WATER STRATEGY AND HYDRO LICENSING

Duke Energy Corporation
Regulated and Renewable Energy
526 South Church Street / EC12Q
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September 27, 2023

Electronically Filed

The Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street N.E.
Washington, DC 20426

Subject: **Bad Creek Pumped Storage Project (P-2740-053)**
Relicensing Study Progress Report No. 3

Dear Secretary Bose:

Duke Energy Carolinas, LLC (Duke Energy or Licensee) is the Licensee, owner, and operator of the 1,400-megawatt (MW) Bad Creek Pumped Storage Project (FERC Project No. 2740) (Project), located in Oconee County, South Carolina, approximately eight miles north of Salem. The Bad Creek Reservoir (or upper reservoir) was formed from the damming of Bad Creek and West Bad Creek and serves as the Project's upper reservoir. Lake Jocassee serves as the lower reservoir and is licensed separately as part of Duke Energy's Keowee-Toxaway Hydroelectric Project (FERC Project No. 2503).

The existing (original) license for the Project was issued on August 1, 1977 by the Federal Energy Regulatory Commission (FERC or Commission) and expires on July 31, 2027. Accordingly, Duke Energy is pursuing a new license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5.

Relicensing Studies

Duke Energy developed a Proposed Study Plan (PSP) in consultation with agencies and stakeholders and filed it on August 5, 2022. After the filing of the PSP, Duke Energy held a site visit and Project tour on August 16, 2022, and the PSP meeting on September 7, 2022. Duke Energy also continued to consult with agencies and other stakeholders regarding its proposed studies.

Duke Energy evaluated the comments submitted by the Commission and stakeholders in response to the PSP. Based on Duke Energy's review of these comments, FERC criteria for study requests under the ILP, and readily available information (i.e., associated with the previous licensing effort or resulting from ongoing monitoring activities), Duke Energy proposed six resource studies in the Revised Study Plan (RSP) filed with FERC on December 5, 2022. The Commission approved the RSP with modifications on January 4, 2023.

The six studies in the RSP will support evaluation of the potential effects of continued operation of the Project as well as potential effects of construction and operation of the proposed Bad Creek II Complex. These studies are:

- Water Resources Study;
- Aquatic Resources Study;
- Visual Resources Study;
- Recreational Resources Study;
- Cultural Resources Study; and
- Environmental Justice Study.

Duke Energy is filing this Study Progress report with the Commission electronically and is distributing this letter to the parties listed on the attached distribution list. For parties listed on the attached distribution list who have provided an email address, Duke Energy is distributing this letter via email; otherwise, it will be distributed via U.S. mail.

Duke Energy looks forward to continuing to work with Commission staff, resource agencies, Indian Tribes, local governments, non-governmental organizations, and interested members of the public throughout the relicensing process. If there are questions regarding this filing, please contact me at Alan.Stuart@duke-energy.com or via phone at 980-373-2079.

Sincerely,

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Enclosure

cc (w/enclosure): Jeff Lineberger, Duke Energy

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Bad Creek Pumped Storage Project
Relicensing Study Progress Report No. 3
September 27, 2023

1.0 BACKGROUND

Duke Energy Carolinas, LLC (Duke Energy or Licensee) is the Licensee, owner, and operator of the 1,400-megawatt (MW) Bad Creek Pumped Storage Project (FERC Project No. 2740) (Project), located in Oconee County, South Carolina, approximately eight miles north of Salem. The Bad Creek Reservoir (or upper reservoir) was formed from the damming of Bad Creek and West Bad Creek and serves as the Project's upper reservoir. Lake Jocassee serves as the lower reservoir and is licensed separately as part of Duke Energy's Keowee-Toxaway Hydroelectric Project (FERC Project No. 2503).

The existing (original) license for the Project was issued on August 1, 1977, by the Federal Energy Regulatory Commission (FERC or Commission) and expires on July 31, 2027. Accordingly, Duke Energy is pursuing a new license for the Project pursuant to the Commission's Integrated Licensing Process (ILP), as described at 18 Code of Federal Regulations (CFR) Part 5.

2.0 STUDY PLAN DEVELOPMENT

In accordance with 18 CFR §5.11, Duke Energy developed a Proposed Study Plan (PSP) in consultation with agencies and stakeholders and filed it on August 5, 2022. After the filing of the PSP, Duke Energy held a site visit and Project tour on August 16, 2022, and the PSP meeting on September 7, 2022. Duke Energy also continued to consult with agencies and other stakeholders regarding its proposed studies.

Duke Energy evaluated the comments submitted by the Commission and stakeholders in response to the PSP. Based on Duke Energy's review of these comments, FERC criteria for study requests under the ILP, and readily available information (e.g., associated with the previous licensing effort or resulting from ongoing monitoring activities), Duke Energy proposed six resource studies in the Revised Study Plan (RSP) filed with FERC on December 5, 2022. The RSP includes copies of and summarizes comments received and Duke Energy's responses.

The six studies in the RSP will support evaluation of the potential effects of continued operation of the Project as well as potential effects of construction and operation of the proposed Bad Creek II complex. These studies are:

- Water Resources Study;
- Aquatic Resources Study;
- Visual Resources Study;
- Recreational Resources Study;
- Cultural Resources Study; and
- Environmental Justice Study.

In FERC's Study Plan Determination (SPD) letter on January 4, 2023, FERC approved the proposed studies as submitted in the RSP except the Recreational Resources Study which was approved with modifications. The Recreational Resources Study was modified to include the following:

- An additional traffic counter was added at the Laurel Valley Trail Access.[1]
- Revisions to the Recreation Site Inventory Form to include the number and height of bear cables and number of latrines.

In addition, Duke Energy provided the following clarifications regarding the Discussion and Staff Recommendations included in the SPD in Study Progress Report No. 1:

- FERC recommended that Duke Energy modify the Recreation Study Plan to include the additional counties that will be used during the future recreation use analysis. Duke Energy will include Oconee and Pickens counties, SC and Jackson and Transylvania counties, NC and additional counties in SC, NC, and GA that are reported on the recreation user surveys. Since recreation user surveys had not yet been completed yet, Duke Energy was unable to list what counties would be reported at that time.
- FERC recommended that Duke Energy include the 14.8 miles of trail that follows logging and access roads in the Conditions Assessment. Duke Energy is evaluating the entire 43 miles of trail, including 28.2 miles of single-track trail segments and 14.8 miles of trail that follow logging and access roads in the Conditions Assessment.

[1] Although the SPD referenced "Laurel Fork Gap", Duke Energy assumes the Foothills Trail Conservancy and FERC meant to reference the Laurel Valley Trail Access.

- FERC recommended that the Recreation Use and Needs (RUN) Study include detail boxes and labels for all spur trails within the 43-mile portion of trail to be studied by Duke Energy. Duke Energy will prepare detailed maps of the Duke Energy-maintained, 43-mile portion of the Foothills Trail that identify parcel boundaries, current property owner(s), access locations, spur trails, structures, and facilities/amenities. Two traffic counters have been installed at the Bad Creek Hydro Project Trail Access (i.e., Bad Creek Parking Access Area and Bad Creek Road) and user surveys are being collected at this site.
- FERC requested additional details on the standards used to define the minimum acceptable values of the indicator variables used to estimate the trail's carrying capacity. Duke Energy held a Recreational Resources Study Resource Committee (RC) meeting on March 28, 2023, to discuss the carrying capacity methodology.

In its Study Progress Report No. 2, Duke Energy provided information on a potential temporary access road to the Fisher Knob community. The study areas for the Water Resources, Aquatic Resources, Visual Resources, and Cultural Resources studies were expanded to incorporate the areas potentially affected by the temporary road.

The following sections summarize progress implementing the relicensing studies since Study Progress Report No. 2 was filed.

3.0 WATER RESOURCES STUDY

The Water Resources RC and Aquatics Resources RC met jointly on July 27, 2023.

The components of the Water Resources Study and status of each are provided below:

- **Summary of Existing Water Quality Data and Standards**: Historical Lake Jocassee and Howard Creek water quality data collected by Duke Energy and Clemson University have been compiled and summarized. The draft report was distributed to Water Resources RC members for their review on June 28, 2023, with comments due by August 28, 2023. Organizations that provided comments on the draft report include Friends of Lake Keowee Society (FOLKS) and Upstate Forever; U.S. Fish and Wildlife Service (USFWS). Advocates for Quality Development (AQD) reviewed the report but had no comments. Duke Energy addressed stakeholder comments in the final study report, which is provided in Attachment A.

- **Water Quality Monitoring in the Whitewater River Arm**: Water quality instrumentation was deployed at three locations in the Whitewater River arm of Lake Jocassee, May 22-23, 2023. Data collection began in June 2023 and will extend through September 2023. Duke Energy has made nine field visits to download dataloggers and collect water quality profile data (DO and temperature) since initial deployment. During three of these trips, water velocity at depth was measured with an acoustic Doppler current profiler (ADCP) across several transects in the Whitewater River arm to collect verification data for CFD model results.
- **Computational Fluid Dynamics (CFD) Modeling of Velocity Effects and Vertical Mixing in Lake Jocassee Due to a Second Powerhouse:** Development of the CFD model and model runs under various Lake Jocassee water level elevations and Project operational scenarios is complete. Model results were presented and discussed at the July 27, 2023, joint RC meeting; the draft report was provided to the Water Resources RC for review on September 11, 2023. Comments are due by October 11, 2023.
- **CHEOPS Modeling of Water Exchange Rates and Lake Jocassee Reservoir Levels:** The CHEOPS model will be used to evaluate potential effects of Bad Creek II on the frequency, timing, and range of Lake Jocassee reservoir level fluctuations. The Water Resources and Aquatics Resources RCs reviewed performance measures that will be used to evaluate model output at the joint RC meeting on July 27; a follow-up meeting (virtual) with the South Carolina Department of Natural Resources (SCDNR) was held on August 17 to further discuss performance measures. Duke Energy expects to schedule a follow-up meeting in October 2023 with the Joint RC to review model results. Following the meeting, Duke Energy will provide the report to the Water Resources and Operations RCs for a 30-day comment period.
- **Future Water Quality Management Plan (WQMP) Development:** Work to develop the WQMP will begin in 2024.

Variance from Approved Study Plan

The study is proceeding in accordance with the approved study plan except the study area has expanded to incorporate a temporary access road. Potential water quality effects associated with the temporary access road would be addressed in the WQMP.

4.0 AQUATIC RESOURCES STUDY

The Water Resources RC and Aquatics Resources RC met jointly on July 27, 2023.

The components of the Aquatic Resources Study and status of each are provided below:

- **Entrainment:** The desktop entrainment study report has been revised to include historical operations data, an assessment of the influence of operations with the increase of renewable energy production, pumping periods (2, 4, 6, 8, 10, and 12 hours), diurnal periods (day versus night), lake levels, and water temperature. The final report will be provided to the RC members during the fourth quarter of 2023.
- **Desktop Studies on Pelagic and Littoral Habitat Effects:** This effort will use results of the CFD and CHEOPS modeling from the Water Resources Study. CFD modeling results will be used to qualitatively evaluate potential effects to Lake Jocassee stratification, dissolved oxygen, and temperatures throughout the water column. CHEOPS modeling results will be used to assess potential effects within the littoral zone with a focus on lake level fluctuation effects. See Section 3.0 for an update on the CFD and CHEOPS modeling.
- **Mussel Surveys and Stream Habitat Quality Surveys:** Mussel surveys were completed the week of July 24, 2023. In consultation with the SCDNR per their request, Duke Energy has refined the methodology for evaluating stream habitat and potential effects to stream function resulting from construction of a temporary access road by implementing the SCDNR Stream Quantification Tool (SQT). This tool includes assessments of stream hydrology, hydraulics, geomorphology, and biology. A summary of the approach to field studies related to the temporary access road and upland spoil locations is described in Attachment B. Stream habitat surveys at uplands spoil locations were completed September 11-13, 2023. Fish surveys in support of the SQT were completed in July and September 2023. A third and final fish survey will occur in October 2023. Habitat surveys for streams crossed by the temporary access road using the SCDNR SQT methodology will be completed in October 2023. Results of the mussel, fish, and stream habitat surveys will be summarized in a report to be shared with the Aquatic Resources RC in Q4 2023.

Variance from Approved Study Plan

The study is proceeding in accordance with the approved study plan except the study area has been expanded to include the temporary access road.

5.0 VISUAL RESOURCES STUDY

The Recreational Resources RC met on July 27, 2023, to discuss the Visual Resources Study and hear an update on the Recreational Resources Study.

The viewshed model has been developed. The Recreational Resources RC identified six potential Key Views during the July 27, 2023, meeting. Photographs will be taken from the Key Views in November 2023 during leaf-off conditions. The Recreational Resources RC will review the resulting photos and select four for use with the remaining visual resources study tasks.

Variance from Approved Study Plan

The study is proceeding in accordance with the approved study plan. The temporary access road route has been incorporated into the viewshed model.

6.0 RECREATIONAL RESOURCES STUDY

The Recreational Resources RC met on July 27, 2023, to discuss the Visual Resources Study and hear an update on the Recreational Resources Study.

The components of the Recreational Resources Study and status of each are provided below:

- **Foothills Trail Recreation Use and Needs (RUN) Study**: Data were collected at Musterground Road between September 2022 and mid-January 2023, and again between March 20 and May 10, 2023. A traffic counter was reinstalled at Musterground Road in early September 2023 and will continue to collect data through mid-January 2024. Data collection at the other access areas began in March 2023 and is scheduled to continue through November 2023.
- **Foothills Trail Condition Assessment**: Fieldwork began in May 2023. Duke Energy anticipates distributing a draft study report for Recreation RC review in the fourth quarter of 2023.
- **Whitewater River Cove Existing Recreational Use Evaluation**: Drone flights to capture recreational boating in the Whitewater River cove began Memorial Day weekend and ended Labor Day. Duke Energy anticipates distributing a draft study report to Recreational Resources RC members in the fourth quarter of 2023.
- **Whitewater River Cove Recreation Public Safety Evaluation:** This effort will integrate the CFD modeling velocity data developed in the Water Resources Study with the

Whitewater River cove recreational use data captured during the 2023 boating season. The draft report will be distributed to Recreational Resources RC members in the spring 2024.

Variance from Approved Study Plan

The study is proceeding in accordance with the study plan as modified by FERC.

7.0 CULTURAL RESOURCES STUDY

The archaeological survey began in March and was completed in August 2023. Duke Energy consulted with the South Carolina State Historic Preservation Office (SCSHPO) and Tribes to modify the Area of Potential Effect (APE) to incorporate the temporary access road on September 25, 2023; concurrence from SCSHPO was received September 26, 2023.

Duke Energy anticipates the draft survey report will be distributed to the South Carolina State Historic Preservation Office, federally recognized Indian Tribes, and other consulting parties in the fourth quarter of 2023.

Variance from Approved Study Plan

The study is proceeding in accordance with the approved study plan except the geographic scope of the study area has been expanded to encompass the proposed temporary access road.

8.0 ENVIRONMENTAL JUSTICE STUDY

Duke Energy distributed the draft study report to the Operations RC on June 6, 2023, with comments due by July 6, 2023. The report identified Environmental Justice (EJ) communities within the 5-mile buffer area. Results indicate there would be no adverse effects to EJ communities associated with the relicensing of Bad Creek or construction of Bad Creek II, so the public outreach meeting included in the study plan is not warranted. No substantive comments were provided on the draft EJ report, so the report has been finalized and is included in Attachment C. No additional work is anticipated in association with the study.

Variance from Approved Study Plan

The study has been completed in accordance with the approved study plan.

9.0 WILDLIFE AND BOTANICAL UPDATE

The Wildlife and Botanical RC met (virtually) on July 31, 2023, to discuss updates regarding endangered species, the potential temporary access road, avian protection along the transmission line corridor, and Clean Water Act permitting. A meeting summary was provided to the Wildlife and Botanical RC on August 14, 2023.

In consultation with the SCDNR, and in anticipation of information needed to support Clean Water Act permitting for Bad Creek II construction, Duke Energy also conducted herpetological surveys at potential spoil areas from September 11 to 13, 2023. Results will be summarized and shared with the Wildlife and Botanical RC.

Attachment A: Summary of Existing Water Quality Data and Standards

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SUMMARY OF EXISTING WATER QUALITY AND STANDARDS

FINAL REPORT

WATER RESOURCES STUDY

Bad Creek Pumped Storage Project
FERC Project No. 2740

Oconee County, South Carolina

September 12, 2023

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WATER RESOURCES STUDY REPORT
BAD CREEK PUMPED STORAGE PROJECT
FERC PROJECT NO. 2740

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Appendix A – Duke Energy Water Quality Field and Sample Collection Procedures
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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
µS/cm	microsiemens per centimeter
Bad Creek (or Project)	Bad Creek Pumped Storage Project
Bad Creek II Complex	Bad Creek II Power Complex
Bad Creek Reservoir	Upper Reservoir
BOD_5	5-day biochemical oxygen demand
CFR	Code of Federal Regulations
cfs	cubic feet per second
DO	dissolved oxygen
Duke Energy or Licensee	Duke Energy Carolinas, LLC
ft	feet
ft msl	feet above mean sea level
FERC or Commission	Federal Energy Regulatory Commission
I/O structure	Bad Creek inlet/outlet structure
KT Project	Keowee-Toxaway Hydroelectric Project
m	meter
mg/L	milligrams per liter
mi^2	square miles
MOU	Memorandum of Understanding
NTU	Nephelometric turbidity units
ORW	Outstanding Resources Waters
RSP	Revised Study Plan
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
stdev	standard deviation
TN	Trout Natural
TKN	Total Kjeldahl Nitrogen
TPGT	Trout Put, Grow, and Take
TR	Trout Waters
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WQMP	Water Quality Monitoring Plan

1 Project Introduction and Background

Duke Energy Carolinas, LLC (Duke Energy or Licensee) is the owner and operator of the 1,400-megawatt Bad Creek Pumped Storage Project (Project) (FERC Project No. 2740) located in Oconee County, South Carolina, approximately eight miles north of Salem. The Project utilizes the Bad Creek Reservoir as the upper reservoir (Upper Reservoir) and Lake Jocassee, which is licensed as part of the Keowee-Toxaway (KT) Hydroelectric Project (FERC Project No. 2503), as the lower reservoir.

The existing (original) license for the Project was issued by the Federal Energy Regulatory Commission (FERC or Commission) for a 50-year term, with an effective date of August 1, 1977 and expiration date of July 31, 2027. The license has been subsequently and substantively amended, with the most recent amendment on August 6, 2018 for authorization to upgrade and rehabilitate the four pump-turbines in the powerhouse and increase the Authorized Installed and Maximum Hydraulic capacities for the Project.[1] Duke Energy is pursuing a new license for the Project pursuant to the Commission's Integrated Licensing Process, as described at 18 Code of Federal Regulations (CFR) Part 5.

In accordance with 18 CFR §5.11 of the Commission's regulations, Duke Energy developed a Revised Study Plan (RSP) for the Project and proposed six studies for Project relicensing. The RSP was filed with the Commission and made available to stakeholders on December 5, 2022. FERC issued the Study Plan Determination on January 4, 2023, which included modifications to one of the six proposed studies (Recreational Resources Study).

This report includes the findings for Task 1 (Summary of Existing Water Quality and Standards) of the Water Resources Study. The Water Resources Study is ongoing in support of preparing an application for a new license for the Project in accordance with 18 CFR §5.15, as provided in the RSP.

[1] *Duke Energy Carolinas LLC, 164 FERC ¶ 62,066 (2018)*

2 Study Goals and Objectives

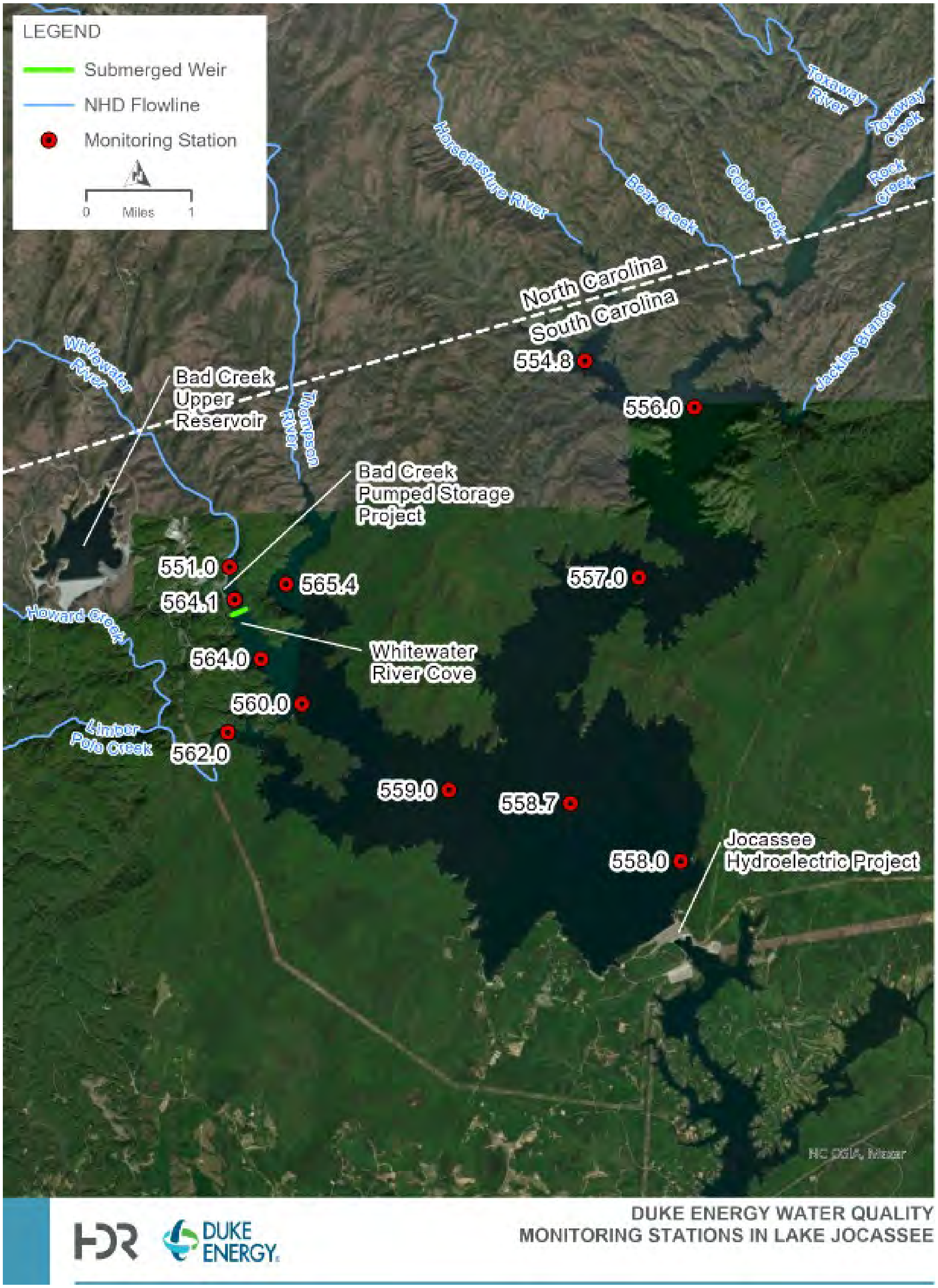
Tasks carried out for the Bad Creek Water Resources Study employ standard methodologies that are consistent with the scope and level of effort described in the RSP filed with the Commission on December 5, 2022. This report was developed in support of Task 1 of the Water Resources Study (Summary of Existing Water Quality Data and Standards) and is intended to provide sufficient information to support an analysis of the potential Project-related effects on water resources with clear nexus to the Project.

The main goal of this desktop review is to compile previously collected water quality data and provide a summary of existing data from Lake Jocassee and Howard Creek under current Project operations and prior to Project operations, while addressing stakeholder concerns.

3 Study Area

The study area for the desktop review of existing water quality data includes Lake Jocassee (i.e., the lower reservoir) and Howard Creek (Figure 3-1), a tributary to Lake Jocassee that flows in a southeasterly direction along the downstream side of the Project dams. These are the waterbodies potentially impacted by the Project[2].

[2] Note that water quality monitoring in the Bad Creek Reservoir is not safe (due to rapid, large fluctuations in water level elevation and typically continuous Project operation) nor is it considered meaningful, given the short retention time of Bad Creek Reservoir. Due to pumping and generating cycles, retention time is approximately 3 days if only a single pump-turbine unit is operating. There are no existing water quality data in the Upper Reservoir; it is used only for Project operations and there is no public access.



Note: NHD = U.S. Geological Survey (USGS) National Hydrology Database

Figure 3-1. Study Area for Desktop Review of Lake Jocassee and Howard Creek

4 Description of Project Waters

4.1 Overview

The Project is located in the Blue Ridge physiographic province in the headwaters of the Savannah River basin. The Savannah River basin has an area of approximately 10,577 square miles (mi^2) and drains portions of the Blue Ridge, Piedmont, and Coastal Plain regions.

The Project uses the Bad Creek Reservoir as its upper reservoir, which has a drainage area of approximately 1.5 mi^2. Construction of the Project began in December 1985 and major work was completed by December 1990 (see Table 4-1); initial filling of the Bad Creek Reservoir began in January 1991. Prior to impoundment, Bad Creek and West Bad Creek were tributaries of Howard Creek (a tributary to Lake Jocassee) located near the toe of the Main Dam and West Dam, respectively. Howard Creek flows from its headwaters (northwest of the Project) and through the southern border of the Project Boundary with a drainage area of approximately 4.3 mi^2 at its downstream confluence with Limber Pole Creek. Seepage through the two earthen dams now flows into Howard Creek near the toe of each dam. Average seepage flows from the Main Dam and the West Dam are approximately 5.0 cubic feet (ft) per second (cfs) combined. Water from Bad Creek Reservoir is exchanged directly with Lake Jocassee. Due to the small drainage area of Bad Creek Reservoir, inflows are minimal and have limited to no effect on water quality or Project operations.

Lake Jocassee, which operates as the lower reservoir for the Project, was formed by impounding the Keowee River at river mile 343.6, just downstream of the confluence of the Whitewater and Toxaway rivers. Lake Jocassee has a drainage area of 145 mi^2, a surface area of approximately 7,980 acres, and approximately 92 miles of shoreline at full pond (1,110 ft above mean sea level [msl]). Water from Lake Jocassee flows directly into Lake Keowee, which was formed by impounding the Keowee River and the Little River, and the two impoundments are connected through an excavated canal creating one large impoundment. Duke Energy has monitored water quality conditions in Lake Jocassee in some capacity since the reservoir's formation in 1973.

During Project construction, excavated rockfill was hauled to the western shore of Whitewater River cove (also called Whitewater River arm), transported out into the lake on barges, and placed in the water to construct an underwater weir approximately 1,800 ft downstream of the

Project inlet/outlet (I/O) structure (weir midpoint coordinates 35.0015, -82.991509). The existing submerged weir is approximately 567 ft wide and 455 ft long with a crest elevation of approximately 1,060 ft msl. It was installed to help minimize the effects of Project operations on the natural stratification of Lake Jocassee and dissipate the energy of the discharging water from the Project's I/O structure.

For reference, Table 4-1 includes a list of significant construction (or other) events at the Project.

Table 4-1. Bad Creek Project Construction or other Significant Events

Date	Event
October 30, 1984	Project access road construction begins
December 12, 1985	Begin tunnel excavation construction
April 18, 1986	Begin main cofferdam construction
Spring 1986	Begin construction of West Abutment of Main Dam
December 6, 1986	Complete intake channel excavation
April 17, 1987	Complete main access shaft
September 14, 1987	Complete Powerhouse cavern
September 25, 1987	Complete excavation of tunnels
February 24, 1989	Complete reservoir grouting
June 11, 1990	Complete West Dam construction
July 23, 1990	Complete East Dike construction
October 10, 1990	Complete Main Dam construction
December 27, 1990	Water up power tunnel
March 15, 1991	Initial reservoir filling
March 1991	Commercial operation – Unit 1 and 2
September 1991	Commercial operation – Unit 3 and 4
August 16-17, 1994	Tropical Storm Beryl

4.2 Water Quality Standards and Use Classifications

North Carolina and South Carolina have assigned state water quality standards commensurate with a designated use of a waterbody and both states have similar categories of designated use. Some of the tributaries flowing into Lake Jocassee are wholly within North Carolina, some are wholly within South Carolina, and some flow through both states. Variations of sub-sets of general classifications between the two states exist; however, both states have recognized and distinguished between general use to maintain and support aquatic life and general contact recreation, trout habitats, and high value resource areas.

Under the authority of the South Carolina Pollution Control Act, the South Carolina Department of Health and Environmental Control (SCDHEC) Water Classification & Standards establishes appropriate water uses and protection classifications, as well as general rules and specific water quality criteria to protect existing water uses, establish anti-degradation rules, protect public welfare, and maintain and enhance water quality. Streams with the following Water Classifications are found in the Project vicinity: Outstanding Resources Waters (ORW); Trout Natural (TN); and Trout Put, Grow, and Take (TPGT). The Whitewater River is classified as ORW, Howard Creek is classified as TN, and Whitewater River tributaries are classified as ORW and TPGT (SCDHEC 2021; NCDEQ 2021). Lake Jocassee is designated as TPGT. TPGT waters are freshwaters suitable for supporting growth of stocked trout populations and a balanced indigenous aquatic community of fauna and flora. These waters are also suitable for contact recreation and as a drinking water supply source after conventional treatment. A summary of the designated use classifications for the Lake Jocassee watershed is provided in Table 4-2. Note the only waterbodies considered in this report are Lake Jocassee and the portion of Howard Creek downstream of the Project dams.

Table 4-2. Surface Water Classifications of Waterbodies within Lake Jocassee Watershed

Name	State	Description	Surface Water Classification
Bear Camp Creek	NC	From source to state line	C; TR
Bear Creek	NC	From source to state line	C; TR
Bear Creek	SC	Portion of the creek from state line to Lake Jocassee	TN
Corbin Creek	SC	The entire creek tributary to Devils Fork	ORW (TPGT)
Devils Fork Creek	SC	Portion of the creek from confluence of Corbin Creek and Howard Creek to Lake Jocassee	TN
Horsepasture River	NC	From a point approximately 0.60 mile downstream of N.C. Hwy 281 (Bohaynee Rd) to state line	B; TR, ORW
Howard Creek	SC	Portion of the creek from its headwaters to 0.3 mile below Hwy 130 upstream of the flow augmentation system at the Bad Creek Bad Creek Main Dam.	ORW (TPGT)
Howard Creek*	SC	The portion below Bad Creek Dam to Lake Jocassee	TN
Lake Jocassee*	SC	The entire lake	TPGT
Laurel Fork Creek	SC	The entire creek tributary to Lake Jocassee	TN
Limber Pole Creek	SC	The entire creek tributary to Devils Fork	TN
Rock Creek	SC	Portion of the creek within South Carolina	TN
Thompson River	NC	From source to state line	C, TR
Thompson River	SC	Portion of the river from state line to Lake Jocassee	TN

Name	State	Description	Surface Water Classification
Toxaway River	NC	From dam at Lake Toxaway Estates, Inc. to state line	C
Whitewater River	NC	From Little Whitewater Creek to state line	C, TR, HWQ
Whitewater River	SC	Portion of the river from state line to Lake Jocassee	ORW (TPGT)
Write Creek	SC	The entire creek tributary to Lake Jocassee	ORW (TPGT)
Coley Creek	SC	The portion of the creek in SC	TPGT
Devils Hole Creek	SC	The entire creek tributary to Lake Jocassee	TPGT
Jackie's Branch	SC	The entire creek tributary to Lake Jocassee	TN
Mill Creek	SC	The entire creek tributary to Lake Jocassee	TPGT

* Evaluated in this report

B- Primary Recreation, Fresh Water; C- Aquatic Life, Secondary Recreation, Fresh Water; HQW- High Quality Waters; ORW- Outstanding Resource Waters; TN- Trout-Natural; TPGT- Trout-Put, Grow, and Take; TR- Trout Waters

Sources: SCDHEC 2020, 2021; NCDEQ 2021

A summary of water quality standards for South Carolina applicable to Project waters (i.e., Blue Ridge; trout waters) is included in Table 4-3. Note that nutrient criteria (i.e., phosphorous, nitrogen, chlorophyll a) in the state of South Carolina apply only to lakes and reservoirs, not rivers and streams. Numeric nutrient criteria are based on an ecoregional approach which takes into account the geographic location of the lake and are applicable to lakes of 40 acres or more (SCDHEC 2020). In evaluating the effects of nutrients on the quality of lakes and other waters of the state, SCDHEC may consider, but not be limited to, such factors as the hydrology and morphometry of the waterbody, the existing and projected trophic state, characteristics of the loadings, and other control mechanisms to protect the existing and classified uses of the waters (SCDHEC 2020).

Table 4-3. South Carolina Numeric State Water Quality Standards for Parameters Assessed in Project Waters

Parameter	South Carolina Water Quality Standard
Temperature (applies to heated effluents only)	Not to exceed 2.8°C (5°F) above natural temperatures up to 32.2°C (90°F) Trout Waters: Not to vary from levels existing under natural conditions, unless determined some other temperature shall protect the classified uses
Dissolved Oxygen	Daily average not less than 5.0 milligrams per liter (mg/L) Instantaneous low of 4.0 mg/L Trout Waters: Not less than 6.0 mg/L
pH	Between 6.0 and 8.5 Trout Waters: between 6.0 and 8.0
Turbidity	Freshwater Lakes Only: Not to exceed 25 NTUs provided existing uses are maintained.

Parameter	South Carolina Water Quality Standard
	Trout Waters: Not to exceed 10 NTUs or 10% above natural conditions, provided existing uses are maintained.
Phosphorus	Blue Ridge – Shall not exceed 0.02 mg/L. Piedmont – Shall not exceed 0.06 mg/L.
Nitrogen	Blue Ridge – Shall not exceed 0.35 mg/L. Piedmont – Shall not exceed 1.5 mg/L.
Chlorophyll a	Blue Ridge – Shall not exceed 10 μg/L. Piedmont – Shall not exceed 40 μg/L.

Source: SCDHEC 2020

4.3 Compliance with SCDHEC State Standards

One important goal of the Clean Water Act, the South Carolina Pollution Control Act, and the State Water Quality Classifications and Standards is to maintain the quality of surface waters to provide for the survival and propagation of a balanced indigenous aquatic community of fauna and flora (SCDHEC n.d.). The degree to which aquatic life is protected is assessed by comparing important water quality characteristics and the concentrations of potentially toxic pollutants with numeric criteria. Support of aquatic life uses is determined based on the percentage of numeric criteria excursions and, where data are available, the composition and functional integrity of the biological community (SCDHEC n.d.).

South Carolina water quality standards and thresholds are listed above in Table 4-3. The SCDHEC assessment methodology (SCDHEC n.d.) states that grab samples or samples collected at a depth of 0.3 meters are considered to be a surface measurement; this is consistent with Duke Energy's surface measurement methods. For the purpose of assessment, only surface samples are used in standards comparisons and trend assessments (SCDHEC n.d.). Note that the SCDHEC and U.S. Environmental Protection Agency (USEPA) do not define the sampling method or frequency of sampling for water quality to compare to criteria, other than indicating it should be "representative" (SCDHEC n.d.).

For temperature and dissolved oxygen (DO) standards, if the percentage of criterion excursions is greater than 10 percent, but less than or equal to 25 percent, the criterion is partially supported. If the percentage of criterion excursions is 10 percent or less across the dataset, the criterion is said to be fully supported (SCDHEC n.d.).

For turbidity, phosphorus, total nitrogen, and chlorophyll a, if the individual criterion is exceeded in more than 25 percent of the samples, the criterion is considered not supported. If the criterion is exceeded in more than 10 but less than 25 percent, sites are evaluated on a case-by-case basis to determine if local conditions indicate that classified uses are impaired. If the criterion is exceeded in less than 10 percent of the samples, the criterion is considered fully supported (SCDHEC n.d.).[3]

5 Lake Jocassee

Lake Jocassee is classified as an oligotrophic waterbody exhibiting low productivity, low nutrient concentrations, and high clarity. Generally, DO concentrations (as well as percent DO saturation) remain relatively high due to the low productivity (slow consumption of oxygen due to limited biological activity and benthic decomposition rates) (Dobson and Frid 2009). It is a monomictic lake experiencing seasonal thermal stratification (summer) and mixing (winter); however, the lake's geomorphological characteristics sometimes result in minor mixing between the upper and lower levels of the water column, allowing for thermal stratification to persist for several years without turn-over (Duke Power Company 1995).

Lake Jocassee is included in the highest water quality classification (i.e., excellent rating) as designated by SCDHEC and preservation of existing conditions is recommended, with most tributaries within the watershed fully supporting their designated use. It is one of only a few reservoirs in South Carolina possessing the necessary aquatic habitat (water temperature and DO) to support both warmwater and coldwater (salmonid [trout]) fisheries year-round (USACE 2014). SCDHEC has consistently identified Lake Jocassee, as well as downstream Lake Keowee, among the cleanest South Carolina reservoirs based on previous data and recent data continue to indicate Lake Jocassee fully supports aquatic life and recreational designated uses (USACE 2014).

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[3] Note that the goal of the standards for aquatic life uses is the protection of a balanced indigenous aquatic community; therefore, biological data are the ultimate deciding factor, regardless of chemical conditions. If biological data show a healthy, balanced community, the use is considered supported even if chemical parameters do not meet the applicable criteria (SCDHEC n.d).

5.1 Data Analysis Methods

Water quality datasets for Lake Jocassee were received directly from Duke Energy's Environmental Science Group in July 2022 (Microsoft Excel®). Methods for water quality data collection, calibration, data entry, and quality control have followed Duke Energy standard operating procedures (SOPs) and guidelines, which have been reviewed and updated periodically since inception of the environmental monitoring program. Duke Energy's most recent water quality monitoring SOPs are the Duke Energy Water Quality Field Procedure (ESFP-SW-0503, Rev1) and the Duke Energy Water Chemistry Sample Collection ESFP-SW-0504, Rev0), which are included for reference in Appendix A.

To satisfy the objective of summarizing existing water quality conditions and comparing them to conditions that existed prior to Project construction, Lake Jocassee water quality data were pooled and separated into two time periods: pre operations and post operations. Because Units 1 and 2 began commercial operation in March 1991 (see Table 4-1), the post operation period (also called post construction period) is 1991-2020. The start year for data from the pre operation/pre construction period is not consistent between monitoring stations but on average, data measurements began in the late 1970's. The pre operation period is considered any year prior to 1991.

Vertical water column measurements were averaged for every 15-foot interval for each month of the year[4] to show average seasonal trends for each of the following water quality parameters:

- Temperature (degrees Celsius [°C])
- Dissolved oxygen (mg/L)
- Dissolved oxygen percent saturation (%)
- pH (Standard units)
- Phosphorus (mg/L)
- Nitrogen (mg/L)
- Chlorophyll a (mg/L)
- Conductivity (microsiemens per centimeter [µS/cm])

[4] Winter months include December through February, spring is March through May, summer is June through August, and fall is September through November.

Water quality data are summarized in Section 5.3 and accompanying detailed data tables are provided in Appendix B for depth and surface-averaged measurements for individual monitoring stations shown on Figure 3-1.

Because water in the Whitewater River arm is directly exchanged with waters of the Upper Reservoir, a separate water quality analysis was carried out for three existing monitoring stations in the Whitewater River cove since those stations are most impacted by Project operations (Stations 564.1, 564.0, and 560.0 shown on Figure 5-1). For the Whitewater River cove analysis, a third time period covering the years during Project construction (1985-1991) was evaluated in addition to pre and post construction.

Turbidity values (vertical profiles) were also assessed at the three Whitewater River cove locations to identify; (1) potential relationships between past project construction activities (or other external drivers such as major storms) and increased turbidity, (2) downstream extent of turbidity impacts in Whitewater River cove, and (3) approximate length of time for elevated turbidity levels to recover. Turbidity data are compiled and presented in a format that shows pre construction, construction, and post construction conditions. This information can be used to help inform future potential water quality/turbidity impacts due to the potential construction of Bad Creek II.

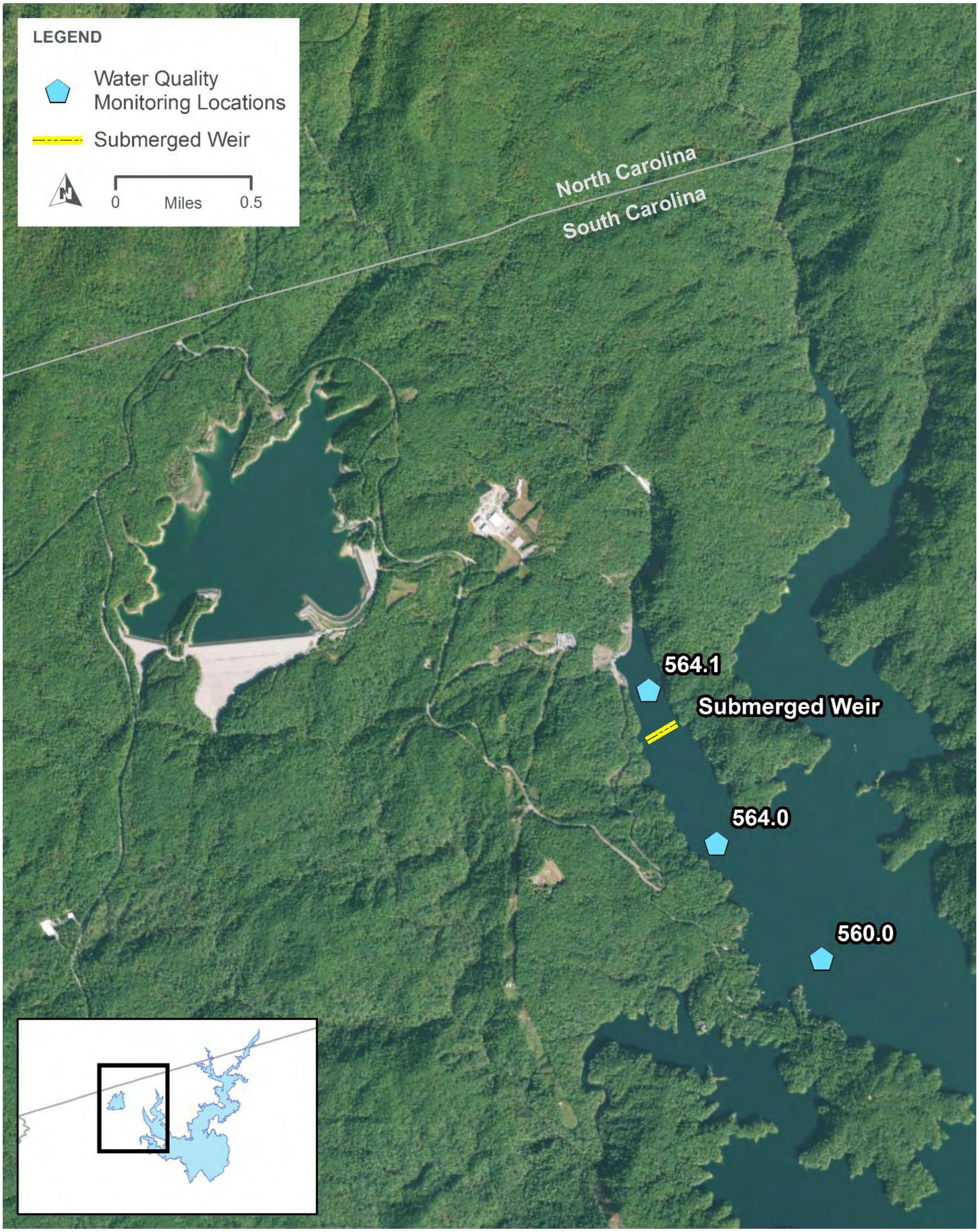

Figure 5-1. Water Quality Monitoring Stations in the Whitewater River Arm of Lake Jocassee

5.2 Water Quality Monitoring Stations

Twelve water quality monitoring stations have been routinely measured by Duke Energy over the last 40 years (Figure 3-1). Depth-averaged and surface data are included in Appendix B for each station. Periods of record for each monitoring station are provided in Table 5-1. Minimum reading elevations[5] (ft msl) at each monitoring station are also presented in Table 5-1. Normal maximum pond elevation is 1,110 ft msl and normal minimum pond elevation is 1,080 ft msl.

Table 5-1. Water Quality Monitoring Station Periods of Record

Monitoring station	Start Year	End Year	Minimum Reading Elevation (ft)
558.7	1987	2015	763
558.0	1975	2020	757
559.0	1987	2015	793
560.0*	1975	2015	826
562.0	1980	2015	965
565.4	1987	1994	918
551.0	1975	2011	1083
564.0*	1976	2015	865
564.1*	1987	2017	960
557.0	1975	2015	820
554.8	1986	2015	945
556.0	1975	2015	918

*Whitewater River arm

As stated previously, water quality at Stations 564.1, 564.0, and 560.0 in the Whitewater River arm were assessed separately over three periods since those locations are most impacted by Project construction and operation due to proximity. The data from these stations also provide information on the function of the submerged weir. Additionally, turbidity values are summarized at the three monitoring stations in the Whitewater River arm (discussed in Section 5.3.8).

5.3 Water Quality Summary Results

5.3.1 Temperature

Water temperature dictates the types of biota that can survive in a waterbody, affects metabolic rates and photosynthesis, influences the rates of chemical reactions, and impacts the physical

[5] Minimum reading elevations are at or near the reservoir bottom for each monitoring station.

capacity of water to hold DO. Water temperature is also important because of its influence on water chemistry; the rate of chemical reactions generally increases at higher temperatures (USGS 2018a). Thermal stratification in a lake is a seasonal phenomenon that occurs from late spring to late fall in temperate regions. In the summer, the uppermost layer of water is warmed by the sun and cooler water in the lower water column begins to separate from the top, resulting in a warmer layer of water at the top (i.e., epilimnion) and a heavier/denser layer of water at the bottom (i.e., hypolimnion). The thinner layer that separates the warmer upper waters from the cooler bottom waters is the metalimnion or thermocline, which acts as a barrier that prevents mixing and heat exchange between the epilimnion and hypolimnion. During winter, there is usually little temperature stratification as the entire lake cools. In Lake Jocassee, the depth of the thermocline varies between locations in the lake (based on depth and geomorphology) as well as between seasons.

Because temperatures at depth determine patterns of stratification (i.e., warmer water in the upper water column, cooler water at depth), depth-averaged temperatures were assessed during this desktop review as well as surface water temperatures. Over the entire reservoir at all depths, Lake Jocassee winter temperatures range between 0 and 17°C, with an average of 10°C. Thermal stratification is not prevalent in the winter months (December – February) and at some stations, February temperatures vary by less than one degree between surface and bottom waters. Spring temperatures range from 5 to 25°C with an average of 11°C. Stratification begins to form in the upper third of the water column as temperatures continue to warm towards late spring. Summer temperatures range from 7 to 30°C with an average of 15°C. Stratification continues to develop through summer and extends further down into the water column. Fall temperatures range from 7 to 28°C with an average of 15°C. Stratification peaks in early fall and begins to wane as temperatures cool. All data tables showing temperatures and patterns of stratification for each monitoring station are included in Appendix B.

Bad Creek operational impacts to temperature are limited to monitoring Station 564.1 in the Whitewater River cove, which is between the I/O structure and submerged weir (see Figure 5-1). Monthly average temperatures within the water column at this location are nearly uniform after 1991 (post Bad Creek operation) (Figure 5-2). Vertical mixing from Bad Creek operations eliminates any stratification at this monitoring station regardless of season. The pre construction depth-averaged temperature at Station 564.1 is 13.9℃, and the post construction average temperature at Station 564.1 (through 2017) is 17.2℃, a difference of 3.3℃.

Monitoring Station 564.0 (see Figure 5-3) is located downstream of the submerged weir and in contrast to Station 564.1, stratification is prevalent at this location after 1991. There is very little difference in temperature profiles between pre and post Bad Creek operations at Station 564.0. This is primarily due to the presence of the submerged weir, which limits mixing downstream of the weir structure (i.e., mixing is confined to the portion of the Whitewater River cove upstream of the submerged weir).

Tables of monthly averaged temperature profiles for pre and post Bad Creek operational conditions at each of the 12 monitoring locations are provided in Appendix B. Additionally, tables of data showing depth-averaged temperatures for pre construction, construction, and post construction in the Whitewater River arm indicating changing stratification trends are included in Appendix B.

Jocassee D_2_564.1: Monthly Average Water Temperatures (deg C) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.9	11.6	12.6	16.0	20.8	24.2	26.1	26.8	25.8	21.6	18.2	13.5
1095 to 1080	10.6	10.2	11.2	14.2	18.3	21.8	24.6	26.0	25.4	21.8	17.9	13.4
1080 to 1065	9.8	9.2	10.8	13.3	16.9	20.3	23.1	25.2	25.1	21.3	17.6	13.1
1065 to 1050	8.8	8.2	9.4	11.9	15.3	18.0	21.5	24.0	23.9	20.3	16.1	11.4
1050 to 1035	8.4	8.2	8.4	10.1	12.6	14.5	18.2	21.5	23.1	19.9	15.6	11.3
1035 to 1020	8.4	8.0	8.1	9.0	10.4	11.1	13.5	16.8	20.6	19.5	15.5	10.8
1020 to 1005	8.3	7.9	7.6	8.1	8.8	10.0	12.6	15.2	17.5	19.2	15.3	11.0
1005 to 990	8.3	8.0	7.5	7.8	8.3	8.9	9.9	12.2	14.8	16.9	15.3	11.1
990 to 975	8.3	8.2	7.5	7.9	8.6	8.9	9.5	11.3	13.7	14.7	14.7	11.0
975 to 960	8.2	7.6	6.7	7.2	8.6	8.9	9.6	11.0	13.2	13.0	13.1	9.9
960 to 945					8.6							
945 to 930												
930 to 915												
915 to 900												
900 to 885						*Minimum Reading 959.9 ft*						
885 to 870												
870 to 855												
< 855												

Jocassee D_2_564.1: Monthly Average Water Temperatures (deg C) 1991 to 2017 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	11.1	10.3	11.3	14.8	20.1	23.5	25.4	26.1	24.9	21.3	18.2	14.3
1095 to 1080	10.7	10.1	11.0	14.0	18.4	22.4	24.7	26.2	25.2	21.5	17.8	13.9
1080 to 1065	10.7	10.0	10.9	13.7	17.2	21.3	24.3	25.7	25.1	21.7	17.8	13.9
1065 to 1050	10.5	9.8	10.7	13.3	16.4	20.8	23.8	24.9	25.0	21.5	17.7	13.8
1050 to 1035	10.6	9.7	10.8	13.2	15.9	20.3	23.5	25.0	24.9	21.6	17.6	13.7
1035 to 1020	10.4	9.6	10.8	13.1	16.0	19.9	23.3	24.8	24.8	21.5	17.4	13.7
1020 to 1005	10.3	9.7	10.8	13.0	15.9	19.8	23.1	24.7	24.8	21.5	17.6	13.6
1005 to 990	10.4	9.5	10.4	12.7	15.2	19.0	22.4	24.3	24.5	21.3	17.3	13.6
990 to 975	10.0	9.5	10.5	12.3	15.4	19.0	22.2	24.0	24.3	20.9	17.0	13.4
975 to 960	10.2	9.4	9.9	12.1	14.5	17.8	21.5	22.4	23.7	20.0	16.8	13.2
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885						*Minimum Reading 963 ft*						
885 to 870												
870 to 855												
< 855												

Legend 8 – 25

Figure 5-2. Station 564.1 Pre Bad Creek Operation (top) Showing Temperature Stratification vs. Post Operation (bottom) Showing Mixing in the Water Column

Jocassee D_2_564.0: Monthly Average Water Temperatures (deg C) 1976 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.4	9.3	10.4	14.8	19.5	24.8	26.5	26.5	25.3	21.6	17.7	13.3
1095 to 1080	10.4	9.1	10.1	13.5	17.7	22.1	24.5	25.3	25.2	21.6	17.5	13.2
1080 to 1065	10.3	8.7	9.6	11.9	15.6	19.5	22.4	24.0	24.8	21.5	17.5	13.3
1065 to 1050	10.2	8.8	9.3	11.2	14.2	18.0	21.1	22.9	24.1	21.4	17.4	13.2
1050 to 1035	10.3	8.7	8.7	10.4	12.6	16.1	19.3	21.6	22.9	21.0	17.5	13.4
1035 to 1020	10.3	8.6	8.8	10.1	11.6	14.2	17.0	19.4	20.7	19.4	16.5	13.0
1020 to 1005	10.2	8.6	8.5	9.6	10.5	12.1	14.3	14.9	15.9	16.1	15.0	12.3
1005 to 990	10.2	8.4	8.4	9.3	10.2	10.9	10.9	11.1	11.9	12.1	13.0	11.4
990 to 975	10.2	8.5	8.6	9.0	9.5	10.1	10.6	9.9	9.9	9.5	10.1	10.6
975 to 960	10.0	8.7	9.3	9.2	9.8	9.4	9.8	9.8	9.9	9.9	9.4	9.8
960 to 945	9.7	9.1	9.2	9.3	9.6	9.9	10.0	10.0	10.0	9.6	9.8	9.8
945 to 930	9.4	9.1	9.2	9.2	9.4	9.8	10.0	9.7	9.9	9.3	9.6	9.6
930 to 915	9.3	9.0	9.1	9.2	9.3	9.6	9.7	9.7	9.8	9.5	9.5	9.4
915 to 900	9.1	8.9	9.0	9.1	9.2	9.5	9.7	9.6	9.6	9.4	9.4	9.2
900 to 885	9.1	8.8	8.9	9.0	9.1	9.4	9.6	9.6	9.5	9.3	9.2	9.3
885 to 870	9.1	8.8	8.9	8.8	9.1	9.1	9.5	9.6	9.6	9.2	9.3	9.1
870 to 855	9.4		8.6	8.5	9.0	9.2	9.7	9.2	9.9	9.4	9.8	8.9
< 855						Minimum Reading 864.7 ft						

Jocassee D_2_564.0: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	11.1	10.4	11.7	15.6	20.4	24.6	26.3	26.2	25.1	21.4	18.2	14.3
1095 to 1080	10.8	10.1	11.4	14.4	18.2	22.6	25.1	26.5	25.2	21.7	17.8	14.0
1080 to 1065	10.9	10.0	10.8	13.5	16.9	20.9	24.0	26.0	25.0	21.7	17.8	14.1
1065 to 1050	10.8	10.0	10.6	12.7	16.0	19.7	22.9	24.9	24.9	21.6	17.8	14.1
1050 to 1035	10.8	9.9	10.3	12.0	14.3	17.9	21.3	23.7	23.8	21.5	17.7	14.0
1035 to 1020	10.7	9.9	10.1	11.4	13.2	15.9	18.9	21.7	22.5	20.8	17.5	14.0
1020 to 1005	10.8	9.8	9.9	10.6	12.0	13.6	15.5	17.1	18.6	19.3	17.0	13.8
1005 to 990	10.8	9.7	9.7	10.2	10.6	11.5	12.4	12.7	13.3	13.6	14.6	13.1
990 to 975	10.5	9.7	9.7	10.0	10.1	10.5	10.5	10.6	10.6	10.8	11.1	11.7
975 to 960	10.2	9.6	9.5	9.7	9.7	9.9	9.9	10.0	10.0	10.0	10.0	10.3
960 to 945	9.9	9.5	9.4	9.6	9.5	9.7	9.7	9.7	9.7	9.8	9.8	9.7
945 to 930	9.6	9.4	9.3	9.5	9.3	9.5	9.5	9.6	9.5	9.6	9.6	9.6
930 to 915	9.4	9.3	9.3	9.4	9.2	9.4	9.4	9.5	9.5	9.5	9.5	9.4
915 to 900	9.4	9.2	9.2	9.3	9.0	9.3	9.3	9.4	9.4	9.5	9.4	9.4
900 to 885	9.3	9.1	9.0	9.1	9.2	9.2	9.1	9.3	9.3	9.3	9.4	9.2
885 to 870	9.1	8.9	9.1	9.0	9.2	9.4	9.2	9.4	9.5	9.2	9.5	9.3
870 to 855	9.2	8.2	9.5	8.9		10.0	9.1	9.3		9.0	10.3	
< 855						Minimum Reading 864.4 ft						

Legend 8 – 25

Figure 5-3. Station 564.0 Downstream of the Weir Showing Temperature Stratification for Pre and Post Operations

Surface water temperature minimum, average, and maximum values for all stations over the entire dataset are included in Table 5-2. Discrete water quality data assessed in Lake Jocassee consistently met South Carolina water quality standards for trout waters for temperature. There is no numeric threshold for temperature, however, for trout waters, narrative criteria indicate water temperatures should not vary from levels existing under natural conditions (unless determined some other temperature shall protect the classified uses), which is supported by study findings.

A comparison of pre vs. post operations for surface water at each station is provided in Table 5-3 and average surface water data are included in Appendix B. There is no clear trend in warming from pre to post operations in surface waters and temperature differences are mostly within one degree. It is important to note that surface waters are affected by ambient air temperature, therefore, any elevated temperatures under present-day conditions may be impacted by climate warming over the last three decades.[6] It is noteworthy that surface waters at Station 564.1 do not indicate the warmer temperatures noted at depth between pre and post operation periods (i.e., -0.8°C change at the surface but +3.3°C change at depth, indicative of the I/O structure at depth).

Table 5-2. Water Temperature in Surface Waters of Lake Jocassee

Lake Jocassee Surface Temperature (degrees C)			
Station	Minimum	Average	Maximum
558.7	8.20	18.59	29.02
558.0	7.10	18.44	28.22
559.0	8.10	18.81	28.90
560.0	7.10	18.87	28.47
562.0	8.10	19.23	29.20
565.4	8.50	18.84	28.50
551.0	0.20	13.48	27.24
564.0	7.40	19.15	28.61
564.1	8.50	18.99	28.40
557.0	7.10	18.81	29.23
554.8	7.70	19.24	29.15
556.0	7.30	19.04	29.12

[6] A climate assessment is beyond the scope of this desktop study, however, a summary of climate trends in the region will be assessed and reported in the license application.

Table 5-3. Average and Standard Deviation of Surface Temperatures, Pre vs. Post Operations

Monitoring Station	Temperature (°C)				Difference of Averages
	Pre operations		Post operations		
	Average	Standard Deviation	Average	Standard Deviation	
558.7	18.3	6.1	18.6	6.1	0.3
558.0	18.1	6.4	18.6	6.1	0.5
559.0	18.4	6.3	18.9	6.1	0.5
560.0	18.5	6.4	19.1	6.1	0.6
562.0	18.6	6.5	19.4	6.3	0.8
565.4	18.9	6.6	18.8	6.2	-0.1
551.0	13.3	6.0	14.7	7.2	1.4
564.0	19.0	6.6	19.2	6.0	0.2
564.1	19.7	6.2	18.9	5.8	-0.8
557.0	18.2	6.4	19.1	6.2	0.9
554.8	19.3	6.5	19.2	6.4	-0.1
556.0	18.7	6.5	19.2	6.3	0.5

5.3.2 Dissolved Oxygen

5.3.2.1 Dissolved Oxygen Concentration

Dissolved oxygen is a measure of how much oxygen is dissolved in the water and is the amount of oxygen available to living aquatic organisms. The concentration of DO in surface water is affected by temperature and has both a seasonal and a daily cycle. In winter and early spring, when water temperature is low, DO concentrations are typically higher as cold water can hold more DO than warm water. In summer and fall, when the water temperature is high, the DO concentration is often lower (USGS 2018b). Similar to temperature, DO typically shows patterns of stratification in large, deep reservoirs like Lake Jocassee. Just after summer stratification is established, the hypolimnion is rich in DO from the early spring mixing of the lake. However, because the metalimnion acts as a barrier between the epilimnion and hypolimnion, the hypolimnion is essentially cut off from oxygen exchange with the atmosphere and the deepest parts of the lake can become hypoxic (i.e., DO concentrations less than 2 mg/L) to anoxic (i.e., depleted of oxygen). Lake Jocassee is very deep in some places, and it is not unusual for DO to be depleted at depth. Because near-surface waters are used by most forms of aquatic life, DO concentrations measured at the water surface or in near-surface waters are used to assess the health of a waterbody (instead of DO at depth). Because depth-averaged values are not considered when determining the health of the waterbody (i.e., SCDHEC standards only apply to water at the surface as explained in Section 4.3), these data are provided for context, however, average surface water values are also provided below for each season and as minimum, maximum, and average for each station in Table 5-4. All data (depth and surface) are included in Appendix B.

The position of the thermocline varies from location to location and between seasons, as is typical for large, deep reservoirs, therefore, an overall trend of DO values are provided herein. Lake Jocassee winter DO concentrations (throughout the water column) are between 0 and 14 mg/L, with an average of 7 mg/L. In deeper portions of Lake Jocassee, winter DO stratification is characterized by a rapid decline in DO in the lower half of the water column, with the upper half generally at constant values. The average winter surface (i.e., measurement depth 0.3 meter) DO over the entire dataset is 9.4 mg/L. Winter stratification is less prevalent in shallower portions of the lake.

Spring DO concentrations range from 0 to 13 mg/L with an average of 8 mg/L. DO concentrations remain consistent throughout the spring months and some stratification is present in the deepest sections of the lake. Average spring surface DO (0.3 m) is 9.7 mg/L.

Summer DO concentrations range from 0 to 13 mg/L with an average of 7 mg/L. Stratification becomes more pronounced throughout the lake with the transition from spring into summer. This stratification is generally limited to the lower half of the lake in both deep and shallow areas. Average summer surface DO is 8.2 mg/L.

Fall DO concentrations range from 0 to 11 mg/L with an average of 6 mg/L. The most notable stratification pattern is seen in the fall where the bottom of the lake can reach anoxic levels. DO concentrations remain constant in the top third of the water column, however, significant stratification is observed in the lower water column. Average fall surface DO is 8.1 mg/L.

Tables of monthly averaged DO profiles for pre and post Bad Creek operational conditions at each of the 12 monitoring locations are provided in Appendix B. Additionally, tables of data showing depth-averaged DO values for pre construction, construction, and post construction in the Whitewater River arm to show changing stratification trends over time are included in Appendix B.

Similar to trends in temperature data, Bad Creek operational impacts to DO are limited to monitoring Station 564.1 between the I/O structure and submerged weir. Monthly average DO concentrations within the water column at this location are nearly uniform after 1991 (post Bad Creek operation) (Figure 5-4). Vertical mixing from Bad Creek operations does not allow for stratification at this monitoring location regardless of season.

DO stratification does occur at monitoring Station 564.0 (downstream of the weir), and there is very little difference in DO profiles between pre and post Bad Creek operation indicating the submerged weir is functioning as intended (Figure 5-5).

In general, DO concentrations in Lake Jocassee are a function of the extent of the previous winter mixing – colder winter temperatures result in deeper mixing within the reservoir, which results in higher DO concentrations the following year (USACE 2014). Multiple droughts over the reservoir's history have resulted in maximum drawdowns up to 29 ft (USACE 2014); however, the overall thermal structure of the reservoir helped to maintain DO concentrations throughout the water column and were not impacted by the drawdown events (i.e., reduced water elevation), indicating even under extreme drought conditions, DO remains above state threshold levels throughout Lake Jocassee (i.e., 6.0 mg/L) (USACE 2014).

Jocassee D_2_564.1: Monthly Averaged Dissolved Oxygen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.0	10.6	9.8	10.2	9.3	8.7	8.6	5.4	7.9	8.2	8.3	9.2
1095 to 1080	9.8	9.5	10.0	10.2	9.5	8.9	8.7	6.3	7.7	8.0	8.5	9.2
1080 to 1065	10.0	9.7	10.0	10.1	9.5	9.0	8.6	5.9	7.6	8.1	8.6	9.2
1065 to 1050	10.6	10.6	10.2	10.3	9.4	8.5	8.2	5.5	7.5	8.0	8.7	9.7
1050 to 1035	10.7	10.4	10.1	10.3	9.2	7.7	6.8	4.7	7.0	7.8	8.6	9.8
1035 to 1020	10.7	10.2	10.0	9.8	8.7	6.2	5.3	2.7	4.6	7.7	8.5	9.9
1020 to 1005	10.6	10.4	9.8	9.1	7.7	5.1	3.8	2.2	1.0	6.2	8.4	9.8
1005 to 990	10.6	10.2	9.3	8.0	5.8	2.9	1.5	0.9	0.1	1.7	8.1	9.7
990 to 975	10.6	10.0	9.0	7.3	4.1	2.1	0.3	0.3	0.0	0.0	5.4	9.7
975 to 960	10.5	9.9	9.5	8.7	2.8	1.5	0.0	0.4	0.0	0.0	1.9	10.1
960 to 945					2.7							
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870						Minimum Reading 959.9 ft						
870 to 855												
< 855												

Jocassee D_2_564.1: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2017 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.2	9.5	9.7	9.7	8.9	8.3	8.2	7.8	7.3	7.5	8.1	8.8
1095 to 1080	9.0	9.4	9.7	9.7	9.0	8.4	8.1	7.6	7.2	7.5	8.1	8.6
1080 to 1065	9.1	9.3	9.6	9.6	9.0	8.5	8.2	7.6	7.2	7.5	8.1	8.6
1065 to 1050	9.1	9.4	9.6	9.6	9.0	8.5	8.3	7.6	7.1	7.5	8.1	8.7
1050 to 1035	9.1	9.4	9.6	9.5	9.0	8.6	8.2	7.5	7.1	7.4	8.1	8.6
1035 to 1020	9.2	9.4	9.6	9.5	9.0	8.6	8.1	7.6	7.1	7.4	8.1	8.7
1020 to 1005	9.1	9.3	9.6	9.4	8.9	8.6	8.1	7.6	7.1	7.4	8.0	8.7
1005 to 990	9.2	9.4	9.6	9.4	8.9	8.6	8.4	7.6	7.1	7.4	8.1	8.7
990 to 975	9.1	9.5	9.6	9.4	8.7	8.6	8.1	7.6	6.9	7.4	8.2	8.7
975 to 960	9.3	9.4	9.8	9.5	8.8	8.3	8.4	7.1	6.8	7.5	8.2	8.9
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870						Minimum Reading 963 ft						
870 to 855												
< 855												
Legend	0.0										10.0	

Figure 5-4. Station 564.1 Pre Bad Creek Operation (top) Showing DO Stratification vs. Post Operation (bottom) Showing Mixing in the Water Column

Jocassee D_2_564.0: Monthly Averaged Dissolved Oxygen (mg/l) 1976 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.7	10.0	10.4	10.5	9.9	8.7	8.6	7.8	8.4	8.3	8.6	9.0
1095 to 1080	9.6	9.6	10.1	10.6	10.1	9.3	9.0	8.1	8.3	8.2	8.6	9.0
1080 to 1065	9.5	9.5	10.0	10.5	10.3	9.8	9.2	7.6	8.3	8.1	8.6	9.0
1065 to 1050	9.5	9.4	9.9	10.3	10.0	9.4	9.0	7.4	7.8	8.1	8.5	9.0
1050 to 1035	9.4	9.3	9.9	10.2	9.4	9.0	8.6	7.1	7.1	8.0	8.7	9.0
1035 to 1020	9.5	9.1	9.6	10.0	8.9	8.5	7.6	6.1	6.2	7.4	8.2	9.1
1020 to 1005	9.5	9.2	9.5	9.6	8.2	7.6	6.7	4.6	4.0	4.8	7.1	8.9
1005 to 990	9.5	9.3	9.4	9.2	7.9	7.3	6.1	3.1	3.3	2.6	4.8	7.5
990 to 975	9.5	9.4	9.2	8.9	7.7	7.3	6.8	3.1	3.5	2.3	2.7	5.6
975 to 960	9.6	9.3	8.6	8.6	7.9	6.6	6.0	3.8	4.1	3.9	3.0	4.3
960 to 945	8.8	9.2	8.7	8.3	7.8	7.0	6.3	4.1	4.9	3.7	3.5	3.4
945 to 930	6.7	9.4	8.5	8.0	7.2	6.2	5.7	3.7	4.2	3.0	2.4	2.2
930 to 915	5.5	8.0	8.3	7.0	6.4	4.9	4.6	2.9	2.9	2.1	1.8	1.5
915 to 900	4.7	5.7	7.4	6.6	5.6	3.8	3.3	2.1	2.1	1.6	1.5	1.1
900 to 885	4.0	4.9	7.4	5.9	5.2	3.2	2.5	1.2	1.5	0.9	1.1	0.6
885 to 870	3.3	4.3	6.1	4.0	3.8	3.1	2.3	0.8	0.7	0.4	0.6	0.7
870 to 855	0.0		7.9	7.2	4.6	1.5	1.7	2.2	0.0	0.0	0.0	0.7
< 855						Minimum Reading 864.7 ft						

Jocassee D_2_564.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.1	9.3	9.9	9.8	9.0	8.2	8.2	7.9	7.7	7.6	8.1	8.8
1095 to 1080	8.9	9.2	9.8	9.8	9.1	8.5	8.1	7.7	7.4	7.6	8.2	8.6
1080 to 1065	8.9	9.1	9.7	9.6	9.1	8.7	8.2	7.6	7.3	7.6	8.2	8.6
1065 to 1050	8.9	9.0	9.6	9.5	9.1	8.7	8.2	7.6	7.1	7.5	8.1	8.6
1050 to 1035	8.8	9.0	9.5	9.4	9.0	8.6	8.1	7.3	6.9	7.5	8.1	8.6
1035 to 1020	8.8	8.9	9.3	9.3	9.0	8.5	7.8	7.0	6.4	7.3	8.0	8.6
1020 to 1005	8.8	8.8	9.1	9.1	8.9	8.4	7.8	6.9	5.9	6.4	7.6	8.4
1005 to 990	8.8	8.8	8.9	8.8	8.6	8.1	7.6	6.7	5.8	5.3	6.1	7.6
990 to 975	8.3	8.7	8.7	8.4	8.1	7.6	6.8	6.1	5.4	5.0	4.6	5.5
975 to 960	6.8	8.2	8.3	7.9	7.5	6.7	6.0	5.4	4.7	4.1	3.8	3.7
960 to 945	5.7	7.6	7.8	7.3	6.8	5.8	5.3	4.9	4.1	3.3	3.0	2.9
945 to 930	3.6	6.8	7.2	6.5	6.3	5.1	4.8	4.2	3.6	2.7	2.3	2.1
930 to 915	2.7	6.0	6.4	5.3	5.6	4.5	4.0	3.5	2.8	2.3	1.9	1.8
915 to 900	2.1	5.7	5.3	5.0	5.4	4.0	3.9	3.1	2.7	1.9	1.6	1.7
900 to 885	1.7	5.3	4.8	4.1	3.7	2.8	3.4	2.6	2.1	1.5	1.2	1.9
885 to 870	2.3	3.9	3.3	4.4	2.9	2.7	3.0	2.2	2.0	2.2	1.0	1.4
870 to 855	0.1	4.3	3.1	5.2		0.0	0.4	2.8		2.3	0.0	
< 855						Minimum Reading 864.4 ft						
Legend	0.0										10.0	

Figure 5-5. Station 564.0 Downstream of the Weir Showing Stratification for Pre and Post Operations

The state standard for DO in trout waters is > 6.0 mg/L (instantaneous minimum). Before 1991 there were two instances of surface DO less than 6.0 mg/L: 4.6 mg/L at monitoring Station 558.0 in 1973 and 5.4 mg/L at monitoring Station 556.0 in 1976, which correspond to the first few years after the reservoir was filled in 1973. There were no instances of surface DO values less than 6.0 mg/L after 1991. Average surface water data are included in Appendix B.

Over the entire dataset, there were 4,241 surface measurements assessed; a total of five measurements were below the state standard, which accounts for 0.12 percent of the dataset (Table 5-4). Therefore, surface water DO concentrations in Lake Jocassee fully support the designated use classification (i.e., less than 10 percent criterion excursions).

Table 5-4. Dissolved Oxygen in Surface Waters of Lake Jocassee

Lake Jocassee Surface DO (mg/L)			
Station	Minimum	Average	Maximum
558.7	6.8	8.7	11.2
558.0	4.6	8.7	11.2
559.0	6.9	8.7	11.1
560.0	6.1	8.7	11.8
562.0	6.9	8.8	11.3
565.4	7.4	8.8	11.2
551.0	7.2	9.9	14.4
564.0	6.6	8.8	12.2
564.1	6.6	8.6	11.1
557.0	6.7	8.9	11.6
554.8	6.7	8.9	11.2
556.0	5.4	9.0	11.6

5.3.2.2 Dissolved Oxygen Saturation

Dissolved oxygen saturation is reported in units of percent and represents the percent of oxygen that has dissolved into water (a value typical of a given temperature). Percent saturation is indicative of the percentage of oxygen dissolved in water at a given temperature and gas pressure. Equilibrium is indicated by 100 percent saturation with higher temperatures decreasing oxygen solubility)[7]. Supersaturation, or saturation greater than 100 percent, may be observed in a reservoir as a result of the photosynthetic process by phytoplankton and other aquatic plants

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[7] https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/3110en.pdf

that may be present. Conversely, saturation less than 100 percent in a reservoir can be a function of microbial respiration from decomposition of organic matter.

Lake Jocassee winter DO saturation ranges from 100 percent at the surface to 0 percent at the bottom of the water column. The average winter surface (measured at 0.3 m) DO saturation is 87.2 percent. DO saturation remains constant in the upper top half of the lake and decreases from about 80 percent saturation to near anoxic levels at the reservoir bottom.

The average lake-wide spring surface DO saturation is 98.6 percent. Spring has the highest average DO saturation; spring DO saturation decreases relatively uniformly with depth, with the deepest sections of the lake generally dropping from 100 percent at the surface to 50 percent saturation at the lake bottom.

The average lake-wide summer surface DO saturation is 101.3 percent. Similar to spring values, DO saturation decreases uniformly with depth, but more sharply, generally decreasing from 100 percent at the surface to 35 percent at the lake bottom.

The average lake-wide fall surface DO saturation is 91.5 percent. As expected, fall continues the trend of decreased saturation in the lower portions of the water column, becoming anoxic near the lake bottom.

Dissolved oxygen saturation depth profile tables are provided in Appendix B (DO saturation sampling began in 1998, i.e., post Bad Creek operations) at each of the 12 monitoring stations. Additionally, depth-averaged DO percentages for pre construction, construction, and post construction in the Whitewater River arm are included in Appendix B. While no data exist prior to operations, stratification between the stations in Whitewater River cove is apparent.

Dissolved oxygen percentage in surface samples are shown in Table 5-5. There is no state standard for DO saturation, however, since Lake Jocassee supports a diverse, healthy fish community, it is assumed percentage of DO saturation is suitable for aquatic resources.

Table 5-5. DO Saturation in Surface Waters of Lake Jocassee

DO Saturation (%)			
Station	**Minimum**	**Average**	**Maximum**
558.7	65.80	93.98	108.50
558.0	68.20	93.63	106.00
559.0	62.70	94.30	109.80
560.0	53.30	93.75	107.70
562.0	66.50	96.59	112.70
565.4	--	--	----
551.0	85.80	95.51	100.80
564.0	58.30	93.84	107.20
564.1	63.00	92.27	108.20
557.0	67.80	95.99	109.60
554.8	74.80	97.26	111.90
556.0	74.00	97.04	110.80

Note: (--) indicates no DO saturation data were collected at Station 565.4

5.3.3 pH

The pH level of a waterbody is a measure of hydrogen ion concentration and is ranked on a scale of 1 (acidic) to 14 (basic). This water quality parameter affects many chemical and biological processes in the water and different organisms have different ranges of pH within which they flourish (USGS 2019). The relationship between phytoplankton and daily pH cycles is well established. Photosynthesis by phytoplankton consumes carbon dioxide during the day, which results in a rise in pH. In the dark, phytoplankton respiration releases carbon dioxide. In productive lakes, carbon dioxide decreases to very low levels, causing the pH to rise (SCDHEC n.d.). Note that the pH of a given waterbody is predominantly determined by the soil and rock type in the area. Surface waters in mountain streams in the vicinity of Lake Jocassee are typically poorly buffered and tend to have low pH values (Abernathy et al. 1994).

Typical Lake Jocassee pH values range between 5 and 10 (averaged throughout the water column) with an average of 6.2, which is considered neutral and indicative of a system with low production (i.e., little potential for algal growth). There is very little difference in pH between seasons and while there is some variation in the water column, there is very little to no pH stratification. Similar to temperature and DO trends, pH concentrations at monitoring station 564.1 are well mixed as a result of Bad Creek operations. Just downstream of the submerged weir at monitoring Station 564.0, there is some pH variation in the water column post 1991 as the submerged weir limits vertical mixing at this location. pH profiles at this monitoring location are similar pre and post Bad Creek operations. Tables of monthly averaged pH depth profiles for pre and post Bad Creek operational conditions at each of the 12 monitoring locations are provided in Appendix B.

Surface pH values for all stations are included in Table 5-6 and average surface water data are included in Appendix B. Instantaneous pH surface readings were compared against the pH state standard for trout waters (6.0-8.0 Standard Units). Over the entire dataset, there were 4,253 samples assessed; a total of 2 samples were above the state standard (i.e., less than 1 percent of the dataset) and 255 samples were below the state standard (i.e., 6 percent of the dataset). Therefore, surface water pH levels in Lake Jocassee fully support the designated use classification (i.e., within 10 percent criterion excursions).

Table 5-6. pH in Surface Waters of Lake Jocassee

Surface Phosphorous (Standard Units)			
Station	**Minimum**	**Average**	**Maximum**
558.7	5.50	6.67	7.60
558.0	5.20	6.56	8.00
559.0	5.30	6.67	7.71
560.0	5.60	6.69	7.80
562.0	5.60	6.76	7.90
565.4	5.60	6.50	8.10
551.0	5.50	6.53	7.90
564.0	5.60	6.78	7.90
564.1	5.60	6.73	7.90
557.0	5.50	6.73	7.80
554.8	5.60	6.84	8.10
556.0	5.63	6.80	7.90

5.3.4 Phosphorus

Phosphorus is a common constituent of agricultural fertilizers, manure, and organic wastes in sewage and industrial effluent; too much phosphorus in a waterbody can speed up eutrophication (a reduction in dissolved oxygen in water bodies caused by an increase of mineral and organic nutrients) (USGS 2018c). Because Lake Jocassee is not in a predominantly agricultural or industrial setting, phosphorus values are typically low.

Lake Jocassee phosphorus concentrations at depth range from 0.002 to 0.68 mg/L with an average of 0.01 mg/L. Tables of monthly averaged depth profiles for pre and post Bad Creek operational conditions at each of the 12 monitoring locations are provided in Appendix B. As with other water quality parameters, mixing due to Bad Creek operations creates relatively constant profiles of phosphorus in the water column at monitoring station 564.1.

Table 5-7 below shows a summary of phosphorus for the surface waters of Lake Jocassee over the entire dataset and surface water data tables are included in Appendix B. The state standard for total phosphorous in lakes and reservoirs in the Blue Ridge region of South Carolina shall not exceed 0.02 mg/L.

Over the entire dataset, there were 2,228 surface samples assessed; a total of 228 samples were above the state standard, which accounts for 9.8 percent of the dataset (Table 5-7). Therefore, surface water phosphorus concentrations in Lake Jocassee fully support the designated use classification (i.e., less than 10 percent criterion excursions).

Table 5-7. Phosphorus in Surface Waters of Lake Jocassee

Surface Phosphorous (mg/L)			
Station	**Minimum**	**Average**	**Maximum**
558.7	0.002	0.007	0.100
558.0	0.002	0.011	0.650
559.0	0.002	0.008	0.056
560.0	0.002	0.009	0.081
562.0	0.002	0.009	0.037
565.4	0.002	0.012	0.082
551.0	0.005	0.015	0.100
564.0	0.002	0.009	0.057
564.1	0.002	0.011	0.165
557.0	0.002	0.010	0.087
554.8	0.002	0.010	0.057
556.0	0.002	0.009	0.061

5.3.5 Nitrogen

Similar to phosphorus, too much nitrogen (in the forms of nitrate, nitrite, or ammonium) can cause a number of adverse effects. Excess nitrogen can cause overstimulation of growth and aquatic plant and algae. Total Kjeldahl Nitrogen (TKN) is a measure of organic nitrogen (i.e., naturally occurring) and ammonia in a water sample and provides a way to quantify the amount of nitrogen contained in organic form (USGS 2018e). Nitrate (NO_3) is the product of aerobic transformation of ammonia and is the most common form of nitrogen used by aquatic plants while nitrite (NO_2) is usually not present in significant amounts (SCDHEC n.d.). Total nitrogen is the sum of TKN and NO_2+ NO_3.

The dataset for total nitrogen is limited in Lake Jocassee relative to other water quality parameters. Of the nearly 2,000 measurements recorded for NO_2 and NO_3, there are only 545 readings where TKN was measured, therefore, the dataset for total nitrogen includes 545 datapoints. Tables of monthly averaged total nitrogen depth profiles for pre and post Bad Creek operational conditions at each of the 12 monitoring locations are provided in Appendix B.

Table 5-8 below shows a summary of total nitrogen for the surface waters of Lake Jocassee over the entire dataset and surface water data tables are included in Appendix B. The state standard for total nitrogen for lakes and reservoirs in the Blue Ridge region of South Carolina shall not exceed 0.35 mg/L. Over the entire dataset, there were 545 surface samples assessed; a total of 33 samples were above the state standard, which accounts for 6.1 percent of the dataset[8] (Table 5-8). Therefore, surface water total nitrogen concentrations in Lake Jocassee fully support the designated use classification (i.e., less than 10 percent criterion excursions).

Table 5-8. Total Nitrogen in Surface Waters of Lake Jocassee

Lake Jocassee Surface Total Nitrogen (mg/L)			
Station	Minimum	Average	Maximum
558.7	0.11	0.23	0.56
558	0.11	0.23	0.59
559	0.14	0.26	0.78
560	0.11	0.23	0.55
562	0.13	0.24	0.56
565.4	0.13	0.21	0.47
551	0.12	0.16	0.20
564	0.11	0.22	0.51
564.1	0.18	0.22	0.34
557	0.11	0.21	0.54
554.8	0.12	0.21	0.48
556	0.11	0.22	0.53

[8] Note that of the 33 total nitrogen excursions, only one excursion was caused by elevated inorganic nitrogen; the remaining excursions were due to elevated organic nitrogen (i.e., TKN), which is naturally occurring.

5.3.6 Chlorophyll a

Chlorophyll allows plants (including phytoplankton [algae]) to photosynthesize, i.e., use sunlight to convert simple molecules into organic compounds. Chlorophyll a is the predominant type of chlorophyll found in green plants and is a surrogate for the amount of algae growing in a waterbody; it can be used to classify the trophic condition of a waterbody (USEPA 2022b). One of the symptoms of degraded water quality condition is the increase of algae biomass as measured by the concentration of chlorophyll a. Typically, increased chlorophyll a is a result of external nutrient inputs from surface runoff from agricultural areas with fertilizers, septic systems, sewage treatment plants, and urban runoff (USEPA 2022a). However, the Lake Jocassee watershed is largely undisturbed (i.e., forested), therefore, does not have these input sources. Rather, chlorophyll a concentrations in Lake Jocassee stem from internal loading of phosphorus from inside the lake. As stratification develops during the summer months, cooler oxygenated water settles to the bottom of the reservoir. The oxygen is consumed over the summer and fall months due to the decomposition of organic matter and uptake from fish. When this happens, it triggers the release of phosphorous from the organic matter and sediments at the bottom of the reservoir. Because Lake Jocassee is oligotrophic (i.e., high dissolved oxygen, lower amounts of organic matter, and low levels of phosphorus), phosphorus input from internal loading does not significantly increase the total phosphorus levels (or chlorophyll a concentrations) in Lake Jocassee. Tables of monthly averaged chlorophyll a depth profiles for pre and post Bad Creek operational conditions at each of the 12 monitoring locations are provided in Appendix B.

Table 5-9 below shows a summary of cholorphyll a for the surface waters of Lake Jocassee over the entire dataset and surface water data tables are included in Appendix B. The state standard for chlorophyll a for lakes and reservoirs in the Blue Ridge region of South Carolina Shall not exceed 10 µg/L. Over the entire dataset, there were 1,753 surface samples assessed; all samples were below the state standard, which accounts for 100 percent of the dataset (Table 5-9). Therefore, surface water chlorophyll a concentrations in Lake Jocassee fully support the designated use classification (i.e., less than 10 percent criterion excursions).

Table 5-9. Chlorophyll a in Surface Waters of Lake Jocassee

Lake Jocassee Surface Chlorophyll (ug/L)			
Station	Minimum	Average	Maximum
558.7	0.46	2.06	5.67
558.0	0.50	2.05	5.44
559.0	0.49	1.92	4.46
560.0	0.28	2.07	5.61
562.0	0.63	2.76	7.53
565.4	0.55	2.38	6.64
551.0	0.25	1.01	1.86
564.0	0.53	2.13	6.54
564.1	0.65	2.06	4.63
557.0	0.36	2.00	5.17
554.8	0.65	2.86	6.61
556.0	0.04	2.46	7.46

5.3.7 Conductivity

Conductivity is a measure of the ability of water to pass an electrical current; because dissolved salts and other inorganic chemicals conduct electrical current, conductivity increases as salinity increases, therefore it is an indirect measure of the saltiness of the water (USEPA 2022b). Conductivity is also directly related to rainfall runoff events as tributary inflows to Lake Jocassee carry these dissolved salts and inorganic chemicals from the watershed into the reservoir. Since rainfall is consistent through the year in the region, conductivity values in Lake Jocassee do not vary seasonally but do increase during periods of higher rainfall runoff. For example, during drier periods, conductivity in Lake Jocassee is very low ranging from 2.0 to 5.0 µS/cm. During wetter periods, conductivity ranges from 85.5 to 275 µS/cm. The overall annual average conductivity in the reservoir was approximately 18.1 µS/cm.

Similar to the other water quality parameters, conductivity values at monitoring station 564.1 on the upstream side of the submerged weir are well mixed due to Bad Creek operations. Downstream of the submerged weir at monitoring station 564.0, there is some variability in conductivity throughout the water column but the conductivity profiles at this location are similar pre and post Bad Creek operations indicating limited vertical mixing due to the submerged weir.

Tables of monthly averaged conductivity profiles for pre and post Bad Creek operational conditions at each of the 12 monitoring locations are provided in Appendix B[9].

Table 5-10 below shows a summary of conductivity for the surface waters of Lake Jocassee over the entire dataset and surface water data tables are included in Appendix B. While there is no state standard for specific conductivity, concentrations less than 500 µS/cm are generally considered to be suitable for aquatic species in southern Appalachian waters (USEPA 2020). The maximum surface conductivity measured was 34 µS/cm and the minimum was 2.0 µS/cm (Table 5-10); since Lake Jocassee supports a diverse, healthy fish community, it is assumed this range of conductivity is suitable for aquatic resources.

Table 5-10. Conductivity in Surface Waters of Lake Jocassee

Lake Jocassee Conductivity (uS/cm)			
Station	Minimum	Average	Maximum
558.7	9.10	18.33	24.00
558.0	4.70	18.16	32.00
559.0	9.00	18.23	24.00
560.0	8.00	17.58	34.00
562.0	9.10	18.29	34.00
565.4	12.00	18.05	24.00
551.0	2.00	10.65	34.00
564.0	8.00	17.90	34.00
564.1	9.00	18.41	26.00
557.0	9.00	17.80	34.00
554.8	8.50	17.85	24.00
556.0	8.50	17.38	24.00

5.3.8 Turbidity

Turbidity is a measure of the amount of suspended particles in water (quantified by the amount of light scattered) and is typically measured in Nephelometric Turbidity Units (NTU). While turbidity is not an inherent property of water like temperature and DO, it is recognized as an indicator of environmental health of a waterbody (USGS 2018d). Turbidity levels in a waterbody are typically episodic in nature and are not spatially or temporally consistent. Generally, turbidity

[9] Erroneously high conductivity readings at or near the lakebed were removed from the dataset as the conductivity measuring device likely impacted the lakebed, stirring up sediment leading to false readings.

values in a river or lake increase proportionally with increased suspended sediment in the water column. Under natural conditions, suspended sediment load contribution to a receiving waterbody increases during a rainstorm/runoff event where sediment is eroded from upland areas or stream banks and flows into surface waters. Another major contributor to upland soil/sediment erosion is construction activities; these activities are often short-lived but can result in large amounts of soil released from the land that is subsequently transported to adjacent waterbodies. Depending on the magnitude of the rain event, amount and grainsize of sediment, proximity to the point of entry, and character of a waterbody, sediment can settle out quickly after the event or may remain suspended in the water column for some time after the event, resulting in prolonged elevated turbidity, which can be detrimental to aquatic habitat. Because turbidity is simply the amount of light that can pass through water, turbidity values can increase due to any solid particles in the water, including organic material and microscopic organisms.

During original Project construction, waters of the Whitewater River cove were directly impacted by construction activities. Historical turbidity data in the Whitewater River cove at three monitoring stations (see Figure 5-1) were evaluated to determine if original construction activities resulted in a noticeable increase in turbidity values and if so, estimate how far downstream impacts extended and for how long turbidity was elevated; this was done by comparing turbidity values from (1) pre construction (<1985), construction (1985-1991)[10], and post construction (1992-2015) (see Table 5-11).

In general, turbidity data were collected once per month, however, there are notable gaps in datasets (several months or years at a time) depending on the station. Measurements were taken at varying depths along the vertical profile (i.e., varied between collection events). Data gaps and vertical depth measurement locations are shown on the turbidity data plots provided in Appendix C. Note that turbidity does not show spatial trends or patterns of stratification such as temperature and DO; turbidity measurements represent a snapshot in time and are typically driven by external factors, therefore, data points do not need to be contiguous in space or time for confidence in interpretation. Where it was obvious that a dataset had a falsely elevated

[10] Duke Energy is considering expanding the existing submerged weir with newly excavated rockfill from the proposed Bad Creek II Complex in part to help mitigate the impacts of a second I/O structure in Whitewater River cove. Assessing pre construction turbidity data and estimating impacts to turbidity during original construction may help inform water quality conditions during proposed construction of the Bad Creek II Complex.

bottom reading (due to resuspension of bed sediment) or an erroneously high measurement in the water column when compared with data above and below it, values were removed from the dataset. Of 6,682 data points, 28 data values were removed, representing less than 1.0 percent of the dataset.

Table 5-11. Monitoring Stations and Years of Data

Station	Pre construction	During construction	Post construction
564.1	N/A	Jan 1988 – Dec 1991	Jan 1992– Jan 2015
564.0	Aug 1976 – Oct 1985	Feb 1986 – Dec 1991	Jan 1992 – Jan 2015
560.0	Sept 1973 – Oct 1985	Feb 1986 – Dec 1991	Jan 1992 – Jan 2015

5.3.8.1 Results

Turbidity results are summarized by monitoring station in the sections below. To evaluate turbidity impacts at depth, this parameter was evaluated throughout the water column. Three sets of turbidity figures are provided in Appendix C for each of the three monitoring stations and include;

- Turbidity values vs. lake elevation and year for pre construction, construction, and post construction periods (three separate figures);
- Turbidity values vs. lake elevation and year for the full dataset;
- Depth-averaged turbidity values compared to the 10 NTU state standard.

5.3.8.1.1 Station 564.1

As mentioned previously, Station 564.1 is located just downstream of the Project I/O structure and immediately upstream of the submerged weir. This station receives direct inflow from the Whitewater River and is approximately 45 meters (148 ft) deep. Details of data from Station 564.1 are provided in Table 5-12. Turbidity was not measured at Station 564.1 until January 1988, therefore, there is no pre construction dataset. During the construction period, when elevated turbidity values were observed, they were elevated consistently in the water column on the same days (i.e., rather than randomly in the water column or across many different days); this likely indicates episodic events contributing increased sediment to the area (e.g., construction activities). In general, turbidity values were elevated lower in the water column vs. near the surface on all days where elevated turbidity values were observed. The depth-averaged turbidity reading at this station during the construction period was 18.5 NTU with a standard deviation [stdev] of 51 NTU, indicating significant variance in the dataset. The dataset from Station 564.1 contains the highest turbidity values from any period or monitoring station. There were three notable instances where turbidity was elevated for several readings in a row:

- January – September 1988 (average 65 NTU); the first two readings at this station (January and February 1988) had the highest values at 476 NTU (Jan) and 202 NTU (February). Consistently elevated readings over a nine-month period are likely the results of construction activities. These values continued to decrease each month from March through September.
- July – December 1990 – Nine consecutive readings with an average of 26 NTU over the nine readings.
- April – August 1989 (average 25 NTU).

Additionally, there was one measurement on February 21, 1990, with elevated turbidity; however, because elevated turbidity values were not noted in the measurements before or after this day, this was likely due to a rain event or very short-lived construction event.

Under post construction conditions, turbidity values at all depths averaged 0.8 NTU (stdev 2.0). The maximum turbidity level measured during this time was 28 NTU.

- There were seven measurements that exceeded the state standard of 10 NTU over the post construction dataset. Six of those seven measurements occurred on the same day - August 17, 1994. This event was correlated with Tropical Storm Beryl, which made landfall in the southeastern U.S. on August 16th. The state of South Carolina suffered more damage than any other state[11].

Overall, turbidity was consistently lower when compared to values from the construction period (see Table 5-12).

Table 5-12. Monitoring Station 564.1 Data Collection Details

Period	Max Depth (m)	Average NTU	Stdev NTU	Max NTU	Count
Pre construction	N/A	N/A	N/A	N/A	N/A
Construction	45	18.5	51.0	476	480
Post construction	44	0.8	2.0	28	890

[11] https://en.wikipedia.org/wiki/Tropical_Storm_Beryl_(1994)

5.3.8.1.2 Station 564.0

Pre construction values were measured on average once per month, however, there are several periods without recorded data; the depth-averaged turbidity at Station 564.0 over the dataset was 6.6 NTU (stdev 10) and the maximum was 71 NTU (July 26, 1983). Details of data from Station 564.1 are provided in Table 5-13. Note that Project construction had not yet begun, therefore, these episodes of higher turbidity in the water column were likely due to rainfall events resulting in high inflows from Whitewater River. Elevated values were episodic and specific to the day the measurement was taken (i.e., high NTU values did not carry over to the following measurement). Higher turbidity values were associated with the same six days, listed below (all maximum values were recorded near the bottom of the lake[12]).

- 8/10/1976 (max 50 NTU)
- 3/15/1977 (max 48 NTU)
- 5/16/1978 (max 60 NTU)
- 9/12/1978 (max 38 NTU)
- 7/26/1983 (max 71 NTU)
- 8/27/1985 (max 40 NTU)

During the construction period, the average turbidity was lower than during the pre construction period with an average of 2.9 NTU (stdev 5.2) and a maximum measurement of 57 NTU. All higher NTU readings (within the water column) were associated with the same days and it is noteworthy that all elevated NTU values were at the bottom depth. The elevated turbidity values noted for Station 564.1 (extended periods of time in 1988 and 1990) were not observed at Station 564.0, indicating that elevated turbidity did not extend downstream into Whitewater River cove.

Post construction values at Station 564.0 were lower than pre construction and construction periods (see Table 5-13) with an average of 0.7 NTU (stdev 1.0) and a maximum reading of 14.0 NTU on February 20, 2012. (Note that this elevated turbidity value was from a surface measurement and decreased to <1.0 NTU just below the surface measurement).

[12] Continued decomposition of organic material early in the life of Lake Jocassee also likely contributed to elevated turbidity values

Table 5-13. Monitoring Station 564.0 Data Collection Details

Period	Max Depth (m)	Average NTU	Stdev NTU	Max NTU	Count
Pre construction	40	6.6	10	71	382
Construction	74	2.9	5.2	57	545
Post construction	74	0.5	1.2	14	1353

5.3.8.1.3 Station 560.0

During the pre construction period, the depth-averaged turbidity was 3.0 NTU (stdev 2.9) and the maximum turbidity value was 19 NTU. Note that half of the elevated turbidity values (i.e., those exceeding 10 NTU) were from a single day on September 12, 1978 (average 13.25 NTU) and includes the maximum reading. During the construction period, there was only one value that exceeded 10 NTU (bottom reading) on February 17, 1988, and during the post construction period, the average NTU was 0.7 (stdev 1.0) with a maximum NTU of 11.6, which was also a bottom reading. Details for monitoring Station 560.0 are included in Table 5-14.

Table 5-14. Monitoring Station 560.0 Data Collection Details

Period	Max Depth (m)	Average NTU	Stdev NTU	Max NTU	Count
Pre construction	60	3	2.9	19	593
Construction	82	1.5	1.0	13	462
Post construction	78	0.7	1.0	11.6	621

5.3.8.1.4 Surface Turbidity

In addition to values at depth, surface turbidity values were assessed and are provided in Table 5-15 and surface water data tables are included in Appendix B. A boxplot of surface turbidity data over all time periods is provided in Figure 5-6 to show a general summary and distribution of surface turbidity at the three stations. A boxplot is a standardized way of displaying the distribution of a dataset; it provides a five number summary, which includes the minimum, first quartile, median, third quartile, and maximum value of a dataset; the box itself extends from the first to the third quartile and a line is drawn within the box to indicate the median value of the dataset. The whiskers extend to the minimum and maximum numbers in the dataset that are not considered outliers, while outliers are plotted individually above and below the box.

Table 5-15. Turbidity in Surface Waters of Lake Jocassee

Lake Jocassee Turbidity (NTU)			
Station	Minimum	Average	Maximum
560.0	0.00	1.90	17.00
564.0	0.00	1.96	47.00
564.1	0.00	1.61	19.00

In freshwater lakes in South Carolina, turbidity is not to exceed 25 NTU provided existing uses are maintained; however, for trout waters, the threshold is not to exceed 10 NTU or 10 percent above natural conditions, provided existing uses are maintained. Over the entire dataset, there were 550 surface samples assessed; a total of 9 samples were above the state standard (i.e., 10 NTU), which accounts for 0.02 percent of the dataset (this also includes data collected during construction). Therefore, surface water turbidity levels in Lake Jocassee fully support the designated use classification (i.e., less than 10 percent criterion excursions).

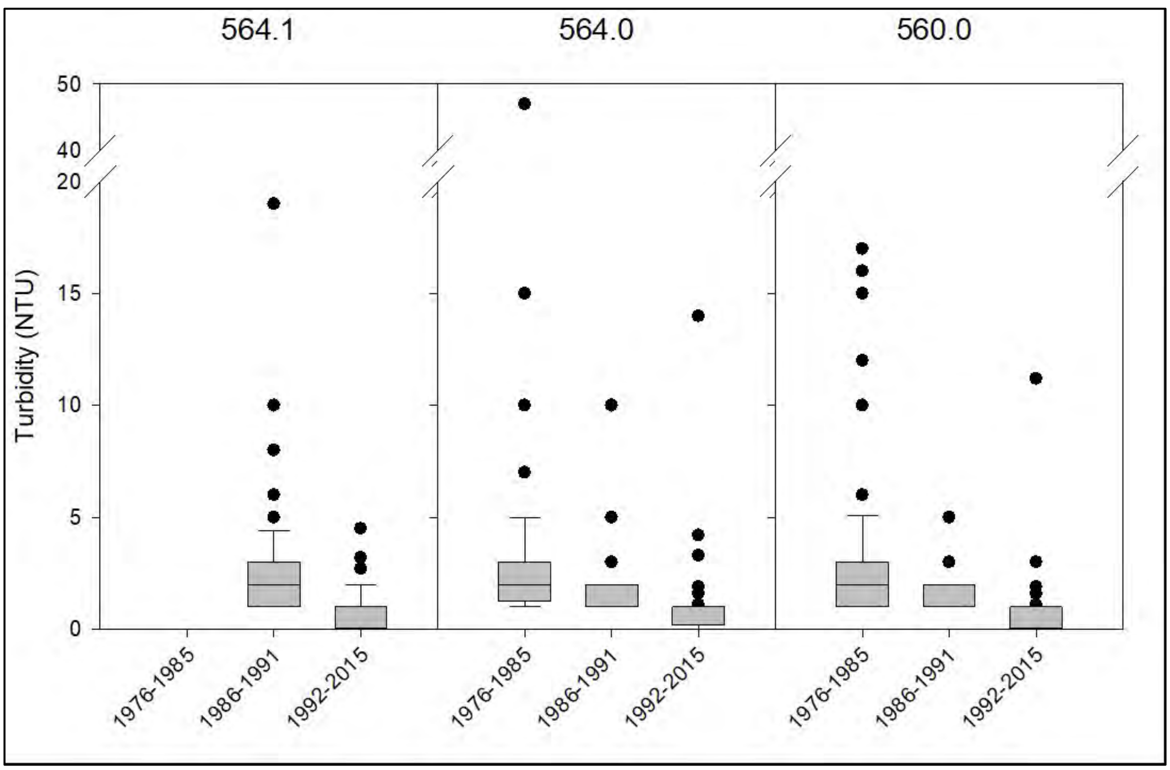


Figure 5-6. Surface Turbidity in the Whitewater River Arm Over Construction Periods

5.4 Summary Pre construction vs. Post Construction Comparison

Overall, the effect of Bad Creek operations on Lake Jocassee water quality is negligible except for the effects seen at the monitoring station upstream of the submerged weir in Whitewater River cove. Tables of water quality data at the three stations in the Whitewater River cove over the three construction periods are included in Appendix B to show trends in stratification patterns upstream and downstream of the weir and turbidity data are included in Appendix C.

Upstream of the submerged weir, data from monitoring Station 564.1 indicate mixing (from Bad Creek operations), which eliminates all stratification. Temperature and DO values have a uniform profile within the water column at Station 564.1. Immediately downstream of the submerged weir at location 564.0, post Bad Creek operation condition datasets show stratification and trends that follow trends at monitoring locations in other portions of the lake; therefore, based on this desktop review, results indicate that the submerged weir confines mixing to the upstream portion of the Whitewater River cove upstream of the submerged weir and effects of operations are not noted downstream of the weir.

Temperature - Prior to 1991 (pre operations), temperatures averaged throughout the water column in Lake Jocassee averaged between 11.7 and 15.3ºC with a standard deviation around 5ºC. After 1991, average temperatures in Lake Jocassee averaged between 12.1 and 17.2 ºC with a standard deviation around 5ºC as shown in Table 5-16. There is little difference between the pre and post operation temperature of Lake Jocassee. The variance in temperature is also reasonably consistent at each station between pre and post operations. As discussed previously, outside of Station 564.1, there are no discernable patterns that would suggest Lake Jocassee temperatures are affected by Bad Creek operations or outside the range of natural conditions and there is no pattern of warming or cooling between time periods (variation between time periods on average is less than one degree); therefore, Project operations have not impacted water temperatures in Lake Jocassee. The notable exception is the average temperature change from pre to post operations at monitoring Station 564.1; this station shows an increase of approximately 3.3°C (see Table 5-16).

Table 5-16. Average and Standard Deviation of Depth-Averaged Temperatures, Pre vs. Post Operations

Monitoring Station	Temperature (°C)				Difference
	Pre operations		Post operations		
	Average	Standard Deviation	Average	Standard Deviation	
558.7	12.5	4.9	12.1	4.8	-0.4
558.0	12.9	5.2	13.5	5.4	0.6
559.0	12.5	5.0	12.1	4.9	-0.4
560.0	11.7	4.6	12.3	4.9	0.6
562.0	15.3	5.6	16.0	5.3	0.7
565.4	14.1	5.4	13.1	4.7	-1.0
551.0	13.5	5.8	14.8	7.3	1.3
564.0	12.1	4.7	12.7	4.9	0.6
564.1	13.9	5.6	17.2	5.5	3.3
557.0	11.7	4.5	12.2	4.8	0.5
554.8	14.6	5.5	14.2	5.3	-0.4
556.0	12.8	4.9	13.4	5.2	0.6

Dissolved Oxygen - There is little difference between the pre and post operation conditions of Lake Jocassee. The variance in DO at each station is also reasonably consistent between pre and post operations. As discussed previously, outside of Station 564.1, there are no discernable patterns that would suggest Lake Jocassee DO values are affected by Bad Creek operations or outside the range of natural conditions and there is no pattern of increasing or decreasing DO between time periods (variation between time periods on average is less than 0.5 mg/L); therefore, Project operations have not impacted water temperatures in Lake Jocassee. The notable exception is the average change from pre to post operations at monitoring Station 564.1, which is immediately downstream of the Project I/O structure; this station shows an increase of approximately 1.1 mg/L and the standard deviation dropped from 3.2 to 0.8, indicating there is little variation in DO at that station due to mixing (Table 5-17).

Table 5-17. Average and Standard Deviation of Surface Dissolved Oxygen, Pre vs. Post Operation

Monitoring Station	Dissolved Oxygen (mg/L)				Difference
	Pre operations		Post operations		
	Average	Standard Deviation	Average	Standard Deviation	
558.7	6.9	2.4	6.9	1.9	0
558.0	6.5	2.8	7.0	1.8	0.5
559.0	6.5	2.7	6.5	2.2	0
560.0	6.7	2.5	6.4	2.3	-0.3

Monitoring Station	Dissolved Oxygen (mg/L)				Difference
	Pre operations		Post operations		
	Average	Standard Deviation	Average	Standard Deviation	
562.0	7.8	2.7	7.9	2.0	0.1
565.4	7.3	2.9	7.1	2.5	-0.2
551.0	9.9	1.3	9.6	1.6	-0.3
564.0	6.4	3.0	6.2	2.6	-0.2
564.1	7.4	3.2	8.5	0.8	1.1
557.0	6.8	2.9	6.8	2.3	0
554.8	7.7	3.1	7.4	2.8	-0.3
556.0	7.4	2.9	7.3	2.6	-0.1

Turbidity - Where data are available, NTU values are higher during pre construction periods than during construction and post construction periods. This is true for depth-averaged turbidity (Table 5-18) as well as surface water turbidity (Table 5-19). Pre construction data show episodic elevated turbidity values likely associated with high surface water inflows during storm events from surface runoff. Additionally, turbidity would have been naturally elevated during that time as organic material decomposed in the years following initial reservoir filling. Over the three stations monitored, the highest values of turbidity are associated with monitoring Station 564.1 immediately downstream of the Project (closest to the Whitewater River mouth) during Project construction; however, these elevated turbidity values are not noted at monitoring Station 564.0, indicating that elevated turbidity does not extend downstream into Whitewater River cove.

Additionally, data indicate that elevated turbidity values typically returned to baseline for the following measurement, indicating rapid recovery from elevated values back to normal values (i.e., within one month conservatively, based on sampling frequency). There were several periods of prolonged elevated turbidity values noted at Station 564.1 during the construction period, therefore, these data are assumed to be associated with construction activities. Future construction activities at Bad Creek could increase turbidity in the Whitewater River cove; however, these events would likely be short-lived and based on previous data, recovery in the water column is expected to be rapid.

Table 5-18. Depth-Averaged Turbidity Values (NTU) over Construction Periods

Period	Station 564.1	Station 564.0	Station 560.0
Pre construction	N/A	6.6	3.0
Construction	18.5	2.9	1.5
Post construction	0.8	0.5	0.7

Table 5-19. Average and Standard Deviation of Surface Turbidity, Pre vs. Post Operation

Monitoring Station	Temperature (°C)			
	Pre operations		Post operations	
	Average	Standard Deviation	Average	Standard Deviation
560	2.5	2.7	1.0	1.6
564	2.6	4.4	1.0	1.6
564.1	2.8	3.1	1.0	0.9

6 Howard Creek

Howard Creek is a high-gradient, third-order, headwater mountain stream. It flows from about 3,200 ft msl to 2,000 ft msl at its confluence with Limber Pole Creek and Lake Jocassee. It is typically less than 30 ft wide and 1.65 ft deep, consists mostly of pools and riffles with steep sections of chutes and waterfalls, and has an average gradient of 8.6 percent (Miller et al. 1997). Howard Creek is a popular recreation stream known for Brook Trout and Rainbow Trout fishing.

6.1 Data Analysis Methods

Pursuant to Article 34 of the original license for the Project (issued to Duke Power Company in 1977) water quality sampling studies in Howard Creek have been carried out, mainly by Clemson University, to assess impacts to Howard Creek associated with construction and operation of the Project.

This section provides an overview of 1993 data presented in Abernathy et al. (1994), which are considered representative of existing (baseline) conditions. While a comparison of water quality between pre and post construction conditions is provided herein (see Section 6.4), water quality data from previous years are documented elsewhere. The body of literature for Howard Creek water quality monitoring is relatively large and there are many notable reports describing water quality for pre construction, construction, and post construction conditions. References for these germane reports are listed below in Table 6-1.

This report provides a summary of: (1) results from January – December 1993, which represent water quality data for Howard Creek under existing (i.e., operational) conditions and (2) changes observed in water quality between pre construction and post construction data, as presented by Abernathy et al. (1994). While baseflow water quality in Howard Creek and major tributaries was monitored from near Howard Creek's confluence with Lake Jocassee to its headwaters upstream of the Project, this data summary only considers water quality downstream of the Project as upstream waters are not considered impacted by the Project.

Table 6-1. Previous Water Quality Reports for Howard Creek

Period	Reference
Pre Construction	Dysart, B.C. III, C.S. Peralta, A.D. Ranson, A.R. Abernathy & J.B. Atkins, Howard Creek Pre construction Water Quality Monitoring: 1980, Rept. No. DPC/HC-TCR-02-0481 by Clemson University for Duke Power Co. (1981).
	Dysart, B.C. III & A.R. Abernathy, Howard Creek Pre- and Early-Construction Water Quality Monitoring: 1981, Rept. No. DPC/HC-TCR-04-0782 by Clemson University for Duke Power Co. (1982).
	Iseman, W.E., A.R. Abernathy, B.C. Dysart III & K.B. Chandler, Water Quality Investigation for the Howard Creek Basin: January 1974-June 1975, Rept. No. DPC/BC-SPR-07-0675 by Clemson University for Duke Power Co. (1975).
	Langdon, C.H. Ill, B.C. Dysart III, R.C. Roberts, R.D. Hatcher Jr. & R.C. Richards, Bottom Sediment and Discharge Studies for the Howard Creek Basin: January-June 1974, Rept. No. DPC/BC-SPR-06-0575 by Clemson University for Duke Power Co. (1975).
	Sigmon, E.B. & B.C. Dysart III, Hydrological Investigations for the Howard Creek Basin from July 1974-September 1975: Analysis of Baseflow and Storm Response, Rept. No. DPC/BC-SPR-09-1275 by Clemson University for Duke Power Co. (1975).
	Swit, F.J., B.C. Dysart III, R.D. Hatcher Jr. & C.H. Langdon Ill, Hydrological and Fluvial Sediment Investigations tor the Howard Creek Basin: April-December 1973, Rept. No. DPC/BC-SPR-01-1273 by Clemson University for Duke Power Co. (1973).
	Abernathy, A.R. & B.C. Dysart III, "Water Quality Investigation," Application for License for Bad Creek Pumped Storage Project, Vol. II, Exhibit W, App. C, Ch. IV, Duke Power Co., Charlotte (1974).
	Dysart, B.C. III, "Stream Flow and Hydrologic Analysis," Application for License for Bad Creek Pumped Storage Project, Vol. II, Exhibit W, App. C, Ch. Ill, Duke Power Co., Charlotte (1974).
Construction	Dysart, B.C. III & A.R. Abernathy, Howard Creek Early-Construction Water Quality Monitoring: 1982, Rept. No. DPC/HC-TCR-07-0683 by Clemson University for Duke Power Co. (1983).
	Dysart, B.C. III & A.R. Abernathy, Howard Creek Early-Construction Water Quality Monitoring: 1983, Rept. No. DPC/HC-TCR-09-0684 by Clemson University for Duke Power Co. (1984).
	Dysart, B.C. III & A.R. Abernathy, Howard Creek Early-Construction Water Quality Monitoring: 1984, Rept. No. DPC/HC-TCR-11-0785 by Clemson University for Duke Power Co. (1985).

Period	**Reference**
	Dysart, B.C. III, A.R. Abernathy & D.R. Kosik, Howard Creek Early-Construction Water Quality Monitoring: 1985, Rept. No. DPC/HC-TCR-14-0286 by Clemson University for Duke Power Co. (1986).
	Dysart, B.C. III, A.R. Abernathy & M.T. Ruane, Howard Creek Major-Construction-Phase Water Quality Monitoring: 1986, Rept. No. DPC/HC-TCR- 19-0687 by Clemson University for Duke Power Co. (1987).
	Dysart, B.C. III, A.R. Abernathy & M.A. Lancaster, Howard Creek Major-Construction-Phase Water Quality Monitoring: 1987, Rept. No. DPC/HC-TCR-22-0588 by Clemson University for Duke Power Co. (1988).
	Dysart, B.C. III, A.R. Abernathy & T.K. Ziegler, Howard Creek Major-Construction-Phase Water Quality Monitoring: 1988, Rept. No. DPC/HC-TCR-26-0889 by Clemson University for Duke Power Co. (1989).
	Dysart, B.C. Ill, A.R. Abernathy & B.S. West. Howard Creek Major-Construction-Phase Water Quality Monitoring: 1989, Rept. No. DPC/HC-TCR-30-0890 by Clemson University for Duke Power Co. (1990).
	Abernathy, A.R., B. C. Dysart Ill & W.H. Jenkins, Howard Creek Construction-Phase Water Quality Monitoring: 1990, Rept. No. DPC/HC-TCR-35-0391 by Clemson University for Duke Power Co. (1991).
	Abernathy, A.R., B. C. Dysart Ill & B.S. Rudolph, Howard Creek Construction-Phase Water Quality Monitoring: 1991, Rept. No. DPC/HC-TCR-43-0692 by Clemson University for Duke Power Co. (1992).
Post Construction	Abernathy, A.R., P.A. Augspurger & B.C. Dysart III, Howard Creek Post-construction Water Quality Monitoring: 1993, Rept. No. DPC/HC-TCR-46-0793 by Clemson University for Duke Power Co. (1993).
	Ward, A. B., Stream Water Quality Changes Associated with Construction of the Bad Creek Project Dams, Special Project Rept. for the College of Engineering, Clemson University, Clemson, S.C. (1991).
	Wood, T. H., The Environmental Significance of Elevated Concentrations of Iron, Aluminum and Calcium in the Bad Creek Project Dam Seepage Flows, M.S. thesis, Clemson University, Clemson, S.C. (1993).
	Ziegler, T.K. & B.C. Dysart Ill, Investigation of Hydrology and Sediment Yield at a Major Construction Site In Steep Mountain Terrain, Rept. No. DPC/HC-MTH-34-1290 by Clemson University for Duke Power Co. (1990).

6.2 Water Quality Monitoring Stations

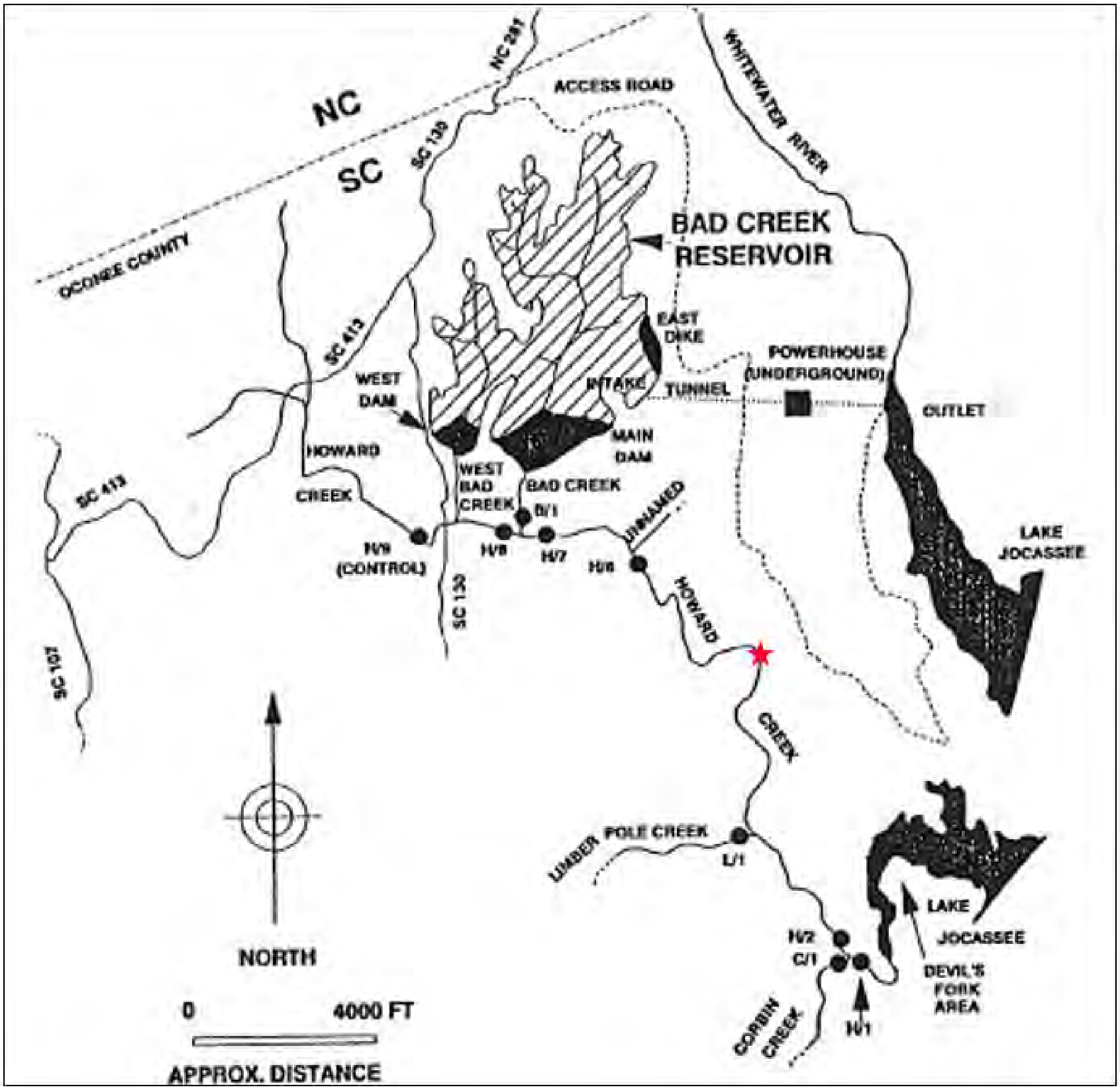
As described in Abernathy et al. (1994), water quality parameters were measured at several points along the length of Howard Creek; locations and specific parameters measured were determined in coordination and agreement with FERC, SCDHEC, and the South Carolina Department of Natural Resources (SCDNR) (formerly SC Wildlife and Marine Resources Department). During sampling, agency personnel were kept apprised of water quality monitoring activities and annual reports were submitted (Abernathy et al. 1994). The following five stations (shown on Figure 6-1) were monitored (listed from downstream to upstream) during the study:

- H/1: Between Corbin Creek and Lake Jocassee
- H/2: Between Limber Pole Creek and Corbin Creek
- H/6: Downstream from the Old Schoolhouse Road and an unnamed tributary entering from the east and upstream from Limber Pole Creek
- H/7: Just downstream from Bad Creek

- H/9[13]: Just upstream of Highway 130

Water quality parameters that were measured on a monthly basis include the following: water temperature, DO, pH, specific conductance, total alkalinity, total suspended solids (TSS), turbidity, flow rate/discharge, 5-day biochemical oxygen demand (BOD_5), fecal coliform, and total hardness. Water quality parameters that were measured on a quarterly basis include: ammonia nitrogen, nitrate/nitrite nitrogen, orthophosphate, and total phosphorus. Details on methodology used to collect water quality parameters are included in Abernathy et al. (1994).

[13] Because Station H/9 is upstream of the Project, it is not considered in this study; however, results are included for completeness.



Note: red star indicates location of USGS 02184475 retired gage on Howard Creek.

Figure 6-1. Howard Creek Monitoring Sites (Abernathy et al. 1994)

6.3 Present-day Water Quality Summary Results

Flow data from the now-retired USGS gage on Howard Creek (USGS 02184475 HOWARD CREEK NEAR JOCASSEE, SC), which drains an area of approximately 2.16 mi^2, for the available period of record (1989-1996) are provided Table 6-2. The location of the retired gage is shown on Figure 6-1 indicated by a red star symbol. USGS 02184475 is located between H/6 and H/2; data from the retired gage are comparable to flows measured during the Abernathy et al. (1994) study as indicated in Table 6-3 below (from 1993). Water quality information from each month of the year (1993) at each location is included in Table 6-4 through Table 6-8. A description and numerical range of all water quality parameters is included in Table 6-9.

Table 6-2. Annual Flow Data for Howard Creek (1989-1996)

Water Year	Discharge (cfs)
1989	10.9
1990	12.9
1991	6.85
1992	7.08
1993	7.79
1994	6.08
1995	6.06
1996	7.4

Source: USGS 02184475 HOWARD CREEK NEAR JOCASSEE, SC
https://waterdata.usgs.gov/nwis/inventory/?site_no=02184475&agency_cd=USGS

Table 6-3. Baseflow Discharge (cfs) for Howard Creek (1993)

Station	Date	H/1	H/2	H/6	H/7	H/9
1	15 JAN	50.53	32.05	16.89	12.65	9.34
2	08 FEB	38.71	19.81	11.11	10.32	5.63
3	01 MAR	36.85	26.02	9.53	9.29	6.27
4	07 APR	48.35	32.55	16.86	11.36	8.70
5	06 MAY	45.17	33.97	17.87	13.83	9.97
6	01 JUN	28.42	15.96	8.20	8.68	3.99
7	07 JUL	16.21	12.06	5.05	5.45	2.07
8	05 AUG	15.59	9.56	6.19	4.97	1.60
9	08 SEP	12.52	10.08	4.92	4.09	1.36
10	06 OCT	9.26	9.98	3.56	3.09	0.86
11	03 NOV	98.26	8.89	3.05	3.25	0.86
12	16 DEC	13.33	12.69	6.15	15.85	2.19

Notes:

(1) Discharge values obtained for Stations H/1, H/6, and H/9 are considered to be of good quality and reliable due to cross-sections which are reasonably well suited for discharge measurements.

(2) Discharge values obtained for Station H/2 are believed to be higher than actual discharge at times due to cross-section conditions which are not well suited for obtaining accurate velocity measurements. Station H/2 has a significant amount of lateral flow. Since early 1981, special care was exercised to minimize the deviations at this Station by noting the angle of flow at each vertical.

(3) Discharge values obtained for Station H/7 are believed to be higher than actual discharge due to a large proportion of the flow being concentrated in a relatively narrow chute. Special care was exercised to minimize deviations by increasing the number of verticals.

Table 6-4. Water Quality Baseflow Conditions for Howard Creek H/1, 1993

OBS	Date	ATEMP	WTEMP	SC	DO	BOD_5	pH	TA	TH	TSS	TUR	FC	NO_3N	NO_2N	NH_3N	OP	TP
1	15 JAN	7.0	8.5	13.3	11.0	0.7	6.1	13.0	7.0	5.1	2.75	3	--	--	--	--	--
2	08 FEB	12.0	11.0	15.0	11.7	1.0	6.2	13.5	7.5	1.9	2.90	2	0.08	<0.01	0.070	0.002	0.001
3	01 MAR	8.0	7.0	14.2	12.8	0.7	6.1	13.5	4.0	2.6	1.90	<2	--	--	--	--	--
4	07 APR	16.0	11.0	16.4	11.2	1.1	6.0	15.5	3.0	6.5	4.00	7	--	--	--	--	--
5	06 MAY	15.0	14.0	16.2	9.8	0.5	6.1	13.0	3.5	9.5	5.20	10	0.10	<0.01	0.072	0.005	0.021
6	01 JUN	15.5	16.0	17.4	10.2	0.8	6.2	19.0	6.5	8.6	5.85	11	--	--	--	--	--
7	07 JUL	23.0	20.0	23.5	9.1	1.1	6.0	21.2	7.0	5.9	5.30	7	--	--	--	--	--
8	05 AUG	19.0	18.5	27.0	8.3	0.9	5.9	20.5	8.0	5.2	4.05	11	0.20	<0.01	0.045	0.006	0.021
9	08 SEP	23.0	19.0	24.5	9.1	1.0	6.2	21.4	7.0	5.8	3.35	19	--	--	--	--	--
10	06 OCT	13.0	14.0	26.0	9.4	0.8	5.8	18.0	10.0	8.0	3.25	13	--	--	--	--	--
11	03 NOV	8.0	7.5	24.0	12.6	0.3	6.3	20.1	6.0	3.4	1.70	11	0.17	<0.01	0.069	0.006	0.021
12	16 DEC	4.0	7.0	23.5	11.4	0.8	6.4	18.0	5.0	0.7	1.50	8	--	--	--	--	--

NOTE: ATEMP = Air Temperature (°C), WTEMP = Water Temperature (°C), SC = Specific Conductance (µmho/cm), DO = Dissolved Oxygen (mg/L), BOD_5 = Biochemical Oxygen Demand (mg/L), TA = Total Alkalinity (mg $CaCO_3$/L), TH = Total Hardness (mg $CaCO_3$/L), TSS = total Suspended Solids (mg/L), TUR = Turbidity (NTU), FC = Fecal Coliforms (# / 100 mL), NO_3N = Nitrate (mg/L), NO_2N = Nitrite (mg/L), NH_3N = Ammonia (mg/L), OP = Orthophosphate (mg/L), TP = Total Phosphorus (mg/L)

Table 6-5. Water Quality Baseflow Conditions for Howard Creek H/2, 1993

OBS	Date	ATEMP	WTEMP	SC	DO	BOD_5	pH	TA	TH	TSS	TUR	FC	NO_3N	NO_2N	NH_3N	OP	TP
1	15 JAN	7.0	8.5	14.0	11.3	0.7	6.2	15.0	6.0	4.9	2.55	3	--	--	--	--	--
2	08 FEB	13.5	11.0	15.3	10.4	1.1	6.2	14.5	6.5	5.5	3.55	2	0.12	<0.01	0.046	0.003	0.008
3	01 MAR	8.0	7.5	16.1	10.8	0.7	6.1	12.0	4.0	2.7	2.95	<2	--	--	--	--	--
4	07 APR	14.5	12.0	15.8	12.8	1.3	6.0	14.5	4.0	5.8	3.65	<2	--	--	--	--	--
5	06 MAY	17.0	14.5	16.2	9.4	0.4	6.0	11.5	3.5	11.8	4.35	11	0.12	<0.01	0.055	0.007	0.018
6	01 JUN	19.0	16.5	17.7	9.6	0.9	6.0	17.0	5.0	6.7	5.30	12	--	--	--	--	--
7	07 JUL	27.0	20.5	26.0	9.2	1.0	5.9	17.0	9.5	5.3	5.00	14	--	--	--	--	--
8	05 AUG	21.0	19.0	28.0	9.0	0.8	5.7	21.5	8.0	5.0	4.00	12	0.28	<0.01	0.079	0.004	0.011

OBS	Date	ATEMP	WTEMP	SC	DO	BOD_5	pH	TA	TH	TSS	TUR	FC	NO_3N	NO_2N	NH_3N	OP	TP
9	08 SEP	22.5	19.0	26.5	9.2	0.9	6.0	23.4	8.0	5.2	4.65	20	--	--	--	--	--
10	06 OCT	15.0	14.0	28.0	9.5	0.5	5.9	20.0	11.0	4.1	2.35	11	--	--	--	--	--
11	03 NOV	9.5	8.0	26.0	12.0	0.2	6.3	27.3	13.0	3.4	2.45	<2	0.32	<0.01	0.077	0.002	0.024
12	16 DEC	7.0	7.0	25.5	12.4	0.2	6.3	25.0	8.0	0.7	2.55	**	--	--	--	--	--

NOTE: ATEMP = Air Temperature (°C), WTEMP = Water Temperature (°C), SC = Specific Conductance (µmho/cm), DO = Dissolved Oxygen (mg/L), BOD_5 = Biochemical Oxygen Demand (mg/L), TA = Total Alkalinity (mg $CaCO_3$/L), TH = Total Hardness (mg $CaCO_3$/L), TSS = total Suspended Solids (mg/L), TUR = Turbidity (NTU), FC = Fecal Coliforms (# / 100 mL), NO_3N = Nitrate (mg/L), NO_2N = Nitrite (mg/L), NH_3N = Ammonia (mg/L), OP = Orthophosphate (mg/L), TP = Total Phosphorus (mg/L); **Sample not taken due to lack of proper sampling bottles

Table 6-6. Water Quality Baseflow Conditions for Howard Creek H/6, 1993

OBS	Date	ATEMP	WTEMP	SC	DO	BOD_5	pH	TA	TH	TSS	TUR	FC	NO_3N	NO_2N	NH_3N	OP	TP
1	15 JAN	6.0	9.0	19.5	10.7	1.0	6.4	21.0	9.0	3.8	2.20	2	--	--	--	--	--
2	08 FEB	12.5	11.5	21.5	9.8	1.4	6.1	17.5	9.3	5.4	2.75	20	0.30	<0.01	0.095	0.002	0.010
3	01 MAR	10.0	8.0	22.0	12.0	0.5	6.1	16.0	7.5	2.9	2.05	4	--	--	--	--	--
4	07 APR	15.5	12.0	21.5	9.4	0.9	6.1	17.0	5.0	4.3	3.00	6	--	--	--	--	--
5	06 MAY	23.0	15.0	21.8	10.3	0.5	6.2	16.0	6.0	7.5	3.35	8	0.23	<0.01	0.089	0.006	0.022
6	01 JUN	22.5	17.0	26.0	8.6	0.8	6.0	21.0	8.1	6.0	4.00	12	--	--	--	--	--
7	07 JUL	31.0	19.0	38.0	8.4	0.9	6.0	24.0	14.0	6.0	4.85	20	--	--	--	--	--
8	05 AUG	25.0	18.0	39.5	8.5	0.8	5.8	26.7	13.5	5.3	3.85	8	0.57	<0.01	0.062	0.002	0.005
9	08 SEP	23.0	19.0	37.0	8.9	1.0	6.0	27.7	12.0	6.3	4.65	18	--	--	--	--	--
10	06 OCT	17.5	15.0	40.0	8.4	0.5	6.1	26.4	14.0	7.1	3.25	5	--	--	--	--	--
11	03 NOV	9.0	10.0	37.5	11.0	0.2	6.4	27.3	13.0	3.4	2.45	<2	0.63	<0.01	0.077	0.005	0.010
12	16 DEC	8.5	10.0	36.0	12.1	0.3	6.4	25.0	14.0	3.3	2.55	**	--	--	--	--	--

NOTE: ATEMP = Air Temperature (°C), WTEMP = Water Temperature (°C), SC = Specific Conductance (µmho/cm), DO = Dissolved Oxygen (mg/L), BOD_5 = Biochemical Oxygen Demand (mg/L), TA = Total Alkalinity (mg $CaCO_3$/L), TH = Total Hardness (mg $CaCO_3$/L), TSS = total Suspended Solids (mg/L), TUR = Turbidity (NTU), FC = Fecal Coliforms (# / 100 mL), NO_3N = Nitrate (mg/L), NO_2N = Nitrite (mg/L), NH_3N = Ammonia (mg/L), OP = Orthophosphate (mg/L), TP = Total Phosphorus (mg/L); **Sample not taken due to lack of proper sampling bottles

Table 6-7. Water Quality Baseflow Conditions for Howard Creek H/7, 1993

OBS	Date	ATEMP	WTEMP	SC	DO	BOD_5	pH	TA	TH	TSS	TUR	FC	NO_3N	NO_2N	NH_3N	OP	TP
1	15 JAN	6.0	10.0	25.0	11.4	0.6	6.4	19.5	13.5	4.6	2.00	<2	--	--	--	--	--
2	08 FEB	10.5	12.0	28.0	11.4	0.8	6.2	23.0	12.0	5.2	2.20	<2	0.52	<0.01	0.046	0.002	0.013
3	01 MAR	6.5	9.5	28.3	11.8	0.5	6.4	21.0	10.0	2.8	1.70	4	--	--	--	--	--
4	07 APR	13.5	12.5	27.5	9.8	0.9	6.2	22.5	10.0	6.7	2.95	<2	--	--	--	--	--
5	06 MAY	18.0	14.0	24.0	9.2	0.4	6.3	18.5	8.5	9.0	3.30	8	0.38	<0.01	0.072	0.009	0.020
6	01 JUN	18.5	15.5	31.5	9.7	0.9	6.1	22.5	9.5	5.7	3.75	8	--	--	--	--	--
7	07 JUL	25.0	18.0	42.5	8.6	0.8	6.1	26.2	15.5	16.7	5.60	4	--	--	--	--	--
8	05 AUG	22.5	17.5	44.5	9.0	0.9	6.0	28.4	13.0	7.1	4.0	10	0.80	<0.01	0.062	0	0.033
9	08 SEP	21.0	18.0	40.5	8.8	0.7	5.9	32.4	14.0	7.3	3.35	<2	--	--	--	--	--
10	06 OCT	17.0	15.5	44.5	8.9	0.4	6.1	30.1	17.0	3.4	2.35	4	--	--	--	--	--
11	03 NOV	9.0	11.0	39.0	9.9	0.0	6.5	30.0	12.0	2.9	1.35	3	0.71	<0.01	0.094	0.004	0.041
12	16 DEC	7.5	11.5	42.5	10.8	0.3	6.4	28.0	16.0	1.4	2.55	6	--	--	--	--	--

NOTE: ATEMP = Air Temperature (°C), WTEMP = Water Temperature (°C), SC = Specific Conductance (µmho/cm), DO = Dissolved Oxygen (mg/L), BOD_5 = Biochemical Oxygen Demand (mg/L), TA = Total Alkalinity (mg $CaCO_3$/L), TH = Total Hardness (mg $CaCO_3$/L), TSS = total Suspended Solids (mg/L), TUR = Turbidity (NTU), FC = Fecal Coliforms (# / 100 mL), NO_3N = Nitrate (mg/L), NO_2N = Nitrite (mg/L), NH_3N = Ammonia (mg/L), OP = Orthophosphate (mg/L), TP = Total Phosphorus (mg/L)

Table 6-8. Water Quality Baseflow Conditions for Howard Creek H/9, 1993

OBS	Date	ATEMP	WTEMP	SC	DO	BOD_5	pH	TA	TH	TSS	TUR	FC	NO_3N	NO_2N	NH_3N	OP	TP
1	15 JAN	6.5	9.0	8.5	12.8	1.3	6.0	9.0	5.0	2.8	1.95	<2	--	--	--	--	--
2	08 FEB	13.0	9.5	8.3	12.5	0.9	6.0	10.5	3.8	9.6	1.80	2	<0.01	<0.01	0.054	0.006	0.003
3	01 MAR	7.5	7.0	9.1	12.6	0.6	6.0	7.5	3.0	1.9	1.20	2	--	--	--	--	--
4	07 APR	12.0	10.5	8.2	11.0	0.6	6.1	6.0	2.2	3.5	2.20	3	--	--	--	--	--
5	06 MAY	15.0	12.5	9.4	10.0	0.3	6.0	7.0	1.5	8.8	2.65	6	<0.01	<0.01	0.080	0.009	0.018
6	01 JUN	17.5	15.0	10.0	9.4	0.9	6.0	9.0	5.0	3.2	4.30	13	--	--	--	--	--
7	07 JUL	22.0	18.0	12.5	8.4	0.9	5.8	9.1	1.0	5.0	4.25	12	--	--	--	--	--
8	05 AUG	20.0	17.5	12.0	9.1	0.7	5.8	8.0	3.0	4.0	3.50	10	0.02	<0.01	0.045	0.001	0.024

OBS	Date	ATEMP	WTEMP	SC	DO	BOD_5	pH	TA	TH	TSS	TUR	FC	NO_3N	NO_2N	NH_3N	OP	TP
9	08 SEP	20.0	18.0	12.0	9.3	1.2	5.9	10.7	1.5	8.5	3.4	7	--	--	--	--	--
10	06 OCT	17.5	14.5	12.5	8.8	0.3	5.9	9.0	5.5	2.3	1.85	7	--	--	--	--	--
11	03 NOV	9.5	8.0	13.0	10.4	0.2	6.4	8.1	2.0	3.7	1.35	3	<0.01	<0.01	0.094	0.007	0.038
12	16 DEC	9.0	7.0	11.0	11.5	0.6	6.1	6.0	3.0	1.2	1.60	4	--	--	--	--	--

NOTE: ATEMP = Air Temperature (°C), WTEMP = Water Temperature (°C), SC = Specific Conductance (µmho/cm), DO = Dissolved Oxygen (mg/L), BOD_5 = Biochemical Oxygen Demand (mg/L), TA = Total Alkalinity (mg $CaCO_3$/L), TH = Total Hardness (mg $CaCO_3$/L), TSS = total Suspended Solids (mg/L), TUR = Turbidity (NTU), FC = Fecal Coliforms (# / 100 mL), NO_3N = Nitrate (mg/L), NO_2N = Nitrite (mg/L), NH_3N = Ammonia (mg/L), OP = Orthophosphate (mg/L), TP = Total Phosphorus (mg/L)

*Instrumental problems with BOD measurement

Table 6-9. Range of Annual Water Quality Baseflow Data for Howard Creek, 1993

Station	Date	ATEMP	WTEMP	SC	DO	BOD_5	pH	TA	TH	TSS	TUR	FC	NO_3N	NO_2N	NH_3N	OP	TP
H/1	MAX	23.0	20.0	27.0	12.8	1.1	6.4	21.4	10.0	9.5	5.85	19	0.20	<0.01	0.072	0.006	0.021
	MIN	4.0	7.0	13.3	8.3	0.3	5.8	13.0	3.0	0.7	1.50	<2	0.08	<0.01	0.045	0.002	0.001
H/2	MAX	27.0	20.5	28.0	12.8	1.1	6.3	27.3	3.0	10.8	5.30	20	0.32	<0.01	0.079	0.007	0.024
	MIN	7.0	7.0	14.0	9.0	0.2	5.7	11.5	3.5	0.7	2.55	<2	0.12	<0.01	0.046	0.002	0.008
H/6	MAX	31.0	19.0	40.0	12.1	1.4	6.4	27.1	14.0	7.5	4.85	20	0.63	<0.01	0.095	0.006	0.022
	MIN	6.0	8.0	19.5	8.4	0.2	5.8	16.0	5.0	2.9	2.05	<21	0.23	<0.01	0.062	0.002	0.005
H/7	MAX	25.0	18.0	4.5	11.8	0.9	6.5	32.4	17.0	16.7	5.6	10	0.80	<0.01	0.094	0.009	0.041
	MIN	6.0	9.5	24.0	8.6	0.0	5.9	18.5	8.5	1.4	1.35	<2	0.38	<0.01	0.046	0.000	0.013
H/9	MAX	22.0	18.0	13.0	12.8	1.3	6.4	10.7	5.5	9.6	4.3	13	0.02	<0.01	0.094	0.009	0.038
	MIN	6.5	7.0	8.2	8.4	0.2	5.8	6.0	1.0	1.2	1.20	<2	<0.01	<0.01	0.045	0.001	0.003

NOTE: ATEMP = Air Temperature (°C), WTEMP = Water Temperature (°C), SC = Specific Conductance (µmho/cm), DO = Dissolved Oxygen (mg/L), BOD_5 = Biochemical Oxygen Demand (mg/L), TA = Total Alkalinity (mg $CaCO_3$/L), TH = Total Hardness (mg $CaCO_3$/L), TSS = total Suspended Solids (mg/L), TUR = Turbidity (NTU), FC = Fecal Coliforms (# / 100 mL), NO_3N = Nitrate (mg/L), NO_2N = Nitrite (mg/L), NH_3N = Ammonia (mg/L), OP = Orthophosphate (mg/L), TP = Total Phosphorus (mg/L)

6.4 Compliance with SCDHEC State Standards

Present day (1993) water quality parameters assessed for Howard Creek and compared against state standards for temperature, DO, pH, and turbidity were all within SCDHEC criteria limits for freshwater (trout) streams.

Since the maximum range of turbidity measured at all three stations in 1993 was consistent with (and even below) those observed during pre construction, baseflow turbidity values under current conditions are considered to be within the trout water turbidity standards set forth by SCDHEC. Post construction DO measurements were greater than the SC trout water standard, therefore DO is also considered to be within state standards for trout waters. Stream standards for trout waters must have a pH of 6.0 to 8.0; mountain streams such as Howard Creek are typically poorly buffered and tend to have low pH values (Abernathy et al. 1994). Low values were recorded in Howard Creek during all phases of sampling and there is a link between pH decreases and prolonged lack of rainfall; however, mean values of pH in 1993 were within the state criteria except for station H/9, which is upstream of the Project and therefore not impacted by the Project. In post construction data, the warmest temperature recorded above and below the Project on Howard Creek was 20.5°C at Station H/2. In pre construction data, water temperatures as high as 21°C were noted, therefore temperatures are consistent and within the range of pre-Project temperatures.[14]

The state standard for fecal coliform in waters call for a maximum of 200/100 milliliter (over five consecutive samples during any 30-day period with <10 percent of total samples any 30-day period exceeding 400/100 milliliter. While fecal coliform is not a state standard that would be affected by Project operations, based on these criteria, post construction values for fecal coliform satisfy the trout water standard.

[14] Note that temperature was monitored on a monthly basis in the seepage at the toe of the main dam. The seepage waters appear to have a somewhat constant temperature, but do experience some ponding before they enter Howard Creek. The result tends to be a slight warming of Howard Creek (l-2°C) at Station H/7 during cooler (winter) months and a slight cooling at the same station in warmer (summer) months. In looking at these data along with the pre construction water temperature data tor Howard Creek, there appear to be no negative trends that would be detrimental to the biological community resulting from the construction of the Bad Creek reservoir.

6.5 Summary Pre construction vs. Post Construction Comparison

Table 6-10 provides water quality parameters for postconstruction (i.e., existing conditions) as well as pre construction (1980-1981) as a comparison, indicating that total suspended solids, turbidity, temperature, DO, pH, BOD_5 and fecal coliform under operational conditions are generally similar and fall well within the range of variation observed during pre construction conditions. Station H/1 is the furthest downstream, Station H/7 is just downstream of the Project, and Station H/9 is the control station (Abernathy et al. 1994). Comparisons between pre construction and post construction water quality data for each monitoring station are included in Figure 6-2 through Figure 6-7.

Table 6-10. Comparison of Water Quality Data: Pre construction vs. Post construction

		H/1		H/7		H/9	
Parameter		**1980-81**	**1993**	**1980-81**	**1993**	**1980-81**	**1993**
TSS	MAX	14.0	9.5	40.0	16.7	17.0	9.6
	MIN	0.05	0.7	0.6	1.4	0.05	1.2
	MEAN	4.9	5.3	8.5	6.1	3.9	4.5
TUR	MAX	19.0	5.8	34.0	5.6	18	4.3
	MIN	0.6	1.5	0.67	1.35	0.53	1.2
	MEAN	4.26	3.48	5.1	2.9	3.9	2.5
DO	MAX	15.2	12.8	15	11.8	13.7	12.8
	MIN	8.2	8.3	8.6	8.6	7.6	8.4
	MEAN	10.8	10.6	10.9	9.9	10.2	10.5
pH	MAX	7.3	6.4	7.2	6.5	7.4	6.4
	MIN	6.0	5.8	5.8	5.9	5.4	5.8
	MEAN	6.36	6.08	6.2	6.18	6.07	5.98
TA	MAX	16.4	21.4	15.4	32.4	10.7	10.7
	MIN	2.6	13	1.4	18.5	0.3	6.0
	MEAN	8.8	17.2	7.2	25.2	5.7	8.3
TH	MAX	24.2	10	36.9	17	38.2	5.5
	MIN	5.9	3.0	5.3	8.5	5.1	1.0
	MEAN	10.7	6.2	10.8	12.6	10.2	3.0
SC	MAX	35.0	27.0	19.0	44.5	19.0	13.0
	MIN	7.5	13.3	7.5	24.0	5.0	8.2
	MEAN	17.8	20.1	13.2	34.8	12.1	10.5
BOD_5	MAX	2.5	1.1	3.3	0.9	3.8	1.3
	MIN	0.2	0.3	0.2	0.0	0.2	0.2
	MEAN	0.8	0.8	0.8	0.6	0.8	0.7
FC	MAX	52.0	19.0	52.0	10.0	28.0	13.0
	MIN	1.0	<2.0	1.0	<2.0	1.0	<2.0
	MEAN	11.0	9.0	9.0	6.0	8.0	6.0

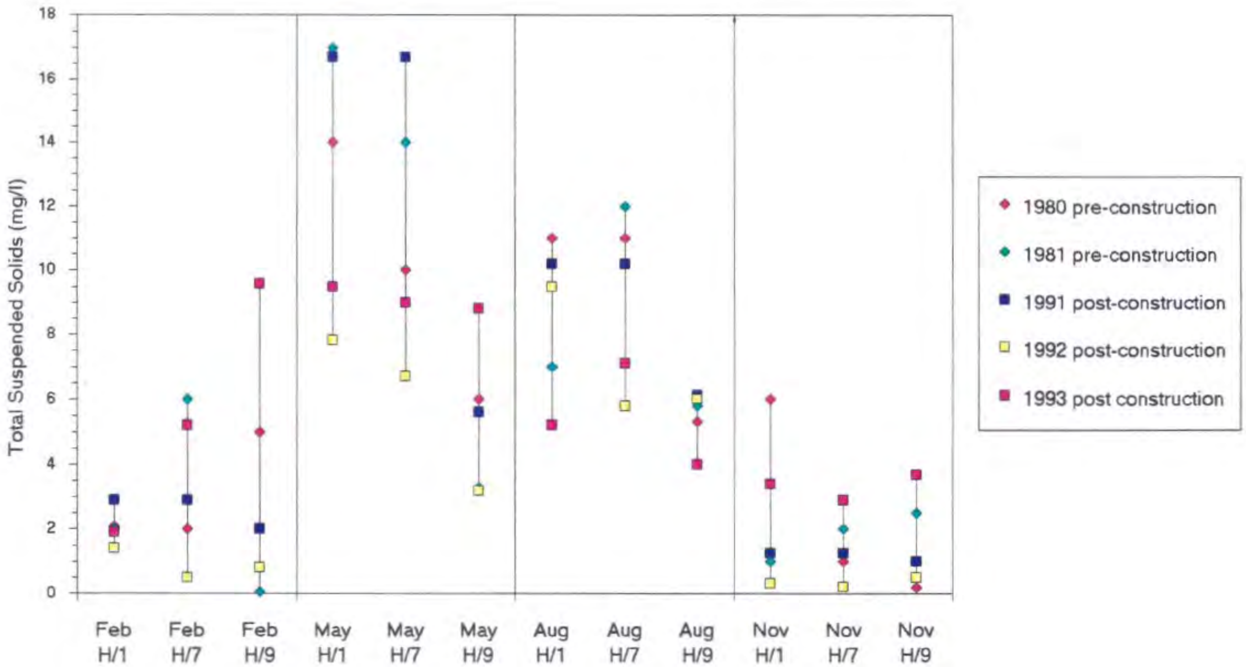


Figure 6-2. Comparison of Pre and Post Construction TSS Values

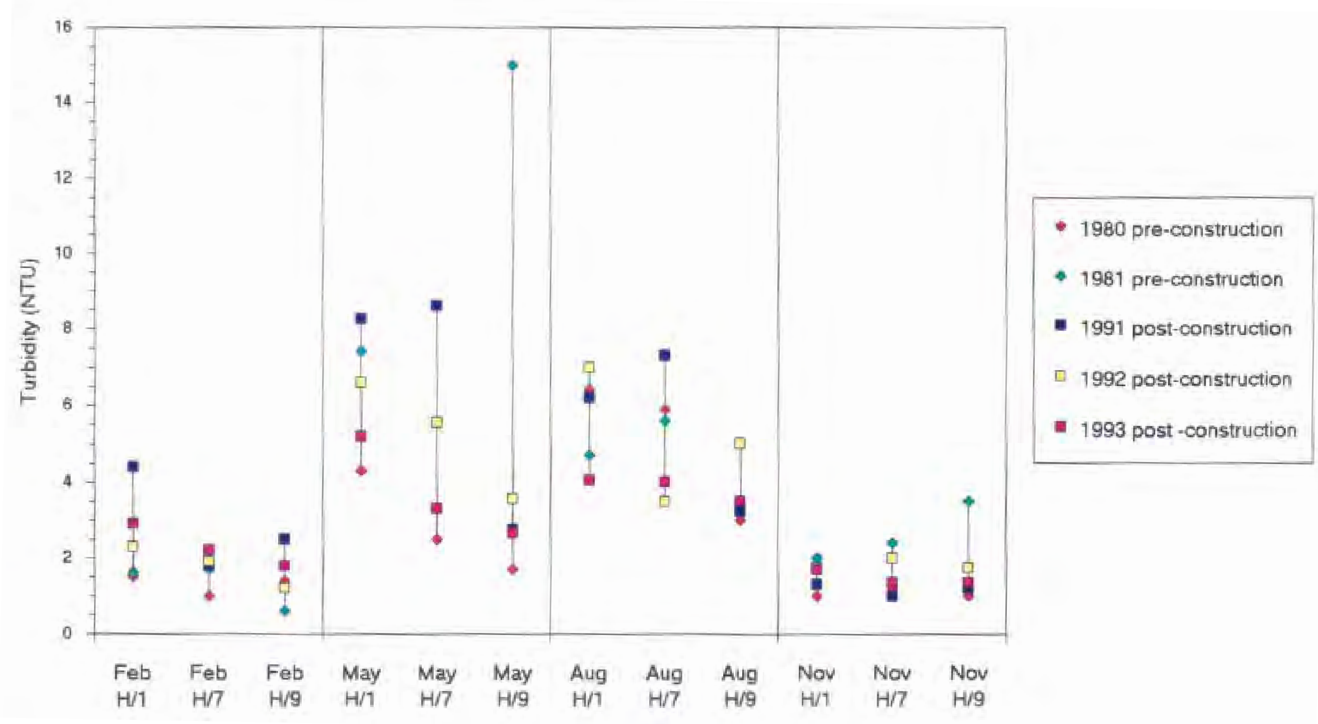


Figure 6-3. Comparison of Pre and Post Construction Turbidity Values

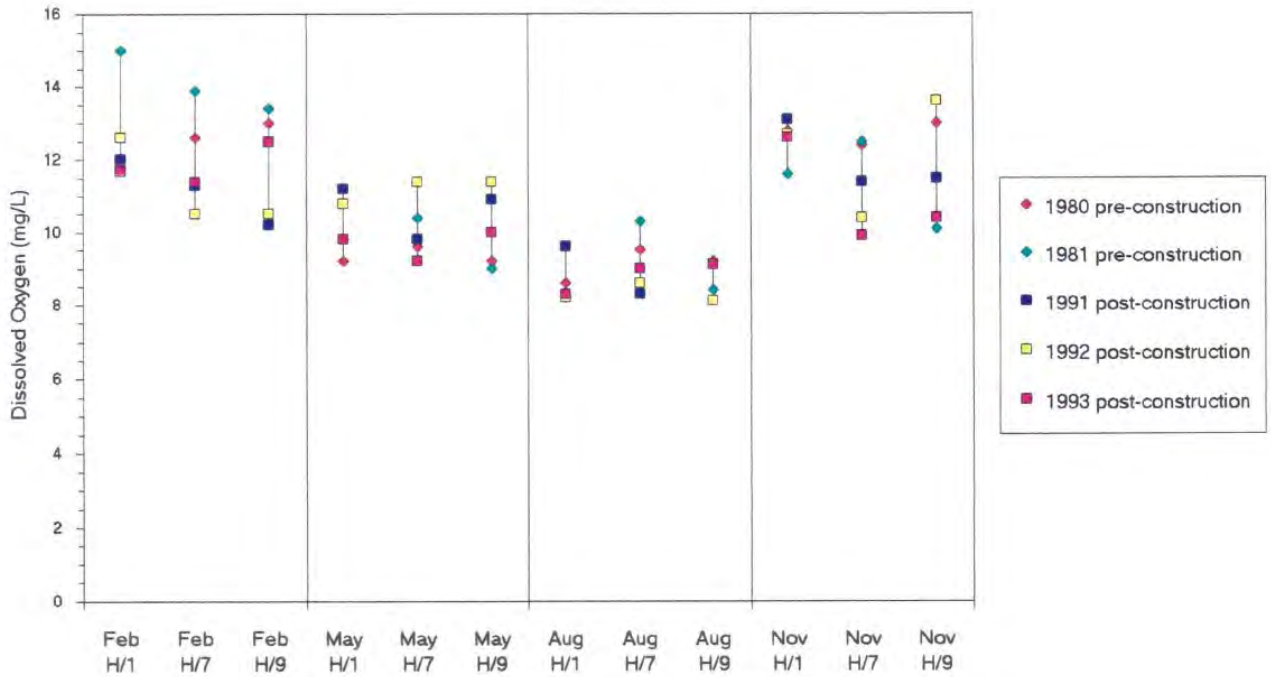


Figure 6-4. Comparison of Pre and Post Construction DO Concentration

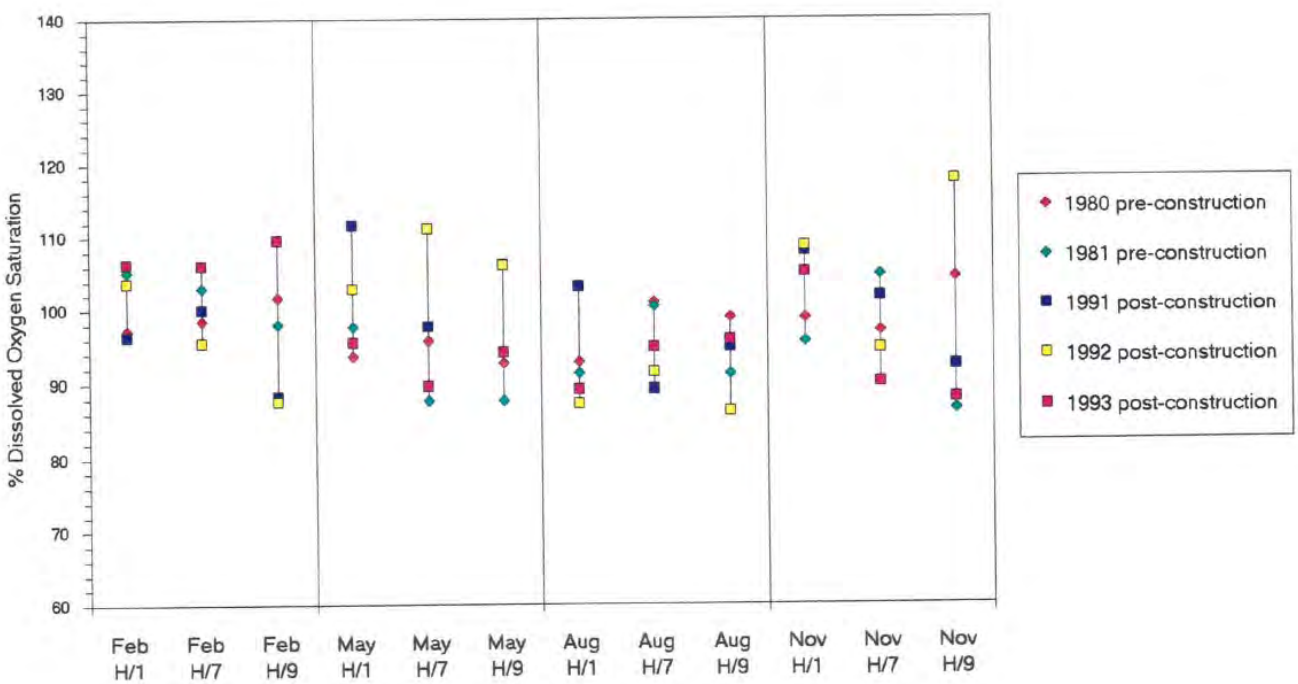


Figure 6-5. Comparison of Pre and Post Construction DO Saturation

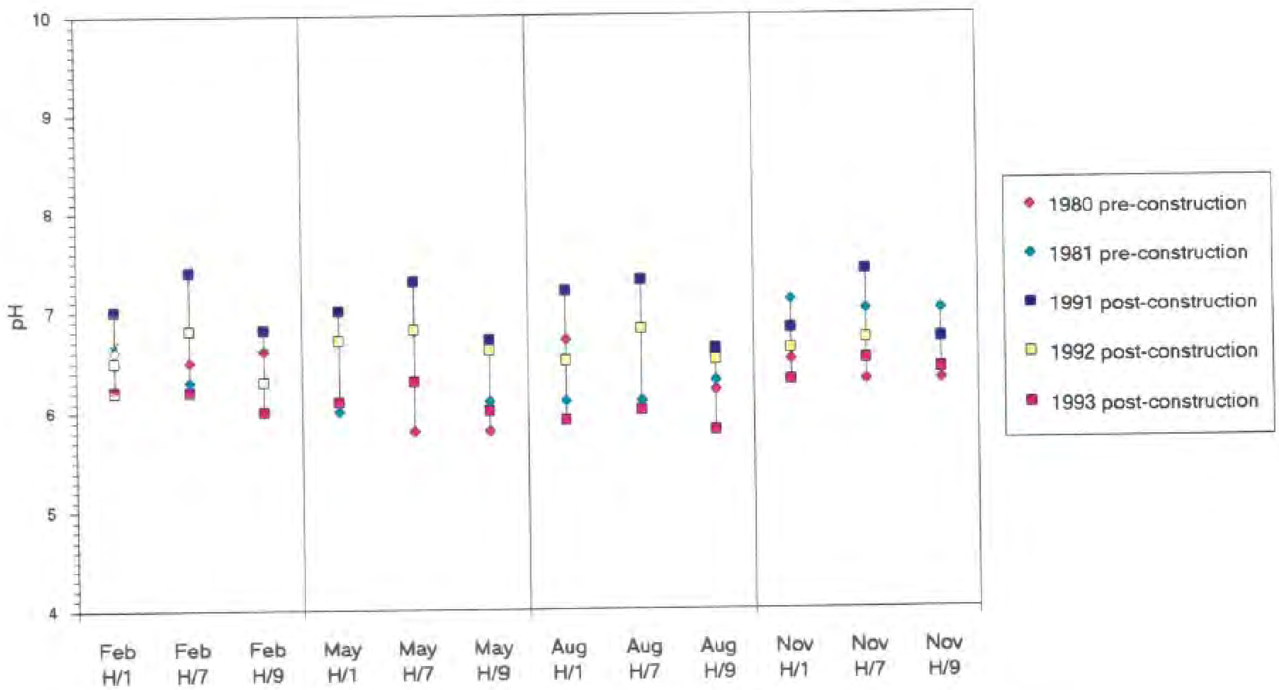


Figure 6-6. Comparison of Pre and Post Construction pH Values

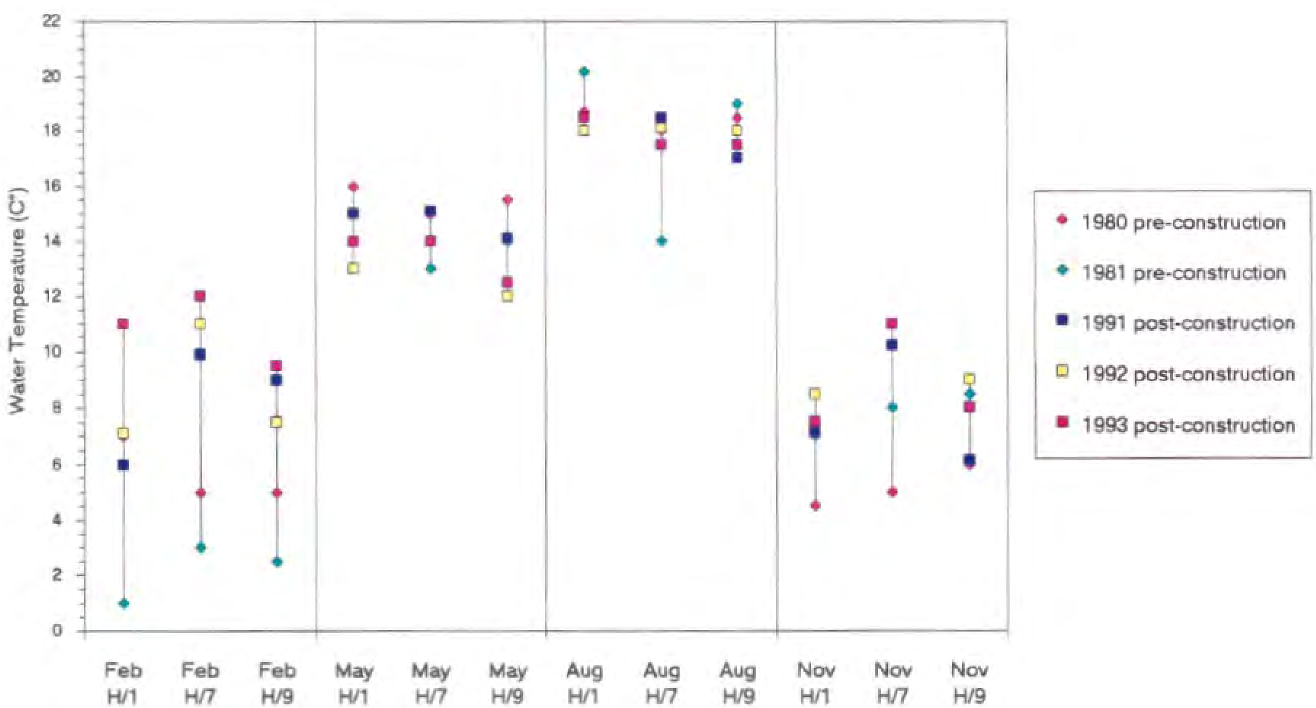


Figure 6-7. Comparison of Pre and Post Construction pH Values

Overall, Howard Creek, while showing typical annual variations, has remained a high-quality mountain stream with no major changes in the upper portion of the watershed upstream of the Project. Abernathy et al. (1994) notes that even with the major construction of the Project, most baseflow water quality conditions were relatively unchanged during and after construction and post construction water quality conditions are generally similar to pre construction, indicating little or no impact for the parameters studied. Notable changes in water quality that were observed between pre and postconstruction conditions included pH, total alkalinity, total hardness, and specific conductance.

Specific conclusions of the Abernathy et al. (1994) study include the following:

- Howards Creek's baseflow water quality in the postconstruction period is similar to that of pre construction. Differences are within the range of normal seasonal/annual variations with the following exceptions:
    - During 1991 pH readings were elevated above pre construction and postconstruction, by 1992 the values had returned to near normal, and in 1993 values dropped near or below pre construction, most likely due to lack of rainfall.
    - Total alkalinity values were elevated above pre construction levels at Station H/7 during 1991 and 1992 and remained elevated through 1993.
    - Total hardness values were elevated above pre construction levels at Station H/7 during 1991 and remained slightly elevated through 1992 and 1993. The control Station H/9, however, experienced a drop in mean total hardness during 1993 as compared to the pre construction mean.
    - Specific conductance values were elevated above pre construction levels at Station H/7 during 1991 and 1992 and-although decreasing-remained elevated through 1993.
- The elevated values of total alkalinity, total hardness, and specific conductance, and to some extent pH, following construction were likely due to seepage waters through the main and west dams coming into contact with grout materials. It is expected that these parameters (with the exception of pH) will continue to decline and stabilize over time.

6.6 Recent Howard Creek Aquatics Sampling Summary

Results from the initial recovery program suggested Howard Creek had returned to pre construction conditions by 1995. Commencing in 1997 and continuing through 2015, additional fishery sampling of Howard Creek was implemented to assess whether the recovered state would persist. Sampling was performed at three monitoring stations (H/1, H/6, H/9).

All three survey locations maintained a consistent level of species diversity over the 18-year monitoring study. Generally, species diversity was higher at the downstream location (N=11 species) as compared to the upstream location (N=2 species); this is likely due to species immigration from the reservoir as well as a natural barrier (bedrock slide) found between H/1 and H/6 that hinders fish migration. All three species of trout known to the region (Rainbow Trout, Brown Trout, and Brook Trout) were collected in Howard Creek, but only Rainbow Trout were collected in significant numbers. The condition of Rainbow Trout was similar between the locations over time and was considered healthy. Other common species present in Howard Creek included Bluehead Chub (*Nocomis leptocephalus*), Yellowfin Shiner (*Notropis lutipinnis*), Blackbanded Darter (*Percina nigrofasciata*), Blacknose Dace, and Northern Hog Sucker (*Hypentelium nigricans*).

While water quality wasn't specifically monitored during this 18-year study, the results of the study suggest that Howard Creek has maintained a recovered condition from 1995 to at least 2015 (the last survey period); in the absence of any other known impacts, it is likely Howard Creek currently supports fish populations similar to those found in other southern Appalachian streams, indicating suitable water quality and habitat. Full results of the Howard Creek aquatics study are included in Duke Energy (2016) "Long-term Recovery Monitoring of the Howard Creek Fishery (1997-2015)".

7 Need for Protection, Mitigation, and Enhancement Measures to Protect Water Quality

Based on the results of this water quality study, and in consideration of results of other data collection efforts in support of the KT relicensing (Duke Energy 2014), there is no need for additional PM&E measures to protect water quality at the Project.

As a condition of the Original License for the Project, and as described in Section 1.6 of the Pre-application Document (Duke Energy 2022), Duke Energy entered into a Memorandum of

Understanding (MOU) with the SCDNR for the long-term management and maintenance of high-quality fishery resources in Lake Keowee, Lake Jocassee, and their tributary streams. The MOU and first 10-Year Work Plan were approved pursuant to Article #32(b)(1) of the Original License for the Project on May 1, 1997. License Article #32(b)(2) covers Lake Jocassee pelagic trout habitat and License Article #34 covers Lake Jocassee water quality. Through this MOU, SCDNR and Duke Energy personnel work cooperatively, and include third parties as necessary, to design and implement data collection and other activities to develop and enhance management strategies for fish in these areas. Activities included in the 10-Year Work Plans are focused on fisheries surveys and inventories, water quality and aquatic habitat evaluations, fish stocking, recreation, and shoreline impacts.

During the New License term, Duke Energy will continue to implement activities established by the MOU, as may be modified in consultation with stakeholders through the relicensing process and will continue to implement PM&E activities established under the KT Project Relicensing Agreement. Duke Energy plans to further consult with SCDHEC and relicensing stakeholders through the Integrated Licensing Process regarding final proposed mitigation and enhancement measures directed at operation of the existing Project and the proposed Bad Creek II Complex to be included in the Final License Application.

It should be noted that in the Environmental Assessment report developed as part of the KT Project relicensing effort in 2014, FERC specifically indicated that (1) existing water quality in the reservoirs and tailwaters (i.e., Lake Jocassee and Lake Keowee) is meeting or exceeding levels consistent with state water quality standards, and is consistent with levels supporting designated uses, and no issues have been raised concerning pH and total dissolved gas; (2) water quality modeling results indicate under the proposed [KT] Project operation, suitable DO levels and water temperatures would exist for the propagation of aquatic life in the Keowee Development water releases; (3) there are no proposed changes in KT Project operation that would alter water quality from existing conditions in the Jocassee Development tailwaters; and (4) the fishery at the KT Project is considered high quality.

This desktop review carried out to support Task 1 of the Water Resources Study is complete and results summarized in this document meet the goals and objectives stated in the RSP to describe and analyze existing baseline conditions in waters impacted by the Project; data reported herein may serve as a reference for future water quality comparison and assessment.

8 Future Work

Under a separate task of the Water Resources Study (i.e., Task 2), Duke Energy will undertake water quality monitoring (continuous temperature and biweekly DO) at three historic monitoring stations in the Whitewater River arm (stations 564.1, 564.0, 560.0) of Lake Jocassee in June through September 2023 (two-unit powerhouse operation) and 2024 (four-unit powerhouse operation, with all ongoing upgrades complete). Water quality sampling in the Upper Reservoir is infeasible and because the Upper Reservoir directly discharges to Whitewater River cove (with very little other water contribution to the Upper Reservoir), water quality in Whitewater River cove and in particular at Station 564.1, is considered representative of conditions in the Bad Creek Reservoir.

These three locations have been routinely monitored by Duke Energy since the impoundment of Lake Jocassee and historic datasets represent data ranging from 1973 to 2015, depending on the location (provided in Appendix B). The continuous water temperature data will be used to better understand the effectiveness of the existing submerged weir and the effects of existing unit discharge in the Whitewater River arm. Additionally, newly collected water quality data will be compared against historical data and a summary comparison will be provided in the license application.

While Project operations are not expected to impose additional adverse effects on water quality, these baseline water quality data, such as what was compiled and assessed as part of this study, can be used to compare future impacts from construction and operation of the Bad Creek II Complex.

Note that pursuant to the existing MOU between Duke Energy and the SCDNR and subsequent 10-Year Work Plans, Duke Energy continues to collect water quality data in Lake Jocassee to support annual aquatic habitat evaluations. As part of the New License, Duke Energy plans to continue this long-term water quality monitoring program and will develop a Water Quality Monitoring Plan (WQMP) in consultation with agencies focused on the proposed Bad Creek II Complex. The WQMP will include three phases: pre construction, construction, and post construction of Bad Creek II, including identification of applicable and appropriate threshold values for water quality parameters and monitoring means and methods. The future WQMP will be developed from January – December 2024 for submittal with the Draft License Application (March 2025) pending approval of Bad Creek II Complex construction.

9 Variances from FERC-approved Study Plan

There were no variances from the FERC-approved RSP for this task of the Water Resources Study.

10 Germane Correspondence and Consultation

Germane correspondence will be included with the Water Resources Study Report to be filed with the Initial Study Report in January 2024.

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Appendix A

Appendix A – Duke Energy Water Quality Field and Sample Collection Procedures

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Procedure Number: ESFP-SW-0503

Procedure Title: Water Quality Field Procedure

Applicability: Applies to Duke Energy, Environmental Science Field Programs

Originator: Environmental Science Group

Approval: Zachary Hall – Director Environmental Science

Signature: Z. Hall

Approval Date: 01/06/2021

Effective Date: 01/06/2021

Summary of Changes

Revision Number	Date Revised/Reviewed	Summary of Changes (Include Page Number)	Revision By
0	01/01/2020	New Procedure	J. C. Green
1	01/06/2021	Section 8.1.1-Note added to identify NPDES requirements (pg.4)	J. C. Green
1	01/06/2021	Section 8.1.1.1- D.O. calibration and check updated to incorporate SC specific NDPES monitoring (pg. 4).	J. C. Green
1	01/06/2021	Section 8.1.1.2.1- Instrument manufacturers added (pg.5).	J. C. Green
1	01/06/2021	Section 8.1.1.2.3-Reference to manufacturer guidance for pH calibrations added (pg.5).	J. C. Green
1	01/06/2021	Section 8.1.1.2.5- Section language deleted. Sections 8.1.1.2.5-10 were updated to 8.1.1.2.5-9 after deletion (pg. 6).	J. C. Green
1	01/06/2021	Section 8.1.1.3.1- Instrument manufacturers added (pg. 6).	J. C. Green

1	01/06/2021	Section 8.1.1.3.6- Requirement for NPDES monitoring added (pg. 7).	J. C. Green
1	01/06/2021	Section 8.1.1.4-clarified digital non-NIST devices will be checked annually against an NIST device (pg.7).	J. R. Quinn
1	01/06/2021	Section 12.11-14-References for instrument user manuals added (pg. 10).	J. C. Green
1	01/06/2021	Section 13.4-Criteria for duplicate pH sample recovery added (pg.11).	J. C. Green
1	01/06/2021	Section 13.6-Table added to identify NC/SC specific field certified laboratory methodology and acceptance criteria (pg.11).	J. C. Green
1	01/06/2021	Section 13-Footnote added to clarify acceptance criteria from table in section 13.6 (pg. 11).	J. C. Green
1	01/06/2021	Section 13.7- Added to describe requirement of LCS during SC NPDES specific monitoring for specific conductivity (pg. 11).	J. C. Green
1	01/06/2021	Section 13.8- Added to describe automatic temperature compensation verifications for instruments used to measure specific conductivity (pg. 11).	J. C. Green
1	01/06/2021	Section 13.9-Added to describe annual instrument thermistor checks and criteria (pg. 11).	J. C. Green

Document title

Water Quality Field Procedure

Document number

ESFP-SW-0503

Applies to: Duke Energy – Environmental Science

1.0 Purpose

To obtain representative field data, including but not limited to: water temperature, dissolved oxygen (DO), hydrogen ion activity (pH), specific conductivity, Secchi disk transparency, salinity, turbidity, and photosynthetically active radiation (PAR) as needed to characterize and detect changes in water quality field conditions.

2.0 Forms Referenced in This Procedure

FRM-SW-0502 - Photosynthetically Active Radiation Field Form

3.0 Scope and Frequency

This procedure applies at all times to all field sampling programs in the Environmental Sciences Department that generate water quality data. Water quality monitoring conducted by third parties should be consistent with this procedure. Refer to Site specific study plans or special studies for current year activities.

4.0 Summary of Methods

Water Quality measurement description are detailed in this procedure to ensure collection of accurate, consistent and reliable information. Methods included detail the verification/operation of instrumentation used to quantitatively evaluate physical water conditions and recording of field information to support program objectives.

5.0 Equipment or Apparatus

5.1 Meter(s) probe(s), or sensor(s) measuring field parameters including the following but not limited to: temperature, dissolved oxygen (D.O.), pH, conductivity, and turbidity. This also includes any ancillary equipment or hardware required for use of instruments.

5.2 Data entry form or datalogger, labels, and pencil or pen.

5.3 Secchi disk with graduated line marked at meter and sub-meter increments.

5.4 LI-COR® or equivalent underwater spherical quantum sensor, lowering frame, and quantum/radiometer/photometer.

5.5 National Institute of Standards and Technology (NIST) traceable thermometer.

5.6 Refractometer.

5.7 Meter stick.

5.8 Depth finder/GPS unit.

5.9 First aid kit and AED.

5.10 Nitrile or latex gloves.

5.11 SPOT unit and cell phone.

5.12 Polarized safety sunglasses and safety glasses.

5.13 Coast Guard approved Personal Flotation Device (PFD) and throwable type IV PFD.

5.14 Closed toe non-slip shoes.

5.15 Spare batteries or battery charger.

5.16 Sunscreen and insect repellant.

6.0 Reagent List

6.1 Specific Conductance Standards (0 – 50,000 µS/cm)

6.2 pH Buffer (4.0, 7.0, and 10.0)

6.3 Reagent grade de-ionized water.

6.4 Turbidity Standards (Formazin secondary, gel based).

6.5 Sodium chloride, reagent grade.

6.6 Sodium chloride solution, 10 ppt

Transfer 1.0 $\pm$ 0.10 g of sodium chloride to a 100-ml volumetric flask. Add approximately 50 ml of deionized water and dissolve salt. Dilute to volume (100-ml) with de-ionized water.

6.7 Sodium chloride solution, 20 ppt

Transfer 2.0 $\pm$ 0.10 g of sodium chloride to a 100-ml volumetric flask. Add approximately 50 ml of deionized water and dissolve salt. Dilute to volume with de-ionized water.

6.8 Sodium chloride solution, 30 ppt

Transfer 3.0 $\pm$ 0.10 g of sodium chloride to a 100-ml volumetric flask. Add approximately 50 ml of deionized water and dissolve salt. Dilute to volume with de-ionized water.

7.0 Safety, Limitations, Precautions, and Interferences

7.1 No element of this procedure may supersede the Company’s safety standards and policies. Appropriate safety precautions and personal protective equipment (PPE) should be used when handling chemicals. Refer to Safety Data Sheets for specific descriptions of the physical and chemical properties, physical and health hazards, and precautions for safe handling and use. Formalin is listed as an irritant and potential human carcinogen by the NC Occupational Safety and Health Standards for General Industry. Refer to the Duke Energy Environmental Health and Safety Handbook for guidelines to the proper use of Extremely Hazardous Chemicals.

7.2 Field staff are to ensure all pre and post operational instrument checks or calibrations have been performed for the parameters to be measured. These activities should occur prior to (pre) the collection of the first water quality sample and after collection of the final water quality sample (post).

7.3 Ensure that equipment found to be out of calibration or functioning improperly is promptly evaluated and the validity of data collected with the instrument since the last calibration is determined in coordination with the Site Lead. Management of this corrective action process will be carried out by instrument managers and field personnel.

7.3.1 Laboratory Supervisor or designee

7.3.1.1 Provide water quality instrumentation and equipment that is available to unit personnel for field monitoring or investigative purposes based on calibrations performed according to the frequency given in the instrument calibration procedures section

7.3.1.2 Provide a centralized location for field monitoring equipment and ensure "physical" control over equipment.

7.3.1.4 For instruments that do not electronically store calibrations internally, attach calibration stickers to instruments and include information as follows: calibration due or expiration date, date calibrated, calibration performed by.

7.3.1.5 Ensure that maintenance and repair work are performed as needed and that non-serviceable, uncalibrated, and/or non-functioning equipment is returned to service only after verified repair. Functional instruments are to be stored in centralized equipment storage area.

7.3.1.7 Maintain documentation of calibration records (including signature or initials of the persons performing the calibrations), repair, and instrument usage.

7.3.2 ES Personnel

7.3.2.1 Use of multiparameter instruments by various manufacturers requires user familiarity. Field staff will review operational manuals prior to usage of water quality instruments. Knowledge of recommended factory or user calibration intervals, specific probe tolerance values, and various maintenance operations are critical in collection of accurate data from this type of instrumentation.

7.3.2.2 Perform an operational check or necessary calibration prior to collection of field data.

7.3.2.3 Ensure proper usage, storage and handling of field equipment including transportation to and from laboratory in truck or boat.

7.3.2.4 Perform a post operational check after collection of field data.

7.3.2.5 Ensure that non-serviceable, uncalibrated, and/or non-functioning equipment is removed from service and flagged and/or tagged with a note indicating that the instrument is not to be used. This will include date, initials, and instrument issue/repair needed.

7.3.2.6 Report any damage, malfunction, and/or failure of equipment directly to laboratory supervisor or designee and coordinate to provide prompt evaluation of data collected during field sampling. Do not return malfunctioning instruments to the centralized location.

7.4 All standards will be obtained following the approved chemical control procedure. Standards for all water quality parameters will be within vendor stated expiration date. Expired or used standards will be disposed of properly.

7.5 Calibration or calibration check standards expiration date, and lot numbers will be documented based on specific parameters.

8.0 Procedure

8.1 Calibration Checks and Calibrations of field equipment (pre and post trip)

8.1.1 Multiparameter Instrument Calibration Check/Calibration

NOTE: Pre-sampling calibrations and post calibration checks must be performed each day prior to making field measurements for NPDES compliance monitoring. For South Carolina compliance monitoring calibrations must be conducted at the certified laboratory.

8.1.1.1 Check and Calibration of Dissolved Oxygen (D.O.)

8.1.1.1.1 Refer to instrument manufacturer calibration instructions (In-situ, YSI, or Hydrolab) for dissolved oxygen. At a minimum, either 100 % saturated air or water calibrations will be performed based on manufacturer instructions for specific instrumentation.

8.1.1.1.2 Determination of accuracy and or need for calibration will be conducted by placing the DO probe in 100% saturated air or 100% saturated water.

8.1.1.1.3 Document the barometric pressure and instrument temperature. If check or calibration occurs at altitude, barometric pressure-corrected values should be used to correct for elevation above sea level.

8.1.1.1.4 Document instrument conductivity for calibration/checks if calculating known dissolved oxygen concentration for saturated water.

NOTE: An excel spreadsheet is utilized to calculate predicted dissolved oxygen concentrations (mg/l) in water based on USGS DO solubility reference tables . The spreadsheet will be checked annually for accuracy against USGS values.

8.1.1.1.5

AIR CALIBRATION – Ensure the dissolved oxygen probe is dry by carefully blotting the measuring surface with a lint free wipe. Place the probe in the calibration cup with sufficient moisture to enable air saturation.

WATER CALIBRATION – Ensure the dissolved oxygen and temperature sensors are fully immersed in air-saturated water.

8.1.1.1.6 Allow the instrument to equilibrate until the dissolved oxygen % saturation is stable based on manufacturer specifications.

8.1.1.1.7 For non-NPDES compliance related monitoring: if the % saturation is between 98.0% and 102.0%, no calibration is needed. Document the % saturation reading from the instrument and move to the next parameter to be checked.

8.1.1.1.8 For NPDES compliance related monitoring OR If the % saturation is outside of 98.0% - 102.0% for non-NPDES compliance related monitoring: follow the calibration procedure in the instrumentation manual and document the new % saturation and calibration values accordingly (8.2.4).

8.1.1.1.9 For South Carolina NPDES compliance related monitoring, a laboratory control standard (LCS) and an LCS duplicate (LCSD) must be analyzed to verify calibration prior to field analysis. The LCS and LCSD must be within 98.0% - 102.0% of the calibrated value

8.1.1.2 Check and Calibration of pH

8.1.1.2.1 Refer to instrument manufacturer calibration procedures (In-situ, YSI, or Hydrolab) for pH. Initial daily calibrations are required for all NPDES permit required monitoring.

8.1.1.2.2 Inspect the status of the pH probe. If the glass bulb at the end of the probe is cloudy or damaged, or if the probe body is cracked or broken, replace the probe.

8.1.1.2.3 Three-point checks or calibrations are to be performed using traceable pH standards (values 4.0, 7.0, 10.0) according to manufacturer instructions.

8.1.1.2.4 Prior to recording instrument values for individual check or calibration reference standards, probes should be rinsed with deionized water, then triple rinsed with fresh respective pH standard 4.0, 7.0, or 10.0.

8.1.1.2.5 Fresh standards should be used to obtain values for calibration. Record values after pH readings have stabilized.

8.1.1.2.6 Calibration is required if NPDES permit required monitoring is to be performed or if measured pH readings deviate from the standard by more than 0.2 pH units for other monitoring. Follow calibration instructions in the instrumentation manual and document post-calibration pH values accordingly (8.2.4).

8.1.1.2.7 Calibration must be verified with a known traceable 7.0 pH reference standard prior to collection of field data. Standard verification results must be with 0.1 pH units of the known standard value to be accepted. If standard values are outside this range corrective action should be taken to identify instrument or calibration process deficiencies.

8.1.1.2.8 A calibration check must be conducted after every ten samples using a traceable pH standard when NPDES sampling is being performed.

8.1.1.2.9 Post check verification values are recorded after daily sampling activities are conducted. Values for 4.0, 7.0, and 10.0 standards are to be within 0.1 pH units for NPDES permit required monitoring, or 0.2 pH units for other monitoring.

8.1.1.3 Check and Calibration of Specific Conductivity

8.1.1.3.1 Refer to instrument manufacturer calibration procedures for conductivity (In-situ, YSI, or Hydrolab).

8.1.1.3.2 Inspect the operational condition of the conductivity probe (i.e cracks, film, fouling etc.).

8.1.1.3.3 Perform a zero check in air. Rinse the conductivity probe with de-Ionized water and blot the probe dry with lint free paper. Value should read 0.0 µS/cm. Record the specific conductance value in the appropriate format.

8.1.1.3.4 Triple rinse the conductivity probe with fresh traceable reference standard (typically 150 µS/cm for inland waters).

8.1.1.3.5 Place the probe in the calibration cup containing fresh standard. Record the specific conductance value in the appropriate format.

8.1.1.3.6 Calibration is required for NPDES permit required monitoring and if the at check, the measured specific conductance (µS/cm) deviates from the standard by more than 10%. Follow the calibration procedure in the instrument manual and document post-calibration values in the appropriate format (8.2.4).

8.1.1.4 Check of Non-NIST Digital Thermistors for Temperature (annually, at a minimum)

8.1.1.4.1 Inspect the operational condition of the temperature probe.

8.1.1.4.2 Immerse the temperature probe into a bucket of water alongside a NIST certified temperature probe and allow for equilibration. Record the temperature readings from both instruments in the appropriate format (8.2.4).

8.1.1.4.3 If the temperature value deviates from the NIST certified probe by more than 0.2°C, condition of the probe should be checked prior to collection of field data. Differences of 0.5 °C or greater require replacement of the temperature probe.

8.1.2 Calibration Check/Calibration of Turbidity

8.1.2.1 Follow procedure ESFP-SW-0500.

8.1.3 Calibration Check of Refractometers (Salinity)

8.1.3.1 Ensure the refractometer is clean and no scratches are present on the lenses.

8.1.3.2 Triple rinse the refractometer with De-Ionized water and zero the instrument if necessary.

8.1.3.3 Triple rinse the refractometer with salinity standard solution (10ppt) and place a small amount of solution on the sensor and record the salinity values in the appropriate format.

8.1.3.4 Triple rinse the refractometer with salinity standard solution (20ppt) and place a small amount of solution on the sensor and record the salinity values in the appropriate format.

8.1.3.5 Triple rinse the refractometer with salinity standard solution (30ppt) and place a small amount of solution on the sensor and record the salinity values in the appropriate format.

8.1.3.6 Discard the refractometer if the salinity values deviate from the standards by more than 10%.

8.1.4 Calibration Check of Photosynthetically Active Radiation (PAR)

8.1.4.1 Inspect the functionality and integrity of the sampling device.

8.1.4.2 An annual calibration is conducted by the manufacturer. Calibration verification information is stored electronically for reference.

8.1.5 Calibration Check of Secchi depth cable

8.1.5.1 Validate the distance markings on the depth cable annually and record. Verify markings are clear and discernable prior to each field usage. Validation information is stored electronically for reference.

8.1.6 Calibration Check of NIST thermometer

8.1.6.1 Inspect the temperature probe for damage and sufficient battery life for field usage.

8.1.6.2 Calibration of NIST thermometers performed annually by a third party. Calibration verification information is stored electronically for reference.

8.2 Collection of water quality data

8.2.1 Record information specific to various programs or studies including but not limited to: site location code, date, sampler identification, station, weather conditions, instrument number, time of sample collection (military format). All information is recorded in an appropriate format enabling consistent and accurate tracking and verification of samples during and after collection (electronic format preferred).

8.2.2 To record water quality parameter values such as D.O., pH, specific conductivity, or temperature, lower the multiparameter meter to surface depth to collect data. Allow time for the instrument to equilibrate and record measurements. Single point surface measurements collected in flowing water should be collected at this depth. Vertical profile water quality data should be collected at intervals described in specific study plans.

8.2.3 To record PAR data the spherical quantum sensor and lowering frame are held just above the surface of the water on the sun-lit side of the boat or stream for a measurement of the amount of incident (I_o) light that is reaching the water surface. Photosynthetically active radiation is measured based on site specific study plan or site depth. Data are recorded on the Photosynthetically Active Radiation Field Form (FRM-SW-0502).

8.2.4 Equilibration time is allowed at each depth. Values recorded are as follows:

Temperature	to the nearest 0.1 (°C)
D.O.	to the nearest 0.1 (mg/L)
pH	to the nearest 0.1 (standard unit)
Conductivity	to the nearest 1.0 (μmho/cm)
Salinity	to the nearest 0.1 (ppt)
PAR	to the nearest 0.01 (μE/sec/m^2)

Turbidity	to the nearest 0.05	@ 0-1 (NTU)
	to the nearest 0.1	@ 1-10 (NTU)
	to the nearest 1.0	@ 10-40 (NTU)
	to the nearest 5.0	@ 40-100 (NTU)
	to the nearest 10	@ 100-400 (NTU)
	to the nearest 50	@ 400-1000 (NTU)
	to the nearest 100	@ >1000 (NTU)

8.2.5 The bottom sample depth is recorded by rounding to the nearest meter.

8.2.6 Secchi disk depth is read at each reservoir station or as required by the current monitoring program. Record Secchi disk depth to the nearest 0.1 m. Measurements should be an average of two readings – first when the disk disappears and the second when the disk reappears as it is being raised. In addition, measurements should be recorded on the shaded (and if possible, leeward) side of the boat without the use of sunglasses.

8.2.7 Procedure discrepancies occurring in the field should be noted on the data sheet or in the comments section of data logging device.

9.0 Calculations

N/A

10.0 Results

Collected field data may be recorded electronically (preferred) or in field notebooks. Hard copy data will be transferred to a digital format following the appropriate QA protocol (see section 13.4). Electronic field data will be loaded to an electronic data storage system for end user analysis.

11.0 Definitions

Calibration Check – Comparison of measured values to known traceable standard.

Calibration – An adjustment made to the instrumentation to bring measured values of known traceable standards within approved/acceptable tolerances.

Operation Check – Ensuring an instrument has power and that measured values are stable without comparing it to known standards.

Multiparameter Instrument – An instrument capable of measuring multiple water quality parameters simultaneously by way of multiple specific probes.

Water Quality – A measured quantitative value generated by an instrument or device that is representative of a physical water condition (water temperature, DO, pH, conductivity, Secchi disk transparency depth, salinity, and PAR)

Surface – An area of the water column beginning at the air water interface and extending down to 0.30 meters in depth.

12.0 References

12.1 LI-COR® instruction manual LI-250 quantum/radiometer/photometer. LI-COR Incorporated, 4421 Superior St., P. O. Box 4425, Lincoln, NE 68504.

12.2 Lind, O. T. 1974. Handbook of common methods in limnology. C. V. Mosby Co., St. Louis, MO.

12.3 American Public Health Association, Standard Methods for the Examination of Water and Wastewater, 22nd Edition 2012, 1015 Fifteenth St., NW, Washington, DC 20005.

12.7 Hach 2100Q and 2100Q*is* User Manual, DOC022.53.80041, 12/2017, Edition 4, HACH COMPANY World Headquarters P.O. Box 389, Loveland, CO 80539-0389 U.S.A.

12.8 North Carolina Wastewater/Groundwater Laboratory Certification Approved Procedure for the Analysis of pH, 15A NCAC 2H .0805 (a) (6) (F) and (g) (3).

12.9 North Carolina Wastewater/Groundwater Laboratory Certification Approved Procedure for the Analysis of Temperature, 15A NCAC 2H .0805 (a) (6) (F) and (g) (3).

12.10 North Carolina Wastewater/Groundwater Laboratory Certification Approved Procedure for the Analysis of Specific Conductance (Conductivity), 15A NCAC 2H .0805 (a) (6) (F) and (g) (3).

12.11 Aqua TROLL®600 Multiparameter Sonde Operator’s Manual. 0096402 / 2019-09-04, In-Situ, 221 East Licoln Avenue, Fort Collins, Co 80524, U.S.A.

12.12 Hydrolab HL Series Sonde User Manual. 04/2017, Edition 2, OTT Hydromet, 5600 Lindbergh Dr., Loveland, CO 80538, U.S.A.

12.13 6-Series Multiparameter Water Quality Sondes User Manual. Item# 069300 Revision J, March 2012, YSI Incorporated, 1700/1725 Brannum Lane, Yellow Springs, Ohio, 45387 U.S.A

12.14 Professional Plus User Manual. Item# 605596 Rev D, March 2009, YSI Incorporated, 1700/1725 Brannum Lane, Yellow Springs, Ohio, 45387 U.S.A

13.0 Quality Control

13.1 Qualified personnel are responsible for briefing personnel on sample collection, study objectives, and sampling locations.

13.2 All project area stations will be sampled on the same day if possible.

13.3 If data are collected in field notebooks and transferred to a digital format, the newly created digital file must be verified by a second party to ensure the data has been transcribed accurately.

13.4 South Carolina NPDES specific: for samples not analyzed *in-situ*, a sample duplicate must be analyzed with each batch of 20 or fewer samples and must recover within the laboratory’s acceptance criteria (± 0.2 SU of the first sample aliquot for pH, 10% of known standard value for specific conductivity) when conducting NPDES sampling in South Carolina.13.5 South Carolina NPDES specific: personnel conducting water quality field collection in South Carolina waters for NPDES related monitoring will participate in initial demonstration of capability (IDOC), and continuing demonstration of capability (CDOC) for variables included as certified field laboratory parameters.

13.6 NPDES Specific Conditions

Parameter	North Carolina Specific Methods	South Carolina Specific Methods	Standard	Acceptance Criteria[1]
Temperature	SM 2550 B-2010 USGS Method 1975	SM 2550 B-2010	NIST-traceable device	*Annual temperature accuracy verification*: ±0.2 °C of NIST device temperature
Dissolved Oxygen	ASTM 0888-09 (C) ASTM 0888-05 HACH 10360 SM 4500-O C-2011 SM 4500-O G-2011	ASTM 0888-09 (C)	Water-saturated air, or air-saturated water	LCS/LCSD within 98 - 102 % of theoretical saturation concentration
Specific Conductance	SM 2510 B-2011 SW-846 9050A	SM 2510 B-2011	NIST-traceable KCl standard	±10% of standard LFB or CCV value
pH	SM 4500-H B-2011 SW-846 9040 C SW-846 9045 D	SM 4500-H B-2011	NIST-traceable buffers	±0.1 pH units of buffer value for calibration or check, ±0.2 pH units for duplicate

13.7 South Carolina NPDES specific: for specific conductivity samples not analyzed *in-situ*, a laboratory control sample (LCS) must be analyzed after every 10 samples and at the end of each analysis batch.

13.8 Specific conductivity instrument automatic temperature compensation will be verified before initial use and annually for equipment used to perform NPDES monitoring. Verification will be performed by analyzing standards which bracket observed temperature conditions where samples are to be collected, and a third temperature of 25° C. All standards measured at, above, or below 25° C must be within 10% of the true value of the standard. Equipment not meeting these criteria will be taken out of service for corrective action.

13.9 Initial and annual temperature verification will be performed on non-NIST thermometers. Comparison of a minimum of two temperature conditions which bracket field sample conditions will be performed for any instrument involved in water quality data collection. All temperatures measured must be within ± 0.2 °C of a certified NIST device. Equipment not meeting criteria will be taken out of service for corrective action

1 The calibration acceptance criteria shown are based on NC and SC lab certification requirements and may in certain cases be modified by study plan-specific criteria, but only for studies that **are not** NPDES compliance-related. All compliance data must meet the criteria in this table. Consult applicable study plans for further details.

Procedure Number: ESFP-SW-0504

Procedure Title: Water Chemistry Field Sample Collection

Applicability: Applies to Duke Energy, Environmental Science Field Programs

Originator: Environmental Science Group

Approval: Zachary Hall – Director Environmental Science

Signature:

Approval Date: 01/01/2020

Effective Date: 01/01/2020

Summary of Changes

Revision Number	Date Revised/Reviewed	Summary of Changes (Include Page Number)	Revision By
0	01/01/2020	New Procedure	J.C. Green

Water Chemistry Sampling Procedure

Document number

ESFP-SW-0504

Applies to: Duke Energy – Environmental Science

1.0 Purpose

To provide representative, viable water chemistry samples as needed to allow for various characterizations of waterbodies associated.

2.0 Forms Referenced in This Procedure

Sample chain of custody forms for various programs.

3.0 Scope and Frequency

This procedure applies to field sampling programs in the Environmental Sciences Department that generate water chemistry data. Water chemistry sampling conducted by third parties should be consistent with this procedure. Refer to location specific study plans for current year.

4.0 Summary of Methods

Water samples are collected in an appropriate manner depending on analyte requirements. Samples are placed in labeled containers, preserved according to current analytical methodology, and sent to a laboratory within holding times for various analysis. A sample chain of custody is generated and maintained as required.

5.0 Equipment or Apparatus

5.1 Cooler, and ice.

5.2 Sample bottles containing appropriate preservatives as required for analysis.

5.3 Nonmetallic, subsurface water bottle sampler.

5.4 Data entry form or labels, and pencil or pen.

5.5 Depth finder/GPS unit.

5.6 Peristaltic pump with power supply.

5.7 Individually bagged pump tubing (Tygon® or equivalent for pump, HDPE for collection segment).

5.8 High capacity, 0.45 µm cartridge filters (meets analytical requirements).

5.9 Powder-free Nitrile, polyethylene, vinyl or latex disposable gloves.

5.10 First aid kit and AED.

5.11 SPOT unit and cell phone.

5.12 Polarized safety sunglasses and safety glasses.

5.13 Coast Guard approved Personal Flotation Device (PFD) and throwable type IV PFD.

5.14 Closed toe non-slip shoes.

5.15 Spare batteries or battery charger.

5.16 Wide range (0-14) pH test strips.

5.17 Nonmetallic bridge sampling basket.

5.18 Spare sample bottle kit.

5.19 Field Computer and portable media storage.

6.0 Reagent List

6.1 De-ionized reagent grade water.

6.2 Laboratory grade detergent (Liquinox® or equivalent).

6.3 Preservatives as defined in Figure 1.

7.0 Safety, Limitations, Precautions, and Interferences

7.1 No element of this procedure may supersede the Company's safety standards and policies. Appropriate safety precautions and personal protective equipment (PPE) should be used when handling chemicals. Refer to Safety Data Sheets for specific descriptions of the physical and chemical properties, physical and health hazards, and precautions for safe handling and use. Formalin is listed as an irritant and potential human carcinogen by the NC Occupational Safety and Health Standards for General Industry. Refer to the Duke Energy Environmental Health and Safety Handbook for guidelines to the proper use of Extremely Hazardous Chemicals.

7.2 Surface samples are collected just below the surface to avoid collecting surface film.

7.3 If a preserved sample is spilled or the bottle is overfilled, the sample must be tested for appropriate pH level and discarded/ recollected if samples are not adequately preserved. pH testing is done by pouring a small amount of sample over the strip, not by inserting the strip into the sample container.

7.4 Samples should be collected, handled, and transferred to the minimum extent possible to reduce contamination. **Direct dip method** is preferred when possible to minimize the contact of sample from multiple containers.

7.5 Samples collection time should be recorded as identical to water quality condition collection time unless times are outside of 15 minutes.

7.6 Sample chain of custody sheets are maintained, and all pertinent information will be filled out accurately and completely. Store all water chemistry samples using appropriate preservation techniques, and in a manner that maintains secure custody and relinquish to the laboratory as soon as possible to avoid exceeding sample holding times.

7.7 Location characteristics should be evaluated prior to any sample collection in order to prevent sample contamination due to various factors. Special consideration should be given to Low Level Mercury and other low-level metals sample collection. See procedure ESFP-SW-0502 for details on this specific process prior to sampling.

Examples of unfavorable conditions include but are not limited to: material spills nearby, leaking fuel/oil from boat motors, or pesticide/herbicide spraying near the sampling location. If samples are collected during atypical conditions. details should be included on field records and chain of custody to provide clarification on analytical results if needed.

7.8 Prior to sampling trip ensure that the appropriate number and type of sample containers are included in field gear. This includes appropriate labels for location/analyte identification and preservatives.

8.0 Procedure

8.1 Navigate to the sampling location. Using GPS or other landmark, to verify location.

8.2 Sampling personnel will put on new gloves prior to sample collection or handling of sampling equipment. If gloves are contaminated during use they will be replaced with a new pair. New gloves will be used at each individual sampling location.

8.3 Sampling locations should be visited in a manner that initiates the sampling day at the least contaminated location and progresses towards the most potentially contaminated location when possible. Sampling of spatial composite locations is to be performed in the same manner from least to most known contaminated areas.

8.4 Label sample container with the sample number, location code, station code, date, and depth using waterproof marking pen. If sample bottles are pre-labeled, verify location information prior to collection.

8.5 Non-preserved sample containers and sampling devices will be rinsed a minimum of two times with site water prior to filling the sample container. Bottles containing preservatives must not be rinsed prior to filling. Care must be taken not to overfill the bottle as preservative may be lost or diluted.

8.2.1 If direct dip method is used to collect grab samples, always collect the sample with the container opening facing upstream to avoid contamination from gloves. If no current is present, use a forward sweeping motion to avoid backflow of water from around the sample bottle. Sample containers should be immersed under the air water interface during collection of surface samples to avoid surface films or scum.

8.2.2 If a sampling device is used to collect grab samples, the water sample is transferred from the sampler into the sample containers and capped securely. The samples should be sealed as soon as possible with the minimal amount of entrained air to prevent oxidative changes.

8.3 Various parameters require specific sample bottles, volume of sample, or sampling technique such as no airspace in the sampling container, or other special considerations to ensure proper preservation. See Figure 1. or refer to analyte methodology for information on specific requirements.

8.4 Sampling equipment will be inspected for integrity and potential contaminants prior to field usage. If cleaning is needed a non-phosphorous detergent must be used followed by a thorough rinse using de-ionized reagent grade water. Samplers are to be suspended with accurately marked nylon rope to ensure proper sampling depth. When collecting samples from bridges or roadways, ensure that rope used to suspend the sampler does not contact railings or other structures which could result in contamination.

8.4.1 Van Dorn style samplers are typically used to collect discrete depth grab samples from a specific depth in the water column. Refer to user manual for proper use and sample collection techniques. Bottom samples are collected ~ 0.5 m from bottom. If silt or sediment appears in sample or if sampling gear does not properly seal, sample must be discarded and recollected.

8.4.2 Integrated Depth Sampler (IDS) may be used to collect both discrete grab and spatial composite samples of the water. When used for collection of spatial photic zone composite sampling, the IDS is lowered through the water column at a consistent rate to a depth equal to twice the secchi depth, and returned to the surface at the same rate. If the sampler fills prior to being returned to the surface, the sampler must be emptied and the photic zone resampled to ensure proper collection.

8.5 Samples requiring In-Field sample filtration will be filtered immediately on location as conditions allow. Secondary collection devices may be used to obtain designated depth samples when filtration is required.

8.5.1 Battery powered peristaltic pumps are preferred for field filtered samples. If location conditions do not allow for immediate on-site field filtration, filtration may occur at a more appropriate location within 15 minutes of sample collection.

8.5.2 A length of new, unused pump tubing should be placed in the pump head and secured to a longer length of HDPE sample tubing to be placed at the designated sampling depth.

8.5.3 Prior to filling sample bottles, pump tubing and filter (if needed) will be flushed for a minimum 20 seconds.

8.5.4 When filtered samples are being collected, attach a new unused 0.45 µm cartridge filter to the outlet end of the pump tubing. Turn the pump on and orient the outlet end of the filter (directional) up to allow air to be purged. After flushing as described in step 8.5.3, fill sample bottles according to steps 8.2.1 and 8.2.2.

8.5.5 After all samples have been collected at a location, discard the tubing and filter. New tubing and filters are to be used at each location, and should remain bagged until use.

8.6 Samples require appropriate temperature and chemical preservation, and tracking.

8.6.1 Samples are placed into location specific sealed bags and immediately stored on ice for transport to the analytical laboratory. If samples are not sent immediately to an analytical lab, they may be stored at a consistent temperature of <6°C.

8.6.2 Samples submitted to a laboratory must be accompanied by a chain of custody. A chain of custody will be maintained during sample transfer. Pertinent information will be filled out accurately and completely according to ESFP-AD-0102.

9.0 Calculations

N/A

10.0 Results

Samples collected are sent to an analytical chemistry laboratory for analysis. Results are placed on computer master file to be utilized in annual reports and/or as requested.

11.0 Definitions

Grab sample – Sample collected at a discrete depth and time.

Composite Sample – Sample collected at 2 or more specified locations or times used to represent a spatial or temporal average.

12.0 References

12.1 American Public Health Association, Standard Methods for the Examination of Water and Waste water, 19th Edition 1995, 1015 Fifteenth St., NW, Washington, DC 20005.

12.2 US Government Printing Office. 201. Code of Federal Regulations. Part 136 Guidelines Establishing Test Procedures For the Analysis of Pollutants. CFR §136 Identification of Test Procedures. April 16, 2019, National Archives and Records Administration, Washington, D.C.

12.3 Intensive Survey Branch Standard Operating Procedures Manual: Physical and Chemical Monitoring, Version 2.1, December 2013, NC Department of Environment and Natural Resources, Division of Water Resources, Environmental Sciences Section.

12.4 Region 4, U.S. Environmental Protection Agency (USEPA) Science and Ecosystem Support Division, Athens, G.A., Operating Procedure, Surface Water Sampling, No. SESDPROC-201-R3, February 28, 2013.

13.0 Quality Control

13.1 Split Samples

Samples representing the same aliquot of the waterbody sampled which are typically used for evaluating sample handling and analytical processes of the recipients of splits samples. When collecting these samples, complete homogenization of samples should occur before samples are dispensed into separate containers.

13.2 Duplicate Samples

Duplicate samples are collected as required by study design to evaluate

sample collection and preservation procedures. Duplicate samples are collected in a manner that minimizes changing site conditions while representing all aspects of sample collection.

13.3 Trip Blank

Trip blanks are used to evaluate storage and transport conditions of field samples. These should be treated as normal samples and not be opened in the field. Sample containers are pre-filled with reagent grade water that is transported into the field during sample collection activities, and is stored alongside samples in appropriate storage containers.

13.4 Equipment Blank

Equipment blanks are to be used in evaluation of sampling gear and equipment. Samples are exposed to reagent grade water which is then collected into sample bottles, preserved accordingly and delivered to an analytical lab for analysis.

13.5 Filter Blank

Filter blanks are used to assess the potential for contamination during the sample filtration process. Reagent grade water is processed through a filter in the same manner as a sample and then preserved according to analyte requirements.

13.6 Field Blank

Field Blanks are used to assess site or field conditions experienced during sampling. Samples are exposed to the same conditions as the sample, opened in the field.

13.7 Temperature Blank

Temperature Blanks are vials of water that accompany the samples that will be opened and tested upon arrival at the laboratory to ensure that the temperature of the contents of the sampling shipping container was within the required 6°C ± 2°.

13.8 Site or Trip lead should instruct personnel taking samples in the proper methods, QA sample frequency, and station locations.

13.9 Sample holding times vary among analytical procedures. Refer to Figure 1. Or contact analytical laboratory for specific hold time and preservative requirements.

FIGURE 1. CFR §136, 136.3

TABLE II—REQUIRED CONTAINERS, PRESERVATION TECHNIQUES, AND HOLDING TIMES

Parameter number/name	Container[1]	Preservation[2,3]	Maximum holding time[4]
Table IA—Bacterial Tests			
1-5. Coliform, total, fecal, and *E. coli*	PA, G	Cool, <10 °C, 0.008% $Na_2S_2O_3$[5]	8 hours.[22,23]
6. Fecal streptococci	PA, G	Cool, <10 °C, 0.008% $Na_2S_2O_3$[5]	8 hours.[22]
7. Enterococci	PA, G	Cool, <10 °C, 0.008% $Na_2S_2O_3$[5]	8 hours.[22]
8. *Salmonella*	PA, G	Cool, <10 °C, 0.008% $Na_2S_2O_3$[5]	8 hours.[22]
Table IA—Aquatic Toxicity Tests			
9-12. Toxicity, acute and chronic	P, FP, G	Cool, ≤6 °C[16]	36 hours.
Table IB—Inorganic Tests			
1. Acidity	P, FP, G	Cool, ≤6 °C[18]	14 days.
2. Alkalinity	P, FP, G	Cool, ≤6 °C[18]	14 days.
4. Ammonia	P, FP, G	Cool, ≤6 °C,[18] H_2SO_4 to pH <2	28 days.
9. Biochemical oxygen demand	P, FP, G	Cool, ≤6 °C[18]	48 hours.
10. Boron	P, FP, or Quartz	HNO_3 to pH <2	6 months.
11. Bromide	P, FP, G	None required	28 days.
14. Biochemical oxygen demand, carbonaceous	P, FP G	Cool, ≤6 °C[18]	48 hours.
15. Chemical oxygen demand	P, FP, G	Cool, ≤6 °C,[18] H_2SO_4 to pH <2	28 days.
16. Chloride	P, FP, G	None required	28 days.
17. Chlorine, total residual	P, G	None required	Analyze within 15 minutes.
21. Color	P, FP, G	Cool, ≤6 °C[18]	48 hours.
23-24. Cyanide, total or available (or CATC) and free	P, FP, G	Cool, ≤6 °C,[18] NaOH to pH >10,[5,6] reducing agent if oxidizer present	14 days.
25. Fluoride	P	None required	28 days.
27. Hardness	P, FP, G	HNO_3 or H_2SO_4 to pH <2	6 months.
28. Hydrogen ion (pH)	P, FP, G	None required	Analyze within 15 minutes.
31, 43. Kjeldahl and organic N	P, FP, G	Cool, ≤6 °C,[18] H_2SO_4 to pH <2	28 days.
Table IB—Metals[7]			
18. Chromium VI	P, FP, G	Cool, ≤6 °C,[18] pH = 9.3-9.7[20]	28 days.

35. Mercury (CVAA)	P, FP, G	HNO_3 to pH <2	28 days.
35. Mercury (CVAFS)	FP, G; and FP-lined cap[17]	5 mL/L 12N HCl or 5 mL/L BrCl[17]	90 days.[17]
3, 5-8, 12, 13, 19, 20, 22, 26, 29, 30, 32-34, 36, 37, 45, 47, 51, 52, 58-60, 62, 63, 70-72, 74, 75. Metals, except boron, chromium VI, and mercury	P, FP, G	HNO_3 to pH <2, or at least 24 hours prior to analysis[19]	6 months.
38. Nitrate	P, FP, G	Cool, ≤6 °C[18]	48 hours.
39. Nitrate-nitrite	P, FP, G	Cool, ≤6 °C,[18] H_2SO_4 to pH <2	28 days.
40. Nitrite	P, FP, G	Cool, ≤6 °C[18]	48 hours.
41. Oil and grease	G	Cool to ≤6 °C,[18] HCl or H_2SO_4 to pH <2	28 days.
42. Organic Carbon	P, FP, G	Cool to ≤6 °C,[18] HCl, H_2SO_4, or H_3PO_4 to pH <2	28 days.
44. Orthophosphate	P, FP, G	Cool, to ≤6 °C[18 24]	Filter within 15 minutes; Analyze within 48 hours.
46. Oxygen, Dissolved Probe	G, Bottle and top	None required	Analyze within 15 minutes.
47. Winkler	G, Bottle and top	Fix on site and store in dark	8 hours.
48. Phenols	G	Cool, ≤6 °C,[18] H_2SO_4 to pH <2	28 days.
49. Phosphorous (elemental)	G	Cool, ≤6 °C[18]	48 hours.
50. Phosphorous, total	P, FP, G	Cool, ≤6 °C,[18] H_2SO_4 to pH <2	28 days.
53. Residue, total	P, FP, G	Cool, ≤6 °C[18]	7 days.
54. Residue, Filterable	P, FP, G	Cool, ≤6 °C[18]	7 days.
55. Residue, Nonfilterable (TSS)	P, FP, G	Cool, ≤6 °C[18]	7 days.
56. Residue, Settleable	P, FP, G	Cool, ≤6 °C[18]	48 hours.
57. Residue, Volatile	P, FP, G	Cool, ≤6 °C[18]	7 days.
61. Silica	P or Quartz	Cool, ≤6 °C[18]	28 days.
64. Specific conductance	P, FP, G	Cool, ≤6 °C[18]	28 days.
65. Sulfate	P, FP, G	Cool, ≤6 °C[18]	28 days.
66. Sulfide	P, FP, G	Cool, ≤6 °C,[18] add zinc acetate plus sodium hydroxide to pH >9	7 days.
67. Sulfite	P, FP, G	None required	Analyze within 15 minutes.
68. Surfactants	P, FP, G	Cool, ≤6 °C[18]	48 hours.
69. Temperature	P, FP, G	None required	Analyze within 15 minutes.

73. Turbidity	P, FP, G	Cool, ≤6 °C[18]	48 hours.
Table IC—Organic Tests[8]			
13, 18-20, 22, 24, 25, 27,28, 34-37, 39-43, 45-47, 56, 76, 104, 105, 108-111, 113. Purgeable Halocarbons	G, FP-lined septum	Cool, ≤6 °C,[18] 0.008% $Na_2S_2O_3$,[5] HCl to pH 2	14 days.
26. 2-Chloroethylvinyl ether	G, FP-lined septum	Cool, ≤6 °C,[18] 0.008% $Na_2S_2O_3$[5]	14 days.
6, 57, 106. Purgeable aromatic hydrocarbons	G, FP-lined septum	Cool, ≤6 °C,[18] 0.008% $Na_2S_2O_3$,[5] HCl to pH 2[9]	14 days.[9]
3, 4. Acrolein and acrylonitrile	G, FP-lined septum	Cool, ≤6 °C,[18] 0.008% $Na_2S_2O_3$, pH to 4-5[10]	14 days.[10]
23, 30, 44, 49, 53, 77, 80, 81, 98, 100, 112. Phenols[11]	G, FP-lined cap	Cool, ≤6 °C,[18] 0.008% $Na_2S_2O_3$	7 days until extraction, 40 days after extraction.
7, 38. Benzidines[11] [12]	G, FP-lined cap	Cool, ≤6 °C,[18] 0.008% $Na_2S_2O_3$[5]	7 days until extraction.[13]
14, 17, 48, 50-52. Phthalate esters[11]	G, FP-lined cap	Cool, ≤6 °C[18]	7 days until extraction, 40 days after extraction.
82-84. Nitrosamines[11] [14]	G, FP-lined cap	Cool, ≤6 °C,[18] store in dark, 0.008% $Na_2S_2O_3$[5]	7 days until extraction, 40 days after extraction.
88-94. PCBs[11]	G, FP-lined cap	Cool, ≤6 °C[18]	1 year until extraction, 1 year after extraction.
54, 55, 75, 79. Nitroaromatics and isophorone[11]	G, FP-lined cap	Cool, ≤6 °C,[18] store in dark, 0.008% $Na_2S_2O_3$[5]	7 days until extraction, 40 days after extraction.
1, 2, 5, 8-12, 32, 33, 58, 59, 74, 78, 99, 101. Polynuclear aromatic hydrocarbons[11]	G, FP-lined cap	Cool, ≤6 °C,[18] store in dark, 0.008% $Na_2S_2O_3$[5]	7 days until extraction, 40 days after extraction.
15, 16, 21, 31, 87. Haloethers[11]	G, FP-lined cap	Cool, ≤6 °C,[18] 0.008% $Na_2S_2O_3$[5]	7 days until extraction, 40 days after extraction.
29, 35-37, 63-65, 107. Chlorinated hydrocarbons[11]	G, FP-lined cap	Cool, ≤6 °C[18]	7 days until extraction, 40 days after extraction.
60-62, 66-72, 85, 86, 95-97, 102, 103. CDDs/CDFs[11]	G	See footnote 11	See footnote 11.
Aqueous Samples: Field and Lab Preservation	G	Cool, ≤6 °C,[18] 0.008% $Na_2S_2O_3$,[5] pH <9	1 year.
Solids and Mixed-Phase Samples: Field Preservation	G	Cool, ≤6 °C[18]	7 days.
Tissue Samples: Field Preservation	G	Cool, ≤6 °C[18]	24 hours.
Solids, Mixed-Phase, and Tissue Samples: Lab Preservation	G	Freeze, ≤−10 °C	1 year.

114-118. Alkylated phenols	G	Cool, <6 °C, H_2SO_4 to pH <2	28 days until extraction, 40 days after extraction.
119. Adsorbable Organic Halides (AOX)	G	Cool, <6 °C, 0.008% $Na_2S_2O_3$, HNO_3 to pH <2	Hold *at least* 3 days, but not more than 6 months.
120. Chlorinated Phenolics	G, FP-lined cap	Cool, <6 °C, 0.008% $Na_2S_2O_3$, H_2SO_4 to pH <2	30 days until acetylation, 30 days after acetylation.
Table ID—Pesticides Tests			
1-70. Pesticides[11]	G, FP-lined cap	Cool, ≤6 °C,[18] pH 5-9[15]	7 days until extraction, 40 days after extraction.
Table IE—Radiological Tests			
1-5. Alpha, beta, and radium	P, FP, G	HNO_3 to pH <2	6 months.
Table IH—Bacterial Tests			
1-4. Coliform, total, fecal	PA, G	Cool, <10 °C, 0.008% $Na_2S_2O_3$[5]	8 hours.[22 23]
5. *E. coli*	PA, G	Cool, <10 °C, 0. 008% $Na_2S_2O_3$[5]	8 hours.[22]
6. Fecal streptococci	PA, G	Cool, <10 °C, 0.008% $Na_2S_2O_3$[5]	8 hours.[22]
7. Enterococci	PA, G	Cool, <10 °C, 0. 008% $Na_2S_2O_3$[5]	8 hours.[22]
Table IH—Protozoan Tests			
8. *Cryptosporidium*	LDPE; field filtration	1-10 °C	96 hours.[21]
9. *Giardia*	LDPE; field filtration	1-10 °C	96 hours.[21]

[1]"P" is for polyethylene; "FP" is fluoropolymer (polytetrafluoroethylene (PTFE); Teflon®), or other fluoropolymer, unless stated otherwise in this Table II; "G" is glass; "PA" is any plastic that is made of a sterilizable material (polypropylene or other autoclavable plastic); "LDPE" is low density polyethylene.

[2]Except where noted in this Table II and the method for the parameter, preserve each grab sample within 15 minutes of collection. For a composite sample collected with an automated sample (e.g., using a 24-hour composite sample; see 40 CFR 122.21(g)(7)(i) or 40 CFR part 403, appendix E), refrigerate the sample at ≤6 °C during collection unless specified otherwise in this Table II or in the method(s). For a composite sample to be split into separate aliquots for preservation and/or analysis, maintain the sample at ≤6 °C, unless specified otherwise in this Table II or in the method(s), until collection, splitting, and preservation is completed. Add the preservative to the sample container prior to sample collection when the preservative will not compromise the integrity of a grab sample, a composite sample, or aliquot split from a composite sample within 15 minutes of collection. If a composite measurement is required but a composite sample would compromise sample integrity, individual grab samples must be collected at prescribed time intervals (e.g., 4 samples over the course of a day, at 6-hour intervals). Grab samples must be analyzed separately and the concentrations averaged. Alternatively, grab samples may be collected in the field and composited in the laboratory if the compositing procedure produces results equivalent to results produced by arithmetic averaging of results of analysis of individual grab samples. For examples of laboratory compositing procedures, see EPA Method 1664 Rev. A (oil and grease) and the procedures at 40 CFR 141.24(f)(14)(iv) and (v) (volatile organics).

[3]When any sample is to be shipped by common carrier or sent via the U.S. Postal Service, it must comply with the Department of Transportation Hazardous Materials Regulations (49 CFR part 172). The person offering such material for transportation is responsible for ensuring such compliance. For the preservation requirement of Table II, the Office of Hazardous Materials, Materials Transportation Bureau, Department of Transportation has determined that the Hazardous Materials Regulations do not apply to the following materials: Hydrochloric acid (HCl) in water solutions at concentrations of 0.04% by weight or less (pH about 1.96 or greater; Nitric acid (HNO_3) in water solutions at concentrations of 0.15% by weight or less (pH about 1.62 or greater); Sulfuric acid (H_2SO_4) in water solutions at concentrations of 0.35% by weight or less (pH about 1.15 or greater); and Sodium hydroxide (NaOH) in water solutions at concentrations of 0.080% by weight or less (pH about 12.30 or less).

[4]Samples should be analyzed as soon as possible after collection. The times listed are the maximum times that samples may be held before the start of analysis and still be considered valid. Samples may be held for longer periods only if the permittee or monitoring laboratory have data on file to show that, for the specific types of samples under study, the analytes are stable for the longer time, and has received a variance from the Regional ATP Coordinator under §136.3(e). For a grab sample, the holding time begins at the time of collection. For a composite sample collected with an automated sampler (e.g., using a 24-hour composite sampler; see 40 CFR 122.21(g)(7)(i) or 40 CFR part 403, appendix E), the holding time begins at the time of the end of collection of the composite sample. For a set of grab samples composited in the field or laboratory, the holding time begins at the time of collection of the last grab sample in the set. Some samples may not be stable for the maximum time period given in the table. A permittee or monitoring laboratory is obligated to hold the sample for a shorter time if it knows that a shorter time is necessary to maintain sample stability. See §136.3(e) for details. The date and time of collection of an individual grab sample is the date and time at which the sample is collected. For a set of grab samples to be composited, and that are all collected on the same calendar date, the date of collection is the date on which the samples are collected. For a set of grab samples to be composited, and that are collected across two calendar dates, the date of collection is the dates of the two days; e.g., November 14-15. For a composite sample collected automatically on a given date, the date of collection is the date on which the sample is collected. For a composite sample collected automatically, and that is collected across two calendar dates, the date of collection is the dates of the two days; e.g., November 14-15. For static-renewal toxicity tests, each grab or composite sample may also be used to prepare test solutions for renewal at 24 h, 48 h, and/or 72 h after first use, if stored at 0-6 °C, with minimum head space.

[5]ASTM D7365-09a specifies treatment options for samples containing oxidants (e.g., chlorine) for cyanide analyses. Also, Section 9060A of Standard Methods for the Examination of Water and Wastewater (20th and 21st editions) addresses dechlorination procedures for microbiological analyses.

[6]Sampling, preservation and mitigating interferences in water samples for analysis of cyanide are described in ASTM D7365-09a. There may be interferences that are not mitigated by the analytical test methods or D7365-09a. Any technique for removal or suppression of interference may be employed, provided the laboratory demonstrates that it more accurately measures cyanide through quality control measures described in the analytical test method. Any removal or suppression technique not described in D7365-09a or the analytical test method must be documented along with supporting data.

[7]For dissolved metals, filter grab samples within 15 minutes of collection and before adding preservatives. For a composite sample collected with an automated sampler (e.g., using a 24-hour composite sampler; see 40 CFR 122.21(g)(7)(i) or 40 CFR part 403, appendix E), filter the sample within 15 minutes after completion of collection and before adding preservatives. If it is known or suspected that dissolved sample integrity will be compromised during collection of a composite sample collected automatically over time (e.g., by interchange of a metal between dissolved and suspended forms), collect and filter grab samples to be composited (footnote 2) in place of a composite sample collected automatically.

[8]Guidance applies to samples to be analyzed by GC, LC, or GC/MS for specific compounds.

[9]If the sample is not adjusted to pH 2, then the sample must be analyzed within seven days of sampling.

[10]The pH adjustment is not required if acrolein will not be measured. Samples for acrolein receiving no pH adjustment must be analyzed within 3 days of sampling.

[11]When the extractable analytes of concern fall within a single chemical category, the specified preservative and maximum holding times should be observed for optimum safeguard of sample integrity (*i.e.,* use all necessary preservatives and hold for the shortest time listed). When the analytes of concern fall within two or more chemical categories, the sample may be preserved by cooling to ≤6 °C, reducing residual chlorine with 0.008% sodium thiosulfate, storing in the dark, and adjusting the pH to 6-9; samples preserved in this manner may be held for seven days before extraction and for forty days after extraction. Exceptions to this optional preservation and holding time procedure are noted in footnote 5 (regarding the requirement for thiosulfate reduction), and footnotes 12, 13 (regarding the analysis of benzidine).

[12]If 1,2-diphenylhydrazine is likely to be present, adjust the pH of the sample to 4.0 ± 0.2 to prevent rearrangement to benzidine.

[13]Extracts may be stored up to 30 days at <0 °C.

[14]For the analysis of diphenylnitrosamine, add 0.008% $Na_2S_2O_3$ and adjust pH to 7-10 with NaOH within 24 hours of sampling.

[15]The pH adjustment may be performed upon receipt at the laboratory and may be omitted if the samples are extracted within 72 hours of collection. For the analysis of aldrin, add 0.008% $Na_2S_2O_3$.

[16]Place sufficient ice with the samples in the shipping container to ensure that ice is still present when the samples arrive at the laboratory. However, even if ice is present when the samples arrive, immediately measure the temperature of the samples and confirm that the preservation temperature maximum has not been exceeded. In the isolated cases where it can be documented that this holding temperature cannot be met, the permittee can be given the option of on-site testing or can request a variance. The request for a variance should include supportive data which show that the toxicity of the effluent samples is not reduced because of the increased holding temperature. Aqueous samples must not be frozen. Hand-delivered samples used on the day of collection do not need to be cooled to 0 to 6 °C prior to test initiation.

[17]Samples collected for the determination of trace level mercury (<100 ng/L) using EPA Method 1631 must be collected in tightly-capped fluoropolymer or glass bottles and preserved with BrCl or HCl solution within 48 hours of sample collection. The time to preservation may be extended to 28 days if a sample is oxidized in the sample bottle. A sample collected for dissolved trace level mercury should be filtered in the laboratory within 24 hours of the time of collection. However, if circumstances preclude overnight shipment, the sample should be filtered in a designated clean area in the field in accordance with procedures given in Method 1669. If sample integrity will not be maintained by shipment to and filtration in the laboratory, the sample must be filtered in a designated clean area in the field within the time period necessary to maintain sample integrity. A sample that has been collected for determination of total or dissolved trace level mercury must be analyzed within 90 days of sample collection.

[18]Aqueous samples must be preserved at ≤6 °C, and should not be frozen unless data demonstrating that sample freezing does not adversely impact sample integrity is maintained on file and accepted as valid by the regulatory authority. Also, for purposes of NPDES monitoring, the specification of "≤ °C" is used in place of the "4 °C" and "<4 °C" sample temperature requirements listed in some methods. It is not necessary to measure the sample temperature to three significant figures (1/100th of 1 degree); rather, three significant figures are specified so that rounding down to 6 °C may not be used to meet the ≤6 °C requirement. The preservation temperature does not apply to samples that are analyzed immediately (less than 15 minutes).

[19]An aqueous sample may be collected and shipped without acid preservation. However, acid must be added at least 24 hours before analysis to dissolve any metals that adsorb to the container walls. If the sample must be analyzed within 24 hours of collection, add the acid immediately (see footnote 2). Soil and sediment samples do not need to be preserved with acid. The allowances in this footnote supersede the preservation and holding time requirements in the approved metals methods.

[20]To achieve the 28-day holding time, use the ammonium sulfate buffer solution specified in EPA Method 218.6. The allowance in this footnote supersedes preservation and holding time requirements in the approved hexavalent chromium methods, unless this supersession would compromise the measurement, in which case requirements in the method must be followed.

[21]Holding time is calculated from time of sample collection to elution for samples shipped to the laboratory in bulk and calculated from the time of sample filtration to elution for samples filtered in the field.

[22]Sample analysis should begin as soon as possible after receipt; sample incubation must be started no later than 8 hours from time of collection.

[23]For fecal coliform samples for sewage sludge (biosolids) only, the holding time is extended to 24 hours for the following sample types using either EPA Method 1680 (LTB-EC) or 1681 (A-1): Class A composted, Class B aerobically digested, and Class B anaerobically digested.

[24]The immediate filtration requirement in orthophosphate measurement is to assess the dissolved or bio-available form of orthophosphorus (*i.e.,* that which passes through a 0.45-micron filter), hence the requirement to filter the sample immediately upon collection (*i.e.,* within 15 minutes of collection).

[38 FR 28758, Oct. 16, 1973]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting §136.3, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at *www.govinfo.gov*.

Appendix B

Appendix B – Existing Water Quality Data Tables

Lake Jocassee

Water Quality Data by Station

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Lake Jocassee

Temperature Data

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Jocassee B_2_558.7: Monthly Average Water Temperatures (deg C) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.5	10.3	12.1	14.9	21.0	24.7	25.4	26.0	24.8	21.4	18.4	13.5
1095 to 1080	10.3	9.5	11.1	13.7	18.3	21.9	24.7	25.9	24.7	21.5	17.6	13.2
1080 to 1065	10.3	9.3	10.4	12.9	16.4	20.5	23.5	25.3	24.7	21.4	17.4	13.4
1065 to 1050	10.2	9.5	10.3	12.2	15.5	19.5	22.5	24.9	24.7	21.4	17.5	13.4
1050 to 1035	10.3	9.5	10.2	11.4	14.5	18.8	21.7	24.3	24.7	21.3	17.6	13.6
1035 to 1020	10.3	9.5	9.8	11.2	13.6	17.2	20.6	23.5	24.0	21.2	17.4	13.3
1020 to 1005	10.2	9.4	9.7	10.7	12.2	14.7	17.1	19.9	20.7	20.8	17.5	13.4
1005 to 990	10.3	9.4	9.6	10.3	11.3	12.0	12.9	13.8	14.1	15.4	16.3	13.5
990 to 975	10.3	9.5	9.6	9.9	10.3	10.5	11.0	11.0	11.4	11.2	12.0	12.5
975 to 960	10.1	9.2	9.3	9.6	9.7	9.9	10.2	10.4	10.3	10.2	10.0	10.8
960 to 945	9.7	9.3	9.3	9.4	9.6	9.7	9.9	10.0	9.8	9.8	9.7	9.9
945 to 930	9.5	9.3	9.3	9.3	9.4	9.3	9.8	9.8	9.6	9.5	9.6	9.6
930 to 915	9.4	9.2	9.1	9.1	9.3	9.4	9.4	9.6	9.5	9.5	9.3	9.4
915 to 900	9.2	9.0	9.0	9.1	9.2	9.2	9.5	9.6	9.3	9.3	9.3	9.2
900 to 885	9.1	8.9	8.9	9.0	9.1	9.1	9.4	9.4	9.3	9.3	9.2	9.3
885 to 870	9.1	8.9	8.9	8.9	9.0	9.1	9.4	9.3	9.3	9.1	9.2	9.2
870 to 855	9.0	8.7	8.7	8.8	8.9	9.0	9.2	9.3	9.3	9.2	9.1	9.1
< 855	9.0	8.7	8.4	8.6	9.0	9.0	9.2	9.2	9.2	9.1	9.1	9.1

Jocassee B_2_558.7: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.7	9.8	11.2	15.1	19.7	24.0	25.9	26.1	24.9	21.4	17.6	13.9
1095 to 1080	10.5	9.8	11.0	14.4	17.7	21.7	24.6	26.0	25.0	21.5	17.4	13.8
1080 to 1065	10.6	9.7	10.6	13.4	16.5	20.4	23.6	25.5	24.9	21.5	17.4	14.0
1065 to 1050	10.6	9.7	10.2	12.5	15.1	19.0	22.6	24.6	24.8	21.5	17.4	13.9
1050 to 1035	10.5	9.5	10.0	11.5	13.4	17.1	20.7	23.4	23.7	21.3	17.3	13.8
1035 to 1020	10.5	9.6	9.8	11.0	12.4	14.9	18.0	21.0	22.3	20.8	17.2	13.9
1020 to 1005	10.6	9.5	9.6	10.3	11.1	12.4	14.0	15.8	17.9	18.6	16.8	13.9
1005 to 990	10.6	9.5	9.5	9.9	10.1	10.7	11.2	11.7	12.5	12.7	14.1	13.2
990 to 975	10.1	9.5	9.4	9.6	9.7	9.8	9.9	10.2	10.3	10.4	10.6	11.2
975 to 960	9.9	9.4	9.3	9.4	9.4	9.5	9.6	9.7	9.8	9.7	9.8	9.9
960 to 945	9.5	9.2	9.1	9.3	9.2	9.3	9.4	9.5	9.5	9.5	9.5	9.4
945 to 930	9.2	9.0	9.1	9.0	9.0	9.1	9.2	9.3	9.3	9.2	9.3	9.2
930 to 915	9.1	9.0	8.9	9.0	9.0	9.0	9.2	9.2	9.3	9.2	9.2	9.1
915 to 900	9.0	8.9	8.9	8.9	8.9	9.0	9.0	9.1	9.2	9.2	9.2	9.1
900 to 885	9.0	8.8	8.8	8.9	8.8	8.9	9.0	9.0	9.1	9.0	9.1	9.0
885 to 870	8.8	8.8	8.8	8.8	8.8	8.8	8.9	9.1	9.1	9.0	9.0	9.1
870 to 855	8.9	8.7	8.7	8.7	8.8	8.8	8.9	9.0	9.1	9.0	9.0	9.0
< 855	8.8	8.5	8.5	8.6	8.7	8.7	8.9	9.0	9.1	9.0	9.0	8.9

Legend	8										25

Jocassee B_3_558.0: Monthly Average Water Temperatures (deg C) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.3	9.1	10.1	13.7	18.8	23.3	25.9	25.8	25.0	21.6	18.3	13.3
1095 to 1080	10.3	8.7	9.3	13.4	19.2	23.2	25.3	25.4	25.1	21.6	17.7	13.4
1080 to 1065	10.3	8.8	9.8	13.1	17.8	21.3	24.2	25.1	24.7	21.4	17.5	13.4
1065 to 1050	10.3	8.8	9.5	12.6	15.8	19.6	22.8	24.0	24.7	21.4	17.5	13.3
1050 to 1035	10.2	8.7	9.3	11.9	14.8	18.8	21.7	23.7	24.3	21.3	17.5	13.6
1035 to 1020	10.2	8.7	9.2	11.5	13.6	16.7	20.5	22.6	24.1	21.3	17.5	13.4
1020 to 1005	10.3	8.6	8.7	10.6	12.3	16.4	19.2	22.1	22.6	20.9	17.4	13.5
1005 to 990	10.2	8.6	8.9	10.2	11.6	13.4	17.1	19.3	22.3	20.5	17.5	13.1
990 to 975	10.3	8.6	8.8	9.9	11.2	13.9	15.7	18.4	19.0	18.9	16.3	13.2
975 to 960	10.2	8.6	8.3	9.6	10.4	11.6	13.4	14.5	16.6	17.7	15.8	12.7
960 to 945	10.3	8.5	8.5	9.1	9.9	10.8	11.5	12.3	12.8	13.2	12.8	11.3
945 to 930	10.1	8.5	8.3	9.0	9.3	9.7	9.9	9.7	10.0	10.0	10.9	10.9
930 to 915	10.0	8.8	9.3	9.1	9.6	9.2	9.5	9.5	9.7	9.6	9.5	9.8
915 to 900	9.5	9.0	9.1	8.9	9.4	9.3	9.5	9.5	9.2	9.1	9.5	9.5
900 to 885	9.1	8.5	8.4	8.7	8.9	8.9	9.0	8.9	9.0	8.8	8.9	9.0
885 to 870	9.0	8.7	8.8	8.7	9.0	9.1	9.3	9.1	9.3	9.1	9.2	9.2
870 to 855	8.9	8.7	8.8	8.7	9.0	9.1	9.2	9.1	9.1	8.8	9.2	9.2
< 855	8.9	8.4	8.4	8.5	8.8	8.8	8.9	8.9	8.9	8.8	9.0	9.0

Jocassee B_3_558.0: Monthly Average Water Temperatures (deg C) 1991 to 2020 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.7	9.8	11.1	14.7	20.1	24.1	25.9	26.2	25.1	21.5	17.5	13.9
1095 to 1080	10.7	9.9	11.5	14.4	19.1	23.1	25.4	26.3	25.3	21.5	17.9	13.9
1080 to 1065	10.6	9.8	11.2	14.1	17.8	21.5	24.6	26.0	25.1	21.6	17.5	13.9
1065 to 1050	10.5	9.8	11.1	13.7	17.0	20.9	24.1	25.8	25.2	21.7	17.6	14.1
1050 to 1035	10.6	9.7	10.6	12.9	15.6	19.5	23.1	25.3	24.9	21.5	17.4	13.8
1035 to 1020	10.6	9.8	10.4	12.5	14.9	18.8	22.2	24.5	24.8	21.7	17.6	14.0
1020 to 1005	10.5	9.6	10.3	11.7	13.8	17.6	21.0	23.8	23.9	21.2	17.3	13.7
1005 to 990	10.6	9.7	10.1	11.2	13.2	16.1	19.9	22.4	23.5	21.3	17.5	14.1
990 to 975	10.5	9.6	10.0	10.8	12.1	14.3	17.5	20.7	21.9	20.6	17.1	13.7
975 to 960	10.7	9.7	9.8	10.3	11.2	12.7	14.3	16.6	18.9	18.7	17.2	13.8
960 to 945	10.4	9.6	9.8	10.0	10.6	11.2	12.4	13.6	15.1	15.6	15.9	13.4
945 to 930	10.4	9.6	9.6	9.7	9.8	10.0	10.3	10.6	11.0	11.0	11.6	11.9
930 to 915	9.7	9.3	9.4	9.4	9.4	9.4	9.5	9.6	9.8	9.6	9.7	9.7
915 to 900	9.3	9.1	9.2	9.2	9.2	9.2	9.3	9.3	9.5	9.3	9.3	9.3
900 to 885	9.0	9.0	9.1	9.0	9.0	9.0	9.1	9.2	9.3	9.2	9.2	9.1
885 to 870	9.0	8.8	8.9	8.9	8.9	8.9	9.0	9.1	9.2	9.1	9.1	9.0
870 to 855	8.9	8.8	8.8	8.8	8.8	8.8	8.9	9.0	9.1	9.0	9.0	9.0
< 855	8.8	8.6	8.7	8.7	8.7	8.8	8.9	8.9	9.1	9.0	9.0	9.0

Legend	**8**										**25**

Jocassee C_2_559.0: Monthly Average Water Temperatures (deg C) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.5	10.3	11.2	16.7	21.3	25.5	25.8	26.1	24.8	21.4	18.6	13.7
1095 to 1080	10.4	9.7	11.1	14.4	18.1	22.9	24.9	26.5	24.9	21.6	17.7	13.6
1080 to 1065	10.5	9.5	10.5	13.1	16.7	21.0	23.6	25.5	24.8	21.5	17.7	13.7
1065 to 1050	10.4	9.6	10.3	12.3	15.6	19.6	22.4	24.8	24.8	21.5	17.7	13.6
1050 to 1035	10.4	9.7	10.0	11.6	14.7	18.7	21.7	24.3	24.6	21.3	17.7	13.7
1035 to 1020	10.4	9.5	9.8	11.3	13.8	17.4	20.5	23.3	24.0	21.3	17.7	13.5
1020 to 1005	10.3	9.4	9.6	10.8	12.6	15.0	17.1	20.1	20.9	20.8	17.6	13.5
1005 to 990	10.4	9.5	9.5	10.5	11.4	12.3	12.9	14.2	13.9	15.2	15.9	13.5
990 to 975	10.4	9.5	9.5	9.9	10.5	10.8	11.1	11.1	11.2	11.2	12.0	12.4
975 to 960	10.3	9.3	9.3	9.6	9.9	10.1	10.2	10.4	10.3	10.2	10.1	10.4
960 to 945	9.7	9.3	9.3	9.5	9.6	9.7	9.9	9.9	9.8	9.8	9.8	9.8
945 to 930	9.4	9.4	9.2	9.3	9.4	9.6	9.8	9.7	9.7	9.5	9.6	9.6
930 to 915	9.3	9.1	9.1	9.2	9.4	9.4	9.4	9.6	9.5	9.5	9.4	9.4
915 to 900	9.1	9.0	9.0	9.1	9.2	9.3	9.4	9.6	9.3	9.3	9.3	9.2
900 to 885	9.1	9.0	8.9	9.0	9.0	9.2	9.3	9.4	9.3	9.3	9.2	9.3
885 to 870	9.0	9.0	8.9	8.9	9.1	9.2	9.3	9.3	9.2	9.2	9.2	9.2
870 to 855	8.9	8.8	8.7	8.9	9.0	9.1	9.1	9.3	9.2	9.2	9.2	9.1
< 855	8.9	8.7	8.7	8.7	8.9	9.0	9.2	9.2	9.1	9.1	9.1	9.1

Jocassee C_2_559.0: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.8	9.8	11.4	15.2	20.1	24.5	26.4	26.4	25.0	21.4	17.7	14.0
1095 to 1080	10.6	9.8	11.1	14.6	18.0	22.0	24.9	26.2	25.1	21.6	17.5	13.8
1080 to 1065	10.6	9.7	10.7	13.5	16.6	20.3	23.7	25.6	25.0	21.6	17.4	13.9
1065 to 1050	10.6	9.7	10.2	12.4	15.2	18.9	22.5	24.5	24.8	21.5	17.5	13.9
1050 to 1035	10.6	9.5	10.0	11.4	13.5	17.1	20.7	23.2	23.7	21.3	17.3	13.8
1035 to 1020	10.5	9.6	9.7	10.9	12.4	15.0	18.2	20.8	22.1	20.8	17.3	13.9
1020 to 1005	10.6	9.5	9.6	10.3	11.2	12.7	14.3	16.0	17.8	18.6	16.8	13.8
1005 to 990	10.6	9.5	9.4	9.9	10.1	10.8	11.4	11.8	12.4	12.9	14.2	13.1
990 to 975	10.1	9.5	9.4	9.6	9.7	9.9	10.1	10.1	10.3	10.4	10.7	11.2
975 to 960	9.8	9.4	9.3	9.4	9.4	9.6	9.7	9.6	9.8	9.7	9.8	9.9
960 to 945	9.5	9.2	9.1	9.3	9.2	9.3	9.4	9.4	9.5	9.5	9.5	9.4
945 to 930	9.1	9.0	9.1	9.1	9.0	9.1	9.2	9.2	9.3	9.2	9.3	9.2
930 to 915	9.0	9.0	8.9	9.1	9.0	9.1	9.2	9.2	9.3	9.2	9.2	9.1
915 to 900	8.9	8.9	8.9	8.9	8.9	9.0	9.1	9.1	9.2	9.2	9.2	9.1
900 to 885	9.0	8.8	8.7	8.9	8.8	8.9	9.0	9.0	9.1	9.1	9.2	9.0
885 to 870	8.8	8.8	8.8	8.8	8.8	8.8	9.0	9.0	9.1	9.0	9.0	9.1
870 to 855	8.9	8.8	8.7	8.8	8.8	8.9	9.0	9.0	9.1	9.1	9.1	9.0
< 855	8.7	8.6	8.6	8.7	8.8	8.8	8.9	8.9	9.0	9.0	9.0	9.0

Legend	8										25

Jocassee C_2_560.0: Monthly Average Water Temperatures (deg C) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.4	9.2	10.1	14.3	19.5	24.5	26.4	26.3	25.1	21.6	18.2	13.3
1095 to 1080	10.4	9.0	10.1	13.3	17.6	21.9	24.4	25.4	25.1	21.6	17.7	13.4
1080 to 1065	10.3	8.7	9.5	12.0	15.2	19.2	22.1	24.0	24.6	21.4	17.6	13.5
1065 to 1050	10.3	8.8	9.3	11.3	13.9	17.5	20.6	22.9	24.0	21.4	17.7	13.4
1050 to 1035	10.3	8.7	8.7	10.4	12.5	15.7	18.8	21.3	22.6	20.8	17.6	13.5
1035 to 1020	10.3	8.6	8.8	10.0	11.6	13.5	16.1	18.8	19.9	18.9	16.7	13.2
1020 to 1005	10.3	8.6	8.4	9.4	10.4	11.5	13.6	14.3	15.1	15.7	14.7	12.4
1005 to 990	10.2	8.4	8.3	9.2	10.1	10.4	10.3	10.8	11.1	11.9	12.5	11.2
990 to 975	10.1	8.5	8.2	8.9	9.4	9.7	9.6	9.7	9.5	9.4	10.0	10.4
975 to 960	10.0	8.7	9.3	9.0	9.8	8.9	9.4	9.4	9.6	9.7	9.4	9.6
960 to 945	9.8	9.2	9.2	9.2	9.7	9.7	9.7	9.6	9.8	9.6	9.8	9.7
945 to 930	9.4	9.0	9.3	8.9	9.3	9.4	9.7	9.5	8.8	8.8	9.4	9.5
930 to 915	9.3	9.0	9.2	9.0	9.4	9.4	9.4	9.5	9.5	9.3	9.5	9.4
915 to 900	8.9	8.3	8.2	8.5	8.7	8.7	8.8	8.8	8.7	8.8	8.8	8.8
900 to 885	9.0	8.8	8.9	8.9	9.1	9.1	9.4	9.3	9.2	9.1	9.1	9.2
885 to 870	9.0	8.8	8.9	8.8	9.2	9.1	9.4	9.2	9.2	9.0	9.3	9.1
870 to 855	8.9	8.6	8.7	8.7	9.0	9.1	9.2	9.2	9.3	9.0	9.2	9.1
< 855	8.9	8.5	8.6	8.7	8.7	9.0	9.1	9.1	8.9	9.0	9.2	9.0

Jocassee C_2_560.0: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.9	9.9	11.5	15.2	20.3	24.6	26.3	26.4	25.1	21.4	17.9	14.2
1095 to 1080	10.8	9.9	11.3	14.5	18.2	22.3	24.9	26.4	25.2	21.6	17.6	13.9
1080 to 1065	10.8	9.7	10.7	13.4	16.7	20.6	23.7	25.7	25.0	21.6	17.6	14.1
1065 to 1050	10.8	9.7	10.4	12.4	15.5	19.1	22.4	24.5	24.8	21.6	17.7	14.0
1050 to 1035	10.8	9.6	10.1	11.4	13.8	17.5	20.8	23.3	23.7	21.5	17.5	13.9
1035 to 1020	10.7	9.6	9.9	11.0	12.9	15.7	18.7	21.2	22.3	20.8	17.4	14.0
1020 to 1005	10.8	9.6	9.7	10.4	11.6	13.3	15.1	16.6	18.0	18.9	16.9	13.9
1005 to 990	10.7	9.5	9.5	10.0	10.5	11.1	11.9	12.2	12.5	13.1	14.1	13.0
990 to 975	10.3	9.5	9.5	9.7	9.9	10.1	10.2	10.3	10.3	10.4	10.8	11.3
975 to 960	10.0	9.4	9.3	9.5	9.6	9.6	9.7	9.7	9.8	9.8	9.9	10.1
960 to 945	9.6	9.3	9.2	9.3	9.3	9.4	9.5	9.5	9.5	9.6	9.6	9.5
945 to 930	9.3	9.1	9.2	9.1	9.1	9.2	9.3	9.3	9.3	9.3	9.4	9.3
930 to 915	9.2	9.1	9.1	9.1	9.1	9.2	9.3	9.3	9.3	9.3	9.3	9.2
915 to 900	9.1	9.1	9.0	9.0	9.0	9.1	9.1	9.2	9.2	9.2	9.3	9.2
900 to 885	9.1	8.9	8.9	9.0	8.9	9.0	9.1	9.1	9.1	9.1	9.2	9.1
885 to 870	8.9	8.9	8.9	8.8	8.8	9.0	9.0	9.1	9.1	9.1	9.1	9.1
870 to 855	9.1	8.9	8.7	8.9	9.0	9.0	9.0	9.1	9.1	9.1	9.2	9.1
< 855	8.6	8.4	8.6	8.6	8.6	8.8	8.7	8.7	8.9	8.7	9.2	9.1

Legend	8										25

Jocassee C_2_562.0: Monthly Average Water Temperatures (deg C) 1980 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.3	10.1	11.0	14.6	20.4	26.6	26.4	26.6	25.0	21.7	18.3	13.5
1095 to 1080	10.4	9.5	10.9	13.4	18.4	23.4	24.9	25.9	25.4	21.8	17.8	13.3
1080 to 1065	10.3	9.3	10.4	12.2	16.3	21.0	23.1	25.0	24.9	21.5	17.6	13.4
1065 to 1050	10.2	9.2	10.2	11.7	15.2	19.7	21.9	24.0	24.6	21.6	17.6	13.3
1050 to 1035	10.2	9.2	9.9	11.1	14.3	18.9	21.1	23.1	24.1	21.3	17.6	13.5
1035 to 1020	10.2	9.1	9.6	10.6	12.9	17.7	19.8	20.9	23.4	20.8	17.5	13.2
1020 to 1005	10.1	9.1	9.5	10.1	12.1	15.5	15.7	17.2	19.8	19.1	17.4	13.2
1005 to 990	9.8	8.7	9.5	9.7	11.3	12.7	12.3	12.9	13.9	14.4	14.9	12.9
990 to 975	8.9	8.1	8.6	9.1	8.6		9.3	8.6	9.3	9.7	9.2	
975 to 960									9.3			
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 964.5 ft

Jocassee C_2_562.0: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.9	10.0	11.9	15.4	20.6	24.8	26.5	26.6	25.2	21.5	17.9	14.1
1095 to 1080	10.6	10.0	11.5	14.2	18.3	22.4	24.9	26.4	25.2	21.6	17.5	13.7
1080 to 1065	10.7	9.7	10.8	13.3	16.9	20.7	23.8	25.6	25.0	21.6	17.5	13.9
1065 to 1050	10.6	9.7	10.4	12.3	15.5	19.1	22.5	24.4	24.8	21.6	17.5	13.9
1050 to 1035	10.6	9.5	10.1	11.3	13.6	17.2	20.8	23.2	23.7	21.3	17.4	13.7
1035 to 1020	10.6	9.6	9.9	10.9	12.5	15.2	18.4	20.9	22.3	20.6	17.3	13.9
1020 to 1005	10.5	9.5	9.7	10.3	11.2	13.0	14.9	16.5	18.2	19.0	17.0	13.7
1005 to 990	10.1	9.3	9.5	10.0	10.3	11.1	12.1	12.9	13.1	14.0	15.2	13.0
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 992.2 ft

Legend	8										25

Jocassee C_2_565.4: Monthly Average Water Temperatures (deg C) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.7	11.0	11.3	16.9	21.6	26.4	26.1	26.8	25.1	21.6	18.2	14.7
1095 to 1080	10.5	9.8	11.1	14.1	18.6	22.2	25.2	26.6	25.1	21.7	17.7	13.7
1080 to 1065	10.3	9.5	10.4	12.6	16.5	20.5	23.9	26.0	24.9	21.5	17.6	13.8
1065 to 1050	10.3	9.5	9.9	11.9	15.6	19.4	22.7	25.0	24.7	21.7	17.6	13.7
1050 to 1035	10.3	9.6	9.7	11.2	14.6	18.7	21.9	24.4	24.5	21.4	17.5	13.9
1035 to 1020	10.3	9.3	9.7	10.9	13.4	17.2	20.9	23.5	23.9	21.4	17.5	13.8
1020 to 1005	10.2	9.3	9.5	10.7	12.5	15.3	17.6	20.0	20.8	20.8	17.4	13.6
1005 to 990	10.2	9.3	9.4	10.4	11.4	12.5	13.3	14.3	14.2	14.5	16.0	13.5
990 to 975	10.2	9.4	9.5	9.9	10.4	10.6	11.1	11.0	11.3	10.8	11.3	12.0
975 to 960	9.9	9.2	9.2	9.5	9.8	10.0	10.0	10.1	10.4	10.0	9.9	10.4
960 to 945	9.8	9.2	9.2	9.4	9.6	9.6	9.7	9.8	9.9	9.9	9.9	9.7
945 to 930	9.4	9.1	9.3	9.5	9.5	9.7	10.2	9.7	9.7	9.6	10.2	9.5
930 to 915			9.9		9.4	10.3		10.3	9.6			
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 918.1 ft

Jocassee C_2_565.4: Monthly Average Water Temperatures (deg C) 1991 to 1994 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.8	10.5	11.2	15.9	21.0	24.5	26.8	26.1	25.1	20.2	17.1	14.2
1095 to 1080	10.5	10.2	10.6	13.8	18.6	21.8	24.8	25.5	25.1	20.5	17.0	13.1
1080 to 1065	10.7	10.0	10.2	12.4	16.1	19.5	22.6	24.8	24.7	20.3	16.7	13.4
1065 to 1050	10.6	9.9	10.1	11.3	14.8	17.3	20.5	22.4	23.8	20.2	16.7	13.6
1050 to 1035	10.7	9.8	9.9	10.8	13.0	15.6	18.5	19.8	20.1	19.7	16.6	13.2
1035 to 1020	10.4	9.9	9.8	10.6	11.8	12.9	14.8	16.7	17.9	16.6	15.8	13.3
1020 to 1005	10.5	9.8	9.7	10.2	11.0	11.7	13.1	12.5	13.9	14.7	14.4	13.1
1005 to 990	10.6	9.7	9.6	10.0	10.3	10.7	11.2	10.9	11.1	11.5	12.4	11.4
990 to 975	10.3	9.8	9.5	9.7	10.2	10.0	10.2	10.3	10.2	10.1	10.1	10.7
975 to 960	10.4	9.7	9.5	9.6	9.9	9.8	9.9	10.0	9.9	9.9	9.9	9.8
960 to 945	10.1	9.7	9.4	9.5	9.7	9.7	9.8	9.8	9.8	9.9	9.8	9.5
945 to 930	9.9	9.4	9.4	9.4	9.8	9.9	9.6	9.9	9.6	9.5	9.5	10.1
930 to 915	8.0				9.9		10.5	10.4	9.9		8.0	
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 926.6 ft

Legend	8										25

Jocassee D_2_551.0: Monthly Average Water Temperatures (deg C) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	5.3	5.7	8.9	11.9	14.4	19.4	21.1	21.3	17.8	13.6	10.1	6.8
1095 to 1080	5.3	7.7	10.0	13.4	15.5	20.0	24.2	21.2	20.0	13.4	10.6	7.4
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1082.8 ft

Jocassee D_2_551.0: Monthly Average Water Temperatures (deg C) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	3.3	6.2	8.9	15.0	20.6	20.2	20.8	22.7	20.1	12.3	16.1	4.0
1095 to 1080		6.2						27.2			18.4	
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1083.7 ft

Legend	8										25

Jocassee D_2_564.0: Monthly Average Water Temperatures (deg C) 1976 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.4	9.3	10.4	14.8	19.5	24.8	26.5	26.5	25.3	21.6	17.7	13.3
1095 to 1080	10.4	9.1	10.1	13.5	17.7	22.1	24.5	25.3	25.2	21.6	17.5	13.2
1080 to 1065	10.3	8.7	9.6	11.9	15.6	19.5	22.4	24.0	24.8	21.5	17.5	13.3
1065 to 1050	10.2	8.8	9.3	11.2	14.2	18.0	21.1	22.9	24.1	21.4	17.4	13.2
1050 to 1035	10.3	8.7	8.7	10.4	12.6	16.1	19.3	21.6	22.9	21.0	17.5	13.4
1035 to 1020	10.3	8.6	8.8	10.1	11.6	14.2	17.0	19.4	20.7	19.4	16.5	13.0
1020 to 1005	10.2	8.6	8.5	9.6	10.5	12.1	14.3	14.9	15.9	16.1	15.0	12.3
1005 to 990	10.2	8.4	8.4	9.3	10.2	10.9	10.9	11.1	11.9	12.1	13.0	11.4
990 to 975	10.2	8.5	8.6	9.0	9.5	10.1	10.6	9.9	9.9	9.5	10.1	10.6
975 to 960	10.0	8.7	9.3	9.2	9.8	9.4	9.8	9.8	9.9	9.9	9.4	9.8
960 to 945	9.7	9.1	9.2	9.3	9.6	9.9	10.0	10.0	10.0	9.6	9.8	9.8
945 to 930	9.4	9.1	9.2	9.2	9.4	9.8	10.0	9.7	9.9	9.3	9.6	9.6
930 to 915	9.3	9.0	9.1	9.2	9.3	9.6	9.7	9.7	9.8	9.5	9.5	9.4
915 to 900	9.1	8.9	9.0	9.1	9.2	9.5	9.7	9.6	9.6	9.4	9.4	9.2
900 to 885	9.1	8.8	8.9	9.0	9.1	9.4	9.6	9.6	9.5	9.3	9.2	9.3
885 to 870	9.1	8.8	8.9	8.8	9.1	9.1	9.5	9.6	9.6	9.2	9.3	9.1
870 to 855	9.4		8.6	8.5	9.0	9.2	9.7	9.2	9.9	9.4	9.8	8.9
< 855	Minimum Reading 864.7 ft											

Jocassee D_2_564.0: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	11.1	10.4	11.7	15.6	20.4	24.6	26.3	26.2	25.1	21.4	18.2	14.3
1095 to 1080	10.8	10.1	11.4	14.4	18.2	22.6	25.1	26.5	25.2	21.7	17.8	14.0
1080 to 1065	10.9	10.0	10.8	13.5	16.9	20.9	24.0	26.0	25.0	21.7	17.8	14.1
1065 to 1050	10.8	10.0	10.6	12.7	16.0	19.7	22.9	24.9	24.9	21.6	17.8	14.1
1050 to 1035	10.8	9.9	10.3	12.0	14.3	17.9	21.3	23.7	23.8	21.5	17.7	14.0
1035 to 1020	10.7	9.9	10.1	11.4	13.2	15.9	18.9	21.7	22.5	20.8	17.5	14.0
1020 to 1005	10.8	9.8	9.9	10.6	12.0	13.6	15.5	17.1	18.6	19.3	17.0	13.8
1005 to 990	10.8	9.7	9.7	10.2	10.6	11.5	12.4	12.7	13.3	13.6	14.6	13.1
990 to 975	10.5	9.7	9.7	10.0	10.1	10.5	10.5	10.6	10.6	10.8	11.1	11.7
975 to 960	10.2	9.6	9.5	9.7	9.7	9.9	9.9	10.0	10.0	10.0	10.0	10.3
960 to 945	9.9	9.5	9.4	9.6	9.5	9.7	9.7	9.7	9.7	9.8	9.8	9.7
945 to 930	9.6	9.4	9.3	9.5	9.3	9.5	9.5	9.6	9.5	9.6	9.6	9.6
930 to 915	9.4	9.3	9.3	9.4	9.2	9.4	9.4	9.5	9.5	9.5	9.5	9.4
915 to 900	9.4	9.2	9.2	9.3	9.0	9.3	9.3	9.4	9.4	9.5	9.4	9.4
900 to 885	9.3	9.1	9.0	9.1	9.2	9.2	9.1	9.3	9.3	9.3	9.4	9.2
885 to 870	9.1	8.9	9.1	9.0	9.2	9.4	9.2	9.4	9.5	9.2	9.5	9.3
870 to 855	9.2	8.2	9.5	8.9		10.0	9.1	9.3		9.0	10.3	
< 855	Minimum Reading 864.4 ft											

Legend	8										25

Jocassee D_2_564.1: Monthly Average Water Temperatures (deg C) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.9	11.6	12.6	16.0	20.8	24.2	26.1	26.8	25.8	21.6	18.2	13.5
1095 to 1080	10.6	10.2	11.2	14.2	18.3	21.8	24.6	26.0	25.4	21.8	17.9	13.4
1080 to 1065	9.8	9.2	10.8	13.3	16.9	20.3	23.1	25.2	25.1	21.3	17.6	13.1
1065 to 1050	8.8	8.2	9.4	11.9	15.3	18.0	21.5	24.0	23.9	20.3	16.1	11.4
1050 to 1035	8.4	8.2	8.4	10.1	12.6	14.5	18.2	21.5	23.1	19.9	15.6	11.3
1035 to 1020	8.4	8.0	8.1	9.0	10.4	11.1	13.5	16.8	20.6	19.5	15.5	10.8
1020 to 1005	8.3	7.9	7.6	8.1	8.8	10.0	12.6	15.2	17.5	19.2	15.3	11.0
1005 to 990	8.3	8.0	7.5	7.8	8.3	8.9	9.9	12.2	14.8	16.9	15.3	11.1
990 to 975	8.3	8.2	7.5	7.9	8.6	8.9	9.5	11.3	13.7	14.7	14.7	11.0
975 to 960	8.2	7.8	6.7	7.2	8.6	8.9	9.6	11.0	13.2	13.0	13.1	9.9
960 to 945					8.6							
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 959.9 ft

Jocassee D_2_564.1: Monthly Average Water Temperatures (deg C) 1991 to 2017 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	11.1	10.3	11.3	14.8	20.1	23.5	25.4	26.1	24.9	21.3	18.2	14.3
1095 to 1080	10.7	10.1	11.0	14.0	18.4	22.4	24.7	26.2	25.2	21.5	17.8	13.9
1080 to 1065	10.7	10.0	10.9	13.7	17.2	21.3	24.3	25.7	25.1	21.7	17.8	13.9
1065 to 1050	10.5	9.8	10.7	13.3	16.4	20.8	23.8	24.9	25.0	21.5	17.7	13.8
1050 to 1035	10.6	9.7	10.8	13.2	15.9	20.3	23.5	25.0	24.9	21.6	17.6	13.7
1035 to 1020	10.4	9.6	10.8	13.1	16.0	19.9	23.3	24.8	24.8	21.5	17.4	13.7
1020 to 1005	10.3	9.7	10.8	13.0	15.9	19.8	23.1	24.7	24.8	21.5	17.6	13.6
1005 to 990	10.4	9.5	10.4	12.7	15.2	19.0	22.4	24.3	24.5	21.3	17.3	13.6
990 to 975	10.0	9.5	10.5	12.3	15.4	19.0	22.2	24.0	24.3	20.9	17.0	13.4
975 to 960	10.2	9.4	9.9	12.1	14.5	17.8	21.5	22.4	23.7	20.0	16.8	13.2
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 963 ft

Legend	8										25

Jocassee E_2_557.0: Monthly Average Water Temperatures (deg C) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.3	8.9	10.4	14.2	19.2	24.0	26.3	25.9	24.8	21.4	18.0	13.3
1095 to 1080	10.3	8.9	10.1	13.5	17.6	21.6	24.0	25.1	24.9	21.4	17.5	13.3
1080 to 1065	10.3	8.6	9.4	12.2	15.1	18.9	22.1	23.7	24.6	21.4	17.4	13.4
1065 to 1050	10.1	8.6	9.2	11.4	13.6	17.2	20.6	22.7	23.9	21.2	17.4	13.3
1050 to 1035	10.1	8.5	8.7	10.4	12.3	15.4	18.8	21.2	22.3	20.9	17.4	13.4
1035 to 1020	10.2	8.5	8.6	9.8	11.2	13.5	16.1	18.7	19.8	19.2	16.5	13.2
1020 to 1005	10.1	8.5	8.4	9.3	10.1	11.3	13.6	14.2	15.2	15.7	14.5	12.4
1005 to 990	10.1	8.3	8.3	9.1	9.9	10.3	10.3	10.6	11.4	12.0	12.2	11.4
990 to 975	10.1	8.4	8.1	8.9	9.4	9.6	9.6	9.7	9.6	9.3	10.0	10.7
975 to 960	9.9	8.7	9.3	8.9	9.7	8.9	9.4	9.4	9.7	9.7	9.5	9.8
960 to 945	9.7	9.1	9.2	9.2	9.6	9.8	9.7	9.6	9.9	9.5	9.7	9.9
945 to 930	9.5	8.8	9.4	8.8	9.3	9.2	9.5	9.5	9.0	8.8	9.4	9.6
930 to 915	9.4	8.9	9.1	9.0	9.3	9.4	9.3	9.5	9.6	9.3	9.4	9.4
915 to 900	9.0	8.1	8.3	8.4	8.7	8.7	8.9	8.7	8.8	8.8	9.0	8.9
900 to 885	9.1	8.5	8.9	8.9	9.1	9.1	9.4	9.4	9.2	9.2	9.1	9.3
885 to 870	9.1	8.4	8.9	8.7	9.0	9.1	9.4	9.2	9.3	9.1	9.2	9.2
870 to 855	9.0	8.4	8.6	8.7	8.9	9.0	8.9	9.2	9.1	9.2	9.2	9.2
< 855	8.9	8.5	8.5	8.6	8.7	8.9	8.7	9.1	9.0	9.0	9.0	9.1

Jocassee E_2_557.0: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.9	9.9	11.6	15.7	20.5	24.7	26.3	26.5	25.0	21.3	17.7	14.2
1095 to 1080	10.7	9.9	11.3	14.7	17.7	22.0	24.8	26.3	25.1	21.4	17.4	13.7
1080 to 1065	10.7	9.8	10.7	13.5	16.4	20.5	23.6	25.5	24.9	21.5	17.4	14.0
1065 to 1050	10.7	9.7	10.4	12.6	15.1	19.2	22.5	24.5	24.7	21.4	17.5	13.9
1050 to 1035	10.7	9.6	10.0	11.6	13.7	17.2	20.8	23.3	23.5	21.2	17.3	13.8
1035 to 1020	10.6	9.6	9.9	11.1	12.6	15.2	18.5	21.0	22.1	20.7	17.2	13.9
1020 to 1005	10.7	9.6	9.7	10.4	11.5	13.0	14.7	16.3	18.0	18.9	16.7	13.8
1005 to 990	10.6	9.5	9.5	9.9	10.3	11.1	11.6	12.0	12.5	13.1	14.4	13.0
990 to 975	10.3	9.4	9.5	9.7	9.8	10.1	10.3	10.3	10.4	10.5	10.8	11.4
975 to 960	9.9	9.3	9.3	9.5	9.5	9.7	9.8	9.7	9.8	9.8	9.8	10.2
960 to 945	9.6	9.2	9.2	9.3	9.3	9.5	9.5	9.5	9.6	9.5	9.6	9.6
945 to 930	9.4	9.0	9.1	9.1	9.2	9.3	9.3	9.4	9.3	9.3	9.4	9.3
930 to 915	9.2	9.0	9.0	9.1	9.1	9.2	9.3	9.3	9.3	9.3	9.3	9.3
915 to 900	9.1	8.8	9.0	9.0	9.0	9.1	9.2	9.2	9.3	9.2	9.3	9.2
900 to 885	9.0	8.7	8.8	8.9	8.9	9.0	9.1	9.1	9.2	9.1	9.2	9.1
885 to 870	8.9	8.6	8.9	8.9	8.9	9.0	9.1	9.1	9.2	9.1	9.1	9.1
870 to 855	8.9	8.6	8.7	8.8	8.9	9.0	9.1	9.1	9.2	9.1	9.2	9.1
< 855	8.9	8.6	8.7	8.6	8.7	8.8	9.1	8.9	9.1	9.0	9.1	9.0

Legend	8										25

Jocassee F_2_554.8: Monthly Average Water Temperatures (deg C) 1986 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.5	10.7	14.0	16.3	22.7	26.2	26.8	26.7	25.0	21.4	18.1	14.3
1095 to 1080	10.1	9.5	11.4	14.5	19.5	22.0	25.2	26.5	25.0	21.5	17.2	13.5
1080 to 1065	10.1	9.1	10.6	13.0	16.2	20.2	23.9	25.4	24.8	21.5	17.2	13.4
1065 to 1050	9.9	9.2	10.1	12.5	15.3	19.5	22.7	25.0	24.6	21.3	17.0	13.3
1050 to 1035	10.0	9.1	10.2	11.5	14.3	18.7	21.9	24.4	24.4	21.2	17.1	13.5
1035 to 1020	10.0	9.2	9.9	11.0	13.2	17.1	20.8	23.6	23.9	21.1	17.0	13.4
1020 to 1005	9.9	9.0	9.6	10.7	12.1	15.0	17.3	20.2	21.2	20.0	16.8	13.2
1005 to 990	9.9	9.0	9.7	10.2	11.1	12.1	13.2	14.2	14.4	14.5	15.7	13.2
990 to 975	9.6	9.1	9.8	9.8	10.2	10.5	11.0	10.9	11.3	10.8	13.4	12.7
975 to 960	9.0	8.5	9.5	9.7	9.6	9.8	10.0	10.2	10.3	10.2	10.1	11.7
960 to 945	8.8	9.1	9.1		10.4	9.9	10.2	9.6	10.2	9.9	9.7	10.4
945 to 930												
930 to 915												
915 to 900												
900 to 885						*Minimum Reading 946.5 ft*						
885 to 870												
870 to 855												
< 855												

Jocassee F_2_554.8: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.7	9.7	11.8	16.1	20.7	24.9	26.8	26.7	25.1	21.3	17.5	14.0
1095 to 1080	10.5	9.8	11.5	14.8	17.7	22.2	24.8	26.4	25.1	21.4	17.2	13.5
1080 to 1065	10.4	9.6	10.6	13.3	16.4	20.4	23.6	25.5	24.9	21.4	17.2	13.7
1065 to 1050	10.5	9.6	10.2	12.3	15.2	19.2	22.5	24.5	24.6	21.4	17.3	13.6
1050 to 1035	10.4	9.4	10.0	11.4	13.8	17.2	20.9	23.3	23.4	21.1	17.1	13.5
1035 to 1020	10.3	9.5	9.8	11.0	12.6	15.2	18.4	21.1	22.1	20.3	16.8	13.6
1020 to 1005	10.4	9.4	9.6	10.3	11.3	12.9	14.6	16.3	18.0	18.5	16.4	13.4
1005 to 990	10.2	9.3	9.4	9.9	10.3	10.9	11.5	12.1	12.4	13.0	14.7	12.8
990 to 975	9.8	9.1	9.4	9.7	9.8	10.0	10.2	10.3	10.3	10.4	11.6	11.6
975 to 960	9.4	8.9	9.2	9.5	9.5	9.7	9.7	9.8	9.8	9.9	10.1	10.7
960 to 945	9.4	8.7	9.0	9.4	9.2	9.5	9.6	9.6	9.7	9.6	9.8	10.0
945 to 930												
930 to 915												
915 to 900												
900 to 885						*Minimum Reading 945.3 ft*						
885 to 870												
870 to 855												
< 855												

Legend	8										25

Jocassee F_2_556.0: Monthly Average Water Temperatures (deg C) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.4	8.6	11.1	15.5	20.0	24.6	26.5	26.0	24.9	21.5	18.0	13.0
1095 to 1080	10.2	8.7	10.5	14.3	17.6	21.8	24.1	24.8	24.9	21.4	17.5	12.9
1080 to 1065	10.2	8.3	9.6	12.5	15.0	19.1	22.2	23.4	24.5	21.4	17.3	13.0
1065 to 1050	10.0	8.5	9.3	11.6	13.8	17.1	20.4	22.5	23.8	21.2	17.3	12.9
1050 to 1035	10.0	8.2	8.6	10.5	12.5	15.4	18.7	20.7	22.4	20.7	17.3	13.1
1035 to 1020	10.1	8.3	8.5	10.2	11.6	13.4	15.7	18.6	19.7	18.5	16.3	12.8
1020 to 1005	9.9	8.2	8.3	9.6	10.5	11.2	13.6	14.1	15.2	15.3	14.4	12.1
1005 to 990	9.9	8.0	8.2	9.5	10.1	10.2	10.3	10.8	11.7	12.4	12.8	11.4
990 to 975	9.7	7.9	8.1	9.2	9.5	9.6	9.7	9.8	9.7	9.5	11.0	10.7
975 to 960	9.4	8.4	9.2	9.6	9.9	8.9	9.5	9.5	9.8	10.2	9.7	10.4
960 to 945	9.1	8.8	9.2	9.5	9.7	9.8	9.9	10.0	9.9	9.8	9.8	10.1
945 to 930	9.0	8.5	9.2	9.4	9.5	9.5	9.9	9.8	9.7	9.6	9.8	9.8
930 to 915	8.6	8.8	9.4	9.3	9.3	10.3	9.7	9.9	9.8	9.4	9.2	10.3
915 to 900					8.9							
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 914.1 ft

Jocassee F_2_556.0: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.8	9.8	11.7	16.0	20.8	24.7	26.6	26.6	25.0	21.4	17.5	14.0
1095 to 1080	10.6	9.8	11.4	14.8	17.7	22.1	24.8	26.3	25.0	21.4	17.2	13.5
1080 to 1065	10.5	9.7	10.6	13.4	16.4	20.5	23.6	25.5	24.9	21.4	17.2	13.8
1065 to 1050	10.6	9.6	10.3	12.3	15.1	19.2	22.5	24.5	24.6	21.4	17.3	13.7
1050 to 1035	10.5	9.5	10.0	11.4	13.8	17.1	20.8	23.3	23.5	21.2	17.2	13.6
1035 to 1020	10.4	9.5	9.8	11.1	12.6	15.1	18.5	21.0	22.1	20.4	16.9	13.7
1020 to 1005	10.5	9.4	9.6	10.4	11.3	12.9	14.7	16.4	18.0	18.7	16.3	13.4
1005 to 990	10.3	9.3	9.4	9.9	10.2	11.0	11.6	12.1	12.4	13.2	14.7	12.7
990 to 975	9.9	9.1	9.4	9.7	9.8	10.0	10.2	10.3	10.3	10.5	11.3	11.6
975 to 960	9.5	9.0	9.3	9.5	9.5	9.7	9.7	9.8	9.8	9.8	10.0	10.7
960 to 945	9.5	8.9	9.1	9.4	9.3	9.5	9.5	9.5	9.6	9.6	9.6	10.0
945 to 930	9.2	8.7	9.1	9.2	9.2	9.3	9.3	9.4	9.3	9.4	9.5	9.5
930 to 915	9.3	8.4	8.9	9.0	9.1	9.1	9.4	9.3	9.3	9.3	9.3	9.4
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 918.4 ft

Legend	8										25

Lake Jocassee

Dissolved Oxygen

Jocassee B_2_558.7: Monthly Averaged Dissolved Oxygen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.6	9.2	10.1	10.1	9.0	8.3	8.5	8.3	7.6	8.2	8.6	9.2
1095 to 1080	9.5	8.8	10.1	10.2	9.5	9.1	8.4	8.1	7.6	8.2	8.7	9.1
1080 to 1065	9.5	8.7	9.8	10.1	9.5	9.1	8.2	8.0	7.6	8.1	8.8	9.0
1065 to 1050	9.4	8.8	9.7	9.9	9.4	9.1	8.1	7.7	7.6	8.1	8.7	9.0
1050 to 1035	9.4	8.8	9.4	9.7	9.4	9.2	8.3	7.6	7.3	8.0	8.6	9.0
1035 to 1020	9.4	8.8	9.3	9.6	9.2	9.1	8.1	7.3	6.5	7.9	8.7	9.0
1020 to 1005	9.3	8.7	9.2	9.6	9.1	8.8	7.7	6.7	5.5	7.2	8.6	8.9
1005 to 990	9.4	8.6	9.1	9.5	9.0	8.4	7.6	6.9	6.2	5.5	7.4	8.8
990 to 975	9.4	8.6	9.0	9.2	8.8	8.2	7.6	7.0	6.4	6.3	5.2	7.6
975 to 960	8.9	8.4	8.7	8.9	8.3	7.8	7.2	6.8	6.1	6.1	5.4	5.1
960 to 945	6.2	8.6	8.6	8.7	8.0	7.4	6.8	6.3	5.7	5.4	4.9	3.5
945 to 930	3.5	8.1	8.5	8.6	7.6	7.1	6.4	5.9	5.2	5.1	4.7	3.3
930 to 915	4.0	7.7	8.3	7.9	6.9	6.4	6.0	5.5	4.8	4.7	4.2	3.0
915 to 900	2.8	6.2	7.9	7.4	6.4	5.7	5.2	4.9	4.5	4.2	3.7	2.9
900 to 885	1.4	6.1	7.1	6.8	5.9	5.5	4.8	4.4	3.9	3.5	3.3	2.3
885 to 870	0.5	6.7	6.3	6.4	5.3	4.9	4.1	4.0	3.2	2.9	2.7	1.7
870 to 855	0.3	7.0	6.7	5.9	4.9	4.5	4.0	3.1	2.4	2.3	2.6	1.3
< 855	0.3	4.6	7.5	5.6	4.0	3.8	3.1	2.5	1.6	1.4	1.7	0.9

Jocassee B_2_558.7: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.3	9.3	10.0	9.9	9.0	8.4	8.2	7.9	7.7	7.8	8.3	8.8
1095 to 1080	9.2	9.2	9.9	9.9	9.3	8.8	8.3	7.8	7.6	7.9	8.4	8.7
1080 to 1065	9.1	9.1	9.9	9.7	9.2	8.8	8.2	7.7	7.5	7.8	8.3	8.7
1065 to 1050	9.1	9.0	9.8	9.6	9.2	8.7	8.2	7.6	7.4	7.8	8.3	8.7
1050 to 1035	9.1	8.9	9.5	9.5	9.1	8.7	8.1	7.2	6.8	7.7	8.2	8.7
1035 to 1020	9.0	8.9	9.3	9.5	9.0	8.6	7.9	6.9	6.3	7.4	8.2	8.6
1020 to 1005	9.0	8.8	9.2	9.3	9.0	8.6	8.0	7.0	6.0	6.3	7.8	8.6
1005 to 990	9.0	8.7	9.2	9.1	8.8	8.4	8.0	7.3	6.7	6.2	6.6	8.1
990 to 975	8.3	8.6	8.9	8.8	8.4	8.0	7.6	7.1	6.8	6.3	5.9	6.0
975 to 960	6.8	8.4	8.5	8.4	7.9	7.5	7.1	6.8	6.5	6.0	5.7	4.9
960 to 945	5.7	7.6	7.8	7.9	7.3	7.0	6.7	6.4	6.1	5.6	5.3	4.7
945 to 930	4.6	7.3	7.3	7.2	6.9	6.5	6.2	5.9	5.7	5.1	4.9	4.3
930 to 915	4.0	6.7	6.9	6.5	6.4	6.0	5.6	5.3	5.2	4.8	4.7	3.9
915 to 900	3.3	6.1	6.6	6.3	6.1	5.6	5.4	5.1	5.1	4.4	4.2	3.6
900 to 885	3.0	5.7	6.3	5.9	6.1	5.2	5.0	4.9	4.6	3.9	3.8	3.6
885 to 870	3.0	5.7	6.2	5.6	5.5	5.3	4.9	4.2	4.2	3.7	3.7	2.9
870 to 855	2.5	6.0	6.1	5.6	5.6	4.9	4.4	4.1	4.0	3.4	3.2	2.7
< 855	2.6	6.0	6.1	5.2	5.2	4.7	4.2	3.8	3.4	3.0	2.7	2.5

Legend											
	0.0										**10.0**

Jocassee B_3_558.0: Monthly Averaged Dissolved Oxygen (mg/l) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.9	9.4	10.1	9.9	9.2	8.3	8.6	8.0	7.3	8.1	8.6	9.1
1095 to 1080	9.8	9.4	9.8	10.2	9.3	8.5	8.4	7.8	7.4	8.1	8.4	9.1
1080 to 1065	9.8	9.3	9.6	10.4	9.2	8.8	8.1	7.8	7.4	8.1	8.3	9.1
1065 to 1050	9.8	9.2	9.5	10.1	9.1	8.8	8.3	7.7	7.3	8.2	8.4	9.1
1050 to 1035	9.8	9.0	9.5	9.5	9.1	8.8	8.3	7.7	7.2	8.1	8.4	9.1
1035 to 1020	9.8	9.0	9.6	9.5	9.1	8.7	8.1	7.3	6.6	8.1	8.3	9.0
1020 to 1005	9.8	9.0	9.5	9.5	9.0	8.6	8.0	7.1	5.6	7.3	8.2	9.0
1005 to 990	9.7	8.9	9.3	9.5	8.9	8.4	7.9	7.2	6.3	6.4	7.7	8.9
990 to 975	9.7	9.0	9.1	9.3	8.8	8.1	7.9	7.2	6.6	6.8	6.1	8.0
975 to 960	9.5	9.1	8.9	9.0	8.6	7.8	7.4	7.2	6.5	6.8	5.8	6.7
960 to 945	9.2	8.9	8.6	8.4	8.0	7.3	6.9	6.6	6.2	6.2	5.5	5.4
945 to 930	8.7	8.5	8.2	8.0	7.1	6.5	6.2	5.8	5.5	5.5	4.7	4.0
930 to 915	7.4	7.6	7.1	6.5	6.1	5.7	5.2	4.8	4.6	4.6	3.9	3.1
915 to 900	4.5	6.4	6.0	5.6	4.9	4.5	4.2	4.0	3.6	3.7	3.2	2.4
900 to 885	2.2	5.7	5.0	4.7	4.0	3.7	3.5	3.2	2.9	2.9	2.6	1.9
885 to 870	0.6	4.3	4.0	3.3	3.3	2.8	2.9	2.4	2.2	2.3	1.8	1.5
870 to 855	0.0	2.6	2.5	2.7	2.6	2.3	2.3	2.1	1.6	1.8	1.2	1.0
< 855	0.0	0.4	1.3	1.8	1.9	1.6	1.5	0.8	0.5	0.4	0.2	0.1

Jocassee B_3_558.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2020 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.5	9.3	9.9	9.9	9.0	8.4	8.0	7.8	7.7	7.7	8.3	8.8
1095 to 1080	9.3	9.2	9.8	9.8	9.1	8.5	8.0	7.7	7.6	7.9	8.4	8.8
1080 to 1065	9.1	9.1	9.7	9.6	9.1	8.6	8.1	7.7	7.5	7.8	8.3	8.8
1065 to 1050	9.1	9.1	9.7	9.5	9.1	8.6	8.1	7.5	7.4	7.8	8.3	8.8
1050 to 1035	9.2	9.1	9.5	9.4	9.1	8.6	8.0	7.3	7.1	7.7	8.3	8.7
1035 to 1020	9.1	9.0	9.3	9.3	9.1	8.6	7.9	7.0	6.6	7.5	8.2	8.7
1020 to 1005	9.1	8.9	9.2	9.2	9.0	8.6	8.0	7.1	6.3	6.8	7.9	8.6
1005 to 990	8.9	8.8	9.1	9.0	8.8	8.5	8.0	7.5	6.9	6.5	7.0	8.1
990 to 975	8.6	8.6	8.8	8.7	8.4	8.1	7.8	7.4	7.1	6.6	6.2	6.7
975 to 960	7.0	8.2	8.5	8.3	8.0	7.7	7.2	7.0	6.7	6.3	6.0	5.6
960 to 945	6.2	7.2	7.8	7.8	7.5	7.1	6.8	6.5	6.3	5.8	5.7	5.3
945 to 930	4.9	6.5	7.2	7.4	7.0	6.7	6.4	6.0	5.9	5.2	5.2	4.9
930 to 915	4.1	5.9	6.5	6.7	6.5	6.2	5.7	5.5	5.3	5.0	4.9	4.4
915 to 900	3.7	5.4	6.0	6.5	6.2	5.8	5.5	5.3	5.1	4.6	4.4	4.1
900 to 885	3.4	5.0	5.8	6.2	6.1	5.4	5.3	5.2	4.9	4.4	4.3	4.2
885 to 870	3.4	5.3	5.6	5.9	5.6	5.7	5.2	4.6	4.7	4.3	4.4	3.7
870 to 855	3.3	5.4	5.6	6.0	5.7	5.2	4.8	4.6	4.5	4.1	3.9	3.6
< 855	2.9	5.7	5.7	5.6	5.4	5.0	4.6	4.2	4.0	3.3	3.2	3.1
Legend	**0.0**										**10.0**	

Jocassee C_2_559.0: Monthly Averaged Dissolved Oxygen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.7	9.8	9.7	10.0	9.0	8.4	8.5	8.1	7.7	8.2	8.4	9.1
1095 to 1080	9.7	9.2	10.0	10.2	9.5	9.1	8.5	8.1	7.8	8.1	8.5	9.0
1080 to 1065	9.6	9.0	9.9	10.1	9.5	9.0	8.3	7.9	7.7	8.0	8.5	9.0
1065 to 1050	9.5	9.1	9.8	9.8	9.4	9.0	8.3	7.6	7.6	8.0	8.4	8.9
1050 to 1035	9.5	9.1	9.6	9.7	9.3	9.1	8.4	7.4	7.3	8.0	8.5	9.0
1035 to 1020	9.4	8.8	9.3	9.6	9.3	9.1	8.0	7.2	6.6	7.9	8.4	9.0
1020 to 1005	9.4	8.8	9.2	9.6	9.1	8.7	7.8	6.6	5.6	7.2	8.4	8.9
1005 to 990	9.3	8.7	8.9	9.5	9.0	8.5	7.7	6.8	6.3	5.5	6.6	8.5
990 to 975	9.3	8.7	8.8	9.1	8.7	8.2	7.5	6.8	6.4	6.2	5.4	7.2
975 to 960	8.3	8.5	8.5	8.7	8.2	7.7	6.9	6.3	5.9	5.8	5.1	5.0
960 to 945	5.0	8.1	8.5	8.4	7.8	7.1	6.3	5.8	5.4	5.2	4.7	4.4
945 to 930	4.1	7.7	8.0	7.9	7.3	6.5	5.7	5.3	4.8	4.7	4.1	3.7
930 to 915	3.0	6.7	7.0	7.0	6.5	5.9	5.2	4.7	4.2	3.9	3.5	3.2
915 to 900	2.4	3.7	6.3	6.5	5.8	5.0	4.4	3.8	3.7	3.5	2.9	2.4
900 to 885	1.5	3.2	5.5	5.8	5.4	4.6	3.9	3.3	3.0	2.5	2.2	1.6
885 to 870	0.8	2.6	4.6	5.1	3.7	4.0	3.2	2.9	2.4	1.7	1.3	0.9
870 to 855	0.7	3.3	4.9	4.5	3.8	3.6	3.0	2.1	1.7	1.0	1.0	0.7
< 855	0.4	4.1	4.3	4.1	3.7	3.2	2.5	2.2	1.7	0.8	0.7	0.5

Jocassee C_2_559.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.3	9.3	10.0	9.9	9.0	8.3	8.1	7.9	7.9	7.7	8.2	8.7
1095 to 1080	9.2	9.2	10.0	10.0	9.2	8.8	8.3	7.8	7.7	7.8	8.3	8.7
1080 to 1065	9.1	9.1	9.9	9.8	9.3	8.8	8.3	7.7	7.6	7.8	8.3	8.7
1065 to 1050	9.1	9.1	9.8	9.7	9.2	8.8	8.2	7.6	7.4	7.7	8.3	8.7
1050 to 1035	9.1	9.0	9.6	9.5	9.1	8.8	8.1	7.2	6.9	7.7	8.2	8.6
1035 to 1020	9.0	9.0	9.4	9.4	9.0	8.7	7.9	6.9	6.3	7.4	8.2	8.6
1020 to 1005	9.0	8.9	9.2	9.3	9.0	8.6	8.0	7.1	6.1	6.2	7.7	8.5
1005 to 990	8.9	8.8	9.1	9.0	8.7	8.4	8.0	7.3	6.7	6.0	6.6	7.8
990 to 975	8.4	8.6	8.7	8.7	8.3	7.9	7.4	6.9	6.5	6.0	5.6	5.9
975 to 960	6.5	8.0	8.4	8.1	7.7	7.2	6.7	6.3	5.9	5.4	5.1	4.7
960 to 945	5.0	7.3	7.5	7.5	7.0	6.6	6.0	5.7	5.4	4.8	4.6	4.3
945 to 930	3.9	6.2	6.9	6.8	6.6	6.0	5.5	5.1	4.9	4.3	4.1	3.7
930 to 915	3.2	5.4	6.2	5.9	5.9	5.4	4.8	4.5	4.4	3.8	3.7	3.2
915 to 900	2.6	5.1	5.7	5.6	5.6	5.0	4.5	4.3	4.1	3.4	3.2	2.9
900 to 885	2.2	4.3	5.4	5.1	5.5	4.5	4.2	4.1	3.8	3.0	2.9	2.8
885 to 870	2.5	4.6	5.4	4.8	5.0	4.7	4.2	3.6	3.5	3.0	2.9	2.2
870 to 855	2.1	5.1	5.5	4.8	5.0	4.3	3.9	3.7	3.5	2.7	2.5	2.1
< 855	2.3	5.2	5.3	4.6	4.7	4.3	3.9	3.6	3.4	2.6	2.4	2.2

Legend	**0.0**										**10.0**

Jocassee C_2_560.0: Monthly Averaged Dissolved Oxygen (mg/l) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.5	9.7	10.3	10.6	9.7	8.8	8.7	8.4	8.3	8.3	8.6	9.0
1095 to 1080	9.5	9.5	10.1	10.6	10.1	9.3	9.6	8.6	8.3	8.2	8.5	9.0
1080 to 1065	9.4	9.3	10.0	10.5	9.9	9.9	9.8	8.6	8.2	8.1	8.6	9.0
1065 to 1050	9.3	9.2	9.8	10.2	9.7	9.6	9.6	8.3	7.6	8.0	8.5	9.0
1050 to 1035	9.3	9.0	9.5	9.8	9.6	9.4	9.2	8.1	7.2	7.7	8.7	9.0
1035 to 1020	9.3	8.9	9.4	9.4	9.1	9.0	8.7	7.6	7.0	7.1	8.5	9.0
1020 to 1005	9.2	8.8	9.1	9.2	8.6	8.3	8.1	7.2	6.5	6.5	7.2	8.6
1005 to 990	9.1	8.8	8.9	9.0	8.4	7.7	7.6	6.7	6.2	5.3	6.2	7.4
990 to 975	8.3	8.8	8.4	8.9	7.8	7.4	7.2	6.3	6.2	5.7	5.1	6.3
975 to 960	7.8	8.1	8.4	8.4	7.6	7.8	7.1	6.6	5.7	5.5	5.3	5.2
960 to 945	6.8	8.2	8.2	8.3	7.9	7.2	6.7	6.0	5.9	5.4	5.3	4.6
945 to 930	5.3	7.2	8.3	7.8	7.2	6.8	6.1	5.6	5.6	5.1	5.0	4.0
930 to 915	4.4	6.6	8.2	6.9	7.0	6.2	5.7	5.1	5.0	4.2	4.3	3.6
915 to 900	1.8	5.7	7.4	6.6	6.0	5.7	4.6	4.2	4.4	3.7	4.0	3.3
900 to 885	1.6	4.6	6.7	6.0	6.1	5.1	4.6	3.6	3.6	2.5	3.0	2.7
885 to 870	1.1	3.8	5.5	4.9	4.8	4.5	3.9	3.2	3.2	1.9	2.4	1.9
870 to 855	1.4	5.3	5.4	4.3	4.4	3.9	3.6	2.8	2.1	1.2	1.7	1.4
< 855	0.9	5.2	5.1	4.0	5.6	3.5	3.4	2.4	2.5	0.7	1.2	1.4

Jocassee C_2_560.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.2	9.3	10.0	9.9	9.0	8.3	8.1	7.9	7.7	7.6	8.1	8.7
1095 to 1080	9.0	9.2	9.9	9.9	9.1	8.5	8.1	7.7	7.5	7.6	8.2	8.6
1080 to 1065	8.9	9.1	9.9	9.8	9.1	8.7	8.2	7.6	7.3	7.6	8.2	8.6
1065 to 1050	8.9	9.0	9.7	9.7	9.2	8.7	8.2	7.6	7.2	7.6	8.1	8.6
1050 to 1035	8.9	9.0	9.6	9.5	9.1	8.7	8.1	7.2	6.8	7.5	8.1	8.5
1035 to 1020	8.8	8.9	9.4	9.4	9.0	8.5	7.9	6.9	6.3	7.2	8.0	8.5
1020 to 1005	8.8	8.7	9.3	9.3	8.9	8.5	7.9	7.0	6.1	6.1	7.6	8.4
1005 to 990	8.8	8.7	9.1	9.0	8.7	8.3	7.9	7.2	6.5	5.8	6.1	7.5
990 to 975	8.0	8.6	8.8	8.6	8.2	7.7	7.2	6.7	6.3	5.8	5.4	5.5
975 to 960	6.7	8.1	8.4	8.1	7.6	6.9	6.4	5.9	5.5	5.0	4.6	4.2
960 to 945	4.8	7.2	7.7	7.4	7.0	6.1	5.7	5.3	5.0	4.4	4.1	3.6
945 to 930	3.6	6.2	7.1	6.6	6.4	5.5	5.3	4.8	4.7	4.0	3.8	3.0
930 to 915	2.8	5.6	6.2	5.7	5.9	5.1	4.7	4.2	4.1	3.7	3.5	2.6
915 to 900	2.2	5.1	5.4	5.4	5.6	4.7	4.5	4.0	3.9	3.3	3.0	2.4
900 to 885	2.0	4.5	5.1	5.0	5.5	4.3	4.2	3.8	3.5	2.8	2.8	2.7
885 to 870	2.4	4.6	4.6	4.6	4.8	4.4	4.2	3.3	3.4	2.8	2.8	1.9
870 to 855	1.8	4.9	5.1	4.6	4.1	3.9	3.6	3.2	3.0	2.1	2.0	1.9
< 855	2.2	4.8	5.3	4.2	4.3	4.1	4.0	3.7	2.8	2.5	2.5	1.7

Legend	0.0										10.0

Jocassee C_2_562.0: Monthly Averaged Dissolved Oxygen (mg/l) 1980 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.9	10.4	10.1	10.6	9.7	8.3	8.8	8.5	7.9	8.3	8.2	9.2
1095 to 1080	9.7	9.9	10.0	10.4	9.5	8.6	8.9	8.8	8.1	8.1	8.5	9.1
1080 to 1065	9.6	9.7	9.9	10.4	9.5	8.7	8.4	8.2	7.9	8.0	8.5	9.1
1065 to 1050	9.7	9.7	9.9	10.3	9.5	8.5	8.1	7.9	7.6	7.9	8.3	9.0
1050 to 1035	9.6	9.7	9.9	10.1	9.3	8.2	7.8	7.3	7.4	7.9	8.4	9.0
1035 to 1020	9.7	9.6	9.7	9.7	9.0	7.7	7.0	5.7	6.7	7.5	8.4	9.0
1020 to 1005	9.7	9.6	9.5	9.3	8.1	6.5	5.6	3.1	2.6	5.9	8.3	9.0
1005 to 990	10.1	9.8	9.4	8.1	7.1	4.8	2.5	0.3	0.1	1.4	5.6	9.1
990 to 975	10.4	10.0	9.7	7.6	4.8		1.0	0.6	0.0	0.3	0.0	
975 to 960									0.0			
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 964.5 ft

Jocassee C_2_562.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.4	9.7	10.1	10.0	9.1	8.6	8.5	8.1	7.9	7.8	8.3	8.8
1095 to 1080	9.3	9.6	10.1	10.1	9.1	8.6	8.6	8.1	7.7	7.8	8.4	8.7
1080 to 1065	9.2	9.6	10.0	9.9	9.1	8.3	8.1	7.9	7.5	7.8	8.3	8.7
1065 to 1050	9.2	9.5	10.0	9.8	9.0	8.1	7.8	7.7	7.4	7.8	8.2	8.7
1050 to 1035	9.2	9.4	9.8	9.6	8.8	7.9	7.2	6.9	7.1	7.7	8.2	8.7
1035 to 1020	9.2	9.4	9.5	9.4	8.5	7.3	6.2	5.4	5.6	7.3	8.0	8.7
1020 to 1005	9.3	9.4	9.3	8.6	7.6	6.4	4.8	3.5	2.7	5.6	7.9	8.6
1005 to 990	9.2	9.4	8.7	7.5	6.2	4.2	2.5	0.9	0.3	0.9	5.9	7.7
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 992.2 ft

Legend	0.0										10.0

Jocassee C_2_565.4: Monthly Averaged Dissolved Oxygen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.8	10.1	10.0	10.1	9.4	8.2	8.5	8.2	7.9	8.0	7.9	9.5
1095 to 1080	9.8	9.3	10.0	10.3	9.8	9.3	8.9	8.4	7.8	7.9	8.4	9.1
1080 to 1065	9.6	9.1	9.8	10.3	9.9	9.6	9.0	8.2	7.6	7.9	8.5	9.1
1065 to 1050	9.6	9.1	9.6	10.1	9.9	9.2	9.0	7.9	7.4	7.8	8.3	9.1
1050 to 1035	9.5	9.0	9.3	9.9	9.7	8.9	8.6	7.7	7.2	7.9	8.4	9.0
1035 to 1020	9.6	8.8	9.1	9.8	9.2	8.1	7.7	6.9	6.4	7.8	8.3	9.0
1020 to 1005	9.7	8.8	9.0	9.7	8.7	7.7	6.7	5.4	4.5	6.9	8.3	9.0
1005 to 990	9.7	8.8	9.0	9.5	8.5	7.1	6.0	4.8	3.8	3.1	6.7	8.9
990 to 975	9.8	9.1	8.7	9.0	8.0	6.5	5.6	4.2	3.6	3.3	1.7	5.8
975 to 960	9.9	9.1	8.6	8.3	7.3	5.7	4.6	3.3	2.4	1.2	0.3	2.1
960 to 945	10.1	9.4	8.6	8.0	6.6	5.0	3.6	2.2	0.9	0.2	0.1	0.4
945 to 930	10.4	9.4	8.6	7.8	6.1	4.6	3.7	1.8	0.4	0.0	0.0	0.1
930 to 915			8.1		5.5	3.8		0.9	0.2			
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 918.1 ft

Jocassee C_2_565.4: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 1994 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	8.9	9.4	9.7	10.2	9.1	8.3	8.9	7.9	8.0	7.8	8.2	8.9
1095 to 1080	8.8	9.3	9.8	10.3	9.7	8.7	9.3	7.9	7.7	7.9	8.5	8.8
1080 to 1065	8.8	9.2	9.6	9.9	9.6	8.7	9.4	7.7	7.5	7.9	8.4	8.8
1065 to 1050	8.8	9.0	9.5	9.6	9.3	8.5	9.0	7.6	7.1	7.8	8.3	8.7
1050 to 1035	8.7	9.1	9.4	9.6	9.0	8.2	8.6	7.0	6.4	7.6	8.4	8.8
1035 to 1020	8.7	9.0	9.2	9.5	8.8	7.7	7.8	6.6	5.8	6.8	7.7	8.8
1020 to 1005	8.7	8.9	9.1	9.2	8.7	7.6	7.8	6.2	5.5	5.8	7.1	8.6
1005 to 990	8.7	8.8	9.0	8.9	8.3	7.2	7.5	5.8	5.0	4.2	5.0	6.4
990 to 975	8.7	9.0	8.9	8.6	7.6	6.3	6.2	4.4	3.7	3.0	3.1	4.6
975 to 960	8.8	9.0	8.9	8.2	6.9	5.6	5.4	3.7	2.8	2.3	1.9	1.8
960 to 945	8.4	9.1	8.9	7.8	6.5	5.0	4.8	3.0	2.2	1.8	1.4	1.4
945 to 930	5.8	9.4	8.9	7.0	5.9	3.8	4.1	2.5	1.8	1.5	1.1	1.1
930 to 915	8.9				5.2		0.9	0.1	1.1		1.7	
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 926.6 ft

Legend	**0.0**										**10.0**

Jocassee D_2_551.0: Monthly Averaged Dissolved Oxygen (mg/l) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	12.1	12.1	11.0	10.4	8.9	8.6	8.4	8.5	8.8	9.4	10.2	11.3
1095 to 1080	11.5	11.2	10.9	9.8	9.8	8.7	8.1	8.1	8.6	10.1	10.6	11.4
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1082.8 ft

Jocassee D_2_551.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	13.3	11.4	10.5	8.9	8.9	8.2	8.3	8.7	8.9	10.7	8.4	10.8
1095 to 1080		11.7						7.7			7.8	
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1083.7 ft

Legend	0.0										10.0

Jocassee D_2_564.0: Monthly Averaged Dissolved Oxygen (mg/l) 1976 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.7	10.0	10.4	10.5	9.9	8.7	8.6	7.8	8.4	8.3	8.6	9.0
1095 to 1080	9.6	9.6	10.1	10.6	10.1	9.3	9.0	8.1	8.3	8.2	8.6	9.0
1080 to 1065	9.5	9.5	10.0	10.5	10.3	9.8	9.2	7.6	8.3	8.1	8.6	9.0
1065 to 1050	9.5	9.4	9.9	10.3	10.0	9.4	9.0	7.4	7.8	8.1	8.5	9.0
1050 to 1035	9.4	9.3	9.9	10.2	9.4	9.0	8.6	7.1	7.1	8.0	8.7	9.0
1035 to 1020	9.5	9.1	9.6	10.0	8.9	8.5	7.6	6.1	6.2	7.4	8.2	9.1
1020 to 1005	9.5	9.2	9.5	9.6	8.2	7.6	6.7	4.6	4.0	4.8	7.1	8.9
1005 to 990	9.5	9.3	9.4	9.2	7.9	7.3	6.1	3.1	3.3	2.6	4.8	7.5
990 to 975	9.5	9.4	9.2	8.9	7.7	7.3	6.8	3.1	3.5	2.3	2.7	5.6
975 to 960	9.6	9.3	8.6	8.6	7.9	6.6	6.0	3.8	4.1	3.9	3.0	4.3
960 to 945	8.8	9.2	8.7	8.3	7.8	7.0	6.3	4.1	4.9	3.7	3.5	3.4
945 to 930	6.7	9.4	8.5	8.0	7.2	6.2	5.7	3.7	4.2	3.0	2.4	2.2
930 to 915	5.5	8.0	8.3	7.0	6.4	4.9	4.6	2.9	2.9	2.1	1.8	1.5
915 to 900	4.7	5.7	7.4	6.6	5.6	3.8	3.3	2.1	2.1	1.6	1.5	1.1
900 to 885	4.0	4.9	7.4	5.9	5.2	3.2	2.5	1.2	1.5	0.9	1.1	0.6
885 to 870	3.3	4.3	6.1	4.0	3.8	3.1	2.3	0.8	0.7	0.4	0.6	0.7
870 to 855	0.0		7.9	7.2	4.6	1.5	1.7	2.2	0.0	0.0	0.0	0.7
< 855	*Minimum Reading 864.7 ft*											

Jocassee D_2_564.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.1	9.3	9.9	9.8	9.0	8.2	8.2	7.9	7.7	7.6	8.1	8.8
1095 to 1080	8.9	9.2	9.8	9.8	9.1	8.5	8.1	7.7	7.4	7.6	8.2	8.6
1080 to 1065	8.9	9.1	9.7	9.6	9.1	8.7	8.2	7.6	7.3	7.6	8.2	8.6
1065 to 1050	8.9	9.0	9.6	9.5	9.1	8.7	8.2	7.6	7.1	7.5	8.1	8.6
1050 to 1035	8.8	9.0	9.5	9.4	9.0	8.6	8.1	7.3	6.9	7.5	8.1	8.6
1035 to 1020	8.8	8.9	9.3	9.3	9.0	8.5	7.8	7.0	6.4	7.3	8.0	8.6
1020 to 1005	8.8	8.8	9.1	9.1	8.9	8.4	7.8	6.9	5.9	6.4	7.6	8.4
1005 to 990	8.8	8.8	8.9	8.8	8.6	8.1	7.6	6.7	5.8	5.3	6.1	7.6
990 to 975	8.3	8.7	8.7	8.4	8.1	7.6	6.8	6.1	5.4	5.0	4.6	5.5
975 to 960	6.8	8.2	8.3	7.9	7.5	6.7	6.0	5.4	4.7	4.1	3.8	3.7
960 to 945	5.7	7.6	7.8	7.3	6.8	5.8	5.3	4.9	4.1	3.3	3.0	2.9
945 to 930	3.6	6.8	7.2	6.5	6.3	5.1	4.8	4.2	3.6	2.7	2.3	2.1
930 to 915	2.7	6.0	6.4	5.3	5.6	4.5	4.0	3.5	2.8	2.3	1.9	1.8
915 to 900	2.1	5.7	5.3	5.0	5.4	4.0	3.9	3.1	2.7	1.9	1.6	1.7
900 to 885	1.7	5.3	4.8	4.1	3.7	2.8	3.4	2.6	2.1	1.5	1.2	1.9
885 to 870	2.3	3.9	3.3	4.4	2.9	2.7	3.0	2.2	2.0	2.2	1.0	1.4
870 to 855	0.1	4.3	3.1	5.2		0.0	0.4	2.8		2.3	0.0	
< 855	*Minimum Reading 864.4 ft*											

Legend	**0.0**										**10.0**

Jocassee D_2_564.1: Monthly Averaged Dissolved Oxygen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.0	10.6	9.8	10.2	9.3	8.7	8.6	5.4	7.9	8.2	8.3	9.2
1095 to 1080	9.8	9.5	10.0	10.2	9.5	8.9	8.7	6.3	7.7	8.0	8.5	9.2
1080 to 1065	10.0	9.7	10.0	10.1	9.5	9.0	8.6	5.9	7.6	8.1	8.6	9.2
1065 to 1050	10.6	10.6	10.2	10.3	9.4	8.5	8.2	5.5	7.5	8.0	8.7	9.7
1050 to 1035	10.7	10.4	10.1	10.3	9.2	7.7	6.8	4.7	7.0	7.8	8.6	9.8
1035 to 1020	10.7	10.2	10.0	9.8	8.7	6.2	5.3	2.7	4.6	7.7	8.5	9.9
1020 to 1005	10.6	10.4	9.8	9.1	7.7	5.1	3.8	2.2	1.0	6.2	8.4	9.8
1005 to 990	10.6	10.2	9.3	8.0	5.8	2.9	1.5	0.9	0.1	1.7	8.1	9.7
990 to 975	10.6	10.0	9.0	7.3	4.1	2.1	0.3	0.3	0.0	0.0	5.4	9.7
975 to 960	10.5	9.9	9.5	8.7	2.8	1.5	0.0	0.4	0.0	0.0	1.9	10.1
960 to 945					2.7							
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 959.9 ft

Jocassee D_2_564.1: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2017 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.2	9.5	9.7	9.7	8.9	8.3	8.2	7.8	7.3	7.5	8.1	8.8
1095 to 1080	9.0	9.4	9.7	9.7	9.0	8.4	8.1	7.6	7.2	7.5	8.1	8.6
1080 to 1065	9.1	9.3	9.6	9.6	9.0	8.5	8.2	7.6	7.2	7.5	8.1	8.6
1065 to 1050	9.1	9.4	9.6	9.6	9.0	8.5	8.3	7.6	7.1	7.5	8.1	8.7
1050 to 1035	9.1	9.4	9.6	9.5	9.0	8.6	8.2	7.5	7.1	7.4	8.1	8.6
1035 to 1020	9.2	9.4	9.6	9.5	9.0	8.6	8.1	7.6	7.1	7.4	8.1	8.7
1020 to 1005	9.1	9.3	9.6	9.4	8.9	8.6	8.1	7.6	7.1	7.4	8.0	8.7
1005 to 990	9.2	9.4	9.6	9.4	8.9	8.6	8.4	7.6	7.1	7.4	8.1	8.7
990 to 975	9.1	9.5	9.6	9.4	8.7	8.6	8.1	7.6	6.9	7.4	8.2	8.7
975 to 960	9.3	9.4	9.8	9.5	8.8	8.3	8.4	7.1	6.8	7.5	8.2	8.9
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 963 ft

Legend	0.0										10.0

Jocassee E_2_557.0: Monthly Averaged Dissolved Oxygen (mg/l) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.8	9.9	10.6	10.4	9.7	8.8	8.7	8.5	8.3	8.2	8.7	9.1
1095 to 1080	9.8	9.8	10.3	10.4	10.1	9.3	9.4	8.6	8.4	8.1	8.7	9.1
1080 to 1065	9.7	9.5	10.1	10.3	10.0	9.9	9.6	8.5	8.1	8.1	8.6	9.1
1065 to 1050	9.6	9.4	9.9	10.1	9.8	9.4	9.4	7.9	7.3	7.9	8.6	9.1
1050 to 1035	9.6	9.3	9.6	9.7	9.5	9.3	8.6	7.5	6.3	7.5	8.7	9.1
1035 to 1020	9.7	9.3	9.5	9.3	8.8	8.8	7.9	6.8	5.9	6.7	8.4	9.1
1020 to 1005	9.6	9.3	9.3	9.2	8.3	8.2	7.3	6.3	5.1	5.8	6.8	8.5
1005 to 990	9.6	9.3	9.2	9.0	8.2	7.7	6.8	5.9	4.9	3.9	5.3	6.8
990 to 975	9.2	9.4	8.9	9.0	7.8	7.3	6.4	5.1	4.7	3.8	3.2	6.4
975 to 960	9.2	9.3	9.2	8.6	7.5	7.5	6.2	5.0	4.2	3.4	3.0	3.8
960 to 945	9.0	9.5	9.1	8.9	7.9	7.0	5.7	4.4	3.6	2.8	2.4	2.6
945 to 930	7.9	8.8	9.5	8.7	7.7	6.6	5.4	4.0	3.7	2.8	2.2	1.2
930 to 915	6.0	9.5	9.5	8.6	7.6	6.5	5.1	3.7	2.9	2.1	1.7	0.8
915 to 900	3.9	8.3	9.2	8.2	7.2	6.0	4.7	3.7	3.4	2.7	1.8	1.4
900 to 885	4.5	8.3	9.5	8.1	7.3	6.1	4.9	3.4	2.9	1.8	1.4	0.7
885 to 870	2.7	8.3	9.4	7.9	7.0	5.9	4.6	3.2	2.7	1.4	1.1	0.5
870 to 855	0.1	8.1	9.3	7.4	6.7	5.5	4.9	2.9	2.4	0.9	0.8	0.5
< 855	0.1	8.1	9.0	7.3	6.6	5.3	4.8	2.6	2.1	0.8	0.7	0.3

Jocassee E_2_557.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.6	9.6	10.2	9.9	9.1	8.4	8.3	8.1	8.0	7.7	8.4	8.9
1095 to 1080	9.4	9.6	10.1	9.9	9.5	9.1	8.5	8.0	7.7	7.8	8.5	8.9
1080 to 1065	9.4	9.5	10.0	9.8	9.5	9.1	8.6	7.9	7.6	7.8	8.4	8.8
1065 to 1050	9.4	9.5	9.9	9.7	9.4	9.0	8.4	7.5	7.1	7.7	8.4	8.8
1050 to 1035	9.3	9.3	9.7	9.6	9.2	8.8	7.9	6.8	6.4	7.6	8.3	8.8
1035 to 1020	9.3	9.3	9.5	9.5	9.0	8.3	7.3	6.0	5.4	7.4	8.2	8.8
1020 to 1005	9.3	9.2	9.4	9.3	8.9	8.1	7.1	6.0	5.1	6.0	7.8	8.6
1005 to 990	9.3	9.3	9.3	9.1	8.7	8.1	7.3	6.4	5.6	4.8	6.4	7.9
990 to 975	9.1	9.3	9.2	8.9	8.4	7.7	7.0	6.2	5.6	4.9	4.5	6.2
975 to 960	8.3	9.1	9.1	8.7	8.1	7.4	6.7	6.0	5.5	4.8	4.2	4.3
960 to 945	6.6	8.7	9.1	8.4	7.8	7.0	6.3	5.5	5.2	4.5	3.7	3.1
945 to 930	5.4	8.8	8.7	8.0	7.4	6.5	5.9	5.0	4.7	3.9	3.3	2.4
930 to 915	4.6	8.4	8.5	7.5	7.1	6.1	5.5	4.6	4.3	3.7	3.1	2.0
915 to 900	3.7	8.2	8.2	7.4	6.8	5.9	5.4	4.6	4.2	3.5	3.0	2.1
900 to 885	3.8	7.3	7.9	7.2	6.7	5.6	5.2	4.5	3.9	3.3	2.9	2.3
885 to 870	3.3	7.0	8.0	6.8	6.2	5.5	5.0	4.0	3.5	3.1	2.8	1.8
870 to 855	3.2	6.8	7.6	6.6	5.9	4.9	4.4	3.6	3.3	2.7	2.2	1.6
< 855	2.4	6.6	6.8	6.1	5.6	4.6	4.5	3.4	2.8	2.3	2.1	1.5

Legend										
0.0										**10.0**

Jocassee F_2_554.8: Monthly Averaged Dissolved Oxygen (mg/l) 1986 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.5	10.5	10.4	10.4	9.1	8.4	8.9	8.7	7.9	8.1	8.2	9.3
1095 to 1080	10.4	10.4	10.9	10.6	9.9	9.8	9.2	8.9	7.8	7.8	8.6	9.2
1080 to 1065	10.2	10.2	10.9	10.4	9.9	9.9	9.4	9.1	7.6	7.8	8.6	9.1
1065 to 1050	10.1	10.1	10.8	10.3	9.7	9.6	9.1	7.9	7.4	7.7	8.6	9.0
1050 to 1035	10.2	10.1	10.3	10.2	9.2	8.9	8.1	6.4	7.3	7.6	8.5	9.1
1035 to 1020	10.2	10.0	10.3	10.0	8.7	7.5	6.8	5.7	6.8	7.5	8.6	9.0
1020 to 1005	10.1	10.0	10.1	9.9	8.4	6.8	4.8	3.4	3.8	6.6	8.4	9.0
1005 to 990	10.2	10.2	10.0	9.6	8.2	6.2	4.5	3.0	1.9	2.3	8.6	9.1
990 to 975	10.4	10.4	10.0	9.3	7.6	5.7	4.6	2.6	1.5	0.5	5.5	9.1
975 to 960	10.7	10.4	10.0	8.2	6.0	3.5	2.1	0.8	0.2	0.1	0.4	7.8
960 to 945	10.7	10.6	9.9		5.9	1.8	0.8	0.8	0.0	0.0	0.0	1.4
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 946.5 ft

Jocassee F_2_554.8: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.8	10.1	10.4	9.9	9.0	8.7	8.4	8.3	8.1	7.7	8.4	8.9
1095 to 1080	9.7	10.2	10.4	10.0	9.5	8.9	9.0	8.5	7.7	7.8	8.4	8.9
1080 to 1065	9.7	10.0	10.2	9.9	9.4	8.7	8.5	8.0	7.4	7.7	8.3	8.9
1065 to 1050	9.6	9.9	10.1	9.8	8.9	8.3	7.3	7.3	7.1	7.6	8.3	8.8
1050 to 1035	9.6	9.9	10.0	9.6	8.7	7.6	6.7	6.4	6.9	7.5	8.3	8.8
1035 to 1020	9.6	9.8	9.8	9.4	8.6	7.3	5.8	4.9	5.4	7.2	8.1	8.8
1020 to 1005	9.6	9.7	9.8	9.2	8.4	7.2	5.6	4.1	3.9	6.0	8.0	8.8
1005 to 990	9.6	9.8	9.8	8.9	8.1	6.9	5.5	4.1	3.1	2.7	6.7	8.7
990 to 975	9.7	10.0	9.7	8.5	7.6	6.2	4.7	3.3	1.9	1.1	2.9	7.4
975 to 960	9.5	10.0	9.6	7.8	6.4	4.3	2.3	1.2	0.3	0.2	0.4	4.3
960 to 945	9.1	9.7	9.3	7.2	5.8	3.3	1.3	0.4	0.1	0.1	0.2	2.0
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 945.3 ft

Legend	0.0										10.0

Jocassee F_2_556.0: Monthly Averaged Dissolved Oxygen (mg/l) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.3	9.4	10.9	9.6	9.9	8.9	9.0	8.8	8.5	8.1	8.7	9.2
1095 to 1080	10.1	9.7	10.6	10.5	10.1	9.6	10.0	9.4	8.6	8.1	8.7	9.1
1080 to 1065	10.0	9.7	10.6	10.5	9.9	9.8	9.7	9.0	8.2	8.0	8.7	9.1
1065 to 1050	10.0	9.5	10.4	10.1	9.6	9.2	8.8	8.0	6.7	8.0	8.6	9.1
1050 to 1035	9.9	9.5	10.0	9.9	9.3	8.9	8.0	6.7	5.8	7.5	8.7	9.1
1035 to 1020	10.0	9.6	9.8	9.4	8.7	8.1	7.1	6.1	5.2	6.9	8.3	9.1
1020 to 1005	10.0	9.6	9.7	9.3	8.3	7.5	6.5	5.4	4.4	5.5	7.1	8.8
1005 to 990	10.0	9.6	9.7	9.2	8.3	7.2	6.3	5.0	3.8	3.9	5.5	7.7
990 to 975	10.1	9.9	9.5	9.4	8.0	7.0	5.9	4.5	3.7	2.9	3.2	7.3
975 to 960	10.1	9.8	9.8	8.9	7.5	6.7	5.2	4.4	2.8	2.1	1.3	5.7
960 to 945	10.3	10.0	9.8	8.8	7.3	5.6	4.0	2.8	1.5	0.7	0.1	2.9
945 to 930	10.4	10.1	9.7	8.2	6.3	4.3	3.2	1.7	0.6	0.1	0.0	2.0
930 to 915	10.5	10.1	8.7	7.2	5.5	3.1	2.5	1.9	0.1	0.0	0.0	4.9
915 to 900					4.6							
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 914.1 ft

Jocassee F_2_556.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.7	10.0	10.4	9.9	9.2	8.6	8.4	8.2	8.0	7.7	8.4	8.9
1095 to 1080	9.6	10.0	10.3	10.0	9.7	9.2	9.0	8.4	7.7	7.8	8.4	8.9
1080 to 1065	9.6	9.9	10.2	9.9	9.7	9.2	8.9	8.2	7.5	7.7	8.4	8.9
1065 to 1050	9.6	9.8	10.0	9.8	9.3	8.7	8.1	7.3	7.0	7.7	8.3	8.8
1050 to 1035	9.6	9.7	9.8	9.6	8.8	7.9	6.8	6.2	6.4	7.5	8.3	8.8
1035 to 1020	9.5	9.7	9.7	9.5	8.7	7.6	6.3	5.3	5.2	7.1	8.1	8.8
1020 to 1005	9.5	9.7	9.6	9.3	8.7	7.6	6.2	5.0	4.4	6.1	7.8	8.6
1005 to 990	9.5	9.7	9.6	9.2	8.5	7.7	6.7	5.7	4.7	4.2	6.8	8.2
990 to 975	9.5	9.8	9.5	9.0	8.2	7.4	6.5	5.6	4.8	3.8	3.9	7.2
975 to 960	9.3	9.8	9.5	8.7	7.7	6.6	5.7	4.7	3.9	2.8	2.0	4.4
960 to 945	9.2	9.7	9.4	8.1	7.0	5.7	4.6	3.6	2.6	1.6	0.9	2.7
945 to 930	8.4	9.4	9.0	7.3	6.1	4.4	3.4	2.3	1.5	0.7	0.4	1.0
930 to 915	7.9	8.5	9.2	7.4	5.4	4.0	2.4	2.1	1.1	0.5	0.4	1.2
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 918.4 ft

Legend	0.0										10.0

Lake Jocassee

Dissolved Oxygen Saturation

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Jocassee B_2_558.7: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Saturation Readings Began in 1998

Jocassee B_2_558.7: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1998 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	86.7	84.8	92.7	98.2	98.3	102.2	99.4	100.4	95.6	90.5	90.9	88.0
1095 to 1080	84.7	84.2	91.9	97.0	95.6	101.3	98.2	98.4	93.8	91.6	90.0	86.9
1080 to 1065	84.2	82.0	90.6	94.0	94.3	98.7	96.2	96.3	92.9	91.3	89.6	86.9
1065 to 1050	84.3	81.5	88.6	90.8	91.5	96.3	93.5	93.6	91.2	90.7	89.4	86.4
1050 to 1035	83.6	79.5	86.1	88.0	87.9	93.7	90.0	88.3	88.1	89.9	88.9	85.8
1035 to 1020	83.6	79.2	83.3	86.8	86.6	89.6	84.6	80.6	78.7	88.7	88.6	85.8
1020 to 1005	83.4	77.9	82.4	84.1	83.7	83.6	77.7	73.2	65.5	74.0	83.9	85.3
1005 to 990	82.9	76.3	80.8	81.2	79.4	78.6	72.6	69.3	64.9	59.7	68.7	80.4
990 to 975	76.3	75.8	79.0	78.4	75.1	73.0	67.5	65.2	63.2	59.4	55.8	59.6
975 to 960	63.0	72.9	76.7	74.7	71.1	66.9	63.0	61.9	59.7	55.4	53.1	46.2
960 to 945	52.4	66.5	71.8	70.2	65.7	62.3	58.5	57.4	55.9	52.3	49.8	43.4
945 to 930	45.9	65.5	67.7	66.6	63.7	58.0	55.7	54.5	53.0	48.5	47.9	40.9
930 to 915	39.3	64.4	65.0	59.2	59.5	53.7	48.7	48.6	50.1	45.6	45.6	37.2
915 to 900	31.2	61.0	62.5	58.7	57.7	49.9	47.9	46.7	48.6	41.4	42.0	34.5
900 to 885	28.6	58.3	62.1	57.7	57.3	48.4	45.3	46.4	44.4	38.8	40.3	34.0
885 to 870	29.3	54.8	59.3	52.2	54.3	47.9	44.2	40.0	41.4	36.1	38.7	28.4
870 to 855	25.0	59.1	60.2	54.4	54.1	44.0	38.7	38.7	39.4	33.0	33.3	25.6
< 855	25.2	59.4	59.3	52.2	51.5	43.3	38.7	37.1	34.9	28.9	30.3	24.3

Legend	**0.0**										**100.00**

Jocassee B_3_558.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Saturation Readings Began in 1998

Jocassee B_3_558.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1998 to 2020 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	87.2	83.8	92.8	97.8	97.5	101.3	97.4	99.3	94.6	90.3	91.0	88.2
1095 to 1080	85.3	84.0	92.0	96.3	95.2	99.0	95.8	96.9	93.9	91.3	90.1	87.5
1080 to 1065	84.3	82.7	89.9	93.7	93.9	97.2	95.1	94.6	93.2	91.0	89.5	87.4
1065 to 1050	84.3	82.6	88.3	90.7	91.2	95.2	92.1	92.6	91.7	90.5	89.4	87.0
1050 to 1035	83.6	82.5	86.4	88.2	88.4	93.4	89.8	88.5	89.3	89.9	88.9	86.4
1035 to 1020	83.7	81.1	84.5	87.1	87.2	89.8	84.9	81.9	82.3	89.2	88.4	86.3
1020 to 1005	83.2	79.8	83.3	84.5	84.1	85.1	78.7	74.6	68.8	81.4	86.7	86.0
1005 to 990	82.7	79.3	82.0	81.7	80.1	79.8	73.8	71.3	66.6	62.4	74.5	83.5
990 to 975	79.8	78.7	80.8	79.7	76.3	74.8	69.7	68.0	65.2	61.4	59.0	67.3
975 to 960	70.0	75.3	77.5	76.5	72.7	70.0	65.5	64.4	61.3	59.1	56.4	52.9
960 to 945	61.6	72.7	74.2	73.2	69.3	67.2	62.4	61.2	57.1	55.6	54.9	49.7
945 to 930	52.2	64.3	68.3	71.6	66.0	64.0	59.9	58.2	53.7	52.7	52.9	47.0
930 to 915	45.2	58.6	63.6	66.0	62.6	59.1	53.6	53.1	49.2	49.9	49.7	44.2
915 to 900	41.6	56.6	60.2	64.0	60.5	56.5	53.0	52.7	47.4	46.8	46.8	41.9
900 to 885	37.6	56.1	58.7	63.2	61.3	56.2	51.5	52.0	45.1	44.3	45.8	41.7
885 to 870	38.6	53.3	56.5	59.5	57.5	54.6	51.4	47.8	44.1	44.5	46.9	37.9
870 to 855	35.9	57.9	55.7	60.1	57.7	51.2	47.7	47.4	41.0	42.3	42.2	37.7
< 855	32.5	58.2	57.1	57.6	56.0	50.0	45.8	42.4	36.6	34.5	35.4	31.0

Legend	0.0									100.00

Jocassee C_2_559.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960						*DO Saturation Readings Began in 1998*						
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Jocassee C_2_559.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1998 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	86.3	84.2	94.1	98.9	99.2	101.6	99.3	101.0	97.5	89.1	90.2	87.2
1095 to 1080	84.1	84.1	93.6	98.1	96.6	102.3	98.8	99.6	94.7	90.6	89.6	86.2
1080 to 1065	83.5	82.5	91.6	95.2	95.0	99.6	97.4	97.1	93.8	90.4	89.3	86.1
1065 to 1050	83.2	82.1	89.4	91.3	92.1	97.0	93.5	93.7	91.7	90.2	89.0	85.8
1050 to 1035	82.6	80.7	86.7	88.1	88.5	94.4	90.1	88.7	87.9	89.5	88.8	85.3
1035 to 1020	82.8	80.1	83.3	86.8	87.1	90.2	84.1	80.8	78.7	87.4	88.5	85.2
1020 to 1005	82.4	78.7	82.2	84.2	83.6	84.6	77.5	73.9	64.4	74.1	84.6	84.0
1005 to 990	82.2	76.8	80.2	80.4	78.9	78.8	72.5	70.3	64.3	58.4	68.9	79.0
990 to 975	75.3	75.6	77.8	77.0	74.2	72.7	65.6	64.0	60.5	56.5	53.0	59.1
975 to 960	60.1	70.7	74.5	72.9	69.8	65.4	59.2	57.8	54.9	50.0	48.7	44.7
960 to 945	47.6	64.2	68.2	68.0	63.9	59.6	53.4	52.9	50.2	45.4	44.7	40.5
945 to 930	37.2	55.9	64.2	63.9	61.7	54.4	50.9	49.3	47.4	41.6	41.7	36.6
930 to 915	30.5	53.1	58.1	54.0	56.4	48.7	42.6	42.7	43.1	37.1	38.7	31.1
915 to 900	25.6	51.8	55.4	53.2	54.1	45.2	40.9	40.7	40.1	33.8	34.1	27.9
900 to 885	22.0	44.5	55.1	51.9	54.2	42.2	38.9	40.5	36.7	30.6	33.0	27.8
885 to 870	24.9	45.0	52.3	44.4	51.1	43.0	39.9	37.0	35.3	29.6	31.9	22.0
870 to 855	19.9	50.6	54.4	47.3	51.1	39.7	35.6	35.7	33.7	26.3	27.7	19.8
< 855	23.5	51.1	55.1	46.2	49.1	41.4	36.8	35.9	33.0	24.8	26.4	21.4

Legend	0.0									100.00

Jocassee C_2_560.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)												
Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960						*DO Saturation Readings Began in 1998*						
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Jocassee C_2_560.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1998 to 2015 (Post Bad Creek Operation)												
Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	85.8	84.8	94.3	98.7	99.4	101.7	98.5	100.6	95.8	87.4	89.2	88.0
1095 to 1080	83.3	84.3	92.9	97.4	96.2	100.1	96.2	98.7	92.9	88.8	88.4	85.7
1080 to 1065	82.8	82.1	90.9	94.8	94.5	99.0	95.6	95.8	90.9	88.3	87.8	85.7
1065 to 1050	83.1	81.6	88.6	92.2	92.2	96.8	93.4	93.3	89.0	88.3	87.5	85.2
1050 to 1035	82.0	80.9	86.7	88.9	88.8	94.2	90.1	88.5	86.3	87.6	87.3	84.9
1035 to 1020	82.1	80.1	84.0	87.5	87.5	90.1	84.2	81.0	78.3	84.6	86.9	84.9
1020 to 1005	81.9	77.9	82.3	84.6	84.1	84.8	78.3	74.8	66.1	72.1	83.1	83.7
1005 to 990	81.7	76.6	80.3	81.0	80.0	78.3	72.0	69.5	61.8	56.1	62.8	76.3
990 to 975	73.2	76.4	78.0	76.1	74.3	70.9	63.9	61.9	57.2	53.4	49.8	54.5
975 to 960	58.6	69.8	74.5	71.8	69.1	62.3	55.6	54.2	50.0	45.8	43.1	40.0
960 to 945	40.4	61.3	68.5	66.5	63.4	55.5	49.0	48.9	45.7	40.5	39.2	32.6
945 to 930	30.1	54.3	64.4	61.4	60.4	50.8	46.9	45.6	44.0	37.5	37.5	29.4
930 to 915	23.3	50.8	58.1	52.3	56.3	47.2	39.7	39.5	39.3	34.2	33.9	24.9
915 to 900	18.8	47.5	51.0	51.1	54.3	44.1	39.1	38.6	37.2	30.6	29.7	22.4
900 to 885	18.2	41.5	49.8	49.2	53.9	42.3	37.9	38.4	33.2	27.4	29.4	25.0
885 to 870	22.7	39.7	42.8	40.5	50.9	42.7	39.2	34.7	33.2	26.4	28.3	19.9
870 to 855	17.9	43.3	46.4	41.7	42.9	38.3	33.1	33.3	27.7	19.7	20.3	18.1
< 855	14.4	57.1	72.7	54.1	55.8	45.6	36.3	43.6	35.7	19.2	24.3	15.3

Legend	0.0										100.00

Jocassee C_2_562.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Saturation Readings Began in 1998

Jocassee C_2_562.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1998 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	87.9	88.3	96.8	100.7	101.5	106.5	104.1	105.0	98.0	91.2	90.6	90.0
1095 to 1080	85.8	88.1	94.9	99.5	96.7	103.1	103.6	104.0	95.8	91.6	89.2	87.0
1080 to 1065	85.6	86.2	92.8	97.0	95.1	97.0	96.7	100.5	93.6	91.2	88.6	87.1
1065 to 1050	85.4	85.1	91.5	94.2	90.9	91.8	91.4	96.9	91.3	90.7	88.2	86.8
1050 to 1035	84.7	84.3	90.0	90.8	87.1	86.1	81.6	86.8	90.6	89.6	87.5	86.3
1035 to 1020	84.8	84.2	86.3	87.8	83.3	77.4	65.8	65.5	75.7	88.4	87.7	86.3
1020 to 1005	84.9	83.7	82.1	79.5	72.9	64.2	45.5	34.9	32.2	72.3	87.2	85.6
1005 to 990	81.8	82.0	75.4	68.5	60.5	43.3	22.7	7.8	3.4	12.6	70.5	78.5
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 992.9 ft

Legend	0.0										100.00

DO Saturation Not Monitored at 565.4

Jocassee D_2_551.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Saturation Readings Began in 2009

Jocassee D_2_551.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) 2009 to 2011 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		90.1			100.5			99.0			88.4	
1095 to 1080		97.0						99.2			85.8	
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1083.7 ft

Legend	**0.0**										**100.00**

Jocassee D_2_564.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960							*DO Saturation Readings Began in 1999*					
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Jocassee D_2_564.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1999 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	87.0	86.4	94.6	99.0	99.8	101.8	98.9	101.0	95.8	87.5	88.7	88.7
1095 to 1080	83.8	84.2	92.3	96.8	96.1	100.4	96.5	98.2	92.4	88.4	87.8	85.9
1080 to 1065	83.3	82.3	89.8	94.4	94.5	99.2	95.1	95.9	90.7	88.1	87.5	85.9
1065 to 1050	83.3	82.2	88.3	92.0	92.7	97.2	93.7	93.7	88.9	87.8	87.0	85.5
1050 to 1035	82.5	81.2	86.7	89.5	89.3	94.3	90.3	89.2	87.1	86.9	87.0	85.1
1035 to 1020	82.4	80.5	83.9	87.2	87.4	89.7	83.2	81.7	78.8	84.8	86.5	85.3
1020 to 1005	82.2	79.3	81.9	83.4	83.6	83.6	77.1	73.3	65.3	72.9	82.7	83.6
1005 to 990	82.4	78.6	79.5	79.5	78.9	76.6	69.0	64.4	56.9	50.9	63.0	78.1
990 to 975	74.7	77.6	77.1	74.6	72.9	69.8	59.3	55.8	50.2	45.6	42.8	55.2
975 to 960	55.3	71.9	73.6	69.7	67.7	60.0	50.7	48.9	42.1	36.0	34.0	34.6
960 to 945	44.7	65.2	67.8	63.8	60.8	51.1	44.3	43.8	36.1	28.4	26.7	26.0
945 to 930	31.2	57.2	61.7	56.7	56.8	45.2	40.0	38.0	32.0	22.7	20.4	18.2
930 to 915	25.6	49.9	55.2	45.7	51.8	39.6	32.1	31.2	25.5	18.8	17.0	15.2
915 to 900	21.4	47.8	46.9	44.2	50.0	35.6	31.9	27.4	25.1	15.5	13.8	14.4
900 to 885	19.7	35.7	38.9	32.8	20.4	20.0	7.3	22.1	11.2	4.1	1.0	11.1
885 to 870	20.9	31.2	7.9	44.5	21.1	52.4	6.6	25.3	3.8	2.0	0.6	5.8
870 to 855	1.2	0.0					3.1					
< 855							*Minimum Reading 868.8 ft*					

Legend	**0.0**										**100.00**

Jocassee D_2_564.1: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)													
Measurement Reading Range (ft msl)		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	1110 to 1095												
	1095 to 1080												
	1080 to 1065												
	1065 to 1050												
	1050 to 1035												
	1035 to 1020												
	1020 to 1005												
	1005 to 990												
	990 to 975												
	975 to 960												
	960 to 945												
	945 to 930												
	930 to 915												
	915 to 900												
	900 to 885												
	885 to 870												
	870 to 855												
	< 855												

DO Saturation Readings Began in 1999

Jocassee D_2_564.1: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1999 to 2017 (Post Bad Creek Operation)													
Measurement Reading Range (ft msl)		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	1110 to 1095	88.1	88.0	92.0	96.7	98.2	99.7	96.3	98.0	90.4	85.5	88.6	88.9
	1095 to 1080	84.9	85.0	90.2	95.1	95.3	98.9	94.5	96.3	89.7	87.2	86.9	85.8
	1080 to 1065	84.9	84.1	89.3	93.6	93.9	98.2	95.2	94.7	89.5	87.2	86.5	86.0
	1065 to 1050	85.2	83.8	89.1	92.8	92.7	98.0	94.5	93.4	88.5	87.0	86.0	85.8
	1050 to 1035	84.6	83.7	88.9	91.4	91.1	97.8	92.4	92.8	88.4	86.4	85.4	85.2
	1035 to 1020	84.8	83.7	88.2	90.9	91.4	97.6	90.9	93.1	88.3	86.2	85.7	85.5
	1020 to 1005	84.2	83.0	88.5	89.5	90.7	96.8	90.9	92.9	87.7	86.2	85.4	85.7
	1005 to 990	84.5	83.1	88.1	88.9	89.4	96.2	90.2	92.2	87.6	85.8	85.0	84.8
	990 to 975	83.6	84.2	88.2	87.4	87.4	97.0	86.8	93.9	87.4	86.0	85.9	84.2
	975 to 960	86.0	77.6	89.1	86.3	92.4	93.7	92.3	86.3	92.3	86.4	86.8	85.8
	960 to 945												
	945 to 930												
	930 to 915												
	915 to 900												
	900 to 885												
	885 to 870												
	870 to 855												
	< 855												

Minimum Reading 964.9 ft

Legend	0.0										100.00

Jocassee E_2_557.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Saturation Readings Began in 1998

Jocassee E_2_557.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1998 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	90.0	87.8	96.6	100.1	100.9	103.8	102.0	103.4	98.5	89.6	91.4	90.1
1095 to 1080	87.8	88.2	94.6	98.5	98.2	105.7	102.0	101.0	95.6	91.7	90.2	88.1
1080 to 1065	87.4	86.5	92.0	95.1	97.1	103.7	100.5	98.2	94.2	91.3	89.9	88.1
1065 to 1050	87.3	85.5	89.4	92.1	94.1	101.5	96.8	95.2	90.2	90.6	89.6	87.5
1050 to 1035	86.7	83.9	87.0	89.2	89.8	95.7	89.3	84.6	84.2	89.7	89.0	87.2
1035 to 1020	86.7	83.0	85.4	87.7	86.7	87.1	78.8	69.9	70.1	89.1	88.6	87.4
1020 to 1005	86.5	82.5	84.2	84.6	83.4	80.0	70.0	61.7	55.5	74.2	84.7	86.7
1005 to 990	85.9	81.9	82.5	81.0	78.8	74.9	66.3	59.7	51.3	45.4	68.5	80.6
990 to 975	83.7	82.9	81.6	78.5	74.9	70.2	61.4	56.4	50.8	44.6	41.4	63.3
975 to 960	74.7	80.3	80.5	76.1	71.8	65.9	58.4	53.2	49.7	44.1	38.2	43.7
960 to 945	54.8	76.2	79.7	73.0	68.6	62.0	54.6	49.1	46.4	41.5	34.0	29.2
945 to 930	42.8	76.9	75.2	70.2	65.7	57.8	51.8	46.1	42.4	37.4	31.1	23.1
930 to 915	34.6	74.3	73.8	65.3	63.0	54.2	47.2	41.9	39.6	34.7	29.8	18.7
915 to 900	29.3	72.6	71.0	65.5	61.0	53.2	45.5	42.2	40.0	33.6	30.4	20.5
900 to 885	31.7	66.7	71.1	64.4	59.3	50.2	45.3	42.5	38.2	32.2	29.7	22.7
885 to 870	28.4	60.0	72.2	58.9	57.1	49.3	43.6	38.3	34.9	30.5	28.9	19.9
870 to 855	24.8	63.0	68.5	59.7	53.5	44.7	37.8	34.6	33.8	26.3	22.9	15.9
< 855	25.2	64.9	64.0	55.0	54.9	42.4	39.0	35.0	27.8	22.3	21.7	15.2

Legend	0.0										100.00

Jocassee F_2_554.8: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Saturation Readings Began in 1998

Jocassee F_2_554.8: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1998 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	91.0	91.9	99.5	101.7	100.2	106.3	104.9	107.6	99.7	72.6	91.2	90.6
1095 to 1080	89.2	92.4	97.7	100.1	99.3	105.9	109.5	107.2	95.7	86.6	89.7	88.3
1080 to 1065	89.1	90.3	94.2	95.8	96.3	103.3	102.9	103.4	91.5	85.9	89.0	88.2
1065 to 1050	88.7	88.9	91.6	92.4	89.6	95.3	87.5	93.5	88.8	84.5	88.6	87.7
1050 to 1035	88.6	87.7	89.8	89.2	85.3	83.6	79.0	83.3	87.0	81.3	88.0	87.4
1035 to 1020	88.2	86.8	88.2	87.1	82.3	75.7	62.3	59.2	76.3	81.5	87.7	87.1
1020 to 1005	87.9	86.1	87.7	83.0	77.6	68.9	53.2	40.1	46.9	68.8	86.4	87.1
1005 to 990	88.1	86.3	86.7	78.9	72.4	62.7	48.2	36.1	28.0	23.7	74.4	85.8
990 to 975	88.2	88.1	85.8	74.2	66.8	55.5	39.7	28.3	14.8	7.6	35.1	72.0
975 to 960	88.1	87.3	84.0	67.8	56.5	36.4	18.2	9.2	1.5	1.2	4.4	48.4
960 to 945	88.6	80.7	81.1	64.3	51.7	29.0	9.8	3.2	0.8	0.8	1.3	33.6
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 948.4 ft

Legend	0.0										100.00

Jocassee F_2_556.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Saturation Readings Began in 1998

Jocassee F_2_556.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1998 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	91.1	90.6	98.9	101.7	102.3	106.6	105.1	106.2	98.9	90.1	91.5	90.2
1095 to 1080	89.2	91.1	96.8	99.5	101.2	107.5	107.6	105.0	95.3	90.7	89.7	88.3
1080 to 1065	88.7	89.4	93.7	96.1	99.4	105.9	105.4	104.6	92.2	90.2	89.3	88.3
1065 to 1050	88.5	87.8	90.7	92.9	93.6	99.9	93.9	95.9	88.3	89.6	88.8	87.7
1050 to 1035	88.1	86.5	88.6	89.7	86.6	85.2	79.2	78.8	83.0	88.7	88.1	87.3
1035 to 1020	88.3	86.0	87.0	87.8	83.4	77.9	68.5	62.6	69.5	84.9	87.6	87.0
1020 to 1005	87.8	85.5	86.1	84.1	80.1	73.5	60.1	49.2	49.3	74.9	84.0	85.7
1005 to 990	86.7	85.3	84.7	81.2	76.3	71.0	60.4	51.8	41.0	40.8	73.7	82.7
990 to 975	85.6	86.1	84.0	78.8	72.6	66.4	56.6	50.0	41.5	32.9	38.2	68.9
975 to 960	84.8	85.8	83.7	74.8	68.1	57.7	48.1	41.0	33.6	24.4	19.1	46.2
960 to 945	84.0	83.7	82.3	69.2	62.1	48.6	38.1	31.3	22.6	12.7	7.8	31.1
945 to 930	74.1	80.4	77.2	61.5	54.4	37.3	29.3	21.1	13.1	5.3	3.4	8.0
930 to 915	62.3	56.3	81.2	65.1	51.4	37.7	18.8	19.6	7.3	1.8	2.2	11.5
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 919.4 ft

Legend	0.0										100.00

Lake Jocassee

pH Concentration

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Jocassee B_2_558.7: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1987 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.5	6.1	6.5	6.6	6.7	6.9	7.2	7.1	6.6	6.6	6.6	6.4
1095 to 1080	6.5	6.5	6.7	6.7	6.7	6.9	7.0	7.0	6.8	6.8	6.9	6.4
1080 to 1065	6.5	6.5	6.6	6.7	6.7	6.9	6.7	6.8	6.7	6.7	6.9	6.3
1065 to 1050	6.5	6.4	6.7	6.7	6.7	6.8	6.7	6.7	6.7	6.8	6.8	6.3
1050 to 1035	6.4	6.4	6.5	6.6	6.6	6.8	6.6	6.6	6.6	6.7	6.8	6.3
1035 to 1020	6.4	6.4	6.5	6.6	6.7	6.6	6.5	6.5	6.3	6.6	6.8	6.3
1020 to 1005	6.4	6.3	6.6	6.5	6.6	6.7	6.5	6.3	6.1	6.5	6.7	6.4
1005 to 990	6.4	6.3	6.4	6.5	6.6	6.7	6.6	6.3	6.2	6.2	6.6	6.3
990 to 975	6.3	6.2	6.4	6.5	6.5	6.6	6.6	6.3	6.2	6.2	6.1	6.2
975 to 960	6.2	6.3	6.3	6.5	6.5	6.5	6.6	6.3	6.2	6.1	6.1	5.9
960 to 945	6.0	6.2	6.4	6.4	6.4	6.5	6.5	6.2	6.2	6.1	6.0	5.7
945 to 930	5.8	6.1	6.3	6.3	6.3	6.4	6.4	6.2	6.2	6.1	5.9	5.6
930 to 915	5.8	6.1	6.2	6.3	6.3	6.3	6.4	6.1	6.1	6.0	6.0	5.5
915 to 900	5.8	5.9	6.2	6.2	6.2	6.2	6.4	6.1	6.1	6.0	5.9	5.6
900 to 885	5.7	5.9	6.1	6.2	6.2	6.2	6.4	6.1	6.0	6.0	5.8	5.4
885 to 870	5.6	5.9	6.0	6.1	6.1	6.1	6.3	6.0	6.0	6.1	5.8	5.4
870 to 855	5.7	5.9	6.0	6.1	6.1	6.1	6.4	5.9	5.9	5.9	5.8	5.4
< 855	5.8	5.8	6.2	6.1	6.0	6.0	6.3	6.0	5.9	6.0	5.8	5.6

Measurement Reading Range (ft msl)

1991 to 2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.3	6.1	6.5	6.6	6.9	6.8	6.8	6.8	6.7	6.4	6.6	6.3
1095 to 1080	6.4	6.3	6.5	6.7	6.9	6.8	6.8	6.9	6.8	6.7	6.7	6.5
1080 to 1065	6.4	6.2	6.5	6.6	6.8	6.6	6.6	6.8	6.8	6.7	6.7	6.5
1065 to 1050	6.4	6.2	6.4	6.5	6.7	6.5	6.5	6.6	6.7	6.7	6.7	6.5
1050 to 1035	6.3	6.2	6.4	6.4	6.5	6.5	6.4	6.5	6.5	6.6	6.7	6.5
1035 to 1020	6.3	6.2	6.4	6.4	6.4	6.4	6.3	6.3	6.3	6.6	6.7	6.5
1020 to 1005	6.3	6.2	6.3	6.3	6.4	6.3	6.2	6.2	6.1	6.3	6.6	6.5
1005 to 990	6.3	6.1	6.3	6.2	6.3	6.1	6.1	6.2	6.0	6.0	6.3	6.4
990 to 975	6.2	6.2	6.2	6.2	6.2	6.1	6.0	6.1	6.0	6.0	6.0	6.0
975 to 960	6.0	6.1	6.2	6.1	6.1	6.0	5.9	6.0	6.0	5.9	6.0	5.8
960 to 945	5.9	6.0	6.1	6.0	6.1	5.9	5.9	6.0	5.9	5.9	5.9	5.8
945 to 930	5.8	5.9	6.0	5.9	6.0	5.9	5.8	6.0	5.9	5.8	5.9	5.7
930 to 915	5.7	5.9	6.0	5.9	6.0	5.9	5.8	5.9	5.9	5.8	5.9	5.7
915 to 900	5.7	5.9	6.0	5.9	6.0	5.8	5.8	5.9	5.8	5.8	5.8	5.7
900 to 885	5.7	5.8	6.0	5.8	6.0	5.8	5.7	5.9	5.8	5.8	5.8	5.7
885 to 870	5.7	5.9	6.0	5.8	5.9	5.8	5.7	5.9	5.8	5.8	5.8	5.7
870 to 855	5.7	5.9	6.0	5.8	5.9	5.7	5.7	5.9	5.8	5.8	5.8	5.7
< 855	5.7	5.9	5.9	5.8	5.9	5.7	5.7	5.9	5.8	5.8	5.9	5.7

	< Acidic				Neutral						Basic >		
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee B_3_558.0: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1975 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.0	6.1	6.4	6.4	6.6	6.6	6.9	6.7	6.3	6.1	6.5	6.2
1095 to 1080	6.1	6.1	6.3	6.4	6.7	6.5	6.8	6.6	6.4	6.2	6.4	6.2
1080 to 1065	6.1	6.0	6.3	6.4	6.7	6.5	6.5	6.5	6.4	6.2	6.3	6.3
1065 to 1050	6.0	6.0	6.2	6.4	6.7	6.5	6.4	6.4	6.4	6.2	6.4	6.2
1050 to 1035	6.0	6.0	6.2	6.2	6.5	6.5	6.3	6.4	6.3	6.2	6.3	6.2
1035 to 1020	6.0	6.0	6.2	6.1	6.6	6.4	6.2	6.3	6.1	6.2	6.3	6.2
1020 to 1005	6.0	6.0	6.2	6.1	6.5	6.5	6.2	6.1	5.8	5.9	6.3	6.2
1005 to 990	6.0	6.0	6.2	6.1	6.4	6.5	6.2	6.1	5.9	5.6	6.1	6.2
990 to 975	5.9	6.0	6.2	6.1	6.4	6.3	6.3	6.1	5.9	5.7	5.7	6.1
975 to 960	6.0	6.0	6.1	6.0	6.3	6.3	6.1	6.1	5.9	5.7	5.6	5.9
960 to 945	5.9	6.0	6.0	6.0	6.3	6.2	6.1	6.0	5.9	5.7	5.6	5.7
945 to 930	5.8	5.9	5.9	5.9	6.1	6.2	6.1	5.9	5.9	5.6	5.5	5.5
930 to 915	5.7	5.8	5.8	5.8	6.1	6.0	6.0	5.8	5.8	5.5	5.5	5.4
915 to 900	5.5	5.7	5.7	5.7	6.0	6.0	5.9	5.8	5.7	5.5	5.4	5.4
900 to 885	5.4	5.7	5.6	5.6	5.9	5.9	6.0	5.8	5.7	5.5	5.4	5.4
885 to 870	5.3	5.6	5.6	5.6	5.9	5.8	5.9	5.7	5.7	5.5	5.4	5.3
870 to 855	5.3	5.6	5.6	5.6	5.8	5.9	5.9	5.7	5.6	5.5	5.4	5.3
< 855	5.5	5.6	5.5	5.7	5.8	5.8	5.9	5.8	5.6	5.6	5.5	5.4

Measurement Reading Range (ft msl)

1991 to 2020	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.3	6.1	6.3	6.5	6.7	6.6	6.6	6.7	6.6	6.3	6.4	6.5
1095 to 1080	6.4	6.1	6.4	6.5	6.7	6.5	6.5	6.7	6.7	6.6	6.6	6.5
1080 to 1065	6.4	6.1	6.4	6.5	6.6	6.4	6.5	6.6	6.7	6.7	6.6	6.5
1065 to 1050	6.3	6.1	6.3	6.4	6.5	6.3	6.4	6.5	6.6	6.6	6.7	6.5
1050 to 1035	6.3	6.1	6.3	6.3	6.4	6.3	6.3	6.3	6.4	6.6	6.6	6.6
1035 to 1020	6.3	6.1	6.3	6.3	6.3	6.3	6.2	6.2	6.3	6.6	6.7	6.5
1020 to 1005	6.3	6.1	6.3	6.2	6.3	6.1	6.1	6.1	6.1	6.3	6.6	6.5
1005 to 990	6.3	6.1	6.2	6.1	6.2	6.1	6.0	6.1	6.0	6.0	6.4	6.4
990 to 975	6.2	6.1	6.2	6.1	6.1	6.0	6.0	6.1	5.9	6.0	6.0	6.1
975 to 960	6.1	6.1	6.1	6.1	6.0	5.9	5.9	6.0	5.9	5.9	5.9	5.9
960 to 945	6.0	6.0	6.1	6.0	6.0	5.8	5.9	6.0	5.8	5.9	5.9	5.8
945 to 930	5.8	5.9	6.0	5.9	5.9	5.8	5.8	5.9	5.8	5.8	5.9	5.8
930 to 915	5.7	5.8	6.0	5.9	5.9	5.8	5.8	5.9	5.8	5.8	5.9	5.8
915 to 900	5.7	5.8	5.9	5.9	5.9	5.7	5.8	5.9	5.8	5.8	5.8	5.8
900 to 885	5.7	5.7	5.9	5.8	5.9	5.7	5.7	5.9	5.8	5.8	5.8	5.8
885 to 870	5.7	5.8	5.9	5.8	5.8	5.8	5.7	5.8	5.8	5.8	5.8	5.8
870 to 855	5.7	5.8	5.9	5.8	5.8	5.7	5.7	5.8	5.8	5.8	5.8	5.7
< 855	5.7	5.9	5.9	5.8	5.8	5.7	5.7	5.8	5.8	5.8	5.8	5.8

< Acidic					Neutral							Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee C_2_559.0: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1987 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.2	6.0	6.3	6.8	6.8	6.7	7.3	7.0	6.7	6.4	6.6	6.3
1095 to 1080	6.3	6.3	6.6	6.7	6.7	7.0	7.2	7.0	6.8	6.6	6.8	6.3
1080 to 1065	6.4	6.4	6.5	6.7	6.7	6.9	6.8	6.9	6.8	6.5	6.8	6.3
1065 to 1050	6.4	6.3	6.6	6.7	6.6	6.8	6.7	6.7	6.7	6.6	6.7	6.3
1050 to 1035	6.3	6.3	6.5	6.6	6.6	6.7	6.6	6.5	6.6	6.6	6.7	6.3
1035 to 1020	6.2	6.4	6.4	6.6	6.6	6.6	6.5	6.5	6.4	6.4	6.7	6.3
1020 to 1005	6.3	6.2	6.5	6.6	6.5	6.6	6.5	6.2	6.2	6.3	6.7	6.4
1005 to 990	6.3	6.2	6.4	6.5	6.5	6.6	6.5	6.3	6.2	6.1	6.4	6.3
990 to 975	6.2	6.1	6.4	6.5	6.4	6.5	6.5	6.2	6.2	6.2	6.1	6.1
975 to 960	6.2	6.2	6.3	6.4	6.4	6.5	6.5	6.2	6.2	6.0	6.0	5.8
960 to 945	5.8	6.0	6.4	6.4	6.3	6.4	6.4	6.2	6.2	6.1	6.0	5.8
945 to 930	5.7	6.0	6.2	6.3	6.2	6.3	6.3	6.1	6.1	6.0	5.9	5.6
930 to 915	5.6	6.0	6.1	6.2	6.2	6.2	6.3	6.1	6.0	5.8	5.8	5.5
915 to 900	5.7	5.7	6.1	6.1	6.1	6.1	6.3	5.9	6.1	5.9	5.8	5.6
900 to 885	5.6	5.7	6.0	6.1	6.1	6.1	6.3	5.9	6.0	6.0	5.8	5.5
885 to 870	5.6	5.7	5.9	6.1	5.9	6.1	6.2	5.9	6.0	6.0	5.7	5.5
870 to 855	5.7	5.8	6.0	6.0	6.0	6.1	6.2	5.8	5.9	5.9	5.7	5.5
< 855	5.8	5.8	6.0	6.0	6.0	6.0	6.2	5.9	6.0	6.0	5.8	5.7

Measurement Reading Range (ft msl)

1991 to 2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.2	6.1	6.5	6.7	7.0	6.8	6.8	6.9	6.7	6.3	6.5	6.4
1095 to 1080	6.3	6.3	6.6	6.8	6.9	6.9	6.8	7.0	6.8	6.6	6.7	6.5
1080 to 1065	6.3	6.2	6.5	6.7	6.8	6.7	6.7	6.8	6.8	6.7	6.7	6.5
1065 to 1050	6.3	6.2	6.5	6.6	6.7	6.5	6.6	6.7	6.7	6.7	6.7	6.5
1050 to 1035	6.3	6.2	6.4	6.4	6.5	6.5	6.4	6.5	6.5	6.6	6.7	6.5
1035 to 1020	6.3	6.2	6.4	6.4	6.5	6.4	6.3	6.3	6.3	6.6	6.7	6.5
1020 to 1005	6.3	6.2	6.3	6.4	6.4	6.3	6.2	6.2	6.1	6.3	6.6	6.5
1005 to 990	6.3	6.1	6.3	6.3	6.3	6.1	6.1	6.1	6.0	6.0	6.3	6.4
990 to 975	6.2	6.1	6.2	6.2	6.2	6.1	6.0	6.1	6.0	5.9	6.0	6.0
975 to 960	6.0	6.1	6.2	6.2	6.1	6.0	5.9	6.0	5.9	5.9	5.9	5.8
960 to 945	5.8	6.0	6.1	6.1	6.1	5.9	5.8	5.9	5.8	5.8	5.9	5.8
945 to 930	5.7	5.9	6.0	5.9	6.0	5.9	5.8	5.9	5.8	5.8	5.8	5.7
930 to 915	5.7	5.8	6.0	5.9	5.9	5.8	5.8	5.9	5.8	5.8	5.8	5.7
915 to 900	5.7	5.8	5.9	5.9	5.9	5.8	5.7	5.8	5.8	5.7	5.8	5.7
900 to 885	5.7	5.7	5.9	5.8	5.9	5.7	5.7	5.8	5.7	5.7	5.8	5.7
885 to 870	5.6	5.8	5.9	5.8	5.9	5.8	5.7	5.8	5.8	5.7	5.8	5.7
870 to 855	5.7	5.9	5.9	5.8	5.9	5.7	5.7	5.8	5.8	5.7	5.8	5.7
< 855	5.7	5.8	5.9	5.8	5.8	5.7	5.7	5.8	5.8	5.7	5.8	5.7

< Acidic						Neutral						Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee C_2_560.0: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1975 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.1	6.2	6.3	6.6	6.8	7.0	7.3	7.3	6.9	6.4	6.6	6.1
1095 to 1080	6.3	6.3	6.5	6.6	6.7	7.0	7.3	7.1	6.9	6.5	6.6	6.1
1080 to 1065	6.3	6.2	6.4	6.6	6.5	7.0	7.1	6.7	6.7	6.4	6.6	6.2
1065 to 1050	6.2	6.1	6.4	6.5	6.5	6.8	6.7	6.5	6.4	6.4	6.4	6.2
1050 to 1035	6.2	6.0	6.3	6.4	6.4	6.6	6.5	6.3	6.3	6.2	6.5	6.2
1035 to 1020	6.2	6.0	6.3	6.3	6.3	6.5	6.3	6.2	6.2	6.1	6.3	6.1
1020 to 1005	6.3	6.0	6.3	6.2	6.2	6.4	6.2	6.1	6.1	6.0	6.1	6.0
1005 to 990	6.1	5.9	6.2	6.3	6.3	6.4	6.2	6.1	6.2	5.9	6.0	5.9
990 to 975	6.0	5.9	6.1	6.2	6.2	6.4	6.2	6.0	6.2	5.9	5.8	5.8
975 to 960	6.1	6.0	6.2	6.2	6.2	6.4	6.2	6.1	6.1	6.0	6.0	5.7
960 to 945	6.0	6.1	6.2	6.2	6.3	6.5	6.2	6.1	6.2	6.0	5.9	5.7
945 to 930	5.9	5.9	6.2	6.1	6.1	6.4	6.2	6.0	6.2	5.9	5.9	5.6
930 to 915	5.7	6.0	6.1	6.1	6.2	6.4	6.2	6.1	6.1	6.0	5.8	5.5
915 to 900	5.8	5.8	6.1	6.0	6.1	6.3	6.2	6.0	6.2	6.0	5.9	5.6
900 to 885	5.6	5.8	6.0	6.1	6.1	6.2	6.3	6.0	6.1	5.9	5.8	5.5
885 to 870	5.6	5.8	5.9	6.0	6.0	6.2	6.2	5.9	6.1	6.0	5.7	5.5
870 to 855	5.8	6.0	5.9	6.0	6.0	6.2	6.2	5.9	5.9	5.9	5.7	5.5
< 855	5.7	5.9	6.0	6.0	6.2	6.2	6.2	6.0	6.2	6.2	5.7	5.6

Measurement Reading Range (ft msl)

1991 to 2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.3	6.2	6.6	6.7	7.0	6.8	6.8	6.8	6.6	6.3	6.6	6.4
1095 to 1080	6.4	6.3	6.6	6.8	6.9	6.8	6.7	6.9	6.7	6.6	6.7	6.5
1080 to 1065	6.4	6.3	6.5	6.7	6.8	6.7	6.6	6.8	6.7	6.7	6.7	6.5
1065 to 1050	6.4	6.3	6.5	6.6	6.7	6.6	6.5	6.6	6.6	6.6	6.7	6.5
1050 to 1035	6.4	6.2	6.4	6.5	6.6	6.5	6.4	6.5	6.4	6.6	6.7	6.5
1035 to 1020	6.3	6.3	6.4	6.4	6.5	6.4	6.3	6.3	6.3	6.5	6.7	6.5
1020 to 1005	6.3	6.2	6.4	6.4	6.4	6.3	6.2	6.2	6.1	6.3	6.6	6.5
1005 to 990	6.4	6.2	6.3	6.3	6.3	6.2	6.1	6.2	6.0	6.0	6.2	6.3
990 to 975	6.2	6.2	6.3	6.2	6.2	6.1	6.0	6.1	6.0	5.9	6.0	5.9
975 to 960	6.1	6.2	6.2	6.1	6.1	6.0	5.9	6.0	5.9	5.9	6.0	5.8
960 to 945	5.9	6.1	6.2	6.0	6.1	5.9	5.8	5.9	5.8	5.8	5.9	5.7
945 to 930	5.8	6.0	6.1	5.9	6.0	5.8	5.8	5.9	5.8	5.8	5.9	5.7
930 to 915	5.7	5.9	6.1	5.9	6.0	5.8	5.8	5.9	5.8	5.8	5.9	5.7
915 to 900	5.7	5.9	6.0	5.9	6.0	5.8	5.7	5.8	5.8	5.8	5.9	5.7
900 to 885	5.7	5.8	5.9	5.8	6.0	5.8	5.7	5.8	5.8	5.7	5.9	5.7
885 to 870	5.7	5.9	6.0	5.8	5.9	5.8	5.7	5.8	5.8	5.7	5.9	5.7
870 to 855	5.7	5.9	6.0	5.9	5.8	5.8	5.7	5.8	5.8	5.8	5.9	5.7
< 855	5.5	5.7	5.8	5.6	5.6	5.6	5.7	5.8	5.7	5.6	6.0	5.9

< Acidic						Neutral						Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee C_2_562.0: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1980 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.3	6.4	6.4	6.7	7.0	7.2	7.5	7.4	6.7	6.5	6.5	6.3
1095 to 1080	6.4	6.4	6.6	6.7	6.7	7.1	7.3	7.4	7.0	6.6	6.7	6.3
1080 to 1065	6.4	6.4	6.5	6.6	6.5	7.0	6.9	6.9	6.8	6.5	6.7	6.4
1065 to 1050	6.3	6.3	6.6	6.5	6.5	6.8	6.6	6.6	6.6	6.4	6.6	6.4
1050 to 1035	6.3	6.3	6.5	6.4	6.5	6.7	6.5	6.5	6.5	6.4	6.6	6.3
1035 to 1020	6.4	6.3	6.5	6.4	6.4	6.6	6.3	6.2	6.4	6.3	6.6	6.3
1020 to 1005	6.5	6.3	6.5	6.3	6.3	6.4	6.0	5.9	6.0	6.2	6.5	6.4
1005 to 990	6.3	6.2	6.4	6.1	6.2	6.3	5.9	5.8	6.1	6.0	6.4	6.2
990 to 975	6.3	6.2	6.7	5.9	5.5		5.6	6.2	6.5	6.1	6.6	
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 964.5 ft

Measurement Reading Range (ft msl)

1991 to 2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.3	6.3	6.6	6.7	7.1	6.9	6.9	6.9	6.7	6.4	6.6	6.4
1095 to 1080	6.5	6.5	6.7	6.8	7.0	6.9	7.0	7.1	6.8	6.7	6.8	6.5
1080 to 1065	6.4	6.4	6.6	6.7	6.9	6.6	6.7	6.8	6.8	6.7	6.8	6.5
1065 to 1050	6.4	6.4	6.6	6.6	6.7	6.4	6.5	6.6	6.7	6.6	6.7	6.5
1050 to 1035	6.4	6.3	6.5	6.4	6.5	6.3	6.3	6.4	6.6	6.6	6.7	6.5
1035 to 1020	6.4	6.4	6.5	6.4	6.4	6.2	6.1	6.1	6.3	6.6	6.8	6.5
1020 to 1005	6.4	6.4	6.4	6.3	6.3	6.1	5.9	5.9	5.9	6.3	6.7	6.5
1005 to 990	6.4	6.3	6.3	6.1	6.1	5.9	5.8	5.9	5.9	5.9	6.5	6.4
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 992.2 ft

< Acidic						Neutral						Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee C_2_565.4: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1987 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.6	6.2	6.2	6.5	7.2	7.3	7.4	6.9	6.7	6.7	6.3	6.3
1095 to 1080	6.5	6.4	6.5	6.6	6.8	7.6	7.2	7.2	6.8	6.8	6.7	6.4
1080 to 1065	6.5	6.4	6.4	6.6	6.8	7.5	7.2	7.0	6.7	6.8	6.7	6.4
1065 to 1050	6.4	6.2	6.5	6.6	6.7	7.4	7.1	6.8	6.6	6.6	6.6	6.5
1050 to 1035	6.4	6.2	6.4	6.5	6.7	7.1	6.9	6.7	6.5	6.7	6.7	6.4
1035 to 1020	6.3	6.2	6.3	6.4	6.5	6.8	6.7	6.5	6.3	6.7	6.6	6.5
1020 to 1005	6.4	6.1	6.3	6.4	6.5	6.6	6.5	6.3	5.9	6.5	6.6	6.5
1005 to 990	6.3	6.1	6.3	6.4	6.4	6.6	6.5	6.2	5.9	6.2	6.4	6.3
990 to 975	6.3	6.0	6.2	6.3	6.2	6.5	6.4	6.0	6.0	6.2	6.0	6.1
975 to 960	6.3	6.1	6.1	6.2	6.2	6.4	6.4	6.0	5.9	6.2	6.0	5.8
960 to 945	6.3	6.1	6.2	6.1	6.2	6.3	6.3	6.0	5.9	6.0	5.7	5.7
945 to 930	6.5	6.2	5.9	6.0	6.1	6.2	6.2	5.9	5.9	6.1	5.5	5.7
930 to 915			5.9		6.1	5.8		5.6	5.9			
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 918.1 ft

Measurement Reading Range (ft msl)

1991 to 1994	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.1	5.9	6.2	6.5	6.6	6.7	6.7	6.7	6.6	6.0	6.3	6.2
1095 to 1080	6.1	6.0	6.2	6.5	6.6	6.7	6.7	6.6	6.4	6.2	6.3	6.2
1080 to 1065	6.1	6.0	6.2	6.3	6.6	6.6	6.5	6.5	6.4	6.1	6.3	6.3
1065 to 1050	6.0	6.0	6.1	6.2	6.4	6.4	6.3	6.3	6.2	6.1	6.3	6.2
1050 to 1035	6.0	5.9	6.1	6.2	6.3	6.3	6.1	6.0	5.9	6.0	6.3	6.2
1035 to 1020	6.0	5.9	6.0	6.1	6.2	6.2	6.0	5.9	5.8	5.9	6.2	6.2
1020 to 1005	6.0	5.9	6.0	6.1	6.2	6.1	6.0	5.9	5.7	5.8	6.0	6.2
1005 to 990	6.0	5.9	6.0	6.0	6.1	6.1	5.9	5.9	5.7	5.7	5.8	5.9
990 to 975	6.0	5.9	5.9	5.9	6.0	6.0	5.9	5.8	5.7	5.6	5.6	5.8
975 to 960	6.0	5.9	5.9	5.8	5.9	5.9	5.8	5.8	5.6	5.6	5.6	5.5
960 to 945	5.9	5.9	5.9	5.8	5.9	5.9	5.8	5.8	5.6	5.5	5.5	5.5
945 to 930	5.7	5.9	5.9	5.7	5.8	5.9	5.7	5.7	5.6	5.5	5.6	5.6
930 to 915	6.0				5.8		5.7	5.8	5.6		5.3	
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 926.6 ft

	< Acidic				Neutral						Basic >		
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee D_2_551.0: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1975 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.4	6.3	6.3	6.4	6.4	6.5	6.8	6.5	6.7	6.6	6.4	6.2
1095 to 1080	7.1	6.3	6.6	6.7	6.7	7.0	7.0	7.0	6.9	6.9	6.9	6.6
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1082.8 ft

Measurement Reading Range (ft msl)

1991 to 2010	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	5.8	6.5	6.4	6.9	6.7	5.7	6.7	6.6	6.6	6.7	6.8	6.2
1095 to 1080		6.7						7.1			6.9	
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1083.7 ft

< Acidic						Neutral						Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee D_2_564.0: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1976 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.2	6.2	6.2	6.6	6.9	7.1	7.4	7.3	7.0	6.5	6.5	6.1
1095 to 1080	6.4	6.3	6.4	6.6	6.8	7.2	7.3	7.1	7.0	6.6	6.6	6.2
1080 to 1065	6.5	6.2	6.4	6.5	6.5	7.0	6.9	6.8	6.7	6.5	6.6	6.2
1065 to 1050	6.3	6.1	6.4	6.5	6.5	6.8	6.6	6.4	6.4	6.5	6.5	6.2
1050 to 1035	6.4	6.0	6.3	6.3	6.4	6.7	6.5	6.3	6.2	6.3	6.5	6.1
1035 to 1020	6.3	6.0	6.2	6.3	6.3	6.5	6.3	6.2	6.2	6.2	6.3	6.1
1020 to 1005	6.4	6.0	6.2	6.2	6.2	6.4	6.2	6.0	6.0	6.0	6.3	6.1
1005 to 990	6.3	6.0	6.2	6.2	6.3	6.4	6.1	6.0	6.0	5.9	6.1	6.0
990 to 975	6.3	6.0	6.2	6.2	6.2	6.4	6.3	6.0	6.1	5.9	5.9	5.9
975 to 960	6.5	6.1	6.2	6.2	6.3	6.3	6.2	6.1	6.1	6.0	6.1	5.8
960 to 945	6.3	6.1	6.3	6.2	6.3	6.4	6.2	6.2	6.2	5.9	5.9	5.7
945 to 930	6.2	6.1	6.1	6.2	6.2	6.3	6.3	6.1	6.1	6.0	5.9	5.6
930 to 915	6.1	6.1	6.1	6.2	6.2	6.3	6.3	6.1	6.0	6.0	5.8	5.5
915 to 900	6.1	5.8	6.1	6.1	6.1	6.2	6.2	6.0	6.0	6.0	5.8	5.6
900 to 885	6.1	5.8	6.1	6.1	6.2	6.1	6.1	5.9	6.0	6.0	5.8	5.5
885 to 870	6.0	5.8	6.0	6.2	6.0	6.3	6.1	5.9	5.9	6.1	5.7	5.6
870 to 855	5.4		5.9	6.4	6.1	6.0	6.1	6.2	5.6	5.9	5.5	5.6
< 855	*Minimum Reading 864.7 ft*											

Measurement Reading Range (ft msl)

1991 to 2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.4	6.3	6.6	6.8	7.1	6.9	6.9	7.0	6.8	6.5	6.6	6.6
1095 to 1080	6.5	6.5	6.6	6.8	7.0	6.9	6.8	7.0	6.8	6.7	6.8	6.6
1080 to 1065	6.4	6.4	6.6	6.7	6.9	6.8	6.7	6.9	6.7	6.7	6.8	6.6
1065 to 1050	6.5	6.4	6.5	6.6	6.8	6.7	6.6	6.7	6.7	6.7	6.7	6.6
1050 to 1035	6.5	6.4	6.5	6.6	6.7	6.6	6.5	6.6	6.6	6.6	6.8	6.6
1035 to 1020	6.4	6.4	6.5	6.5	6.6	6.5	6.4	6.5	6.4	6.6	6.7	6.6
1020 to 1005	6.4	6.4	6.4	6.4	6.5	6.4	6.3	6.3	6.2	6.4	6.6	6.6
1005 to 990	6.5	6.3	6.4	6.3	6.4	6.2	6.1	6.2	6.1	6.0	6.3	6.4
990 to 975	6.4	6.4	6.4	6.3	6.3	6.1	6.0	6.0	6.0	5.9	6.0	6.1
975 to 960	6.2	6.3	6.3	6.2	6.2	6.0	5.9	6.0	5.9	5.9	5.9	5.9
960 to 945	6.1	6.2	6.3	6.1	6.2	5.9	5.8	6.0	5.8	5.8	5.9	5.8
945 to 930	5.9	6.1	6.2	6.0	6.1	5.9	5.8	5.9	5.9	5.8	5.9	5.8
930 to 915	5.8	6.1	6.2	6.0	6.0	5.9	5.8	5.9	5.8	5.8	5.9	5.8
915 to 900	5.9	6.1	6.1	6.0	6.1	5.8	5.8	5.9	5.8	5.8	5.9	5.8
900 to 885	5.7	5.8	6.0	5.8	5.8	5.8	5.7	5.9	5.7	5.7	5.7	5.5
885 to 870	5.7	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.7	5.9	5.7
870 to 855	5.6	5.7	5.7	5.6		5.8	6.3	6.0		5.7	6.1	
< 855	*Minimum Reading 864.4 ft*											

< Acidic					Neutral							Basic >
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee D_2_564.1: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1987 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.3	6.2	6.3	6.3	6.3	6.8	7.4	7.2	6.9	6.5	6.5	6.3
1095 to 1080	6.5	6.5	6.6	6.6	6.6	6.8	7.2	7.3	6.8	6.7	6.7	6.4
1080 to 1065	6.6	6.5	6.7	6.6	6.7	6.8	6.9	6.9	6.7	6.8	6.8	6.4
1065 to 1050	6.5	6.4	6.6	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6	6.4
1050 to 1035	6.7	6.4	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.4	6.3
1035 to 1020	6.7	6.3	6.4	6.4	6.3	6.3	6.3	6.3	6.2	6.4	6.4	6.3
1020 to 1005	7.1	6.3	6.4	6.4	6.4	6.4	6.2	6.1	6.0	6.3	6.3	6.3
1005 to 990	6.9	6.3	6.4	6.2	6.2	6.3	6.2	6.1	6.1	6.3	6.3	6.1
990 to 975	6.9	6.3	6.4	6.2	5.9	6.1	6.2	6.0	6.0	6.5	6.2	6.1
975 to 960	7.3	6.4	7.0	6.6	5.7	6.1	6.2	6.1	6.1	7.0	6.2	6.2
960 to 945					5.8							
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 959.9 ft

Measurement Reading Range (ft msl)

1991 to 2017	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.5	6.3	6.6	6.6	7.0	6.8	6.8	6.9	6.6	6.4	6.7	6.5
1095 to 1080	6.5	6.4	6.6	6.6	6.9	6.8	6.7	6.9	6.7	6.6	6.7	6.6
1080 to 1065	6.5	6.4	6.6	6.6	6.8	6.7	6.7	6.8	6.7	6.7	6.7	6.6
1065 to 1050	6.5	6.3	6.5	6.6	6.8	6.6	6.6	6.6	6.6	6.6	6.7	6.5
1050 to 1035	6.5	6.4	6.5	6.5	6.7	6.6	6.6	6.6	6.6	6.6	6.7	6.6
1035 to 1020	6.4	6.3	6.6	6.5	6.7	6.6	6.6	6.6	6.6	6.6	6.7	6.6
1020 to 1005	6.5	6.4	6.6	6.5	6.8	6.6	6.6	6.6	6.6	6.6	6.7	6.6
1005 to 990	6.4	6.3	6.5	6.4	6.7	6.5	6.5	6.6	6.6	6.5	6.7	6.6
990 to 975	6.4	6.3	6.6	6.4	6.7	6.6	6.5	6.5	6.5	6.5	6.7	6.5
975 to 960	6.2	6.0	6.4	6.3	6.4	6.4	6.3	6.1	6.2	6.3	6.5	6.3
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 963 ft

< Acidic						Neutral							Basic >
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee E_2_557.0: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1975 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.3	6.3	6.5	6.7	6.7	7.0	7.2	7.2	6.8	6.4	6.6	6.2
1095 to 1080	6.4	6.4	6.6	6.7	6.7	7.0	7.2	7.0	6.9	6.5	6.7	6.2
1080 to 1065	6.4	6.3	6.5	6.6	6.5	6.9	7.0	6.7	6.7	6.4	6.7	6.2
1065 to 1050	6.3	6.2	6.5	6.5	6.5	6.6	6.7	6.4	6.4	6.5	6.6	6.2
1050 to 1035	6.3	6.1	6.4	6.4	6.4	6.6	6.5	6.2	6.2	6.2	6.6	6.2
1035 to 1020	6.3	6.1	6.4	6.3	6.3	6.4	6.3	6.1	6.1	6.1	6.4	6.2
1020 to 1005	6.4	6.1	6.4	6.2	6.3	6.3	6.2	6.0	6.0	6.0	6.2	6.1
1005 to 990	6.3	6.0	6.3	6.3	6.3	6.3	6.2	6.0	6.0	5.8	6.1	5.9
990 to 975	6.3	6.1	6.3	6.3	6.3	6.3	6.1	6.0	6.1	5.8	5.8	5.8
975 to 960	6.3	6.2	6.4	6.3	6.3	6.2	6.2	6.0	6.0	5.8	5.9	5.7
960 to 945	6.4	6.4	6.4	6.3	6.4	6.4	6.2	6.0	6.0	5.9	5.9	5.7
945 to 930	6.2	6.3	6.4	6.2	6.3	6.3	6.2	6.0	6.0	5.8	5.8	5.5
930 to 915	6.1	6.4	6.3	6.2	6.3	6.2	6.2	6.0	5.9	5.8	5.8	5.5
915 to 900	6.1	6.1	6.3	6.2	6.2	6.2	6.1	6.0	6.2	5.8	5.7	5.5
900 to 885	6.0	6.2	6.3	6.2	6.2	6.2	6.2	5.9	6.0	5.9	5.8	5.5
885 to 870	5.9	6.2	6.2	6.2	6.2	6.1	6.1	5.9	6.0	6.0	5.6	5.5
870 to 855	5.8	6.2	6.2	6.2	6.2	6.1	6.3	5.9	6.0	5.9	5.7	5.5
< 855	5.9	6.1	6.1	6.1	6.2	6.1	6.2	6.0	6.0	6.1	5.8	5.5

Measurement Reading Range (ft msl)

1991 to 2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.4	6.2	6.6	6.7	7.1	6.9	6.9	7.1	6.8	6.4	6.5	6.5
1095 to 1080	6.5	6.4	6.7	6.8	7.0	7.1	7.0	7.1	6.8	6.7	6.7	6.6
1080 to 1065	6.5	6.4	6.6	6.7	7.0	6.9	6.9	6.9	6.8	6.8	6.7	6.6
1065 to 1050	6.5	6.4	6.5	6.6	6.8	6.7	6.7	6.7	6.6	6.7	6.7	6.6
1050 to 1035	6.5	6.3	6.4	6.5	6.6	6.5	6.4	6.4	6.3	6.6	6.7	6.6
1035 to 1020	6.5	6.3	6.4	6.4	6.5	6.4	6.2	6.2	6.1	6.6	6.7	6.6
1020 to 1005	6.5	6.3	6.4	6.4	6.4	6.2	6.1	6.0	5.9	6.3	6.6	6.6
1005 to 990	6.5	6.3	6.4	6.2	6.3	6.1	6.0	6.0	5.9	5.9	6.3	6.4
990 to 975	6.4	6.3	6.4	6.2	6.2	6.1	5.9	6.0	5.9	5.8	5.9	6.1
975 to 960	6.3	6.3	6.3	6.2	6.2	6.0	5.9	5.9	5.8	5.8	5.9	5.8
960 to 945	6.1	6.3	6.3	6.1	6.2	6.0	5.8	5.9	5.8	5.8	5.8	5.7
945 to 930	6.1	6.2	6.2	6.0	6.1	5.9	5.8	5.9	5.8	5.7	5.8	5.7
930 to 915	6.0	6.2	6.2	6.0	6.1	5.9	5.8	5.9	5.8	5.8	5.8	5.7
915 to 900	5.9	6.2	6.2	6.0	6.1	5.9	5.8	5.9	5.8	5.8	5.8	5.7
900 to 885	5.9	6.1	6.2	5.9	6.1	5.8	5.7	5.8	5.7	5.7	5.8	5.7
885 to 870	5.9	6.1	6.2	5.9	6.0	5.9	5.8	5.8	5.7	5.7	5.8	5.7
870 to 855	6.0	6.1	6.1	5.9	6.0	5.8	5.7	5.8	5.7	5.7	5.8	5.7
< 855	6.0	6.1	6.1	5.8	6.0	5.8	5.8	5.8	5.7	5.7	5.8	5.8

< Acidic						Neutral						Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee F_2_554.8: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1986 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.7	6.2	6.5	6.7	7.0	7.1	7.3	7.3	6.9	6.8	6.4	6.4
1095 to 1080	6.7	6.6	6.8	6.8	7.1	7.6	7.3	7.4	6.9	6.8	6.9	6.4
1080 to 1065	6.7	6.6	6.8	6.8	6.9	7.5	7.4	7.5	6.8	6.7	6.8	6.5
1065 to 1050	6.6	6.5	6.9	6.7	6.8	7.3	7.3	7.0	6.6	6.8	6.9	6.5
1050 to 1035	6.6	6.5	6.7	6.6	6.7	7.1	6.9	6.7	6.6	6.7	6.8	6.5
1035 to 1020	6.6	6.5	6.7	6.5	6.5	6.6	6.7	6.4	6.4	6.6	6.8	6.5
1020 to 1005	6.6	6.4	6.7	6.5	6.5	6.5	6.3	6.1	6.0	6.5	6.7	6.5
1005 to 990	6.6	6.4	6.6	6.4	6.4	6.3	6.3	6.0	5.9	6.2	6.6	6.5
990 to 975	6.5	6.3	6.5	6.4	6.3	6.2	6.3	6.0	5.9	6.1	6.4	6.5
975 to 960	6.5	6.4	6.5	6.2	6.3	6.1	6.3	6.0	6.0	6.1	6.1	6.3
960 to 945	6.5	6.0	6.6		5.8	6.0	6.0	6.3	6.0	6.3	6.3	6.1
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 946.5 ft

Measurement Reading Range (ft msl)

1991 to 2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.5	6.4	6.6	6.7	7.0	7.1	7.2	7.4	6.9	6.4	6.6	6.5
1095 to 1080	6.6	6.5	6.7	6.8	7.0	7.2	7.6	7.6	6.8	6.6	6.8	6.6
1080 to 1065	6.6	6.5	6.6	6.7	6.8	6.9	7.2	7.2	6.7	6.7	6.8	6.6
1065 to 1050	6.6	6.5	6.6	6.5	6.6	6.6	6.5	6.7	6.6	6.6	6.7	6.6
1050 to 1035	6.6	6.4	6.5	6.4	6.4	6.3	6.2	6.4	6.4	6.5	6.7	6.6
1035 to 1020	6.6	6.4	6.5	6.4	6.3	6.2	6.0	6.1	6.2	6.5	6.7	6.6
1020 to 1005	6.5	6.4	6.4	6.3	6.2	6.1	5.9	5.9	5.9	6.3	6.6	6.6
1005 to 990	6.6	6.4	6.4	6.2	6.2	6.0	5.8	5.9	5.8	5.8	6.5	6.5
990 to 975	6.5	6.4	6.4	6.1	6.1	5.9	5.8	5.9	5.8	5.7	6.1	6.3
975 to 960	6.5	6.4	6.3	6.1	6.0	5.8	5.7	5.9	5.8	5.8	6.1	6.1
960 to 945	6.3	6.3	6.2	5.9	6.0	5.8	5.8	5.9	6.0	5.9	6.1	6.1
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 945.3 ft

< Acidic						Neutral						Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee F_2_556.0: Monthly pH (SI) (Top: Pre Bad Creek Operation, Bottom: Post Bad Creek Operation)

Measurement Reading Range (ft msl)

1975 to 1991	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.6	6.3	6.4	6.7	6.8	7.2	7.2	7.3	6.9	6.3	6.6	6.3
1095 to 1080	6.5	6.5	6.6	6.8	6.8	7.3	7.4	7.3	6.9	6.5	6.7	6.3
1080 to 1065	6.6	6.3	6.6	6.9	6.6	6.8	7.1	6.8	6.6	6.4	6.6	6.3
1065 to 1050	6.6	6.4	6.5	6.7	6.6	6.6	6.6	6.5	6.2	6.5	6.5	6.3
1050 to 1035	6.5	6.2	6.4	6.6	6.5	6.6	6.5	6.2	6.1	6.3	6.5	6.2
1035 to 1020	6.5	6.2	6.4	6.6	6.4	6.3	6.3	6.1	6.1	6.1	6.4	6.2
1020 to 1005	6.6	6.2	6.4	6.5	6.3	6.2	6.3	6.0	5.9	6.0	6.2	6.2
1005 to 990	6.5	6.1	6.3	6.5	6.4	6.2	6.2	6.0	5.9	5.9	6.1	6.1
990 to 975	6.5	6.1	6.3	6.5	6.3	6.2	6.1	6.0	6.0	5.8	5.9	6.0
975 to 960	6.5	6.3	6.4	6.4	6.3	6.2	6.1	6.0	5.9	5.8	5.9	5.9
960 to 945	6.5	6.4	6.5	6.4	6.3	6.2	6.2	5.9	5.9	6.0	5.9	5.9
945 to 930	6.5	6.3	6.3	6.2	6.2	6.2	6.1	5.9	6.0	5.9	5.8	5.9
930 to 915	6.6	6.4	6.4	6.4	6.1	5.7	6.1	5.9	5.9	6.1	6.2	5.9
915 to 900					6.3							
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 914.1 ft

Measurement Reading Range (ft msl)

1991 to 2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.5	6.3	6.6	6.7	7.2	7.1	7.2	7.3	6.8	6.5	6.6	6.5
1095 to 1080	6.6	6.5	6.7	6.9	7.3	7.3	7.5	7.5	6.9	6.7	6.8	6.6
1080 to 1065	6.6	6.5	6.7	6.8	7.1	7.1	7.3	7.3	6.7	6.7	6.8	6.6
1065 to 1050	6.6	6.4	6.6	6.6	6.8	6.8	6.8	6.8	6.6	6.6	6.8	6.6
1050 to 1035	6.6	6.4	6.5	6.4	6.5	6.4	6.2	6.3	6.3	6.6	6.7	6.6
1035 to 1020	6.6	6.4	6.5	6.4	6.4	6.2	6.1	6.1	6.1	6.5	6.7	6.6
1020 to 1005	6.5	6.4	6.4	6.3	6.3	6.1	6.0	6.0	5.9	6.3	6.6	6.6
1005 to 990	6.5	6.4	6.4	6.3	6.3	6.1	5.9	6.0	5.8	5.9	6.4	6.4
990 to 975	6.5	6.4	6.4	6.2	6.2	6.0	5.9	6.0	5.8	5.8	6.0	6.2
975 to 960	6.4	6.4	6.4	6.2	6.1	5.9	5.8	5.9	5.8	5.8	5.8	6.0
960 to 945	6.4	6.4	6.3	6.1	6.1	5.9	5.7	5.9	5.7	5.7	5.8	5.9
945 to 930	6.4	6.3	6.3	6.0	6.0	5.8	5.7	5.8	5.8	5.8	5.9	5.8
930 to 915	6.2	6.2	6.5	5.9	6.0	5.7	5.8	5.8	5.7	5.8	5.9	5.9
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 918.4 ft

		< Acidic				**Neutral**						**Basic >**	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Lake Jocassee

Phosphorus

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Jocassee B_2_558.7: Monthly Averaged Phosphorus (mg/L) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.008	0.005	0.011	0.028	0.008	0.005	0.005	0.006	0.008	0.005	0.039	
1095 to 1080	0.015	0.015	0.015	0.019	0.015	0.015		0.015	0.015	0.015	0.015	0.015
1080 to 1065		0.005	0.011	0.017	0.008	0.005	0.005	0.016	0.006	0.005	0.029	
1065 to 1050	0.015	0.015	0.015	0.015	0.015	0.015	0.037	0.015	0.015	0.015	0.015	0.017
1050 to 1035				0.016	0.017	0.005	0.005	0.007	0.006	0.015		
1035 to 1020	0.015	0.010	0.013	0.015	0.015	0.015	0.015	0.015	0.015		0.038	
1020 to 1005							0.005		0.005	0.015	0.015	0.040
1005 to 990	0.015	0.010	0.013	0.014	0.008	0.005		0.010		0.005	0.027	
990 to 975				0.015	0.015	0.032	0.015	0.015	0.015	0.015	0.015	0.015
975 to 960		0.010	0.009	0.018	0.006	0.005	0.005	0.034	0.007	0.005	0.042	
960 to 945	0.015		0.015	0.015	0.015	0.034	0.015	0.015	0.015	0.015	0.015	0.015
945 to 930		0.005	0.011	0.015	0.008	0.005	0.005	0.009	0.005	0.005	0.036	
930 to 915	0.015	0.015	0.015	0.020	0.020	0.015	0.019	0.015	0.015	0.015	0.015	0.015
915 to 900		0.005	0.010	0.014	0.006	0.005	0.005	0.024	0.005	0.023	0.032	
900 to 885	0.015	0.015	0.015	0.015	0.015			0.015	0.015	0.015	0.015	0.026
885 to 870			0.010		0.020	0.005	0.005	0.013	0.005	0.016		
870 to 855	0.015	0.010	0.015	0.015	0.015	0.015	0.015	0.015	0.015			
< 855		0.005	0.012	0.019	0.016	0.011	0.005	0.013	0.006	0.016	0.015	0.015

Jocassee B_2_558.7: Monthly Averaged Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.003	0.006	0.006	0.006	0.006	0.003	0.005	0.005	0.004	0.005	0.006	0.008
1095 to 1080	0.005	0.005	0.005	0.006	0.006	0.006	0.006	0.005	0.005	0.006	0.006	0.005
1080 to 1065	0.005	0.005	0.005	0.006	0.005	0.006	0.005	0.006	0.005	0.006	0.006	0.005
1065 to 1050	0.005	0.005	0.005	0.006	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.005
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855											0.004	
	Legend	**0.000**										**0.020**

Jocassee B_3_558.0: Monthly Averaged Phosphorus (mg/L) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.008	0.007	0.008	0.011	0.010	0.010	0.008	0.011	0.008	0.011	0.014	0.005
1095 to 1080	0.010	0.015	0.009	0.008	0.012	0.013	0.011	0.013	0.011	0.012	0.027	0.011
1080 to 1065	0.005	0.007	0.008	0.010	0.009	0.008	0.009	0.010	0.007	0.011	0.010	0.005
1065 to 1050	0.011	0.013	0.014	0.014	0.014	0.009	0.012	0.012	0.010	0.012	0.011	0.017
1050 to 1035	0.009	0.008	0.005	0.009	0.006	0.009	0.008	0.008	0.006	0.012	0.009	0.005
1035 to 1020	0.010	0.009	0.011	0.018	0.017	0.010	0.011	0.011	0.008	0.019	0.013	0.011
1020 to 1005	0.007	0.011	0.006	0.006	0.008	0.013	0.008	0.007	0.007	0.009	0.014	0.011
1005 to 990	0.015	0.009	0.010	0.012	0.012	0.008	0.008	0.009	0.006	0.009	0.019	0.008
990 to 975	0.006	0.008	0.006	0.008	0.017	0.025	0.019	0.009	0.008	0.009	0.010	0.026
975 to 960	0.005	0.008	0.010	0.009	0.013	0.007	0.006	0.010	0.006	0.007	0.009	0.006
960 to 945	0.021	0.015	0.015	0.015	0.015	0.015	0.034	0.015	0.015	0.015	0.015	0.015
945 to 930	0.006	0.005	0.008	0.010	0.007	0.005	0.005	0.007	0.007	0.007	0.014	0.005
930 to 915	0.015	0.015	0.015	0.016	0.015	0.015	0.038	0.015	0.015	0.015	0.029	0.017
915 to 900	0.005	0.009	0.007	0.013	0.014	0.010	0.009	0.013	0.008	0.011	0.014	0.007
900 to 885	0.027	0.019	0.015	0.015	0.015	0.015	0.029	0.015	0.012	0.010	0.010	0.013
885 to 870	0.009	0.005	0.008	0.010	0.006	0.006	0.006	0.025	0.007	0.022	0.005	0.005
870 to 855	0.017	0.010	0.015	0.016	0.015	0.056	0.015	0.015	0.010	0.005	0.022	0.008
< 855	0.021	0.010	0.010	0.012	0.017	0.012	0.009	0.011	0.012	0.011	0.016	0.011

Jocassee B_3_558.0: Monthly Averaged Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.006	0.008	0.009	0.007	0.007	0.007	0.005	0.008	0.006	0.007	0.007	0.010
1095 to 1080	0.005	0.005	0.005	0.006	0.006	0.005	0.005	0.006	0.005	0.007	0.012	0.008
1080 to 1065	0.009	0.012	0.008	0.008	0.007	0.010	0.006	0.009	0.009	0.006	0.008	0.019
1065 to 1050	0.005	0.006	0.008	0.006	0.005	0.005	0.005	0.005	0.006	0.006	0.005	0.004
1050 to 1035	0.014	0.014	0.008	0.008	0.007	0.010	0.006	0.007	0.011	0.012	0.006	0.019
1035 to 1020	0.002	0.006	0.006					0.005	0.004	0.004	0.005	0.005
1020 to 1005	0.013	0.011	0.010	0.009	0.010	0.010	0.007	0.007	0.012	0.011	0.007	0.018
1005 to 990	0.002		0.005				0.005	0.005	0.004	0.002	0.002	0.004
990 to 975	0.014	0.006	0.009	0.010	0.008	0.009	0.008	0.012	0.011	0.010	0.007	0.017
975 to 960	0.002	0.005	0.023					0.004	0.002	0.002	0.002	0.002
960 to 945	0.005	0.004	0.005		0.003			0.002		0.005		0.002
945 to 930	0.013	0.007	0.011	0.009	0.010	0.013	0.006	0.011	0.006	0.014	0.007	0.019
930 to 915			0.005							0.002		
915 to 900	0.011	0.006	0.009	0.010	0.007	0.012	0.006	0.010	0.011	0.011	0.007	0.020
900 to 885		0.041	0.027						0.002	0.002	0.002	0.002
885 to 870	0.014	0.007	0.009	0.010	0.007	0.011	0.006	0.008	0.011	0.012	0.007	0.025
870 to 855	0.002								0.002	0.002	0.002	0.002
< 855	0.012	0.007	0.012	0.011	0.006	0.012	0.007	0.011	0.009	0.011	0.008	0.016

Legend	**0.000**										**0.020**

Jocassee C_2_559.0: Monthly Averaged Phosphorus (mg/L) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.006	0.007	0.010	0.014	0.007	0.007	0.006	0.006	0.006	0.006	0.005	0.006
1095 to 1080	0.016	0.015	0.015	0.016	0.036	0.027	0.032	0.015	0.015	0.015	0.032	0.013
1080 to 1065	0.005	0.006	0.010	0.010	0.005	0.006	0.006	0.005	0.006	0.005	0.005	0.005
1065 to 1050	0.040	0.020	0.015	0.055	0.015	0.020	0.038		0.015	0.010	0.010	0.012
1050 to 1035	0.009	0.005	0.006	0.024	0.006	0.006	0.005	0.005	0.007	0.005	0.005	0.005
1035 to 1020	0.015	0.010	0.014	0.018	0.015	0.031	0.020	0.015	0.012	0.005	0.030	0.008
1020 to 1005	0.005	0.015	0.005	0.005	0.006	0.006	0.005	0.005	0.005	0.015	0.010	0.015
1005 to 990	0.015	0.010	0.013	0.017	0.012	0.005		0.074	0.006	0.020	0.005	0.006
990 to 975	0.006	0.010	0.005	0.012	0.006	0.020	0.018	0.010	0.015	0.015	0.010	0.015
975 to 960		0.010	0.010	0.016	0.014	0.005	0.005	0.033	0.007	0.007	0.030	0.006
960 to 945	0.015	0.015	0.015	0.015	0.015	0.016	0.016	0.015	0.015	0.015	0.015	0.015
945 to 930	0.022	0.005	0.009	0.010	0.006	0.005	0.005	0.016	0.006	0.005	0.016	0.005
930 to 915	0.015	0.015	0.015	0.015	0.015	0.035	0.015	0.015	0.015	0.015	0.015	0.011
915 to 900	0.014	0.006	0.008	0.010	0.006	0.005	0.005	0.010	0.005	0.006	0.005	0.005
900 to 885	0.015	0.015	0.015	0.018	0.015	0.015		0.015	0.015	0.015	0.016	0.011
885 to 870	0.006	0.006	0.006	0.032	0.010	0.005	0.005	0.008	0.006	0.033	0.005	0.005
870 to 855	0.015	0.010	0.014	0.015	0.015	0.016	0.015	0.015	0.010	0.005	0.006	0.005
< 855	0.023	0.011	0.011	0.013	0.010	0.010	0.020	0.023	0.009	0.015	0.013	0.011

Jocassee C_2_559.0: Monthly Averaged Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.006	0.007	0.007	0.008	0.006	0.009	0.003	0.007	0.005	0.005	0.007	0.013
1095 to 1080	0.005	0.005	0.005	0.006	0.006	0.005	0.006	0.006	0.004	0.005	0.006	0.004
1080 to 1065	0.009	0.008	0.010	0.009	0.007	0.009	0.005	0.008	0.009	0.007	0.005	0.013
1065 to 1050	0.005	0.005	0.005	0.006	0.005	0.005	0.005	0.005	0.004	0.004	0.004	0.004
1050 to 1035	0.013	0.010	0.011	0.009	0.009	0.011	0.006	0.010	0.012	0.008	0.013	0.018
1035 to 1020	0.002								0.002	0.004	0.004	0.002
1020 to 1005	0.014	0.009	0.011	0.010	0.007	0.008	0.004	0.012	0.011	0.008	0.013	0.019
1005 to 990	0.015								0.002	0.002	0.002	0.002
990 to 975	0.019	0.010	0.010	0.009	0.008	0.011	0.004	0.010	0.010	0.004	0.015	0.018
975 to 960	0.004		0.031					0.002	0.002	0.002	0.002	0.002
960 to 945		0.005		0.005				0.004		0.005	0.035	0.002
945 to 930	0.011	0.011	0.009	0.010	0.008	0.015	0.005	0.014	0.008	0.010	0.003	0.016
930 to 915										0.002		
915 to 900	0.011	0.013	0.010	0.010	0.008	0.012	0.007	0.013	0.011	0.007	0.015	0.011
900 to 885			0.013						0.002	0.002	0.002	0.002
885 to 870	0.011	0.011	0.011	0.009	0.009	0.013	0.005	0.012	0.011	0.007	0.015	0.010
870 to 855									0.002	0.002	0.003	0.002
< 855	0.012	0.011	0.011	0.010	0.009	0.015	0.006	0.011	0.010	0.008	0.013	0.008

Legend	**0.000**										**0.020**

Jocassee C_2_560.0: Monthly Averaged Phosphorus (mg/L) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.011	0.009	0.008	0.009	0.012	0.007	0.009	0.008	0.007	0.010	0.009	0.005
1095 to 1080	0.017	0.015	0.009	0.020	0.016	0.011	0.014	0.012	0.012	0.012	0.017	0.010
1080 to 1065	0.008	0.007	0.008	0.008	0.009	0.008	0.011	0.010	0.006	0.013	0.008	0.005
1065 to 1050	0.017	0.010	0.010	0.051	0.012	0.011	0.013	0.010	0.011	0.011	0.016	0.009
1050 to 1035	0.008	0.007	0.006	0.008	0.006	0.008	0.010	0.011	0.008	0.008	0.008	0.005
1035 to 1020	0.014	0.008	0.011	0.010	0.014	0.013	0.011	0.010	0.010	0.008	0.011	0.013
1020 to 1005	0.008	0.008	0.006	0.007	0.008	0.006	0.009	0.007	0.005	0.009	0.010	0.008
1005 to 990	0.010	0.008	0.010	0.017	0.014	0.007	0.009	0.012	0.008	0.008	0.010	0.006
990 to 975	0.009	0.010	0.006	0.006	0.008	0.009	0.014	0.011	0.010	0.010	0.009	0.010
975 to 960	0.011	0.008	0.011	0.010	0.012	0.005	0.009	0.011	0.010	0.007	0.007	0.005
960 to 945		0.024	0.015	0.033	0.015	0.015	0.015	0.015	0.015	0.015		0.010
945 to 930	0.005	0.007	0.010	0.010	0.005	0.005	0.005	0.010	0.006	0.006	0.015	0.005
930 to 915	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.012
915 to 900	0.008	0.007	0.007	0.010	0.010	0.008	0.009	0.012	0.010	0.008	0.010	0.005
900 to 885	0.015	0.016	0.015	0.018	0.022	0.015	0.015	0.015	0.015	0.010	0.014	0.011
885 to 870	0.007	0.006	0.006	0.010	0.011	0.005	0.005	0.017	0.005	0.007	0.005	0.008
870 to 855	0.015	0.009	0.014		0.011	0.015	0.015	0.015	0.009	0.005	0.019	0.005
< 855	0.011	0.012	0.012	0.012	0.013	0.008	0.008	0.011	0.011	0.008	0.013	0.022

Jocassee C_2_560.0: Monthly Averaged Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.007	0.007	0.009	0.009	0.006	0.009	0.005	0.008	0.007	0.005	0.007	0.013
1095 to 1080	0.005	0.009	0.006	0.006	0.005	0.006	0.007	0.005	0.005	0.004	0.005	0.005
1080 to 1065	0.009	0.009	0.011	0.009	0.007	0.009	0.007	0.008	0.009	0.007	0.009	0.008
1065 to 1050	0.005	0.005	0.005	0.006	0.005	0.005	0.007	0.005	0.005	0.004	0.004	0.005
1050 to 1035	0.013	0.009	0.010	0.010	0.006	0.012	0.006	0.013	0.013	0.007	0.009	0.010
1035 to 1020	0.002								0.002	0.002	0.004	0.002
1020 to 1005	0.013	0.008	0.010	0.010	0.007	0.012	0.005	0.014	0.010	0.007	0.010	0.010
1005 to 990	0.002								0.002	0.002	0.003	0.002
990 to 975	0.017	0.010	0.011	0.011	0.006	0.011	0.005	0.010	0.011	0.009	0.010	0.011
975 to 960	0.004		0.003					0.002	0.002	0.002	0.003	0.002
960 to 945		0.004		0.007				0.004		0.005	0.023	0.002
945 to 930	0.011	0.008	0.011	0.012	0.006	0.011	0.006	0.014	0.009	0.009	0.003	0.008
930 to 915										0.002		
915 to 900	0.011	0.010	0.011	0.010	0.006	0.013	0.004	0.011	0.013	0.009	0.009	0.009
900 to 885									0.002	0.002	0.003	0.002
885 to 870	0.012	0.009	0.010	0.010	0.006	0.012	0.005	0.011	0.010	0.007	0.008	0.010
870 to 855	0.005	0.006	0.004	0.005	0.010	0.012	0.010	0.004	0.003	0.007	0.011	0.002
< 855	0.014	0.014	0.018	0.012	0.003	0.017	0.002	0.017	0.013	0.005	0.007	0.010

Legend **0.000** … **0.020**

Jocassee C_2_562.0: Monthly Averaged Phosphorus (mg/L) 1980 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.011	0.009	0.012	0.011	0.010	0.006	0.008	0.011	0.007	0.009	0.007	0.005
1095 to 1080	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.013	0.015	0.015	0.013
1080 to 1065	0.005	0.009	0.011	0.015	0.014	0.015	0.010	0.012	0.011	0.008	0.006	0.005
1065 to 1050	0.015	0.012	0.015	0.015	0.019	0.015	0.042	0.015	0.013	0.012	0.017	0.011
1050 to 1035	0.007	0.010	0.013	0.012	0.007	0.020	0.011	0.017	0.007	0.008	0.007	0.005
1035 to 1020	0.023	0.010	0.014	0.019	0.015		0.019	0.020	0.010	0.009	0.016	0.009
1020 to 1005		0.010	0.010	0.015	0.006		0.012	0.009		0.011		0.015
1005 to 990	0.017	0.013	0.014	0.023	0.011	0.020	0.019	0.016	0.013	0.015	0.010	0.009
990 to 975	0.005	0.009	0.021	0.015	0.008		0.013	0.012		0.009	0.010	
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 964.5 ft

Jocassee C_2_562.0: Monthly Averaged Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.008	0.009	0.009	0.011	0.007	0.009	0.006	0.007	0.006	0.007	0.009	0.015
1095 to 1080	0.005	0.005	0.006	0.007	0.007	0.007	0.006	0.005	0.004	0.004	0.005	0.004
1080 to 1065	0.009	0.010	0.010	0.011	0.008	0.014	0.008	0.009	0.008	0.008	0.011	0.008
1065 to 1050	0.005	0.006	0.007	0.008	0.009	0.008	0.010	0.005	0.004	0.004	0.005	0.004
1050 to 1035	0.013	0.011	0.011	0.010	0.008	0.014	0.008	0.016	0.013	0.009	0.009	0.004
1035 to 1020	0.002								0.003	0.003	0.004	0.002
1020 to 1005		0.007			0.006			0.012			0.009	
1005 to 990	0.010	0.010	0.011	0.013	0.010	0.021	0.012	0.012	0.012	0.010	0.010	0.008
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 993.5 ft

Legend **0.000** … **0.020**

Jocassee C_2_565.4: Monthly Averaged Phosphorus (mg/L) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.010	0.016	0.011	0.012	0.007	0.007	0.008	0.006	0.009	0.009	0.008	0.006
1095 to 1080	0.031	0.015	0.015	0.034	0.015	0.017	0.015	0.015	0.015	0.015	0.012	0.013
1080 to 1065	0.037	0.010	0.010	0.011	0.007	0.006	0.007	0.017	0.007	0.006		0.005
1065 to 1050	0.015	0.013	0.015	0.015	0.015	0.015	0.048	0.015	0.015	0.011	0.016	0.011
1050 to 1035	0.012	0.007	0.009	0.011	0.006	0.006	0.006	0.025	0.008	0.005		0.005
1035 to 1020	0.015	0.015	0.013	0.021	0.015	0.015	0.034	0.015	0.011	0.006	0.011	0.008
1020 to 1005	0.006	0.017	0.008	0.005	0.005	0.005	0.007	0.005	0.007	0.015	0.043	0.015
1005 to 990	0.015	0.010	0.014	0.031	0.011	0.005		0.070	0.006	0.008	0.039	0.012
990 to 975	0.011	0.016	0.009	0.006	0.005	0.010	0.013	0.010	0.015	0.015	0.019	0.015
975 to 960	0.016	0.015	0.013	0.017	0.013	0.005	0.005	0.062	0.007	0.006	0.012	0.005
960 to 945		0.005	0.015	0.026		0.015	0.015	0.015	0.015	0.015		0.014
945 to 930	0.017	0.018	0.011	0.012	0.015	0.011	0.006	0.015	0.008	0.010	0.023	0.009
930 to 915			0.009		0.006	0.007		0.006	0.015			
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 918.1 ft

Jocassee C_2_565.4: Monthly Averaged Phosphorus (mg/L) 1991 to 1994 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.013	0.015	0.010	0.011	0.009	0.012	0.008	0.010	0.013	0.009	0.012	0.011
1095 to 1080									0.003	0.002	0.004	0.002
1080 to 1065	0.011	0.011	0.006	0.011	0.009	0.011	0.006	0.009	0.011	0.009	0.014	0.010
1065 to 1050									0.004	0.002	0.002	0.002
1050 to 1035	0.014	0.009	0.009	0.013	0.009	0.013	0.008	0.014	0.013	0.010	0.010	0.009
1035 to 1020	0.002								0.004	0.002	0.003	0.002
1020 to 1005	0.016	0.010	0.007	0.009	0.008	0.013	0.006	0.012	0.012	0.004	0.014	0.010
1005 to 990	0.002								0.002	0.002	0.005	0.002
990 to 975	0.021	0.010	0.011	0.009	0.008	0.013	0.007	0.013	0.012	0.009	0.014	0.009
975 to 960	0.004							0.002	0.003	0.002	0.004	0.002
960 to 945												0.002
945 to 930	0.014	0.011	0.010	0.004	0.014	0.011	0.003	0.012	0.002	0.009	0.016	0.010
930 to 915	0.002				0.004		0.012	0.005	0.012		0.002	
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 926.6 ft

Legend	0.000										0.020

Jocassee D_2_551.0: Monthly Averaged Phosphorus (mg/L) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.010	0.008	0.010	0.013	0.011	0.019	0.014	0.013	0.012	0.012	0.016	0.006
1095 to 1080	0.028	0.042	0.023	0.019	0.015	0.017	0.017	0.015	0.014	0.015	0.009	0.035
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1082.8 ft

Jocassee D_2_551.0: Monthly Averaged Phosphorus (mg/L) 1991 to 2011 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.020	0.011	0.005	0.006	0.008	0.020	0.017	0.020	0.034	0.033	0.011	0.058
1095 to 1080		0.007						0.005			0.008	
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1083.7 ft

Legend **0.000** … **0.020**

Jocassee D_2_564.0: Monthly Averaged Phosphorus (mg/L) 1976 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.007	0.007	0.008	0.010	0.007	0.005	0.008	0.010	0.007	0.008	0.007	0.014
1095 to 1080	0.015	0.013	0.010	0.020	0.014	0.015	0.015	0.014	0.010	0.010	0.009	0.010
1080 to 1065	0.016	0.008	0.008	0.010	0.005	0.006	0.009	0.009	0.007	0.008	0.007	0.006
1065 to 1050	0.015	0.010	0.018	0.029	0.012	0.008	0.015	0.015	0.011	0.010	0.027	0.016
1050 to 1035	0.005	0.007	0.011	0.010	0.006	0.006	0.012	0.013	0.009	0.011	0.007	0.005
1035 to 1020	0.015	0.007	0.013	0.015	0.012	0.008	0.013	0.010	0.013	0.006	0.008	0.009
1020 to 1005	0.010	0.010	0.010	0.012	0.008	0.005	0.014	0.008	0.008	0.012	0.008	0.011
1005 to 990	0.010	0.007	0.008	0.019	0.011	0.005	0.009	0.020	0.010	0.014	0.017	0.008
990 to 975	0.037	0.010	0.010	0.010	0.007	0.008	0.007	0.012	0.010	0.013	0.015	0.012
975 to 960	0.010	0.014	0.010	0.011	0.014	0.005	0.012	0.022	0.012	0.007	0.012	0.005
960 to 945	0.015	0.015	0.015	0.016	0.015	0.011	0.015	0.015	0.015	0.015	0.015	0.011
945 to 930	0.007	0.009	0.006	0.011	0.006	0.005	0.005	0.007	0.007	0.005	0.015	0.007
930 to 915	0.015	0.016	0.027	0.015	0.015	0.011	0.015	0.015	0.015	0.015	0.015	0.012
915 to 900	0.008	0.009	0.011	0.005	0.007	0.005	0.005	0.007	0.006	0.005	0.007	0.005
900 to 885	0.021	0.017	0.015	0.016	0.015	0.011	0.012	0.025	0.015	0.010	0.037	0.014
885 to 870	0.025	0.016	0.012	0.015	0.015	0.008	0.005	0.022	0.006	0.015	0.033	0.014
870 to 855	0.015		0.065	0.015	0.009		0.006	0.005	0.007	0.006	0.007	0.009
< 855	Minimum Reading 864.7 ft											

Jocassee D_2_564.0: Monthly Averaged Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.013	0.011	0.011	0.010	0.008	0.010	0.006	0.008	0.009	0.015	0.012	0.010
1095 to 1080	0.005	0.005	0.005	0.007	0.006	0.005	0.006	0.005	0.005	0.004	0.005	0.004
1080 to 1065	0.010	0.008	0.010	0.013	0.007	0.012	0.007	0.018	0.009	0.005	0.010	0.008
1065 to 1050	0.005	0.006	0.006	0.007	0.005	0.005	0.008	0.005	0.004	0.004	0.005	0.004
1050 to 1035	0.014	0.010	0.011	0.010	0.009	0.012	0.005	0.013	0.012	0.007	0.014	0.009
1035 to 1020	0.002								0.002	0.003	0.003	0.002
1020 to 1005	0.013	0.009	0.008	0.010	0.008	0.013	0.006	0.011	0.011	0.009	0.015	0.010
1005 to 990	0.006								0.002	0.002	0.004	0.002
990 to 975	0.019	0.010	0.010	0.011	0.008	0.010	0.006	0.012	0.011	0.007	0.015	0.010
975 to 960	0.008							0.002	0.002	0.002	0.003	0.002
960 to 945		0.005		0.007				0.004		0.005	0.038	0.002
945 to 930	0.012	0.010	0.009	0.012	0.008	0.012	0.006	0.015	0.010	0.009	0.003	0.011
930 to 915										0.002		
915 to 900	0.012	0.011	0.009	0.014	0.020	0.013	0.006	0.010	0.011	0.009	0.015	0.008
900 to 885	0.005	0.005			0.006	0.003			0.005	0.002	0.003	0.014
885 to 870	0.004	0.029	0.002	0.006	0.028	0.017	0.007	0.016	0.018	0.004	0.008	0.005
870 to 855	0.037	0.006	0.016	0.011		0.018		0.004		0.014	0.005	
< 855	Minimum Reading 864.4 ft											

Legend	**0.000**										**0.020**

Jocassee D_2_564.1: Monthly Averaged Phosphorus (mg/L) 1988 to 1991 (Pre Bad Creek Operation)												
Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.005	0.014	0.008	0.005	0.006	0.006	0.010	0.010	0.009	0.006	0.007	0.006
1095 to 1080	0.014	0.013	0.024	0.017	0.012	0.011	0.009	0.011	0.010	0.009	0.009	0.009
1080 to 1065	0.018	0.013	0.012	0.012	0.013	0.015	0.019	0.019	0.014	0.011	0.014	0.020
1065 to 1050	0.022	0.030	0.025	0.014	0.012	0.014	0.011	0.021	0.013	0.009	0.013	0.009
1050 to 1035	0.012	0.012	0.013	0.018	0.020	0.009	0.010	0.033	0.022	0.009	0.009	0.035
1035 to 1020	0.006	0.014	0.015	0.016	0.016	0.016	0.010	0.031	0.025	0.006	0.010	0.011
1020 to 1005	0.017	0.015	0.018	0.018	0.012	0.016	0.014	0.034	0.041	0.012	0.034	0.027
1005 to 990	0.013	0.026	0.025	0.037	0.019	0.012	0.012	0.033	0.027	0.022	0.018	0.006
990 to 975	0.011	0.056	0.038	0.016	0.019	0.014	0.018	0.033	0.046	0.043	0.031	0.008
975 to 960	0.013	0.024	0.041	0.044		0.020	0.017	0.051	0.054	0.032	0.021	0.005
960 to 945					0.008							
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 959.9 ft

Jocassee D_2_564.1: Monthly Averaged Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)												
Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.011	0.010	0.009	0.011	0.008	0.014	0.006	0.008	0.026	0.007	0.012	0.009
1095 to 1080	0.009	0.009	0.008	0.008	0.009	0.012	0.006	0.008	0.009	0.004	0.009	0.007
1080 to 1065	0.009	0.009	0.009	0.009	0.008	0.012	0.007	0.009	0.010	0.005	0.009	0.007
1065 to 1050	0.009	0.009	0.009	0.016	0.008	0.012	0.006	0.015	0.009	0.007	0.011	0.008
1050 to 1035	0.013	0.010	0.011	0.010	0.008	0.012	0.008	0.021	0.011	0.007	0.012	0.008
1035 to 1020	0.011	0.011	0.009	0.010	0.008	0.016	0.007	0.014	0.010	0.007	0.012	0.006
1020 to 1005	0.010	0.011	0.013	0.011	0.008	0.011	0.009	0.018	0.010	0.006	0.012	0.008
1005 to 990	0.012	0.010	0.009	0.010	0.009	0.012	0.008	0.026	0.012	0.005	0.013	0.009
990 to 975	0.002	0.005					0.012	0.002	0.003	0.003	0.003	0.002
975 to 960	0.011	0.011	0.014	0.009	0.008	0.012	0.007	0.021	0.010	0.011	0.013	0.011
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 963 ft

Legend	0.000										0.020

Jocassee E_2_557.0: Monthly Averaged Phosphorus (mg/L) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.029	0.007	0.007	0.009	0.012	0.008	0.010	0.014	0.007	0.007	0.014	0.006
1095 to 1080	0.014	0.016	0.008	0.010	0.015	0.023	0.012	0.014	0.011	0.011	0.011	0.008
1080 to 1065	0.007	0.007	0.006	0.009	0.008	0.011	0.010	0.008	0.008	0.009	0.012	0.005
1065 to 1050	0.018	0.013	0.010	0.058	0.015	0.020	0.020	0.011	0.010	0.012	0.024	0.008
1050 to 1035	0.007	0.007	0.006	0.014	0.006	0.007	0.009	0.025	0.008	0.008	0.009	0.005
1035 to 1020	0.011	0.008	0.010	0.012	0.014	0.017	0.012	0.012	0.011	0.007	0.023	0.006
1020 to 1005	0.010	0.010	0.005	0.006	0.009	0.007	0.012	0.007	0.005	0.009	0.010	0.008
1005 to 990	0.043	0.008	0.011	0.012	0.013	0.006	0.008	0.024	0.009	0.009	0.020	0.005
990 to 975	0.008	0.008	0.008	0.009	0.011	0.011	0.011	0.009	0.014	0.012	0.022	0.010
975 to 960	0.005	0.008	0.010	0.010	0.011	0.013	0.007	0.009	0.008	0.008	0.024	0.006
960 to 945		0.015	0.015	0.027	0.015	0.064		0.015	0.015	0.015	0.015	0.015
945 to 930	0.006	0.006	0.011	0.012	0.009	0.006	0.007	0.006	0.006	0.016	0.011	0.005
930 to 915	0.015	0.015	0.015	0.026	0.015	0.015	0.017	0.015	0.015	0.015	0.091	0.010
915 to 900	0.006	0.008	0.009	0.010	0.014	0.009	0.015	0.011	0.009	0.011	0.017	0.006
900 to 885		0.015	0.015	0.015	0.015		0.015		0.013	0.011	0.016	0.011
885 to 870	0.039	0.007	0.008	0.012	0.006	0.008	0.005	0.005			0.006	0.005
870 to 855		0.009	0.015	0.015	0.023			0.015	0.010	0.005	0.030	0.006
< 855	0.008	0.019	0.012	0.017	0.011	0.008		0.009	0.010	0.011	0.014	0.010

Jocassee E_2_557.0: Monthly Averaged Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.007	0.006	0.014	0.008	0.007	0.009	0.006	0.009	0.004	0.008	0.008	0.016
1095 to 1080	0.005	0.005	0.006	0.007	0.007	0.006	0.005	0.006	0.004	0.004	0.006	0.004
1080 to 1065	0.009	0.008	0.008	0.009	0.007	0.010	0.006	0.008	0.008	0.007	0.010	0.012
1065 to 1050	0.005	0.006	0.005	0.006	0.005	0.005	0.005	0.005	0.004	0.004	0.005	0.004
1050 to 1035	0.015	0.009	0.015	0.009	0.009	0.012	0.006	0.011	0.012	0.010	0.012	0.025
1035 to 1020	0.002								0.002	0.002	0.004	0.002
1020 to 1005	0.013	0.010	0.010	0.010	0.008	0.012	0.006	0.009	0.012	0.012	0.013	0.025
1005 to 990	0.002								0.002	0.002	0.002	0.002
990 to 975	0.014	0.010	0.009	0.011	0.009	0.012	0.006	0.012	0.011	0.009	0.014	0.017
975 to 960	0.002	0.005						0.004	0.002	0.002	0.003	0.002
960 to 945	0.005	0.005			0.003			0.002		0.002		0.002
945 to 930	0.015	0.010	0.010	0.010	0.014	0.012	0.006	0.011	0.008	0.013	0.011	0.019
930 to 915										0.002		
915 to 900	0.012	0.012	0.009	0.010	0.008	0.012	0.006	0.009	0.013	0.004	0.021	0.025
900 to 885									0.002	0.002	0.003	0.002
885 to 870	0.015	0.010	0.010	0.012	0.008	0.015	0.006	0.010	0.012	0.011	0.019	0.037
870 to 855	0.002								0.003	0.002	0.003	0.002
< 855	0.012	0.011	0.011	0.011	0.009	0.013	0.013	0.011	0.009	0.010	0.014	0.017

Legend **0.000** … **0.020**

Jocassee F_2_554.8: Monthly Averaged Phosphorus (mg/L) 1986 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.006	0.013	0.013	0.016	0.008	0.007	0.006	0.008	0.006	0.008	0.029	0.006
1095 to 1080	0.018	0.015	0.015	0.017	0.015	0.018	0.015	0.015	0.015	0.013	0.015	0.011
1080 to 1065	0.057	0.006	0.011	0.014	0.008	0.006	0.007	0.010	0.006	0.015	0.006	0.005
1065 to 1050	0.015	0.015	0.015	0.021	0.015	0.026	0.048	0.015	0.015	0.013	0.015	0.013
1050 to 1035	0.008	0.005	0.006	0.012	0.007	0.006	0.006	0.009	0.008	0.011		0.006
1035 to 1020	0.015	0.010	0.012	0.015	0.015	0.025	0.015	0.015	0.012	0.011	0.030	0.007
1020 to 1005	0.018	0.005	0.006	0.006	0.006	0.006	0.007	0.007	0.009	0.015	0.015	0.015
1005 to 990	0.015	0.010	0.013	0.022	0.011	0.005		0.011	0.006	0.011	0.041	0.007
990 to 975				0.032	0.015	0.026	0.015	0.015	0.015	0.015	0.015	0.024
975 to 960		0.015	0.010	0.015	0.012	0.006	0.005	0.023	0.007	0.011		0.012
960 to 945	0.023	0.011	0.012	0.020	0.006	0.011	0.014	0.015	0.011	0.016	0.019	0.011
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 946.5 ft

Jocassee F_2_554.8: Monthly Averaged Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.009	0.007	0.010	0.010	0.008	0.010	0.006	0.007	0.007	0.010	0.010	0.023
1095 to 1080	0.005	0.006	0.008	0.009	0.009	0.008	0.007	0.006	0.005	0.005	0.006	0.004
1080 to 1065	0.010	0.008	0.009	0.013	0.009	0.012	0.007	0.009	0.010	0.011	0.008	0.014
1065 to 1050	0.005	0.007	0.006	0.009	0.009	0.008	0.008	0.005	0.004	0.004	0.005	0.004
1050 to 1035	0.014	0.006	0.010	0.012	0.009	0.014	0.006	0.010	0.016	0.011	0.010	0.020
1035 to 1020	0.002								0.002	0.003	0.007	0.002
1020 to 1005	0.015	0.007	0.013	0.010	0.008	0.013	0.006	0.009	0.012	0.011	0.012	0.020
1005 to 990	0.002								0.003	0.002	0.003	0.002
990 to 975		0.006			0.008			0.005			0.005	
975 to 960		0.006		0.005								0.005
960 to 945	0.012	0.012	0.010	0.016	0.009	0.016	0.006	0.012	0.013	0.010	0.012	0.023
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 946.2 ft

Legend	**0.000**										**0.020**

Jocassee F_2_556.0: Monthly Averaged Phosphorus (mg/L) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.011	0.006	0.009	0.019	0.010	0.007	0.008	0.007	0.008	0.009	0.013	0.005
1095 to 1080	0.013	0.015	0.009	0.016	0.017	0.016	0.017	0.012	0.013	0.013	0.010	0.010
1080 to 1065	0.006	0.009	0.007	0.008	0.010	0.010	0.007	0.011	0.007	0.017	0.009	0.005
1065 to 1050	0.012	0.018	0.010	0.021	0.012	0.020	0.020	0.013	0.012	0.014	0.010	0.009
1050 to 1035	0.006	0.012	0.005	0.008	0.009	0.007	0.010	0.008	0.013	0.010	0.009	0.005
1035 to 1020	0.011	0.009	0.011	0.015	0.019	0.013	0.012	0.015	0.010	0.010	0.011	0.006
1020 to 1005	0.006	0.011	0.005	0.008	0.009	0.010	0.009	0.009	0.005	0.013	0.009	0.008
1005 to 990	0.015	0.010	0.010	0.015	0.013	0.016	0.007	0.008	0.011	0.023	0.030	0.005
990 to 975	0.008	0.009	0.006	0.008	0.009	0.017	0.014	0.008	0.017	0.014	0.010	
975 to 960	0.014	0.015	0.011	0.015	0.019	0.006	0.007	0.009	0.010	0.008	0.010	0.007
960 to 945	0.035	0.021	0.015	0.022	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.025
945 to 930		0.005	0.011	0.015		0.015		0.006	0.007	0.005	0.018	0.013
930 to 915	0.026	0.013		0.031	0.011	0.008	0.025	0.010	0.011	0.017	0.015	0.006
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 920.3 ft

Jocassee F_2_556.0: Monthly Averaged Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.008	0.007	0.008	0.008	0.008	0.009	0.005	0.007	0.007	0.012	0.008	0.005
1095 to 1080	0.005	0.005	0.006	0.008	0.006	0.008	0.006	0.006	0.004	0.005	0.006	0.005
1080 to 1065	0.010	0.009	0.008	0.010	0.008	0.011	0.006	0.010	0.010	0.008	0.008	0.005
1065 to 1050	0.005	0.006	0.006	0.007	0.005	0.005	0.006	0.005	0.004	0.004	0.004	0.004
1050 to 1035	0.015	0.008	0.013	0.011	0.007	0.015	0.006	0.012	0.012	0.011	0.009	0.004
1035 to 1020	0.002								0.002	0.002	0.005	0.002
1020 to 1005	0.015	0.011	0.010	0.010	0.007	0.009	0.006	0.010	0.011	0.010	0.009	0.004
1005 to 990	0.002								0.002	0.002	0.003	0.002
990 to 975	0.015	0.007	0.013	0.012	0.007	0.014	0.006	0.011	0.011	0.010	0.010	0.004
975 to 960	0.002	0.005						0.003	0.002	0.002	0.004	0.002
960 to 945		0.004			0.002							
945 to 930		0.008	0.013	0.007	0.007	0.010	0.005	0.010		0.023	0.009	
930 to 915	0.011	0.004	0.005	0.017	0.012	0.028	0.006	0.014	0.009	0.005	0.005	0.003
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 919.9 ft

Legend	**0.000**										**0.020**

Lake Jocassee

Nitrogen

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Jocassee B_2_558.7: Monthly Averaged Nitrogen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.22	0.16	0.22	0.27	0.16	0.17	0.21	0.44	0.23	0.22	0.17	
1095 to 1080	0.24	0.25	0.23	0.24	0.23	0.20	0.20	0.29	0.20	0.20	0.21	0.21
1080 to 1065		0.16	0.17	0.18	0.17	0.18	0.19	0.39	0.17	0.27	0.15	
1065 to 1050	0.23	0.26	0.23	0.23	0.23	0.20	0.20	0.20	0.20	0.20	0.20	0.22
1050 to 1035				0.18	0.18	0.20	0.16	0.35	0.16	0.23		
1035 to 1020	0.23	0.21	0.20	0.23	0.23	0.20	0.20	0.21	0.20		0.17	
1020 to 1005							0.21		0.22	0.20	0.21	0.21
1005 to 990	0.23	0.21	0.20	0.18	0.18	0.20		0.36		0.36	0.19	
990 to 975				0.23	0.25	0.22	0.22	0.24	0.26	0.26	0.26	0.21
975 to 960		0.20	0.17	0.26	0.19	0.22	0.23	0.28	0.23	0.32	0.25	
960 to 945	0.25		0.23	0.23	0.27	0.27	0.24	0.27	0.27	0.27	0.28	0.28
945 to 930		0.16	0.17	0.30	0.20	0.24	0.23	0.46	0.28	0.27	0.24	
930 to 915	0.28	0.25	0.23	0.24	0.25	0.27	0.25	0.28	0.28	0.27	0.24	0.25
915 to 900		0.14	0.18	0.27	0.21	0.24	0.24	0.38	0.34	0.25	0.24	
900 to 885	0.31	0.24	0.24	0.24	0.28	0.28	0.26	0.28	0.28	0.28	0.29	0.28
885 to 870			0.17	0.27	0.22	0.25	0.25	0.36	0.27	0.27		
870 to 855	0.32	0.18	0.23	0.25	0.28	0.28	0.26	0.28	0.29		0.26	
< 855		0.15	0.16	0.27	0.21	0.27	0.25	0.33	0.25	0.27	0.29	0.29

Jocassee B_2_558.7: Monthly Averaged Nitrogen (mg/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.16			0.16						0.17	
1095 to 1080		0.25			0.23			0.29			0.21	
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855											0.29	

Legend	0.00										0.35

Jocassee B_3_558.0: Monthly Averaged Nitrogen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.17	0.21	0.18	0.18	0.18	0.17	0.29	0.33	0.20	0.38	0.21	
1095 to 1080	0.22	0.24	0.22	0.29	0.24	0.20	0.20	0.33	0.20	0.20	0.22	0.18
1080 to 1065		0.20	0.18	0.18	0.19	0.18	0.19	0.27	0.25	0.33	0.22	
1065 to 1050	0.22	0.24	0.23	0.23	0.23	0.20	0.20	0.10	0.20	0.20	0.20	0.20
1050 to 1035		0.24		0.19	0.20	0.19	0.16	0.29	0.23	0.26	0.22	
1035 to 1020	0.23	0.21	0.20	0.23	0.24	0.20	0.20	0.10	0.20		0.19	0.16
1020 to 1005		0.24			0.24		0.18	0.27	0.20	0.20	0.21	0.21
1005 to 990	0.23	0.21	0.21	0.18	0.28	0.20		0.36		0.34	0.20	0.16
990 to 975		0.24		0.24	0.24	0.24	0.22	0.29	0.26	0.25	0.24	0.21
975 to 960		0.21	0.18	0.21	0.25	0.21	0.23	0.30	0.21	0.50	0.28	0.24
960 to 945	0.23	0.24	0.24	0.25	0.27	0.26	0.24		0.27	0.27	0.27	0.27
945 to 930		0.21	0.18	0.19	0.22	0.24	0.24	0.34	0.24	0.39	0.36	
930 to 915	0.31	0.25	0.24	0.25	0.29	0.28	0.25		0.27	0.27	0.28	0.26
915 to 900		0.21	0.18	0.22	0.23	0.25	0.24	0.34	0.24	0.47	0.34	
900 to 885	0.32	0.25	0.23	0.25	0.29	0.28	0.26		0.27	0.27	0.28	0.27
885 to 870		0.22	0.17	0.21	0.23	0.25	0.24	0.30	0.25	0.40	0.30	
870 to 855	0.32	0.23	0.22	0.25	0.29	0.27	0.25		0.28		0.27	0.34
< 855	0.35	0.23	0.19	0.21	0.26	0.27	0.28	0.35	0.28	0.32	0.28	0.28

Jocassee B_3_558.0: Monthly Averaged Nitrogen (mg/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.24			0.21			0.23			0.22	
1095 to 1080		0.23			0.16			0.21			0.31	
1080 to 1065		0.23			0.21			0.22			0.21	
1065 to 1050											0.20	
1050 to 1035		0.23			0.20			0.21			0.33	
1035 to 1020											0.20	
1020 to 1005		0.24			0.23			0.24			0.19	
1005 to 990											0.26	
990 to 975		0.23			0.23			0.26			0.26	
975 to 960		0.23						0.24			0.27	
960 to 945		0.25			0.11							
945 to 930		0.29			0.26			0.26			0.27	
930 to 915												
915 to 900		0.28			0.24			0.26			0.28	
900 to 885											0.26	
885 to 870		0.28			0.25			0.26			0.27	
870 to 855											0.29	
< 855		0.31			0.26			0.31			0.31	

Legend	0.00										0.35

Jocassee C_2_559.0: Monthly Averaged Nitrogen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.19	0.20	0.78	0.23	0.18	0.15	0.14	0.26	0.26	0.78	0.24	
1095 to 1080	0.23	0.24	0.23	0.23	0.22	0.20	0.20	0.25	0.20	0.20	0.22	0.19
1080 to 1065		0.23	0.22	0.20	0.21	0.17	0.16	0.29	0.16	0.43	0.23	
1065 to 1050	0.23	0.22	0.23	0.23	0.22	0.20	0.20		0.20	0.20	0.19	0.19
1050 to 1035		0.24		0.24	0.20	0.17	0.18	0.23	0.15	0.44	0.22	
1035 to 1020	0.23	0.21	0.21	0.23	0.23	0.20	0.20	0.20	0.20		0.24	0.17
1020 to 1005		0.24			0.25		0.19	0.21	0.29	0.20	0.22	0.21
1005 to 990	0.28	0.21	0.21	0.26	0.22	0.19		0.32		0.55	0.19	0.16
990 to 975		0.23		0.25	0.25	0.24	0.23	0.28	0.27	0.26	0.29	0.21
975 to 960		0.21	0.19	0.23	0.23	0.22	0.22	0.30	0.23	0.52	0.24	0.24
960 to 945	0.29	0.23	0.25	0.26	0.26	0.28	0.25	0.27	0.28	0.27	0.24	0.29
945 to 930		0.21	0.19	0.21	0.24	0.24	0.24	0.35	0.24	0.44	0.29	
930 to 915	0.32	0.25	0.25	0.26	0.27	0.27	0.26	0.28	0.29	0.28	0.29	0.28
915 to 900		0.21	0.23	0.29	0.24	0.25	0.26	0.31	0.27	0.93	0.31	
900 to 885	0.34	0.28	0.25	0.26	0.28	0.29	0.27	0.29	0.29	0.29	0.23	0.29
885 to 870		0.23		0.33	0.25	0.26	0.27	0.39	0.27	1.07	0.29	
870 to 855	0.32	0.18	0.25	0.26	0.28	0.29	0.27	0.29	0.30		0.27	0.26
< 855	0.29	0.23	0.21	0.27	0.26	0.28	0.27	0.32	0.29	0.52	0.25	0.28

Jocassee C_2_559.0: Monthly Averaged Nitrogen (mg/l) 1991 to 2000 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.28			0.19			0.39			0.20	
1095 to 1080												
1080 to 1065		0.24			0.18			0.31			0.21	
1065 to 1050											0.20	
1050 to 1035		0.32			0.25			0.21			0.22	
1035 to 1020											0.22	
1020 to 1005		0.37			0.21			0.24			0.26	
1005 to 990											0.26	
990 to 975		0.26			0.20			0.24			0.27	
975 to 960								0.24			0.27	
960 to 945		0.21						0.32			0.28	
945 to 930		0.25			0.23			0.40			0.26	
930 to 915												
915 to 900		0.28			0.22			0.28			0.25	
900 to 885											0.28	
885 to 870		0.30			0.20			0.32			0.20	
870 to 855											0.28	
< 855		0.29			0.19			0.29			0.26	

Legend 0.00 – 0.35

Jocassee C_2_560.0: Monthly Averaged Nitrogen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.21	0.21	0.17	0.20	0.18	0.16	0.18	0.29	0.22		0.24	
1095 to 1080	0.23	0.25	0.25	0.23	0.23	0.20	0.20	0.25	0.20	0.20	0.18	0.20
1080 to 1065		0.23	0.18	0.18	0.18	0.14	0.14	0.23	0.18	0.65	0.24	
1065 to 1050	0.24	0.23	0.24	0.23	0.22	0.20	0.20	0.20	0.20	0.20	0.20	0.19
1050 to 1035		0.24		0.19	0.19	0.15	0.14	0.23	0.20	0.55	0.22	
1035 to 1020	0.23	0.23	0.21	0.23	0.23	0.20	0.20	0.20	0.20		0.19	0.18
1020 to 1005		0.24			0.24		0.29	0.27	0.49	0.20	0.21	0.21
1005 to 990	0.23	0.23	0.23	0.35	0.22	0.20		0.44		0.73	0.22	0.19
990 to 975		0.29			0.24	0.23	0.22	0.27	0.26	0.26	0.27	0.21
975 to 960	0.25	0.23	0.19	0.23	0.22	0.24	0.22	0.27	0.28	0.38	0.27	
960 to 945		0.25	0.24	0.25	0.26	0.27	0.25	0.28	0.29	0.28	0.28	0.28
945 to 930		0.21	0.20	0.24	0.28	0.29	0.26	0.29	0.29	0.34	0.34	
930 to 915	0.27	0.28	0.24	0.25	0.27	0.28	0.26	0.29	0.29	0.28	0.29	0.29
915 to 900		0.22	0.26	0.32	0.26	0.31	0.28	0.29	0.33		0.32	
900 to 885	0.34	0.29	0.25	0.26	0.28	0.29	0.27	0.29	0.30	0.29	0.29	0.29
885 to 870		0.28		0.28	0.28	0.31	0.28	0.32	0.31	0.70	0.31	
870 to 855	0.34	0.25	0.27	0.26	0.25	0.28	0.27	0.30	0.30		0.55	0.29
< 855	0.34	0.30	0.25	0.27	0.29	0.30	0.28	0.32	0.29	0.56	0.29	0.29

Jocassee C_2_560.0: Monthly Averaged Nitrogen (mg/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.23			0.25			0.21			0.22	
1095 to 1080		0.29			0.22			0.19			0.30	
1080 to 1065		0.24			0.21			0.21			0.21	
1065 to 1050											0.22	
1050 to 1035		0.22			0.20			0.30			0.20	
1035 to 1020											0.25	
1020 to 1005		0.26			0.22			0.24			0.21	
1005 to 990											0.27	
990 to 975		0.23			0.23			0.28			0.27	
975 to 960								0.24				
960 to 945		0.25						0.27			0.28	
945 to 930		0.25			0.23			0.31			0.28	
930 to 915												
915 to 900		0.25			0.24			0.32			0.28	
900 to 885											0.27	
885 to 870		0.28			0.25			0.28			0.28	
870 to 855		0.24			0.19			0.26			0.25	
< 855		0.25			0.28			0.29			0.33	

Legend 0.00 – 0.35

Jocassee C_2_562.0: Monthly Averaged Nitrogen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.22	0.24	0.37	0.18	0.18	0.17	0.18	0.31	0.15	0.56	0.33	
1095 to 1080	0.25	0.28	0.26	0.26	0.23	0.20	0.26	0.20	0.22	0.24	0.20	0.21
1080 to 1065		0.45	0.17	0.19	0.42	0.35	0.22	0.34	0.22	0.68	0.34	
1065 to 1050	0.24	0.27	0.30	0.31	0.27	0.25	0.33	0.30	0.22	0.24	0.26	0.24
1050 to 1035		0.51		0.18	0.23	0.19	0.33	0.35	0.16	0.58	0.40	
1035 to 1020	0.26	0.25	0.26	0.30	0.24		0.32	0.35	0.26		0.21	0.19
1020 to 1005		0.32		0.29						0.24	0.24	0.24
1005 to 990	0.29	0.30	0.26	0.19	0.25	0.23	0.22	0.33	0.24	0.44	0.28	0.24
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 991.4 ft

Jocassee C_2_562.0: Monthly Averaged Nitrogen (mg/l) 1991 to 1997 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.26			0.24						0.20	
1095 to 1080											0.20	
1080 to 1065		0.25			0.24						0.20	
1065 to 1050											0.20	
1050 to 1035		0.27			0.23						0.20	
1035 to 1020											0.22	
1020 to 1005		0.31			0.24						0.20	
1005 to 990		0.29			0.25						0.24	
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 995.2 ft

Legend 0.00 — 0.35

Jocassee C_2_565.4: Monthly Averaged Nitrogen (mg/l) 1987 to 1988 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.19	0.18	0.18	0.23	0.16	0.13	0.14	0.25	0.14	0.47		
1095 to 1080	0.24	0.26	0.26	0.23	0.21	0.20	0.20	0.20	0.20	0.20	0.18	0.19
1080 to 1065			0.18	0.18	0.16	0.15	0.15	0.28	0.18	0.50		
1065 to 1050	0.24	0.22	0.25	0.23	0.22	0.20	0.20	0.20	0.20	0.20	0.18	0.18
1050 to 1035				0.20	0.18	0.15	0.18	0.22	0.16	0.56		
1035 to 1020	0.23	0.22	0.22	0.23	0.23	0.20	0.20	0.20	0.20		0.16	0.17
1020 to 1005							0.21		0.25	0.20	0.20	0.20
1005 to 990	0.23	0.22	0.22	0.32	0.21	0.17		0.23		0.36	0.22	0.20
990 to 975						0.23	0.22	0.29	0.29	0.27	0.22	0.20
975 to 960	0.23	0.25	0.22	0.19	0.19	0.22	0.23	0.27	0.32	0.75	0.25	
960 to 945		0.19	0.26	0.26		0.21	0.24	0.27	0.30	0.26		0.25
945 to 930	0.27	0.25	0.17	0.20	0.26	0.27		0.36	0.30	0.57	0.29	0.26
930 to 915					0.23				0.27			
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 918.1 ft

Jocassee C_2_565.4: Monthly Averaged Nitrogen (mg/l)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Measurements Only 1987 and 1988

Legend	0.00										0.35

Jocassee D_2_551.0: Monthly Averaged Nitrogen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.19										
1095 to 1080		0.21										
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1083.4 ft

Jocassee D_2_551.0: Monthly Averaged Nitrogen (mg/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.16			0.16						0.24	
1095 to 1080		0.16						0.16				
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1084.2 ft

Legend **0.00** – **0.35**

Jocassee D_2_564.0: Monthly Averaged Nitrogen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.22	0.23	0.51	0.21	0.19	0.18	0.22	0.27	0.16	0.32	0.22	
1095 to 1080	0.24	0.26	0.24	0.23	0.23	0.20	0.20	0.20	0.20	0.20	0.22	0.20
1080 to 1065		0.23	0.25	0.35	0.20	0.17	0.16	0.24	0.19	0.79	0.22	
1065 to 1050	0.24	0.23	0.24	0.23	0.22	0.20	0.20	0.20	0.20	0.20	0.23	0.19
1050 to 1035		0.24		3.00	0.19	0.20	0.16	0.24	0.28	0.34	0.23	
1035 to 1020	0.23	0.23	0.23	0.23	0.23	0.20	0.20	0.20	0.20		0.18	0.18
1020 to 1005		0.34			0.23		0.36	0.27	0.54	0.20	0.21	0.20
1005 to 990	0.24	0.25	0.23	0.22	0.22	0.25		0.52		0.93	0.21	0.20
990 to 975		0.22			0.25	0.23	0.23	0.22	0.27	0.26	0.26	0.20
975 to 960	0.24	0.36	0.19	0.26	0.25	0.39	0.44	0.34	0.34	0.71	0.30	
960 to 945		0.22	0.25	0.24	0.26	0.27	0.27	0.27	0.30	0.28	0.26	0.29
945 to 930		0.23	0.18	0.23	0.28	0.35	0.30	0.30	0.32	0.47	0.30	
930 to 915	0.24	0.26	0.26	0.25	0.27	0.28	0.27		0.30	0.29	0.29	0.30
915 to 900		0.22	0.29		0.30	0.37	0.29	0.31	0.32	0.76	0.32	
900 to 885	0.24	0.28	0.25	0.28	0.28	0.28	0.27	0.43	0.31	0.29	0.31	0.30
885 to 870	0.24	0.35	0.29		0.31	0.31	0.29	0.29	0.29	0.28	0.30	0.29
870 to 855			0.40	0.24	0.29			0.28		0.92	0.30	0.29
< 855	*Minimum Reading 864.7 ft*											

Jocassee D_2_564.0: Monthly Averaged Nitrogen (mg/l) 1991 to 1994 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.23			0.17			0.22			0.20	
1095 to 1080											0.20	
1080 to 1065		0.22			0.17			0.21			0.20	
1065 to 1050											0.20	
1050 to 1035		0.22			0.23			0.23			0.21	
1035 to 1020											0.23	
1020 to 1005		0.29			0.21			0.27			0.22	
1005 to 990											0.27	
990 to 975		0.22			0.21			0.27			0.26	
975 to 960								0.25			0.28	
960 to 945		0.20						0.24			0.28	
945 to 930		0.23			0.22			0.37			0.27	
930 to 915												
915 to 900		0.21			0.21			0.33			0.20	
900 to 885		0.22			0.24						0.30	
885 to 870		0.20			0.21			0.25			0.25	
870 to 855		0.23						0.21			0.26	
< 855	*Minimum Reading 868.7 ft*											

Legend	**0.00**										**0.35**

Jocassee D_2_564.1: Monthly Averaged Nitrogen (mg/l) 1988 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.23			0.20			0.24			0.21	
1095 to 1080	0.20	0.33	0.24	0.19	0.22	0.36	0.15		0.32	0.21	0.16	0.20
1080 to 1065		0.21			0.20			0.20			0.22	
1065 to 1050	0.18	0.28	0.37	0.18	0.18	0.30		0.20	0.80	0.28	0.18	0.20
1050 to 1035		0.21			0.21			0.20			0.24	
1035 to 1020	0.23	0.24	1.61	0.20	0.19		0.29	0.28	0.36		0.23	
1020 to 1005		0.22			0.20			0.24		0.15	0.19	0.20
1005 to 990	0.28	0.25	0.26	0.20	0.20						0.20	
990 to 975		0.22			0.20					0.15	0.19	
975 to 960								0.31			0.20	
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 959.9 ft

Jocassee D_2_564.1: Monthly Averaged Nitrogen (mg/l) 1991 to 1994 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.22			0.20			0.22			0.21	
1095 to 1080											0.20	
1080 to 1065		0.21			0.20			0.20			0.20	
1065 to 1050											0.20	
1050 to 1035		0.22			0.26			0.20			0.20	
1035 to 1020											0.20	
1020 to 1005		0.22			0.30			0.20			0.23	
1005 to 990											0.20	
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 963 ft

Legend	0.00										0.35

Jocassee E_2_557.0: Monthly Averaged Nitrogen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.22	0.20	0.18	0.18	0.17	0.16	0.16	0.22	0.20	0.21	0.23	
1095 to 1080	0.38	0.22	0.21	0.23	0.23	0.20	0.20	0.20	0.20	0.20	0.20	0.18
1080 to 1065		0.21	0.17	0.20	0.19	0.17	0.17	0.27	0.13	0.21	0.18	
1065 to 1050	0.20	0.23	0.22	0.22	0.24	0.20	0.20	0.20	0.20	0.20	0.20	0.20
1050 to 1035		0.24		0.21	0.19	0.18	0.21	0.23	0.13	0.24	0.23	
1035 to 1020	0.21	0.19	0.20	0.23	0.25	0.20	0.20	0.20	0.20		0.17	0.16
1020 to 1005		0.23			0.23		0.17	0.27	0.21	0.20	0.20	0.20
1005 to 990	0.20	0.19	0.20	0.19	0.23	0.19		0.38		0.33	0.25	0.15
990 to 975		0.22		0.22	0.24	0.23	0.20	0.24	0.27	0.27	0.34	0.20
975 to 960		0.19	0.18	0.20	0.24	0.22	0.22	0.33	0.26	0.22	0.29	0.25
960 to 945	0.20	0.25	0.22	0.23	0.25	0.26	0.24	0.28	0.29	0.29	0.30	0.29
945 to 930		0.19	0.17	0.20	0.22	0.23	0.23	0.34	0.23	0.37	0.37	
930 to 915	0.20	0.22	0.22	0.23	0.28	0.28	0.26	0.30	0.29	0.29	0.30	0.29
915 to 900		0.19	0.17	0.19	0.23	0.25	0.24	0.32	0.23	0.24	0.30	
900 to 885		0.23	0.21	0.23	0.28		0.26		0.29	0.29	0.30	0.28
885 to 870		0.22		0.18	0.23	0.22	0.23	0.32			0.54	
870 to 855		0.18	0.22	0.24	0.28			0.28	0.29		0.27	0.25
< 855		0.21	0.19	0.21	0.26	0.24	0.26	0.34	0.29	0.29	0.24	0.29

Jocassee E_2_557.0: Monthly Averaged Nitrogen (mg/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.25			0.18			0.23			0.19	
1095 to 1080		0.18			0.19			0.14			0.33	
1080 to 1065		0.23			0.22			0.21			0.20	
1065 to 1050											0.20	
1050 to 1035		0.28			0.24			0.21			0.20	
1035 to 1020											0.20	
1020 to 1005		0.24			0.23			0.22			0.20	
1005 to 990											0.28	
990 to 975		0.25			0.25			0.22			0.28	
975 to 960		0.23						0.23			0.27	
960 to 945		0.20			0.15							
945 to 930		0.24			0.30			0.28			0.28	
930 to 915												
915 to 900		0.25			0.25			0.26			0.30	
900 to 885											0.29	
885 to 870		0.24			0.22			0.31			0.29	
870 to 855											0.31	
< 855		0.23			0.23			0.28			0.27	

Legend 0.00 – 0.35

Jocassee F_2_554.8: Monthly Averaged Nitrogen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.16	0.15	0.20	0.15	0.16	0.13	0.14	0.30	0.23	0.33	0.16	
1095 to 1080	0.22	0.22	0.21	0.22	0.22	0.20	0.20	0.20	0.20	0.20	0.20	0.17
1080 to 1065		0.14	0.18	0.19	0.18	0.14	0.16	0.47	0.29	0.19	0.12	
1065 to 1050	0.20	0.23	0.21	0.21	0.21	0.20	0.20	0.20	0.20	0.20	0.20	0.17
1050 to 1035				0.27	0.18	0.15	0.14		0.16	0.20		
1035 to 1020	0.20	0.20	0.20	0.22	0.20	0.20	0.20	0.20	0.20		0.14	0.18
1020 to 1005					0.21		0.19		0.20	0.20	0.20	0.20
1005 to 990	0.20	0.18	0.21	0.16	0.17	0.18		0.27		0.23	0.18	0.16
990 to 975				0.22	0.21	0.22	0.20	0.25	0.25	0.24	0.20	0.20
975 to 960		0.23	0.21	0.20	0.19	0.18	0.18	0.46	0.34			0.36
960 to 945	0.20	0.14	0.28	0.28	0.22	0.28	0.29	0.54	0.34	0.34	0.28	0.19
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 946.5 ft

Jocassee F_2_554.8: Monthly Averaged Nitrogen (mg/l) 1991 to 1997 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.20			0.23			0.29			0.20	
1095 to 1080												
1080 to 1065		0.20			0.20			0.20			0.20	
1065 to 1050												
1050 to 1035		0.21			0.20			0.23			0.20	
1035 to 1020												
1020 to 1005		0.20			0.22			0.27			0.22	
1005 to 990												
990 to 975		0.20			0.22			0.31			0.25	
975 to 960		0.21										
960 to 945		0.20			0.22			0.23			0.31	
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 948.1 ft

Legend **0.00** – **0.35**

Jocassee F_2_556.0: Monthly Averaged Nitrogen (mg/l) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.17	0.19	0.17	0.17	0.16	0.14	0.18	0.31	0.23	0.25	0.18	
1095 to 1080	0.20	0.22	0.20	0.21	0.21	0.20	0.20	0.20	0.20	0.20	0.20	0.17
1080 to 1065		0.19	0.18	0.18	0.18	0.16	0.15	0.24	0.23	0.19	0.18	
1065 to 1050	0.20	0.22	0.22	0.22	0.22	0.20	0.20	0.20	0.20	0.20	0.20	0.17
1050 to 1035		0.21		0.18	0.18	0.15	0.14	0.28	0.18	0.14	0.20	
1035 to 1020	0.20	0.18	0.23	0.23	0.22	0.20	0.22	0.21	0.20		0.17	0.15
1020 to 1005		0.22			0.22		0.17	0.26	0.22	0.20	0.20	0.20
1005 to 990	0.20	0.19	0.22	0.17	0.20	0.16		0.52		0.23	0.23	0.14
990 to 975		0.22		0.22	0.23	0.23	0.20	0.30	0.28	0.29	0.29	0.20
975 to 960		0.18	0.49	0.16	0.20	0.19	0.22	0.38	0.24	0.32	0.21	0.21
960 to 945	0.20	0.21	0.20	0.22	0.24	0.23	0.22	0.26		0.28	0.23	0.25
945 to 930		0.14	0.19	0.18		0.22		0.46	0.19		0.23	0.26
930 to 915	0.20	0.22		0.22	0.22		0.23	0.24	0.28	0.33	0.23	
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 920.3 ft

Jocassee F_2_556.0: Monthly Averaged Nitrogen (mg/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		0.25			0.21			0.21			0.22	
1095 to 1080		0.23			0.20			0.19			0.29	
1080 to 1065		0.22			0.21			0.22			0.20	
1065 to 1050											0.20	
1050 to 1035		0.22			0.22			0.23			0.26	
1035 to 1020											0.20	
1020 to 1005		0.24			0.37			0.23			0.20	
1005 to 990											0.30	
990 to 975		0.25			0.23			0.26			0.31	
975 to 960		0.21						0.26			0.32	
960 to 945		0.20										
945 to 930		0.24			0.25			0.29			0.27	
930 to 915		0.22			0.24			0.29			0.31	
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 922 ft

Legend **0.00** … **0.35**

Lake Jocassee

Chlorophyll a

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Jocassee B_2_558.7: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.61	1.03	2.14	1.19	1.19	1.05	0.70	1.45	2.10	1.53	2.02	3.62
1095 to 1080	0.83	1.29	1.74	1.49	1.21	0.75	1.01	1.70	2.30	2.18	2.57	3.62
1080 to 1065	0.77	0.65	0.97	1.37	1.09	0.81	0.73	2.10	2.34	2.30	2.82	3.82
1065 to 1050	0.77	0.57	1.22	0.93	1.09	1.01	1.37	1.61				3.22
1050 to 1035	0.69	0.61	0.85	0.55	0.81	1.10	1.25	1.53	2.14	2.02	2.72	3.72
1035 to 1020	0.77	0.55	0.73	0.38	0.79	0.77	0.81	1.09	2.14	2.02	2.67	
1020 to 1005	0.73	0.47	0.37	0.28	0.32	0.22	0.45	0.93	1.53	2.74	2.87	3.82
1005 to 990									0.32	0.77	2.62	3.02
990 to 975	0.73	0.41	0.47	0.30	0.23	0.15	0.35	0.27				
975 to 960									0.52	0.49	0.37	1.09
960 to 945												
945 to 930												
930 to 915												
915 to 900	0.49	0.24	0.61	0.13	0.10	0.08	0.07	0.11	0.49	0.12	0.13	0.25
900 to 885												
885 to 870												
870 to 855												
< 855	1.01	0.20	0.21	0.06	0.03	0.08	0.06	0.06	0.08	0.12	0.08	0.09

Jocassee B_2_558.7: Monthly Averaged Chlorophyll (ug/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	1.82	1.63	2.09	2.95	2.24	1.22	1.18	1.76	2.32	3.07	3.10	2.88
1095 to 1080	2.07	1.54	2.55	3.57	2.68	1.99	1.91	1.88	2.31	3.47	2.89	2.84
1080 to 1065	2.18	1.91	2.20	2.59	3.14	2.90	2.85	2.70	3.14	3.53	3.56	2.84
1065 to 1050	2.17	1.73	2.00	2.18	2.62	2.61	2.52	2.54	2.62	3.76	3.45	2.89
1050 to 1035	2.38	1.64	1.72	1.80	1.79	2.10	2.10	2.22	1.89	3.39	3.32	2.83
1035 to 1020	2.16	1.55	1.41	1.33	0.83	1.09	1.21	1.00	1.09	2.87	3.38	2.85
1020 to 1005	2.18	1.66	1.13	0.72	0.56	0.67	0.72	0.53	0.68	1.17	2.54	2.56
1005 to 990	1.13								0.81	3.41	0.82	0.91
990 to 975	2.19	1.70	0.95	0.58	0.40	0.34	0.38	0.57	0.37	0.55	0.51	1.07
975 to 960	1.09	2.89						0.46	0.33	0.32	1.56	0.41
960 to 945												
945 to 930												
930 to 915												
915 to 900	0.53	0.94	0.92	0.32	0.24	0.19	0.21	0.16	0.13	0.27	0.30	0.32
900 to 885									0.18	0.31	0.95	0.25
885 to 870												
870 to 855												
< 855	0.38	0.83	0.52	0.22	0.45	0.15	0.12	0.10	0.12	0.10	0.26	0.15

Legend	0.00										10.00

Jocassee B_3_558.0: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.65	1.17	1.25	1.17	1.11	0.91	1.33	1.29	2.38	1.92	2.34	3.27
1095 to 1080	1.03	0.89	1.49	1.53	1.37	0.77	1.08	1.82	2.54	2.14	2.52	3.42
1080 to 1065	0.95	0.77	1.05	1.61	1.45	2.42	1.78	1.61	2.58	2.10	2.62	3.42
1065 to 1050	0.93	0.63	0.77	1.25	1.21	1.29	1.41	1.41				3.82
1050 to 1035	0.87	0.59	0.57	0.97	1.21	0.57	1.17	1.41	2.54	1.94	2.27	3.92
1035 to 1020	0.87	0.53	0.47	0.45	0.81	0.57	0.85	1.21	2.54	2.62	2.82	
1020 to 1005	0.95	0.47	0.39	0.45	0.39	0.49	0.65	0.93	1.61	2.34	2.62	3.02
1005 to 990									1.29	0.89	2.72	3.62
990 to 975	0.95	0.35	0.38	0.29	0.25	0.39	0.26	0.32				
975 to 960									0.83	0.55	0.51	0.77
960 to 945												
945 to 930												
930 to 915												
915 to 900	0.49	0.10	0.23	0.25	0.11	0.11	0.11	0.15	0.16	0.23	0.27	0.18
900 to 885												
885 to 870												
870 to 855												
< 855	0.28	0.09	0.14	0.10	0.06	0.05	0.05	0.13	0.08	0.09	0.38	0.13

Jocassee B_3_558.0: Monthly Averaged Chlorophyll (ug/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	1.66	1.69	1.97	2.69	2.22	1.44	1.32	1.51	2.34	3.18	3.14	2.96
1095 to 1080	1.79	1.95	2.43	2.38	2.72	1.73	1.75	2.08	2.36	3.14	2.99	2.84
1080 to 1065	2.13	1.60	2.30	2.54	2.40	2.38	2.11	2.32	2.70	3.56	3.22	2.98
1065 to 1050	2.09	1.71	1.91	1.79	2.11	2.42	2.43	2.36	2.42	3.40	3.51	2.80
1050 to 1035	2.10	1.73	1.55	1.16	1.59	2.03	1.90	1.64	1.88	3.16	3.34	3.16
1035 to 1020	2.26	1.67	1.43	0.93	1.05	1.09	1.14	1.08	1.13	3.28	3.24	2.89
1020 to 1005	2.27	1.63	1.25	0.66	0.62	0.67	0.68	0.69	0.66	1.14	2.55	2.74
1005 to 990	1.15								0.66	0.69	0.58	1.18
990 to 975	1.72	1.25	0.93	0.59	0.37	0.30	0.29	0.28	0.36	0.53	0.58	0.60
975 to 960	1.07	2.85	0.53					0.39	0.24	0.27	0.34	0.40
960 to 945	0.32		0.45	0.31								
945 to 930	0.45	0.37	0.34	0.31	0.21	0.24	0.15	0.11	0.17	0.35	0.33	0.24
930 to 915												
915 to 900	0.37	0.46	0.70	0.28	0.22	0.18	0.15	0.11	0.18	0.23	0.22	0.25
900 to 885									0.28	0.16	0.26	0.27
885 to 870	0.18	0.25	0.24	0.17	0.12	0.06	0.15	0.06	0.13	0.17	0.15	0.15
870 to 855												
< 855	0.26	0.25	0.42	0.26	0.13	0.12	0.10	0.19	0.14	0.13	0.13	0.16
	Legend	**0.00**										**10.00**

Jocassee C_2_559.0: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.49	0.71	1.41	1.05	0.93	0.58	0.81	1.03	1.86	2.97	2.57	2.82
1095 to 1080	0.73	1.05	1.70	1.25	1.25	0.67	1.29	1.49	1.90	2.92	2.92	3.02
1080 to 1065	1.57	1.14	0.71	1.29	1.33	1.61	1.86	1.90	1.90	2.92	2.51	2.72
1065 to 1050	0.73	1.16	0.43	0.73	1.17	2.14	1.74	1.82				2.92
1050 to 1035	0.75	1.10	0.57	0.47	0.83	1.53	1.21	1.74	1.94	2.82	3.02	2.92
1035 to 1020	0.79	0.69	0.51	0.30	0.61	0.81	0.47	1.08	1.21	3.12	2.92	
1020 to 1005	0.71	0.71	0.41	0.32	0.28	0.39	0.47	0.81	1.09	1.94	2.92	2.82
1005 to 990									0.69	0.57	3.02	2.82
990 to 975	0.69	0.35	0.33	0.26	0.20	0.20	0.28	0.24				
975 to 960									0.41	0.53	3.52	1.09
960 to 945												
945 to 930												
930 to 915												
915 to 900	0.28	0.15	0.18	0.18	0.07	0.08	0.09	0.09	0.06	0.15	3.42	0.22
900 to 885												
885 to 870												
870 to 855												
< 855	0.11	0.02	0.04	0.03	0.04	0.03	0.07	0.05	0.07	0.09	3.42	0.11

Jocassee C_2_559.0: Monthly Averaged Chlorophyll (ug/l) 1991 to 1997 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	1.86	1.84	2.08	2.34	1.92	1.34	1.23	1.45	2.02	3.06	2.93	2.53
1095 to 1080	2.06	1.79	2.29	2.21	3.00	2.04	1.98	1.71	2.27	2.84	2.80	2.19
1080 to 1065	2.01	1.90	2.37	2.21	3.54	3.05	3.02	2.63	2.58	3.32	3.16	2.49
1065 to 1050	1.95	1.93	1.87	1.81	2.68	2.35	3.25	2.22	2.78	2.88	2.91	2.42
1050 to 1035	2.15	1.82	1.62	1.45	1.62	1.48	2.64	1.79	1.80	3.81	2.79	2.22
1035 to 1020	1.87	1.83	1.30	0.76	0.80	0.88	1.58	1.14	0.80	2.65	3.47	2.62
1020 to 1005	1.87	1.60	1.09	0.77	0.55	0.90	0.71	0.65	0.68	1.08	2.09	2.14
1005 to 990	0.98								0.79	0.79	1.28	0.80
990 to 975	1.94	1.21	1.07	0.77	0.51	0.34	0.46	0.34	0.33	0.57	0.54	0.58
975 to 960	0.86	2.64						0.51	0.36	0.26	0.36	0.38
960 to 945												
945 to 930												
930 to 915												
915 to 900	0.44	0.37	0.63	0.35	0.23	0.19	0.20	0.13	0.12	0.28	0.21	0.27
900 to 885									0.10	0.17	0.18	0.20
885 to 870												
870 to 855												
< 855	0.39	0.31	0.40	0.19	0.13	0.08	0.09	0.07	0.07	0.11	0.12	0.67

Legend	0.00										10.00

Jocassee C_2_560.0: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.75	1.33	1.29	1.05	1.05	1.17	0.99	0.83	1.78	2.46	2.51	2.11
1095 to 1080	0.83	1.61	1.25	1.25	1.49	1.29	1.25	1.13	2.02	2.51	2.62	2.31
1080 to 1065	0.89	1.12	1.17	1.21	1.65	1.53	2.02	1.78	2.06	2.82	2.31	3.02
1065 to 1050	0.93	0.95	0.55	0.69	1.09	2.62	1.41	1.01				2.31
1050 to 1035	1.01	0.39	0.43	0.37	0.81	2.18	1.09	1.21	1.61	2.72	2.72	2.31
1035 to 1020	0.97	0.18	0.39	0.81	0.49	1.25	0.77	0.93	0.81	2.54	2.92	
1020 to 1005	0.95	0.37	0.37	0.22	0.32	0.43	0.48	0.53	0.59	2.06	3.12	2.31
1005 to 990									0.51	0.53	2.82	2.62
990 to 975	0.87	0.28	0.32	0.17	0.14	0.22	0.24	0.26				
975 to 960									0.24	0.28	1.53	1.01
960 to 945												
945 to 930												
930 to 915												
915 to 900		0.15	0.18	0.09	0.07		0.10	0.09	0.07	0.10	0.18	0.21
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 901.1 ft

Jocassee C_2_560.0: Monthly Averaged Chlorophyll (ug/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	1.66	1.34	2.12	3.55	2.65	1.32	1.64	1.50	2.10	3.12	2.99	2.61
1095 to 1080	1.83	1.41	2.28	2.76	2.95	1.85	1.69	1.82	2.29	2.61	2.44	2.01
1080 to 1065	1.81	1.49	1.90	2.24	3.25	2.49	2.89	2.27	2.28	2.93	2.83	2.33
1065 to 1050	1.84	1.42	1.46	1.70	2.77	2.94	3.36	2.57	2.02	2.85	2.69	2.23
1050 to 1035	1.73	1.31	1.50	1.32	1.64	1.96	2.52	1.72	1.60	2.87	2.69	2.23
1035 to 1020	1.65	1.16	1.15	0.96	0.82	1.01	1.30	0.82	0.79	3.32	2.65	2.21
1020 to 1005	1.72	1.11	0.94	0.66	0.61	0.50	0.76	0.49	0.46	0.80	2.08	2.06
1005 to 990	0.91								0.46	0.47	0.73	0.65
990 to 975	2.23	0.86	1.11	0.53	0.40	0.33	0.46	0.26	0.29	0.39	0.32	0.58
975 to 960	1.02	1.75						0.34	0.26	0.23	0.35	0.33
960 to 945												
945 to 930		0.35		0.13	0.24			0.17			0.21	
930 to 915												
915 to 900	0.46	0.31	0.70	0.41	0.19	0.18	0.25	0.13	0.11	0.17	0.17	0.21
900 to 885									0.18	0.16	0.19	0.15
885 to 870		0.28		0.08	0.10			0.07			0.11	
870 to 855												
< 855				0.10								

Legend **0.00** … **10.00**

Jocassee C_2_562.0: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.69	2.26	1.33	1.67	1.51	1.37	1.35	1.09	1.53	2.51	2.42	3.17
1095 to 1080	1.24	1.08	1.65	2.02	2.26	1.94	2.42	1.53	2.46	2.62	3.02	2.82
1080 to 1065	0.89	0.81	1.25	1.49	0.67	0.77	1.17	2.46	2.38	3.42	1.91	3.32
1065 to 1050	0.91	0.65	0.83	0.57	0.60	0.43	0.73	1.21				3.92
1050 to 1035	0.99	0.53	0.75	0.35	0.39	0.26	0.48	0.57	2.22	2.51	2.92	3.32
1035 to 1020		0.28	0.45	0.25		0.14	0.31	0.24	2.14	3.02	2.92	
1020 to 1005	0.99	0.37	0.39	0.30	0.30	0.13	0.23	0.22	1.98	2.72	3.02	3.42
1005 to 990									0.48	0.65	3.02	3.32
990 to 975	0.89											
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 975.3 ft

Jocassee C_2_562.0: Monthly Averaged Chlorophyll (ug/l) 1991 to 1999 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	2.68	2.53	3.14	3.68	3.62	1.98	2.19	1.95	1.92	3.18	4.33	3.73
1095 to 1080	2.88	2.21	2.40	2.72	4.30	2.64	3.27	2.38	3.02	3.15	3.96	3.00
1080 to 1065	2.31	2.02	2.68	2.01	2.89	2.24	1.89	3.60	3.48	3.84	4.05	2.90
1065 to 1050	2.39	2.08	2.00	1.24	2.55	0.97	0.98	1.57	3.08	3.56	3.89	3.04
1050 to 1035	2.47	1.90	1.62	0.81	1.18	0.52	0.53	0.73	1.83	3.52	3.75	3.14
1035 to 1020	2.41	1.93	1.43	0.73	0.54	0.39	0.42	0.38	0.66	2.77	3.35	2.98
1020 to 1005	2.34	1.79	1.35	0.74	1.11	0.41	0.34	0.24	0.40	1.22	2.53	2.96
1005 to 990	1.21											0.85
990 to 975				0.32								
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 976.6 ft

Legend	0.00										10.00

Jocassee C_2_565.4: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.55	2.02	1.29	1.19	1.41	0.65	1.25	0.94	1.55	2.11	2.37	2.87
1095 to 1080	0.67	1.94	1.37	1.45	1.98	1.41	1.90	1.57	2.18	2.46	3.02	2.72
1080 to 1065	0.79	0.75	0.53	1.41	1.86	1.82	1.78	2.37	2.02	1.91	3.22	2.11
1065 to 1050	0.71	0.59	0.61	0.45	0.77	2.22	1.25	2.34				2.41
1050 to 1035	0.73	0.47	0.53	0.39	0.83	0.77	1.25	1.25	1.98	2.62	2.82	2.62
1035 to 1020	0.75	1.53	0.41	0.32	0.45	0.41	0.69	0.77	1.94	2.62	3.02	
1020 to 1005	0.79	0.39	0.30	0.28	0.28	0.37	0.43	0.47	1.37	1.91	3.52	2.62
1005 to 990									0.47	0.47	2.62	2.72
990 to 975	0.69	0.39	0.37	0.26	0.21	0.22	0.24	0.24				
975 to 960									0.32	0.28	0.37	1.11
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 966.8 ft

Jocassee C_2_565.4: Monthly Averaged Chlorophyll (ug/l) 1991 to 1994 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	2.35	2.43	2.38	4.34	3.23	1.43	1.27	1.54	1.95	3.62	3.45	3.78
1095 to 1080	2.68	2.52	2.46	3.69	4.20	2.29	2.74	2.47	2.88	2.54	3.29	3.08
1080 to 1065	2.63	2.31	2.22	2.74	4.25	3.49	4.20	3.28	3.39	2.94	3.67	3.52
1065 to 1050	2.49	2.01	1.92	1.78	3.34	2.61	2.83	2.21	2.48	3.27	3.79	3.40
1050 to 1035	2.84	1.89	1.36	1.43	1.80	1.58	2.07	1.20	1.55	3.16	3.36	3.41
1035 to 1020	2.53	1.64	1.41	0.77	0.92	0.72	0.85	0.92	0.70	3.17	3.18	3.64
1020 to 1005	2.56	1.56	1.32	0.77	0.68	0.59	0.52	0.43	0.36	1.05	2.35	2.86
1005 to 990	1.12								0.40	0.34	0.61	0.57
990 to 975	2.93	1.19	1.10	0.67	0.61	0.44	0.33	0.35	0.21	0.46	0.64	1.06
975 to 960	1.28	3.54						0.32	0.29	0.32	0.44	0.53
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 962.2 ft

Legend	0.00										10.00

Jocassee D_2_551.0: Monthly Averaged Chlorophyll (ug/l)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Readings Began in 2009

Jocassee D_2_551.0: Monthly Averaged Chlorophyll (ug/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080		0.25			1.16							
1080 to 1065												
1065 to 1050								1.86			1.43	
1050 to 1035		0.35										
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1043.6 ft

Legend **0.00** … **10.00**

Jocassee D_2_564.0: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.53	1.82	1.33	1.13	1.21	1.61	1.13	0.79	1.72	2.26	2.49	2.14
1095 to 1080	0.59	1.18	1.41	1.37	1.70	2.02	1.70	1.57	2.34	3.02	2.82	2.92
1080 to 1065	0.69	0.93	1.25	0.97	1.78	2.62	1.41	2.54	0.97	2.31	2.62	3.22
1065 to 1050	0.67	0.65	0.65	0.51	1.25	2.37	1.29	1.29				2.82
1050 to 1035	0.71	0.43	0.53	0.39	0.75	1.98	0.81	1.17	1.87	2.11	3.22	3.32
1035 to 1020	0.75	0.45	0.45	0.30	0.39	1.33	0.65	0.48	1.54	2.30	2.92	
1020 to 1005	0.75	0.37	0.37	0.30	0.28	0.89	0.48	0.45	1.01	1.82	3.12	2.62
1005 to 990									0.45	0.47	2.26	2.51
990 to 975	0.75	0.39	0.30	0.28	0.15	0.23	0.25	0.23				
975 to 960									0.25	0.32	0.37	0.89
960 to 945												
945 to 930												
930 to 915												
915 to 900		0.18	1.41	0.09	0.09	0.08	0.07	0.08	0.09	0.09	0.16	0.16
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 901.1 ft

Jocassee D_2_564.0: Monthly Averaged Chlorophyll (ug/l) 1991 to 1994 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	1.87	2.14	2.15	3.54	2.88	1.25	1.38	1.57	2.11	3.32	3.03	2.75
1095 to 1080	2.01	2.79	2.15	2.44	4.09	1.63	1.49	1.83	2.31	2.40	2.90	2.63
1080 to 1065	2.23	2.53	2.19	2.20	3.72	2.65	2.70	2.40	2.22	2.82	3.55	2.44
1065 to 1050	2.05	1.39	2.18	1.72	2.82	3.09	3.67	2.63	2.42	3.13	3.87	2.88
1050 to 1035	2.60	2.17	1.72	1.13	3.15	1.87	2.85	1.72	1.83	3.25	3.54	2.84
1035 to 1020	2.12	1.67	1.59	0.80	1.56	1.05	1.78	1.07	0.84	2.91	3.57	2.94
1020 to 1005	2.27	1.47	1.47	0.66	1.08	0.61	0.86	0.69	0.47	1.17	2.26	2.52
1005 to 990	1.21								0.56	0.50	0.75	0.66
990 to 975	2.20	1.33	1.24	0.62	0.75	0.34	0.42	0.34	0.24	0.52	0.43	0.52
975 to 960	0.86	2.02						0.17	0.23	0.37	0.29	0.30
960 to 945												
945 to 930												
930 to 915												
915 to 900	1.07	1.88	0.84	0.39	0.36	0.17	0.59	0.72	0.21	0.20	0.24	0.15
900 to 885									0.24	0.16	0.13	0.13
885 to 870												
870 to 855												
< 855												

Minimum Reading 896.5 ft

Legend	0.00										10.00

Jocassee D_2_564.1: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.69	2.62	0.65	1.84	1.43	1.43	1.09	1.94	1.44	2.92	2.51	2.57
1095 to 1080	0.75	1.37	1.17	1.13	1.05	2.54	1.53	1.18	1.66	3.02	2.62	2.92
1080 to 1065	0.67	0.63	0.63	0.93	0.81	2.34	0.77	0.61	1.34	3.32	2.62	3.12
1065 to 1050	0.63	0.49	0.43	0.55	0.55	1.49	0.61	0.31				1.81
1050 to 1035	0.61	0.18	0.57	0.35	0.24	0.48	0.41	0.20	1.14	1.57	1.71	1.91
1035 to 1020	0.51	0.35	0.49	0.30	0.14	0.47	0.22	0.17	1.22	1.46	3.31	
1020 to 1005	0.45	0.23	0.35	0.21	0.11	0.10	0.13	0.20	0.49	0.89	2.34	1.86
1005 to 990									0.45	0.31	2.02	2.07
990 to 975	0.57	0.28	0.35	0.25	0.11	0.10	0.05	0.15				
975 to 960									0.69	0.45	1.86	2.17
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 966.8 ft

Jocassee D_2_564.1: Monthly Averaged Chlorophyll (ug/l) 1991 to 1999 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	1.92	1.94	1.91	2.48	3.05	1.52	1.45	1.79	2.26	2.88	3.22	2.81
1095 to 1080	1.85	1.86	1.86	1.86	2.68	2.22	1.68	1.98	1.83	2.09	2.34	2.02
1080 to 1065	1.93	1.72	1.78	1.89	2.96	2.30	2.43	1.86	2.02	2.43	2.91	2.19
1065 to 1050	1.87	1.81	1.75	1.90	3.24	2.40	2.99	2.29	2.06	2.64	2.78	2.19
1050 to 1035	2.09	1.76	1.51	1.86	2.77	2.41	3.48	1.95	1.97	2.58	2.59	2.24
1035 to 1020	1.87	1.64	1.55	1.73	2.80	2.78	3.63	1.82	1.88	2.50	2.65	2.22
1020 to 1005	1.81	1.60	1.50	1.88	2.49	2.65	3.45	1.82	1.82	2.45	2.82	2.06
1005 to 990	0.93								1.50	2.19	2.02	1.54
990 to 975	1.97	1.60	1.62	1.70	2.55	2.59	3.45	2.10	1.88	2.64	2.93	2.76
975 to 960	0.96	2.00						2.06				2.34
960 to 945												
945 to 930	0.69											
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 938.2 ft

Legend	**0.00**										**10.00**

Jocassee E_2_557.0: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	0.61	1.41	1.98	1.31	1.39	1.07	0.87	0.89	1.86	1.74	2.21	3.52
1095 to 1080	0.67	1.78	2.54	1.25	1.49	1.25	1.29	1.09	1.94	2.22	3.07	3.32
1080 to 1065	0.85	0.87	0.93	1.21	1.74	2.14	2.22	2.34	1.94	2.21	2.67	3.72
1065 to 1050	0.77	0.20	0.63	1.01	1.74	2.58	1.78	2.30				3.12
1050 to 1035	0.85	0.53	0.65	0.63	1.25	1.45	1.82	2.22	2.02	2.41	3.07	3.42
1035 to 1020	0.87	0.49	0.61	0.35	0.65	0.77	0.57	0.81	2.10	2.92	2.62	
1020 to 1005	0.83	0.41	0.45	0.29	0.30	0.53	0.45	0.89	0.61	0.81	3.12	1.31
1005 to 990									0.51	0.57	3.02	4.53
990 to 975	0.83	0.49	0.30	0.22	0.22	0.22	0.15	0.32				
975 to 960									0.31	0.30	0.39	2.11
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 901.1 ft

Jocassee E_2_557.0: Monthly Averaged Chlorophyll (ug/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	2.15	2.33	1.99	3.36	2.06	1.21	1.02	1.32	1.80	3.24	4.12	3.54
1095 to 1080	2.29	2.55	2.62	3.26	2.64	2.33	2.39	2.05	1.88	3.03	3.40	2.58
1080 to 1065	2.63	2.37	2.49	3.60	3.77	2.83	3.78	3.40	4.06	3.25	3.87	3.09
1065 to 1050	2.66	2.20	2.13	2.48	3.58	3.34	4.24	4.05	4.52	3.42	3.42	3.97
1050 to 1035	3.21	1.97	1.84	1.70	2.63	2.07	3.40	1.87	2.05	4.41	3.39	3.25
1035 to 1020	2.65	1.76	1.52	1.00	1.06	1.39	1.92	1.32	1.22	3.88	3.74	2.88
1020 to 1005	2.87	1.61	1.46	1.01	0.68	0.68	1.00	0.61	0.68	1.42	3.29	2.40
1005 to 990	1.29								0.64	0.41	0.58	0.70
990 to 975	2.69	1.75	1.35	0.79	0.49	0.42	0.46	0.45	0.37	0.42	0.62	1.85
975 to 960	1.41	2.89						0.52	0.36	0.24	0.41	0.39
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 896.5 ft

Legend	**0.00**										**10.00**

Jocassee F_2_554.8: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	1.45	3.83	1.98	1.53	1.21	0.69	0.99	0.68	1.84	2.77	2.97	4.73
1095 to 1080	1.37	0.49	1.17	1.70	2.72	4.93	3.02	0.97	2.31	4.02	3.02	4.02
1080 to 1065	1.53	0.89	0.73	1.33	1.78	1.53	1.37	1.41	2.82	4.53	3.92	3.82
1065 to 1050	1.41	0.59	0.59	0.63	0.77	1.33	0.81	1.49				3.92
1050 to 1035	1.57	0.53	0.55	0.45	0.61	0.48	0.57	0.73	2.82	4.12	3.72	3.92
1035 to 1020	1.53	0.51	0.73	0.41	0.35	0.39	0.37	0.35	2.41	3.02	3.32	
1020 to 1005	1.29	0.51	0.65	0.28	0.22	0.25	0.26	0.14	2.06	3.02	3.22	6.14
1005 to 990									0.43	2.31	3.22	2.92
990 to 975	1.21	0.47	0.43	0.20	0.18	0.11	0.90	0.22				
975 to 960									0.24	0.37	0.30	2.62
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 966.8 ft

Jocassee F_2_554.8: Monthly Averaged Chlorophyll (ug/l) 1991 to 1997 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	3.16	3.97	3.27	3.39	2.93	1.79	1.45	1.70	2.02	3.73	4.71	4.48
1095 to 1080	3.53	4.07	3.56	4.08	3.52	4.61	4.14	2.21	2.81	4.02	4.55	3.48
1080 to 1065	3.35	3.53	3.20	3.05	3.71	2.77	4.07	4.57	4.28	4.56	4.72	3.77
1065 to 1050	2.96	3.01	2.47	2.00	1.88	1.32	1.97	1.96	3.02	3.90	4.11	3.52
1050 to 1035	2.92	2.77	2.24	1.13	1.12	0.66	0.85	0.86	2.23	3.51	3.98	4.01
1035 to 1020	2.74	2.48	1.83	0.89	0.60	0.51	0.38	0.44	0.75	3.02	3.40	3.67
1020 to 1005	2.72	2.24	1.57	0.59	0.44	0.35	0.25	0.22	0.40	1.39	2.72	3.46
1005 to 990	1.70								0.18	0.24	0.34	0.96
990 to 975	3.41	2.43	2.48	0.65	0.41	0.27	0.26	0.27	0.25	0.36	3.27	2.34
975 to 960	1.20	2.96						0.18	0.18	0.28	0.24	0.25
960 to 945												
945 to 930				0.26								
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 943.8 ft

Legend	**0.00**										**10.00**

Jocassee F_2_556.0: Monthly Averaged Chlorophyll (ug/l) 1990 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	1.01	1.21	1.65	1.21	1.29	1.05	0.91	0.34	1.67	3.22	2.48	3.57
1095 to 1080	1.08	0.97	1.53	1.57	1.65	0.77	1.09	2.82	2.26	3.62	1.51	3.72
1080 to 1065	1.12	0.99	0.93	1.33	2.58	1.53	1.37	2.54	2.30	4.83	2.72	3.92
1065 to 1050	1.16	0.57	0.77	0.85	1.41	2.30	1.09	0.73				3.72
1050 to 1035	1.03	0.57	0.61	0.47	0.73	2.06	1.09	1.53	2.06	3.92	3.72	3.92
1035 to 1020	1.03	0.45	0.49	0.32	0.45	1.05	0.43	0.65	1.94	3.12	2.82	
1020 to 1005	0.97	0.43	0.41	0.30	0.37	0.20	0.41	0.45	1.17	2.62	3.12	3.42
1005 to 990									0.35	1.65	2.26	2.72
990 to 975	1.03	0.43	0.43	0.17	0.23	0.21	0.15	0.28				
975 to 960									0.22	0.32	2.77	3.22
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 966.8 ft

Jocassee F_2_556.0: Monthly Averaged Chlorophyll (ug/l) 1991 to 2010 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	2.73	2.69	3.15	4.06	2.60	1.36	1.12	1.26	2.04	3.56	3.35	3.47
1095 to 1080	3.07	2.64	3.16	4.58	3.22	3.47	2.29	1.70	2.73	3.71	3.53	3.02
1080 to 1065	3.12	2.85	2.67	4.39	4.05	3.02	3.62	3.98	3.53	3.68	4.21	3.24
1065 to 1050	2.75	2.48	2.33	2.71	3.18	2.05	3.48	2.40	2.96	3.96	3.59	3.24
1050 to 1035	2.91	2.38	1.92	1.65	1.83	1.25	1.85	0.96	1.91	3.91	3.45	3.09
1035 to 1020	2.87	2.38	1.71	1.01	1.31	0.73	0.70	0.60	0.70	2.71	2.95	3.16
1020 to 1005	2.30	1.60	1.54	0.75	0.61	0.43	0.46	0.25	0.42	0.99	2.15	1.88
1005 to 990	1.34								0.38	0.26	0.46	0.98
990 to 975	2.93	1.65	1.68	0.65	0.42	0.34	0.35	0.21	0.18	0.43	0.43	2.29
975 to 960	1.31	3.05						0.21	0.32	0.27	0.39	0.28
960 to 945												
945 to 930		1.16		0.36	0.13			0.05			0.18	
930 to 915												
915 to 900		1.14		0.17				0.34				
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 910.9 ft

Legend	0.00										10.00

Lake Jocassee

Conductivity

Jocassee B_2_558.7: Monthly Averaged Conductivity (uS/cm) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	18.3	19.0	18.0	19.3	19.0	18.5	19.6	19.8	20.5	19.2	19.8	21.0
1095 to 1080	20.5	19.0	20.0	20.4	20.0	20.5	20.6	20.6	21.0	19.7	20.8	21.7
1080 to 1065	20.5	19.0	20.5	20.3	20.0	20.5	20.8	20.3	20.9	20.0	20.7	21.7
1065 to 1050	20.4	19.0	20.8	20.3	20.0	20.7	20.9	20.3	21.1	20.2	20.6	21.7
1050 to 1035	20.0	19.0	20.2	20.6	20.0	20.2	20.4	20.1	21.3	19.6	20.4	20.9
1035 to 1020	19.8	19.0	20.5	20.7	19.4	20.3	19.9	20.4	20.8	19.4	20.2	21.1
1020 to 1005	19.4	19.0	20.6	20.7	19.7	19.9	20.3	19.9	20.4	19.3	20.2	21.0
1005 to 990	19.5	19.0	20.0	20.5	19.7	19.7	19.9	19.9	20.0	18.4	19.6	20.4
990 to 975	19.2	19.0	19.6	20.1	19.3	19.5	22.7	19.8	20.3	17.1	19.1	20.6
975 to 960	19.0	19.0	19.5	20.3	19.3	19.5	20.7	20.2	20.3	18.3	18.9	20.0
960 to 945	18.8	18.5	19.8	20.2	19.3	19.7	20.1	20.0	20.0	18.2	18.9	19.6
945 to 930	18.8	18.8	18.6	20.0	19.3	19.1	19.7	19.4	20.0	17.3	19.1	19.7
930 to 915	18.4	18.5	19.3	19.9	19.3	19.2	19.8	19.7	19.7	18.1	19.4	20.6
915 to 900	17.6	18.5	19.6	19.8	19.3	19.6	19.9	20.3	19.6	17.9	19.0	19.4
900 to 885	18.8	18.5	19.8	20.0	19.3	19.0	19.8	19.9	19.8	17.4	18.8	19.4
885 to 870	19.6	18.4	19.6	20.0	19.6	19.7	19.9	19.8	20.0	16.8	19.2	20.4
870 to 855	19.5	18.0	20.0	20.2	19.7	19.5	20.1	20.4	20.3	18.0	18.2	20.0
< 855	22.0	23.5	20.8	20.4	19.7	19.9	20.0	21.5	23.3	22.4	22.1	28.6

Jocassee B_2_558.7: Monthly Averaged Conductivity (uS/cm) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	17.1	17.0	17.0	17.5	18.2	18.0	18.6	18.6	18.5	18.2	18.3	16.6
1095 to 1080	17.1	17.6	17.3	18.0	18.2	18.3	18.9	18.9	18.3	18.8	18.1	17.6
1080 to 1065	17.2	17.5	17.3	18.1	18.4	18.6	18.9	19.1	18.5	18.9	18.2	17.5
1065 to 1050	17.4	17.5	17.1	17.9	18.2	18.2	18.8	19.1	18.2	18.9	18.1	17.6
1050 to 1035	17.2	17.3	17.3	17.7	17.9	18.1	18.5	18.8	18.1	18.7	18.1	17.5
1035 to 1020	17.3	17.4	17.3	17.9	18.0	17.9	18.3	18.6	17.9	18.6	18.2	17.5
1020 to 1005	17.2	17.5	17.3	17.8	17.9	17.8	17.6	17.9	17.1	18.4	18.0	17.5
1005 to 990	17.4	17.2	17.0	17.7	17.9	17.2	17.3	17.4	16.7	17.4	17.5	17.3
990 to 975	17.0	17.5	17.1	17.5	17.5	17.4	17.4	17.4	16.8	17.5	17.0	17.0
975 to 960	17.0	17.4	17.1	17.7	17.7	17.3	17.4	17.4	16.7	17.7	17.2	16.9
960 to 945	17.3	17.2	17.0	17.5	17.7	17.3	17.4	17.4	16.5	17.6	17.1	17.0
945 to 930	17.2	17.0	17.0	17.5	17.7	17.3	17.4	17.3	16.6	17.5	17.1	17.0
930 to 915	17.4	17.3	17.0	18.0	17.9	17.6	17.6	17.5	17.0	17.6	17.2	17.2
915 to 900	17.8	17.4	17.0	17.8	17.9	17.4	17.5	17.5	16.8	17.7	17.4	17.5
900 to 885	18.1	17.2	17.0	17.7	17.8	17.3	17.4	17.9	16.9	17.7	17.6	17.6
885 to 870	17.9	17.5	17.2	17.8	17.7	17.5	17.6	17.9	17.3	17.8	17.6	18.0
870 to 855	18.6	17.4	17.2	18.0	17.9	17.7	17.8	18.2	17.5	18.0	18.0	18.4
< 855	20.1	18.3	17.4	18.2	18.2	18.0	18.3	18.9	19.2	19.4	20.3	20.0
	Legend	**15.0**										**25.0**

Jocassee B_3_558.0: Monthly Averaged Conductivity (uS/cm) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	15.8	17.2	17.1	17.0	15.3	16.5	19.0	18.1	17.4	17.8	15.9	17.9
1095 to 1080	17.5	17.5	17.8	18.1	17.2	18.2	18.6	19.4	18.1	19.0	17.6	18.0
1080 to 1065	17.4	17.6	17.2	17.8	17.4	18.2	19.0	18.8	18.0	18.6	17.3	17.8
1065 to 1050	17.0	17.0	17.9	17.3	17.9	18.1	19.4	19.1	18.7	18.5	18.1	18.4
1050 to 1035	16.8	17.3	17.2	17.6	16.9	17.9	18.6	18.6	16.8	18.3	17.9	19.1
1035 to 1020	17.3	17.1	17.8	17.3	16.6	17.6	18.0	18.9	17.6	18.2	17.2	18.3
1020 to 1005	17.0	16.9	17.7	17.0	16.2	17.3	19.1	17.7	16.8	17.6	16.8	17.8
1005 to 990	17.3	16.7	17.3	16.5	16.7	17.1	17.5	17.5	16.9	16.7	16.3	18.5
990 to 975	17.2	16.7	17.1	17.7	16.7	17.7	17.9	18.8	16.5	16.2	15.9	18.1
975 to 960	17.7	19.0	20.0	19.0	17.9	17.8	22.1	18.6	18.7	17.2	17.1	18.8
960 to 945	18.8	16.8	19.7	18.3	20.3	19.8	20.8	19.5	21.1	17.3	19.6	19.6
945 to 930	18.5	17.4	19.2	18.8	19.7	18.8	20.0	20.7	18.6	17.6	18.6	19.9
930 to 915	18.6	17.1	19.5	19.0	20.1	19.0	20.7	19.8	21.0	17.5	19.4	20.3
915 to 900	19.4	18.1	17.7	18.0	19.2	18.7	18.9	18.9	19.2	17.8	18.3	20.0
900 to 885	19.0	16.7	20.0	18.9	20.3	19.4	20.8	20.2	20.4	17.1	18.9	19.7
885 to 870	19.6	18.1	20.6	19.5	20.2	19.8	20.6	20.3	20.5	17.5	19.7	20.2
870 to 855	19.5	18.0	21.0	19.3	20.7	19.8	20.9	19.6	20.6	17.8	19.1	19.1
< 855	23.1	20.1	20.6	19.7	20.3	19.6	20.5	21.7	21.5	21.4	22.5	24.6

Jocassee B_3_558.0: Monthly Averaged Conductivity (uS/cm) 1991 to 2020 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	17.3	17.5	17.4	17.6	18.3	18.3	19.0	19.2	19.2	18.7	18.9	16.8
1095 to 1080	17.4	17.8	17.9	18.2	18.5	18.7	19.4	19.4	19.1	19.0	18.5	17.6
1080 to 1065	17.5	17.7	17.8	18.3	18.8	18.7	19.3	19.4	19.1	19.2	18.4	17.8
1065 to 1050	17.5	17.7	17.5	18.0	18.4	18.3	19.0	19.3	18.8	19.1	18.5	17.8
1050 to 1035	17.3	17.5	17.7	18.0	18.2	18.2	18.9	19.1	18.7	19.0	18.4	17.6
1035 to 1020	17.4	17.7	17.7	18.0	18.2	18.0	18.5	18.8	18.6	18.9	18.4	17.7
1020 to 1005	17.4	17.7	17.6	18.0	18.0	17.6	17.9	18.1	17.9	18.6	18.2	17.6
1005 to 990	17.4	17.5	17.5	17.8	18.0	17.3	17.6	17.5	17.3	17.6	17.9	17.4
990 to 975	17.3	17.7	17.5	17.8	17.7	17.4	17.7	17.6	17.2	17.7	17.2	17.2
975 to 960	17.2	17.6	17.4	17.9	17.9	17.4	17.5	17.4	17.2	17.7	17.3	17.0
960 to 945	17.5	17.7	17.3	17.7	17.9	17.4	17.4	17.6	17.0	17.9	17.3	17.0
945 to 930	17.7	17.5	17.5	17.7	17.9	17.5	17.6	17.4	17.1	17.6	17.4	17.1
930 to 915	17.6	17.9	17.5	17.9	18.0	17.7	17.8	17.6	17.5	17.8	17.5	17.2
915 to 900	17.9	17.9	17.6	17.9	18.1	17.6	17.7	17.6	17.3	17.9	17.7	17.5
900 to 885	18.1	17.9	17.5	17.9	18.0	17.6	17.7	17.5	17.4	17.8	17.9	17.4
885 to 870	18.1	18.1	17.9	18.0	17.9	17.5	17.7	17.8	17.6	17.9	17.7	17.9
870 to 855	18.6	18.4	17.7	18.1	18.0	17.7	17.8	18.0	17.9	18.1	18.2	18.1
< 855	20.0	18.9	17.9	18.3	18.2	18.0	18.5	18.8	18.9	20.4	20.3	20.1

Legend	**15.0**										**25.0**

Jocassee C_2_559.0: Monthly Averaged Conductivity (uS/cm) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	18.0	19.0	18.7		20.5	19.2	19.6	19.4	20.5	19.3	19.8	20.5
1095 to 1080	20.5	19.0	20.0	20.0	21.0	20.7	20.5	20.2	21.0	20.1	20.1	21.2
1080 to 1065	20.5	19.0	20.0	20.0	21.0	20.6	20.5	20.2	20.6	20.1	20.0	21.1
1065 to 1050	20.4	19.0	20.2	20.0	21.0	20.5	20.5	20.1	20.4	20.4	20.2	21.2
1050 to 1035	20.0	19.0	20.0	19.9	20.7	20.5	20.3	20.1	20.6	19.8	19.8	20.8
1035 to 1020	20.0	19.0	19.8	20.1	21.2	20.6	19.8	20.7	20.9	19.6	20.0	20.8
1020 to 1005	19.4	19.0	20.2	20.0	20.5	20.6	20.4	19.9	20.2	19.6	20.2	20.9
1005 to 990	19.5	19.3	20.5	19.8	20.3	20.1	19.8	20.1	20.4	18.8	19.0	20.2
990 to 975	19.2	19.0	20.4	19.9	20.0	20.0	19.7	19.9	19.9	29.3	19.0	20.4
975 to 960	19.0	19.0	20.5	19.7	19.6	19.4	20.1	20.1	19.9	18.6	18.8	19.7
960 to 945	18.2	19.0	20.4	19.7	19.6	19.5	19.8	20.0	19.6	18.5	18.8	19.7
945 to 930	18.8	19.0	20.0	19.5	19.3	19.6	19.6	19.9	19.8	17.8	18.5	19.6
930 to 915	19.4	19.0	20.0	20.0	19.7	19.3	20.0	19.9	19.9	17.8	18.8	20.3
915 to 900	18.4	19.5	20.6	19.7	19.8	19.8	20.2	20.4	19.6	18.2	19.0	19.8
900 to 885	19.0	19.3	20.7	19.8	19.4	19.6	20.0	20.3	19.8	17.9	18.0	20.0
885 to 870	20.0	19.8	23.2	20.4	20.3	19.8	20.0	20.0	20.1	17.3	19.3	21.4
870 to 855	19.0	19.8	22.0	20.8	20.3	23.9	20.3	20.6	20.2	18.4	19.6	21.6
< 855	25.0	24.0	23.7	22.9	20.0	19.8	20.3	21.0	20.8	23.0	23.1	29.1

Jocassee C_2_559.0: Monthly Averaged Conductivity (uS/cm) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	16.7	16.9	16.8	17.3	18.1	17.8	18.4	18.5	18.3	18.1	18.1	17.4
1095 to 1080	16.6	17.4	17.2	17.7	18.0	18.2	18.6	18.7	18.6	18.6	17.9	17.6
1080 to 1065	16.7	17.3	17.2	17.8	18.2	18.2	18.8	18.9	18.8	18.7	18.0	17.6
1065 to 1050	16.9	17.3	16.9	17.6	18.1	18.1	18.6	18.8	18.6	18.7	17.9	17.7
1050 to 1035	16.8	17.1	17.2	17.6	17.9	18.0	18.5	18.6	18.3	18.6	17.9	17.7
1035 to 1020	16.9	17.3	17.2	17.7	18.0	17.9	18.3	18.4	18.1	18.5	18.0	17.6
1020 to 1005	16.8	17.3	17.1	17.7	17.9	17.5	17.8	17.8	17.5	18.3	17.7	17.6
1005 to 990	17.0	17.0	16.9	17.5	17.8	17.2	17.5	17.3	17.1	17.6	17.5	17.7
990 to 975	16.7	17.2	17.1	17.4	17.5	17.3	17.5	17.3	17.1	17.7	17.3	17.4
975 to 960	16.9	17.2	17.0	17.6	17.6	17.2	17.4	17.3	17.1	17.9	17.2	17.3
960 to 945	17.2	17.3	16.9	17.8	17.8	17.2	17.4	17.4	17.0	17.7	17.2	17.4
945 to 930	17.4	17.2	17.2	17.4	17.6	17.3	17.4	17.2	17.0	17.7	17.3	17.6
930 to 915	17.6	17.6	17.3	17.6	18.0	17.5	17.6	17.5	17.4	17.8	17.4	17.8
915 to 900	18.1	17.7	17.4	17.8	17.9	17.6	17.7	17.8	17.4	18.0	18.0	18.3
900 to 885	18.6	17.9	17.4	17.8	18.0	17.7	17.7	17.8	17.5	18.0	18.2	18.3
885 to 870	18.7	18.1	17.7	18.2	18.0	17.7	17.9	18.2	17.9	18.1	18.2	19.1
870 to 855	21.7	18.2	17.9	18.4	18.2	18.0	18.3	18.6	18.4	18.5	18.9	19.6
< 855	20.7	19.0	19.0	19.5	19.0	18.2	18.8	18.7	18.6	20.0	20.5	21.7

Legend	**15.0**										**25.0**

Jocassee C_2_560.0: Monthly Averaged Conductivity (uS/cm) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	15.6	16.4	16.6	16.6	16.6	15.9	18.1	17.7	16.7	16.7	15.6	16.8
1095 to 1080	17.3	16.7	17.5	17.6	17.4	17.5	17.8	19.2	17.7	17.6	17.0	17.7
1080 to 1065	17.4	17.0	17.1	17.4	17.3	17.3	18.1	18.5	17.2	17.7	16.8	17.3
1065 to 1050	16.6	16.3	17.8	16.8	17.5	17.4	18.3	18.8	17.5	17.4	17.3	18.1
1050 to 1035	16.6	16.7	16.7	17.2	17.6	17.3	18.0	18.0	16.4	17.1	17.4	18.3
1035 to 1020	16.8	16.5	17.5	17.0	16.8	16.9	17.3	18.6	17.2	16.9	16.6	17.8
1020 to 1005	16.6	16.1	16.9	16.8	16.7	16.6	18.1	17.8	16.4	16.8	16.7	17.6
1005 to 990	16.1	16.2	17.1	16.6	17.6	16.8	17.1	17.8	17.1	16.6	16.4	17.9
990 to 975	16.6	15.9	16.7	17.0	16.9	17.1	17.3	18.7	16.3	16.3	16.0	17.8
975 to 960	17.0	18.1	19.8	18.4	17.7	17.2	18.1	18.4	18.0	16.8	17.2	18.3
960 to 945	18.8	16.0	19.5	17.3	19.5	18.6	19.6	19.4	19.6	16.7	18.2	19.8
945 to 930	18.5	16.6	19.3	17.5	19.3	18.5	19.8	20.2	17.9	17.3	17.6	19.9
930 to 915	19.2	16.4	19.2	18.1	19.6	18.8	20.1	20.3	20.2	16.6	18.5	20.9
915 to 900	20.4	17.3	17.3	18.0	18.7	17.8	18.4	19.4	17.8	17.0	17.8	20.1
900 to 885	19.8	17.0	20.0	18.2	19.6	19.1	20.0	20.6	20.3	16.5	18.0	20.0
885 to 870	20.0	17.7	20.6	18.2	20.2	19.4	20.1	20.3	20.8	16.5	19.3	20.9
870 to 855	19.6	16.8	21.0	19.1	20.5	19.6	20.4	20.0	20.9	18.7	20.1	21.1
< 855	24.5	15.7	21.0	21.3	19.1	19.9	21.1	26.4	21.3	17.8	20.0	21.1

Jocassee C_2_560.0: Monthly Averaged Conductivity (uS/cm) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	16.7	16.5	17.0	17.3	18.1	17.9	18.2	18.5	18.1	17.8	17.9	17.2
1095 to 1080	16.5	16.9	17.4	17.7	18.1	18.2	18.5	18.7	18.2	18.3	17.7	17.2
1080 to 1065	16.7	16.9	17.2	17.8	18.1	18.2	18.5	18.8	18.3	18.4	17.6	17.4
1065 to 1050	16.7	16.7	17.2	17.7	18.1	18.2	18.5	18.8	18.1	18.4	17.7	17.5
1050 to 1035	16.6	16.6	17.1	17.6	18.0	18.2	18.5	18.6	17.9	18.3	17.7	17.5
1035 to 1020	16.6	16.8	17.4	17.7	18.0	18.0	18.3	18.6	17.9	18.3	17.6	17.5
1020 to 1005	16.6	16.8	17.1	17.6	17.8	17.5	17.8	18.1	17.4	18.2	17.4	17.4
1005 to 990	16.8	16.5	17.2	17.6	17.6	17.1	17.3	17.4	17.1	17.7	17.4	17.4
990 to 975	16.5	16.8	17.5	17.4	17.4	17.3	17.5	17.4	17.1	17.7	17.3	17.5
975 to 960	16.8	16.8	17.1	17.5	17.5	17.3	17.4	17.5	17.1	17.9	17.4	17.8
960 to 945	17.5	16.8	17.2	17.4	17.5	17.4	17.4	17.6	17.0	17.9	17.6	18.1
945 to 930	18.2	17.2	17.3	17.5	17.7	17.6	17.5	17.5	17.1	17.9	17.7	18.3
930 to 915	18.5	17.6	17.7	17.8	18.0	17.8	17.7	17.9	17.6	18.1	18.0	18.4
915 to 900	19.0	17.8	17.8	18.0	17.9	18.0	17.8	18.2	18.0	18.3	18.4	19.1
900 to 885	19.3	18.3	17.9	18.1	18.1	18.0	17.8	18.1	18.0	18.3	18.6	18.9
885 to 870	19.1	18.9	18.7	18.2	18.2	18.3	18.1	18.5	18.5	18.6	18.6	19.4
870 to 855	20.0	19.3	18.8	18.7	18.8	18.8	18.9	18.8	19.3	19.6	20.2	20.3
< 855	19.6	20.5	19.5	23.3	17.7	17.9	17.5	18.7	18.6	20.1	18.4	26.8

Legend	**15.0**										**25.0**

Jocassee C_2_562.0: Monthly Averaged Conductivity (uS/cm) 1980 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	16.7	17.6	18.5	17.2	19.1	18.7	20.8	20.9	20.6	18.9	19.3	21.0
1095 to 1080	19.6	17.7	19.3	18.2	20.5	21.4	22.2	22.1	21.4	19.4	19.3	21.5
1080 to 1065	19.1	17.4	19.3	18.0	20.7	21.8	22.6	21.9	21.0	19.7	20.0	21.5
1065 to 1050	18.0	17.0	19.7	17.8	20.4	22.1	24.0	23.4	21.8	19.3	19.6	21.7
1050 to 1035	18.5	17.6	19.7	18.1	20.8	22.4	22.2	23.1	22.1	19.1	19.2	21.3
1035 to 1020	18.7	16.9	19.6	18.3	20.1	21.8	21.8	23.2	22.5	19.1	19.4	21.7
1020 to 1005	18.1	16.5	19.7	18.2	20.3	22.4	22.5	24.7	25.9	20.8	19.7	21.4
1005 to 990	18.0	17.5	20.0	17.6	21.3	23.2	25.8	30.0	40.4	29.6	26.3	21.7
990 to 975	14.0	16.4	16.0	16.9	18.0		25.0	24.0		43.6	56.0	
975 to 960									32.0			
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 964.5 ft

Jocassee C_2_562.0: Monthly Averaged Conductivity (uS/cm) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	16.9	16.8	17.1	17.3	18.1	18.0	18.2	18.4	18.1	18.0	17.9	17.5
1095 to 1080	16.7	17.1	17.4	17.3	18.5	18.6	18.8	18.6	18.3	18.4	17.8	17.6
1080 to 1065	17.0	17.0	17.3	17.6	18.5	18.6	19.3	19.0	18.4	18.5	17.9	17.5
1065 to 1050	16.9	17.0	17.3	17.4	18.2	18.1	18.8	19.2	18.4	18.6	17.9	17.5
1050 to 1035	16.9	16.9	17.3	17.4	18.1	18.2	18.6	18.9	18.4	18.5	17.9	17.7
1035 to 1020	16.9	17.1	17.6	17.6	18.2	18.5	19.1	19.5	18.9	18.6	17.9	17.6
1020 to 1005	16.8	17.1	17.5	17.9	18.6	19.1	19.9	20.6	20.7	19.2	17.9	17.5
1005 to 990	17.1	17.3	17.6	18.4	19.7	21.2	21.4	25.1	30.9	27.6	22.1	21.4
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 992.2 ft

Legend	**15.0**										**25.0**

Jocassee C_2_565.4: Monthly Averaged Conductivity (uS/cm) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	18.0	18.0	17.0	17.3	20.0	18.0	19.5	19.2	20.6	18.0	18.0	19.0
1095 to 1080	20.5	18.5	19.5	18.5	20.0	19.5	20.3	20.0	20.9	19.8	19.8	20.9
1080 to 1065	20.6	18.8	20.0	18.5	20.5	19.2	20.0	20.1	20.5	20.1	20.3	20.8
1065 to 1050	20.0	19.0	20.2	18.3	20.0	18.7	20.0	19.8	20.9	19.4	19.6	20.9
1050 to 1035	20.0	18.8	19.8	18.7	20.0	19.3	20.0	19.7	20.1	19.4	19.4	20.4
1035 to 1020	20.0	18.6	19.8	19.0	19.5	18.7	19.9	20.1	19.9	19.0	19.5	20.3
1020 to 1005	19.2	18.0	20.0	18.5	19.0	18.8	19.5	20.2	20.4	19.3	19.4	20.5
1005 to 990	19.0	18.3	19.8	18.4	19.1	18.6	19.7	20.3	21.3	19.8	19.0	19.4
990 to 975	19.0	17.0	18.8	17.8	18.7	19.3	19.4	20.1	21.2	17.9	19.8	20.0
975 to 960	17.2	16.8	19.0	18.5	19.0	19.0	19.6	20.9	21.3	20.1	22.1	20.5
960 to 945	16.3	16.0	18.8	18.5	19.3	19.0	20.6	20.7	21.6	21.3	21.6	22.1
945 to 930	14.5	16.2	17.0	16.0	18.3	19.1	19.3	20.2	22.8	23.7	22.0	23.6
930 to 915			17.0		17.7	20.0		20.0	25.7			
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 918.1 ft

Jocassee C_2_565.4: Monthly Averaged Conductivity (uS/cm) 1991 to 1994 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	16.9	15.4	17.6	16.3	17.9	16.8	17.1	17.7	17.5	16.7	16.5	16.0
1095 to 1080	16.7	15.9	17.5	15.5	17.4	15.4	17.0	17.3	17.3	16.8	16.2	15.9
1080 to 1065	16.8	15.5	17.5	15.4	17.5	15.5	17.3	17.1	17.0	16.8	16.4	15.9
1065 to 1050	16.8	15.2	17.5	16.1	17.6	15.9	16.8	16.4	16.3	16.7	16.7	15.8
1050 to 1035	16.9	15.2	17.3	16.2	17.4	16.2	16.6	16.3	15.8	16.8	16.1	16.0
1035 to 1020	16.6	15.3	17.3	16.2	17.6	16.0	16.6	16.4	16.4	16.6	16.3	15.8
1020 to 1005	16.8	15.3	17.1	16.1	17.5	15.8	16.4	17.0	16.9	17.1	16.3	15.4
1005 to 990	16.7	15.2	17.0	16.2	17.9	16.4	16.4	17.5	16.9	17.6	17.1	16.0
990 to 975	16.5	15.3	16.7	15.8	18.2	16.7	17.2	17.9	17.9	18.2	17.6	17.3
975 to 960	16.2	15.1	16.6	16.0	18.5	16.8	17.1	18.3	18.3	18.6	18.5	19.0
960 to 945	16.3	14.8	16.5	16.3	18.5	16.8	17.3	18.8	18.9	19.4	20.1	19.4
945 to 930	18.3	14.1	16.4	16.1	18.8	17.8	17.8	18.7	19.0	20.3	20.9	22.0
930 to 915	14.0				19.0		19.5	22.0	21.0		18.0	
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 926.6 ft

Legend	**15.0**										**25.0**

Jocassee D_2_551.0: Monthly Averaged Conductivity (uS/cm) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095		8.9	7.8	9.6	8.3	10.1	10.4	13.7	8.8	10.3	9.1	10.0
1095 to 1080	11.0	11.5	10.0	11.0	14.5	13.5	14.0	14.0	14.0	12.0	10.3	10.5
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1082.8 ft

Jocassee D_2_551.0: Monthly Averaged Conductivity (uS/cm) 1991 to 2011 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.0	12.7	10.0	9.0	17.3	9.0	12.0	16.0	16.0	14.0	17.0	7.0
1095 to 1080		11.4						21.0			20.0	
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 1083.7 ft

Legend **15.0** … **25.0**

Jocassee D_2_564.0: Monthly Averaged Conductivity (uS/cm) 1976 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	16.3	16.3	15.9	16.5	17.5	17.7	19.4	18.1	17.4	16.4	15.5	17.3
1095 to 1080	18.9	16.3	16.6	16.9	18.3	18.7	18.8	18.7	18.3	17.8	17.1	18.3
1080 to 1065	18.6	16.6	16.5	16.2	17.7	17.8	18.9	18.0	17.5	17.8	16.9	18.0
1065 to 1050	17.0	16.0	17.0	16.2	18.5	18.0	19.4	18.2	17.7	17.2	17.4	18.6
1050 to 1035	17.7	16.0	15.6	16.2	18.1	18.1	19.0	18.4	16.8	17.3	17.1	18.5
1035 to 1020	17.7	16.2	16.6	16.0	18.2	17.8	18.7	19.4	18.1	17.0	16.6	18.3
1020 to 1005	17.6	15.5	15.6	16.0	17.9	17.7	19.3	19.5	18.4	17.4	17.0	18.0
1005 to 990	16.4	15.5	16.0	16.5	18.3	17.6	19.0	20.1	19.1	18.8	17.6	19.1
990 to 975	17.4	15.4	16.1	16.2	18.3	18.1	19.0	21.0	18.7	19.3	19.7	21.1
975 to 960	17.3	16.7	19.3	16.7	19.2	17.8	20.0	20.1	19.4	18.9	21.8	21.4
960 to 945	18.5	14.2	19.2	17.3	19.5	18.8	19.4	20.8	20.5	17.4	19.9	21.2
945 to 930	18.3	14.4	19.5	17.6	19.5	19.3	19.7	20.8	20.6	18.3	20.1	21.8
930 to 915	17.8	15.4	19.2	18.4	21.0	20.9	20.8	22.3	22.1	19.5	20.5	22.8
915 to 900	18.0	16.1	20.0	19.6	21.6	21.2	21.8	23.2	21.9	19.4	20.9	22.1
900 to 885	20.3	17.8	20.2	20.9	21.5	21.1	21.7	24.3	22.0	19.3	21.9	22.6
885 to 870	22.0	18.3	22.0	23.8	21.6	22.5	21.4	25.9	23.6	18.8	22.2	24.0
870 to 855	26.0			26.0	21.0	22.0	26.3	24.3	26.0	26.7	24.0	22.0
< 855	*Minimum Reading 864.7 ft*											

Jocassee D_2_564.0: Monthly Averaged Conductivity (uS/cm) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	17.1	16.7	17.7	17.5	18.4	18.1	18.4	18.8	18.1	17.6	17.7	17.5
1095 to 1080	16.7	17.1	17.8	17.7	18.3	18.4	18.8	18.9	18.3	18.5	17.6	17.6
1080 to 1065	16.9	17.0	17.7	18.0	18.4	18.4	18.7	19.1	18.4	18.5	17.7	17.5
1065 to 1050	16.8	16.9	17.5	17.9	18.4	18.5	18.8	18.8	18.2	18.5	17.6	17.5
1050 to 1035	17.0	16.8	17.6	17.9	18.4	18.4	18.7	18.7	18.0	18.3	17.7	17.7
1035 to 1020	16.8	16.9	17.7	17.9	18.3	18.2	18.5	18.8	17.9	18.3	17.5	17.5
1020 to 1005	16.6	16.9	17.7	17.9	18.1	17.9	18.1	18.4	17.6	18.4	17.4	17.3
1005 to 990	16.9	16.6	17.8	17.8	17.9	17.5	17.7	17.9	17.6	18.1	17.6	17.5
990 to 975	16.7	17.0	17.9	17.6	17.8	17.6	18.0	18.0	17.7	18.2	17.7	17.8
975 to 960	17.1	17.0	17.7	17.9	18.1	17.7	18.0	18.0	17.9	18.5	18.2	18.3
960 to 945	17.6	17.0	17.6	17.8	18.1	17.9	18.1	18.3	17.9	18.7	18.4	18.9
945 to 930	18.9	17.2	17.7	18.0	18.3	18.1	18.4	18.4	18.4	19.1	19.2	19.9
930 to 915	19.5	17.6	18.0	18.5	18.5	18.6	19.0	19.1	19.0	19.5	20.0	20.8
915 to 900	20.5	19.9	23.4	18.8	18.6	19.0	19.2	19.6	19.7	20.2	21.2	21.3
900 to 885	22.2	19.4	18.5	19.2	19.0	18.9	18.5	18.5	20.5	19.7	21.8	21.6
885 to 870	22.7	24.0	21.8	18.0	17.8	19.1	19.6	18.9	24.7	20.7	23.6	26.3
870 to 855	30.9	23.0	28.0	18.3		23.0	27.0	21.5		25.0		
< 855	*Minimum Reading 864.4 ft*											

Legend	15.0										25.0

Jocassee D_2_564.1: Monthly Averaged Conductivity (uS/cm) 1987 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	20.0	18.0	17.0	18.0	20.7	19.7	20.4	21.2	20.8	18.8	19.0	20.5
1095 to 1080	20.6	18.3	18.7	18.8	19.8	19.7	20.3	22.3	21.2	19.7	19.6	21.1
1080 to 1065	18.2	17.4	18.8	18.4	20.3	20.8	19.7	21.2	21.0	20.9	20.6	21.4
1065 to 1050	17.6	15.8	16.5	16.6	17.6	19.5	19.8	21.9	20.6	18.8	18.7	19.2
1050 to 1035	19.3	16.4	16.8	16.8	17.2	19.3	19.7	23.4	20.6	18.7	17.9	18.7
1035 to 1020	20.0	17.0	16.8	17.6	16.8	19.1	19.5	24.3	23.5	18.5	17.8	19.0
1020 to 1005	22.2	17.0	18.5	19.6	19.6	21.3	20.9	25.2	27.6	21.1	18.3	18.2
1005 to 990	21.0	17.2	20.3	21.0	22.1	23.7	24.7	28.5	31.9	33.8	18.1	18.5
990 to 975	20.8	17.6	20.2	21.9	22.0	24.3	26.3	29.0	31.1	51.1	23.6	18.5
975 to 960	22.2	18.7	26.0	25.5	22.5	25.3	28.3	31.3	34.4		28.0	18.5
960 to 945					23.0							
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 959.9 ft

Jocassee D_2_564.1: Monthly Averaged Conductivity (uS/cm) 1991 to 2017 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	17.1	16.4	17.4	17.5	18.2	18.2	18.4	18.8	18.4	17.4	17.8	17.2
1095 to 1080	16.5	16.7	17.5	17.2	17.9	18.2	18.7	18.7	18.3	18.2	17.6	17.3
1080 to 1065	16.7	16.7	17.5	17.6	18.3	18.3	18.7	18.5	18.3	18.4	17.7	17.2
1065 to 1050	16.5	16.3	17.5	17.4	18.4	18.4	18.4	17.7	18.0	18.2	17.6	17.1
1050 to 1035	16.6	16.3	17.4	17.7	18.4	18.4	18.8	17.9	18.0	18.3	17.5	17.2
1035 to 1020	16.3	16.2	17.5	17.7	18.5	18.3	18.6	17.9	18.2	18.2	17.2	17.0
1020 to 1005	16.3	16.4	17.3	17.8	18.5	18.5	18.9	17.7	17.9	18.3	17.3	16.9
1005 to 990	16.4	15.9	17.2	17.9	18.6	18.2	18.3	17.2	17.8	17.9	17.1	16.9
990 to 975	16.0	15.6	17.1	17.7	19.3	18.7	18.6	17.8	17.9	18.1	16.4	16.7
975 to 960	15.5	14.6	15.6	17.0	19.1	18.5	17.9	18.6	18.6	18.3	15.8	15.4
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 963 ft

Legend	**15.0**										**25.0**

Jocassee E_2_557.0: Monthly Averaged Conductivity (uS/cm) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	15.6	16.3	16.6	16.8	15.1	16.1	18.9	17.9	16.7	16.8	15.8	17.0
1095 to 1080	17.3	16.8	17.4	17.9	17.3	18.1	18.7	19.4	17.5	17.7	17.1	17.5
1080 to 1065	17.0	17.0	17.2	17.6	16.8	17.5	19.2	18.3	17.6	17.5	16.9	17.3
1065 to 1050	16.9	16.4	17.8	17.0	16.7	17.6	19.3	18.4	17.5	17.3	17.5	17.6
1050 to 1035	16.8	16.5	17.2	17.3	17.1	17.4	18.5	17.9	16.3	17.0	17.4	17.9
1035 to 1020	17.0	16.6	17.5	16.9	16.5	17.4	17.9	18.1	17.1	16.8	16.6	17.7
1020 to 1005	16.8	16.0	17.5	16.8	16.2	17.1	18.6	17.3	16.3	16.6	16.6	17.1
1005 to 990	16.6	16.2	16.9	16.3	16.8	16.6	17.3	17.0	16.4	15.8	16.1	17.9
990 to 975	16.9	16.0	16.9	17.1	16.5	17.2	17.5	18.5	15.9	15.8	16.1	17.6
975 to 960	17.2	18.3	19.3	18.2	17.2	17.3	18.5	18.4	19.6	16.5	16.9	18.0
960 to 945	18.0	16.3	19.0	17.7	19.5	18.9	20.2	19.5	20.2	16.7	19.4	19.6
945 to 930	17.8	16.7	18.4	17.7	18.8	18.2	19.5	20.3	17.9	16.5	18.5	19.7
930 to 915	17.8	15.8	18.8	17.2	19.1	18.7	20.1	19.8	20.4	16.7	18.3	20.6
915 to 900	19.3	16.3	16.9	17.5	17.2	17.2	18.1	18.5	18.2	16.7	19.1	20.3
900 to 885	17.5	14.7	18.5	16.6	19.0	18.2	18.9	20.6	20.0	16.5	18.3	19.9
885 to 870	20.3	15.0	17.4	17.3	19.0	18.8	18.8	19.5	20.1	16.5	19.6	21.1
870 to 855	25.5	16.2	18.0	17.0	19.8	18.8	18.9	19.1	20.1	18.5	19.5	20.9
< 855	30.3	16.1	18.0	17.7	20.5	19.1	18.7	19.3	20.4	19.8	19.0	22.3

Jocassee E_2_557.0: Monthly Averaged Conductivity (uS/cm) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	17.0	16.9	17.3	17.4	17.9	17.8	18.5	18.9	18.9	18.1	18.5	17.5
1095 to 1080	17.1	17.4	17.8	18.1	18.1	18.4	19.0	19.0	18.6	18.7	18.2	17.7
1080 to 1065	17.2	17.4	17.6	18.3	18.3	18.2	19.0	19.0	18.6	18.8	18.3	17.7
1065 to 1050	17.1	17.3	17.7	18.2	18.0	18.1	18.4	18.8	18.3	18.7	18.2	17.7
1050 to 1035	17.1	17.2	17.6	17.9	17.7	17.7	18.0	18.4	17.8	18.6	18.3	17.8
1035 to 1020	17.1	17.3	17.6	17.9	17.7	17.6	18.3	18.4	17.8	18.5	18.1	17.7
1020 to 1005	17.0	17.4	17.4	17.9	17.6	17.2	17.6	17.8	17.1	18.4	17.9	17.6
1005 to 990	17.0	17.1	17.4	17.7	17.5	16.9	17.2	17.4	17.0	17.8	17.6	17.5
990 to 975	16.7	17.2	17.5	17.4	17.3	17.1	17.6	17.4	17.1	17.9	17.5	17.2
975 to 960	16.6	17.0	17.2	17.6	17.5	17.1	17.5	17.4	17.0	17.9	17.9	17.4
960 to 945	17.3	16.9	17.2	17.4	17.5	17.1	17.4	17.5	17.0	17.8	17.7	17.9
945 to 930	17.9	16.8	17.0	17.3	17.4	16.9	17.4	17.4	17.1	17.9	18.1	18.2
930 to 915	18.3	16.8	17.1	17.5	17.5	17.4	17.7	17.8	17.2	18.1	18.2	18.6
915 to 900	18.8	16.9	17.0	17.6	17.6	17.3	17.6	17.9	17.6	18.1	18.5	19.0
900 to 885	18.8	17.0	17.0	17.4	17.7	17.4	17.6	17.9	17.7	18.0	18.5	18.9
885 to 870	19.3	17.5	17.3	17.8	17.6	17.7	18.0	18.2	17.9	18.3	18.6	19.0
870 to 855	19.9	18.1	17.3	18.1	18.3	17.9	18.2	18.6	18.5	18.7	19.3	19.9
< 855	22.2	18.3	17.8	17.7	18.1	18.2	18.5	18.5	17.9	19.6	20.5	21.1

Legend	**15.0**										**25.0**

Jocassee F_2_554.8: Monthly Averaged Conductivity (uS/cm) 1986 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	17.3	14.0	15.0	18.0	17.0	17.5	18.7	18.4	21.0	17.0		18.0
1095 to 1080	20.5	17.5	17.3	18.8	17.7	19.8	19.7	19.9	20.8	18.6	20.4	20.3
1080 to 1065	20.5	18.0	18.3	18.3	18.0	19.5	20.0	19.8	20.6	19.2	20.4	20.1
1065 to 1050	20.0	17.8	19.8	18.0	18.3	19.2	19.7	19.7	20.9	19.1	20.9	20.3
1050 to 1035	20.0	18.0	19.2	17.3	18.3	19.1	19.4	19.6	20.6	18.4	20.3	19.6
1035 to 1020	19.4	18.2	19.5	18.0	17.8	18.4	19.8	19.6	20.3	18.2	19.7	19.7
1020 to 1005	19.0	18.0	19.6	17.3	17.3	18.8	19.5	20.0	20.9	19.1	20.0	19.7
1005 to 990	19.0	16.5	19.3	18.0	18.0	17.6	19.2	19.8	21.9	19.0	18.7	19.0
990 to 975	18.2	15.4	18.6	18.7	18.7	19.3	19.0	20.6	22.5	19.8	21.2	18.7
975 to 960	17.3	15.4	18.8	18.6	20.4	20.1	21.5	23.3	27.9	28.1	29.0	19.6
960 to 945	16.8	12.0	19.0		17.5	23.0	21.5	35.0	33.8	38.4	40.7	33.0
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 946.5 ft

Jocassee F_2_554.8: Monthly Averaged Conductivity (uS/cm) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	16.7	16.5	16.5	16.5	17.2	17.1	18.1	18.8	18.2	17.7	17.9	17.4
1095 to 1080	16.7	17.1	17.1	16.7	17.3	17.2	18.7	18.9	18.2	18.4	17.8	17.6
1080 to 1065	16.8	17.1	16.9	16.8	17.6	17.1	18.5	18.7	18.2	18.5	17.9	17.6
1065 to 1050	16.7	17.0	16.9	16.9	17.3	17.1	18.1	18.7	18.2	18.5	17.8	17.6
1050 to 1035	16.6	16.9	16.9	16.5	16.9	17.1	17.7	18.3	17.9	18.4	17.9	17.7
1035 to 1020	16.7	17.0	16.8	16.8	16.9	17.0	18.0	18.5	18.0	18.3	17.7	17.5
1020 to 1005	16.5	16.9	16.6	17.0	17.0	16.8	17.8	18.4	17.7	18.5	17.5	17.2
1005 to 990	16.5	16.5	16.4	17.0	17.3	16.7	17.7	18.2	18.1	19.1	17.9	17.3
990 to 975	16.4	16.5	16.8	17.2	17.5	17.5	18.8	19.1	19.4	20.8	19.9	17.7
975 to 960	16.3	16.3	16.5	17.8	18.7	19.8	20.7	22.1	23.5	26.6	30.4	22.5
960 to 945	15.7	16.8	16.5	17.7	20.4	20.0	23.3	24.5	29.2	32.9	37.0	26.6
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 945.3 ft

Legend	**15.0**										**25.0**

Jocassee F_2_556.0: Monthly Averaged Conductivity (uS/cm) 1975 to 1991 (Pre Bad Creek Operation)

Measurement Reading Range (ft, msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	16.0	15.1	14.9	15.8	14.3	15.7	16.2	15.7	16.9	16.0	15.2	17.3
1095 to 1080	17.7	16.3	16.8	18.0	16.5	17.5	16.8	16.8	17.3	16.7	16.9	18.2
1080 to 1065	18.0	16.7	16.7	17.2	16.1	16.6	17.3	16.2	17.5	17.0	16.6	18.0
1065 to 1050	18.0	16.3	17.1	16.9	16.3	17.1	16.5	16.2	16.9	17.4	17.4	18.3
1050 to 1035	17.5	15.8	16.3	16.8	16.4	17.1	16.2	16.0	15.9	16.4	16.8	18.2
1035 to 1020	17.7	16.9	16.9	17.0	15.2	16.6	16.1	16.1	17.4	16.5	16.3	18.3
1020 to 1005	17.0	16.2	17.0	16.3	15.6	16.6	16.8	15.7	18.8	16.9	16.5	17.7
1005 to 990	17.4	15.9	16.6	16.3	16.4	16.5	16.1	15.7	18.4	16.6	16.4	18.2
990 to 975	16.6	15.4	16.5	17.5	16.3	17.2	16.3	18.5	17.9	16.2	16.8	17.9
975 to 960	16.6	17.7	18.8	20.6	17.0	17.5	17.6	17.9	20.5	18.4	18.6	19.0
960 to 945	17.4	17.0	18.4	19.3	19.3	19.7	19.8	21.0	21.8	20.2	22.0	22.4
945 to 930	17.5	16.8	18.0	19.3	20.0	20.0	20.2	21.0	22.5	20.9	26.8	26.6
930 to 915	16.7	16.5		21.0	21.3	19.0	20.8	20.5	23.8	25.6	29.0	27.0
915 to 900					23.0							
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 914.1 ft

Jocassee F_2_556.0: Monthly Averaged Conductivity (uS/cm) 1991 to 2015 (Post Bad Creek Operation)

Measurement Reading Range (ft, msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	16.7	16.6	16.9	16.9	17.4	17.5	18.3	18.9	18.2	18.0	18.2	17.4
1095 to 1080	16.9	17.2	17.4	17.6	17.9	17.9	18.9	18.9	18.3	18.6	17.9	17.5
1080 to 1065	17.0	17.1	17.4	17.8	18.1	18.0	18.7	18.8	18.3	18.6	17.9	17.6
1065 to 1050	17.0	17.1	17.4	17.6	17.6	17.4	18.0	18.4	18.2	18.6	17.8	17.6
1050 to 1035	16.9	17.0	17.3	17.1	17.1	17.1	17.6	18.1	17.7	18.5	17.9	17.8
1035 to 1020	16.9	17.1	17.3	17.3	17.1	17.1	18.0	18.2	17.7	18.3	17.7	17.6
1020 to 1005	16.7	17.1	16.9	17.3	17.2	16.9	17.6	17.8	17.2	18.5	17.5	17.4
1005 to 990	16.7	16.6	16.9	17.3	17.3	16.7	17.2	17.4	17.1	18.1	17.6	17.3
990 to 975	16.4	16.6	17.0	17.1	17.2	16.9	17.6	17.6	17.4	18.4	18.1	17.2
975 to 960	16.3	16.5	16.6	17.3	17.6	17.3	17.9	18.0	17.7	19.0	19.1	18.2
960 to 945	16.4	16.3	16.6	17.5	17.9	17.7	18.3	18.8	18.6	19.6	20.6	20.0
945 to 930	17.0	16.5	17.0	17.9	18.4	18.9	19.3	20.3	20.2	22.2	24.4	24.2
930 to 915	18.2	16.8	16.1	17.5	19.2	18.4	21.6	20.5	21.6	21.8	33.3	29.4
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 918.4 ft

Legend	15.0										25.0

Lake Jocassee

Surface Water Quality
Data by Station

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Jocassee Monthly Averaged Surface Temperature (deg C) 1987 to 1991 (Pre Bad Creek Operation)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	558.7	10.3	9.7	11.3	14.5	20.1	23.9	25.6	26.2	24.8	21.4	17.7	13.3
	558.0	10.4	8.8	10.2	13.7	19.2	23.5	26.1	25.9	24.9	21.5	17.5	13.4
	559.0	10.5	9.7	11.2	15.2	19.7	24.9	25.8	26.8	25.0	21.5	17.9	13.6
	560.0	10.4	9.0	10.6	14.4	19.4	24.3	26.6	26.4	25.1	21.6	17.7	13.5
	562.0	10.4	10.0	11.3	14.9	20.1	25.7	26.8	27.3	25.5	21.9	17.9	13.4
	565.4	10.6	10.0	11.1	16.3	21.1	26.2	26.8	27.3	25.3	21.7	17.7	13.8
	551.0	5.6	5.9	9.1	11.6	14.8	18.9	21.1	21.1	18.4	13.7	9.8	6.5
	564.0	10.4	9.1	10.7	14.9	19.1	24.8	26.8	26.9	25.4	21.7	17.6	13.4
	564.1	10.7	10.4	11.8	15.1	19.8	24.3	26.4	27.4	25.6	21.7	17.9	13.4
	557.0	10.3	8.9	10.8	14.4	19.4	24.0	26.3	26.2	24.9	21.5	17.6	13.4
	554.8	10.3	9.8	12.4	16.4	22.3	25.5	27.8	27.5	25.1	21.6	17.2	13.5
	556.0	10.4	8.7	11.3	15.1	20.0	24.9	26.7	26.4	24.9	21.5	17.4	13.1
	Legend	**8**											**25**

Jocassee Monthly Averaged SurfaceTemperature (deg C) 1991 to 2013 (Post Bad Creek Operation)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	558.7	10.7	10.0	11.4	15.4	20.0	24.5	26.2	26.6	25.1	21.6	17.5	13.9
	558.0	10.7	9.9	11.6	15.0	20.1	24.4	26.0	26.6	25.4	21.7	17.6	13.9
	559.0	10.8	10.0	11.7	15.6	20.5	25.0	26.7	27.0	25.2	21.6	17.6	13.9
	560.0	10.9	10.1	11.8	15.6	20.6	25.2	26.6	26.9	25.3	21.7	17.7	14.0
	562.0	10.8	10.2	12.4	16.1	21.1	25.8	27.2	27.4	25.5	21.8	17.7	14.0
	565.4	10.6	10.7	11.4	16.5	21.2	25.1	27.0	26.4	25.3	20.5	17.1	13.5
	551.0	3.3	6.2	8.9	15.0	20.6	20.2	20.8	22.5	20.1	12.3	16.6	4.0
	564.0	10.9	10.4	12.0	15.8	20.8	25.1	26.7	26.9	25.4	21.8	17.9	14.1
	564.1	10.9	10.3	11.4	15.1	20.1	23.7	25.6	26.5	25.2	21.7	18.0	14.1
	557.0	10.8	10.1	11.9	16.2	21.0	25.3	26.6	27.1	25.3	21.6	17.5	13.9
	554.8	10.6	10.0	12.2	16.7	21.5	25.9	27.4	27.3	25.3	21.6	17.3	13.7
	556.0	10.7	10.0	12.1	16.6	21.3	25.7	27.1	27.2	25.3	21.5	17.3	13.8
	Legend	**8**											**25**

Jocassee Monthly Averaged Surface Do (mg/L) 1987 to 1991 (Pre Bad Creek Operation)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	558.7	9.340	8.960	10.100	10.140	9.480	8.640	8.300	8.140	7.720	8.260	8.700	9.000
	558.0	9.350	9.144	9.838	10.167	9.508	8.655	8.343	7.994	8.100	8.120	8.738	8.636
	559.0	9.433	9.300	10.000	10.150	9.360	8.520	8.220	8.000	7.800	8.100	8.520	9.000
	560.0	9.480	9.459	10.077	10.456	9.683	8.625	8.464	8.300	8.236	8.158	8.507	8.982
	562.0	9.629	9.990	10.150	10.436	9.617	8.360	8.429	8.311	7.933	8.145	8.500	9.100
	565.4	9.680	9.375	10.150	10.325	9.500	8.175	8.175	8.125	7.840	7.875	8.400	9.150
	551.0	11.878	11.911	10.862	10.283	9.283	8.758	8.393	8.618	8.750	9.526	10.233	11.355
	564.0	9.457	9.787	10.364	10.407	9.778	8.573	8.454	7.825	8.300	8.171	8.609	8.933
	564.1	9.625	9.550	10.025	10.250	9.575	8.550	8.343	6.500	7.840	7.940	8.580	9.100
	557.0	9.750	9.750	10.369	10.339	9.825	8.717	8.507	8.376	8.315	8.083	8.607	9.009
	554.8	10.260	10.200	10.700	10.600	9.550	8.600	8.425	8.425	7.900	7.840	8.575	9.125
	556.0	10.044	9.769	10.718	10.118	9.955	8.700	8.692	8.562	8.392	8.108	8.554	9.040
		Legend	**6.0**										**10.0**

Jocassee Monthly Averaged Surface Do (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	558.7	9.255	9.300	9.902	9.799	8.932	8.335	8.070	7.794	7.590	7.859	8.392	8.813
	558.0	9.379	9.350	9.835	9.793	8.907	8.287	7.991	7.734	7.558	7.865	8.394	8.851
	559.0	9.234	9.292	9.968	9.855	8.896	8.229	8.044	7.791	7.700	7.769	8.348	8.731
	560.0	9.033	9.317	10.019	9.896	8.890	8.204	7.984	7.775	7.506	7.629	8.254	8.671
	562.0	9.363	9.721	10.060	9.904	9.034	8.324	8.258	7.951	7.719	7.854	8.360	8.784
	565.4	8.833	9.500	9.500	9.933	8.867	8.167	8.933	7.833	7.833	7.933	8.633	8.900
	551.0	13.100	11.505			8.617			7.660			8.110	
	564.0	8.959	9.359	9.883	9.754	8.858	8.196	8.075	7.791	7.459	7.592	8.219	8.669
	564.1	9.105	9.473	9.746	9.621	8.865	8.297	7.995	7.612	7.198	7.524	8.139	8.659
	557.0	9.465	9.710	10.159	9.794	8.930	8.271	8.110	7.900	7.722	7.840	8.473	8.873
	554.8	9.695	10.228	10.375	9.873	8.966	8.400	8.113	8.081	7.796	7.787	8.455	8.943
	556.0	9.663	10.055	10.279	9.836	8.938	8.340	8.185	8.005	7.713	7.767	8.457	8.933
		Legend	**6.0**										**10.0**

Jocassee Monthly Averaged Surface DO Saturation (%) 1987 to 1991 (Pre Bad Creek Operation)

	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Station	*558.7*												
	558.0												
	559.0												
	560.0												
	562.0												
	565.4												
	551.0				*DO Saturation Readings Began in 1998*								
	564.0												
	564.1												
	557.0												
	554.8												
	556.0												
		Legend	**0.0**	**10.00**	**20.00**	**30.00**	**40.00**	**50.00**	**60.00**	**70.00**	**80.00**	**90.00**	**100.00**

Jocassee Monthly Averaged Surface Do Saturation (%) 1991 to 2013 (Post Bad Creek Operation)

	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Station	*558.7*	85.1	85.1	93.3	98.9	98.4	102.1	99.4	99.0	94.5	92.0	90.3	87.5
	558.0	85.5	85.3	92.9	97.7	98.0	101.1	98.8	98.4	94.0	91.8	90.4	88.2
	559.0	84.3	85.1	95.0	99.7	99.4	101.6	99.7	100.0	95.6	90.9	90.2	87.1
	560.0	83.6	85.5	94.9	99.9	99.7	101.7	98.7	99.8	93.9	89.3	89.1	86.7
	562.0	86.3	88.8	97.3	102.2	102.2	105.4	103.1	103.7	96.7	92.2	89.7	87.7
	565.4												
	551.0		94.7			100.5			99.2			87.8	
	564.0	84.2	85.8	94.5	99.6	99.9	101.8	99.5	100.1	93.8	88.8	88.4	86.5
	564.1	85.5	86.6	92.1	96.9	98.1	99.8	96.0	96.7	90.3	87.7	87.5	86.4
	557.0	88.1	88.9	96.5	100.8	100.7	103.0	101.6	101.7	96.3	92.1	90.6	88.8
	554.8	89.5	93.1	99.6	102.6	102.2	105.8	104.1	104.9	97.0	86.1	90.3	89.2
	556.0	89.7	91.7	98.5	102.3	101.5	104.9	103.9	103.8	96.1	91.4	90.4	88.9
		Legend	**0.0**	**10.00**	**20.00**	**30.00**	**40.00**	**50.00**	**60.00**	**70.00**	**80.00**	**90.00**	**100.00**

Jocassee Monthly Surface pH (SI) 1987 to 1991 (Pre Bad Creek Operation)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	558.7	6.550	6.525	6.725	6.600	6.650	6.925	6.875	7.025	6.725	6.850	6.875	6.333
	558.0	6.378	6.247	6.427	6.600	6.745	6.930	6.977	6.931	6.785	6.474	6.692	6.200
	559.0	6.320	6.325	6.575	6.733	6.675	6.850	6.975	6.950	6.800	6.625	6.825	6.250
	560.0	6.344	6.300	6.400	6.624	6.809	7.018	7.108	7.206	6.908	6.450	6.646	6.120
	562.0	6.450	6.456	6.600	6.680	6.900	7.050	7.267	7.263	6.860	6.640	6.760	6.300
	565.4	6.700	6.367	6.433	6.567	6.900	7.400	7.067	6.900	6.750	6.833	6.767	6.433
	551.0	6.838	6.329	6.336	6.400	6.464	6.582	6.777	6.550	6.646	6.628	6.538	6.250
	564.0	6.467	6.214	6.367	6.650	6.825	7.100	7.292	7.227	7.100	6.581	6.670	6.200
	564.1	6.600	6.500	6.667	6.533	6.567	6.940	7.100	7.050	6.850	6.725	6.775	6.375
	557.0	6.522	6.359	6.555	6.618	6.773	7.018	7.138	7.131	6.908	6.471	6.723	6.170
	554.8	6.800	6.533	6.850	6.767	6.967	7.200	6.900	7.133	6.875	6.850	6.967	6.367
	556.0	6.663	6.425	6.556	6.660	6.870	7.073	7.109	7.158	6.883	6.418	6.683	6.211

< Acidic						Neutral						Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee Monthly Averaged Surface PH (SI) 1991 to 2020 (Post Bad Creek Operation)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	558.7	6.402	6.240	6.528	6.639	6.950	6.800	6.774	6.885	6.730	6.675	6.725	6.498
	558.0	6.412	6.121	6.298	6.546	6.776	6.606	6.584	6.726	6.695	6.567	6.596	6.535
	559.0	6.339	6.263	6.528	6.737	6.994	6.816	6.818	6.987	6.793	6.614	6.673	6.487
	560.0	6.405	6.317	6.619	6.762	7.004	6.887	6.852	6.944	6.731	6.630	6.714	6.478
	562.0	6.449	6.442	6.664	6.796	7.124	6.969	6.901	6.998	6.824	6.620	6.779	6.465
	565.4	6.100	5.900	6.175	6.400	6.475	6.550	6.575	6.550	6.400	6.100	6.250	6.050
	551.0	5.750	6.582	6.400	6.900	6.726	5.700	6.700	6.700	6.600	6.700	6.786	6.200
	564.0	6.523	6.446	6.647	6.838	7.162	6.998	6.914	7.042	6.853	6.704	6.741	6.616
	564.1	6.549	6.413	6.627	6.718	7.053	6.852	6.787	6.888	6.686	6.609	6.758	6.599
	557.0	6.502	6.370	6.620	6.751	7.090	6.881	6.901	7.103	6.779	6.710	6.665	6.546
	554.8	6.600	6.495	6.713	6.819	7.115	7.034	7.062	7.311	6.847	6.636	6.759	6.601
	556.0	6.575	6.459	6.684	6.804	7.193	7.004	7.041	7.294	6.827	6.678	6.754	6.586

Jocassee Monthly Averaged Surface Phosphorus (mg/L) 1987 to 1991 (Pre Bad Creek Operation)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
558.7	0.012	0.010	0.013	0.024	0.012	0.010	0.053	0.011	0.012	0.010	0.027	0.015
558.0	0.012	0.009	0.011	0.015	0.011	0.011	0.011	0.055	0.011	0.012	0.022	0.008
559.0	0.009	0.011	0.012	0.015	0.021	0.013	0.015	0.009	0.009	0.009	0.019	0.011
560.0	0.014	0.011	0.011	0.012	0.014	0.009	0.011	0.017	0.009	0.010	0.012	0.007
562.0	0.012	0.010	0.013	0.012	0.012	0.009	0.010	0.011	0.010	0.010	0.012	0.010
565.4	0.017	0.016	0.012	0.019	0.009	0.010	0.010	0.034	0.011	0.011	0.010	0.010
551.0	0.018	0.012	0.018	0.015	0.012	0.018	0.015	0.020	0.013	0.012	0.014	0.012
564.0	0.010	0.009	0.010	0.013	0.009	0.006	0.009	0.011	0.008	0.008	0.008	0.013
564.1	0.014	0.015	0.063	0.017	0.012	0.011	0.011	0.011	0.011	0.009	0.010	0.009
557.0	0.025	0.010	0.013	0.015	0.013	0.010	0.016	0.014	0.009	0.008	0.013	0.007
554.8	0.010	0.013	0.014	0.016	0.010	0.010	0.009	0.010	0.009	0.010	0.024	0.009
556.0	0.012	0.009	0.013	0.018	0.012	0.008	0.012	0.009	0.010	0.010	0.013	0.007
Legend	**0.000**											**0.020**

Jocassee Monthly Averaged Surface Phosphorus (mg/L) 1991 to 2013 (Post Bad Creek Operation)

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
558.7	0.004	0.006	0.006	0.006	0.006	0.004	0.005	0.005	0.004	0.005	0.006	0.008
558.0	0.005	0.007	0.008	0.007	0.007	0.007	0.005	0.006	0.004	0.006	0.008	0.006
559.0	0.006	0.007	0.007	0.008	0.006	0.008	0.003	0.005	0.004	0.005	0.005	0.008
560.0	0.007	0.008	0.008	0.009	0.006	0.006	0.004	0.006	0.004	0.004	0.004	0.009
562.0	0.007	0.007	0.009	0.009	0.007	0.007	0.005	0.005	0.004	0.005	0.004	0.010
565.4	0.015	0.012	0.011	0.013	0.010	0.012	0.005	0.004	0.005	0.003	0.004	0.003
551.0	0.034	0.010			0.009			0.005			0.006	
564.0	0.012	0.010	0.010	0.009	0.008	0.008	0.005	0.004	0.005	0.010	0.004	0.004
564.1	0.010	0.009	0.009	0.009	0.007	0.011	0.004	0.004	0.017	0.004	0.005	0.004
557.0	0.007	0.006	0.013	0.007	0.007	0.007	0.005	0.006	0.004	0.005	0.005	0.010
554.8	0.009	0.007	0.010	0.010	0.008	0.008	0.005	0.004	0.004	0.007	0.006	0.015
556.0	0.007	0.006	0.008	0.008	0.008	0.008	0.004	0.005	0.004	0.008	0.005	0.012
Legend	**0.000**											**0.020**

Jocassee Monthly Surface Total Nitrogen (mg/L) 1987 to 1991 (Pre Bad Creek Operation)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Station	*558.7*	0.229	0.205	0.222	0.253	0.198	0.186	0.204	0.365	0.215	0.208	0.187	0.211
	558.0	0.196	0.229	0.203	0.239	0.213	0.183	0.245	0.330	0.200	0.290	0.216	0.185
	559.0	0.209	0.225	0.503	0.228	0.209	0.174	0.168	0.313	0.229	0.489	0.222	0.190
	560.0	0.222	0.232	0.212	0.216	0.224	0.178	0.189	0.269	0.211	0.200	0.210	0.199
	562.0	0.238	0.265	0.314	0.222	0.204	0.185	0.221	0.270	0.182	0.400	0.253	0.212
	565.4	0.216	0.219	0.218	0.227	0.186	0.166	0.170	0.223	0.172	0.336	0.182	0.188
	551.0		0.160										
	564.0	0.233	0.242	0.374	0.219	0.206	0.189	0.212	0.258	0.179	0.261	0.215	0.195
	564.1	0.238	0.250	0.290	0.242	0.216	0.202	0.200	0.256	0.200	0.200	0.208	0.203
	557.0	0.300	0.215	0.195	0.204	0.200	0.182	0.179	0.234	0.202	0.205	0.217	0.177
	554.8	0.191	0.186	0.203	0.185	0.179	0.166	0.169	0.248	0.215	0.266	0.182	0.173
	556.0	0.183	0.245	0.185	0.189	0.188	0.170	0.192	0.266	0.216	0.226	0.196	0.171
		Legend	**0.00**										**0.35**

Jocassee Monthly Averaged Surface Total Nitrogen (mg/L) 1991 to 2010 (Post Bad Creek Operation)

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Station	*558.7*												
	558.0		0.248			0.240			0.233			0.200	
	559.0		0.293			0.172			0.319			0.200	
	560.0		0.229			0.169			0.220			0.210	
	562.0		0.230			0.290			0.218			0.200	
	565.4												
	551.0												
	564.0		0.223			0.156			0.200			0.200	
	564.1		0.224			0.188			0.200			0.239	
	557.0		0.228			0.170			0.200			0.200	
	554.8												
	556.0		0.224			0.198			0.200			0.200	
		Legend	**0.00**										**0.35**

Jocassee Monthly Surface Chlorophyll a (ug/L) 1987 to 1991 (Pre Bad Creek Operation)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	558.7	1.71	2.11	3.03	3.00	2.29	1.38	1.67	2.89	2.48	2.70	3.38	4.09
	558.0	1.52	2.63	2.29	2.43	2.17	1.31	1.61	1.92	2.23	3.53	3.60	4.21
	559.0	1.45	2.53	2.61	1.65	1.47	1.40	1.70	1.82	1.84	3.30	3.25	3.22
	560.0	1.63	1.51	2.43	2.60	2.16	1.43	1.70	1.60	1.64	3.05	3.42	3.01
	562.0	1.85	2.98	4.55	3.71	1.36	1.37	1.97	1.86	1.42	2.80	4.43	4.60
	565.4	1.87	2.84	3.68	3.53	2.12	1.25	1.47	1.34	1.43	2.99	3.20	3.62
	551.0												
	564.0	1.79	2.94	2.82	3.69	2.40	1.60	1.33	1.38	1.73	2.89	3.34	2.81
	564.1	1.62	2.47	2.68	2.36	2.27	1.71	1.22	2.07	1.76	2.71	3.48	3.44
	557.0	1.58	1.99	2.61	2.91	1.91	1.44	1.24	1.26	1.65	2.46	3.64	3.68
	554.8	2.19	3.68	3.49	2.36	2.92	1.46	1.37	1.33	1.72	3.29	4.71	5.13
	556.0	1.98	2.46	3.15	3.25	2.14	1.50	1.11	1.06	1.59	3.54	3.14	3.90
		Legend	**0.00**										**10.00**

Jocassee Monthly Surface Chlorophyll a (ug/L) 1991 to 2010 (Post Bad Creek Operation)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	558.7	1.74	1.40	1.82	2.54	2.15	1.11	0.97	1.33	2.02	2.60	2.45	2.41
	558.0	1.61	1.38	1.83	2.51	2.19	1.39	1.21	1.51	2.18	2.46	2.48	2.38
	559.0	1.85	1.48	1.85	2.36	1.91	1.14	0.93	1.19	1.82	2.53	2.43	2.18
	560.0	1.58	1.24	1.96	3.44	2.72	1.25	1.48	1.39	2.22	2.56	2.43	2.15
	562.0	2.72	2.37	2.59	3.26	4.06	1.98	2.11	1.82	2.42	3.02	3.64	3.02
	565.4	2.29	2.15	1.55	3.83	3.37	1.29	1.14	1.48	2.29	2.71	2.98	3.10
	551.0		0.30			1.16			1.86			1.43	
	564.0	1.69	1.69	1.68	2.64	2.65	1.13	1.33	1.43	2.16	2.55	2.43	2.22
	564.1	1.87	1.79	1.40	2.36	3.03	1.39	1.48	1.67	1.94	2.30	2.25	1.65
	557.0	2.08	1.73	2.12	2.76	2.13	1.14	0.80	1.15	1.70	2.46	2.59	2.51
	554.8	3.28	4.06	3.08	3.43	2.59	1.70	1.38	1.63	2.05	3.46	4.18	3.82
	556.0	2.78	2.58	3.01	3.81	2.65	1.24	1.08	1.18	2.15	3.15	3.08	3.07
		Legend	**0.00**										**10.00**

Jocassee Monthly Averaged Surface Conductivity (uS/cm) 1987 to 1991 (Pre Bad Creek Operation)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Station	*558.7*	18.0	19.0	20.0	20.3	20.0	20.3	20.5	20.5	21.0	20.0	21.3	21.7
	558.0	16.1	17.1	16.5	17.6	16.5	16.5	18.3	18.4	17.5	18.5	17.2	17.9
	559.0	17.7	19.0	19.5	21.0	21.0	20.8	20.5	20.0	21.0	20.3	20.0	21.3
	560.0	15.4	16.8	16.4	16.9	17.2	16.7	17.9	18.0	16.8	17.4	16.3	16.9
	562.0	17.3	18.3	19.3	18.1	19.8	20.3	21.2	21.6	21.0	19.7	20.0	21.5
	565.4	17.7	18.5	19.0	18.5	20.3	19.3	20.3	20.3	20.8	19.7	20.3	21.0
	551.0	8.3	9.3	7.8	9.5	9.5	10.6	10.5	13.3	9.8	10.4	9.8	9.8
	564.0	16.8	16.8	15.6	17.3	18.4	18.1	18.8	18.5	17.8	17.1	16.5	18.5
	564.1	21.0	18.5	19.5	19.7	21.3	21.6	20.8	21.8	21.3	20.0	20.0	21.3
	557.0	15.3	16.6	16.1	17.1	16.7	17.0	18.2	18.1	17.3	17.6	16.5	17.2
	554.8	17.3	16.0	18.0	19.0	18.5	19.0	19.7	19.7	21.3	18.8	20.7	20.3
	556.0	15.0	15.2	15.4	16.6	15.9	16.7	16.6	16.2	16.6	16.6	15.8	17.7
		Legend	**15.0**										**25.0**

Jocassee Monthly Averaged Surface Conductivity (uS/cm) 1991 to 2020 (Post Bad Creek Operation)

Station		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Station	*558.7*	17.2	17.4	17.3	18.0	18.3	18.2	18.9	19.0	18.3	18.8	18.2	17.6
	558.0	17.4	17.8	18.0	18.1	18.4	18.5	19.1	19.4	19.3	19.2	18.6	17.5
	559.0	16.7	17.3	17.1	17.8	18.3	18.1	18.7	18.8	18.5	18.6	18.0	17.6
	560.0	16.7	16.9	17.3	17.8	18.2	18.2	18.6	18.7	18.3	18.4	17.8	17.3
	562.0	16.8	17.1	17.4	17.8	18.3	18.2	18.5	18.7	18.3	18.4	17.9	17.6
	565.4	16.8	15.3	17.8	16.3	18.0	16.8	17.3	17.8	17.3	16.8	16.5	15.8
	551.0	9.0	12.2	10.0	9.0	17.3	9.0	12.0	16.5	16.0	14.0	17.6	7.0
	564.0	16.9	17.0	17.8	18.0	18.5	18.4	18.7	19.0	18.4	18.4	17.6	17.7
	564.1	16.7	16.7	17.5	17.9	18.5	18.4	18.8	19.0	18.5	18.4	17.7	17.4
	557.0	17.1	17.4	17.6	17.9	18.0	18.1	18.8	19.1	18.9	18.7	18.2	17.8
	554.8	16.8	17.0	16.9	17.1	17.3	17.5	18.5	19.0	18.3	18.4	17.9	17.7
	556.0	16.9	17.1	17.3	17.5	17.5	17.7	18.6	19.0	18.4	18.6	18.0	17.7
		Legend	**15.0**										**25.0**

Jocassee Monthly Averaged Surface Turbidity (NTU) 1975 to 1986 (Pre Bad Creek Construction)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Station	*560.0*	5.5	2.3	4.6	1.9	3.2	2.5	2.1	2.6	9.3	1.7	1.9	2.8
	564.0	2.0	1.9	11.0	2.5	2.5	2.0	2.2	3.6	6.4	2.2	1.8	2.0
	564.1	*Measurements began in 1988*											

Jocassee Monthly Averaged Surface Turbidity (NTU) 1986 to 1991 (Bad Creek Construction)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Station	*560.0*	1.3	1.8	1.3	1.8	1.5	1.3	2.3	2.3	1.3	1.0	1.3	1.0
	564.0	1.6	1.8	1.8	2.0	1.5	1.7	1.6	3.8	2.2	1.3	1.3	1.0
	564.1	2.0	3.3	2.3	2.0	2.7	2.8	2.3	6.5	4.8	1.3	1.7	1.0

Jocassee Monthly Averaged Surface Turbidity (NTU) 1991 to 2015 (Post Bad Creek Construction)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Station	*560.0*	0.8	3.1	1.4	1.0	0.6	0.8	0.5	0.8	0.9	0.7	1.2	0.7
	564.0	0.8	3.1	1.5	1.0	0.6	0.8	0.5	0.8	0.9	0.7	1.3	0.6
	564.1	0.9	1.2	1.2	1.6	0.6	0.7	0.6	1.0	1.2	0.7	0.7	1.2
		Legend	**0.0**										**10.0**

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Whitewater River Cove

Water Quality Data

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Whitewater River Cove

Temperature Data

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Jocassee C_2_560.0: Monthly Average Water Temperatures (deg C) 1975 to 1985 (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.1	8.7	9.7	13.4	18.5	23.7	26.7	26.3	25.2	21.5	18.1	13.2
1095 to 1080	10.1	8.5	9.1	12.4	17.4	21.4	24.2	24.7	25.3	21.5	17.6	13.4
1080 to 1065	10.1	8.1	8.5	11.2	14.4	17.9	21.2	22.9	24.5	21.4	17.6	13.5
1065 to 1050	10.0	8.2	8.2	10.5	12.5	15.3	19.5	21.4	23.3	21.1	17.5	13.3
1050 to 1035	10.1	8.0	7.8	9.5	10.4	11.9	16.8	19.0	21.5	20.4	17.4	13.4
1035 to 1020	10.0	7.9	7.7	9.0	9.8	10.0	12.9	14.5	15.9	17.2	16.0	13.0
1020 to 1005	10.0	7.9	7.3	8.6	8.7	8.3	10.9	10.5	10.7	12.5	12.3	11.4
1005 to 990	9.9	7.8	7.2	8.4	8.6	8.1	8.5	8.7	9.0	10.0	9.4	8.8
990 to 975	9.7	7.8	7.2	8.1	8.3	8.2	8.4	8.4	8.2	8.5	8.4	8.5
975 to 960	9.3	7.7		8.2	9.4	7.0	7.9	7.8	8.4	8.6	8.2	8.1
960 to 945		8.2	8.0	8.6			8.7	7.1		8.8		
945 to 930		7.9		8.2	8.1	7.3	8.6	8.3	7.3	7.8	7.0	
930 to 915				8.6			8.4			8.6		
915 to 900	8.3	7.5	7.0	7.9	8.1	7.8	8.0	7.9	7.9	8.2	7.6	7.9
900 to 885									8.3	8.4	8.2	
885 to 870				7.7						8.4		
870 to 855										8.3		
< 855	*Minimum Reading 854.4 ft*											

Jocassee C_2_560.0: Monthly Average Water Temperatures (deg C) 1985 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.6	10.1	11.2	16.3	21.3	26.0	25.8	26.2	24.9	21.6	18.6	13.5
1095 to 1080	10.5	9.6	11.3	14.2	17.9	22.4	24.9	26.1	24.8	21.7	17.9	13.3
1080 to 1065	10.5	9.5	10.6	13.1	16.4	20.7	23.3	25.3	24.8	21.5	17.7	13.4
1065 to 1050	10.4	9.5	10.2	12.2	15.5	19.5	22.4	24.6	24.8	21.7	17.8	13.4
1050 to 1035	10.4	9.5	9.9	11.5	14.7	18.7	21.6	24.1	24.6	21.5	17.8	13.6
1035 to 1020	10.4	9.3	9.8	11.1	13.8	17.5	20.6	22.9	23.8	21.4	17.7	13.4
1020 to 1005	10.4	9.4	9.7	10.7	12.6	15.4	17.6	19.3	20.5	20.5	17.6	13.4
1005 to 990	10.4	9.3	9.5	10.2	11.5	12.8	13.6	13.8	14.0	14.5	16.2	13.4
990 to 975	10.3	9.3	9.5	9.8	10.6	10.9	11.3	10.9	11.1	10.9	12.2	12.3
975 to 960	10.1	9.3	9.3	9.5	10.0	10.1	10.3	10.2	10.3	10.0	10.1	10.6
960 to 945	9.8	9.3	9.3	9.3	9.7	9.7	9.9	9.8	9.8	9.7	9.8	9.7
945 to 930	9.4	9.2	9.3	9.2	9.5	9.6	9.9	9.6	9.6	9.4	9.6	9.5
930 to 915	9.3	9.0	9.2	9.1	9.4	9.4	9.5	9.5	9.5	9.4	9.5	9.4
915 to 900	9.1	8.9	9.0	9.0	9.2	9.3	9.5	9.4	9.3	9.3	9.4	9.2
900 to 885	9.0	8.8	8.9	8.9	9.1	9.1	9.4	9.3	9.3	9.2	9.2	9.2
885 to 870	9.0	8.8	8.9	8.8	9.2	9.1	9.4	9.2	9.2	9.1	9.3	9.1
870 to 855	8.9	8.6	8.7	8.7	9.0	9.1	9.2	9.2	9.3	9.1	9.2	9.1
< 855	8.9	8.5	8.6	8.7	8.7	9.0	9.1	9.1	8.9	9.0	9.2	9.0

Jocassee C_2_560.0: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.9	9.9	11.5	15.2	20.3	24.6	26.3	26.4	25.1	21.4	17.9	14.2
1095 to 1080	10.8	9.9	11.3	14.5	18.2	22.3	24.9	26.4	25.2	21.6	17.6	13.9
1080 to 1065	10.8	9.7	10.7	13.4	16.7	20.6	23.7	25.7	25.0	21.6	17.6	14.1
1065 to 1050	10.8	9.7	10.4	12.4	15.5	19.1	22.4	24.5	24.8	21.6	17.7	14.0
1050 to 1035	10.8	9.6	10.1	11.4	13.8	17.5	20.8	23.3	23.7	21.5	17.5	13.9
1035 to 1020	10.7	9.6	9.9	11.0	12.9	15.7	18.7	21.2	22.3	20.8	17.4	14.0
1020 to 1005	10.8	9.6	9.7	10.4	11.6	13.3	15.1	16.6	18.0	18.9	16.9	13.9
1005 to 990	10.7	9.5	9.5	10.0	10.5	11.1	11.9	12.2	12.5	13.1	14.1	13.0
990 to 975	10.3	9.5	9.5	9.7	9.9	10.1	10.2	10.3	10.3	10.4	10.8	11.3
975 to 960	10.0	9.4	9.3	9.5	9.6	9.6	9.7	9.7	9.8	9.8	9.9	10.1
960 to 945	9.6	9.3	9.2	9.3	9.3	9.4	9.5	9.5	9.5	9.6	9.6	9.5
945 to 930	9.3	9.1	9.2	9.1	9.1	9.2	9.3	9.3	9.3	9.3	9.4	9.3
930 to 915	9.2	9.1	9.1	9.1	9.1	9.2	9.3	9.3	9.3	9.3	9.3	9.2
915 to 900	9.1	9.1	9.0	9.0	9.0	9.1	9.1	9.2	9.2	9.2	9.3	9.2
900 to 885	9.1	8.9	8.9	9.0	8.9	9.0	9.1	9.1	9.1	9.1	9.2	9.1
885 to 870	8.9	8.9	8.9	8.8	8.8	9.0	9.0	9.1	9.1	9.1	9.1	9.1
870 to 855	9.1	8.9	8.7	8.9	9.0	9.0	9.0	9.1	9.1	9.1	9.2	9.1
< 850	8.6	8.4	8.6	8.6	8.6	8.8	8.7	8.7	8.9	8.7	9.2	9.1

Legend	8										25

Jocassee D_2_564.0: Monthly Average Water Temperatures (deg C) 1976 to 1985 (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.1	8.8	10.0	13.6	18.5	24.8	27.3	26.5	25.2	21.6	17.5	13.0
1095 to 1080	10.0	8.4	9.2	12.3	17.5	23.2	24.7	24.5	25.2	21.6	17.2	12.9
1080 to 1065	9.9	7.9	8.6	11.0	14.9	18.4	21.6	22.8	24.4	21.4	17.3	13.0
1065 to 1050	9.9	8.0	8.1	10.2	12.2	15.7	20.1	21.4	23.2	21.2	17.2	12.8
1050 to 1035	9.9	7.8	7.8	9.4	9.7	10.4	16.5	19.2	21.5	20.7	17.2	13.2
1035 to 1020	9.9	7.8	7.7	9.1	8.7	8.2	12.4	14.9	16.0	17.9	15.6	12.5
1020 to 1005	9.9	7.7	7.4	8.7	7.9	7.5	11.2	11.0	10.6	12.9	12.5	10.8
1005 to 990	9.7	7.6	7.4	8.4	7.8	7.4	8.4	8.9	9.2	10.1	9.4	8.0
990 to 975	9.6	7.6	7.5	8.2	7.7	7.5	9.1	8.4	8.2	8.5	7.8	7.4
975 to 960	9.5	7.1		8.5	8.5	7.4	8.3	7.8	8.4	9.2	7.8	7.4
960 to 945		8.2	8.2	8.8			9.5			9.0		
945 to 930		8.2		8.8						8.4		
930 to 915												
915 to 900												
900 to 885												
885 to 870							*Minimum Reading 937.5 ft*					
870 to 855												
< 855												

Jocassee D_2_564.0: Monthly Average Water Temperatures (deg C) 1985 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.6	10.2	11.4	16.8	20.9	24.8	25.8	26.5	25.4	21.7	18.0	13.6
1095 to 1080	10.5	9.7	11.2	14.5	17.9	21.8	24.3	26.0	25.1	21.7	17.8	13.4
1080 to 1065	10.4	9.5	10.7	13.0	16.3	20.1	23.1	25.0	25.1	21.5	17.6	13.5
1065 to 1050	10.4	9.5	10.3	12.1	15.5	19.0	22.0	24.4	24.8	21.7	17.7	13.4
1050 to 1035	10.4	9.5	10.0	11.5	14.7	17.9	21.3	23.9	24.6	21.5	17.7	13.6
1035 to 1020	10.4	9.3	9.8	11.2	13.8	16.7	19.8	22.6	23.8	21.4	17.7	13.4
1020 to 1005	10.3	9.4	9.7	10.7	12.8	14.6	16.6	18.8	20.8	20.4	17.5	13.4
1005 to 990	10.3	9.3	9.5	10.2	11.6	12.2	13.1	13.5	14.3	14.6	16.2	13.3
990 to 975	10.3	9.3	9.5	9.8	10.7	10.8	11.2	11.1	11.3	10.9	12.2	12.4
975 to 960	10.0	9.4	9.3	9.5	10.0	10.2	10.4	10.4	10.5	10.1	10.1	10.7
960 to 945	9.7	9.2	9.3	9.4	9.6	9.9	10.1	10.0	10.0	9.8	9.8	9.8
945 to 930	9.4	9.2	9.2	9.2	9.4	9.8	10.0	9.7	9.9	9.5	9.6	9.6
930 to 915	9.3	9.0	9.1	9.2	9.3	9.6	9.7	9.7	9.8	9.5	9.5	9.4
915 to 900	9.1	8.9	9.0	9.1	9.2	9.5	9.7	9.6	9.6	9.4	9.4	9.2
900 to 885	9.1	8.8	8.9	9.0	9.1	9.4	9.6	9.6	9.5	9.3	9.2	9.3
885 to 870	9.1	8.8	8.9	8.8	9.1	9.1	9.5	9.6	9.6	9.2	9.3	9.1
870 to 855	9.4		8.6	8.5	9.0	9.2	9.7	9.2	9.9	9.4	9.8	8.9
< 855							*Minimum Reading 864.7 ft*					

Jocassee D_2_564.0: Monthly Average Water Temperatures (deg C) 1991 to 2015 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	11.1	10.4	11.7	15.6	20.4	24.6	26.3	26.2	25.1	21.4	18.2	14.3
1095 to 1080	10.8	10.1	11.4	14.4	18.2	22.6	25.1	26.5	25.2	21.7	17.8	14.0
1080 to 1065	10.9	10.0	10.8	13.5	16.9	20.9	24.0	26.0	25.0	21.7	17.8	14.1
1065 to 1050	10.8	10.0	10.6	12.7	16.0	19.7	22.9	24.9	24.9	21.6	17.8	14.1
1050 to 1035	10.8	9.9	10.3	12.0	14.3	17.9	21.3	23.7	23.8	21.5	17.7	14.0
1035 to 1020	10.7	9.9	10.1	11.4	13.2	15.9	18.9	21.7	22.5	20.8	17.5	14.0
1020 to 1005	10.8	9.8	9.9	10.6	12.0	13.6	15.5	17.1	18.6	19.3	17.0	13.8
1005 to 990	10.8	9.7	9.7	10.2	10.6	11.5	12.4	12.7	13.3	13.6	14.6	13.1
990 to 975	10.5	9.7	9.7	10.0	10.1	10.5	10.5	10.6	10.6	10.8	11.1	11.7
975 to 960	10.2	9.6	9.5	9.7	9.7	9.9	9.9	10.0	10.0	10.0	10.0	10.3
960 to 945	9.9	9.5	9.4	9.6	9.5	9.7	9.7	9.7	9.7	9.8	9.8	9.7
945 to 930	9.6	9.4	9.3	9.5	9.3	9.5	9.5	9.6	9.5	9.6	9.6	9.6
930 to 915	9.4	9.3	9.3	9.4	9.2	9.4	9.4	9.5	9.5	9.5	9.5	9.4
915 to 900	9.4	9.2	9.2	9.3	9.0	9.3	9.3	9.4	9.4	9.5	9.4	9.4
900 to 885	9.3	9.1	9.0	9.1	9.2	9.2	9.1	9.3	9.3	9.3	9.4	9.2
885 to 870	9.1	8.9	9.1	9.0	9.2	9.4	9.2	9.4	9.5	9.2	9.5	9.3
870 to 855	9.2	8.2	9.5	8.9		10.0	9.1	9.3		9.0	10.3	
< 850							*Minimum Reading 864.4 ft*					

Legend	8										25

Jocassee D_2_564.1: Monthly Average Water Temperatures (deg C) 1987 to 1985 (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Temperature Readings Began During Bad Creek Construction (1987)

Jocassee D_2_564.1: Monthly Average Water Temperatures (deg C) 1985 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.9	11.6	12.6	16.0	20.8	24.2	26.1	26.8	25.8	21.6	18.2	13.5
1095 to 1080	10.6	10.2	11.2	14.2	18.3	21.8	24.6	26.0	25.4	21.8	17.9	13.4
1080 to 1065	9.8	9.2	10.8	13.3	16.9	20.3	23.1	25.2	25.1	21.3	17.6	13.1
1065 to 1050	8.8	8.2	9.4	11.9	15.3	18.0	21.5	24.0	23.9	20.3	16.1	11.4
1050 to 1035	8.4	8.2	8.4	10.1	12.6	14.5	18.2	21.5	23.1	19.9	15.6	11.3
1035 to 1020	8.4	8.0	8.1	9.0	10.4	11.1	13.5	16.8	20.6	19.5	15.5	10.8
1020 to 1005	8.3	7.9	7.6	8.1	8.8	10.0	12.6	15.2	17.5	19.2	15.3	11.0
1005 to 990	8.3	8.0	7.5	7.8	8.3	8.9	9.9	12.2	14.8	16.9	15.3	11.1
990 to 975	8.3	8.2	7.5	7.9	8.6	8.9	9.5	11.3	13.7	14.7	14.7	11.0
975 to 960	8.2	7.8	6.7	7.2	8.6	8.9	9.6	11.0	13.2	13.0	13.1	9.9
960 to 945					8.6							
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 959.9 ft

Jocassee D_2_564.1: Monthly Average Water Temperatures (deg C) 1991 to 2017 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	11.1	10.3	11.3	14.8	20.1	23.5	25.4	26.1	24.9	21.3	18.2	14.3
1095 to 1080	10.7	10.1	11.0	14.0	18.4	22.4	24.7	26.2	25.2	21.5	17.8	13.9
1080 to 1065	10.7	10.0	10.9	13.7	17.2	21.3	24.3	25.7	25.1	21.7	17.8	13.9
1065 to 1050	10.5	9.8	10.7	13.3	16.4	20.8	23.8	24.9	25.0	21.5	17.7	13.8
1050 to 1035	10.6	9.7	10.8	13.2	15.9	20.3	23.5	25.0	24.9	21.6	17.6	13.7
1035 to 1020	10.4	9.6	10.8	13.1	16.0	19.9	23.3	24.8	24.8	21.5	17.4	13.7
1020 to 1005	10.3	9.7	10.8	13.0	15.9	19.8	23.1	24.7	24.8	21.5	17.6	13.6
1005 to 990	10.4	9.5	10.4	12.7	15.2	19.0	22.4	24.3	24.5	21.3	17.3	13.6
990 to 975	10.0	9.5	10.5	12.3	15.4	19.0	22.2	24.0	24.3	20.9	17.0	13.4
975 to 960	10.2	9.4	9.9	12.1	14.5	17.8	21.5	22.4	23.7	20.0	16.8	13.2
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 850												
	Legend	8										25

Minimum Reading 963 ft

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Whitewater River Cove

Dissolved Oxygen

Jocassee C_2_560.0: Monthly Averaged Dissolved Oxygen (mg/l) 1975 to 1985 (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.2	9.7	10.5	10.7	9.9	9.2	8.8	8.5	8.6	8.3	8.7	8.9
1095 to 1080	9.1	9.7	10.2	10.9	10.5	9.6	10.0	9.0	8.7	8.3	8.6	9.0
1080 to 1065	9.1	9.4	10.2	10.7	10.1	10.3	10.4	9.1	8.6	8.2	8.6	9.0
1065 to 1050	9.1	9.3	10.1	10.5	9.9	10.0	10.1	8.8	7.8	8.0	8.7	9.1
1050 to 1035	9.0	9.0	9.6	10.0	9.6	9.7	9.6	8.6	7.4	7.6	8.9	9.0
1035 to 1020	9.0	9.0	9.6	9.4	8.9	9.0	9.0	8.3	7.6	6.8	8.7	9.1
1020 to 1005	8.8	8.8	9.1	9.1	8.2	8.1	8.3	7.7	7.3	6.5	6.4	8.1
1005 to 990	8.5	8.8	8.9	8.7	7.6	7.1	7.6	7.0	6.4	5.7	5.5	5.8
990 to 975	5.5	8.9	8.3	8.7	7.0	6.3	6.8	6.1	5.9	5.9	4.6	5.1
975 to 960	2.2	7.6		7.9	5.5	7.9	6.9	6.6	4.7	4.8	4.7	4.6
960 to 945		8.2	5.6	7.5			6.4	5.8		4.7		
945 to 930		6.6		7.5	4.0	6.0	4.4	5.2	5.6	5.1	7.1	
930 to 915				6.1			3.0			4.6		
915 to 900	0.7	6.2	7.4	6.8	5.2	6.2	3.7	4.0	4.3	3.7	4.6	3.4
900 to 885									1.6	0.6	1.2	
885 to 870										0.0		
870 to 855										0.0		
< 855	*Minimum Reading 856.1 ft*											

Jocassee C_2_560.0: Monthly Averaged Dissolved Oxygen (mg/l) 1985 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.7	9.7	9.8	10.3	9.3	8.2	8.5	8.2	7.9	8.2	8.4	9.1
1095 to 1080	9.6	9.2	9.9	10.3	9.7	9.1	8.8	8.2	7.8	7.9	8.4	9.0
1080 to 1065	9.5	9.0	9.8	10.1	9.7	9.4	8.9	8.1	7.8	7.9	8.5	9.0
1065 to 1050	9.4	9.1	9.6	9.9	9.6	9.2	8.8	7.6	7.5	7.9	8.3	9.0
1050 to 1035	9.4	9.0	9.3	9.7	9.5	9.1	8.6	7.4	7.0	7.8	8.4	9.0
1035 to 1020	9.4	8.7	9.2	9.5	9.3	9.0	8.2	7.0	6.4	7.5	8.4	8.9
1020 to 1005	9.4	8.8	9.1	9.4	9.1	8.6	7.8	6.4	5.4	6.6	8.2	9.0
1005 to 990	9.4	8.7	8.9	9.3	9.1	8.3	7.6	6.2	6.0	4.7	7.1	8.8
990 to 975	9.4	8.7	8.7	9.0	8.8	8.2	7.7	6.6	6.5	5.4	5.7	7.4
975 to 960	8.9	8.4	8.4	8.7	8.4	7.8	7.3	6.5	6.2	5.8	5.6	5.5
960 to 945	6.8	8.2	8.5	8.4	7.9	7.2	6.7	6.0	5.9	5.5	5.3	4.6
945 to 930	5.3	7.3	8.3	8.0	7.5	6.9	6.3	5.6	5.5	5.1	4.8	4.0
930 to 915	4.4	6.6	8.2	7.1	7.0	6.2	5.9	5.1	5.0	4.2	4.3	3.6
915 to 900	2.0	5.3	7.4	6.4	6.5	5.5	5.1	4.4	4.5	3.7	3.8	3.3
900 to 885	1.6	4.6	6.7	6.0	6.1	5.1	4.6	3.6	3.9	2.7	3.2	2.7
885 to 870	1.1	3.8	5.5	4.9	4.8	4.5	3.9	3.2	3.2	2.1	2.4	1.9
870 to 855	1.4	5.3	5.4	4.3	4.4	3.9	3.6	2.8	2.1	1.3	1.7	1.4
< 855	0.9	5.2	5.1	4.0	5.6	3.5	3.4	2.4	2.5	0.7	1.2	1.4

Jocassee C_2_560.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.2	9.3	10.0	9.9	9.0	8.3	8.1	7.9	7.7	7.6	8.1	8.7
1095 to 1080	9.0	9.2	9.9	9.9	9.1	8.5	8.1	7.7	7.5	7.6	8.2	8.6
1080 to 1065	8.9	9.1	9.9	9.8	9.1	8.7	8.2	7.6	7.3	7.6	8.2	8.6
1065 to 1050	8.9	9.0	9.7	9.7	9.2	8.7	8.2	7.6	7.2	7.6	8.1	8.6
1050 to 1035	8.9	9.0	9.6	9.5	9.1	8.7	8.1	7.2	6.8	7.5	8.1	8.5
1035 to 1020	8.8	8.9	9.4	9.4	9.0	8.5	7.9	6.9	6.3	7.2	8.0	8.5
1020 to 1005	8.8	8.7	9.3	9.3	8.9	8.5	7.9	7.0	6.1	6.1	7.6	8.4
1005 to 990	8.8	8.7	9.1	9.0	8.7	8.3	7.9	7.2	6.5	5.8	6.1	7.5
990 to 975	8.0	8.6	8.8	8.6	8.2	7.7	7.2	6.7	6.3	5.8	5.4	5.5
975 to 960	6.7	8.1	8.4	8.1	7.6	6.9	6.4	5.9	5.5	5.0	4.6	4.2
960 to 945	4.8	7.2	7.7	7.4	7.0	6.1	5.7	5.3	5.0	4.4	4.1	3.6
945 to 930	3.6	6.2	7.1	6.6	6.4	5.5	5.3	4.8	4.7	4.0	3.8	3.0
930 to 915	2.8	5.6	6.2	5.7	5.9	5.1	4.7	4.2	4.1	3.7	3.5	2.6
915 to 900	2.2	5.1	5.4	5.4	5.6	4.7	4.5	4.0	3.9	3.3	3.0	2.4
900 to 885	2.0	4.5	5.1	5.0	5.5	4.3	4.2	3.8	3.5	2.8	2.8	2.7
885 to 870	2.4	4.6	4.6	4.6	4.8	4.4	4.2	3.3	3.4	2.8	2.8	1.9
870 to 855	1.8	4.9	5.1	4.6	4.1	3.9	3.6	3.2	3.0	2.1	2.0	1.9
< 855	2.2	4.8	5.3	4.2	4.3	4.1	4.0	3.7	2.8	2.5	2.5	1.7

Legend	**6.0**										**10.0**

Jocassee D_2_564.0: Monthly Averaged Dissolved Oxygen (mg/l) 1976 to 1985 (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.8	10.2	10.6	10.8	10.3	9.1	8.6	8.8	8.8	8.4	8.7	9.0
1095 to 1080	9.8	10.0	10.3	10.9	10.8	9.5	8.8	9.0	8.8	8.4	8.6	8.9
1080 to 1065	9.8	9.8	10.2	10.9	10.8	10.4	9.4	8.7	9.0	8.3	8.7	9.0
1065 to 1050	9.8	9.7	10.2	10.9	10.4	9.8	9.1	8.2	8.3	8.3	8.8	9.1
1050 to 1035	9.8	9.6	10.1	10.6	9.2	9.0	8.5	7.7	7.0	8.2	9.1	9.1
1035 to 1020	9.8	9.6	9.9	10.3	8.3	7.8	6.7	6.4	5.5	7.3	8.2	9.3
1020 to 1005	9.8	9.5	9.7	9.8	7.2	6.0	5.5	4.0	2.4	3.3	6.1	8.7
1005 to 990	9.9	9.6	9.7	9.2	6.2	4.9	4.6	1.5	0.6	1.3	1.8	5.0
990 to 975	10.0	9.9	9.6	8.7	5.8	4.5	5.1	1.0	0.6	0.8	0.1	1.4
975 to 960	10.0	10.2		8.6	5.3	4.5	3.9	1.2	0.5	1.0	0.1	1.2
960 to 945		9.5	9.5	9.2			6.1			1.0		
945 to 930		9.4		9.0						1.6		
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 937.5 ft

Jocassee D_2_564.0: Monthly Averaged Dissolved Oxygen (mg/l) 1985 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.7	9.7	9.9	10.1	9.4	8.5	8.7	6.7	8.0	8.2	8.4	9.1
1095 to 1080	9.6	9.2	10.0	10.2	9.7	9.2	9.1	7.3	7.8	7.9	8.5	9.0
1080 to 1065	9.4	9.1	9.8	10.1	9.8	9.5	9.1	6.7	7.7	7.9	8.5	9.0
1065 to 1050	9.4	9.1	9.8	9.8	9.8	9.3	8.9	6.6	7.4	7.9	8.3	9.0
1050 to 1035	9.4	9.0	9.5	9.7	9.6	9.0	8.7	6.6	7.3	7.7	8.4	9.0
1035 to 1020	9.4	8.7	9.3	9.6	9.3	8.8	8.2	5.9	6.7	7.6	8.3	9.0
1020 to 1005	9.4	8.9	9.2	9.5	9.1	8.5	7.6	5.3	5.4	6.8	8.2	9.0
1005 to 990	9.4	8.9	9.0	9.3	9.0	8.2	7.5	4.7	5.6	4.3	7.4	8.9
990 to 975	9.4	9.1	8.9	9.1	8.8	8.0	7.4	4.8	5.8	4.5	5.0	7.8
975 to 960	9.5	8.9	8.6	8.7	8.3	7.5	6.9	4.5	5.5	4.5	4.3	5.4
960 to 945	8.8	9.2	8.6	8.2	7.8	7.0	6.3	4.1	4.9	4.2	3.5	3.4
945 to 930	6.7	9.3	8.5	7.9	7.2	6.2	5.7	3.7	4.2	3.2	2.4	2.2
930 to 915	5.5	8.0	8.3	7.0	6.4	4.9	4.6	2.9	2.9	2.1	1.8	1.5
915 to 900	4.7	5.7	7.4	6.6	5.6	3.8	3.3	2.1	2.1	1.6	1.5	1.1
900 to 885	4.0	4.9	7.4	5.9	5.2	3.2	2.5	1.2	1.5	0.9	1.1	0.6
885 to 870	3.3	4.3	6.1	4.0	3.8	3.1	2.3	0.8	0.7	0.4	0.6	0.7
870 to 855	0.0		7.9	7.2	4.6	1.5	1.7	2.2	0.0	0.0	0.0	0.7
< 855	*Minimum Reading 864.7 ft*											

Jocassee D_2_564.0: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2015 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.1	9.3	9.9	9.8	9.0	8.2	8.2	7.9	7.7	7.6	8.1	8.8
1095 to 1080	8.9	9.2	9.8	9.8	9.1	8.5	8.1	7.7	7.4	7.6	8.2	8.6
1080 to 1065	8.9	9.1	9.7	9.6	9.1	8.7	8.2	7.6	7.3	7.6	8.2	8.6
1065 to 1050	8.9	9.0	9.6	9.5	9.1	8.7	8.2	7.6	7.1	7.5	8.1	8.6
1050 to 1035	8.8	9.0	9.5	9.4	9.0	8.6	8.1	7.3	6.9	7.5	8.1	8.6
1035 to 1020	8.8	8.9	9.3	9.3	9.0	8.5	7.8	7.0	6.4	7.3	8.0	8.6
1020 to 1005	8.8	8.8	9.1	9.1	8.9	8.4	7.8	6.9	5.9	6.4	7.6	8.4
1005 to 990	8.8	8.8	8.9	8.8	8.6	8.1	7.6	6.7	5.8	5.3	6.1	7.6
990 to 975	8.3	8.7	8.7	8.4	8.1	7.6	6.8	6.1	5.4	5.0	4.6	5.5
975 to 960	6.8	8.2	8.3	7.9	7.5	6.7	6.0	5.4	4.7	4.1	3.8	3.7
960 to 945	5.7	7.6	7.8	7.3	6.8	5.8	5.3	4.9	4.1	3.3	3.0	2.9
945 to 930	3.6	6.8	7.2	6.5	6.3	5.1	4.8	4.2	3.6	2.7	2.3	2.1
930 to 915	2.7	6.0	6.4	5.3	5.6	4.5	4.0	3.5	2.8	2.3	1.9	1.8
915 to 900	2.1	5.7	5.3	5.0	5.4	4.0	3.9	3.1	2.7	1.9	1.6	1.7
900 to 885	1.7	5.3	4.8	4.1	3.7	2.8	3.4	2.6	2.1	1.5	1.2	1.9
885 to 870	2.3	3.9	3.3	4.4	2.9	2.7	3.0	2.2	2.0	2.2	1.0	1.4
870 to 855	0.1	4.3	3.1	5.2		0.0	0.4	2.8		2.3	0.0	
< 855	*Minimum Reading 864.4 ft*											

Legend	**6.0**										**10.0**

Jocassee D_2_564.1: Monthly Averaged Dissolved Oxygen (mg/l) (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Readings Began During Bad Creek Construction (1987)

Jocassee D_2_564.1: Monthly Averaged Dissolved Oxygen (mg/l) 1987 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	10.0	10.6	9.8	10.2	9.3	8.7	8.6	5.4	7.9	8.2	8.3	9.2
1095 to 1080	9.8	9.5	10.0	10.2	9.5	8.9	8.7	6.3	7.7	8.0	8.5	9.2
1080 to 1065	10.0	9.7	10.0	10.1	9.5	9.0	8.6	5.9	7.6	8.1	8.6	9.2
1065 to 1050	10.6	10.6	10.2	10.3	9.4	8.5	8.2	5.5	7.5	8.0	8.7	9.7
1050 to 1035	10.7	10.4	10.1	10.3	9.2	7.7	6.8	4.7	7.0	7.8	8.6	9.8
1035 to 1020	10.7	10.2	10.0	9.8	8.7	6.2	5.3	2.7	4.6	7.7	8.5	9.9
1020 to 1005	10.6	10.4	9.8	9.1	7.7	5.1	3.8	2.2	1.0	6.2	8.4	9.8
1005 to 990	10.6	10.2	9.3	8.0	5.8	2.9	1.5	0.9	0.1	1.7	8.1	9.7
990 to 975	10.6	10.0	9.0	7.3	4.1	2.1	0.3	0.3	0.0	0.0	5.4	9.7
975 to 960	10.5	9.9	9.5	8.7	2.8	1.5	0.0	0.4	0.0	0.0	1.9	10.1
960 to 945					2.7							
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 963 ft

Jocassee D_2_564.1: Monthly Averaged Dissolved Oxygen (mg/l) 1991 to 2017 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	9.2	9.5	9.7	9.7	8.9	8.3	8.2	7.8	7.3	7.5	8.1	8.8
1095 to 1080	9.0	9.4	9.7	9.7	9.0	8.4	8.1	7.6	7.2	7.5	8.1	8.6
1080 to 1065	9.1	9.3	9.6	9.6	9.0	8.5	8.2	7.6	7.2	7.5	8.1	8.6
1065 to 1050	9.1	9.4	9.6	9.6	9.0	8.5	8.3	7.6	7.1	7.5	8.1	8.7
1050 to 1035	9.1	9.4	9.6	9.5	9.0	8.6	8.2	7.5	7.1	7.4	8.1	8.6
1035 to 1020	9.2	9.4	9.6	9.5	9.0	8.6	8.1	7.6	7.1	7.4	8.1	8.7
1020 to 1005	9.1	9.3	9.6	9.4	8.9	8.6	8.1	7.6	7.1	7.4	8.0	8.7
1005 to 990	9.2	9.4	9.6	9.4	8.9	8.6	8.4	7.6	7.1	7.4	8.1	8.7
990 to 975	9.1	9.5	9.6	9.4	8.7	8.6	8.1	7.6	6.9	7.4	8.2	8.7
975 to 960	9.3	9.4	9.8	9.5	8.8	8.3	8.4	7.1	6.8	7.5	8.2	8.9
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 959.9 ft

Legend	6.0										10.0

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Whitewater River Cove

Dissolved Oxygen Saturation

Jocassee C_2_560.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)

Range	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Saturation Readings Began in 1998

Jocassee C_2_560.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Bad Creek Construction)

Measurement Reading Range (ft msl)

Range	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1095 to 1110												
1080 to 1095												
1065 to 1080												
1050 to 1065												
1035 to 1050												
1020 to 1035												
1005 to 1020												
990 to 1005												
975 to 990												
960 to 975												
945 to 960												
930 to 945												
915 to 930												
900 to 915												
885 to 900												
870 to 885												
855 to 870												
< 855												

DO Saturation Readings Began in 1998

Jocassee C_2_560.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1998 to 2015 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)

Range	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	85.8	84.8	94.3	98.7	99.4	101.7	98.5	100.6	95.8	87.4	89.2	88.0
1095 to 1080	83.3	84.3	92.9	97.4	96.2	100.1	96.2	98.7	92.9	88.8	88.4	85.7
1080 to 1065	82.8	82.1	90.9	94.8	94.5	99.0	95.6	95.8	90.9	88.3	87.8	85.7
1065 to 1050	83.1	81.6	88.6	92.2	92.2	96.8	93.4	93.3	89.0	88.3	87.5	85.2
1050 to 1035	82.0	80.9	86.7	88.9	88.8	94.2	90.1	88.5	86.3	87.6	87.3	84.9
1035 to 1020	82.1	80.1	84.0	87.5	87.5	90.1	84.2	81.0	78.3	84.6	86.9	84.9
1020 to 1005	81.9	77.9	82.3	84.6	84.1	84.8	78.3	74.8	66.1	72.1	83.1	83.7
1005 to 990	81.7	76.6	80.3	81.0	80.0	78.3	72.0	69.5	61.8	56.1	62.8	76.3
990 to 975	73.2	76.4	78.0	76.1	74.3	70.9	63.9	61.9	57.2	53.4	49.8	54.5
975 to 960	58.6	69.8	74.5	71.8	69.1	62.3	55.6	54.2	50.0	45.8	43.1	40.0
960 to 945	40.4	61.3	68.5	66.5	63.4	55.5	49.0	48.9	45.7	40.5	39.2	32.6
945 to 930	30.1	54.3	64.4	61.4	60.4	50.8	46.9	45.6	44.0	37.5	37.5	29.4
930 to 915	23.3	50.8	58.1	52.3	56.3	47.2	39.7	39.5	39.3	34.2	33.9	24.9
915 to 900	18.8	47.5	51.0	51.1	54.3	44.1	39.1	38.6	37.2	30.6	29.7	22.4
900 to 885	18.2	41.5	49.8	49.2	53.9	42.3	37.9	38.4	33.2	27.4	29.4	25.0
885 to 870	22.7	39.7	42.8	40.5	50.9	42.7	39.2	34.7	33.2	26.4	28.3	19.9
870 to 855	17.9	43.3	46.4	41.7	42.9	38.3	33.1	33.3	27.7	19.7	20.3	18.1
< 855	14.4	57.1	72.7	54.1	55.8	45.6	36.3	43.6	35.7	19.2	24.3	15.3

Legend	**0.0**										**100.00**

Jocassee D_2_564.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Saturation Readings Began in 1999

Jocassee D_2_564.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1095 to 1110												
1080 to 1095												
1065 to 1080												
1050 to 1065												
1035 to 1050												
1020 to 1035												
1005 to 1020												
990 to 1005												
975 to 990												
960 to 975												
945 to 960												
930 to 945												
915 to 930												
900 to 915												
885 to 900												
870 to 885												
855 to 870												
< 855												

DO Saturation Readings Began in 1999

Jocassee D_2_564.0: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1999 to 2015 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	87.0	86.4	94.6	99.0	99.8	101.8	98.9	101.0	95.8	87.5	88.7	88.7
1095 to 1080	83.8	84.2	92.3	96.8	96.1	100.4	96.5	98.2	92.4	88.4	87.8	85.9
1080 to 1065	83.3	82.3	89.8	94.4	94.5	99.2	95.1	95.9	90.7	88.1	87.5	85.9
1065 to 1050	83.3	82.2	88.3	92.0	92.7	97.2	93.7	93.7	88.9	87.8	87.0	85.5
1050 to 1035	82.5	81.2	86.7	89.5	89.3	94.3	90.3	89.2	87.1	86.9	87.0	85.1
1035 to 1020	82.4	80.5	83.9	87.2	87.4	89.7	83.2	81.7	78.8	84.8	86.5	85.3
1020 to 1005	82.2	79.3	81.9	83.4	83.6	83.6	77.1	73.3	65.3	72.9	82.7	83.6
1005 to 990	82.4	78.6	79.5	79.5	78.9	76.6	69.0	64.4	56.9	50.9	63.0	78.1
990 to 975	74.7	77.6	77.1	74.6	72.9	69.8	59.3	55.8	50.2	45.6	42.8	55.2
975 to 960	55.3	71.9	73.6	69.7	67.7	60.0	50.7	48.9	42.1	36.0	34.0	34.6
960 to 945	44.7	65.2	67.8	63.8	60.8	51.1	44.3	43.8	36.1	28.4	26.7	26.0
945 to 930	31.2	57.2	61.7	56.7	56.8	45.2	40.0	38.0	32.0	22.7	20.4	18.2
930 to 915	25.6	49.9	55.2	45.7	51.8	39.6	32.1	31.2	25.5	18.8	17.0	15.2
915 to 900	21.4	47.8	46.9	44.2	50.0	35.6	31.9	27.4	25.1	15.5	13.8	14.4
900 to 885	19.7	35.7	38.9	32.8	20.4	20.0	7.3	22.1	11.2	4.1	1.0	11.1
885 to 870	20.9	31.2	7.9	44.5	21.1	52.4	6.6	25.3	3.8	2.0	0.6	5.8
870 to 855	1.2	0.0					3.1					
< 855	*Minimum Reading 868.8 ft*											

Legend	0.0										100.00

Jocassee D_2_564.1: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

DO Saturation Readings Began in 1999

Jocassee D_2_564.1: Montly Averaged Dissolved Oxygen Percent Saturation (%) (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1095 to 1110												
1080 to 1095												
1065 to 1080												
1050 to 1065												
1035 to 1050												
1020 to 1035												
1005 to 1020												
990 to 1005												
975 to 990												
960 to 975												
945 to 960												
930 to 945												
915 to 930												
900 to 915												
885 to 900												
870 to 885												
855 to 870												
< 855												

DO Saturation Readings Began in 1999

Jocassee D_2_564.1: Montly Averaged Dissolved Oxygen Percent Saturation (%) 1999 to 2017 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	88.1	88.0	92.0	96.7	98.2	99.7	96.3	98.0	90.4	85.5	88.6	88.9
1095 to 1080	84.9	85.0	90.2	95.1	95.3	98.9	94.5	96.3	89.7	87.2	86.9	85.8
1080 to 1065	84.9	84.1	89.3	93.6	93.9	98.2	95.2	94.7	89.5	87.2	86.5	86.0
1065 to 1050	85.2	83.8	89.1	92.8	92.7	98.0	94.5	93.4	88.5	87.0	86.0	85.8
1050 to 1035	84.6	83.7	88.9	91.4	91.1	97.8	92.4	92.8	88.4	86.4	85.4	85.2
1035 to 1020	84.8	83.7	88.2	90.9	91.4	97.6	90.9	93.1	88.3	86.2	85.7	85.5
1020 to 1005	84.2	83.0	88.5	89.5	90.7	96.8	90.9	92.9	87.7	86.2	85.4	85.7
1005 to 990	84.5	83.1	88.1	88.9	89.4	96.2	90.2	92.2	87.6	85.8	85.0	84.8
990 to 975	83.6	84.2	88.2	87.4	87.4	97.0	86.8	93.9	87.4	86.0	85.9	84.2
975 to 960	86.0	77.6	89.1	86.3	92.4	93.7	92.3	86.3	92.3	86.4	86.8	85.8
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 964.9 ft

Legend	0.0										100.00

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Whitewater River Cove

pH Concentration

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Jocassee C_2_560.0: Monthly pH (SI) 1975 to 1985 (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	5.8	6.1	6.3	6.5	6.7	7.1	7.2	7.2	7.0	6.3	6.6	6.1
1095 to 1080	5.8	6.0	6.4	6.5	6.5	7.0	7.4	6.8	7.0	6.3	6.5	6.0
1080 to 1065	5.8	5.9	6.3	6.4	6.3	6.9	7.1	6.5	6.6	6.2	6.5	6.0
1065 to 1050	5.8	5.8	6.2	6.3	6.2	6.5	6.6	6.3	6.2	6.1	6.3	6.0
1050 to 1035	5.8	5.7	6.2	6.2	6.1	6.2	6.3	6.1	6.1	6.0	6.4	6.0
1035 to 1020	5.8	5.7	6.2	6.1	6.0	6.1	6.1	6.0	6.1	5.8	6.1	5.9
1020 to 1005	5.8	5.7	6.1	6.0	5.9	6.1	6.1	5.9	6.2	5.8	5.8	5.7
1005 to 990	5.6	5.6	6.0	6.0	5.9	6.0	6.0	5.9	6.2	5.7	5.7	5.5
990 to 975	5.5	5.6	6.0	6.0	5.9	6.0	5.9	5.8	6.2	5.7	5.7	5.4
975 to 960	5.3	5.6		6.0	5.9	6.0	5.8	5.9	6.1	5.6	6.0	5.4
960 to 945		5.9	5.9	5.7			5.6	6.0		5.6		
945 to 930		5.6		5.7	5.1	6.0	5.2	5.8	6.2	5.6	6.4	
930 to 915				5.6			5.2			5.4		
915 to 900	6.0	5.7	6.3	6.0	6.0	6.3	6.1	6.0	6.5	5.9	6.2	5.5
900 to 885									6.0	5.3	6.4	
885 to 870				6.2						5.3		
870 to 855										5.3		
< 855						*Minimum Reading 856.1 ft*						

Jocassee C_2_560.0: Monthly pH (SI) 1985 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.4	6.5	6.2	6.8	7.1	7.0	7.4	7.4	6.8	6.6	6.6	6.2
1095 to 1080	6.5	6.5	6.6	6.8	6.8	7.1	7.2	7.3	6.9	6.7	6.7	6.3
1080 to 1065	6.5	6.5	6.5	6.8	6.8	7.1	7.1	7.0	6.8	6.7	6.7	6.3
1065 to 1050	6.4	6.5	6.6	6.7	6.8	7.0	6.9	6.7	6.7	6.7	6.6	6.3
1050 to 1035	6.4	6.4	6.4	6.6	6.6	6.9	6.8	6.6	6.5	6.6	6.6	6.3
1035 to 1020	6.3	6.4	6.4	6.6	6.6	6.8	6.6	6.4	6.3	6.6	6.6	6.3
1020 to 1005	6.4	6.4	6.4	6.5	6.5	6.8	6.5	6.2	6.1	6.4	6.5	6.3
1005 to 990	6.4	6.3	6.4	6.5	6.5	6.8	6.5	6.3	6.2	6.1	6.3	6.3
990 to 975	6.3	6.3	6.3	6.4	6.4	6.7	6.6	6.2	6.3	6.2	6.0	6.1
975 to 960	6.3	6.2	6.2	6.4	6.4	6.6	6.5	6.2	6.1	6.1	6.0	5.8
960 to 945	6.0	6.1	6.3	6.3	6.3	6.5	6.4	6.1	6.2	6.1	5.9	5.7
945 to 930	5.9	6.0	6.2	6.2	6.2	6.4	6.3	6.1	6.2	6.0	5.8	5.6
930 to 915	5.7	6.0	6.1	6.2	6.2	6.4	6.3	6.1	6.1	6.0	5.8	5.5
915 to 900	5.7	5.9	6.1	6.1	6.1	6.3	6.3	6.0	6.1	6.0	5.8	5.6
900 to 885	5.6	5.8	6.0	6.1	6.1	6.2	6.3	6.0	6.1	6.0	5.8	5.5
885 to 870	5.6	5.8	5.9	6.0	6.0	6.2	6.2	5.9	6.1	6.0	5.7	5.5
870 to 855	5.8	6.0	5.9	6.0	6.0	6.2	6.2	5.9	5.9	6.0	5.7	5.5
< 855	5.7	5.9	6.0	6.0	6.2	6.2	6.2	6.0	6.2	6.2	5.7	5.6

Jocassee C_2_560.0: Monthly pH (SI) 19912015 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.3	6.2	6.6	6.7	7.0	6.8	6.8	6.8	6.6	6.3	6.6	6.4
1095 to 1080	6.4	6.3	6.6	6.8	6.9	6.8	6.7	6.9	6.7	6.6	6.7	6.5
1080 to 1065	6.4	6.3	6.5	6.7	6.8	6.7	6.6	6.8	6.7	6.7	6.7	6.5
1065 to 1050	6.4	6.3	6.5	6.6	6.7	6.6	6.5	6.6	6.6	6.6	6.7	6.5
1050 to 1035	6.4	6.2	6.4	6.5	6.6	6.5	6.4	6.5	6.4	6.6	6.7	6.5
1035 to 1020	6.3	6.3	6.4	6.4	6.5	6.4	6.3	6.3	6.3	6.5	6.7	6.5
1020 to 1005	6.3	6.2	6.4	6.4	6.4	6.3	6.2	6.2	6.1	6.3	6.6	6.5
1005 to 990	6.4	6.2	6.3	6.3	6.3	6.2	6.1	6.2	6.0	6.0	6.2	6.3
990 to 975	6.2	6.2	6.3	6.2	6.2	6.1	6.0	6.1	6.0	5.9	6.0	5.9
975 to 960	6.1	6.2	6.2	6.1	6.1	6.0	5.9	6.0	5.9	5.9	6.0	5.8
960 to 945	5.9	6.1	6.2	6.0	6.1	5.9	5.8	5.9	5.8	5.8	5.9	5.7
945 to 930	5.8	6.0	6.1	5.9	6.0	5.8	5.8	5.9	5.8	5.8	5.9	5.7
930 to 915	5.7	5.9	6.1	5.9	6.0	5.8	5.8	5.9	5.8	5.8	5.9	5.7
915 to 900	5.7	5.9	6.0	5.9	6.0	5.8	5.7	5.8	5.8	5.8	5.9	5.7
900 to 885	5.7	5.8	5.9	5.8	6.0	5.8	5.7	5.8	5.8	5.7	5.9	5.7
885 to 870	5.7	5.9	6.0	5.8	5.9	5.8	5.7	5.8	5.8	5.7	5.9	5.7
870 to 855	5.7	5.9	6.0	5.9	5.8	5.8	5.7	5.8	5.8	5.8	5.9	5.7
< 855	5.5	5.7	5.8	5.6	5.6	5.6	5.7	5.8	5.7	5.6	6.0	5.9

< Acidic						Neutral						Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee D_2_564.0: Monthly pH (SI) 1976 to 1985 (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	5.9	6.1	6.2	6.5	6.9	7.2	7.5	7.3	7.1	6.5	6.7	6.1
1095 to 1080	5.9	6.0	6.3	6.4	6.6	7.1	6.8	6.7	7.1	6.5	6.6	6.0
1080 to 1065	5.9	5.9	6.3	6.3	6.2	6.6	6.6	6.4	6.6	6.3	6.6	6.1
1065 to 1050	5.9	5.9	6.2	6.2	6.0	6.3	6.2	6.0	6.1	6.3	6.5	6.0
1050 to 1035	5.9	5.8	6.2	6.1	6.0	6.1	6.0	6.0	5.9	6.1	6.5	6.0
1035 to 1020	5.9	5.8	6.1	6.0	5.8	5.9	5.8	5.8	5.9	5.9	6.2	6.0
1020 to 1005	5.9	5.8	6.1	6.0	5.8	5.8	5.7	5.7	5.9	5.7	6.0	5.8
1005 to 990	5.9	5.8	6.0	6.0	5.8	5.7	5.7	5.7	5.9	5.6	5.8	5.5
990 to 975	5.9	5.8	6.1	5.9	5.7	5.7	5.7	5.7	5.9	5.6	5.8	5.5
975 to 960	5.9	5.9		5.9	5.4	5.7	5.8	5.6	6.0	5.6	6.3	5.5
960 to 945		6.0	6.6	5.7			5.5			5.5		
945 to 930		5.9		5.7						5.5		
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 937.5 ft

Jocassee D_2_564.0: Monthly pH (SI) 1985 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.4	6.4	6.2	6.9	7.0	7.0	7.4	7.2	6.9	6.7	6.3	6.2
1095 to 1080	6.5	6.5	6.6	6.8	6.9	7.2	7.5	7.4	6.9	6.8	6.7	6.3
1080 to 1065	6.6	6.5	6.5	6.8	6.9	7.2	7.2	7.1	6.8	6.7	6.7	6.3
1065 to 1050	6.5	6.4	6.5	6.7	6.8	7.0	6.9	6.8	6.7	6.7	6.6	6.3
1050 to 1035	6.5	6.3	6.4	6.6	6.7	6.9	6.8	6.7	6.6	6.6	6.6	6.3
1035 to 1020	6.4	6.3	6.3	6.6	6.7	6.8	6.6	6.4	6.4	6.6	6.6	6.3
1020 to 1005	6.5	6.3	6.4	6.5	6.6	6.7	6.5	6.3	6.1	6.4	6.6	6.3
1005 to 990	6.5	6.2	6.3	6.5	6.6	6.7	6.5	6.3	6.2	6.2	6.4	6.2
990 to 975	6.4	6.2	6.2	6.4	6.5	6.6	6.5	6.2	6.3	6.2	6.0	6.1
975 to 960	6.5	6.2	6.2	6.4	6.4	6.5	6.4	6.2	6.2	6.1	6.1	5.9
960 to 945	6.3	6.2	6.2	6.3	6.3	6.4	6.3	6.2	6.2	6.0	5.9	5.7
945 to 930	6.2	6.2	6.1	6.2	6.2	6.3	6.3	6.1	6.1	6.1	5.9	5.6
930 to 915	6.1	6.1	6.1	6.2	6.2	6.3	6.3	6.1	6.0	6.0	5.8	5.5
915 to 900	6.1	5.8	6.1	6.1	6.1	6.2	6.2	6.0	6.0	6.0	5.8	5.6
900 to 885	6.1	5.8	6.1	6.1	6.2	6.1	6.1	5.9	6.0	6.0	5.8	5.5
885 to 870	6.0	5.8	6.0	6.2	6.0	6.3	6.1	5.9	5.9	6.1	5.7	5.6
870 to 855	5.4		5.9	6.4	6.1	6.0	6.1	6.2	5.6	5.9	5.5	5.6
< 855	*Minimum Reading 864.7 ft*											

Jocassee D_2_564.0: Monthly pH (SI) 19912015 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.4	6.3	6.6	6.8	7.1	6.9	6.9	7.0	6.8	6.5	6.6	6.6
1095 to 1080	6.5	6.5	6.6	6.8	7.0	6.9	6.8	7.0	6.8	6.7	6.8	6.6
1080 to 1065	6.4	6.4	6.6	6.7	6.9	6.8	6.7	6.9	6.7	6.7	6.8	6.6
1065 to 1050	6.5	6.4	6.5	6.6	6.8	6.7	6.6	6.7	6.7	6.7	6.7	6.6
1050 to 1035	6.5	6.4	6.5	6.6	6.7	6.6	6.5	6.6	6.6	6.6	6.8	6.6
1035 to 1020	6.4	6.4	6.5	6.5	6.6	6.5	6.4	6.5	6.4	6.6	6.7	6.6
1020 to 1005	6.4	6.4	6.4	6.4	6.5	6.4	6.3	6.3	6.2	6.4	6.6	6.6
1005 to 990	6.5	6.3	6.4	6.3	6.4	6.2	6.1	6.2	6.1	6.0	6.3	6.4
990 to 975	6.4	6.4	6.4	6.3	6.3	6.1	6.0	6.0	6.0	5.9	6.0	6.1
975 to 960	6.2	6.3	6.3	6.2	6.2	6.0	5.9	6.0	5.9	5.9	5.9	5.9
960 to 945	6.1	6.2	6.3	6.1	6.2	5.9	5.8	6.0	5.8	5.8	5.9	5.8
945 to 930	5.9	6.1	6.2	6.0	6.1	5.9	5.8	5.9	5.9	5.8	5.9	5.8
930 to 915	5.8	6.1	6.2	6.0	6.0	5.9	5.8	5.9	5.8	5.8	5.9	5.8
915 to 900	5.9	6.1	6.1	6.0	6.1	5.8	5.8	5.9	5.8	5.8	5.9	5.8
900 to 885	5.7	5.8	6.0	5.8	5.8	5.8	5.7	5.9	5.7	5.7	5.7	5.5
885 to 870	5.7	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.7	5.9	5.7
870 to 855	5.6	5.7	5.7	5.6		5.8	6.3	6.0		5.7	6.1	
< 855	*Minimum Reading 864.4 ft*											

< Acidic						Neutral						Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Jocassee D_2_564.1: Monthly pH (SI) (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095												
1095 to 1080												
1080 to 1065												
1065 to 1050												
1050 to 1035												
1035 to 1020												
1020 to 1005												
1005 to 990												
990 to 975												
975 to 960												
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

pH Readings Began During Bad Creek Construction (1987)

Jocassee D_2_564.1: Monthly pH (SI) 1987 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.3	6.2	6.3	6.3	6.3	6.8	7.4	7.2	6.9	6.5	6.5	6.3
1095 to 1080	6.5	6.5	6.6	6.6	6.6	6.8	7.2	7.3	6.8	6.7	6.7	6.4
1080 to 1065	6.6	6.5	6.7	6.6	6.7	6.8	6.9	6.9	6.7	6.8	6.8	6.4
1065 to 1050	6.5	6.4	6.6	6.5	6.5	6.6	6.6	6.6	6.6	6.6	6.6	6.4
1050 to 1035	6.7	6.4	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.4	6.3
1035 to 1020	6.7	6.3	6.4	6.4	6.3	6.3	6.3	6.3	6.2	6.4	6.4	6.3
1020 to 1005	7.1	6.3	6.4	6.4	6.4	6.4	6.2	6.1	6.0	6.3	6.3	6.3
1005 to 990	6.9	6.3	6.4	6.2	6.2	6.3	6.2	6.1	6.1	6.3	6.3	6.1
990 to 975	6.9	6.3	6.4	6.2	5.9	6.1	6.2	6.0	6.0	6.5	6.2	6.1
975 to 960	7.3	6.4	7.0	6.6	5.7	6.1	6.2	6.1	6.1	7.0	6.2	6.2
960 to 945					5.8							
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 959.9 ft

Jocassee D_2_564.1: Monthly pH (SI) 1991 to 2017 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	6.5	6.3	6.6	6.6	7.0	6.8	6.8	6.9	6.6	6.4	6.7	6.5
1095 to 1080	6.5	6.4	6.6	6.6	6.9	6.8	6.7	6.9	6.7	6.6	6.7	6.6
1080 to 1065	6.5	6.4	6.6	6.6	6.8	6.7	6.7	6.8	6.7	6.7	6.7	6.6
1065 to 1050	6.5	6.3	6.5	6.6	6.8	6.6	6.6	6.6	6.6	6.6	6.7	6.5
1050 to 1035	6.5	6.4	6.5	6.5	6.7	6.6	6.6	6.6	6.6	6.6	6.7	6.6
1035 to 1020	6.4	6.3	6.6	6.5	6.7	6.6	6.6	6.6	6.6	6.6	6.7	6.6
1020 to 1005	6.5	6.4	6.6	6.5	6.8	6.6	6.6	6.6	6.6	6.6	6.7	6.6
1005 to 990	6.4	6.3	6.5	6.4	6.7	6.5	6.5	6.6	6.6	6.5	6.7	6.6
990 to 975	6.4	6.3	6.6	6.4	6.7	6.6	6.5	6.5	6.5	6.5	6.7	6.5
975 to 960	6.2	6.0	6.4	6.3	6.4	6.4	6.3	6.1	6.2	6.3	6.5	6.3
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 855												

Minimum Reading 963 ft

< Acidic						Neutral						Basic >	
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Whitewater River Cove

Conductivity

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Jocassee C_2_560.0: Monthly Averaged Conductivity (uS/cm) 1975 to 1985 (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	13.6	16.3	16.3	16.2	14.7	14.4	17.5	15.7	13.9	16.2	14.0	14.1
1080 to 1095	13.4	16.3	16.4	16.5	13.9	14.3	16.3	16.1	14.7	16.3	14.9	14.7
1065 to 1080	13.5	17.1	15.9	17.0	14.6	15.0	17.1	15.9	14.1	16.6	14.4	14.6
1050 to 1065	13.6	16.0	16.0	16.0	14.1	14.8	17.4	16.5	14.3	16.4	14.8	14.5
1035 to 1050	13.3	16.6	15.5	16.5	14.4	14.1	16.4	15.8	13.5	16.4	15.0	15.9
1020 to 1035	13.0	16.6	16.0	16.2	13.8	14.1	15.8	15.7	13.6	15.8	14.1	14.3
1005 to 1020	13.0	16.5	15.6	16.6	14.1	14.3	16.7	15.0	12.1	15.5	13.8	14.1
990 to 1005	13.0	16.4	15.1	16.0	14.5	14.4	15.5	14.3	13.1	15.5	13.8	15.4
975 to 990	13.3	16.1	15.3	17.0	14.4	14.4	15.8	15.6	12.4	16.0	13.5	15.1
960 to 975	13.5	18.7		19.0	13.0	14.4	16.0	14.8	14.2	16.0	13.6	15.8
945 to 960			18.0	18.0			20.0	12.0		16.0		
930 to 945		21.0		17.3	18.0	15.0	22.0	21.0	14.0	17.8	12.0	
915 to 930				19.0			22.0					
900 to 915	22.5	17.8	15.0	18.2	17.5	15.0	16.4	18.1	14.5	17.0	15.2	20.3
885 to 900											16.0	
870 to 885				15.0								
855 to 870												
< 855												

Minimum Reading 873.3 ft

Jocassee C_2_560.0: Monthly Averaged Conductivity (uS/cm) 1985 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	18.0	16.7	18.0	17.6	20.5	18.0	19.6	21.1	20.5	17.9	19.8	20.0
1095 to 1080	20.5	17.0	19.5	18.8	20.9	19.9	20.1	22.4	21.2	19.4	19.8	21.0
1080 to 1065	20.6	16.7	19.8	18.0	21.0	19.9	19.5	21.5	20.7	19.2	20.7	20.9
1065 to 1050	20.3	16.6	20.2	17.8	20.9	19.6	20.0	21.6	20.7	18.6	20.1	20.9
1050 to 1035	20.0	16.8	20.0	18.1	20.5	19.8	20.0	20.8	20.5	18.4	20.0	20.8
1035 to 1020	19.8	16.4	19.8	17.8	20.2	19.6	19.5	21.4	20.5	18.3	20.3	20.9
1020 to 1005	19.4	15.6	20.0	16.9	19.9	19.2	20.2	21.4	20.8	18.7	20.3	20.7
1005 to 990	19.3	16.0	20.2	17.3	20.1	18.9	20.1	22.7	21.5	18.0	19.4	20.1
990 to 975	19.2	15.7	19.8	17.1	19.7	19.0	19.3	21.6	20.2	16.6	19.2	20.6
975 to 960	18.4	17.5	19.8	17.9	19.5	18.9	19.5	20.3	19.9	17.1	19.2	19.9
960 to 945	18.8	16.0	19.8	17.3	19.5	18.6	19.5	20.1	19.6	16.7	18.2	19.8
945 to 930	18.5	16.0	19.3	17.6	19.4	18.9	19.6	20.1	19.9	16.9	18.2	19.9
930 to 915	19.2	16.4	19.2	18.0	19.6	18.8	19.9	20.3	20.2	16.6	18.5	20.9
915 to 900	19.6	16.5	19.5	17.8	19.6	19.3	20.0	20.5	20.0	17.0	19.1	20.0
900 to 885	19.8	17.0	20.0	18.2	19.6	19.1	20.0	20.6	20.3	16.5	18.2	20.0
885 to 870	20.0	17.7	20.6	18.5	20.2	19.4	20.1	20.3	20.8	16.5	19.3	20.9
870 to 855	19.6	16.8	21.0	19.1	20.5	19.6	20.4	20.0	20.9	18.7	20.1	21.1
< 850	24.5	15.7	21.0	21.3	19.1	19.9	21.1	26.4	21.3	17.8	20.0	21.1

Jocassee C_2_560.0: Monthly Averaged Conductivity (uS/cm) 1991 to 2015 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	16.7	16.5	17.0	17.3	18.1	17.9	18.2	18.5	18.1	17.8	17.9	17.2
1095 to 1080	16.5	16.9	17.4	17.7	18.1	18.2	18.5	18.7	18.2	18.3	17.7	17.2
1080 to 1065	16.7	16.9	17.2	17.8	18.1	18.2	18.5	18.8	18.3	18.4	17.6	17.4
1065 to 1050	16.7	16.7	17.2	17.7	18.1	18.2	18.5	18.8	18.1	18.4	17.7	17.5
1050 to 1035	16.6	16.6	17.1	17.6	18.0	18.2	18.5	18.6	17.9	18.3	17.7	17.5
1035 to 1020	16.6	16.8	17.4	17.7	18.0	18.0	18.3	18.6	17.9	18.3	17.6	17.5
1020 to 1005	16.6	16.8	17.1	17.6	17.8	17.5	17.8	18.1	17.4	18.2	17.4	17.4
1005 to 990	16.8	16.5	17.2	17.6	17.6	17.1	17.3	17.4	17.1	17.7	17.4	17.4
990 to 975	16.5	16.8	17.5	17.4	17.4	17.3	17.5	17.4	17.1	17.7	17.3	17.5
975 to 960	16.8	16.8	17.1	17.5	17.5	17.3	17.4	17.5	17.1	17.9	17.4	17.8
960 to 945	17.5	16.8	17.2	17.4	17.5	17.4	17.4	17.6	17.0	17.9	17.6	18.1
945 to 930	18.2	17.2	17.3	17.5	17.7	17.6	17.5	17.5	17.1	17.9	17.7	18.3
930 to 915	18.5	17.6	17.7	17.8	18.0	17.8	17.7	17.9	17.6	18.1	18.0	18.4
915 to 900	19.0	17.8	17.8	18.0	17.9	18.0	17.8	18.2	18.0	18.3	18.4	19.1
900 to 885	19.3	18.3	17.9	18.1	18.1	18.0	17.8	18.1	18.0	18.3	18.6	18.9
885 to 870	19.1	18.9	18.7	18.2	18.2	18.3	18.1	18.5	18.5	18.6	18.6	19.4
870 to 855	20.0	19.3	18.8	18.7	18.8	18.8	18.9	18.8	20.3	19.6	20.2	21.1
< 850	19.6	20.5	19.5	23.3	17.7	17.9	17.5	18.7	18.6	20.1	18.4	26.8

Legend	**15.0**										**25.0**

Jocassee D_2_564.0: Monthly Averaged Conductivity (uS/cm) 1976 to 1985 (Pre Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	14.0	16.4	15.3	16.3	15.2	15.4	19.2	15.4	13.3	15.8	13.6	14.7
1095 to 1080	14.0	16.8	15.0	15.3	14.4	14.5	16.8	14.2	14.3	16.5	14.8	15.0
1080 to 1065	13.5	17.2	15.2	15.5	14.4	14.2	18.0	14.4	12.7	16.3	14.3	15.0
1065 to 1050	13.0	16.8	14.7	15.0	14.4	14.3	18.9	15.3	12.7	16.0	14.5	14.7
1050 to 1035	13.0	16.2	14.0	14.9	14.8	14.0	17.9	15.7	12.0	16.4	14.6	16.0
1035 to 1020	13.0	17.0	14.6	14.5	15.3	14.0	17.4	16.5	13.8	15.9	14.4	14.5
1020 to 1005	13.0	16.7	13.7	15.4	15.4	15.1	18.8	16.7	13.6	16.1	14.1	14.0
1005 to 990	13.0	16.4	13.6	15.1	15.3	14.8	17.8	17.0	15.4	18.6	16.0	17.6
990 to 975	13.0	16.7	14.3	15.7	16.0	15.0	19.0	19.2	14.4	20.9	20.3	22.2
975 to 960	13.0	19.3		15.4	16.0	14.8	21.7	17.5	16.8	24.3	25.8	23.3
960 to 945			16.0				20.0			18.0		
945 to 930												
930 to 915												
915 to 900												
900 to 885							*Minimum Reading 937.5 ft*					
885 to 870												
870 to 855												
< 855												

Jocassee D_2_564.0: Monthly Averaged Conductivity (uS/cm) 1985 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	18.0	16.1	18.0	17.0	21.0	18.7	19.6	21.3	20.6	17.8	19.0	20.0
1095 to 1080	20.5	15.9	19.5	18.3	20.8	19.7	19.9	22.5	21.2	19.3	19.5	21.0
1080 to 1065	20.6	15.9	19.5	17.2	21.0	19.6	19.5	20.9	20.8	19.6	20.4	21.0
1065 to 1050	20.0	15.5	20.2	17.5	21.0	19.5	19.8	21.1	20.9	18.4	19.9	21.0
1050 to 1035	20.0	15.9	20.0	17.8	20.5	19.4	19.7	21.0	21.1	18.5	19.6	20.8
1035 to 1020	19.6	15.6	19.8	17.5	20.4	19.4	19.4	21.4	20.6	18.3	19.3	20.9
1020 to 1005	19.4	14.3	20.0	16.7	20.0	19.1	19.8	22.2	21.9	19.1	19.8	20.8
1005 to 990	19.0	14.5	19.8	17.8	20.1	18.6	20.0	23.4	21.7	18.9	19.1	20.0
990 to 975	19.2	14.4	18.6	16.8	19.7	18.9	19.1	22.5	21.5	17.2	19.2	20.6
975 to 960	18.2	15.4	19.3	17.5	19.6	19.1	19.4	20.8	20.2	17.7	20.0	20.6
960 to 945	18.5	14.2	19.8	17.3	19.5	18.8	19.3	20.8	20.5	17.4	19.9	21.2
945 to 930	18.3	14.4	19.5	17.6	19.5	19.3	19.7	20.8	20.6	18.0	20.1	21.8
930 to 915	17.8	15.4	19.2	18.4	21.0	20.9	20.8	22.3	22.1	19.5	20.5	22.8
915 to 900	18.0	16.1	20.0	19.6	21.6	21.2	21.8	23.2	21.9	19.4	20.9	22.1
900 to 885	20.3	17.8	20.2	20.9	21.5	21.1	21.7	24.3	22.0	19.3	21.9	22.6
885 to 870	22.0	18.3	22.0	23.8	21.6	22.5	21.4	25.9	23.6	18.8	22.2	24.0
870 to 855	26.0			26.0	21.0	22.0	26.3	24.3	26.0	26.7	24.0	22.0
< 850							*Minimum Reading 864.7 ft*					

Jocassee D_2_564.0: Monthly Averaged Conductivity (uS/cm) 1991 to 2015 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	17.1	16.7	17.7	17.5	18.4	18.1	18.4	18.8	18.1	17.6	17.7	17.5
1095 to 1080	16.7	17.1	17.8	17.7	18.3	18.4	18.8	18.9	18.3	18.5	17.6	17.6
1080 to 1065	16.9	17.0	17.7	18.0	18.4	18.4	18.7	19.1	18.4	18.5	17.7	17.5
1065 to 1050	16.8	16.9	17.5	17.9	18.4	18.5	18.8	18.8	18.2	18.5	17.6	17.5
1050 to 1035	17.0	16.8	17.6	17.9	18.4	18.4	18.7	18.7	18.0	18.3	17.7	17.7
1035 to 1020	16.8	16.9	17.7	17.9	18.3	18.2	18.5	18.8	17.9	18.3	17.5	17.5
1020 to 1005	16.6	16.9	17.7	17.9	18.1	17.9	18.1	18.4	17.6	18.4	17.4	17.3
1005 to 990	16.9	16.6	17.8	17.8	17.9	17.5	17.7	17.9	17.6	18.1	17.6	17.5
990 to 975	16.7	17.0	17.9	17.6	17.8	17.6	18.0	18.0	17.7	18.2	17.7	17.8
975 to 960	17.1	17.0	17.7	17.9	18.1	17.7	18.0	18.0	17.9	18.5	18.2	18.3
960 to 945	17.6	17.0	17.6	17.8	18.1	17.9	18.1	18.3	17.9	18.7	18.4	18.9
945 to 930	18.9	17.2	17.7	18.0	18.3	18.1	18.4	18.4	18.4	19.1	19.2	19.9
930 to 915	19.5	17.6	18.0	18.5	18.5	18.6	19.0	19.1	19.0	19.5	20.0	20.8
915 to 900	20.5	17.8	18.4	18.8	18.6	19.0	19.2	19.6	19.7	20.2	21.2	21.3
900 to 885	22.2	19.4	18.5	19.2	19.0	18.9	18.5	18.5	20.5	19.7	21.8	21.6
885 to 870	22.7	24.0	21.8	18.0	17.8	19.1	19.6	18.9	24.7	20.7	23.6	26.3
870 to 855	30.9	23.0	28.0	18.3		23.0	27.0	21.5		25.0	28.0	
< 850							*Minimum Reading 864.4 ft*					

Legend	**15.0**										**25.0**

Data Collection at D_2_564.1 Began in 1987

Jocassee D_2_564.1: Monthly Averaged Conductivity (uS/cm) 1987 to 1991 (Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1095 to 1110	20.0	18.0	17.0	18.0	20.7	19.7	20.4	21.2	20.8	18.8	19.0	20.5
1080 to 1095	20.6	18.3	18.7	18.8	19.8	19.7	20.3	22.3	21.2	19.7	19.6	21.1
1065 to 1080	18.2	17.4	18.8	18.4	20.3	20.8	19.7	21.2	21.0	20.9	20.6	21.4
1050 to 1065	17.6	15.8	16.5	16.6	17.6	19.5	19.8	21.9	20.6	18.8	18.7	19.2
1035 to 1050	19.3	16.4	16.8	16.8	17.2	19.3	19.7	23.4	20.6	18.7	17.9	18.7
1020 to 1035	20.0	17.0	16.8	17.6	16.8	19.1	19.5	24.3	23.5	18.5	17.8	19.0
1005 to 1020	22.2	17.0	18.5	19.6	19.6	21.3	20.9	25.2	27.6	21.1	18.3	18.2
990 to 1005	21.0	17.2	20.3	21.0	22.1	23.7	24.7	28.5	31.9	25.8	18.1	18.5
975 to 990	20.8	17.6	20.2	21.9	22.0	24.3	26.3	29.0	31.1	35.6	25.8	18.5
960 to 975	22.2	18.7	26.0	25.5	22.5	25.3	28.3	31.3	34.4		34.8	18.5
945 to 960					23.0							
930 to 945												
915 to 930												
900 to 915												
885 to 900												
870 to 885												
855 to 870												
< 850												

Minimum Reading 959.9 ft

Jocassee D_2_564.1: Monthly Averaged Conductivity (uS/cm) 1985 to 1991 (Post Bad Creek Construction)

Measurement Reading Range (ft msl)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1110 to 1095	17.1	16.4	17.4	17.5	18.2	18.2	18.4	18.8	18.4	17.4	17.8	17.2
1095 to 1080	16.5	16.7	17.5	17.2	17.9	18.2	18.7	18.7	18.3	18.2	17.6	17.3
1080 to 1065	16.7	16.7	17.5	17.6	18.3	18.3	18.7	18.5	18.3	18.4	17.7	17.2
1065 to 1050	16.5	16.3	17.5	17.4	18.4	18.4	18.4	17.7	18.0	18.2	17.6	17.1
1050 to 1035	16.6	16.3	17.4	17.7	18.4	18.4	18.8	17.9	18.0	18.3	17.5	17.2
1035 to 1020	16.3	16.2	17.5	17.7	18.5	18.3	18.6	17.9	18.2	18.2	17.2	17.0
1020 to 1005	16.3	16.4	17.3	17.8	18.5	18.5	18.9	17.7	17.9	18.3	17.3	16.9
1005 to 990	16.4	15.9	17.2	17.9	18.6	18.2	18.3	17.2	17.8	17.9	17.1	16.9
990 to 975	16.0	15.6	17.1	17.7	19.3	18.7	18.6	17.8	17.9	18.1	16.4	16.7
975 to 960	15.5	14.6	15.6	17.0	19.1	18.5	17.9	18.6	18.6	18.3	15.8	15.4
960 to 945												
945 to 930												
930 to 915												
915 to 900												
900 to 885												
885 to 870												
870 to 855												
< 850												

Minimum Reading 963 ft

Legend	15.0										25.0

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Appendix C

Appendix C – Turbidity in Whitewater River Cove

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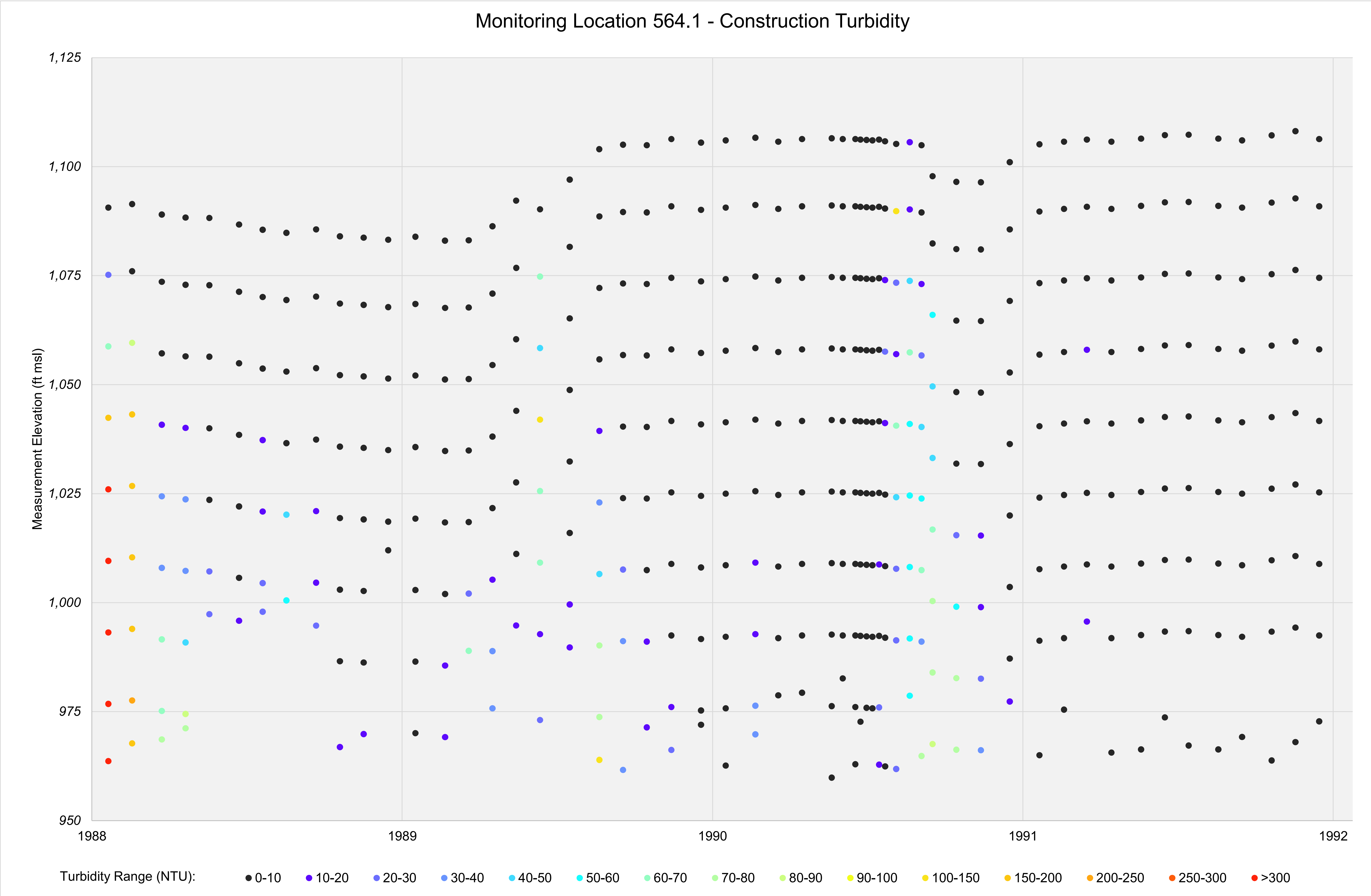
Station 564.1

Construction [1988-1991]



Monitoring Location 564.1 - Construction Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
1988
1989
1990
1991
1992
Turbidity Range (NTU):
0-10
10-20
20-30
30-40
40-50
50-60
60-70
70-80
80-90
90-100
100-150
150-200
200-250
250-300
>300

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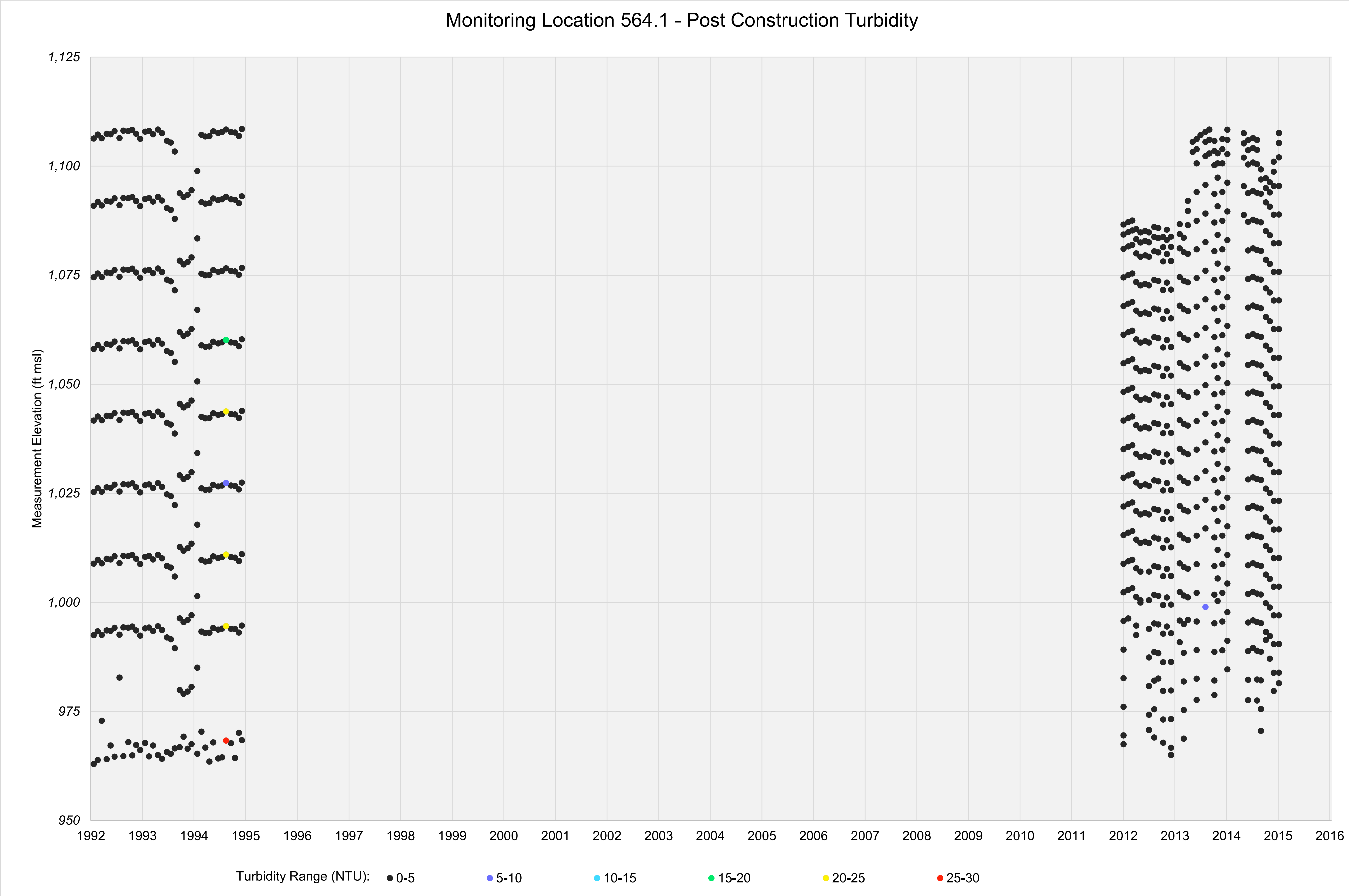
Station 564.1

Post Construction
[1992-2015]



Monitoring Location 564.1 - Post Construction Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Turbidity Range (NTU):
0-5
5-10
10-15
15-20
20-25
25-30

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Station 564.1

Full Dataset

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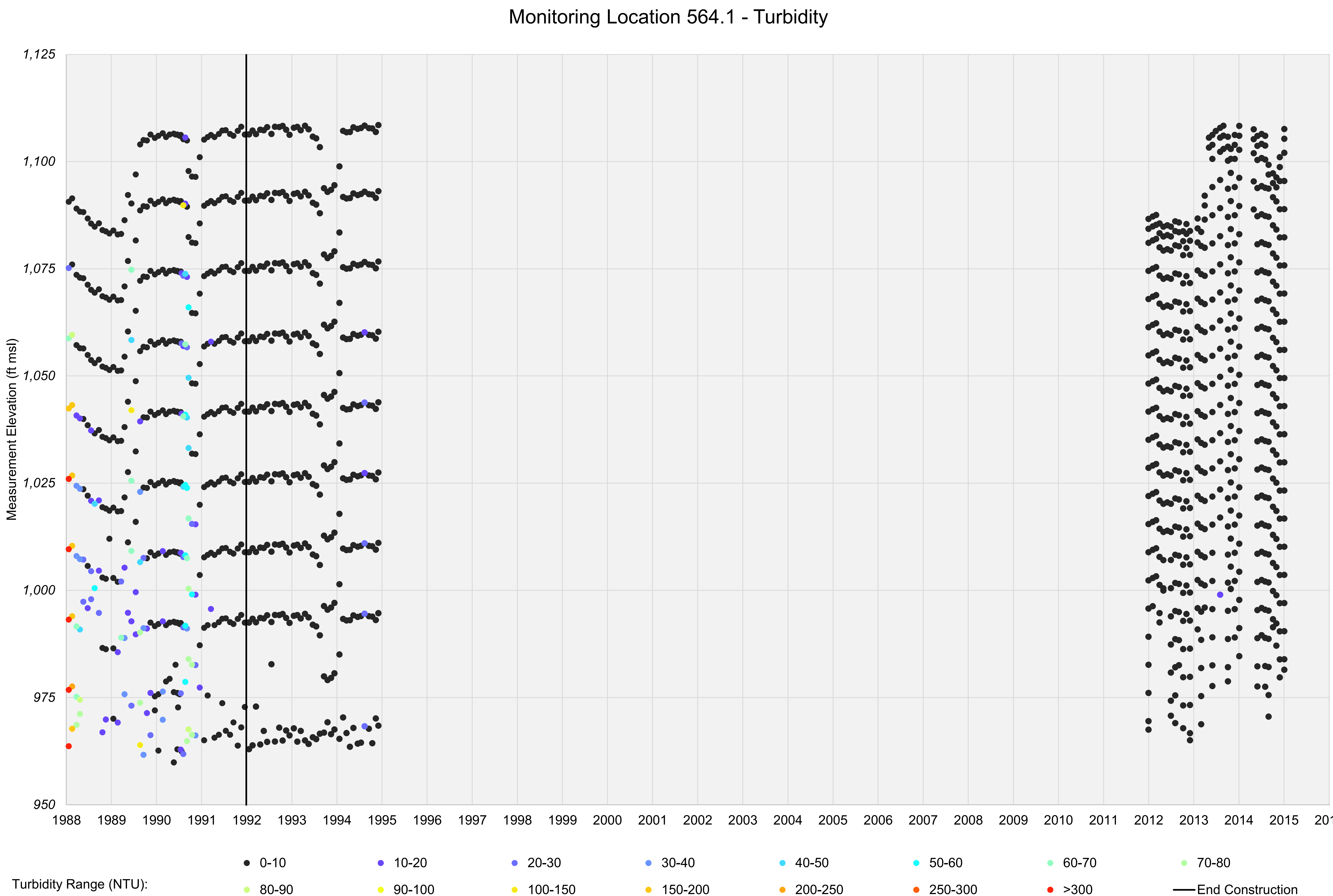

Monitoring Location 564.1 - Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016
Turbidity Range (NTU):
0-10
10-20
20-30
30-40
40-50
50-60
60-70
70-80
80-90
90-100
100-150
150-200
200-250
250-300
>300
End Construction

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Station 564.1

Depth-Averaged with SC State Standard

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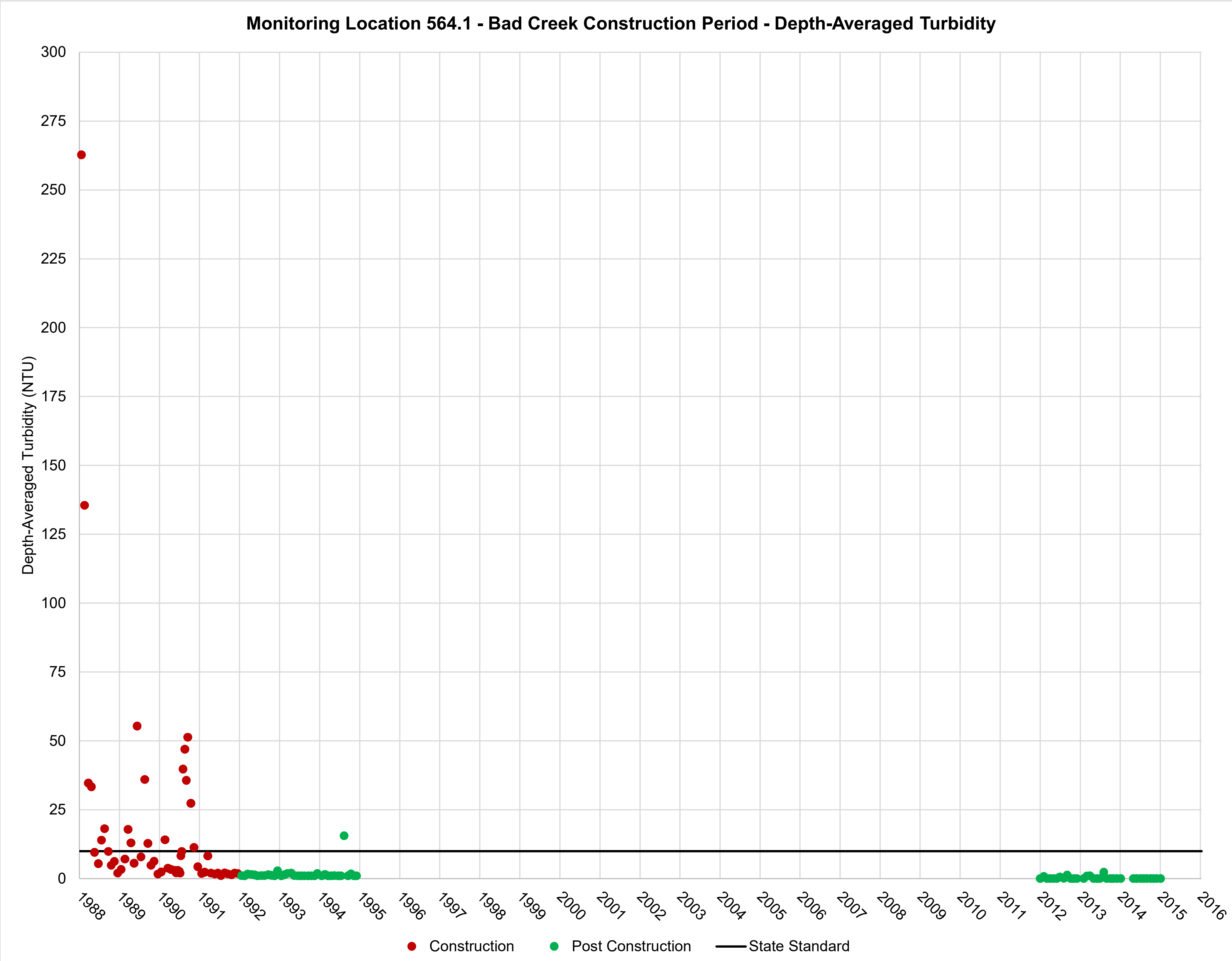
Monitoring Location 564.1 - Bad Creek Construction Period - Depth-Averaged Turbidity
Depth-Averaged Turbidity (NTU)
0
25
50
75
100
125
150
175
200
225
250
275
300
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Construction
Post Construction
State Standard

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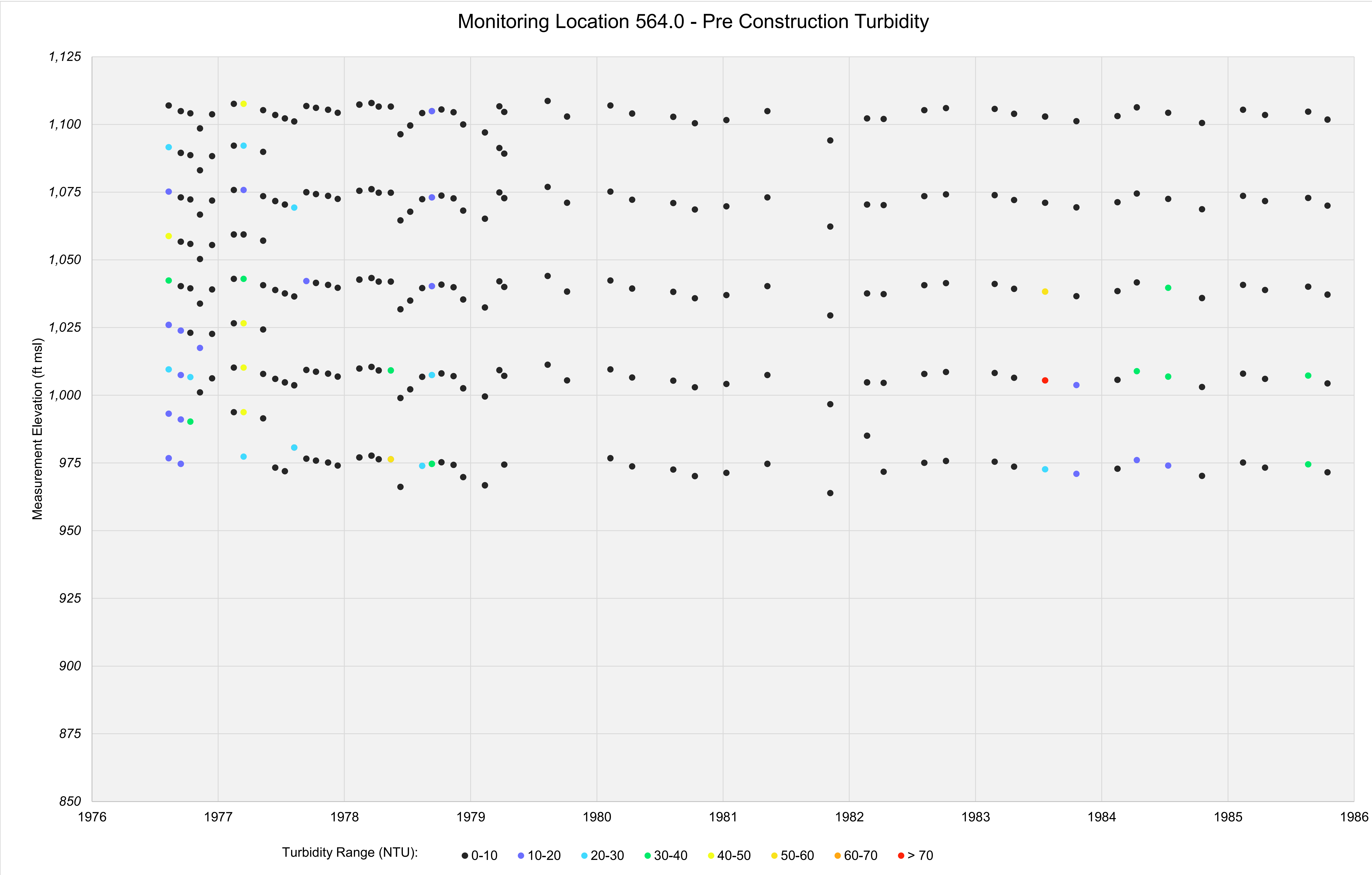
Station 564.0

Pre Construction

[<1985]


Monitoring Location 564.0 - Pre Construction Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
925
900
875
850
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
Turbidity Range (NTU):
0-10
10-20
20-30
30-40
40-50
50-60
60-70
> 70

Station 564.0

Construction
[1986-1991]

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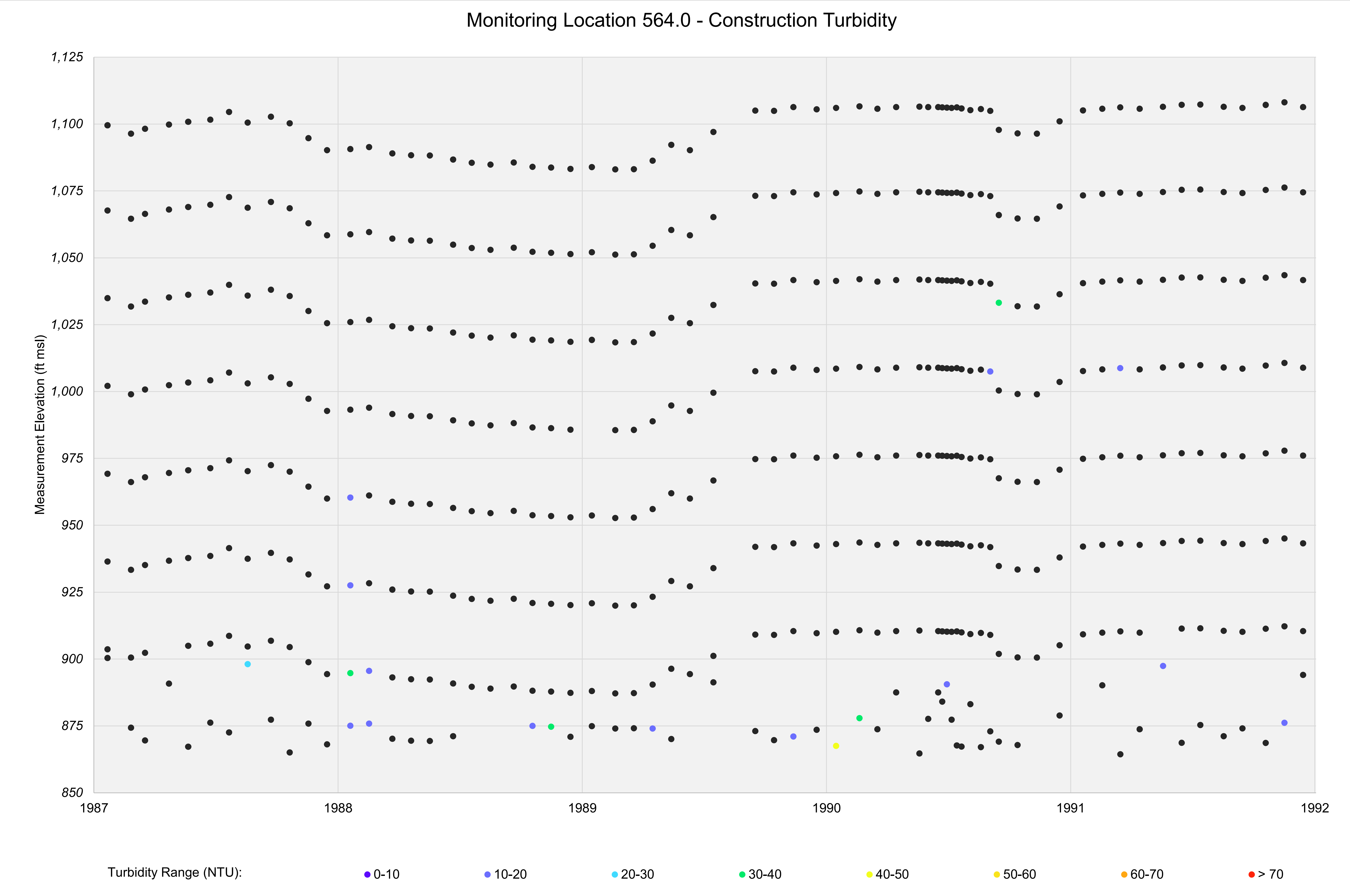

Monitoring Location 564.0 - Construction Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
925
900
875
850
1987
1988
1989
1990
1991
1992
Turbidity Range (NTU):
0-10
10-20
20-30
30-40
40-50
50-60
60-70
> 70

Station 564.0

Post Construction
[1992-2015]

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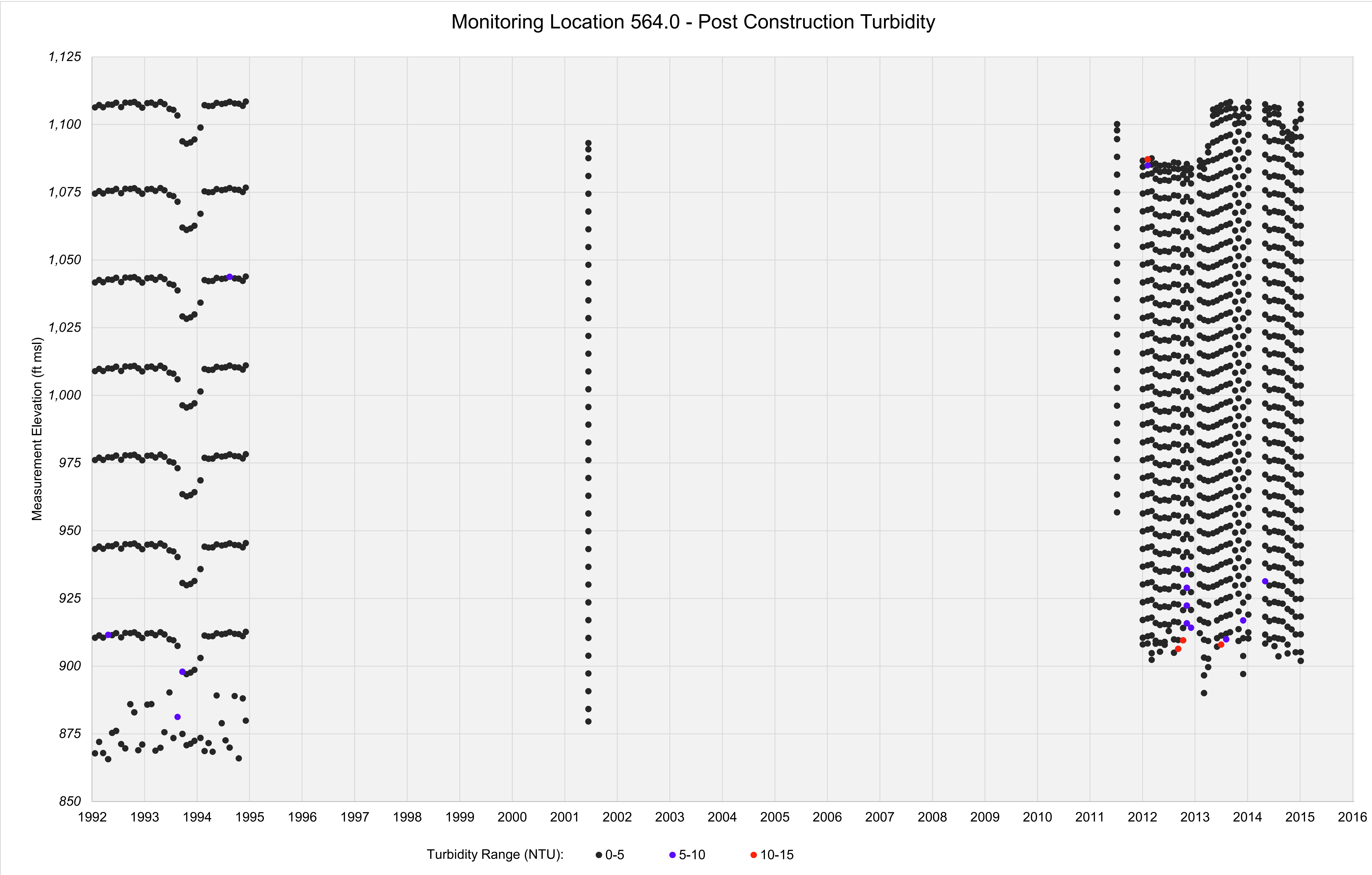

Monitoring Location 564.0 - Post Construction Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
925
900
875
850
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Turbidity Range (NTU):
0-5
5-10
10-15

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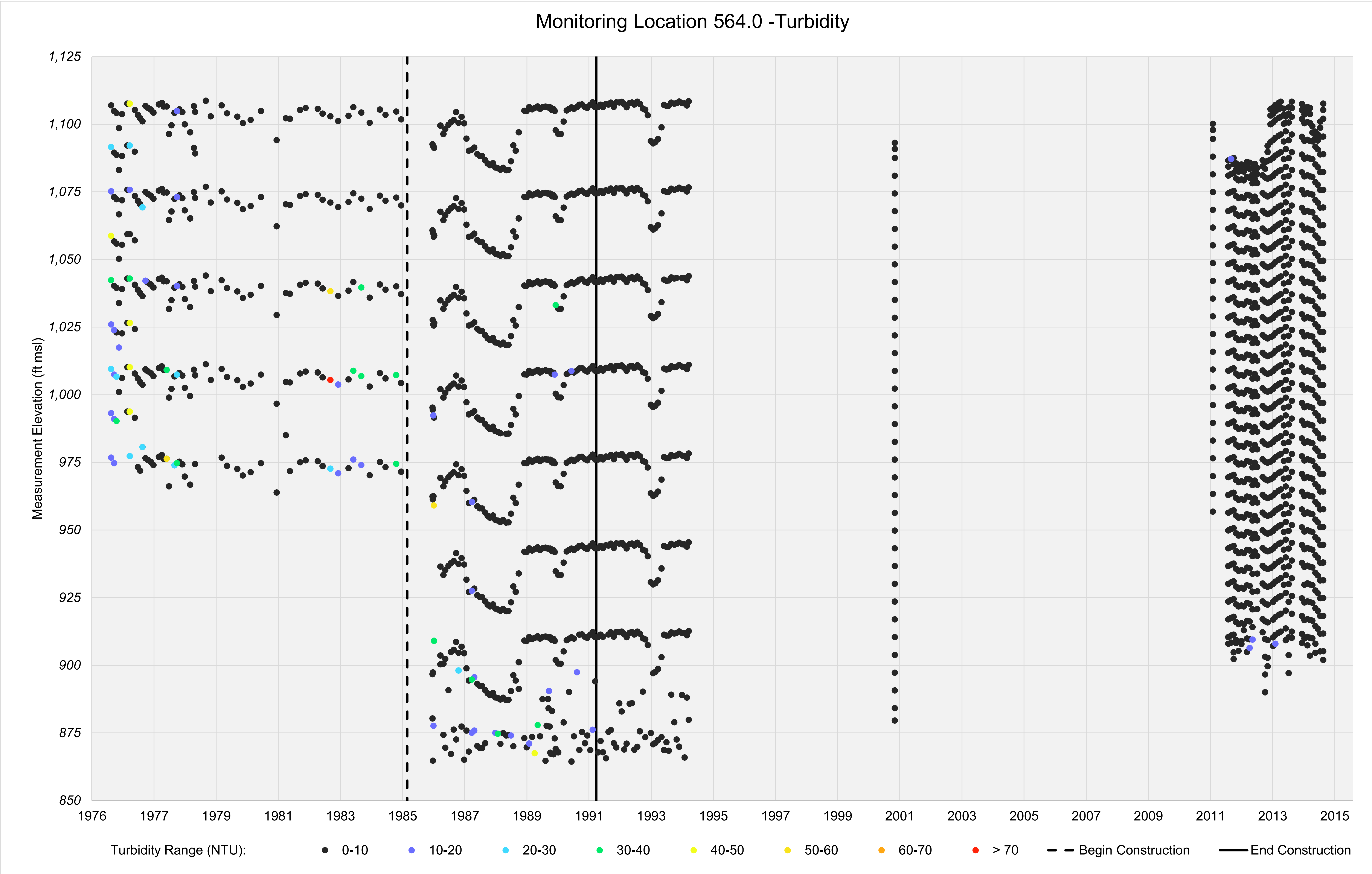
Station 564.0

Full Dataset



Monitoring Location 564.0 -Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
925
900
875
850
1976
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
Turbidity Range (NTU):
0-10
10-20
20-30
30-40
40-50
50-60
60-70
> 70
Begin Construction
End Construction

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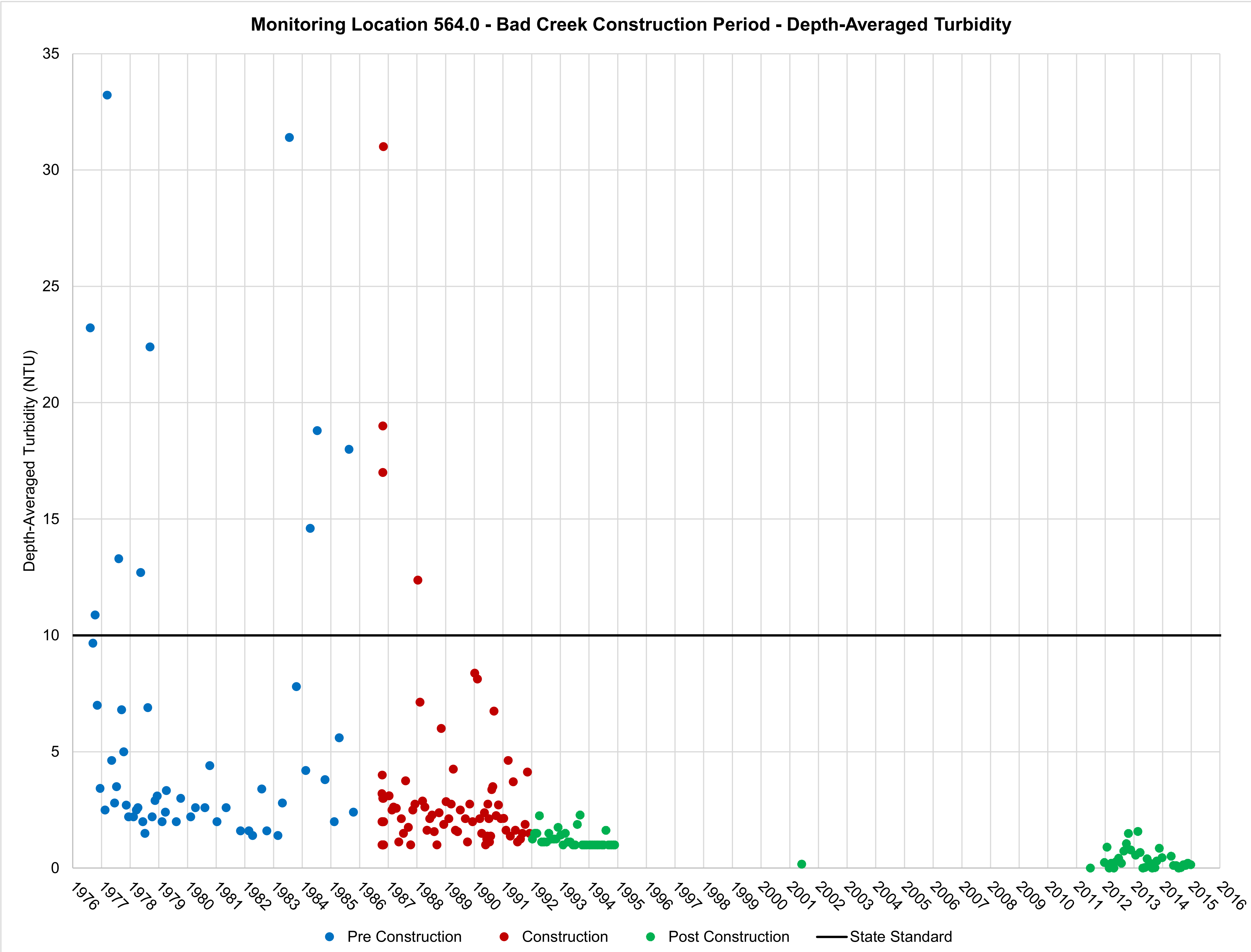
Station 564.0

Depth-Averaged with SC State Standard



Monitoring Location 564.0 - Bad Creek Construction Period - Depth-Averaged Turbidity
Depth-Averaged Turbidity (NTU)
0
5
10
15
20
25
30
35
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Pre Construction
Construction
Post Construction
State Standard

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Station 560.0

Pre Construction [<1985]

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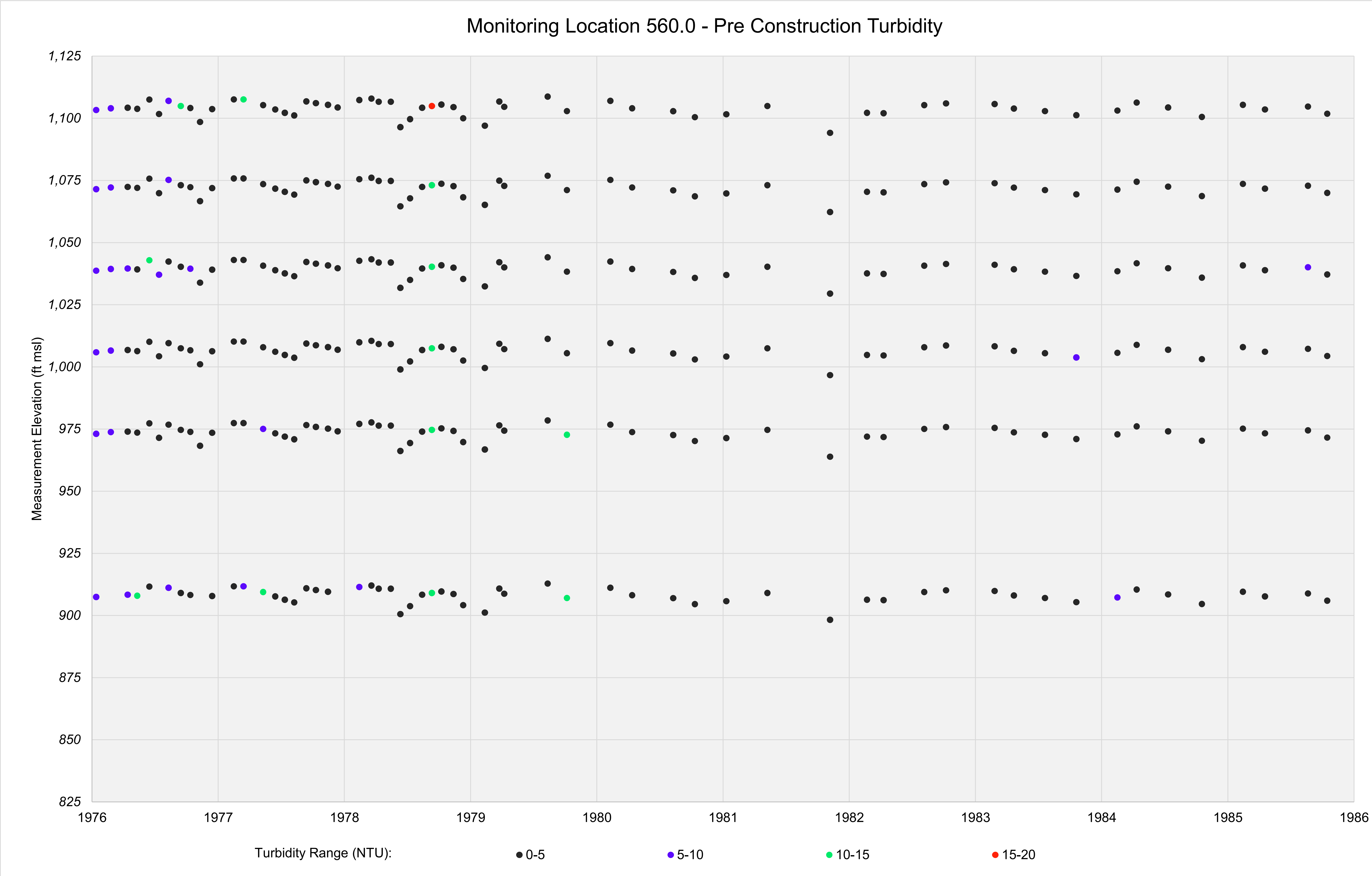
Monitoring Location 560.0 - Pre Construction Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
925
900
875
850
825
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
Turbidity Range (NTU):
0-5
5-10
10-15
15-20

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Station 560.0

Construction [1986-1991]

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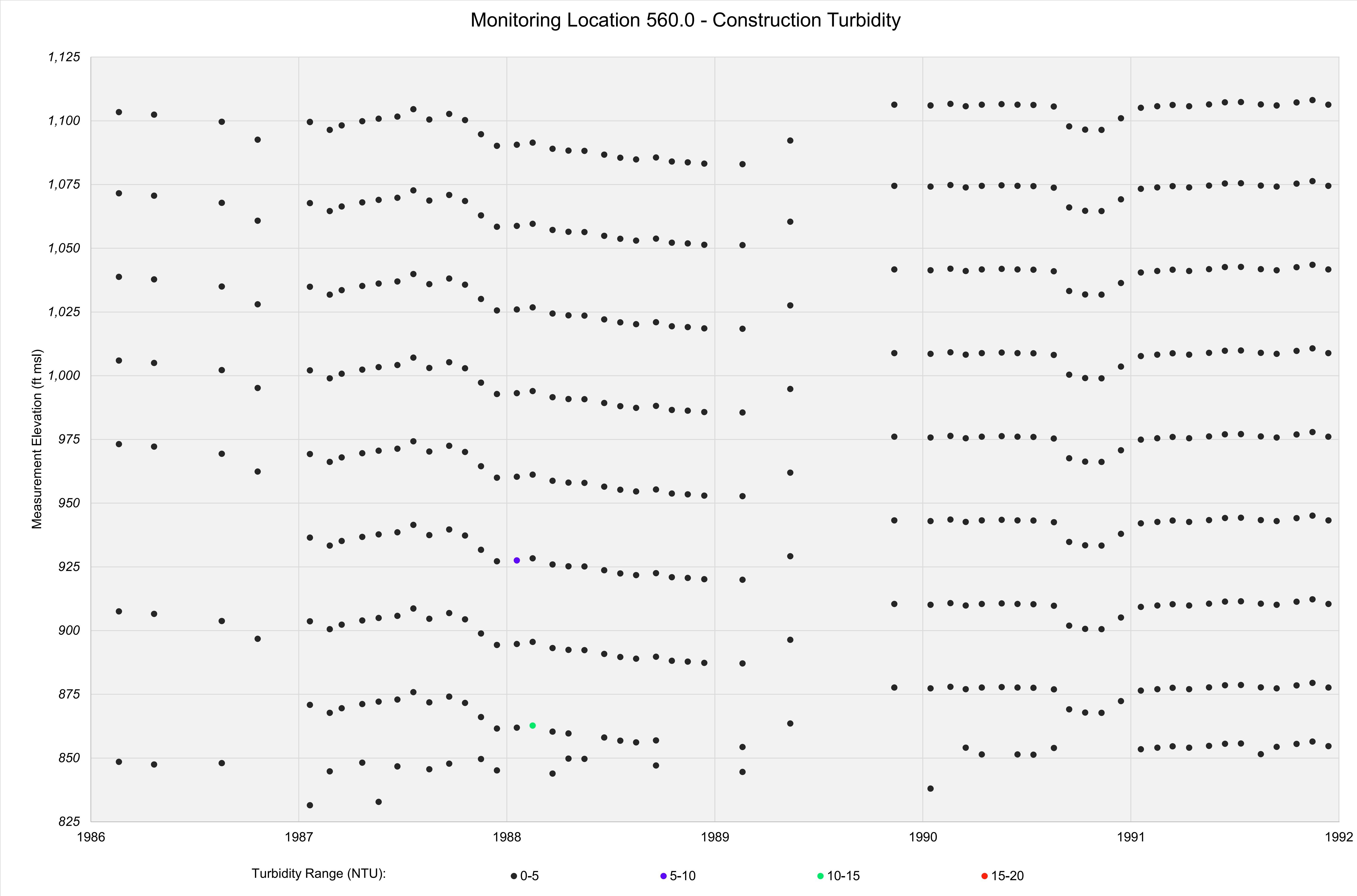

Monitoring Location 560.0 - Construction Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
925
900
875
850
825
1986
1987
1988
1989
1990
1991
1992
Turbidity Range (NTU):
0-5
5-10
10-15
15-20

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Station 560.0

Post Construction [1992-2015]

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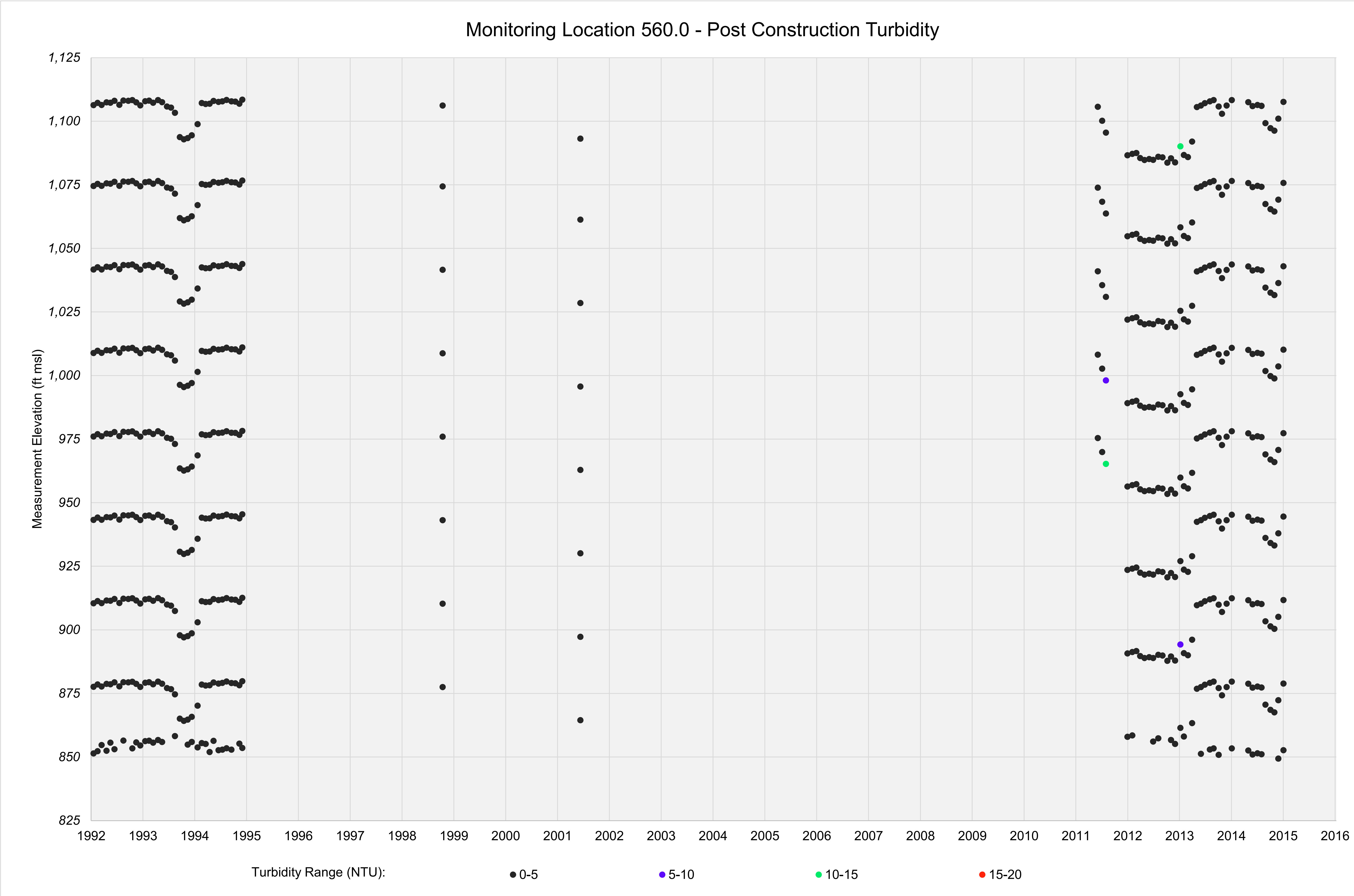
Monitoring Location 560.0 - Post Construction Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
925
900
875
850
825
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Turbidity Range (NTU):
0-5
5-10
10-15
15-20

Station 560.0

Full Dataset

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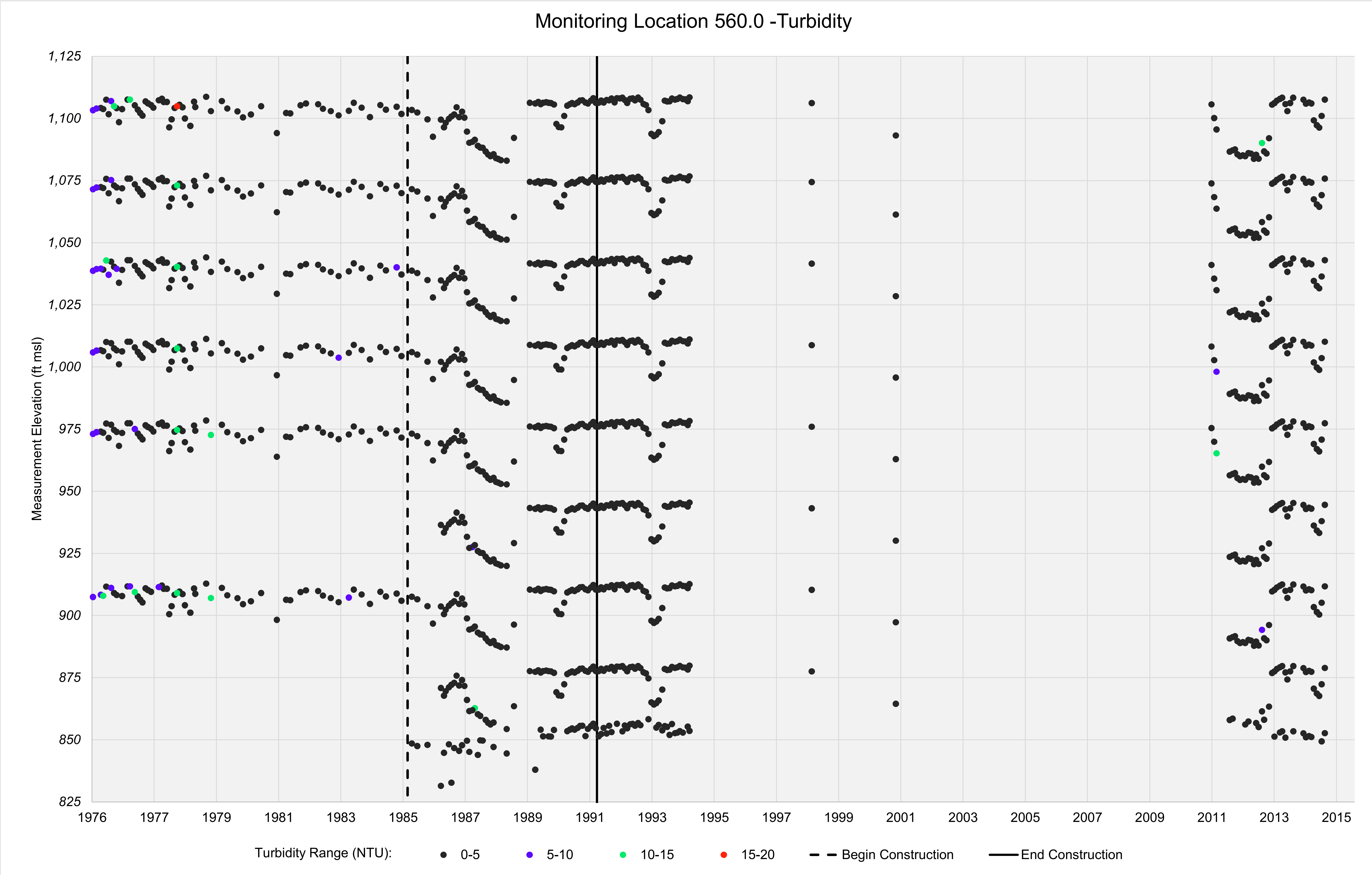

Monitoring Location 560.0 -Turbidity
Measurement Elevation (ft msl)
1,125
1,100
1,075
1,050
1,025
1,000
975
950
925
900
875
850
825
1976
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
Turbidity Range (NTU):
0-5
5-10
10-15
15-20
Begin Construction
End Construction

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Station 560.0

Depth-Averaged with SC State Standard

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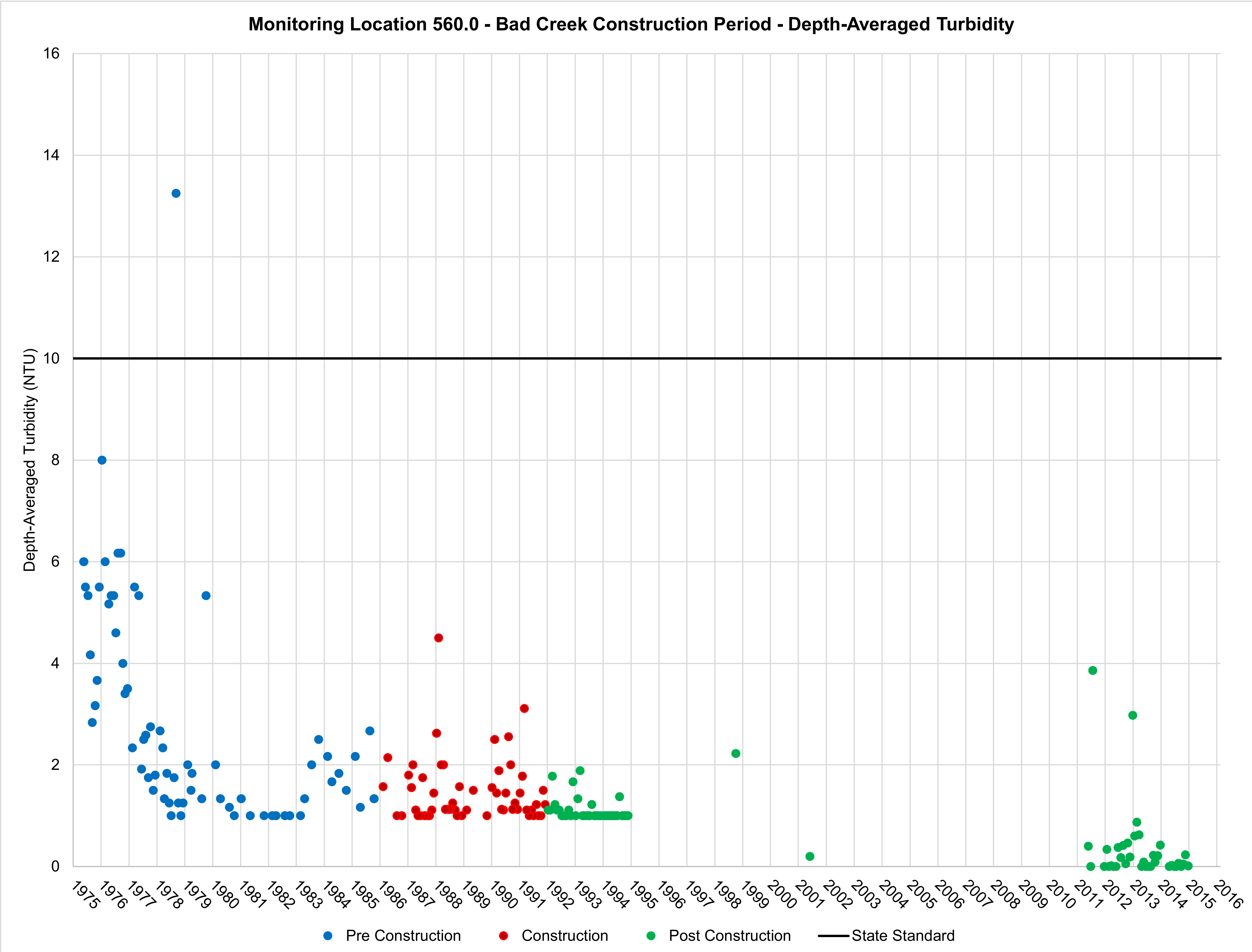

Monitoring Location 560.0 - Bad Creek Construction Period - Depth-Averaged Turbidity
Depth-Averaged Turbidity (NTU)
0
2
4
6
8
10
12
14
16
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
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1994
1995
1996
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1998
1999
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2003
2004
2005
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2009
2010
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2012
2013
2014
2015
2016
Pre Construction
Construction
Post Construction
State Standard

Attachment B: Stream Assessment Methodology

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Memo

Date:	Wednesday, July 26, 2023
Project:	Bad Creek Pumped Storage Project Relicensing
To:	South Carolina Department of Natural Resources
From:	HDR Engineering of the Carolinas, Inc.
Subject:	Aquatic Resources Study Approach to Stream Surveys – Revised Post-Consultation

Project Understanding

Duke Energy Carolinas, LLC (Duke Energy or Licensee) is the owner and operator of the 1,400-megawatt Bad Creek Pumped Storage Project (Project) (Federal Energy Regulatory Commission [FERC] Project No. 2740) located in Oconee County, South Carolina. Duke Energy is pursuing a new license for the Project and in accordance with 18 Code of Federal Regulations §5.11, developed a Revised Study Plan (RSP) which proposed six studies for Project relicensing, including an Aquatic Resources Study. The goal of the Aquatic Resources Study is to evaluate potential impacts to fish and aquatic life populations, communities, and habitats due to the potential construction and operation of an additional power complex (Bad Creek II Power Complex [Bad Creek II Complex]) adjacent to the existing Project. The Aquatic Resources Study is ongoing.

As additional information, Duke Energy is proposing the development of an access road to provide an alternate route to the Fisher Knob community, for use during Bad Creek II construction. The access road is not presently included in the proposed expanded FERC Project Boundary and was not yet planned at the time of preparation of the RSP. Consistent with the objective of the Aquatic Resources Study to "evaluate the aquatic resources (streams, wetlands, and Lake Jocassee) that may experience direct impacts from spoil placement or other construction activities", Duke Energy plans to evaluate surface waters that may be crossed by the access road in addition to waters within potential spoil locations as described in the RSP.

Approach to Streams within Potential Spoil Locations

According to preliminary studies and estimates for proposed material removed from underground excavations for the Bad Creek II Complex, approximately 4 million cubic yards of overburden material for the project infrastructure will need to be deposited at upland spoil locations or along the submerged weir in Lake Jocassee (Attachment 1). An additional spoil area related to the construction of a proposed transformer yard, potential spoil location J, adds an approximately 0.4 million cubic yards to the overburden amount, for a total of 4.4 million cubic yards. Nine potential streams are present within the proposed on-site spoil locations (see Table 1 and Attachment 1). Surface waters (including wetlands) in these locations were evaluated in the field during the Natural Resources Assessment completed by HDR in September 2021 (HDR 2021; Appendix E of the Pre-Application Document filed with FERC on February 23, 2022).

Consistent with the RSP, Duke Energy will complete U.S. Environmental Protection Agency (USEPA) Rapid Bioassessment Protocol (USEPA RBP; Barbour et al. 1999) stream habitat assessments for all streams within potential spoil locations. During the Joint Resource

Committee Meeting on February 22, 2023, and the Aquatic Resources Study Resource Committee Meeting held on April 6, 2023, committee members expressed interest in biological assessments. In follow-up correspondence with the Aquatic Resources Committee, Duke Energy proposed to complete stream assessments using the North Carolina Stream Assessment Method (NCSAM; N.C. Stream Functional Assessment Team 2013) in addition to the USEPA RBP.

The South Carolina Department of Natural Resources (SCDNR) also requested that Duke Energy use the SCDNR Stream Quantification Tool (SQT)[1] (South Carolina Steering Committee 2022) for stream assessments. Duke Energy consulted with the SCDNR on May 24 and June 21, 2023, to discuss the applicability and methodology of the SQT. Duke Energy, HDR, and SCDNR also participated in a site visit to Bad Creek on July 12, 2023. The site visit included Alan Stuart (Duke Energy), Allan Boggs (Duke Energy), Nick Wahl (Duke Energy), Eric Mularski (HDR), Erin Settevendemio (HDR), and Lorianne Riggin (SCDNR). The group visited spoil locations B and D (see figures in Attachment 1), which were considered locations with representative conditions of stream and riparian habitat. During the site visit, SCDNR and Duke Energy agreed that the streams within spoil locations are generally high functioning with limited (if any) anthropogenically caused degradation, and that field data collection to support SQT analysis for streams within spoil locations was not likely to produce significantly different results (i.e., lower functionality scores) than an assumption of fully functional. Therefore, field surveys of the streams within potential spoil locations applying the SQT methodology are not required.

Approach to Streams Crossed by the Access Road to the Fisher Knob Community

The potential access road would require crossings at three named streams (Limber Pole Creek, Howard Creek, and Devils Fork) and potentially other unidentified streams (see figures provided in Attachment 2). Currently, two access road routes are being considered, however only one would be developed. The routes diverge just west of Howard Creek, where Option 1 crosses Howard Creek and heads north across a ridge. Option 2 crosses Howard Creek and heads south along the left bank of Howard Creek before directing northeast. The road options converge east of the transmission line corridor west of Devils Fork. It is anticipated that Option 1 would result in fewer riparian buffer impacts and therefore this is the preferred route.

Based on review of two-foot topography contour maps, an additional three streams may be present along the access road, though the flow of these streams is currently unknown. A surface waters delineation is scheduled for mid-late August to identify stream conditions/flow of these unnamed features. If Duke Energy develops the access road, streams and creeks along the alignment will likely be spanned by [temporary] bridges. Duke Energy will conduct field assessments using the SCDNR SQT to evaluate stream function as a baseline prior to construction activities to document any changes that may occur, though none are anticipated.

Streams crossed by the access road will be assessed with the USEPA RBP and NCSAM. Stream assessments will be conducted upstream and downstream of each road crossing. The intent is to document a baseline, existing condition of the stream before the construction of the access road. When and if the road is decommissioned, the streams would be re-assessed to compare to the baseline condition. Additionally, evaluating the streams at upstream and downstream locations

[1] SCDNR Stream Quantification Tool

allows an opportunity to document changes that may have happened elsewhere (i.e., upstream) in the watershed or as a result of other factors, such as storm events.

Proposed Field Methods

Numerous methods for stream habitat and biological assessments will be used for evaluating streams in the vicinity of the Project. Field methods to be implemented at each stream are based on consultation with the Aquatic Resources Study Resource Committee (RC) and SCDNR, as discussed above. The following summary provides an overview of planned field methods for streams within spoil locations and those crossed by the potential access road.

USEPA Rapid Bioassessment Protocol

In accordance with the RSP, the USEPA RBP stream habitat assessment will be completed at all streams within spoil locations. Barbour et al. (1999) states, "an evaluation of habitat quality is critical to any assessment of ecological integrity". Stream habitat assessments are defined as the "evaluation of the structure of the surrounding physical habitat that influences the quality of the water resource and the condition of the resident aquatic community" (Barbour et al. 1999). These assessments provide information regarding stream functionality and condition, which in turn can indicate the value of aquatic habitat to aquatic and terrestrial life, and ecosystem services such as nutrient reduction and support of watershed health. The USEPA RBP includes an evaluation of the variety and quality of (1) stream substrate, (2) channel morphology, (3) bank structure, and (4) riparian vegetation. Ten parameters within the four categories are rated on a numerical scale for each sampled reach.

NC Stream Assessment Method

The NCSAM provides "an accurate, reproducible, rapid, observational, and science-based field method to determine the level of stream function relative to a reference condition" (N.C. Stream Functional Assessment Team 2013). While the NCSAM was developed for use in North Carolina, the Project is just a few miles from the North-South Carolina border and stream categories identified for the method include those in the Blue Ridge ecoregion, where the Project is located. Similarities between topography and streams in the Carolinas allow this method to provide valuable information regarding the overall function of streams with a simple and efficient tool.

The NCSAM rates streams for three Class 1 functions: hydrology, water quality, and habitat. Within each Class 1 function, streams are rated for up to eight Class 2 functions, which may include Class 3 and Class 4 functions. The functions provided by a stream are a product of the hydrologic, geologic, morphologic, and vegetational setting of the stream and its drainage area (Gordon et al. 1992 as cited by N.C. Stream Functional Assessment Team 2013). Alterations and/or stressors can contribute to the degradation of a stream, either naturally or anthropogenically, including storm damage, excessive vegetation, beaver impoundment, stream migration, and sedimentation, which can lead to lower stream function. Parameters evaluated with NCSAM protocol include flow restrictions; streambank erosion; buffer size and type; water quality stressors; substrate composition; in-stream habitat; visual and dip netting assessments for aquatic life; presence of wetlands; shade; and others.

SCDNR Stream Quantification Tool Approach

As stated above, six or more streams could be crossed by the access road and Duke Energy proposes to use the SQT field methodology for stream assessments in this area. The SCDNR SQT was developed in a collaborative effort between federal and state representatives to provide a tool for assessing and quantifying functional lift and loss of streams in South Carolina. The SQT can be used to determine the functional condition of a stream, with the SQT Debit Calculator as a means of calculating credits or debits resulting from reach-scale activities typically encountered in the Clean Water Act 404 program.

The SQT requires the assessment of five functional categories: hydrology, hydraulics, geomorphology, physiochemical, and biology (South Carolina Steering Committee 2022). Depending on the anticipated type of impacts or lift, physiochemical and biology categories are optional. Guidance from the SQT suggests physiochemical parameters be measured for stream projects with "goals or objectives related to physiochemical functions or where watershed conditions suggest that uplift is possible." Work would be conducted from upland locations and no in-water work would occur. Best management practices to prevent sedimentation such as silt fencing would be installed to prevent water quality impacts at stream crossings. The future Water Quality Management Plan (developed under the Water Resources Study) will also consider water quality in the areas of the new access road. Given that impacts to water quality are not anticipated and appropriate protection measures will be taken, Duke Energy is not proposing physiochemical monitoring.

At prior meetings with Duke Energy, Aquatic Resources RC members have expressed interest in the biological community of streams in the vicinity of the proposed Bad Creek II Complex. Duke Energy therefore proposes to conduct fish and macroinvertebrate sampling supporting the SQT assessment.

Hydrology, Hydraulics, and Geomorphology

Duke Energy will survey all streams crossed by both access road options using the first three functional categories of the SQT, which comprise hydrology, hydraulics, and geomorphology, using the Rapid Method outlined in the SQT Data Collection and Analysis Manual (South Carolina Steering Committee 2022). Parameters evaluated under these categories include reach runoff, floodplain connectivity, flow dynamics, large woody debris, lateral migration, riparian vegetation, and bed form diversity. Up to 17 metrics will be taken for the parameters evaluated; metrics selection, instruction, and applicability is provided in the SQT Data Collection and Analysis Manual (South Carolina Steering Committee 2022).

Fish Surveys

Fish surveys for use with the SQT are only applicable to perennial streams with drainage areas between 1.5 and 63 square miles (South Carolina Steering Committee 2022), which includes Limber Pole Creek and Howard Creek. As outlined by the SQT Data Collection and Analysis Manual, fish surveys will follow Fish Collection Protocols for Streams as described in the SCDNR Fish Sampling Guidance[2] (SCDNR 2022). For streams in the Blue Ridge ecoregion, sample reaches will be 30 times the average wetted width, or a minimum 100 meters with one electrofishing pass. Surveys will be completed upstream and downstream of the road crossings

[2] SCDNR Fish Sampling Guidance

three times between July and October 2023. A calibrated multiparameter water quality data sonde will be used to record existing water quality conditions during sampling events, including temperature, dissolved oxygen, conductivity, pH, salinity, and turbidity.

Macroinvertebrate Surveys

Macroinvertebrate surveys under the SQT are limited to perennial streams with a minimum three-square mile drainage area (South Carolina Steering Committee 2022), which includes Limber Pole Creek and Howard Creek. As outlined in the SQT Data Collection and Analysis Manual, macroinvertebrate surveys will be completed following the Standard Operating and Quality Control Procedures for Macroinvertebrate Sampling[3] (SCDHEC 2017). This method uses a qualitative multiple habitat sampling protocol with kick nets, D-shaped dip nets, and sieves to collect as many different macroinvertebrate taxa as possible during a specified amount of time. One survey per stream reach will be conducted during the recommended index period (June 15, 2023 to September 15, 2023 for the Blue Ridge ecoregion). Stream reach lengths will be determined on a site-by-site basis consistent with guidance provided in SCDHEC (2017), which is typically 100 meters of stream. Water quality conditions at the time of sampling will be recorded with a multiparameter data sonde. Collected samples will be preserved in 85 percent ethanol and labeled with the station number and collection date. Samples will be transported to a qualified laboratory for identification and analysis under chain-of-custody. Identified taxa and relative abundance will be used to calculate biotic indices to assess stream conditions.

Mussel Surveys

Consistent with the RSP, Duke Energy biologists surveyed upland spoil locations for mussel habitat and determined that no supportive habitat is present for mussel assemblages. SCDNR concurred with this assessment during the July 12, 2023 site visit to two representative spoil locations with streams characteristics of those throughout the Aquatic Resources study area.

Mussel surveys of Limber Pole Creek and Howard Creek will be conducted in late July 2023 following methods adapted from the USEPA Technical Support Document for Conducting and Reviewing Freshwater Mussel Occurrence Surveys for the Development of Site-specific Water Quality Criteria for Ammonia (USEPA 2013). The survey will include visual and tactile collection of mussels, identification to species, and enumeration. Habitat conditions will be documented, including substrate and water quality, through stream habitat assessments and fish surveys.

Summary of Proposed Field Methods

Field surveys of streams within spoil locations were proposed in the RSP. Since the proposed access road was not planned at the time of the filing of the RSP, the stream crossings were not included in Aquatic Resources Study; however, for completeness, field surveys will also be performed at potential stream crossing locations. The field methods proposed for each stream were developed in consultation with the Aquatic Resources RC and SCDNR. A summary of the proposed field methods is provided in Table 1, with brief descriptions of methods provided in Table 2.

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[3] SCDHEC Standard Operating and Quality Control Procedures for Macroinvertebrate Sampling

Results and Conclusions

An overview of results of field studies will be discussed in a future meeting to be scheduled for late October or early November 2023. Results and conclusions of the stream habitat assessments and SQT will be summarized in a draft report, which will be provided to the Aquatic Resources RC in November 2023 for comment and in the Initial Study Report (to be filed with FERC by January 4, 2024).

Table 1. Proposed Field Survey Approach for Streams within Potential Spoil Locations and Road Crossings

Potential Impact	Stream Name/No.	Flow	Drainage Area (sq. mi)	Stream Habitat Assessment	Fish Survey	Macroinvertebrate Survey	Mussel Survey[1]
Potential Spoil Locations							
B	20	Perennial	0.05	USEPA RBP & NCSAM	NCSAM visual/dipnet assessment	NCSAM presence/absence assessment	USEPA qualitative presence survey
B	21	Perennial	0.05	USEPA RBP & NCSAM	NCSAM visual/dipnet assessment	NCSAM presence/absence assessment	USEPA qualitative presence survey
C	17	Perennial	0.05	USEPA RBP & NCSAM	NCSAM visual/dipnet assessment	NCSAM presence/absence assessment	USEPA qualitative presence survey
D	13	Intermittent	0.04	USEPA RBP & NCSAM	NCSAM visual/dipnet assessment	NCSAM presence/absence assessment	N/A
D	14	Perennial	0.04	USEPA RBP & NCSAM	NCSAM visual/dipnet assessment	NCSAM presence/absence assessment	USEPA qualitative presence survey
G	4	Intermittent	0.06	USEPA RBP & NCSAM	NCSAM visual/dipnet assessment	NCSAM presence/absence assessment	N/A
G	4a	Perennial	0.06	USEPA RBP & NCSAM	NCSAM visual/dipnet assessment	NCSAM presence/absence assessment	USEPA qualitative presence survey
J	11	Perennial	0.11	USEPA RBP & NCSAM	NCSAM visual/dipnet assessment	NCSAM presence/absence assessment	USEPA qualitative presence survey
Potential Access Road Crossings							
1	Limber Pole Creek	Perennial	1.8	USEPA RBP, NCSAM, & SCDNR SQT	SCDNR Fish Collection Protocol	SCDHEC Standard Operating and Quality Control Procedures	USEPA qualitative presence survey
2	UT Howard Creek	Unknown[2]	0.03	USEPA RBP & NCSAM	Unknown[2]	Unknown[2]	Unknown[2]
3a/b	Howard Creek	Perennial	4.16	USEPA RBP, NCSAM, & SCDNR SQT	SCDNR Fish Collection Protocol	SCDHEC Standard Operating and Quality Control Procedures	USEPA qualitative presence survey
4	UT Howard Creek	Unknown[2]	0.01	USEPA RBP & NCSAM	Unknown[2]	Unknown[2]	Unknown[2]
5	UT Devils Fork	Unknown[2]	0.03	USEPA RBP & NCSAM	Unknown[2]	Unknown[2]	Unknown[2]
6	Devils Fork (Stream 19)	Perennial	0.09	USEPA RBP, NCSAM, & SCDNR SQT	NCSAM visual/dipnet assessment	NCSAM presence/absence assessment	USEPA qualitative presence survey

UT: unnamed tributary
[1]Mussel surveys will only be completed in waters determined to provide supportive mussel habitat.
[2]Aquatic life surveys would only be conducted in intermittent or perennial streams.

Table 2. Descriptions of Field Survey Protocols

Survey Type	Survey Method	Brief Summary of Methods
Stream Habitat Assessment	USEPA Rapid Bioassessment Protocol Stream Assessment	Scored condition parameters including epifaunal substrate/available cover, substrate embeddedness, velocity/depth regime, sediment deposition, channel flow status, channel alteration, frequency of riffles or bends, bank stability, vegetative protection, and riparian vegetative zone width.
	NC Stream Assessment Method (NCSAM)	Documentation of in-stream habitat types including aquatic macrophytes and mosses; sticks, leaf packs, or emergent vegetation; snags and logs; undercut banks and root mats; and bedform and substrate types. Observations of stream instability or stressors.
	SCDNR Stream Quantification Tool (SQT)	Hydrology, hydraulics, and geomorphology will be assessed across seven functional parameters, including reach runoff, floodplain connectivity, flow dynamics, large woody debris, lateral migration, riparian vegetation, and bed form diversity. Metrics will be taken applying the Rapid Method, using tapes and stadia rods.
Fish Surveys	NC Stream Assessment Method (NCSAM)	Visual assessment for fish and semi-aquatic life such as reptiles and amphibians.
	SCDNR Stream Quantification Tool (SQT)/ SCDNR Fish Collection Protocols for Streams	Fish surveys completed for the SCDNR SQT will follow the SCDNR Fish Collection Protocols for Streams. For streams in the Blue Ridge Ecoregion, the survey reach will encompass 30 times the average wetted width of the stream or a minimum of 100 meters with one survey pass. Two to three electrofishers, two netters, and one to two buckets will be used. Water quality parameters and photo vouchers will be taken.
Macroinvertebrate Surveys	NC Stream Assessment Method (NCSAM)	Presence/absence survey of macroinvertebrates in all available habitats, including riffles, pools, snags and logs, leaf packs, macrophytes, root mats, hard substrates, and banks. Macroinvertebrates sampled via dipnet with mesh size between 0.5-0.8 mm.
	SCDNR Stream Quantification Tool (SQT)/ SCDHEC Standard Operating and Quality Control Procedures	Macroinvertebrate surveys completed for the SCDNR SQT will follow the SCDHEC Standard Operating and Quality Control Procedures. This includes a qualitative, multiple habitat sampling protocol with kick nets, D-shaped dip nets, and sieves to collect as many different macroinvertebrate taxa as possible during a specified amount of time. Stream reach lengths are typically 100 meters. Collected samples will be preserved in 85 percent ethanol and labeled with the station number and collection date. Samples will be transported to a qualified laboratory for identification and analysis under chain-of-custody. Macroinvertebrate surveys under the SQT are limited to waters with a minimum 3-square-mile drainage area.
Mussel Surveys	Adapted from USEPA Technical Support Document for Conducting and Reviewing Freshwater Mussel Occurrence Surveys	Visual sampling approach to determine mussel presence, richness, and relative density. Mussels collected visually and tactilely (grubbing) during timed searches within well-defined areas.

References

Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

North Carolina Stream Functional Assessment Team. 2013. N.C. Stream Assessment Method (NC SAM) Draft User Manual. Accessed June 2023. [URL]: https://www.saw.usace.army.mil/Portals/59/docs/regulatory/publicnotices/2013/NCSAM_Draft_User_Manual_130318.pdf

South Carolina Department of Health and Environmental Control. 2017. Standard Operating and Quality Control Procedures for Macroinvertebrate Sampling. Technical Report No. 0914-17. Bureau of Water. Columbia, South Carolina.

South Carolina Department of Natural Resources. 2022. Fish Sampling Guidance: Fish Collection Protocols for Streams. Accessed July 2023. [URL]: https://www.dnr.sc.gov/environmental/SCDNRSamplingProcedureFishes.pdf.

South Carolina Steering Committee. 2022. South Carolina Stream Quantification Tool: Data Collection and Analysis Manual, SC SQT v1.1. South Carolina Department of Natural Resources, Columbia, SC.

U.S. Environmental Protection Agency (USEPA). 2013. Technical Support Document for Conducting and Reviewing Freshwater Mussel Occurrence Surveys for the Development of Site-specific Water Quality Criteria for Ammonia. EPA 800-R-13-003. Office of Water. Washington, DC. Accessed June 2023. [URL]: https://www.epa.gov/sites/default/files/2015-08/documents/tsd_for_conducting_and_reviewing_freshwater_mussel_occurrence_surveys_for_the_development_of_site-specific_wqc_for_ammonia.pdf.

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Attachment 1

Attachment 1 – Streams and Wetlands within Potential Spoil Locations

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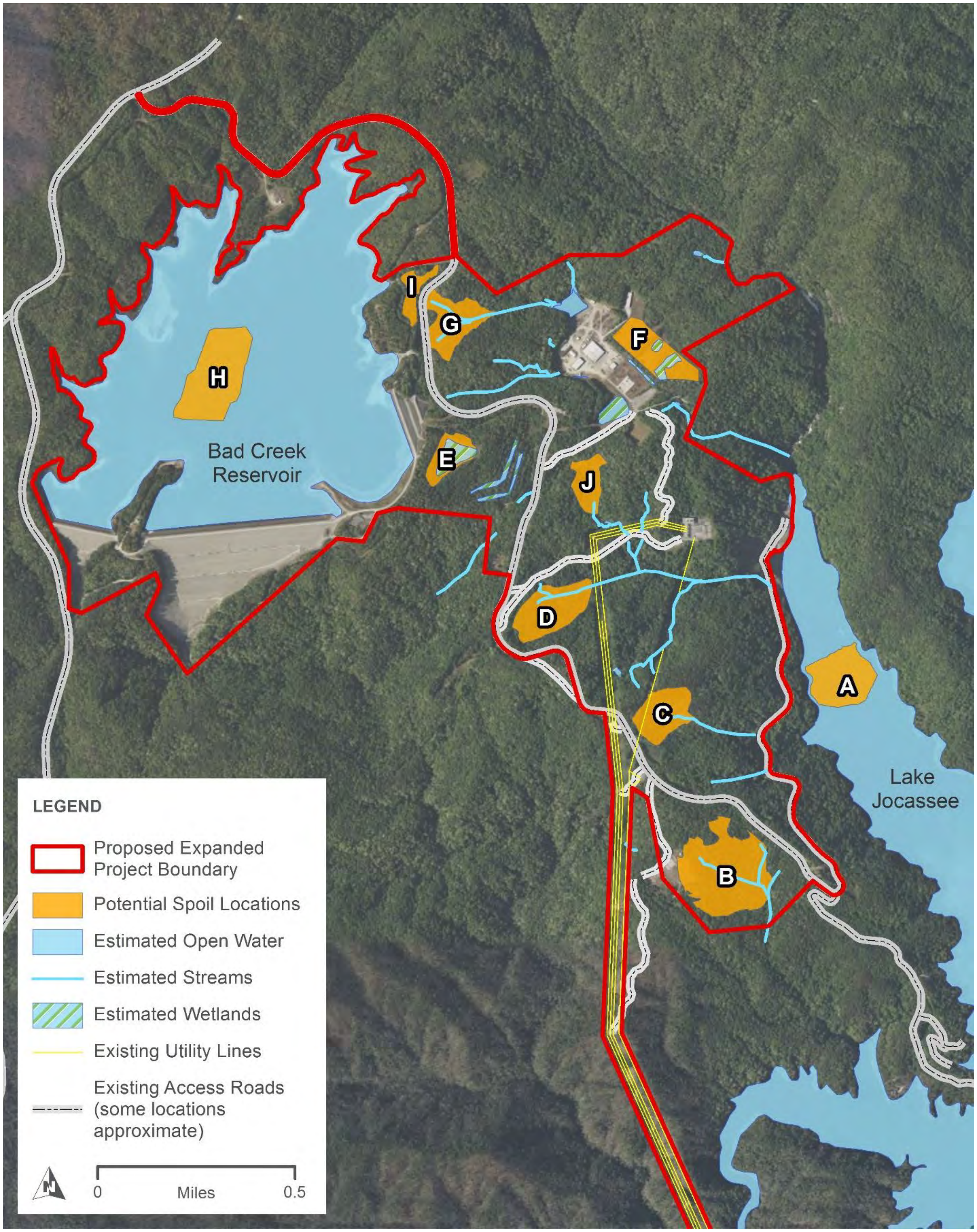
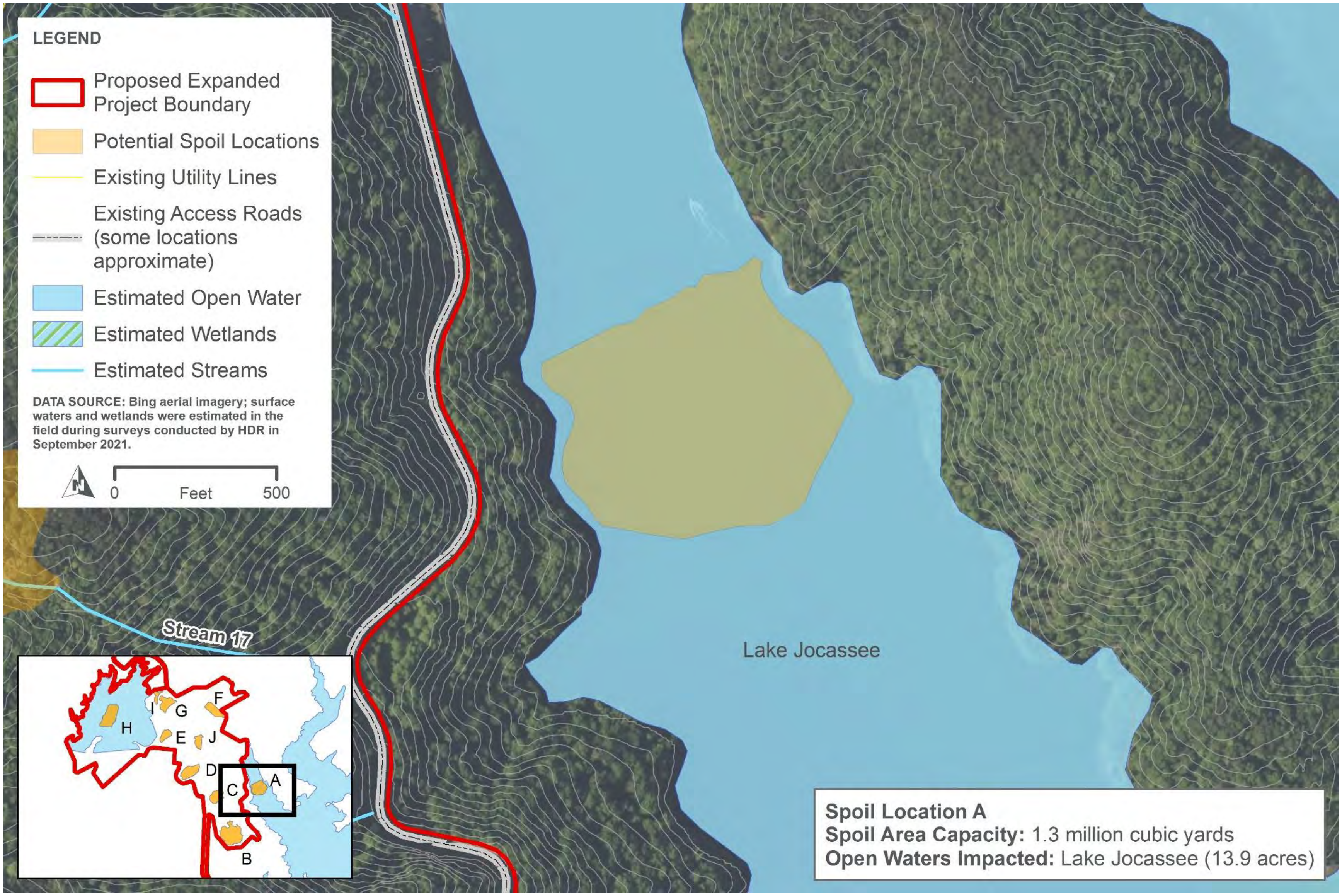
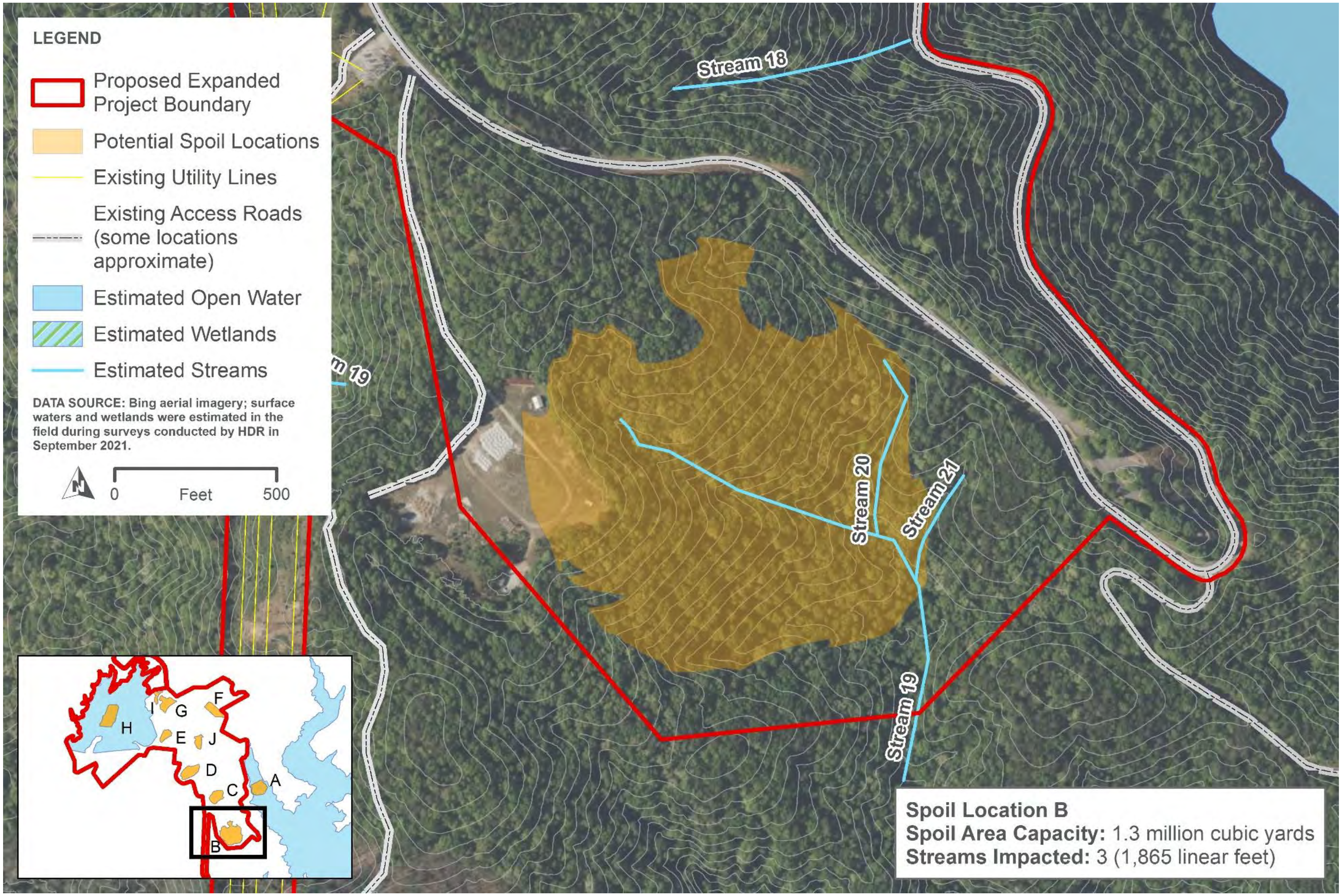
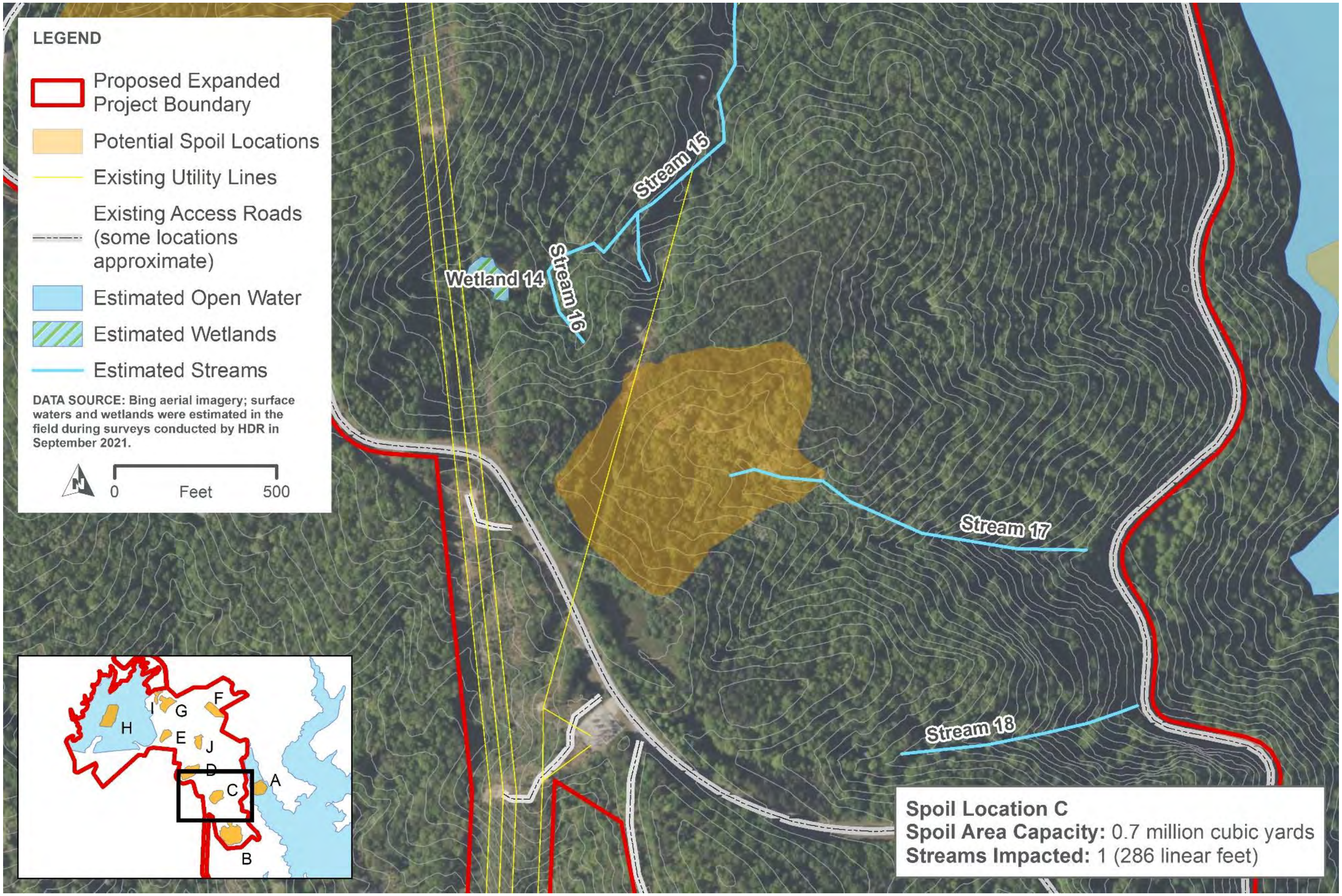
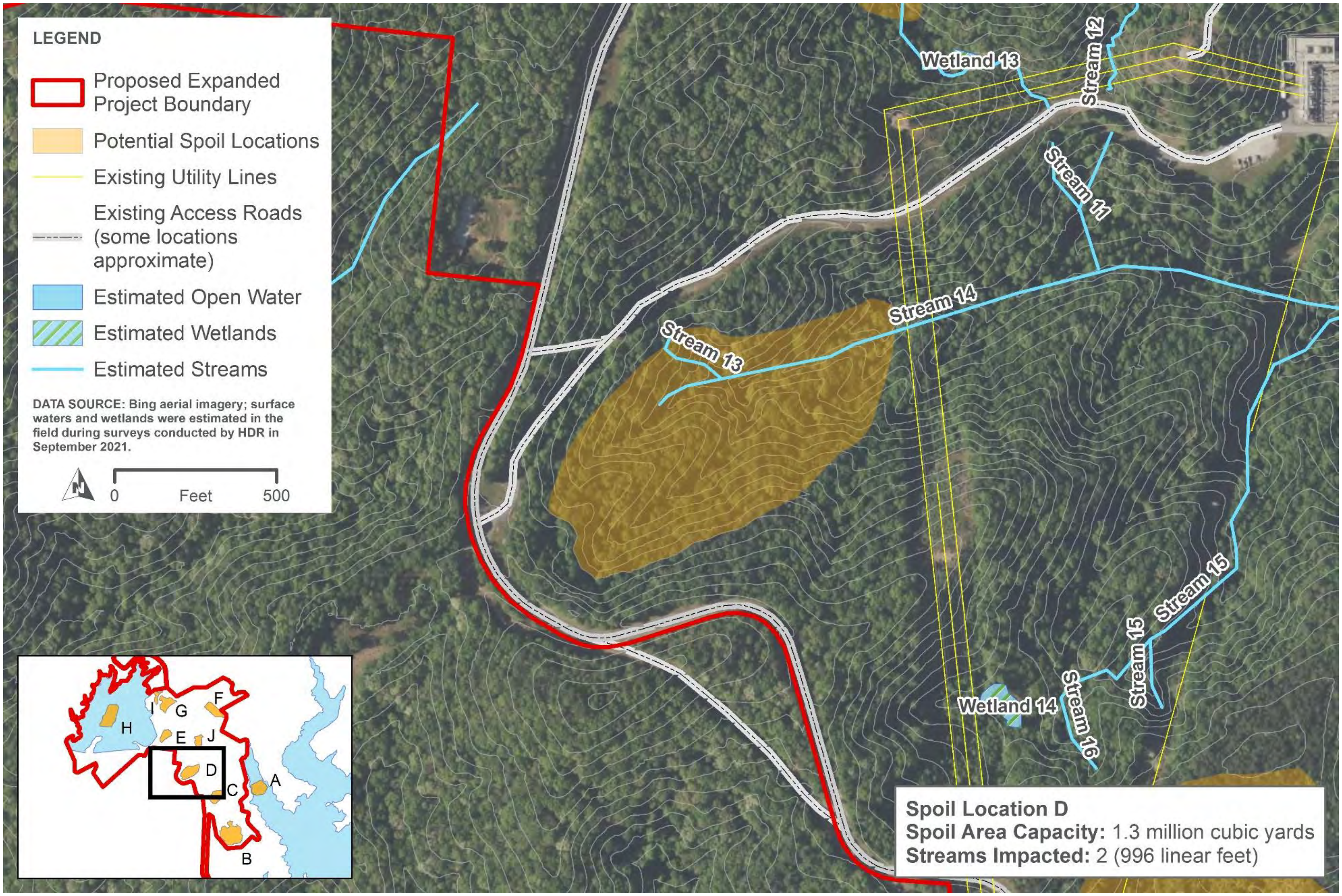
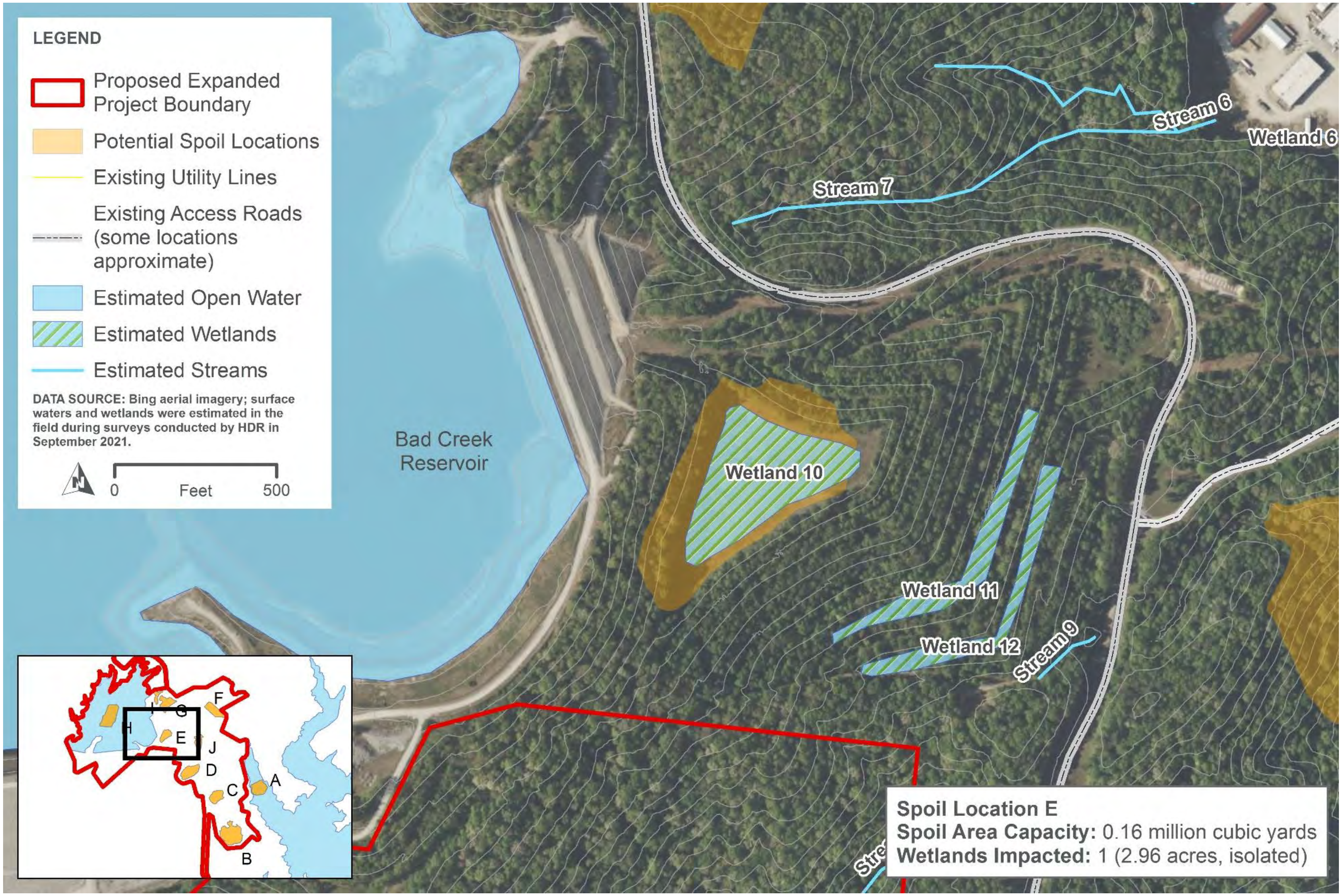

H
Bad Creek
Reservoir
I
G
F
E
J
D
C
A
B
Lake
Jocassee
LEGEND
Proposed Expanded
Project Boundary
Potential Spoil Locations
Estimated Open Water
Estimated Streams
Estimated Wetlands
Existing Utility Lines
Existing Access Roads
(some locations
approximate)
0
Miles
0.5

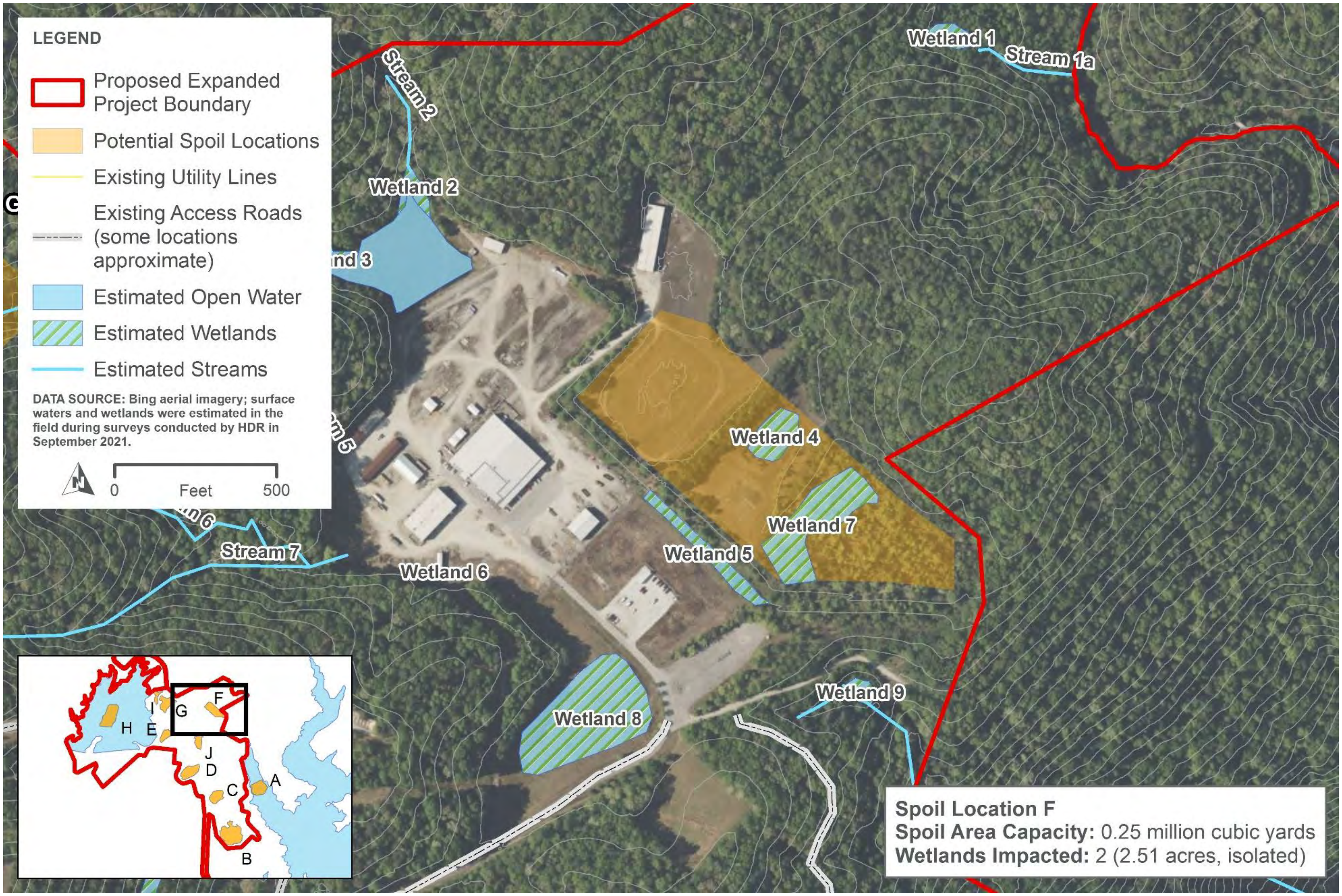

LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Existing Utility Lines
Existing Access Roads (some locations approximate)
Estimated Open Water
Estimated Wetlands
Estimated Streams
DATA SOURCE: Bing aerial imagery; surface waters and wetlands were estimated in the field during surveys conducted by HDR in September 2021.
0 Feet 500
Stream 17
Lake Jocassee
H
I
G
F
E
J
D
C
A
B
Spoil Location A
Spoil Area Capacity: 1.3 million cubic yards
Open Waters Impacted: Lake Jocassee (13.9 acres)

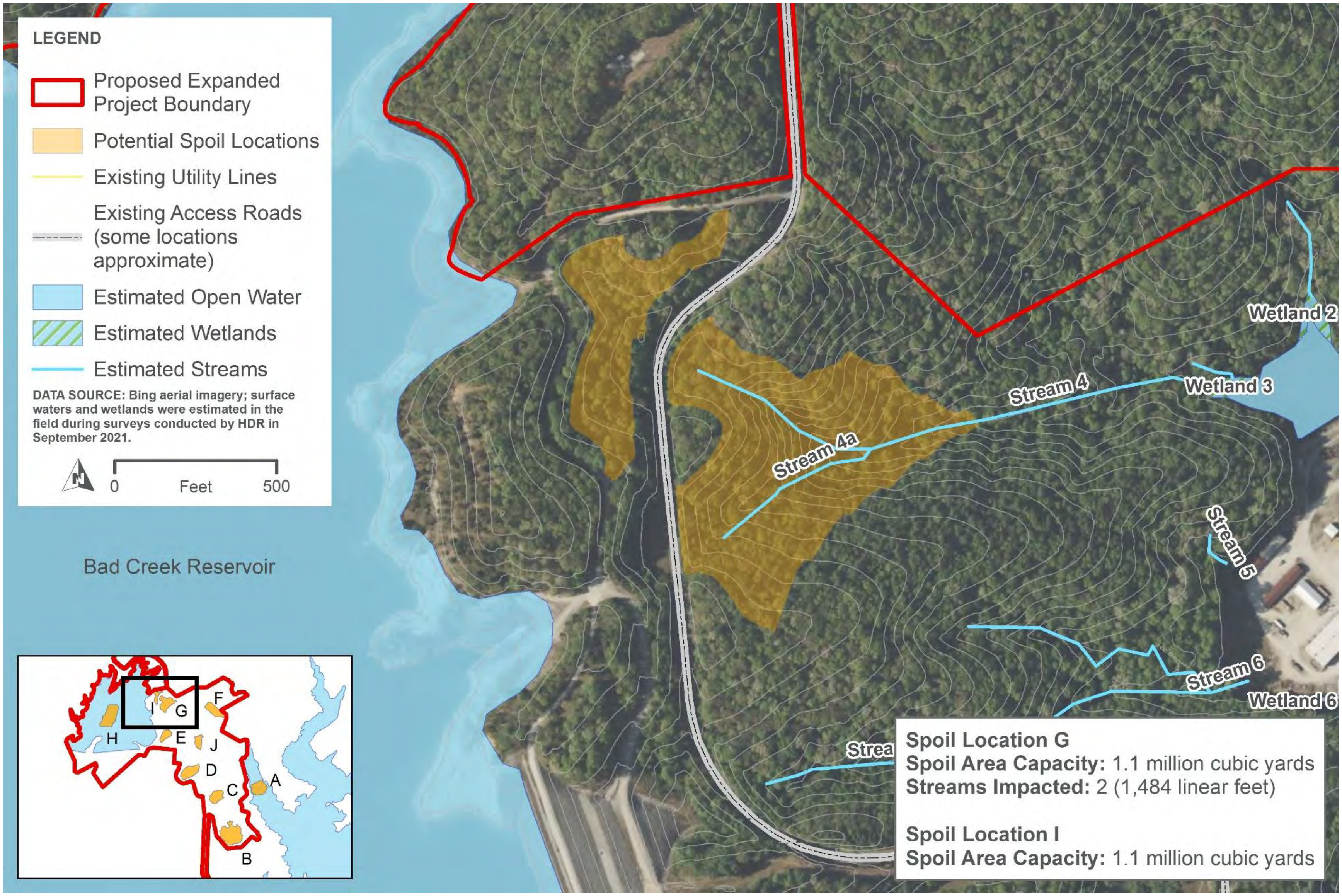

LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Existing Utility Lines
Existing Access Roads (some locations approximate)
Estimated Open Water
Estimated Wetlands
Estimated Streams
DATA SOURCE: Bing aerial imagery; surface waters and wetlands were estimated in the field during surveys conducted by HDR in September 2021.
0 Feet 500
Stream 18
Stream 19
Stream 20
Stream 21
Stream 19
H
I
G
F
E
J
D
C
A
B
Spoil Location B
Spoil Area Capacity: 1.3 million cubic yards
Streams Impacted: 3 (1,865 linear feet)

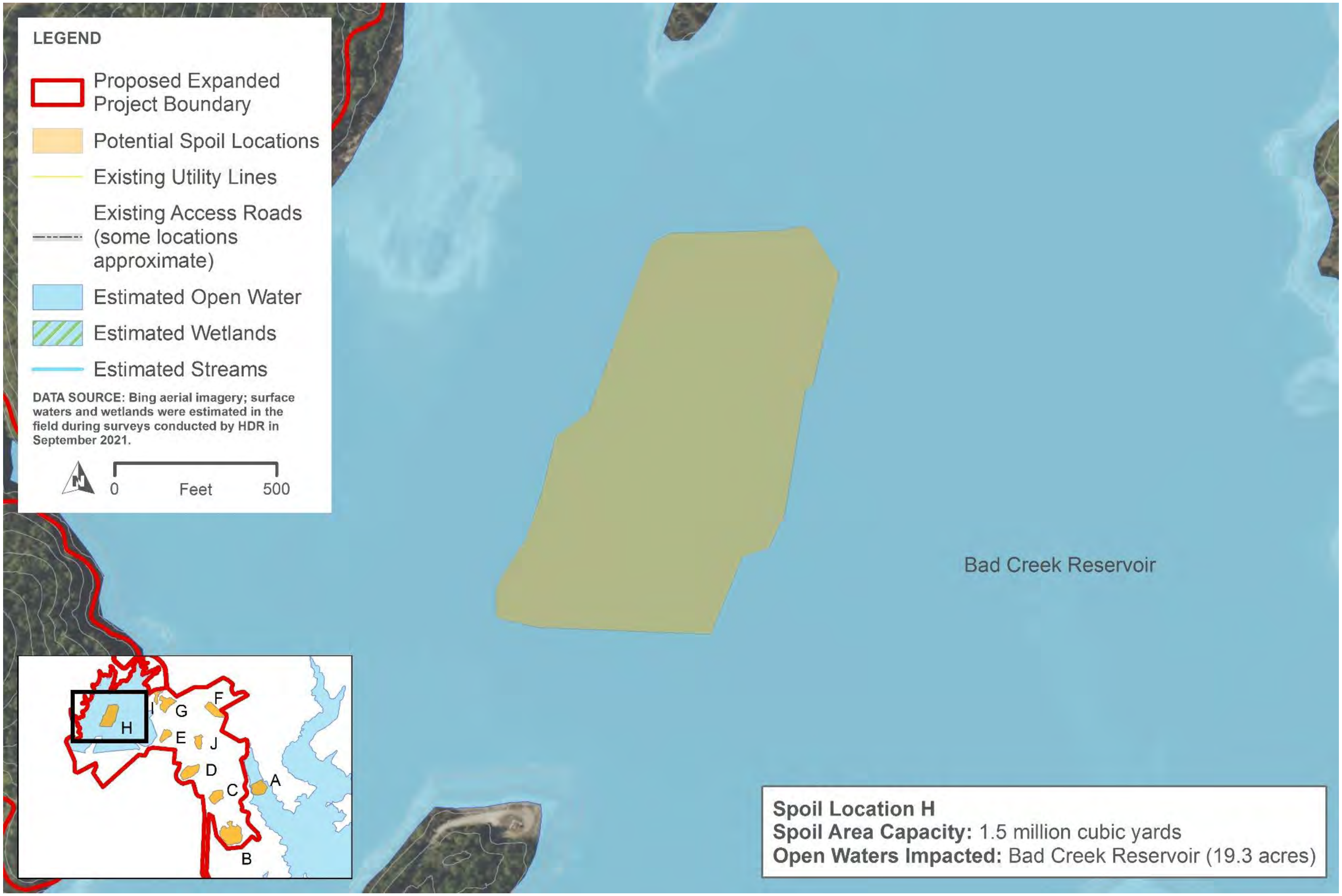

LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Existing Utility Lines
Existing Access Roads (some locations approximate)
Estimated Open Water
Estimated Wetlands
Estimated Streams
DATA SOURCE: Bing aerial imagery; surface waters and wetlands were estimated in the field during surveys conducted by HDR in September 2021.
0 Feet 500
Stream 15
Stream 16
Wetland 14
Stream 17
Stream 18
A
B
C
D
E
F
G
H
I
J
Spoil Location C
Spoil Area Capacity: 0.7 million cubic yards
Streams Impacted: 1 (286 linear feet)

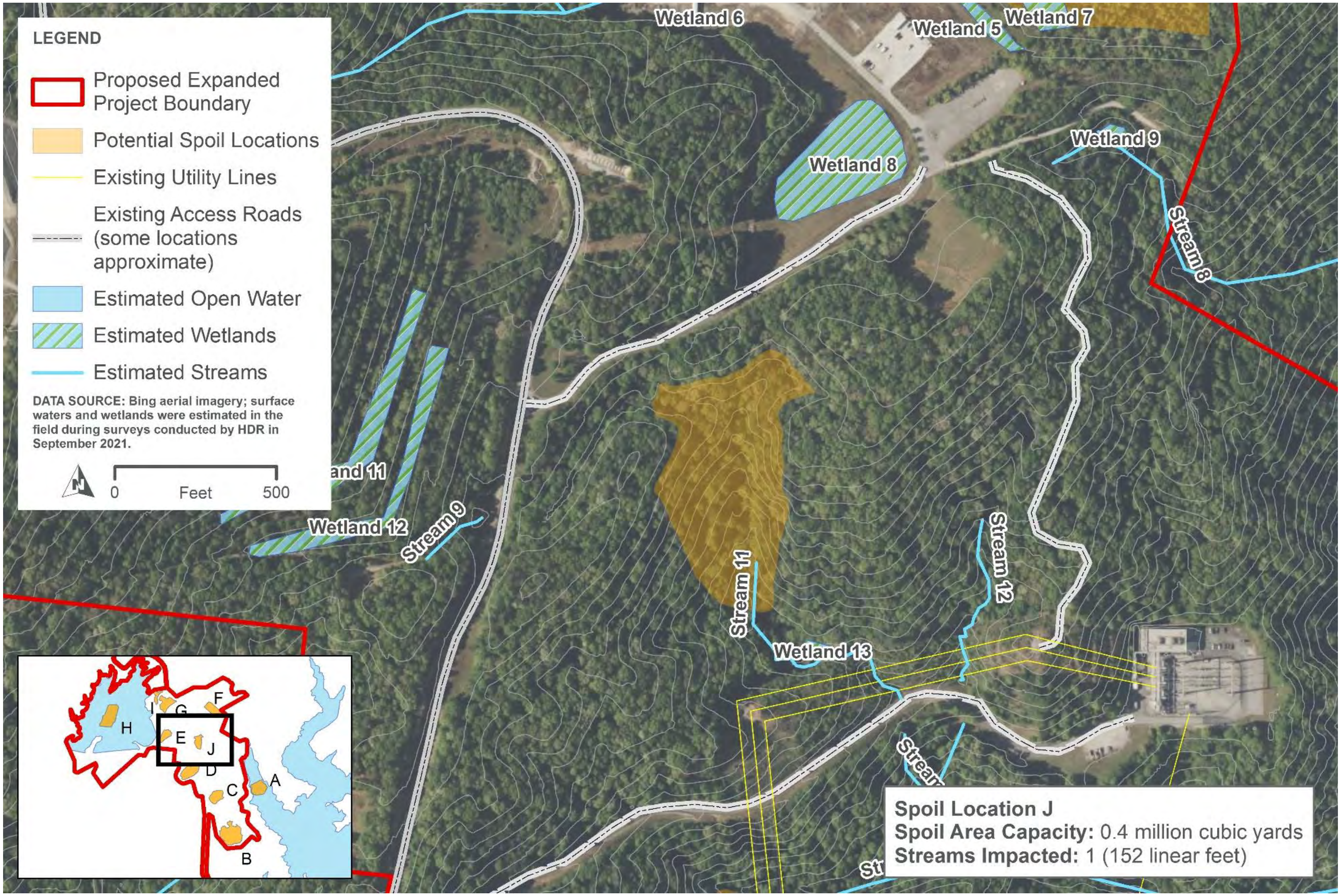

LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Existing Utility Lines
Existing Access Roads (some locations approximate)
Estimated Open Water
Estimated Wetlands
Estimated Streams
DATA SOURCE: Bing aerial imagery; surface waters and wetlands were estimated in the field during surveys conducted by HDR in September 2021.
0 Feet 500
Wetland 13
Stream 12
Stream 11
Stream 14
Stream 13
Stream 15
Wetland 14
Stream 16
A
B
C
D
E
F
G
H
I
J
Spoil Location D
Spoil Area Capacity: 1.3 million cubic yards
Streams Impacted: 2 (996 linear feet)


LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Existing Utility Lines
Existing Access Roads (some locations approximate)
Estimated Open Water
Estimated Wetlands
Estimated Streams
DATA SOURCE: Bing aerial imagery; surface waters and wetlands were estimated in the field during surveys conducted by HDR in September 2021.
0
Feet
500
Bad Creek Reservoir
Stream 6
Wetland 6
Stream 7
Wetland 10
Wetland 11
Wetland 12
Stream 9
A
B
C
D
E
F
G
H
I
J
Spoil Location E
Spoil Area Capacity: 0.16 million cubic yards
Wetlands Impacted: 1 (2.96 acres, isolated)


LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Existing Utility Lines
Existing Access Roads (some locations approximate)
Estimated Open Water
Estimated Wetlands
Estimated Streams
DATA SOURCE: Bing aerial imagery; surface waters and wetlands were estimated in the field during surveys conducted by HDR in September 2021.
0
Feet
500
Wetland 1
Stream 1a
Stream 2
Wetland 2
Wetland 3
Wetland 4
Wetland 5
Wetland 6
Wetland 7
Wetland 8
Wetland 9
Stream 7
Spoil Location F
Spoil Area Capacity: 0.25 million cubic yards
Wetlands Impacted: 2 (2.51 acres, isolated)
A
B
C
D
E
F
G
H
I
J


LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Existing Utility Lines
Existing Access Roads (some locations approximate)
Estimated Open Water
Estimated Wetlands
Estimated Streams
DATA SOURCE: Bing aerial imagery; surface waters and wetlands were estimated in the field during surveys conducted by HDR in September 2021.
0
Feet
500
Bad Creek Reservoir
Stream 4
Stream 4a
Stream 5
Stream 6
Wetland 2
Wetland 3
Wetland 6
H
I
G
F
E
J
D
C
A
B
Spoil Location G
Spoil Area Capacity: 1.1 million cubic yards
Streams Impacted: 2 (1,484 linear feet)
Spoil Location I
Spoil Area Capacity: 1.1 million cubic yards


LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Existing Utility Lines
Existing Access Roads (some locations approximate)
Estimated Open Water
Estimated Wetlands
Estimated Streams
DATA SOURCE: Bing aerial imagery; surface waters and wetlands were estimated in the field during surveys conducted by HDR in September 2021.
0
Feet
500
Bad Creek Reservoir
H
I
G
F
E
J
D
C
A
B
Spoil Location H
Spoil Area Capacity: 1.5 million cubic yards
Open Waters Impacted: Bad Creek Reservoir (19.3 acres)


LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Existing Utility Lines
Existing Access Roads (some locations approximate)
Estimated Open Water
Estimated Wetlands
Estimated Streams
DATA SOURCE: Bing aerial imagery; surface waters and wetlands were estimated in the field during surveys conducted by HDR in September 2021.
0 Feet 500
Wetland 6
Wetland 5
Wetland 7
Wetland 8
Wetland 9
Stream 8
Wetland 12
Stream 9
Stream 11
Stream 12
Wetland 13
H
I
G
F
E
J
D
C
A
B
Spoil Location J
Spoil Area Capacity: 0.4 million cubic yards
Streams Impacted: 1 (152 linear feet)

Attachment 2

Attachment 2 – Potential Access Road Stream Crossings

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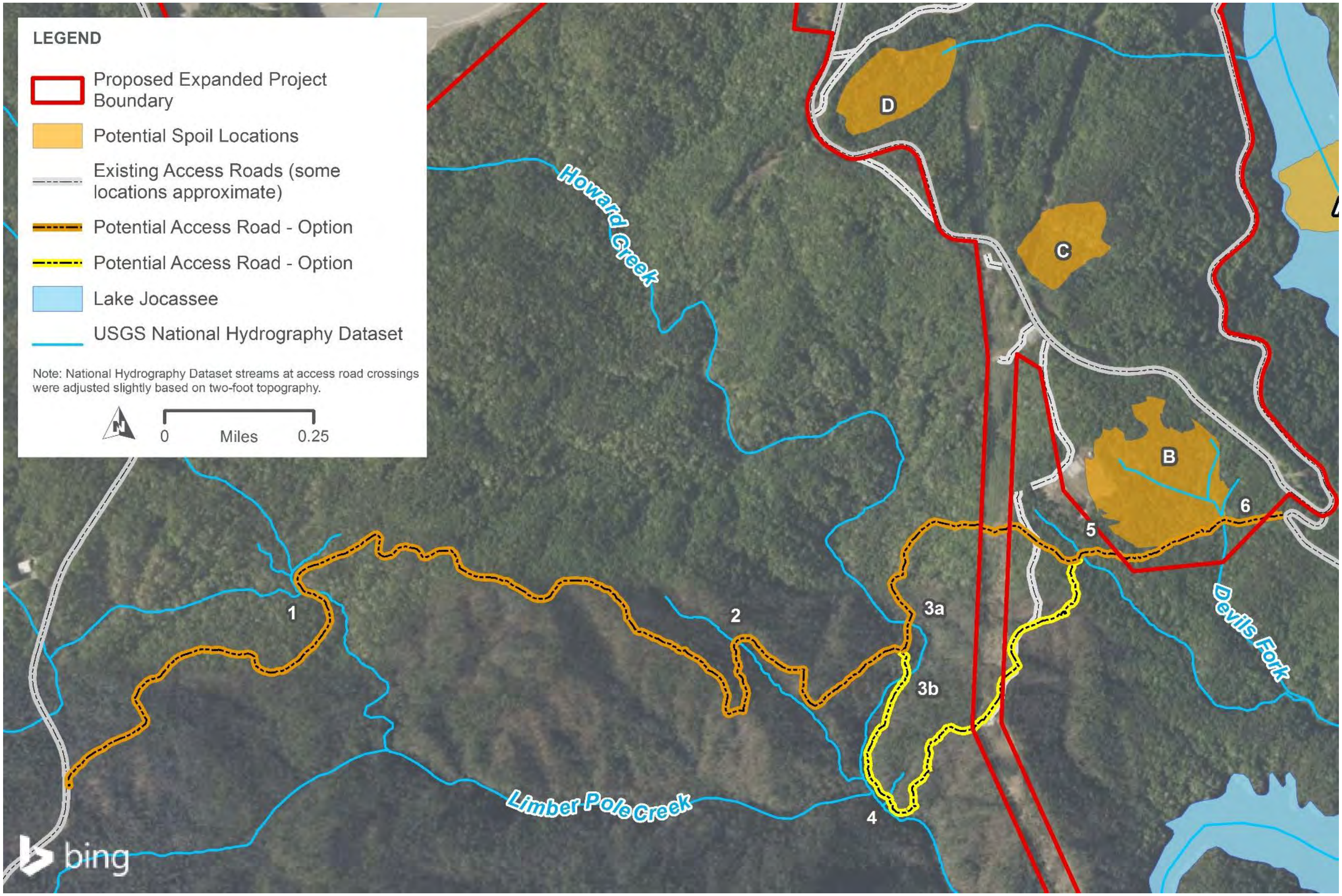
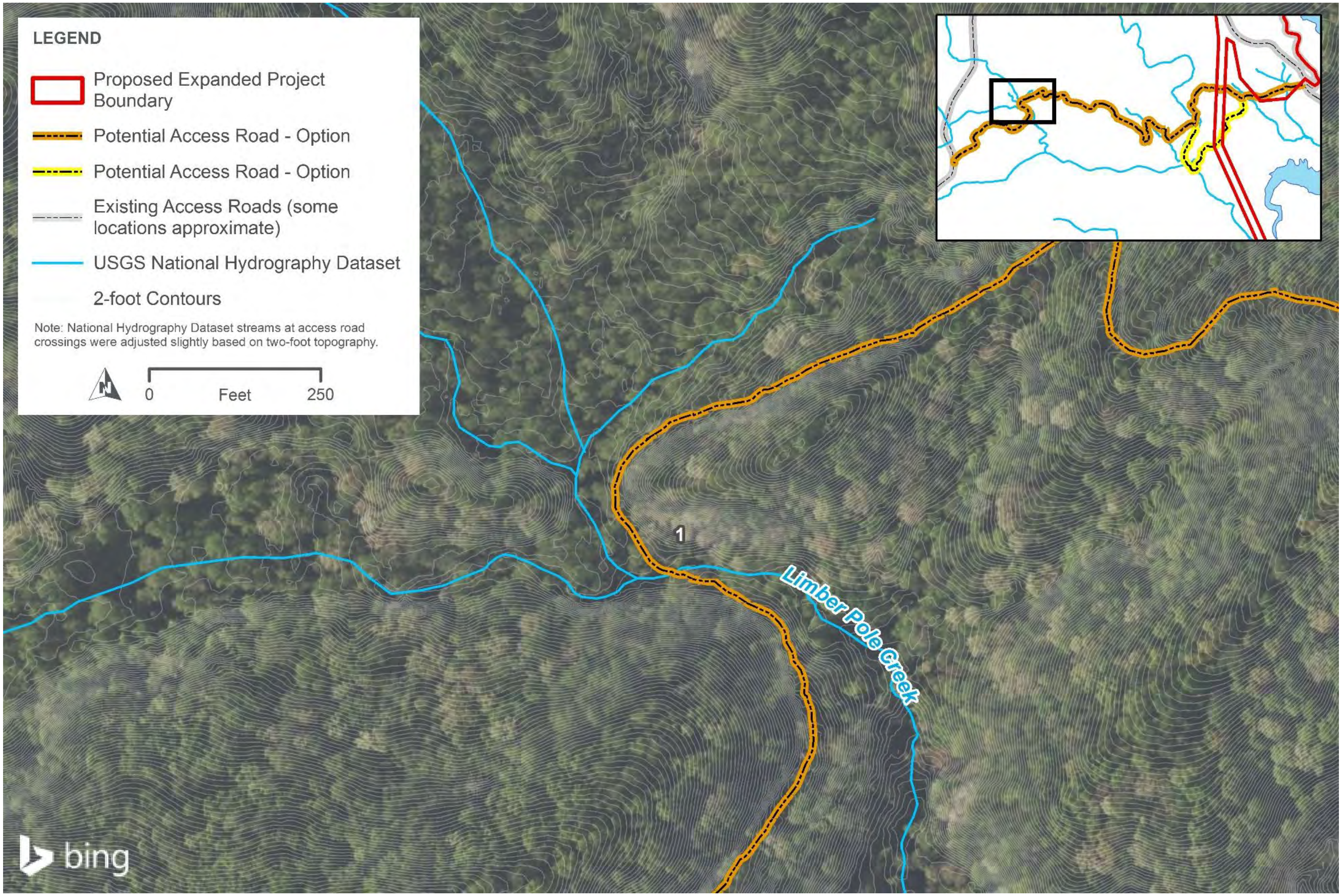
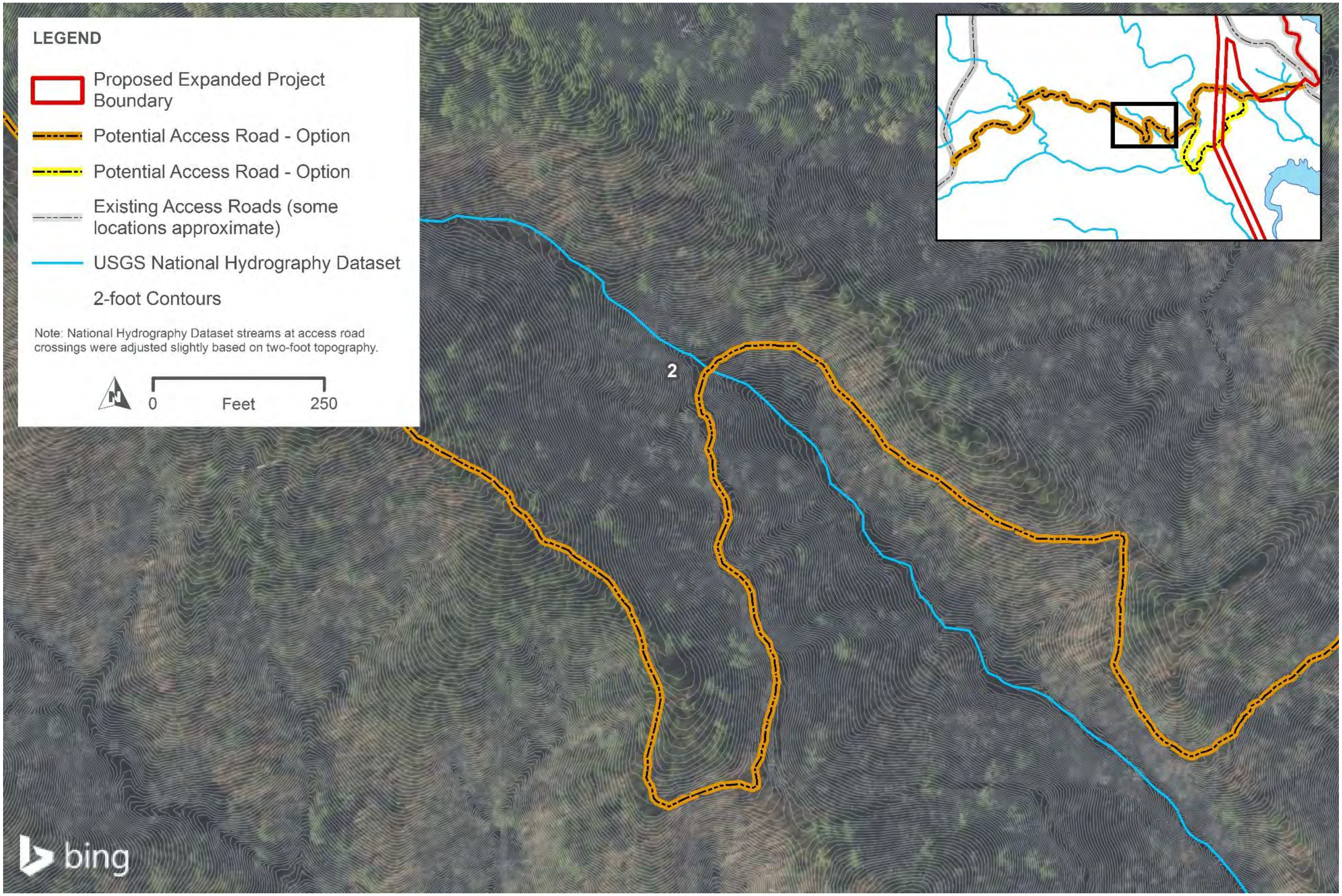
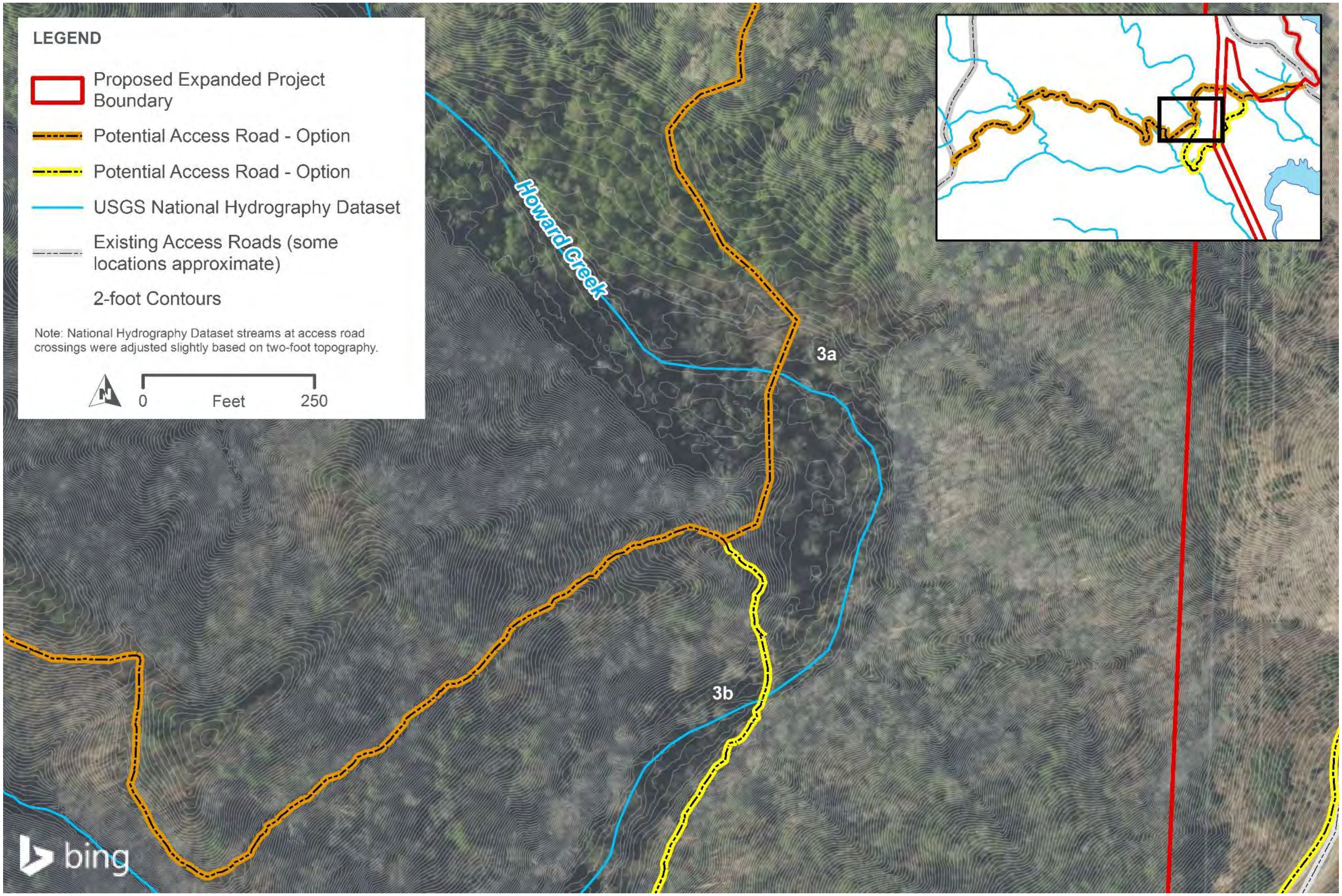
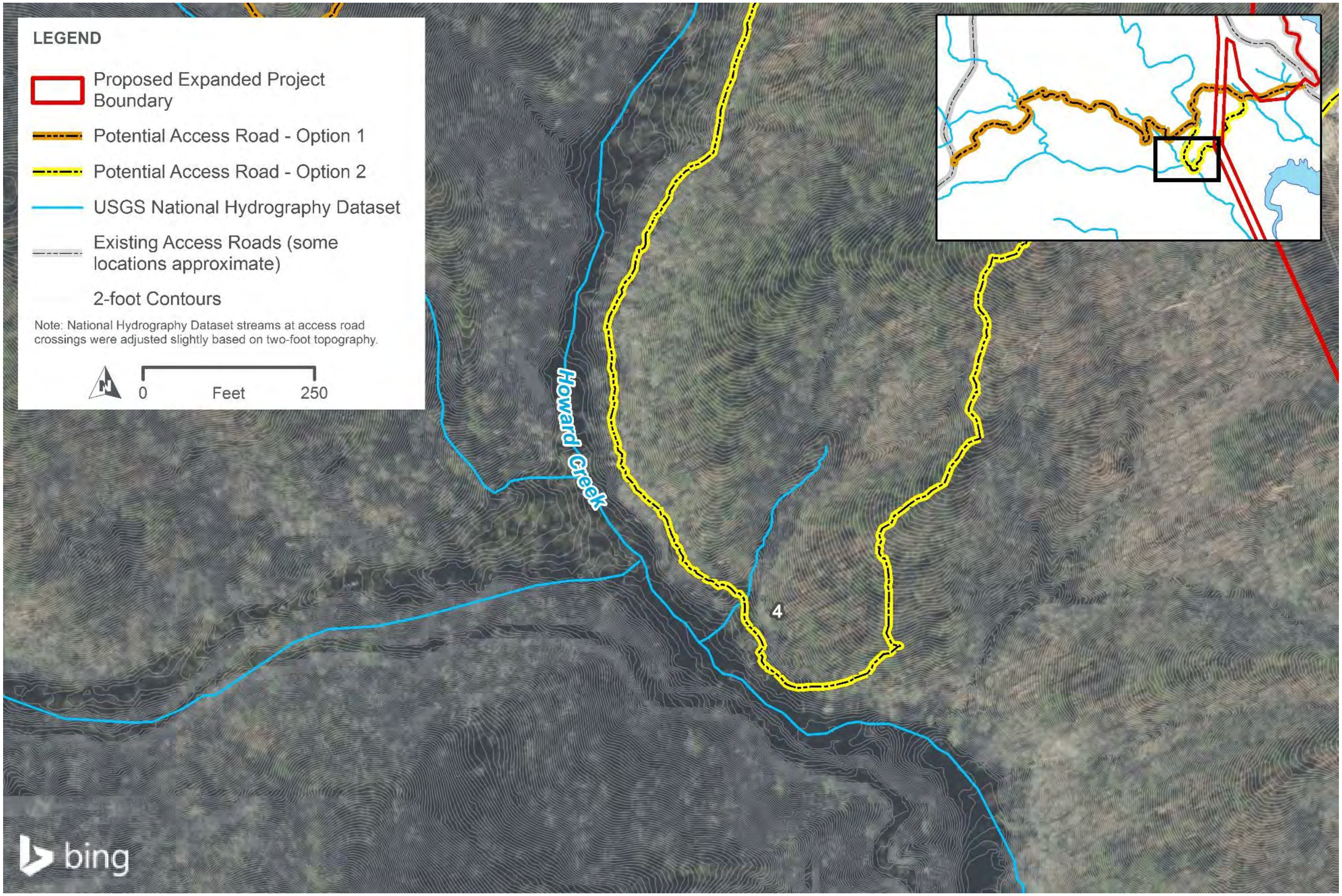
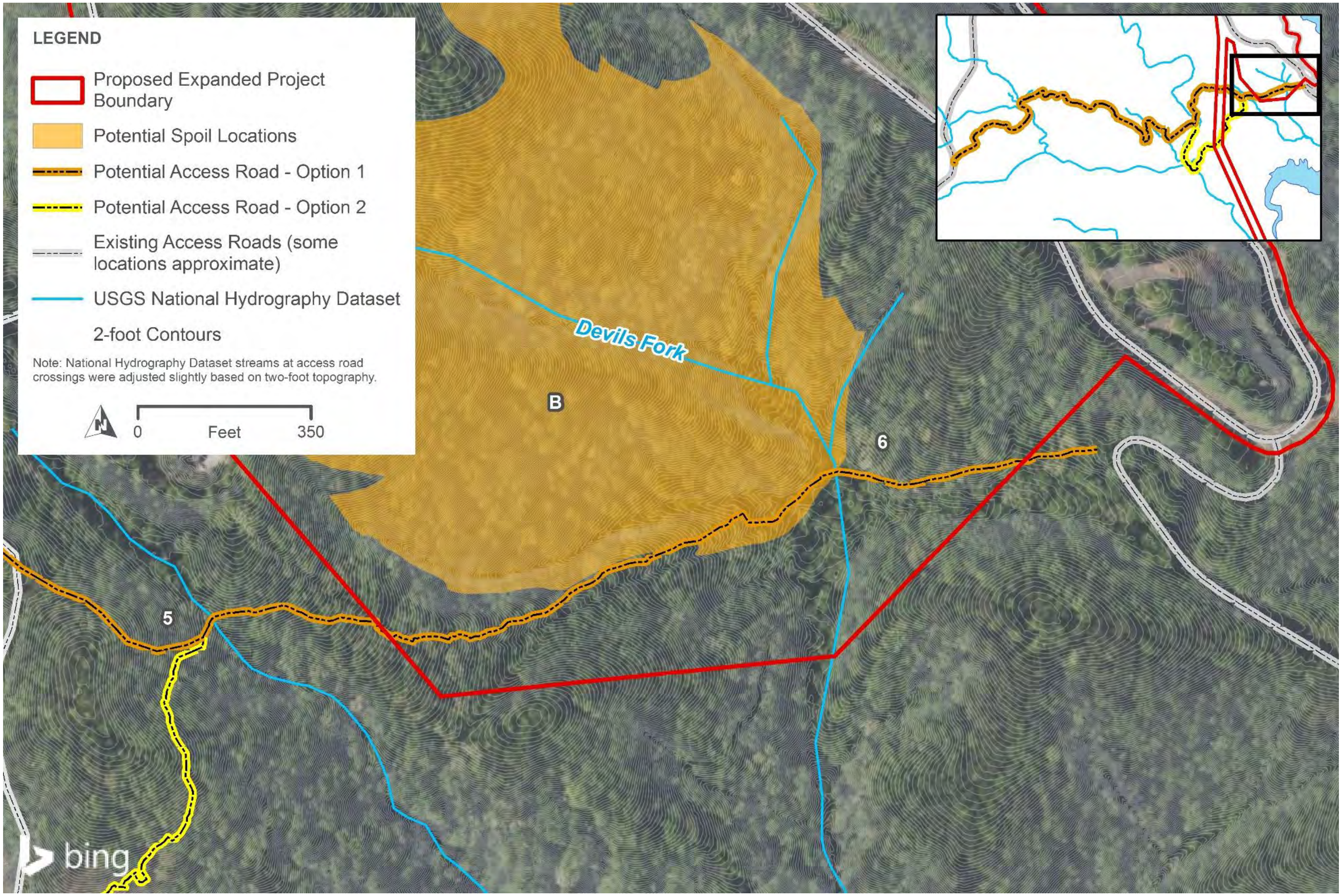

LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Existing Access Roads (some locations approximate)
Potential Access Road - Option
Potential Access Road - Option
Lake Jocassee
USGS National Hydrography Dataset
Note: National Hydrography Dataset streams at access road crossings were adjusted slightly based on two-foot topography.
0 Miles 0.25
Howard Creek
Limber Pole Creek
Devils Fork
D
C
B
1
2
3a
3b
4
5
6
bing


LEGEND
Proposed Expanded Project Boundary
Potential Access Road - Option
Potential Access Road - Option
Existing Access Roads (some locations approximate)
USGS National Hydrography Dataset
2-foot Contours
Note: National Hydrography Dataset streams at access road crossings were adjusted slightly based on two-foot topography.
N
0
Feet
250
1
Limber Pole Creek
bing


LEGEND
Proposed Expanded Project Boundary
Potential Access Road - Option
Potential Access Road - Option
Existing Access Roads (some locations approximate)
USGS National Hydrography Dataset
2-foot Contours
Note: National Hydrography Dataset streams at access road crossings were adjusted slightly based on two-foot topography.
0
Feet
250
2
bing


LEGEND
Proposed Expanded Project Boundary
Potential Access Road - Option
Potential Access Road - Option
USGS National Hydrography Dataset
Existing Access Roads (some locations approximate)
2-foot Contours
Note: National Hydrography Dataset streams at access road crossings were adjusted slightly based on two-foot topography.
N
0
Feet
250
Howard Creek
3a
3b
bing


LEGEND
Proposed Expanded Project Boundary
Potential Access Road - Option 1
Potential Access Road - Option 2
USGS National Hydrography Dataset
Existing Access Roads (some locations approximate)
2-foot Contours
Note: National Hydrography Dataset streams at access road crossings were adjusted slightly based on two-foot topography.
N
0
Feet
250
Howard Creek
4
bing


LEGEND
Proposed Expanded Project Boundary
Potential Spoil Locations
Potential Access Road - Option 1
Potential Access Road - Option 2
Existing Access Roads (some locations approximate)
USGS National Hydrography Dataset
2-foot Contours
Note: National Hydrography Dataset streams at access road crossings were adjusted slightly based on two-foot topography.
0
Feet
350
Devils Fork
B
6
5
bing

Attachment C: Environmental Justice Study Report

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Environmental Justice Study Report

Bad Creek Pumped Storage Project

FERC No. 2740

Prepared for:

Duke Energy Carolinas, LLC

Prepared by:

Kleinschmidt Associates

August 2023

Kleinschmidt

EXECUTIVE SUMMARY

The Bad Creek Pumped Storage Project (Bad Creek Project or Project; FERC No. 2740) provides a variety of socioeconomic benefits to the region by providing clean, renewable energy and energy storage capabilities, recreational opportunities, and wildlife habitat preservation (Duke Energy 2022). Duke Energy is currently evaluating opportunities to add pumping and generating capacity by adding a second power complex (Bad Creek II Complex) adjacent to the existing Project. The additional facilities proposed, if pursued, would increase that regional benefit by supporting local employment and economic output, and result in additional state and local tax revenues (Duke Energy 2022). The area surrounding the Project has minimal residential development, and it is anticipated that the small population of environmental justice (EJ) individuals would see an overall benefit from the added economic growth of the Bad Creek II Complex construction. This study report describes the existing Bad Creek Project with and without the proposed additions and provides an analysis of the impacts that can reasonably be expected as they relate to EJ communities in the surrounding area.

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Appendix A Consultation Documentation

ACRONYMS

B	
Bad Creek Project	Bad Creek Pumped Storage Project, FERC No. 2740
C	
Commission	Federal Energy Regulatory Commission
CT	census tract
D	
DPM	diesel particulate matter
Duke Energy	Duke Energy Carolinas, LLC
E	
EJ	environmental justice
F	
FERC	Federal Energy Regulatory Commission
K	
KT Project	Keowee-Toxaway Hydroelectric Project, FERC No. 2503
N	
NEPA	National Environmental Policy Act
P	
PAD	Pre-Application Document
PM	particulate matter
Project	Bad Creek Pumped Storage Project, FERC No. 2740
S	
SCDNR	South Carolina Department of Natural Resources
SD2	Scoping Document 2
U	
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

On February 23, 2022, Duke Energy Carolinas, LLC (Duke Energy) submitted the Bad Creek Pumped Storage Project (Bad Creek Project or Project; FERC No. 2740) Notice of Intent to Relicense and Pre-Application Document (PAD) to the Federal Energy Regulatory Commission (FERC or Commission). The PAD included an alternative licensing proposal for installation of additional energy storage and generation capacity by constructing a new 1,400-megawatt power complex (Bad Creek II Complex) adjacent to the existing Bad Creek Powerhouse to meet the growing need for energy storage and renewable energy production across Duke Energy's service territories. Duke Energy plans to make a final decision regarding the alternative licensing proposal for the construction of the Bad Creek II Complex prior to the submittal of a Final License Application for the Bad Creek Project.

Following the submittal of the PAD, the Commission filed a letter on June 16, 2022 requesting that Duke Energy conduct an Environmental Justice (EJ) Study for the Bad Creek Project relicensing pursuant to Section 5.9 of the Commission's regulations. The request for an EJ Study aligns with the socioeconomic resource issues identified by the Commission in Scoping Document 2 (SD2)[1] issued for the Bad Creek Project relicensing on August 5, 2022. Resource issues identified in SD2 address the effects of continued operations under the existing license as well as potential construction and operation of a second powerhouse (Bad Creek II Complex) during the new license term.

This study evaluates impacts to EJ communities as they relate to 1) relicensing the existing Project without construction of the Bad Creek II Complex, and 2) relicensing the existing Project and including construction of the additional facilities as described in the PAD alternative licensing proposal. The following impacts to the region surrounding the Bad Creek Project, as they relate to EJ and as requested by FERC in SD2, are addressed in this study:

- Effects of Bad Creek Project construction and operation activities on local roads (including traffic), housing, businesses, employment opportunities, and government services; and
- Effects of Bad Creek Project construction and operation activities on human health or the environment in identified environmental justice communities.

[1] Scoping Document 1 was issued for the Project on April 22, 2022 and superseded by Scoping Document 2 on August 5, 2022.

2.0 CURRENT OPERATION

The Bad Creek Project began operation in 1991 after roughly ten years of construction. Located in Oconee County, South Carolina, approximately eight miles north of Salem, South Carolina, the Bad Creek Reservoir (upper reservoir) was formed when Bad Creek and West Bad Creek were dammed and serves as the Bad Creek Project's upper reservoir. Lake Jocassee (lower reservoir) serves as the Bad Creek Project's lower reservoir and is licensed as part of Duke Energy's Keowee-Toxaway Hydroelectric Project (KT Project; FERC No. 2503). The structures and features of the Bad Creek Project include the upper reservoir and dams, inlet/outlet structures in the upper and lower reservoirs, a water conveyance system, an underground powerhouse, tailrace tunnels, transmission facilities, and an approximately 9.25-mile-long transmission line corridor extending from the Bad Creek Project to the KT Project's Jocassee switchyard. The entirety of the Bad Creek Powerhouse is built within a large cavern inside a mountain. Similar to other hydroelectric stations, the engineering design of the Bad Creek Project involves the flow of water to produce electricity; however, the roughly 1,200-foot vertical distance between the upper and lower reservoirs makes the Bad Creek Project well-suited to take advantage of gravity to produce larger quantities of electricity for a given flow rate.

The Bad Creek Project was originally designed as a "weekly cycle" facility with approximately six hours of generation per day. This allowed Duke Energy to utilize roughly 29 hours of storage in the upper reservoir to generate at full load three hours in the morning and three hours in the evening, five days per week, and then pump back for a portion of each night and over the weekend utilizing Duke Energy's baseload coal and nuclear fleet. Current operations at the Bad Creek Project are "daily cycle" mode, alternating between generating and pumping on a daily basis, with the upper reservoir surface elevation typically maintained in the upper 50 to 60 feet, compared to a maximum drawdown of 160 feet. This operating mode allows Duke Energy to maximize head, energy density, and plant/unit efficiency and utilize the Bad Creek Project like a large battery to help balance the regional transmission system. Additionally, this mode of operation results in utilization of only 30 to 40 percent of the storage capacity of the Bad Creek Project due to the upper reservoir operating in the upper third of possible drawdown range.

The 30-year-old Bad Creek Project is one of the most powerful and flexible energy generation and storage assets in Duke Energy's system. Built primarily to store surplus energy from baseload nuclear and fossil-fuel-driven power plants during times of low energy demand, today the Bad Creek Project is used to balance an increasingly complex energy grid. By pumping water from Lake Jocassee up to the Bad Creek Reservoir, the Bad Creek Project is able to provide storage of surplus baseload energy during low demand periods. While the Bad Creek Project is in turbine operation mode, water runs from the upper reservoir down to Lake Jocassee, providing power back to the grid when energy demand is higher or when renewable generation is unavailable (Figure 4.1).

3.0 PROPOSED ACTION

The demand for energy and energy storage has been steadily on the rise in the southeastern region of the country. In an effort to meet this growing demand, Duke Energy is proposing an expansion to the Bad Creek Project that will double the energy output of the station. The proposed Bad Creek II Complex would utilize the existing upper and lower reservoirs and consist of a new inlet/outlet within the existing upper reservoir, water conveyance system, and underground powerhouse. Additionally, a new inlet/outlet along the shoreline of the Whitewater River arm of Lake Jocassee would be constructed for the lower reservoir. As currently conceptualized, construction of the new Bad Creek II Complex would include the following additions to the FERC Project Boundary, with additional pertinent discussion included below:

- Upper reservoir inlet/outlet
- Low and high pressure headrace tunnels
- Manifold and penstock tunnels
- Vertical shaft
- Transformer yard
- New 525-kV switchyard
- New 525-kV transmission line from the new switchyard to the Jocassee switchyard (utilizing the existing transmission line right-of-way)
- Underground power complex
- Draft tube and tailrace tunnels
- Lower reservoir inlet/outlet

The Bad Creek II Complex underground powerhouse will be arranged and sized similarly to the existing Bad Creek Project powerhouse. In general, most of the features for the Bad Creek II Complex will be submerged, underground, and/or within lands classified as "project operations," which are not accessible to the general public. The location of the proposed lower reservoir inlet/outlet structure has been chosen to minimize construction-related environmental impacts to the Whitewater River arm of Lake Jocassee. Nevertheless, the Whitewater River cove of Lake Jocassee is anticipated to be closed to the public during construction of the Bad Creek II Complex.

4.0 DESCRIPTION OF STUDY AREA

The geographic scope (i.e., study area) of this EJ Study includes all areas within one mile of the proposed expanded Bad Creek Project Boundary[2], and within five miles of the proposed construction of the Bad Creek II Complex (Figure 4.1). The area surrounding the Bad Creek Project is generally rural, with minimal residential development on Lake Jocassee, and no residential development on the Bad Creek Reservoir. The expanded Project Boundary encompasses 1,490 acres, and includes primarily deciduous forest and open water, with mixed forest, pastureland, and agricultural land, and smaller amounts of development, barren land, and scrubland (Table 4.1).

Table 4.1 Land Use in the Expanded Project Boundary, Not Including the Transmission Line Corridor

Land Use Type	Percent
Barren Land	1.0
Cultivated Crops	2.4
Deciduous Forest	36.5
High Intensity Development	1.0
Medium Intensity Development	1.1
Low Intensity Development	2.1
Developed Open Space	3.3
Evergreen Forest	1.7
Hay/Pasture	8.2
Herbaceous	6.3
Mixed Forest	14.8
Open Water	20.5
Shrub/Scrub	1.1

Source: Duke Energy 2022

Each state, county, and applicable census block within the proposed expanded Bad Creek Project Boundary and proposed Bad Creek II Complex study area has been analyzed for

[2] Construction of the Bad Creek II Complex would require modifications to the existing Project Boundary to enclose the new facilities. Duke Energy currently owns or maintains under a property easement all lands that would be required for construction of the Bad Creek II Complex and intends to propose an expanded Project Boundary in the Final License Application that would include all lands necessary for access to, or control of, the expanded Project facilities.

EJ populations and potential impacts to them. Thirteen total census blocks have been identified within the study area. Of the thirteen total census blocks, five census block groups within four counties and two states are located within one mile of the Bad Creek Project: one in Jackson County, North Carolina; one in Transylvania County, North Carolina; two in Oconee County, South Carolina; and one in Pickens County, South Carolina. An additional eight census blocks within four counties and three states are located within five miles of the proposed Bad Creek II Complex: one in Rabun County, Georgia; one in Macon County, North Carolina; two in Pickens County, South Carolina; and four in Oconee County, South Carolina.

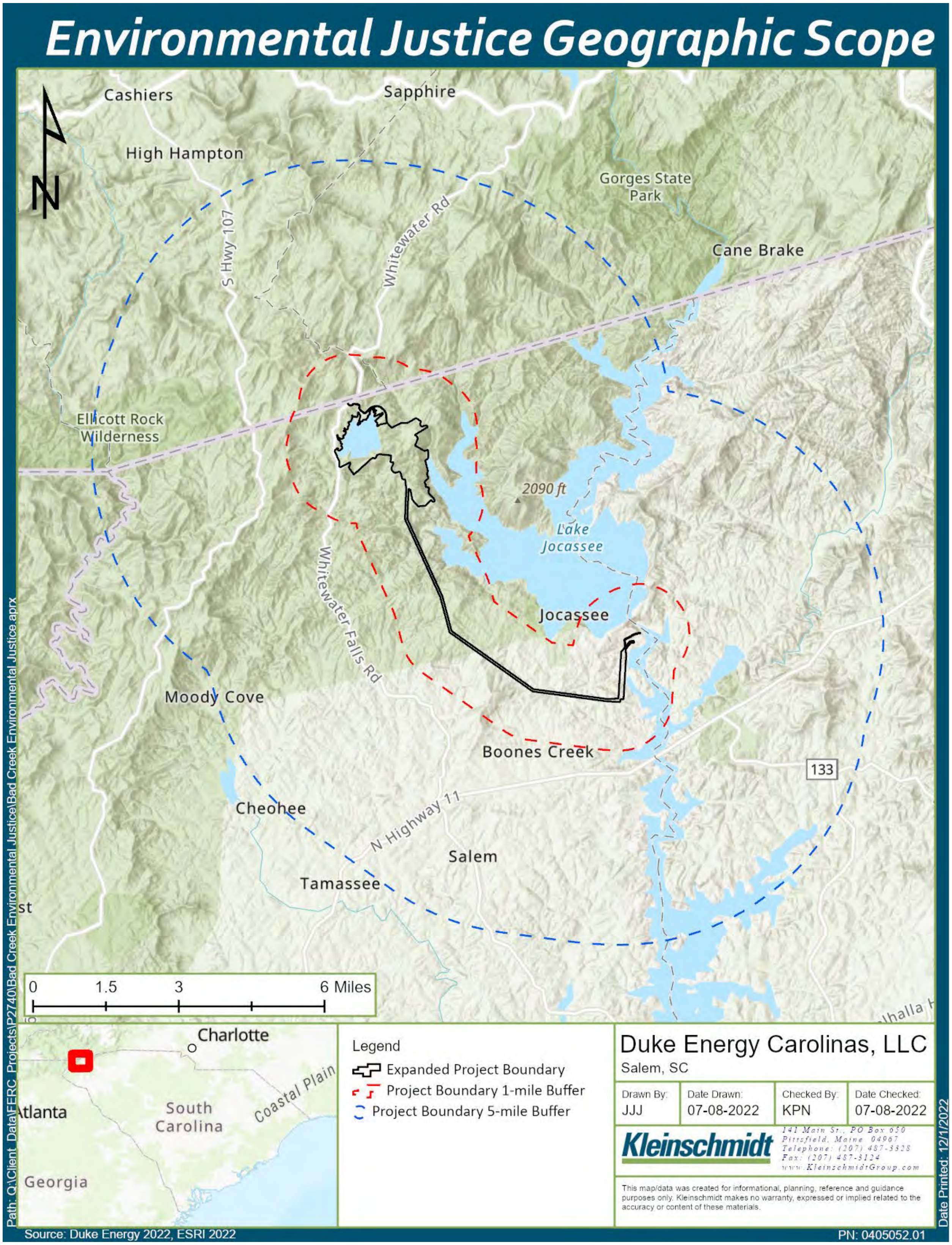

Figure 4.1 Environmental Justice Study Area

5.0 METHODOLOGY

Six objectives for accomplishing study goals were identified as part of the EJ Study Plan. The methods for accomplishing these objectives are outlined below.

Objective 1: Identify the presence of EJ communities that may be present within the study area.

The methodology used to identify the presence of EJ communities within the Bad Creek Project vicinity was adopted from the U.S. Environmental Protection Agency's (USEPA) *Promising Practices for EJ Methodologies in NEPA*[3] *Reviews* (2016). A table was prepared that included the racial, ethnic, and poverty statistics for each state, county, and census block group within the geographic study area (Table 6.1). The table includes information from the U.S. Census Bureau's most recently available (2020a, 2020b, 2020c) American Community Surveys 5-Year Estimates for each state, county, and block group within the scope of this study. Racial data was obtained using Table B03002, and poverty data was obtained using Table B17017.

The thresholds used for populations meeting EJ status are as follows:

- For minority populations, the meaningfully greater analysis method was used, where the total minority population for a block group is at least 10 percent greater than that of the county population:

  (County minority population) x (1.10) = threshold above which a block group minority population must be for inclusion as an EJ community
- The "low-income threshold criteria" was used to identify EJ communities based on income level, where the block group must have a higher percentage of low-income households than the county.

Objective 2: Identify the presence of non-English speaking populations that may be present within the study area.

The presence of non-English speaking populations was identified using Table B16004 from the most recently available U.S. Census Bureau American Community Survey 5-Year Estimates for each state, county, and block group within the scope of this study.

[3] National Environmental Policy Act

Objective 3: Identify sensitive receptor locations in the study area.

Sensitive receptor locations include, but are not limited to, schools, daycare centers, hospitals, and elderly care facilities. Sensitive receptor locations within the scope of this study were identified using the U.S. Geological Survey National Structures Dataset. The dataset consists of the name, function, and location of manmade facilities as determined by disaster planning and emergency response needs (USGS 2022). The data from The National Map viewer was downloaded as an Esri™ File Geodatabase, and then populated onto a map of the Bad Creek Project vicinity showing the 1-mile and 5-mile buffers around the proposed expanded Project Boundary.

Objective 4: Identify outreach strategies to engage EJ communities and non-English speaking populations in the relicensing if present within the study area.

The Environmental Justice Guidance Under the NEPA (USEPA 1997) suggests outreach could engage universities, labor organizations, local schools and libraries, senior citizen's groups, civic associations, environmental and EJ non-governmental organizations. Additionally, EJ outreach employed by the USEPA has consisted of engagement calls, dialogue meetings and the use of "data sharing tools." Engagement calls are typically hosted over ZOOM™ or a similar platform to maintain a dialogue with members of the public on EJ issues. Dialogue meetings are very similar to engagement calls; however, they are targeted towards specific stakeholders, members of the community, or tribal governments. Data sharing tools include the use of web-based data and information sharing tools to disseminate information related to EJ issues.

This document discusses the potential need for outreach to EJ communities within the study area, above and beyond that currently proposed for the relicensing process. As this document has been developed prior to a decision regarding the development of the Bad Creek II Complex, targeted EJ outreach has not yet been undertaken.

Objective 5: Discuss:

a. **The effects of the relicensing and Bad Creek II Complex construction on identified EJ communities;**
b. **Effects that are disproportionately high and adverse; and**
c. **Potential effects on non-English speaking communities and sensitive receptor locations, if present within the study area.**

Potential effects to EJ communities were identified using the USEPA's *Promising Practices for EJ Methodologies in NEPA Reviews* (2016) document and regional and site-specific conditions that may contribute to impacts. These are discussed in Section 7.0 of this study report.

Objective 6: Identify mitigation measures to avoid or minimize project effects on EJ communities, non-English speaking communities, and sensitive receptor locations, if present within the study area.

Mitigation measures for existing and potential Project effects are further discussed in Section 7.1 of this study report.

6.0 RESULTS

Using the meaningfully greater analysis method, one EJ community based on race was identified out of the thirteen census block groups within the scope of this study. Located in Transylvania County, North Carolina, the one race-related EJ community is primarily within the 5-mile buffer zone around the Project, with the southwestern portion located within the 1-mile buffer. Two EJ communities were identified based on income below poverty level, measured by household: one in Oconee County, South Carolina, and one in Transylvania County, North Carolina, both of which are located within the 5-mile buffer zone (Table 6.1; Figure 6.1). None of the identified EJ communities are in block groups that border Project lands (Figure 6.1).

Within the thirteen block groups in the study area, one block group includes a population of non-English speaking individuals. This block group is located in Pickens County, South Carolina, with one percent of the population unable to speak English (Table 6.1).

No sensitive receptor locations are present within the 1-mile radius surrounding the proposed expanded Bad Creek Project Boundary. Within the 5-mile radius around the proposed expanded Bad Creek Project Boundary there are two sensitive receptor locations: two schools, located within the 5-mile radius, on the southwestern extremity of the potentially effected zone (Figure 6.2). A table depicting the distances of identified sensitive receptor locations to the Bad Creek Project Boundary, the primary area within which proposed activities would take place, is provided as Table 6.2.

Table 6.1 Race and Ethnicity, Low Income, and English-Speaking Data for the 5-Mile Radius Around the Bad Creek Project

Geographic Area	Total Population (count)	White Alone, not Hispanic (count)	African American/ Black (count)	Native American/ Alaska Native (count)	Asian (count)	Native Hawaiian & Other Pacific Islander (count)	Some Other Race (count)	Two or More Races (count)	Hispanic or Latino (count)	Total Minority Population (%)	Below Poverty Data (%)	Non-English Speaking Persons Aged 5 Years and Greater (%)
Georgia	10403847	5485855	3244348	19382	410705	5164	32810	213189	992394	47%	14%	1%
Rabun County	16645	14598	316	55	188	0	41	113	1334	12%	16%	0%
Census Tract 970202, Block Group 1	1348	1335	0	0	0	0	0	0	13	1%	14%	0%
North Carolina	10264876	6474688	2165301	112504	290525	5640	22962	230591	962665	37%	14%	1%
Jackson County	42938	34635	928	3283	302	0	56	1182	2552	19%	18%	0%
Census Tract 950900, Block Group 2	1425	1410	0	0	0	0	0	0	15	1%	9%	0%
Macon County	34813	30998	541	240	302	0	91	201	2440	11%	14%	0%
Census Tract 970502, Block Group 1	2128	2023	6	0	18	0	0	0	81	5%	9%	0%
Transylvania County	33775	30528	1560	89	47	17	0	410	1124	10%	13%	0%
Census Tract 960600, Block Group 3	1143	1019	0	0	19	0	0	0	105	11%	18%	0%
South Carolina	5020806	3196421	1333876	14748	78102	3784	9139	99278	285458	36%	15%	0%
Oconee County	77528	65463	5288	231	570	11	44	1686	4235	16%	16%	0%
Census Tract 030200, Block Group 1	1340	1261	0	0	0	0	15	36	28	6%	9%	0%
Census Tract 030100, Block Group 2	679	671	0	0	0	0	0	0	8	1%	12%	0%
Census Tract 030100, Block Group 1	1167	1142	7	0	0	0	0	4	14	2%	8%	0%
Census Tract 030200, Block Group 5	872	872	0	0	0	0	0	0	0	0%	6%	0%
Census Tract 030200, Block Group 2	1109	1090	16	0	0	0	0	3	0	2%	25%	0%
Census Tract 030200, Block Group 3	1201	1201	0	0	0	0	0	0	0	0%	8%	0%
Pickens County	124029	106292	8392	306	2424	26	178	1854	4557	14%	17%	0%
Census Tract 010200, Block Group 2	2267	2216	24	0	0	0	0	0	27	2%	9%	0%
Census Tract 010100, Block Group 1	1443	1331	76	0	16	0	0	20	0	8%	4%	0%
Census Tract 010200, Block Group 1	2279	2164	27	0	0	0	0	20	68	5%	14%	1%

Source: U.S. Census Bureau 2020a, 2020b, 2020c

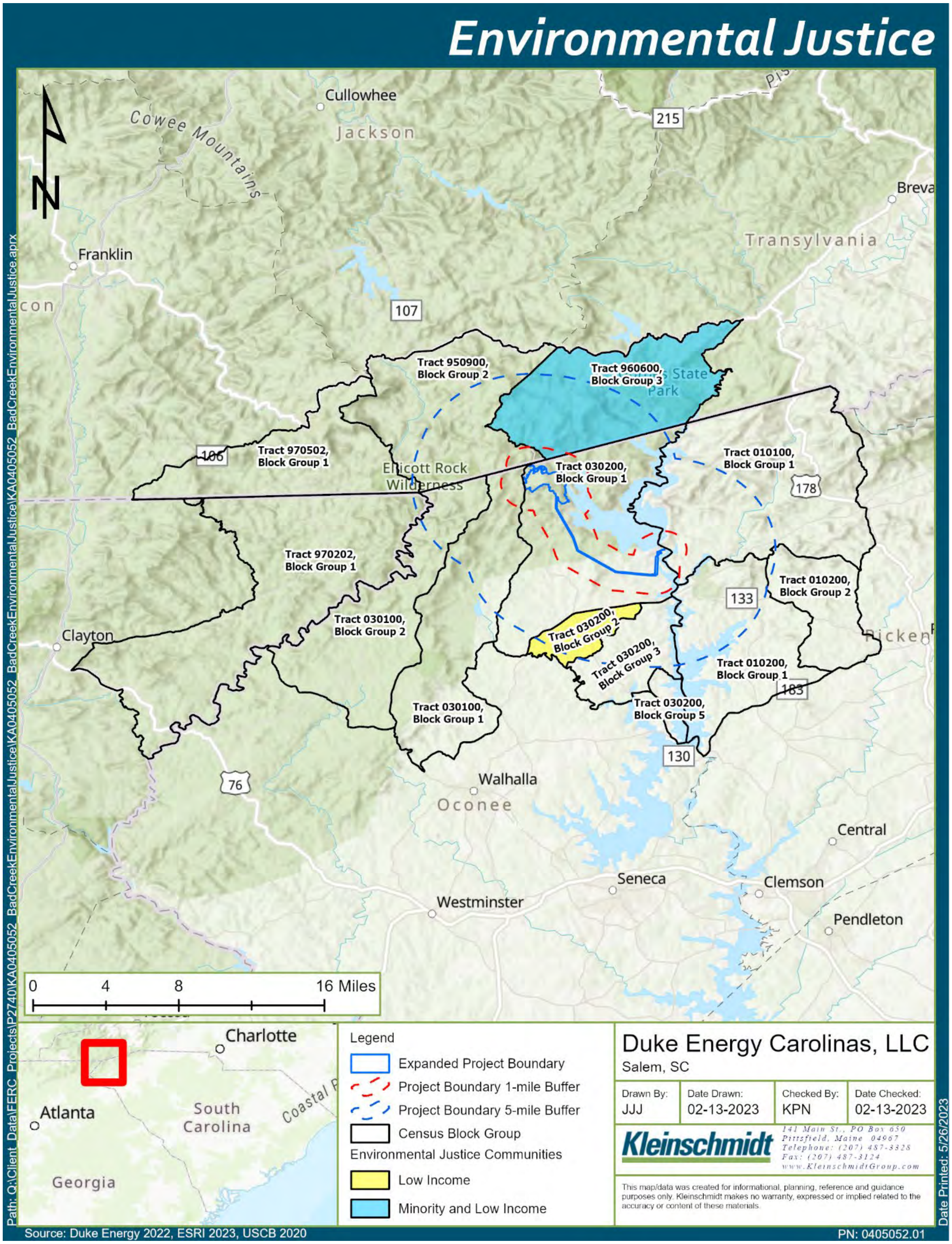

Figure 6.1 **Census Block Groups within a 1-mile and 5-mile Radius of the Bad Creek Project.**

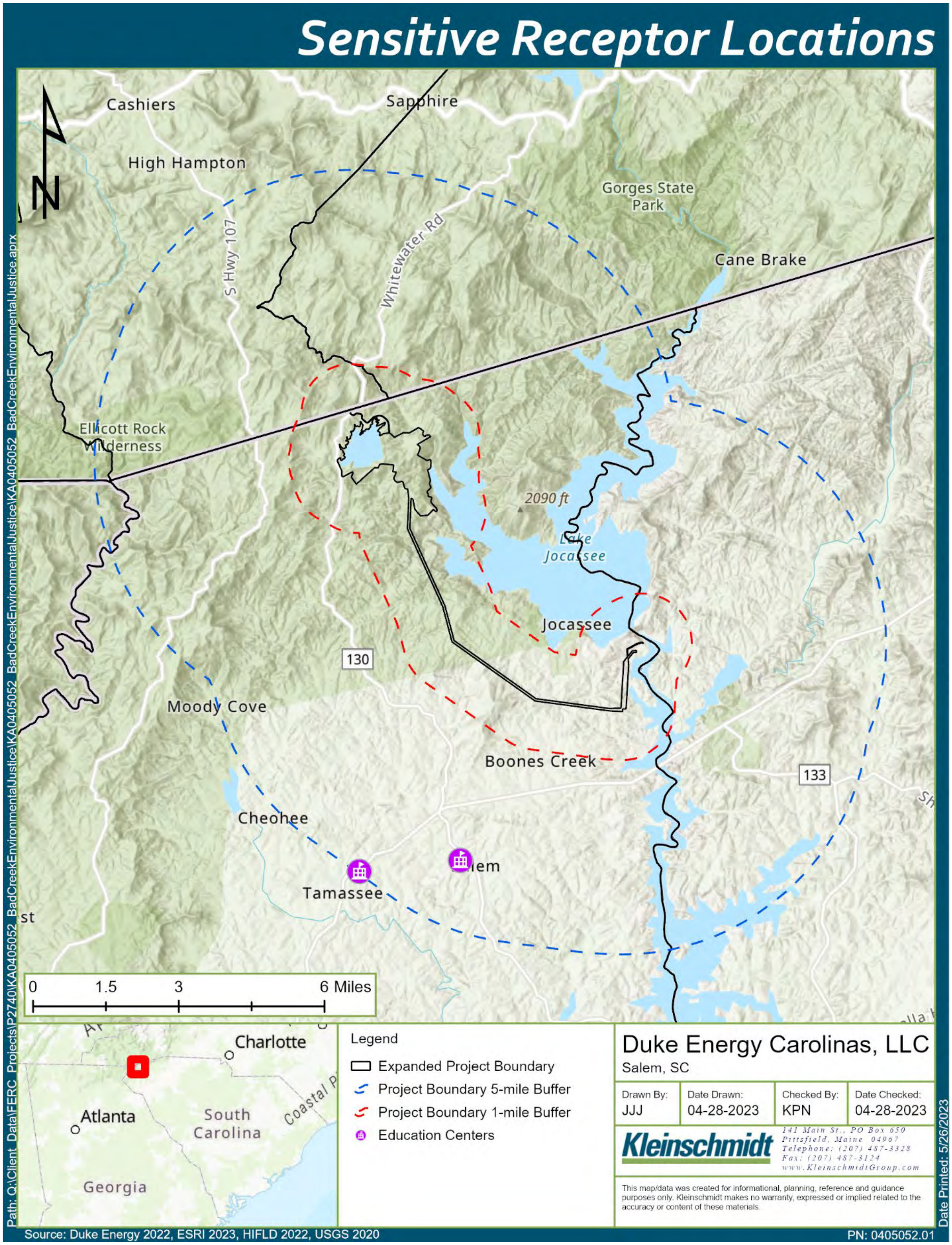

Figure 6.2 Sensitive Receptor Locations within a 1-mile and 5-mile Radius of the Bad Creek Project.

Table 6.2 Distances of Sensitive Receptor Locations to Proposed Expanded Bad Creek Project Boundary

Sensitive Receptor Location	Distance from Project Boundary (miles)
NEXT School Eagle Ridge	3.62
Tamassee Salem Elementary School	4.96

7.0 ANALYSIS

The USEPA-issued guidance document *Promising Practices for EJ Methodologies in NEPA Reviews* (2016) outlined the considerations for analysis of impacts to EJ communities as including exposure pathways; direct, indirect, and cumulative impacts to communities; and the distribution of potential impacts, either beneficial or adverse.

Exposure pathways are the routes by which contact, and the resulting impact, can occur. For the purpose of this study, the exposure pathways include noise, construction vehicle air pollution, and effects of project construction on local traffic and road networks. Additionally, potential impacts to subsistence fishing opportunities are reviewed and analyzed. These potential effects have been analyzed as they relate to relicensing both with and without the construction of the Bad Creek II Complex. The exposure pathways have been analyzed by direct, indirect, and cumulative impacts. The direct impacts occur at the time of the event and will include the time during construction of the Bad Creek II Complex. Indirect impacts are considered a result of the event but occur later in time or potentially farther away. They can be reasonably expected to happen and will include impacts during the year following completion of the Bad Creek II Complex construction. Cumulative impacts take into consideration the incremental impact of the event as it relates to past, present, and reasonably foreseeable future actions. Finally, given the pre-disposition of EJ populations to experiencing effects due to the historically disproportionate siting of environmentally hazardous locations, this study analyzes the uneven distribution of effects on EJ communities within the scope of the proposed actions.

7.1 Noise

Broadly, noise is considered unwanted and/or harmful sound and was first recognized as a hazard to public health in 1968 (APHA 2021). Environmental noise is more distinct and defined as unwanted and/or harmful noise created by outdoor sounds from human activities, such as road and railway traffic, airports, and industrial sites (APHA 2021). Major sources of environmental noise pollution related to construction activities include industrial machinery, outdoor power equipment, and increased traffic.

Research done over several decades indicates that excessive noise levels in the environment can contribute directly to auditory impacts such as hearing loss, sleep disruption, and general annoyance (APHA 2021; Medic et al. 2017). Cumulative impacts from long-term environmental noise exposure include non-auditory impacts such as metabolic disturbances leading to diabetes and obesity, cardiovascular disease, noise-related hypertension, and exacerbation of mental health conditions such as depression and anxiety (APHA 2021). In general, temporary noise exposure is reversible and does not contribute to long-term cumulative impacts; however, in some instances, when coupled with underlying conditions, a temporary exposure of sufficiently intense noise levels can contribute to cardiovascular disease (Jariwala et al. 2017).

Finally, land use decisions and local zoning have historically favored wealthy and non-minority populations in determining where to locate sites that could result in elevated levels of noise pollution. This inequity at the decision-making level has led to roads, industrial sites, and other sources of noise pollution to be developed near EJ communities (APHA 2021). Due to the proximity of these types of sites to low-income and minority populations, EJ communities experience a higher baseline level of environmental noise compared to primarily non-EJ neighborhoods, leading to a population that is at a higher risk of developing noise-related health conditions. Added noise from temporary construction has the potential to have a disproportionately higher impact on EJ communities already experiencing poorer pre-existing health conditions from the baseline level of noise they are exposed to.

7.1.1 Impacts

Relicensing the Project as it Currently Operates (1-mile Radius Only)

Direct, Indirect, and Cumulative Impacts

Noise caused by the current operation of the Bad Creek Project is minimal. The powerhouse is located 600 feet underground within a mountain, resulting in negligible turbine or generator-related sound being emitted beyond the cavern, and therefore does not cause direct, indirect, or cumulative noise impacts to the surrounding EJ communities.

Additionally, only an exceedingly small portion of the block group containing EJ populations overlaps with the 1-mile radius around the Project and does not directly border the Project Boundary, further distancing any potential noise-related impacts to EJ communities within the Project vicinity.

Distribution of Impacts

There will be no substantive noise-related impacts to EJ communities within the 1-mile radius around the Bad Creek Project due to the relative distance of these populations to the Project powerhouse. Additionally, the location of the powerhouse 600 feet underground results in minimal noise reaching nearby populations from current operation. Therefore, there will be no disproportionately high impacts to EJ communities from relicensing the Bad Creek Project as it currently operates.

Relicensing the Current Project with Construction of the Bad Creek II Complex (1-mile and 5-mile Radiuses)

Direct Impacts

Noise from construction of the powerhouse, upper reservoir inlet/outlet, and lower reservoir inlet/outlet are the most likely causes of noise-related impacts to EJ communities from the addition of the Bad Creek II Complex. The most direct impacts will be isolated to the upper reservoir inlet/outlet construction due to the proximity of identified EJ census blocks to this section of the Project. However, further analysis of the land uses directly surrounding the upper reservoir, within the identified census block, indicates little to no residential development.

Indirect Impacts

The work done in the upper reservoir as part of the addition of the Bad Creek II Complex has the highest potential for impact to EJ populations; however, due to the sparse amounts of development and forested nature of the surrounding area, indirect noise-related impacts to EJ communities are not anticipated.

Cumulative Impacts

The Bad Creek II Complex powerhouse will be constructed underground and be of a similar size and arrangement to the existing powerhouse. Once constructed, the operation will be similar to existing Project operations, and will not cause additional noise-related impacts due to the depth underground of the second powerhouse. As such, cumulative noise-related impacts to EJ communities are not anticipated.

Distribution of Impacts

The area surrounding the Bad Creek Project is rural, with low levels of development, resulting in a generally quiet atmosphere. There is no residential development on the Bad Creek Reservoir, and the land around Lake Jocassee is dominated by mature growth forest, with minor residential development (Duke Energy 2022). The EJ communities present within the study area are not exposed to higher-than-average ambient noise, and therefore would not be disproportionately impacted by temporary construction noise.

7.2 Air Quality

The primary source of construction-related air pollution is diesel exhaust from earth moving machinery, resulting in a diesel particulate matter (DPM) release to the local environment (Boyle 2020). DPM is considered any solid particle that is emitted during the combustion process of a diesel engine and contains multiple types of metals and chemicals (Betts 2011). DPM is not the only pollutant to come from diesel machinery but it is among the most harmful, carrying particulates into lungs, and resulting in the potential development of chronic health conditions (Betts 2011).

Direct impacts occurring to nearby communities from construction include inhalation of DPM, general vehicle exhaust and particulate matter (PM), and dust turned up by increased road traffic and operations from earth-moving equipment. Exposure to these pollutants can contribute to health conditions that include asthma, reduced lung function, and cardiovascular disease (USEPA 2022a), as well as other chronic conditions such as chronic obstructive pulmonary disease and pulmonary fibrosis (Betts 2011). The effects of short-term exposure to PM and other forms of air pollution are not well known due to the difficulty of isolating the impacts of short-term exposure from impacts of consistent, ambient air pollution. Cumulative impacts of poor air quality resulting in chronic health conditions are influenced by many factors, including distance to traffic-related pollution, distance to point-source pollution, home environmental conditions, and socioeconomic factors that differ among communities (HEI 2013).

People living in communities of color and low-income tend to be disproportionately impacted by air pollution due to their proximity to factories, major roadways, and ports with diesel truck operations (USEPA 2022b), among other such industries. These sites are often located near EJ communities due to inequity at the decision-making level when developing and siting highly polluting facilities, leading to a higher baseline of conditions caused by air pollution for EJ communities.

7.2.1 Impacts

Relicensing the Project as it Currently Exists (1-mile Radius Only)

Direct, Indirect, and Cumulative Impacts

Existing Project operation does not result in air quality related impacts to the Project vicinity. There will be no air quality related impacts from relicensing and continued operation of the existing Bad Creek Project.

Distribution of Impacts

There are no air quality related impacts from relicensing and continued operation of the Bad Creek Project. EJ communities will not be disproportionately impacted by continued Project operation.

Relicensing the Existing Project with Construction of the Bad Creek II Complex (1-mile and 5-mile Radiuses)

Direct Impacts

The short-term construction-related air pollution from building the Bad Creek II Complex has the potential to result in exacerbating already existing health conditions for EJ populations near the site. The construction activity most likely to impact air quality in the vicinity of EJ communities is the upper reservoir inlet/outlet work due to the proximity of that work to identified EJ populations. The air pollution caused by construction vehicles and equipment has the potential to be carried long distances on the wind and can include PM10 (particulate matter smaller than 10 microns in diameter), volatile organic compounds, and gases such as carbon dioxide, carbon monoxide, and nitrogen oxides (EPC 2023). The distance between EJ populations and the construction site, generally greater than one mile, will serve to mitigate potential impacts.

Indirect Impacts

Indirect impacts from construction of the Bad Creek II Complex may include exacerbation of pre-existing conditions but is unlikely to be the sole cause of development of those conditions due to the short duration of exposure and the good air quality that exists as a baseline in the Project vicinity. As with direct impacts, the distance between EJ populations and the construction site will be sufficient to result in minimal indirect impacts.

Cumulative Impacts

The Bad Creek Project vicinity is rural and largely undeveloped, with much of the land adjacent to Lake Jocassee designated for public recreation and resource conservation. Due to the natural character of the region and low baseline levels of air pollution, as well as the highly variable effect of localized, ongoing environmental conditions, it is not likely that the short duration of exposure from the Bad Creek II Complex construction will contribute to cumulative impacts to EJ communities in the Project vicinity.

Distribution of Impacts

The Bad Creek Project vicinity is rural and not highly developed, resulting in generally good air quality. There are no pre-existing facilities in the immediate Project vicinity leading to higher-than-average baseline air pollution conditions for EJ communities, and therefore, construction of the Bad Creek II Complex will not impact EJ communities at a disproportionately higher rate.

7.3 Subsistence Fishing

Across the country, many rural, marginalized, and Indigenous communities rely on subsistence resources, such as fish, for food and trade (OEPC 2021). Subsistence fishing, hunting, and harvesting continue to be important to the life and economy of marginalized and Indigenous people (OEPC 2021), and therefore an important part of the environmental discussion related to the construction of new projects and facilities.

7.3.1 Impacts

Relicensing the Project as it Currently Operates (1-mile Radius Only)

Direct, Indirect, and Cumulative Impacts

Due to the large fluctuations in upper reservoir elevations from approved existing Project operations, there are no recreational facilities or subsistence fishing opportunities located on the upper reservoir. Additionally, the upper reservoir is fenced in to prohibit public access and ensure public safety. The recreational facilities and subsistence fishing opportunities located within the nearby Devil's Fork State Park and Lake Jocassee will remain unchanged and be unaffected by continued Project operation. No direct, indirect, or cumulative impacts to subsistence fishing are anticipated as a result of relicensing the Bad Creek Project.

Distribution of Impacts

No impacts to subsistence fishing opportunities are anticipated as a result of relicensing and the continued operation of the Bad Creek Project.

Relicensing the Existing Project with Construction of the Bad Creek II Complex (1-mile and 5-mile Radiuses)

Direct Impacts

Although fishing is not permitted within the upper reservoir, the nearby Devil's Fork State Park potentially provides subsistence fishing opportunities on Lake Jocassee within the 5-mile buffer zone surrounding construction of the Bad Creek II Complex. Additionally, the Whitewater River located adjacent to the Project Boundary near the Bad Creek Reservoir is managed by the S.C. Department of Natural Resources (SCDNR) and stocked regularly, functioning as a desirable wild and stocked rainbow and brown trout fishery. The Whitewater River is located within the 1-mile and 5-mile buffer zones around the Project Boundary, and adjacent to a census block group with both low-income and minority populations. The Whitewater River cove of Lake Jocassee is expected to be closed to the general public for much of the duration of construction of the Bad Creek II Complex. However, the cove is only accessible by boat. Therefore, direct impacts to subsistence fishing opportunities for EJ communities as a result of project construction are not anticipated as the construction activities will be contained within the Bad Creek Reservoir and a portion of Lake Jocassee only accessible by boat.

Indirect Impacts

There will be no anticipated changes to the SCDNR stocking schedule or quantity associated with the project construction, and every effort will be made to limit the amount of pollution potentially entering the local freshwater rivers and streams. Temporary, localized water quality impacts during construction are not expected to adversely affect the Lake Jocassee fishery. Indirect impacts to subsistence fishing opportunities for EJ communities are not anticipated as a result of the Bad Creek II Complex construction.

Cumulative Impacts

There are no anticipated direct or indirect impacts to subsistence fishing opportunities for EJ communities, and the healthy baseline conditions and abundant fish population will not change as a result of construction. Therefore, no cumulative impacts are anticipated.

Distribution of Impacts

There will be no impacts to EJ communities related to subsistence fishing as a result of construction, and, therefore, no unequal distribution of impacts.

7.4 Effects of Project Construction on Local Traffic, Road Networks, and Aesthetics

Construction has the potential to impact local roads and traffic by creating congestion and travel delays, as well as temporarily restricting access to local businesses and residential areas (USDOT 2015). It is possible for these immediate impacts to spread to neighboring locations as people find alternate routes, potentially causing stress to roads that were not meant for increased capacity (USDOT 2015). Additionally, local businesses can experience hardship if customers are unable to access their location due to construction activities that block roads (USDOT 2015).

7.4.1 Impacts

Relicensing the Project as it Currently Exists (1-mile Radius Only)

Direct, Indirect, and Cumulative Impacts

There will be no changes to local traffic, road networks, or aesthetics as a result of relicensing and continued operation of the Bad Creek Project. Therefore, there will be no impacts to EJ communities related to local traffic, road networks, or aesthetics as a result of relicensing.

Distribution of Impacts

There will be no impacts to EJ communities related to local traffic, road networks, or aesthetics as a result of relicensing, and, therefore, no unequal distribution of impacts.

Relicensing the Existing Project with Construction of the Bad Creek II Complex (1-mile and 5-mile Radiuses)

Direct Impacts

Existing access to the Bad Creek Project is by a 4.8-mile-long paved road leading from the Project entrance at SC Highway 130 to the powerhouse portal area at Lake Jocassee. It is expected that this existing access road will be utilized for construction-related activities at the powerhouse and lower reservoir intake/outlet work, with the potential addition of laydown areas for equipment. It is unlikely that EJ communities will be impacted by work done at this location due to the distance between the powerhouse construction and identified EJ populations.

Work conducted at the upper reservoir inlet/outlet location is the closest to identified EJ populations; however, impact to traffic and local roads within identified EJ census blocks is anticipated to be minimal. No residential development exists on the upper reservoir, and therefore no need for EJ populations to be traveling from this area for work or other activities, and no recreation is allowed on the upper reservoir due to the large drawdown fluctuations, limiting the need for travel to this area.

The removal of rock and soil to build the underground cavern for the additional powerhouse likely has the highest potential to cause impact to EJ communities. Excavation of the underground powerhouse will require disposal of significant quantities of material, mostly earth and rock "spoil." Spoil disposal methods and locations have not yet been determined but may include: 1) placement of rockfill at the submerged weir in Lake Jocassee; 2) disposal at designated, permitted upland spoil areas within the expanded Project Boundary or on Duke Energy-owned land adjacent to the Project Boundary; or 3) transport off-site. Disposal of excavated spoils may temporarily impact aesthetics, streams and lands in the expanded Project Boundary, local water quality in and immediately downstream of the Whitewater River cove, or construction traffic.

Indirect Impacts

Following construction there will be no impact to local roads or traffic, and, therefore, no indirect impacts to EJ communities related to roads and traffic.

The disposal of excavated spoils has the potential for indirect impacts to long-term aesthetics and property value. If the disposal site is in close proximity to an EJ community, this could have the highest level of indirect impact. In analyzing potential spoil locations identified within the PAD, locations will be located within the immediate vicinity of the upper reservoir, Project operations properties, or adjacent to the Whitewater River arm of Lake Jocassee on Duke Energy-owned property. As such, no impacts to identified EJ communities would be anticipated from presently proposed spoil locations.

Cumulative Impacts

Cumulative impacts for this exposure pathway would be anticipated to be the same as indirect impacts. Please see the section above for a discussion on indirect impacts.

Distribution of Impacts

The distribution of impacts related to local roads and traffic will not be disproportionately high for EJ communities due to the undeveloped nature of the surrounding area. The pre-Project baseline of minimal pressure on local roads and traffic will result in even distribution of impacts.

Disproportionate impacts resulting from the disposal of excavated spoils are unlikely due to the undeveloped nature of the surrounding area but are not outside the realm of possibility depending on where the disposal site is and the baseline conditions of the site before material is left there.

7.5 Potential Effects on Non-English-Speaking Communities and Sensitive Receptor Locations

The nearest sensitive receptor location is a school located approximately four miles from the proposed construction site (Figure 6.2). Although noise can disrupt learning and contribute to mental and physical dysfunction in children and individuals with known sensory processing disorders, attention-deficit/hyperactivity disorder, post-traumatic stress disorder, and noise-induced developmental disorders (APHA 2021), it is unlikely that construction of the Bad Creek II Complex would have an effect on the sensitive receptor location due to the distance between the two sites.

Within the Project vicinity there is one small population of non-English speaking individuals located in Pickens County representing one percent of the population of the block group, or approximately 23 people (Table 6.1). This block group is primarily outside of the 5-mile radius, with only a small portion located within the 5-mile radius at the southeastern end. Due to the distance between the construction site and any non-English speaking individuals, impacts are not anticipated to this group.

8.0 DISCUSSION

The existing Bad Creek Project's continued operation is not expected to cause any noise or air quality-related effects due, in part, to the Project's relative distance to identified EJ communities. Subsistence fishing opportunities will remain unchanged in the vicinity with the continued operation of the existing Project. In addition, no changes to the local traffic, road networks, or aesthetics will occur as a result of relicensing, nor will there be effects to local non-English speaking communities and sensitive receptor locations.

Due to the history of inequitable siting of highly polluting facilities and industries within EJ communities, the potential for unequal distribution of impacts to these communities exists with any construction project or industrial site proposed today. The natural way in which sound and air pollution travel may result in temporary impacts outside the main construction area, necessitating the 1-mile and 5-mile radius analyses. Overall, the impacts to EJ communities from construction of the Bad Creek II Complex would be minimal due to the distance between construction activities and the nearest residential areas with EJ populations, and disproportionately adverse impacts to EJ communities should not occur due to the healthy baseline environmental conditions in the region.

Due to the distance between identified EJ communities and the potential project impacts, we have not identified the need for additional outreach efforts beyond those currently being employed by Duke Energy as part of the relicensing process. Should the proposed locations of spoil areas change, or alternative road closures/uses be identified, outreach may become necessary.

Construction of the Bad Creek II Complex has the potential for beneficial impact to the local economy by creating local jobs in areas such as contracting and construction work, plumbing, electrical, masonry, welding, and engineering (HoldRite 2023). Additional local economy benefits include increased business from the construction work force to establishments providing food and hospitality, entertainment, and retail sales. Though the direct sales impact from the construction work force will be temporary, it will contribute to indirect and cumulative benefits by giving the area a boost that will aid in the continuation of self-sufficiency and potentially providing resources for future improvements.

9.0 CONSULTATION RECORD

This report was provided in draft form to potentially interested agencies and stakeholders for review and comment on June 6, 2023. Comments were accepted on the draft report through July 31, 2023. Official responses to draft report distribution were received from the following entities:

- Advocates for Quality Development – June 28, 2023
- South Carolina Department of Parks, Recreation & Tourism – July 11, 2023
- South Carolina Department of Natural Resources – July 27, 2023

No substantive comments regarding the report, requests for report modifications, or requests for additional consultation were received. Consultation is included in Appendix A.

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Appendix A

Consultation Documentation

From:	James Keane
To:	Crutchfield Jr., John U
Cc:	Alex Pellett; Dan Rankin; Elizabeth Miller; Greg Mixon; John Haines; Morgan Amedee; Pat Cloninger; Rowdy Harris; Tom Daniel; Wenonah Haire; Caitlin Rogers; syerka@ebci-nsn.gov; Alan.Stuart@duke-energy.com; Sarah Kulpa; Huff, Jen; Bruce, Ed; Dunn, Lynne; Maggie Salazar; Alison Jakupca
Subject:	Re: Bad Creek Relicensing Operations Resource Committee-Environmental Justice Draft Study Report Request for Review
Date:	Wednesday, June 28, 2023 9:07:36 PM

June 28, 2023

Mr. Stuart:

On behalf of AQD (Advocates for Quality Development), I have reviewed the above captioned report by Kleinschmidt and Associates of June 2023.
I find the report to be well researched and the findings in accordance with my understanding of the subject study area around the Bad Creek Project. I have no issues with the report and it confirms my belief that there will be minimal, if any, environmental justice issues resulting from the project.

Sincerely yours,

Terry Keane
Seneca, SC

From: Charles (Rowdy) B Harris
To: Crutchfield Jr., John U
Subject: [EXTERNAL] Re: Bad Creek Relicensing Operations Resource Committee-Environmental Justice Draft Study Report Request for Review
Date: Tuesday, July 11, 2023 1:30:16 PM
Attachments: image001.png

***** CAUTION! EXTERNAL SENDER *** STOP. ASSESS. VERIFY!!** Were you expecting this email? Are grammar and spelling correct? Does the content make sense? Can you verify the sender? If suspicious report it, then do not click links, open attachments or enter your ID or password.

No comments from SCPRT.

Rowdy Harris
Park Manager
Devils Fork State Park
SC Department of Parks, Recreation & Tourism
161 Holcombe Circle
Salem, SC 29676
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From: Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>
Sent: Tuesday, July 11, 2023 11:39 AM
To: Alex Pellett <PellettC@dnr.sc.gov>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Greg Mixon <mixong@dnr.sc.gov>; John Haines <jhains@g.clemson.edu>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Charles (Rowdy) B Harris <charris@scprt.com>; Terry Keene <jtk7140@me.com>; Tom Daniel <danielt@dnr.sc.gov>; Wenonah Haire <wenonah.haire@catawba.com>; Caitlin Rogers <caitlin.rogers@catawba.com>; syerka@ebci-nsn.gov <syerka@ebci-nsn.gov>
Cc: Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sarah Kulpa <sarah.kulpa@hdrinc.com>; Huff, Jen <Jen.Huff@hdrinc.com>; Bruce, Ed <Ed.Bruce@duke-energy.com>; Dunn, Lynne <Lynne.Dunn@duke-energy.com>; Maggie Salazar <maggie.salazar@hdrinc.com>; Alison Jakupca <alison.jakupca@kleinschmidtgroup.com>
Subject: RE: Bad Creek Relicensing Operations Resource Committee-Environmental Justice Draft Study Report Request for Review

Dear Bad Creek Relicensing Stakeholders:

Just a reminder to provide comments on the Bad Creek Relicensing Environmental Justice Study, if you have not done so already.

The comment period will be extended until July 31, 2023.

Please reply if you do or don’t have any comments so we can include in the stakeholder consultation record.

Please let me know if you have any questions.

Thank you,

John Crutchfield

Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
526 S. Church Street, EC12Q | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

From: Crutchfield Jr., John U
Sent: Tuesday, June 6, 2023 7:43 AM
To: Alex Pellett <PellettC@dnr.sc.gov>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Greg Mixon <mixong@dnr.sc.gov>; John Haines <jhains@g.clemson.edu>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Terry Keene <jtk7140@me.com>; Tom Daniel <danielt@dnr.sc.gov>; Wenonah Haire <wenonah.haire@catawba.com>; Caitlin Rogers <caitlin.rogers@catawba.com>; syerka@ebci-nsn.gov
Cc: Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sarah Kulpa <sarah.kulpa@hdrinc.com>; Huff, Jen <Jen.Huff@hdrinc.com>; Bruce, Ed <Ed.Bruce@duke-energy.com>; Dunn, Lynne <Lynne.Dunn@duke-energy.com>; Maggie Salazar <maggie.salazar@hdrinc.com>; Alison Jakupca <alison.jakupca@kleinschmidtgroup.com>
Subject: Bad Creek Relicensing Operations Resource Committee-Environmental Justice Draft Study Report Request for Review
Importance: High

Dear Bad Creek Relicensing Stakeholders:

Please find attached the draft Environmental Justice Study Report which is being provided for your review and comment. I have included the Bad Creek Relicensing Stakeholder SharePoint link where you can also access the report: 405052 Draft Bad Creek EJ Study Report_Draft for Stakeholder Review 06.2023.pdf

As you may be aware, the Environment Justice Study was placed into the Operations Resource Committee during our study plan identification process last year.

I am providing the draft report to those stakeholders who signed up for the Operations Resource Committee as well as other pertinent stakeholders who may have an interest in this study.

Duke Energy requests your review of the draft study report with comments provided via email to Alan Stuart and me by July 6, 2023.

Please reply to all recipients copied on this email so all stakeholders are aware of filed comments. Please reply if you do or don't have any comments so we can include in the stakeholder consultation record.

Note that all comments will be included in the relicensing consultation record and included in the final Environmental Justice Study Report which will be filed as part of the relicensing application with FERC.

After comments are received, Duke Energy will convene a virtual Teams meeting to review the Environmental Justice study report and received stakeholder comments.

Please let me know if you have any questions.

Thank you,

John Crutchfield
Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
526 S. Church Street, EC12Q | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

From:	Elizabeth Miller
To:	Crutchfield Jr., John U
Subject:	[EXTERNAL] RE: Bad Creek Relicensing Operations Resource Committee-Environmental Justice Draft Study Report Request for Review
Date:	Thursday, July 27, 2023 9:19:36 AM
Attachments:	image001.png

***** CAUTION! EXTERNAL SENDER *** STOP. ASSESS. VERIFY!!** Were you expecting this email? Are grammar and spelling correct? Does the content make sense? Can you verify the sender? If suspicious report it, then do not click links, open attachments or enter your ID or password.

Hi John,

The SCDNR has no comments to provide on the Environmental Justice Draft Study Report.

Thank you,

Elizabeth

Elizabeth C. Miller
SCDNR
Office: 843-953-3881
Cell: 843-729-4636

From: Crutchfield Jr., John U <John.Crutchfield@duke-energy.com>
Sent: Tuesday, July 11, 2023 11:40 AM
To: Alex Pellett <PellettC@dnr.sc.gov>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Greg Mixon <MixonG@dnr.sc.gov>; John Haines <jhains@g.clemson.edu>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <CloningerP@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Terry Keene <jtk7140@me.com>; Tom Daniel <DanielT@dnr.sc.gov>; Wenonah Haire <wenonah.haire@catawba.com>; Caitlin Rogers <caitlin.rogers@catawba.com>; syerka@ebci-nsn.gov
Cc: Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sarah Kulpa <sarah.kulpa@hdrinc.com>; Huff, Jen <Jen.Huff@hdrinc.com>; Bruce, Ed <Ed.Bruce@duke-energy.com>; Dunn, Lynne <Lynne.Dunn@duke-energy.com>; Maggie Salazar <maggie.salazar@hdrinc.com>; Alison Jakupca <alison.jakupca@kleinschmidtgroup.com>
Subject: RE: Bad Creek Relicensing Operations Resource Committee-Environmental Justice Draft Study Report Request for Review
Importance: High

Dear Bad Creek Relicensing Stakeholders:

Just a reminder to provide comments on the Bad Creek Relicensing Environmental Justice Study, if you have not done so already.

The comment period will be extended until July 31, 2023.

Please reply if you do or don’t have any comments so we can include in the stakeholder consultation record.

Please let me know if you have any questions.

Thank you,

John Crutchfield
Project Manager II
Water Strategy, Hydro Licensing & Lake Services
Regulated & Renewable Energy
Duke Energy
526 S. Church Street, EC12Q | Charlotte, NC 28202
Office 980-373-2288| Cell 919-757-1095

From: Crutchfield Jr., John U
Sent: Tuesday, June 6, 2023 7:43 AM
To: Alex Pellett <PellettC@dnr.sc.gov>; Dan Rankin <RankinD@dnr.sc.gov>; Elizabeth Miller <MillerE@dnr.sc.gov>; Greg Mixon <mixong@dnr.sc.gov>; John Haines <jhains@g.clemson.edu>; Morgan Amedee <amedeemd@dhec.sc.gov>; Pat Cloninger <cloningerp@dnr.sc.gov>; Rowdy Harris <charris@scprt.com>; Terry Keene <jtk7140@me.com>; Tom Daniel <danielt@dnr.sc.gov>; Wenonah Haire <wenonah.haire@catawba.com>; Caitlin Rogers <caitlin.rogers@catawba.com>; syerka@ebci-nsn.gov
Cc: Stuart, Alan Witten <Alan.Stuart@duke-energy.com>; Sarah Kulpa <sarah.kulpa@hdrinc.com>; Huff, Jen <Jen.Huff@hdrinc.com>; Bruce, Ed <Ed.Bruce@duke-energy.com>; Dunn, Lynne <Lynne.Dunn@duke-energy.com>; Maggie Salazar <maggie.salazar@hdrinc.com>; Alison Jakupca <alison.jakupca@kleinschmidtgroup.com>
Subject: Bad Creek Relicensing Operations Resource Committee-Environmental Justice Draft Study Report Request for Review
Importance: High

Dear Bad Creek Relicensing Stakeholders:

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