P							68.2	2.88	0.45		0.41	0.72	0.06		1.47	0.145	0.186				2		
KR22161	10/12/2022	8:30	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P	18.4	9.6	128	10.8	12.98	0.46		4.1	0.90		0.012	<0.01	0.14		0.31	0.079	0.098				<2.0		0.1
KR22162	10/12/2022	8:55	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0-8	I																							0.21
KR22163	10/12/2022	9:30	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	21.0	P	15.5	7.5	132	0.4	8.19	0.80		4.21	0.56		0.13	0.43	0.06		0.86	0.137	0.148				<2.0		
KR22164	10/12/2022	9:15	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	43	P	7.0	6.4	159	0.0	2.41	0.92	72.3	2.73	0.46		0.43	0.58	0.04		1.21	0.147	0.179				<2.0		
KR22187	11/15/2022	9:55	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P	11.0	7.8	146	6.9	3.47	0.94		4.12	0.48		0.18	0.64	0.06		1.33	0.103	0.118				<2.0		
KR22188	11/15/22	10:05	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0-8	I					3.15	0.91																	
KR22189	11/15/2022	10:45	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	24.0	P	10.2	7.3	148	3.6	1.36	1.21		3.85	0.40		0.24	0.65	0.04		1.24	0.108	0.136				<2.0		
KR22190	11/15/2022	10:25	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	43.0	P	7.2	6.9	187	0.0			72	2.76	0.40		0.46	0.54	0.03		1.15	0.144	0.165				2		
KR22209	12/7/2022	9:55	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0.5	P	6.8	7.6	147	8.6	1.64	0.86		4.39	0.41		0.21	0.72	0.05		1.66	0.100	0.11				<2.0		
KR22210	12/7/2022	10:15	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	0-8	I					0.98	0.77																	
KR22211	12/7/2022	10:45	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	15	P	6.7	7.6	147	8.5	1.30	1.37		4.31	0.50		0.24	0.75	0.06		2.04	0.09	0.11				2		
KR22212	12/7/2022	10:30	KR19019	Iron Gate Reservoir (RM 190.19; Baseline)	PacifiCorp	42.0	P	5.7	7.6	148	9.4			60.7	4.12	0.63		0.24	0.76	0.07		2.05	0.088	0.109				3		
KR22000	4/26/2022	18:00	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	12.8	8.6	138	10.5	11.13	3.43	60.8	2.91	1.09		<0.01	0.5	0.17		1	0.034	0.078	0.025	0.001	10.60	6		
KR22011	4/26/2022	18:15	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	S								8.49			0.5	0.99			3.93	0.54	0.597				85		
KR22012	4/26/2022	18:30	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.17	0.09		<0.01	<0.01	0.03		<0.2	<0.01	<0.01	0.001	0.0010	0.15	<2		
KR22013	04/26/22	18:05	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	D					12.39	3.32		2.89	1.18		0.01	0.49	0.18		0.99	0.040	0.081	0.02332	0.001064	10.6	6		
KR22022	5/10/2022	16:00	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	12.2	8.4	128	10.9	10.15	3.79	57.3	2.73	0.95		<0.01	0.42	0.13		1	0.034	0.07	0.019	0.0010	10.80	5		
KR22033	5/10/2022	16:15	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	S								8.42			0.49	0.94			4.13	0.537	0.559				78		
KR22034	5/10/2022	16:35	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.21	0.06		<0.01	<0.01	0.03		<0.2	<0.01	<0.01	0.001	0.0010	0.09	<2		

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophylla	Algae, Pheophytin	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate/Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22035	5/10/2022	16:05	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	D					10.63	4.24		2.74	0.99		0.01	0.42	0.14		1.11	0.036	0.07	0.02	0.00	10.40	4		
KR22048	06/07/22	15:10	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	16.1	7.8	127	9.2	3.77	3.23	54.9	2.55	0.51		0.01	0.2	0.07		0.58	0.045	0.068	0.021792	0.001	5.66	2		
KR22059	06/07/22	15:25	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	S								8.21			0.51	0.72			3.49	0.566	0.57				73		
KR22060	06/07/22	15:40	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.15	0.06		<0.01	<0.01	0.03		<0.2	0.016	<0.01	0.001	0.001	0.13	<2		
KR22061	6/7/2022	15:20	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	D					3.15	2.41		2.58	0.55		0.01	0.23	0.07		0.61	0.047	0.07	0.009232	0.001	5.41	2		
KR22076	7/12/2022	14:10	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R					4.30	2.34	63.2	2.80	0.64		<0.01	0.08	0.08		0.38	0.074	0.107	0.001	0.001	2.47	<2		<0.15
KR22087	7/12/2022	14:25	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	S								8.63			0.47	0.62			3.51	0.567	0.667				70		
KR22088	7/12/2022	14:45	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.1	0.06		<0.01	0.11	0.03		<0.2	<0.01	<0.01	0.00100	0.00108	0.14	<2		
KR22089	7/12/2022	14:20	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	D					3.50	1.70		2.79	0.49		<0.01	0.07	0.07		0.36	0.078	0.101	0.015	0.0070	2.47	<2		<0.15
KR22104	8/9/2022	15:40	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R					6.54	1.67	75	2.95	0.89		0.0088	0.09	0.11		0.6	0.122	0.138	0.016	0.011	2.40	5		0.1
KR22115	8/9/2022	16:05	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	S								8.50			0.51	0.61			3.62	0.614	0.641				75		
KR22116	8/9/2022	16:30	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.11	0.17		<0.01	<0.01	0.03		<0.2	<0.01	<0.01	0.001	0.001	0.21	<2.0		
KR22117	8/9/2022	15:55	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	D					6.97	1.75		2.93	1.07		0.012	0.09	0.12		0.59	0.117	0.131	0.00474	0.00100	2.17	4		0.13
KR22132	9/13/2022	15:05	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R					5.12	1.24	62.2	4.1	1.09		0.034	0.09	0.13		0.86	0.122	0.154	0.024178	0.00979	2.59	4		0.1
KR22143	9/13/2022	15:20	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	S								4.02			0.55	0.64			4.1	0.623	0.651				77		
KR22144	09/13/22	15:45	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.18	0.06		<0.01	<0.01	0.03		0.15	<0.01	<0.01	0.00100	0.00100	0.13	<2.0		
KR22145	9/13/2022	15:15	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	D					5.87	1.17		3.98	1.05		0.03	0.1	0.12		0.89	0.12	0.149	0.02439	0.00796	3.01	4		0.16
KR22160	10/12/2022	15:00	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	17.5	9.0	129	9.2	2.20	0.91	64.1	4.290	0.52		0.08	0.42	0.06		0.82	0.143	0.136			1.59	<2.0		0.12
KR22171	10/12/2022	15:15	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	S								10.00			0.56	0.91			3.82	0.648	0.66				78		
KR22172	10/12/2022	15:50	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.18	0.11		<0.01	<0.01	0.03		<0.2	<0.01	<0.01	0.010754	0.007154		<2.0		
KR22173	10/12/2022	15:05	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	D					1.52	0.92		4.26	0.57		0.07	0.43	0.06		0.79	0.145	0.143	0.0113	0.0062		<2.0		<0.15
KR22186	11/15/2022	14:30	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	11.0	7.9	145	9.3	2.49	1.20	66	4.19	0.49		0.16	0.67	0.05		1.57	0.104	0.139	0.008	0.007	1.78	<2.0		
KR22197	11/15/2022	14:55	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	S								9.67			0.65	1.18			4.27	0.635	0.612				81		
KR22198	11/15/2022	15:15	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.12	0.06		<0.01	<0.01	0.03		<0.2	<0.01	<0.01	0.001	0.002008	0.11	<2.0		
KR22199	11/15/2022	14:40	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	D					2.81	0.95		4.13	0.56		0.16	0.66	0.05		1.1	0.094	0.148	0.01	0.01	1.65	2		
KR22208	12/7/2022	15:50	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	R	6.7	7.6	148	11.1	1.18	1.09	119	4.33	0.40		0.19	0.74	0.05		2.36	0.096	0.111	0.006	0.010	2.15	<2.0		

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth	Type	Water Temperature	pH	Specific Conductivity	Dissolved Oxygen	Algae, Chlorophylla	Algae, Pheophytin	Alkalinity	Carbon, Dissolved Organic Carbon	Carbon, Particulate Carbon	Demand, Carbonaceous Biological Oxygen Demand	Nitrogen, Ammonia	Nitrogen, Nitrate/Nitrite	Nitrogen, Particulate Nitrogen	Nitrogen, Total Kjeldahl Nitrogen	Nitrogen, Total Nitrogen	Phosphorus, Phosphate	Phosphorus, Total Phosphorus	Phosphorus, Particulate Phosphorus	Phosphorus, Particulate Inorganic Phosphorus	Turbidity	Solids, Total Suspended Solids	Solids, Volatile Suspended Solids	Toxins, Microcystin
KR22219	12/7/2022	16:10	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	S								10.63			0.7	1.22			4.59	0.637	0.701			74			
KR22220	12/7/2022	16:30	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	NA	B					0.68	0.46		0.28	0.06	<0.01	<0.01	0.03		0.16	<0.01	<0.01	0.001	0.002	0.08	<2.0			
KR22221	12/7/2022	16:00	KR18973	Klamath River below Iron Gate Dam (RM 189.73; Baseline)	PacifiCorp	0.5	D					1.19	1.10		4.41	0.37		0.18	0.74	0.04		1.41	0.097	0.116	0.006	0.007	2.47	<2.0		

**Table 3-A. 2022 KHSA Public Health Monitoring Data during QA Assessment. This dataset may vary from the final 2022 KHSA dataset.**

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth m	Type -	Water Temperature C	pH -	Specific Conductivity uS/cm	Dissolved Oxygen mg/l	Toxins, Microcystin ug/l
KR22801	5/24/2022	0.33	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P	16.22	8.478	125	9.893	<0.15
KR22806	6/7/2022	0.56	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P	24.31	8.685	120.8	9.034	1.4
KR22811	6/21/2022	0.44	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P	22.21	8.93	120.9	10.14	<0.15
KR22816	7/12/2022	0.51	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P		9.005	122.7	9.511	360
KR22821	7/26/2022	0.4	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P		9.028	119.1	9.391	42
KR22826	8/9/2022	0.56	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P		9.591	124.5	11.43	280
KR22831	8/23/2022	0.42	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P		9.729	113.7	11.98	660
KR22836	9/13/2022	0.52	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P		9.146	106.1	7.713	2.6
KR22841	9/27/2022	0.44	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P	19	9.67	124.7	15.87	1.2
KR22846	10/12/2022	0.54	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P	18.39	9.284	124.5	12.1	<0.15
KR22851	10/24/2022	0.47	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P	14.63	8.024	138.5	9.061	<0.15
KR22856	11/15/2022	0.51	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P	8.829	7.956	140.4	9.988	<0.15
KR22861	12/7/2022	0.62	CRCC	Copco Reservoir at Copco Cove (Public Health)	PacifiCorp	0.1	P	4.808	8.174	144.1	13.15	<0.15
KR22800	5/24/2022	0.31	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P	16.55	7.983	126.4	8.912	<0.15
KR22805	6/7/2022	0.34	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P	18.73	8.352	124.3	9.218	<0.15
KR22810	6/21/2022	0.39	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P	21.78	8.365	122.5	8.19	<0.15
KR22815	7/12/2022	0.66	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P		9.042	118.3	10.43	0.22
KR22820	7/26/2022	0.47	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P		8.825	119.9	9.038	1.9
KR22825	8/9/2022	0.71	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P		9.237	120.8	8.253	30
KR22830	8/23/2022	0.36	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P		9.439	111.9	8.824	350
KR22835	9/13/2022	0.69	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P		9.926	30.06	14.3	0.27
KR22840	9/27/2022	0.38	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P	18.17	9.303	124.9	11.17	<0.15
KR22845	10/12/2022	0.69	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P	19.5	9.226	124.1	11.7	3.1
KR22850	10/24/2022	0.4	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P	14.24	7.703	138.2	9.328	5.8
KR22855	11/15/2022	0.32	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P	5.991	7.557	141.4	10.63	<0.15
KR22860	12/7/2022	0.31	CRMC	Copco Reservoir at Mallard Cove (Public Health)	PacifiCorp	0.1	P	4.316	7.384	146.2	10.73	<0.15
KR22803	5/24/2022	0.36	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P	15.13	8.77	125.2	11.18	<0.15
KR22808	6/7/2022	0.61	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P	21.33	9.241	125.2	11.74	<0.15



Sample ID	Date	Time	Site ID	Site Name	Agency	Depth m	Type -	Water Temperature C	pH -	Specific Conductivity uS/cm	Dissolved Oxygen mg/l	Toxins, Microcystin ug/l
KR22813	6/21/2022	0.47	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P	22.54	9.04	120.7	10.24	0.12
KR22818	7/12/2022	0.57	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P		9.374	123.3	10.46	0.12
KR22823	7/26/2022	0.37	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P		9.858	126.2	12.75	0.2
KR22828	8/9/2022	0.64	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P		10.09	131.4	11.09	0.27
KR22833	8/23/2022	0.46	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P		10.01	122.4	7.778	0.67
KR22838	9/13/2022	0.6	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P		9.988	129	10.61	0.22
KR22843	9/27/2022	0.48	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P	20.93	9.756	127.8	11.32	0.19
KR22848	10/12/2022	0.6	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P	20.37	9.736	128.1	12.7	0.1
KR22853	10/24/2022	0.5	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P	15.81	9.164	133.8	9.344	3.2
KR22858	11/15/2022	0.58	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P	11.79	9.127	142.8	10.25	<0.15
KR22863	12/7/2022	0.49	IGJW	Iron Gate Reservoir at Jay Williams Boat Ramp (Public Health)	PacifiCorp	0.1	P	5.633	8.588	144.3	12.56	<0.15
KR22802	5/24/2022	0.35	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P	14.33	8.197	125	10.28	<0.15
KR22807	6/7/2022	0.6	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P	22.41	9.373	125.3	12.78	0.14
KR22812	6/21/2022	0.46	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P	23.63	7.259	125.3	2.717	<0.15
KR22817	7/12/2022	0.56	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P		9.325	122.6	11.81	0.15
KR22822	7/26/2022	0.38	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P		9.889	127.1	12.4	1.1
KR22827	8/9/2022	0.63	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P		9.916	136.3	11.76	0.31
KR22832	8/23/2022	0.45	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P		9.81	124.3	11.26	0.17
KR22837	9/13/2022	0.59	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P		9.15	106	13.3	0.24
KR22842	9/27/2022	0.47	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P	20.95	9.767	122.7	12.21	<0.15
KR22847	10/12/2022	0.59	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P	20.99	9.666	126.2	12.88	0.14
KR22852	10/24/2022	0.49	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P	14.41	9.611	130.5	17.62	1
KR22857	11/15/2022	0.57	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P	12.67	9.384	124.5	19.26	<0.15
KR22862	12/7/2022	0.5	IGCC	Iron Gate Reservoir at Camp Creek (Public Health)	PacifiCorp	0.1	P	5.674	8.13	151.5	10.78	<0.15
KR22804	5/24/2022	0.37	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P	15.08	8.317	132.4	10.73	<0.15
KR22809	6/7/2022	0.63	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P	17.76	8.367	155	9.48	<0.15

Sample ID	Date	Time	Site ID	Site Name	Agency	Depth m	Type -	Water Temperature C	pH -	Specific Conductivity uS/cm	Dissolved Oxygen mg/l	Toxins, Microcystin ug/l
KR22814	6/21/2022	0.48	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P	21.47	8.874	131.5	10.81	<0.15
KR22819	7/12/2022	0.59	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P		8.335	138.7	7.987	<0.15
KR22824	7/26/2022	0.5	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P		8.718	135.9	8.785	0.13
KR22829	8/9/2022	0.65	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P		8.848	122.3	7.631	0.1
KR22834	8/23/2022	0.48	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P		9.181	116.6	8.471	0.22
KR22839	9/13/2022	0.62	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P		9.457	140.5	8.239	0.14
KR22844	9/27/2022	0.5	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P	19.94	9.464	143.2	11.43	0.11
KR22849	10/12/2022	0.62	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P	18.14	9.107	129.1	10.14	0.18
KR22854	10/24/2022	0.51	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P	16.09	8.977	148.4	9.987	<0.15
KR22859	11/15/2022	0.6	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P	11.2	8.177	144.6	9.801	<0.15
KR22864	12/7/2022	0.66	KRBI	Klamath River below Iron Gate Dam (RM 189.73; Public Health)	PacifiCorp	0.1	P	6.765	7.744	148.7	11.04	<0.15