Pacific Gas and Electric Company

Power Generation

77 Beale Street
San Francisco, CA 94105

Mailing Address:
Mail Code N11D
P.O. Box 770000
San Francisco, CA 94177

December 2, 2022

Via Electronic Mail (E-Mail)

Christopher Carlton
Forest Supervisor
United States Department of Agriculture
Plumas National Forest
159 Lawrence Street
Quincy, CA 95971-6025
Christopher.Carlton@usda.gov

RE: Rock Creek-Cresta Hydroelectric Project, FERC No. 1962-CA
Forest Service 4(e) Condition No. 4.D Additional Reasonable Control Measures Report– Request for Approval

Dear Christopher Carlton

This letter presents the *Additional Reasonable Control Measures Report* (Control Measures Report) for approval, which is part of Pacific Gas and Electric Company's (PG&E) Rock Creek-Cresta Hydroelectric Project, Federal Energy Regulatory Commission (FERC) No. 1962.

The Control Measures Report is required by ordering paragraph (D) of the Order Modifying and Approving Water Temperature Monitoring Plan under Article 401 and U.S. Department of Agriculture, Forest Service (Forest Service) 4(e), Condition No. 4.D (Additional Reasonable Control Measures) from the appendix of the Order Approving Settlement and Issuing New License (issued October 24, 2001) for the Rock Creek-Cresta Hydroelectric Project.

The requirements of Condition No. 4.D are for PG&E to "prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available."

On December 22, 2020, FERC ordered that PG&E, in consultation with the Rock Creek-Cresta Ecological Resources Committee (ERC) and the Forest Service, prepare and submit a plan and schedule for completion of the Reasonable Control Measures Report by December 31, 2022.

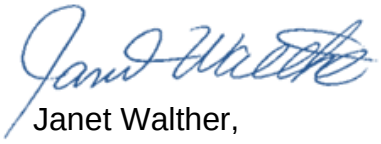
Pursuant to the approved plan and schedule, PG&E prepared a draft of the Control Measures Report and submitted it to the ERC and Forest Service for review on October

17, 2022. Comments from members of the ERC and the Forest Service were received on November 15, 2022. PG&E reviewed, compiled, and responded to all submitted comments before finalizing the report.

The *Additional Reasonable Control Measures Report* is included as enclosure 1 of this letter. The 4.D Report also includes multiple appendices (Appendices A, B, C, D, and E). Due the large size of the files, the appendices can be accessed on the Rock Creek-Cresta ERC SharePoint Site (Condition No. 4.D Report and Appendices). In addition, PG&E's response to ERC and Forest Service staff comments on the draft report are included as Enclosure 2 of this letter.

For general questions, please contact Chadwick McCready, license coordinator for PG&E, at (530) 685-5710.

Sincerely,



Janet Walther,
Senior Manager, Hydro Licensing

Enclosures:
1. Additional Reasonable Control Measures Report, prepared by PG&E and dated December 2022
2. PG&E response to Comments from the Plumas National Forest staff, California Department of Fish and Wildlife, United States Department of Fish and Wildlife, Plumas County, American Whitewater, and California Sportfishing Protection Alliance

cc: Via Email with Attachments
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Chris Shutes, CA Sportfishing Protection Alliance - blancapaloma@msn.com
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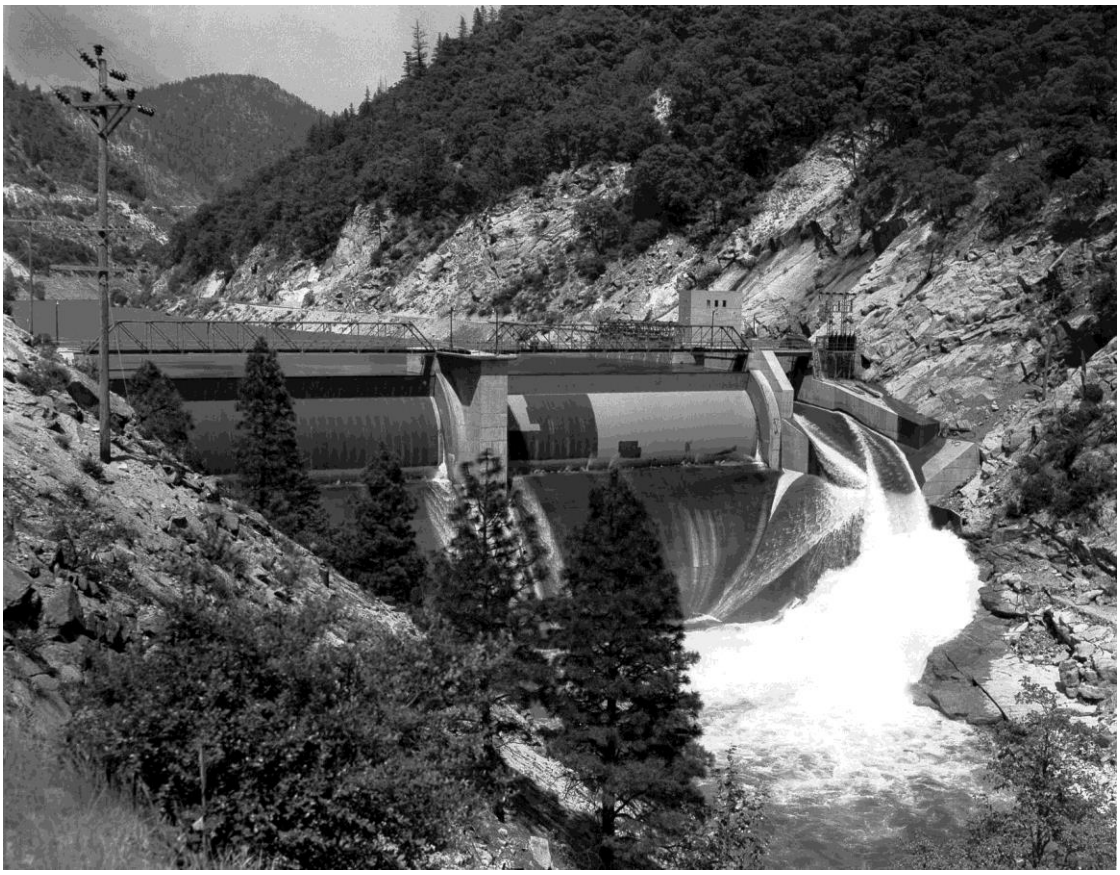
ENCLOSURE 1

Additional Reasonable Water Temperature Control Measures Report

Rock Creek-Cresta Project, FERC No. 1962

License Condition No. 4.D



December 2022

Pacific Gas and Electric Company™

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APPENDICES

ACRONYM LIST

Abbreviation	Definition
°C	degrees Celsius
2005 Informational Report	*North Fork Feather River Study Data and Informational Report on Water Temperature Monitoring and Additional Reasonable Water Temperature Control Measures* (PG&E 2005a)
4.D Report	*Additional Reasonable Control Measures Report*
Bucks Creek Project	Bucks Creek Hydroelectric Project, FERC No. 619
cfs	cubic feet per second
Control Measures Report	*Additional Reasonable Control Measures Report*
EIR	environmental impact report
EIS	environmental impact statement
ERC	Ecological Resources Committee
FERC	Federal Energy Regulatory Commission
Forest Service	U.S. Department of Agriculture, Forest Service
Fund	Coldwater Habitat and Fishery Mitigation and Enhancement Fund
IWTCM	interim water temperature control measures
Licensee	Pacific Gas and Electric Company
LLO	low-level outlet
MIFs	minimum instream flows
NFFR	North Fork Feather River
NGVD	National Geodetic Vertical Datum
PG&E	Pacific Gas and Electric Company
Poe Project	Poe Hydroelectric Project, FERC No. 2107
RCC Project	Rock Creek-Cresta Hydroelectric Project, FERC No. 1962
RCC Project License	License (issued October 24, 2001) for the Rock Creek-Cresta Hydroelectric Project, FERC No. 1962
SA	*Rock Creek-Cresta Relicensing Settlement Agreement*
SWRCB	State Water Resources Control Board
UNFFR	Upper North Fork Feather River
UNFFR Project	Upper North Fork Feather River Hydroelectric Project, FERC No. 2105
WYT	Water Year Type

1. EXECUTIVE SUMMARY

Pacific Gas and Electric Company's (PG&E) *Additional Reasonable Control Measures Report* (Control Measures Report or 4.D Report) is prepared pursuant to Condition No. 4.D of the license for the Rock Creek-Cresta Hydroelectric Project, Federal Energy Regulatory Commission (FERC) No. 1962, which was issued on October 24, 2001. Condition No. 4.D requires that "the licensee shall prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available. The report shall include recommendations for the implementation of any such measures." The purpose of achieving a mean daily water temperature of 20°C or less is to protect cold freshwater habitat.

As described in the Control Measures Report, PG&E collected data between 2002 and 2021 and verified that mean daily water temperatures cannot be maintained at or below 20°C within the Rock Creek and Cresta reaches. Further, assessments completed by PG&E and the State Water Resources Control Board conclude that no additional reasonable water temperature control measures are available to achieve this goal. While several alternatives could reduce water temperature in the Rock Creek and Cresta reaches, the assessments show:

- No alternatives achieve the objective of maintaining mean daily water temperatures of 20°C or less in the Rock Creek and Cresta reaches and in addition, the measures:
    - Require changes to infrastructure and operations that were analyzed during the FERC Project No. 2105 relicensing proceedings and not recommended by PG&E;
    - Could have a negative impact to fisheries in Lake Almanor and Butt Valley Reservoir;
    - Involve unreasonable costs that, if implemented, would be borne by PG&E's electric customers.

Since 2001, PG&E has implemented higher minimum flows in the Rock Creek and Cresta reaches as a reasonable control measure per the requirements of the License. In addition, PG&E, in consultation with other members of the Rock Creek-Cresta Ecological Committee and the USDA Forest Service, has implemented four interim water temperature control measures since 2012. These measures have not maintained mean daily water temperatures of 20°C or less in the Rock Creek and Cresta reaches.

Twenty years of biological monitoring and observations in the Rock Creek and Cresta reaches has shown no substantial evidence of physiological stress to the coldwater fishery. This suggests that the concerns about water temperature in these reaches are unfounded.

PG&E concludes that no additional reasonable control measures are available that can maintain mean daily water temperatures of 20°C or below in the Rock Creek and Cresta reaches. PG&E recommends ceasing implementation of the interim water temperature control measures and that this report satisfies the requirement of License Condition No. 4.D.

2. INTRODUCTION

This report, the *Additional Reasonable Control Measures Report* (Control Measures Report or 4.D Report), provides the results of Pacific Gas and Electric Company's (PG&E) evaluation of whether mean daily water temperatures of 20 degrees Celsius (°C) or less have been and will be achieved in the Rock Creek and Cresta reaches, and if not, whether additional reasonable control measures are available. The Rock Creek and Cresta reaches are part of PG&E's Rock Creek-Cresta Hydroelectric Project, Federal Energy Regulatory Commission's (FERC) No. 1962 (RCC Project).

This report is required by the following provisions:

- Ordering paragraph (D) from FERC's Order Modifying and Approving Water Temperature Monitoring Plan (issued February 28, 2003) under Article 401
- Article 401 and U.S. Department of Agriculture, Forest Service (Forest Service) 4(e), Condition No. 4.D (Additional Reasonable Control Measures) from the appendix of the Order Approving Settlement and Issuing New License (issued October 24, 2001) for the RCC Project (RCC Project License)
- Section I.4 from the *Rock Creek-Cresta Relicensing Settlement Agreement* (SA, PG&E 2000a)

The SA parties' agreement in Section I.4 of the SA to evaluate maintenance of a mean daily water temperature of 20°C in the Rock Creek and Cresta reaches was negotiated during the relicensing for the RCC Project and is not based on any prior or existing approved water quality objective for the Feather River (PG&E 2000a & 2000b, SWRCB 2019). This temperature maintenance criteria was incorporated into the RCC Project License as part of Forest Service 4(e) Condition No. 4- Water Temperature Requirement Section 4.A, Water Temperature Requirement (FERC 2001) which States:

> In order to reasonably protect cold freshwater habitat, Licensee shall maintain mean daily water temperatures of 20 degrees Celsius or less in the Rock Creek and Cresta Reaches, to the extent that licensee can reasonably control such temperatures. Reasonable control measures are: the flow schedules stated in Condition 5 [Minimum River Flows], Table A below and implementation of the measures stated in this condition.

To evaluate the objective set forth in Condition 4.A, PG&E was required to develop and implement a water temperature monitoring plan under Forest Service 4(e) Condition No. 4.C-Water Temperature Monitoring.

The requirements of Condition No. 4.D are for PG&E to "prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available. The report shall include recommendations for the implementation of any such measures" Condition No. 4.D goes on to specify that the 4.D Report shall include

recommendations for implementing additional reasonable control measures to achieve mean daily water temperatures of 20°C or less in the Rock Creek and Cresta reaches. The 4.D Report "shall also factor in economic considerations in evaluating whether additional measures are reasonable." Condition No. 4.D also states (FERC 2001):

> Subject to the provisions of Paragraph 5 below [referring to the Condition No. 4.E Coldwater Habitat and Fishery Mitigation and Enhancement Fund] which sets forth the licensee's total financial commitment for reasonable control measures as set forth in this condition, the ERC[1] and Forest Service shall make an affirmative determination whether additional temperature control measures shall be implemented. This affirmative determination shall be based on the best scientific information available, the use of sound scientific methods, consideration of the relative cost of different control measures, and other relevant factors. As soon as practicable after such affirmative determination, the licensee shall implement any additional reasonable control measures for which no further regulatory approval is necessary. The licensee shall promptly apply for regulatory approval for any other additional reasonable control measures that the ERC and Forest Service affirmatively determine shall be implemented.

Concerning the costs associated with water temperature control measures, Condition No. 4.E required the establishment of a Coldwater Habitat and Fishery Mitigation and Enhancement Fund (Fund), which limits the total financial commitment for reasonable control measures. The condition provides the following requirements for PG&E:

> [E]stablish the fund with $5,000,000 (current dollars) and an interest on the fund balance that accrues at the 90-day commercial paper rate as published by the Federal Reserve Bank of New York…add to the Fund an additional amount not to exceed $2,000,000 (January 2001 dollars, escalated based on the U.S. Gross Domestic Product - Implicit Price Deflator), provided that the Commission makes a determination, based on the water temperature monitoring report required by Condition 4.D, that further measures would be necessary for the licensee to maintain a mean daily water temperature of 20 degrees Celsius in the project reaches and that additional funding would be appropriate for this purpose…The Fund shall primarily be use for the water temperature control measures described in Condition 4.D…The Fund may be used to undertake other measures that directly enhance coldwater habitat and the fishery in the Rock Creek-Cresta bypassed reaches and/or in the North Fork Feather River Basin as may be required by the Commission during the license term.

To meet the objectives outlined in Condition No. 4.D, this report includes:

- An overview of the RCC Project and the North Fork Feather River (NFFR)
- Observations from the ongoing water temperature monitoring in the Rock Creek and Cresta reaches

[1] The Ecological Resources Committee (ERC) consists of PG&E, the California Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, the State Water Resources Control Board, American Whitewater, the California Sportfishing Protection Alliance, and Plumas County.

- A review of the measures included in PG&E's initial informational report prepared to comply with Condition No. 4.D titled *North Fork Feather River Study Data and Informational Report on Water Temperature Monitoring and Additional Reasonable Water Temperature Control Measures* (PG&E 2005a) (2005 Informational Report), provided in Appendix B
- A summary and review of the outcome from multiple State Water Resources Control Board (SWRCB) studies associated with the relicensing the Upper North Fork Feather River (UNFFR) Hydroelectric Project, FERC No. 2105 (UNFFR Project) that investigated options for reducing water temperature in the NFFR
- Results from the implementation of interim water temperature control measures (IWTCM) in the Rock Creek and Cresta reaches
- A review of the conclusions of all evaluations (i.e., models, studies, and monitoring) related to water temperature control in the Rock Creek and Cresta reaches

3. 4.D REPORT PLAN AND SCHEDULE

On December 22, 2020, PG&E submitted an extension of time request to develop a plan and schedule, for preparing the 4.D Report by December 31, 2022 (PG&E 2020). In response, FERC granted PG&E an extension of time but required that the deadline for the submission of the 4.D Report was December 31, 2022. FERC also required a plan and schedule for completion of the 4.D Report to be submitted by April 1, 2021 (FERC 2020).

After consultation with the other members of the ERC and Forest Service, PG&E submitted a final plan and schedule to FERC on April 1, 2021. FERC approved PG&E's plan and schedule for completing the 4.D Report in a letter to PG&E dated May 18, 2021 (provided in Appendix A).

Over the course of 2021, PG&E compiled all existing water temperature monitoring and modeling reports developed for the NFFR and provided them to the other members of the ERC and the Forest Service as part of the requirements of the plan and schedule. PG&E presented and discussed the outcome of these reports over a series of monthly meetings with the ERC and the Forest Service.

4. RCC PROJECT DESCRIPTION

The RCC Project is located on the NFFR, which is embedded in the greater Sacramento River Watershed. The NFFR originates at the southeastern slope of Mount Lassen and extends to Lake Oroville, traversing through Lassen, Plumas, and Butte Counties (Figure 1). The main stem of the Feather River is formed downstream of Lake Oroville. The North, Middle, and South forks of the Feather River are impounded behind Oroville Dam, which was completed in 1967.

The RCC Project is one of five PG&E hydroelectric projects within the NFFR watershed. The UNFFR Project is directly upstream of the RCC Project, and the Poe Hydroelectric Project,

FERC No. 2107 (Poe Project) is directly downstream. The Bucks Creek Hydroelectric Project, FERC No. 619 (Bucks Creek Project) is located on a tributary above the RCC Project and drains into the Rock Creek Reach of the NFFR. The fifth project, Hamilton Branch, is located on a tributary upstream of Lake Almanor. Figure 2 provides a schematic of the overall hydrology within the NFFR Basin.

The RCC Project includes the Rock Creek Reservoir and its associated dam (crest elevation of 2,230.2 ft National Geodetic Vertical Datum [NGVD]), the Rock Creek Reach (an 8.4-mile-long bypass), Rock Creek Powerhouse, Cresta Reservoir and its associated dam (crest elevation of 1,690.2 ft NGVD), Cresta Powerhouse, and Cresta Reach (a 4.9-mile-long bypass). Upstream sources of water include the UNFFR and the East Branch of the Feather River. Cresta Powerhouse is located just upstream of the Poe Project. Tributaries draining into the Rock Creek Reach include Milk Ranch Creek, Chambers Creek, and Bucks Creek. Rock Creek Powerhouse discharges water into the Cresta Reservoir; other upstream sources of inflow into the Cresta Reservoir include:

- The NFFR downstream of Rock Creek Dam
- Tributary inflows to Cresta Reach from Chambers, Jackass, and other smaller tributaries
- Rock Creek

See Figure 3 for a map of the RCC Project and the surrounding features.

Figure 1: Regional location of the Rock Creek-Cresta Project

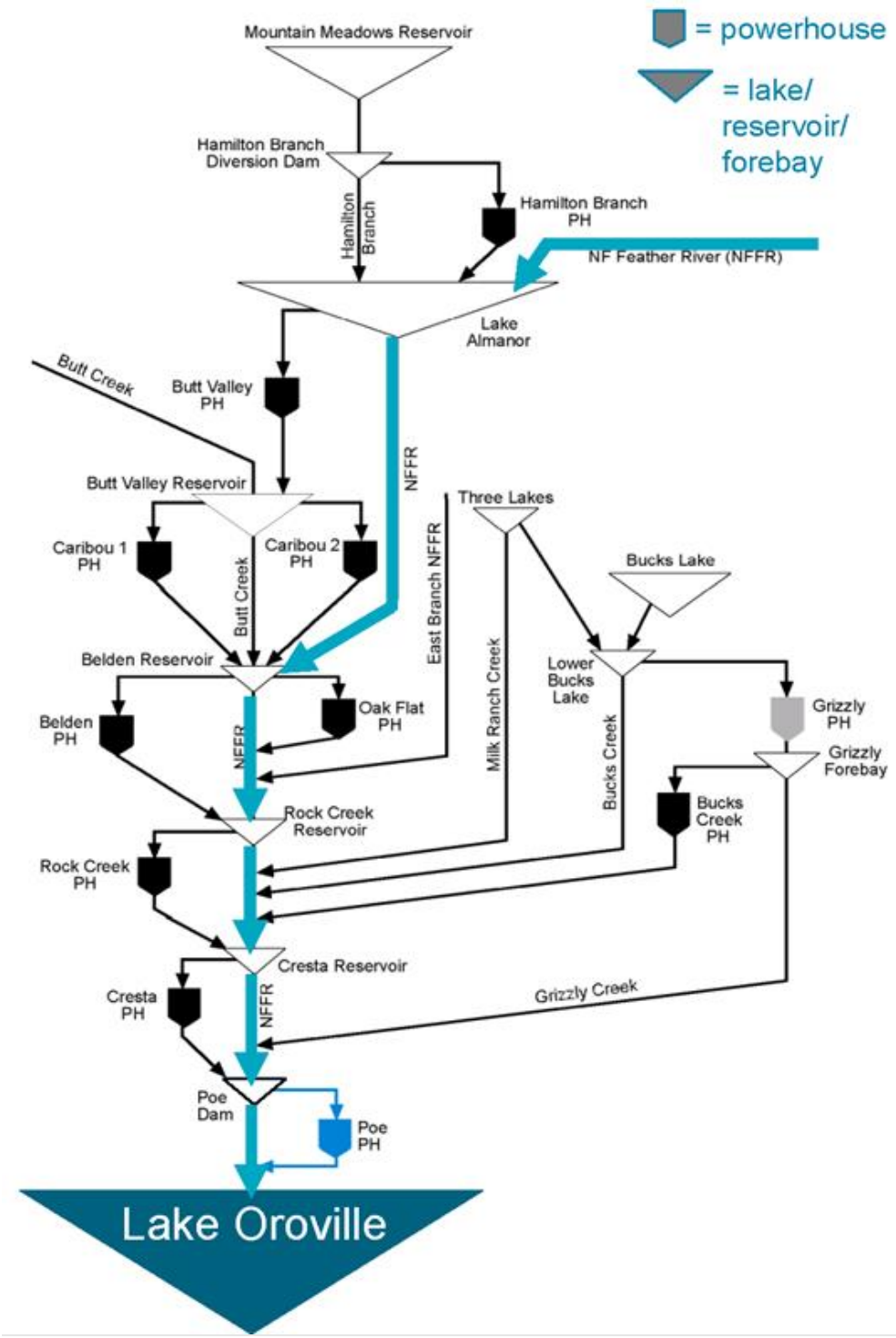


Figure 2: Schematic of the North Fork Feather River hydroelectric system

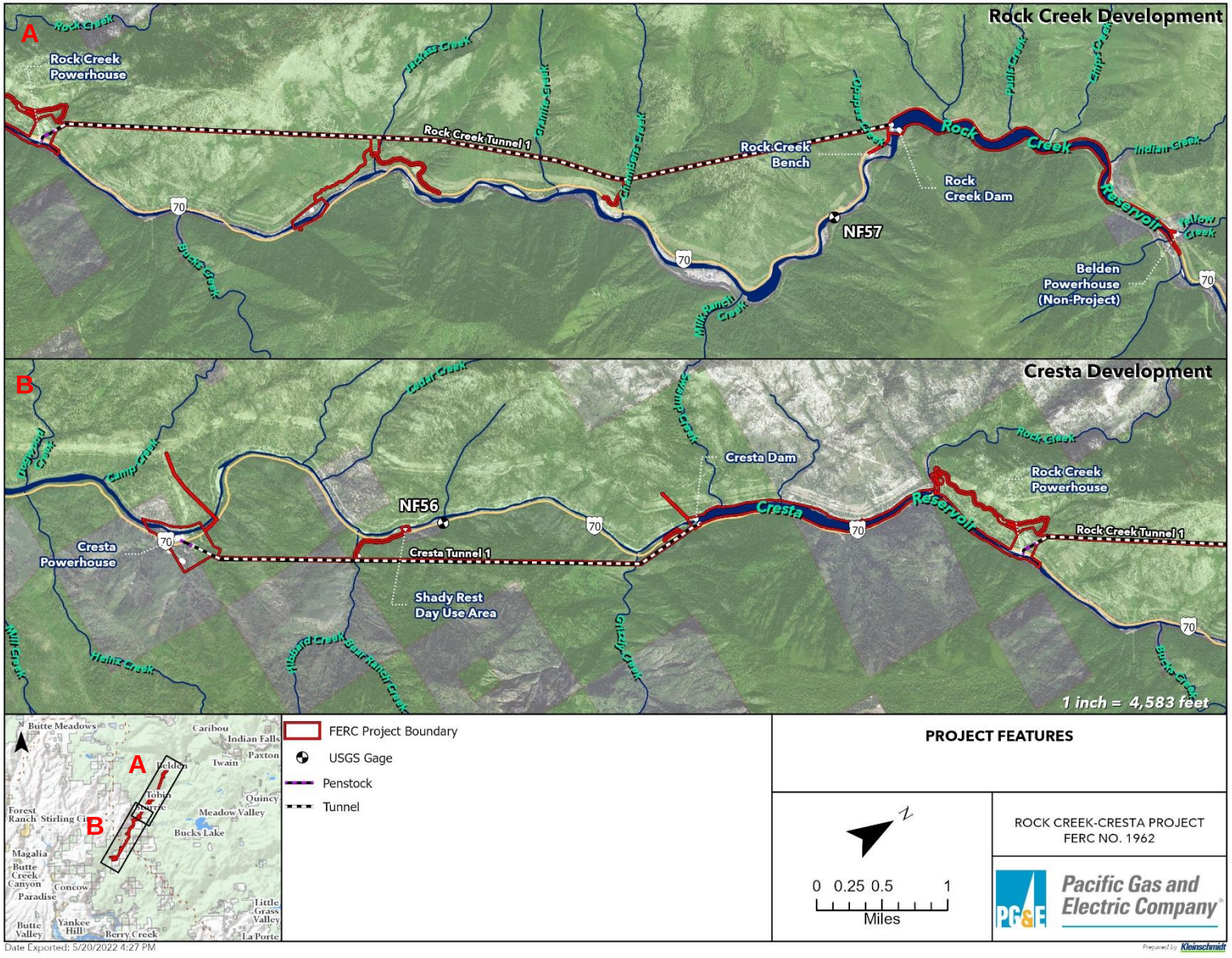


Figure 3: Overview map of the Rock Creek-Cresta Project

Under the current Rock Creek-Cresta License Condition No. 5.A, PG&E (Licensee) is required to maintain minimum instream flows (MIFs) within the Rock Creek and Cresta reaches as a reasonable control measure. MIF levels were implemented in a set of three test flow periods, each of which were designed to last 5 years, beginning in 2001, with MIFs increasing with each subsequent test flow period (FERC 2001, Table 1). MIFs for the three test flow periods were maintained via releases from the RCC Project dams based on the Water Year Type (WYT) and month. Four WYTs (i.e., Wet, Normal, Dry, and Critically Dry) are identified for the RCC Project waters based on California Department of Water Resources records of annual inflow to Lake Oroville (Table 2). All final WYT determinations are made in early May and are based on the Bulletin 120 report (Department of Water Resources). Dry and Critically Dry water years were assigned separate MIFs, while MIFs for both Normal and Wet years were the same. All three test flow periods varied in duration and were completed by 2019. PG&E finalized MIFs for the Rock Creek and Cresta reaches with the ERC and Forest Service in January 2022. PG&E has proposed to implement the final MIFs for the remainder of the RCC Project License term, including any annual license, after FERC has reviewed and approved a pending amendment to the RCC Project License.

Table 1: Minimum Instream Flows[1] for the Rock Creek and Cresta Reaches During Each of the Three Test Periods

Rock Creek Reach	Table A1			Table A2			Table A3		
Month	N&W	Dry	CD	N&W	Dry	CD	N&W	Dry	CD
Mar	250	200	110	350	280	110	525	420	150
Apr	250	200	110	350	280	110	525	420	150
May	250	200	150	350	280	150	525	420	150
Jun	220	175	150	260	210	150	390	310	150
Jul	180	150	150	260	210	150	390	310	150
Aug	180	150	150	260	210	150	390	310	150
Sep	180	150	150	260	210	150	390	310	150
Oct	180	150	150	260	210	150	390	310	150
Nov	180	150	110	260	210	110	390	310	110
Dec	200	160	110	350	280	110	525	420	110
Jan	225	180	110	350	280	110	525	420	110
Feb	225	180	110	350	280	110	525	420	110
Cresta Reach	Table A1			Table A2			Table A3		
Month	N&W	Dry	CD	N&W	Dry	CD	N&W	Dry	CD
Mar	250	200	100	250	200	100	400	350	100
Apr	250	200	100	250	200	100	525	420	100
May	250	200	140	600	500	140	490	420	140
Jun	240	190	140	500	400	140	460	385	140
Jul	220	175	140	325	260	140	440	350	140
Aug	220	175	140	325	260	140	351	300	140
Sep	220	175	140	325	260	140	300	250	140
Oct	220	175	140	325	260	140	200	200	140
Nov	220	175	100	325	260	100	150	150	100
Dec	240	190	100	240	190	100	400	300	100
Jan	240	190	100	240	190	100	400	300	100
Feb	240	190	100	240	190	100	400	300	100

Note: N&W = Normal and Wet; CD = Critical Dry
[1] Minimum instream flows are provided in cubic feet per second.

Table 2: Water Year Type Designation for the Rock Creek-Cresta Project

Water Year Type	Flow Threshold (Inflow to Lake Oroville)
Wet	> 5,679 thousand acre-feet
Normal	> 3,228 < 5,679 thousand acre-feet
Dry	> 2,505 < 3,228 thousand acre-feet
Critical Dry	< 2,505 thousand acre-feet

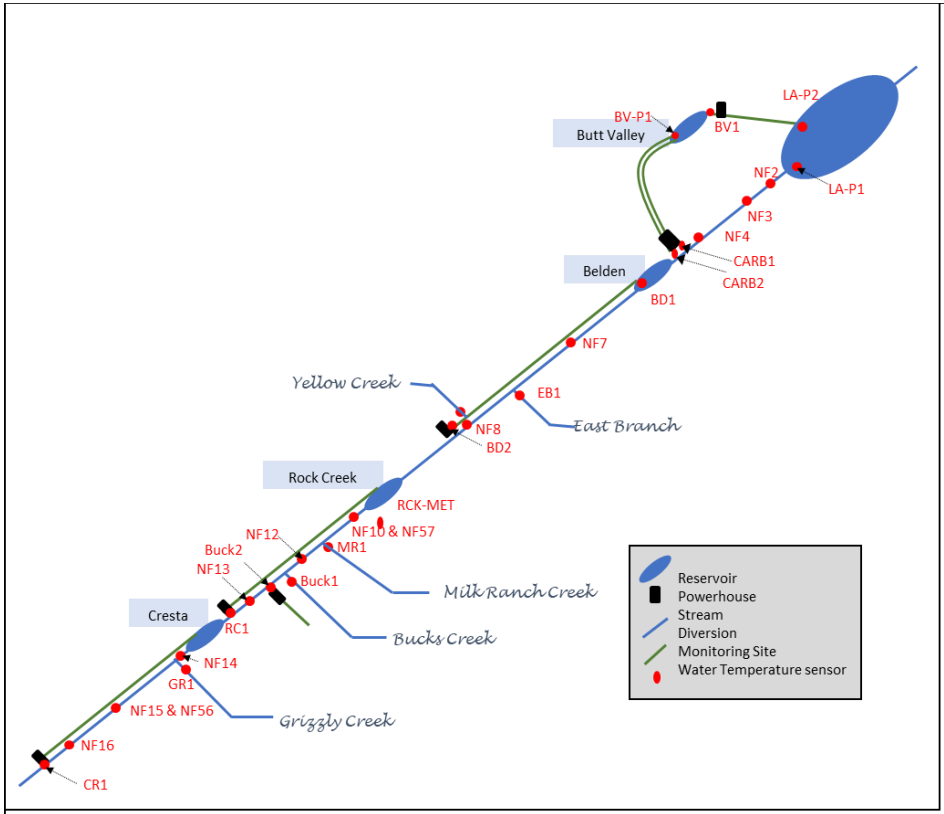
5. WATER TEMPERATURE IN THE ROCK CREEK AND CRESTA REACHES (2002–2020)

As required in License Condition No. 4.C, Water Temperature Monitoring, PG&E developed and implemented a water temperature monitoring plan to assess whether mean daily water temperatures of 20°C or less have been or will be achieved within the Rock Creek and Cresta reaches of the NFFR (FERC 2003). Since 2002, in accordance with its water temperature monitoring plan, PG&E has monitored water temperature during the summer (June through September) in various locations along the NFFR, including both the Rock Creek and Cresta reaches (Figure 4). PG&E evaluated data from this long-term monitoring effort and determined that mean daily water temperatures were not maintained at or below 20°C within the Rock Creek and Cresta reaches.

During the monitoring period, each of the four WYTs were applicable, which prompted a range of MIFs in the Rock Creek and Cresta reaches (Tables 3 and 4), as prescribed in the RCC Project License. As required by License, MIFs have generally increased in both reaches with each test-flow period. Further, since 2012, four IWTCMs have been implemented. A description of these measures and their impacts to water temperature in the Rock Creek and Cresta reaches is included in Appendix E, "Evaluation of Interim Water Temperature Control Measures."

As shown in Figure 5, the mean daily water temperature in both reaches varied between 2002 and 2020 but followed a similar seasonal trend: gradually increasing until the end of July or early August before declining. The number of days in each year during which the mean daily water temperature exceeded 20°C in the Rock Creek and Cresta reaches also varied significantly between years and at different locations along both reaches (Figure 6). For all years except 2011, temperatures exceeded 20°C along the entire length of the two reaches (Figure 6).

During the 2 years (i.e., 2006 and 2011) with the lowest number of days when temperatures exceeded 20°C, mean daily air temperatures were cooler. In other words, for those 2 years air temperatures measured at Rock Creek Dam were at or below the average of daily mean air temperatures measured between 2002 and 2019 (Figure 7). This suggests, at least in the Cresta Reach, that water temperature remaining below 20°C during the warm summer months is a rare occurrence and is likely a consequence of ambient air temperatures and not the primary result of current project operations. Warming trends associated with ambient air temperatures are likely to further reduce the number of days when water temperatures remain below 20°C.



ID	Location	Latitude	Longitude
LA – P1	Lake Almanor near Canyon Dam – near intake	40°10'34.00"N	121°05'19.30"W
LA – P2	Lake Almanor - Offshore of Prattville Intake (LA2)	40°12'59.80"N	121°09'36.80"W
NF2	NFFR below Canyon Dam (at NF-2)	40°10'09.09"N	121°05'33.94"W
NF3	NFFR at Seneca	40°07'02.45"N	121°05'03.87"W
NF4	NFFR above Caribou No.1 Powerhouse	40°05'08.08"N	121°08'48.04"W
BV1	Butt Valley Powerhouse Tailrace	40°10'32.21"N	121°11'25.82"W
BV-P1	BVR at Caribou No. 1 Intake	40°07'00.00"N	121°08'44.90"W
CARB1	Caribou No. 1 Powerhouse (internal)	40°05'07.84"N	121°08'53.98"W
CARB2	Caribou No. 2 Powerhouse tailrace (internal)	40°05'09.27"N	121°08'57.76"W
BD1	Belden Reservoir at powerhouse intake	40°04'32.68"N	121°09'34.68"W
NF7	NFFR near Gansner Bar	40°01'0.54"N	121°13'21.00"W
EB1	East Branch of NFFR above confluence	40°00'51.01"N	121°13'25.74"W
NF8	NFFR at Belden Town Bridge	40°00'23.97"N	121°14'49.56"W
BD2	Belden Powerhouse (internal)	40°00'26.85"N	121°14'58.45"W
YC1	Yellow Creek near mouth	40°00'36.90"N	121°14'55.70"W
RCK-MET	Meteorological Station on Rock Creek Dam	39°59'13.04"N	121°16'59.33"W
NF10	NFFR below Rock Creek Dam at NF-57	39°58'48.10"N	121°16'37.60"W
MR1	Milk Ranch Creek near mouth	39°57'39.72"N	121°16'26.02"W
NF12	NFFR above confluence with Bucks Creek	39°54'56.82"N	121°19'29.61"W
BUCK1	Bucks Creek near mouth	39°54'50.75"N	121°19'34.09"W
BUCK2	Bucks Creek Powerhouse tailrace	39°54'38.42"N	121°19'40.26"W
NF13	NFFR above Rock Creek Powerhouse	39°54'20.61"N	121°20'39.45"W
RC1	Rock Creek Powerhouse (internal)	39°54'17.64"N	121°20'42.87"W
NF14	NFFR below Cresta Dam	39°52'07.53"N	121°22'25.97"W
GR1	Grizzly Creek near mouth	39°52'04.49"N	121°22'22.25"W
NF15	NFFR downstream of Grizzly Creek at NF-56	39°51'08.00"N	121°23'32.84"W
NF16	NFFR upstream of Cresta Powerhouse	39°49'36.86"N	121°24'36.18"W
CR1	Cresta Powerhouse (tailrace)	39°49'33.29"N	121°24'36.05"W

Figure 4: Water temperature monitoring stations used in the assessment of interim water temperature control measures
The embedded table includes a brief description of the locations of the stations.

Table 3: Actual Minimum Instream Flow Schedules for the Rock Creek Reach during the Three Test-Flow Periods (2002–2019)

Test Period	Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Final Water Year Type
1	**2002**	150	110	110	110	110	250	250	250	220	180	180	180	Normal
	2003	180	180	200	225	225	250	250	250	220	180	180	180	Normal
	2004	180	180	200	225	225	250	250	250	220	180	180	180	Normal
	2005	180	180	200	225	225	200	250	250	220	180	180	180	Normal
	2006	180	180	200	225	225	250	250	250	220	180	180	180	Wet
2	**2007**	180	180	200	225	225	280	110	150	150	150	150	150	Critically Dry
	2008	150	110	110	110	110	280	280	150	150	150	150	150	Critically Dry
	2009	150	110	110	110	110	280	280	280	210	210	210	210	Dry
	2010	210	210	280	280	280	280	280	350	260	260	260	260	Normal
	2011	260	260	350	350	350	350	350	350	260	260	260	260	Wet
	2012	260	260	350	350	350	110	280	280	210	210	210	210	Dry
	2013	210	210	280	280	280	350	350	280	210	210	210	210	Dry
	2014	210	210	280	280	280	110	110	150	150	150	150	150	Critically Dry
3	**2015**	150	110	110	110	110	574	150	150	150	150	150	150	Critically Dry
	2016	150	110	110	110	110	676	600	525	390	390	390	390	Normal
	2017	390	390	525	525	525	676	600	525	390	390	390	390	Wet
	2018	390	390	525	525	525	150	500	525	390	390	390	390	Normal
	2019	390	390	525	525	525	676	600	525	390	390	390	390	Wet

Table 4: Actual Minimum Instream Flow Schedules for the Cresta Reach during the Three Test-Flow Periods (2002–2019)

Test Period	Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Final Water Year Type
1	**2002**	140	100	100	100	100	250	250	250	240	220	220	220	Normal
	2003	220	220	240	240	240	250	250	250	240	220	220	220	Normal
	2004	220	220	240	240	240	250	250	250	240	220	220	220	Normal
	2005	220	220	240	240	240	200	250	250	240	220	220	220	Normal
	2006	220	220	240	240	240	250	250	250	240	220	220	220	Wet
2	**2007**	220	220	240	240	240	200	100	140	140	140	140	140	Critically Dry
	2008	140	100	100	100	100	200	200	140	140	140	140	140	Critically Dry
	2009	140	100	100	100	100	200	200	500	400	260	260	260	Dry
	2010	260	260	190	190	190	200	200	600	500	325	325	325	Normal
	2011	325	325	240	240	240	250	250	600	500	325	325	325	Wet
	2012	325	325	240	240	240	100	200	500	400	260	260	260	Dry
	2013	260	260	190	190	190	250	250	500	400	260	260	260	Dry
	2014	260	260	190	190	190	100	100	140	140	140	140	140	Critically Dry
3	**2015**	140	100	100	100	100	350	100	140	140	140	140	140	Critically Dry
	2016	140	100	100	100	100	400	525	490	460	440	351	300	Normal
	2017	200	150	400	400	400	400	525	490	460	440	351	300	Wet
	2018	200	150	400	400	400	100	420	490	460	440	351	300	Normal
	2019	200	150	400	400	400	400	525	490	460	440	351	300	Wet

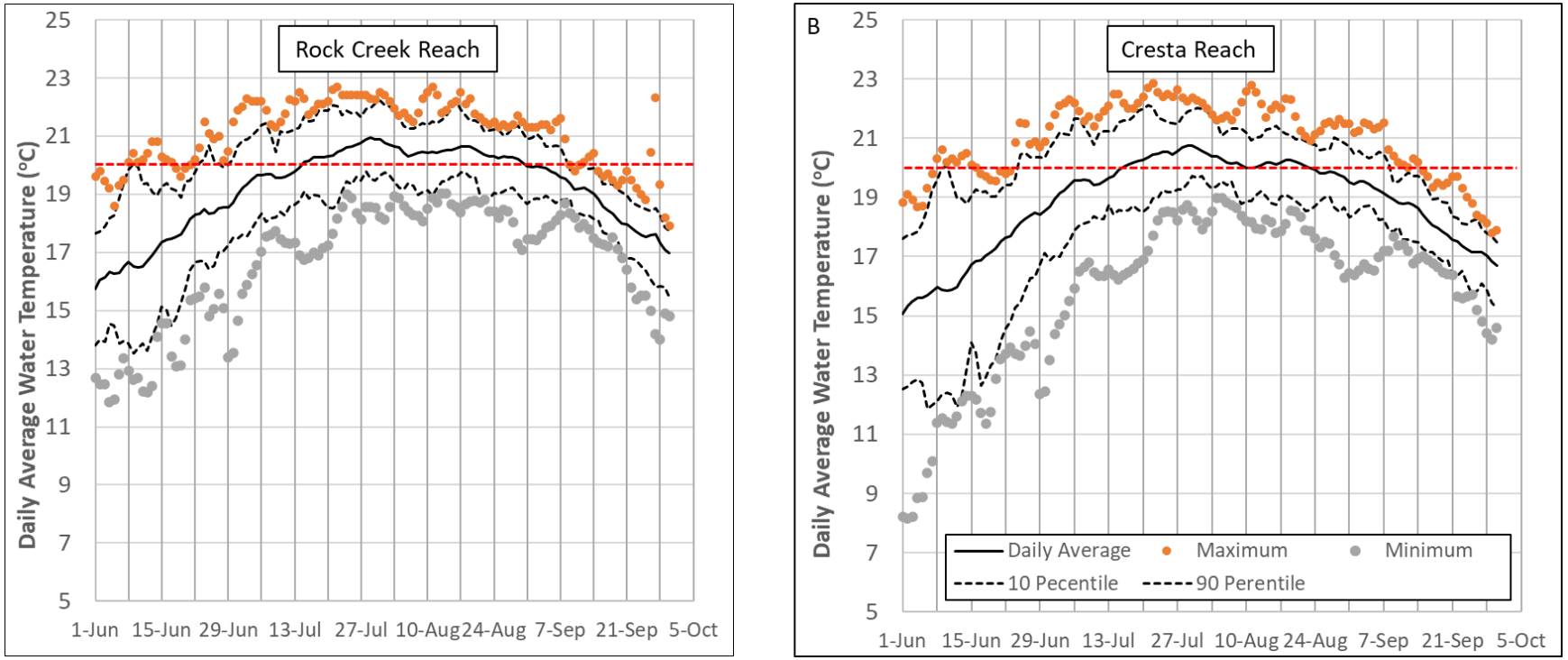


Figure 5: Mean Daily water temperature measured for 2002–2020 in the Rock Creek and Cresta reaches
Dashed redline indicates the 20°C threshold identified in the RCC Project SA.

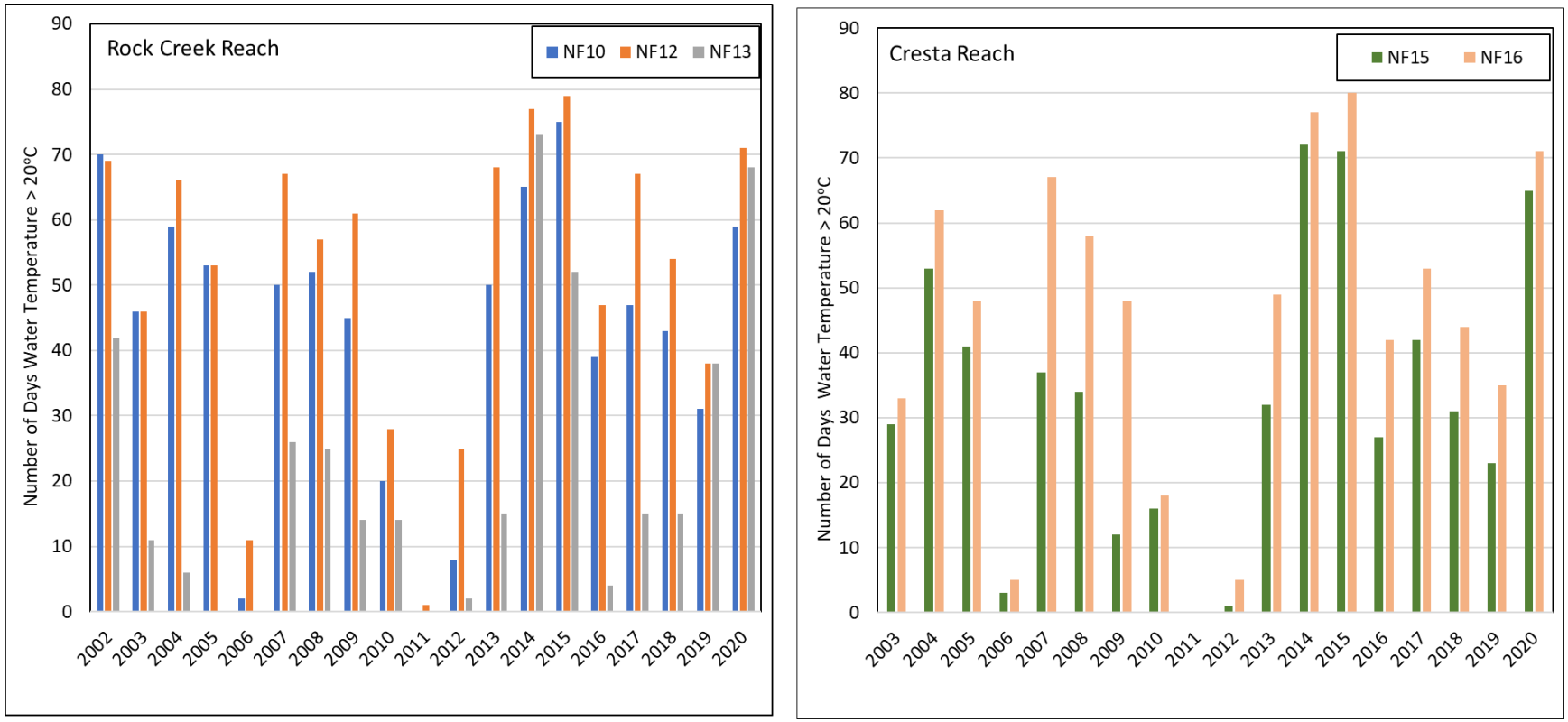


Figure 6: Number of days during each year that mean daily water temperature exceeded 20ºC in the Rock Creek and Cresta reaches The measurements are from multiple locations in both the reaches (as indicated in Figure 4).

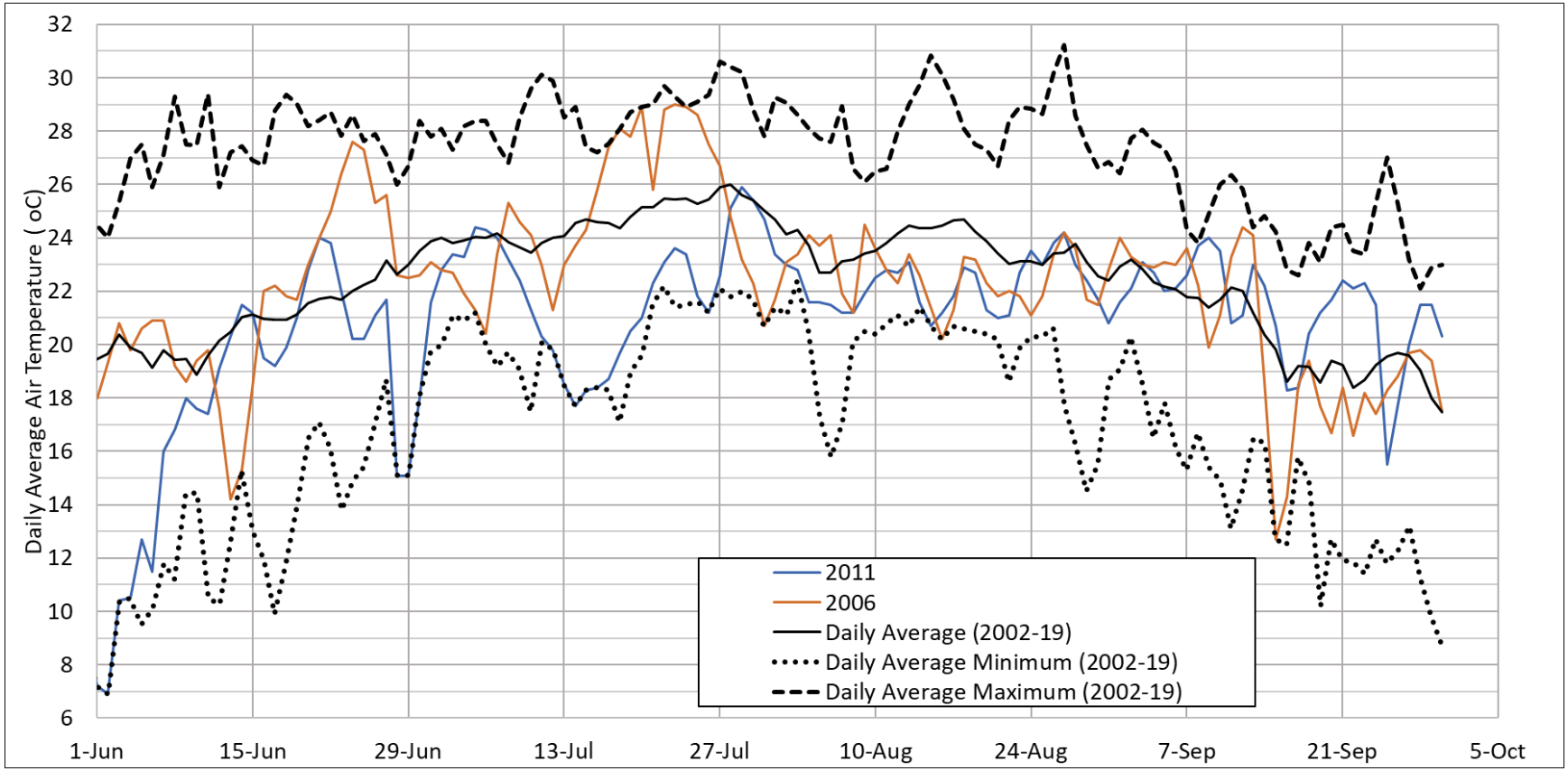


Figure 7: Mean Daily air temperature measured for 2002–2019 at Rock Creek Dam
Solid orange and blue lines indicate the mean daily air temperature for 2006 and 2011, the years with the lowest number of days when water temperature in Rock Creek and Cresta reaches exceeded 20°C.

6. WATER TEMPERATURE CONTROL IN THE NFFR

Water temperature dynamics in the Rock Creek and Cresta reaches and along the NFFR in general have been studied for more than 30 years. PG&E or the SWRCB commissioned at least 14 studies to identify and evaluate water temperature reduction measures. Several of the technical reports produced from these studies provided details of model set-up, calibration, and validation, while others focused on the application of the models for determining the effectiveness of the water temperature reduction measures.

The studies can be broken into two distinct categories: (1) studies conducted from 1986 to 2004 for PG&E's initial report on water temperature and in support of the UNFFR relicensing, and (2) the SWRCB studies conducted from 2004 to 2016 in support of the relicensing efforts for PG&E's UNFFR Project. Figure 8 provides a chronology of the various types of models and approaches, their connections, and the modeling reports involved in their development.

The following section provides an overview of events associated with identifying, evaluating, and implementing potential measures to control water temperature in the Rock Creek and Cresta reaches.

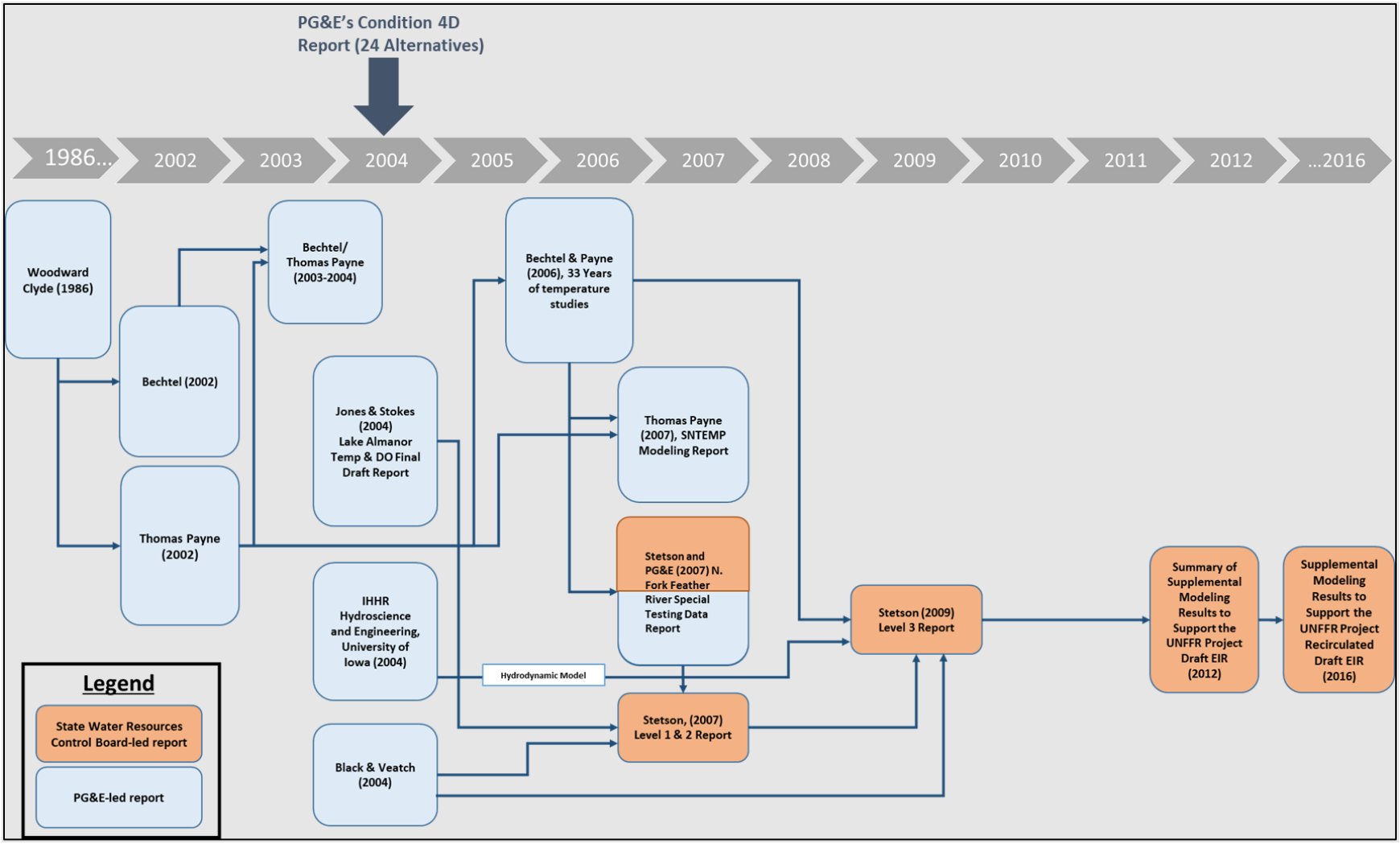


Figure 8: Chronology of water temperature modeling studies in the North Fork Feather River

6.1 THE 2005 INFORMATIONAL REPORT

6.1.1 Background

Formal discussions related to water temperature control measures were initiated during formulation of the RCC Project SA (PG&E et al. 2000a). These discussions precipitated the requirement for PG&E to identify potential additional measures to control water temperature and assess the measures' efficacy. The earliest study of water temperature related to the RCC Project was performed in 1986 (Woodward Clyde Consultants 1986a, 1986b) as part of the relicensing discussions for the RCC Project license.

Stipulations included in the SA and in the RCC Project License required a report on the assessment of additional water temperature control measures to be completed within 5 years of FERC approval of a water temperature monitoring plan. FERC approved the monitoring plan in 2003, which set the completion of the report to 2008 at the latest.

To develop the report, PG&E conducted a series of studies from 2000 to 2004 that evaluated 24 water temperature control measures (alternatives). Bechtel and Payne (2004 and 2006) later collaborated on a study in support of the report that applied improved models to assess various water temperature control measures. PG&E conducted three more studies in 2004 for the 2005 report: (1) a physical model and hydrodynamic model of Lake Almanor (IIHR 2004), (2) a feasibility study based on the physical model and potential water temperature control measures (Black & Veatch 2004), and (3) a dissolved oxygen model of Lake Almanor (Jones & Stokes 2004). Using these studies and other available information (e.g., groundwater well driller logs), PG&E completed the assessment of additional water temperature control measures and submitted the study results to FERC on July 28, 2005 (PG&E 2005a). In this report, PG&E concluded that there were no additional reasonable control measures that could maintain mean daily water temperatures of 20^{o}C or less in the Rock Creek and Cresta reaches. The report containing the study results is included in Appendix B.

After submission of the report, members of the ERC and Forest Service argued that it did not, but should, include the SWRCB's impending analysis in support of the UNFFR relicensing project. The SWRCB analysis was initiated in 2009 and continued through 2016, a timeframe that was outside of FERC's 2007 deadline to submit the report (as further described in Section 6.2).

On September 19, 2005, PG&E informed FERC that the filing of the 2005 report was not to seek FERC action on Condition No. 4.D and was for informational purposes only. PG&E also requested that the title of the submitted report be changed to *North Fork Feather River Study Data and Informational Report on Water Temperature Monitoring and Additional Reasonable Water Temperature Control Measures, amended September 2005* (2005 Informational Report, PG&E 2005b). Disagreements over the scope of potential additional reasonable water temperature control measures caused the ERC and Forest Service to decide not to submit

recommendations at that time, opting instead to wait for additional analysis of water temperatures in the NFFR that were being conducted for the relicensing efforts for the UNFFR Project and the associated SWRCB California Environmental Quality Act (CEQA) review as part of the water quality certification (PG&E 2006).

6.1.2 Alternatives Evaluated

To address the requisites in Condition No. 4.D, PG&E monitored water temperature along the NFFR, including the Rock Creek and Cresta reaches, and determined that water temperature in the Rock Creek and Cresta reaches routinely exceeded 20°C during the warm summer months (i.e., June–September). PG&E then identified 24 potential water temperature control measures (alternatives) for achieving colder water in the NFFR. PG&E assessed the efficacy of each measure by evaluating both the potential for water temperature reduction and the economic and ecological impacts of implementation.

Twenty of the 24 alternatives identified could be applied in the Rock Creek and Cresta reaches. Two others were targeted at the downstream Poe Reach, and two were targeted at the upstream Belden Reach. The 24 alternatives were grouped into the following three categories based on the source of cold water to be used for cooling:

Category 1: Alternatives with cold water sourced from Lake Almanor and accessed through the use of thermal curtains or other means at the existing Prattville intake structure located in the lake (Table 5).

Category 2: Alternatives with cold water sourced from Lake Almanor and obtained by increasing the magnitude of seasonal water releases using the low-level gates in the existing Canyon Dam outlet structure located in the lake, and/or by reoperating the Licensee's UNFFR, Rock Creek-Cresta, Poe, and Bucks Creek projects (Table 6).

Category 3: Alternatives with cold water from sources other than Lake Almanor (Table 7).

To evaluate the alternatives, PG&E developed and tested five instream water temperature models and two reservoir models using data from 1983 to 2003 from FERC-licensed projects (UNFFR, Rock Creek-Cresta, and Poe).

PG&E evaluated environmental and economic factors associated with the alternatives, including:

- Water temperature response
- Construction and implementation costs
- Potential impacts to water quality
- Potential impacts to fisheries

Table 5. Alternatives with Cold Water Sourced from Lake Almanor Accessed through the Use of Thermal Curtains or Other Means at the Existing Prattville Intake

Category	Alternative	Butt Valley Reservoir		Prattville (Lake Almanor)			Estimated Temperature Decrease		Negative Impacts	
		Thermal Curtain Upstream	*Thermal Curtain Downstream*	*Curtain*	*Hooded Pipeline*	*Dredge*	*Magnitude (ºC)*	*Location*	*Loss of Cold-Water Habitat (Lake Almanor)*	*Reduced Fish Population (Butt Valley Reservoir)*
1. Cold Water from Lake Almanor using thermal curtains or modifications to Prattville intake	1			x			~1	B, R, C, P	x	x
	2				x		<0.5	B, R, C, P		
	3			x	x	x	~0.5	B, R, C, P		
	4	x	x	x		x	~3	B, R, C, P	x	x
Notes: B = Belden Dam; C = Cresta Dam; NFFR = North Fork Feather River; P = Poe Dam; R = Rock Creek Dam.										

Table 6. Alternatives with Cold Water Sourced from Lake Almanor Obtained by Increasing the Magnitude of Seasonal Water Releases at the Low-Level Gates in Canyon Dam

Category	*Alternative*	Dam Releases (Increased Flows)					Butt Valley Reservoir		Lake Almanor		Temperature Change		Negative Impacts		Power Generation Decreases
		B	*R*	*C*	*P*	*BK*	*Butt Valley Powerhouse Release*	*Lake Almanor Release*	*Prattville*	*Canyon Dam*	*Magnitude (ºC)*	*Location*	*Reduced Fish Population*	*Reduced Flows to B, R, C, and P*	
2. Increased flows from Canyon Dam and/or reoperation of NFFR projects	5						Reduced flows	x			None	B, R, C, P	x	x	x
	6						Reduced flows	x		Increased flows	~1–2	B, R, C, P	x		x
	7										0.5–3 (few days)	C, B			
	8								Increased flows	Selective cold releases	None				x
	9	x									Temperature rise	B			x
	10		x								Temperature rise	R			x
	11			x							None				
	12				x						0.5–1.5	P			
	13					x					Minor				
Notes: B = Belden Dam; BK = Bucks System; C = Cresta Dam; NFFR = North Fork Feather River; P = Poe Dam; R = Rock Creek Dam.															

Table 7. Alternatives with Cold Water from Sources Other Than Lake Almanor

Category	Alternative	Activity	Location	Temperature Drop		Challenging Construction
				Magnitude (ºC)	*Location*	
3. Obtain Cold Water from Sources Other than Lake Almanor	14	Construct mechanical water-cooling towers.	B, R, C, P	~1	Immediately downstream of dam	
	15	Construct mechanical water chillers.	B, R, C, P	~1	Immediately downstream of dam	
	16	Construct water wells.	B, R, C, P			Not viable
	17	Construct a water pipeline and pumping stations to pump cool water from Lake Oroville.	B, R, C, P			
	18	Construct a new dam and water pipeline on Upper NFFR to cool the Belden Reach.	Above Caribou Powerhouse	~2.5	Below Belden Dam	
	19	Construct a new dam and water pipeline on Yellow Creek to cool the Rock Creek Reach.	Above Belden Powerhouse	~1.2	Below Rock Creek Dam	
	20	Construct a new diversion structure and water pipeline at Bucks Creek Powerhouse to cool the Cresta Reach.	Bucks Powerhouse tailrace	~1.2	Below Cresta Dam	
	21	Construct a new large dam and reservoir.	Yellow Creek and/or the East Branch Feather River			
	22	Enlarge an existing dam and reservoir.	East Branch Feather River			
	23	Plant and Manage Riparian Vegetation to Improve River Shading.	East Branch Feather River			
	24	Construct a Water Pipeline.	Existing Poe tunnel adit (#1) to portion of the Poe Reach			
Notes: B = Belden Dam; C = Cresta Dam; NFFR = North Fork Feather River; P = Poe Dam; R = Rock Creek Dam.						

6.1.3 Evaluation Results

PG&E's analysis of the 24 potential water temperature control alternatives indicated that a few of the first and second category alternatives had the potential to reduce water temperatures in the Rock Creek and Cresta reaches. However, none of the alternatives could maintain mean daily water temperature at or below 20°C for the duration of the summer. Further, reductions in water temperature would increase the cold-water trout habitat in the Rock Creek Reach by about 3 to 8 percent and in the Cresta Reach by about 0.5 to 2 percent in July and August of normal water years. The overall benefits of such modest gains in cold water trout habitat were found to be limited and likely not measurable given natural fish population variability. Also, these alternatives were found to likely reduce cold-water fish habitat in Lake Almanor and fish production in Butt Valley Reservoir, resulting in a decrease of the aquatic resources and recreational value at each of these reservoirs.

All potential water temperature control alternatives were found to have substantial costs (i.e., in the range of tens of millions of dollars), which, if implemented, would be borne by PG&E's customers. As a result of the analysis, PG&E concluded that no additional reasonable water temperature control measures were available for achieving a year-round mean daily water temperature of 20°C or less in the Rock Creek and Cresta reaches.

6.2 STATE WATER RESOURCES CONTROL BOARD STUDIES (2009–2016)

6.2.1 Background

In April 2004, the UNFFR Project reached a final relicensing settlement agreement (PG&E et al. 2004a). This settlement agreement set out new flow requirements for the UNFFR Project and was agreed upon and supported by all signatory parties. FERC subsequently completed an environmental impact statement (EIS) as part of the National Environmental Policy Act process, and the SWRCB completed a draft environmental impact report (EIR) through the CEQA process as part of the water quality certification process.

For the draft EIR, the SWRCB analyzed various water temperature control measures between 2007 and 2016 for the UNFFR, Rock Creek-Cresta, and Poe projects and provided the results in a series of reports. The SWRCB drew on PG&E's modeling studies and the 2005 Informational Report to identify and assess temperature control measures. The SWRCB also contracted with Stetson Engineers, Inc., to complete a series of modeling and technical studies, including a collaborative operational testing study with PG&E (Stetson Engineers Inc. and PG&E 2007). The SWRCB investigations resulted in the Level 1, Level 2, and Level 3 reports (Stetson Engineers, Inc. 2007, 2009), followed by two supplemental reports (Stetson Engineers, Inc., 2012, 2016). The alternatives evaluated are summarized in Section 7 of this report, and the entire reports are included in Appendix C, with additional details included in Appendix D.

On July 16, 2020, FERC determined that the SWRCB had waived its water quality certification authority under Section 401 of the Clean Water Act for the UNFFR Project relicensing (FERC 2020).

Consistent with *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region, Fifth Edition* (Basin Plan) (SWRCB 2019), the UNFFR settlement agreement contains no requirements for the UNFFR Project to maintain water temperature at or below 20°C in the Rock Creek and Cresta reaches. The only commitment to evaluate the goal to maintain water temperatures at or below 20°C in the Rock Creek and Cresta reaches is found in the RCC Project SA.

The following section summarizes the water temperature studies the SWRCB completed.

6.2.2 Alternatives Evaluated

The SWRCB's analysis built on PG&Es 2005 Informational Report. In addition to the 24 alternatives assessed by PG&E in the 2005 Informational Report, the SWRCB's assessments included some additions and modifications. During the initial stages of developing the draft EIR for the UNFFR Project, the SWRCB identified 17 additional alternatives, resulting in a total of 41 potential water temperature control measures. These measures were evaluated through a "Preliminary Formulation" (Stetson Engineers, Inc., 2007). This was followed by the Level 1, 2, 3, and two additional supplemental modeling studies completed in 2016. These studies involved the elimination, addition, and modification of various alternatives that resulted in nine water temperature control measures the SWRCB identified as potentially viable. For the Level 3 evaluations, the SWRCB assessed alternatives that were not eliminated during the Level 2 process. Specifically, additional modeling was used to determine the effectiveness, feasibility, sustainability, and reliability of the water temperature reduction alternatives. The 2012 and 2016 supplemental studies further investigated a select number of alternatives.

The 41 alternatives considered in the preliminary formulation are summarized in Appendix D, Table 1 and the 14 alternatives considered in Level 1 and 2 are summarized in Appendix D, Table 2. The alternatives added for Level 3 and the 2012 and 2016 supplemental modeling are summarized in Appendix D, Tables 3 through 5.

6.2.3 Evaluation Results

The SWRCB's preliminary assessment of PG&E's 24 alternatives and an additional 17 measures resulted in the elimination of 27 measures (Appendix D, Table 1). The remaining 14 alternatives became part of the Level 1 evaluation (in Appendix D, Table 2) during which three alternatives were eliminated. Five other alternatives were eliminated through the Level 2 assessment. Subsequently, Level 3 focused on alternatives remaining after Level 1 and 2 studies, in addition to three new alternatives.

During the Level 3 assessment, three alternatives were eliminated. A later supplemental modeling study in 2012 added two new alternatives derived from the existing alternatives. Another supplemental modeling study was performed in 2016 that included three additional alternatives.

Figure 9 outlines the evolution of the temperature control measures the SWRCB evaluated.

The SWRCB's assessments (as detailed in the Levels 1–3 and Supplement 1 and 2 reports) found that none of the 63 alternatives considered could achieve the Condition No. 4.D objectives by maintaining mean daily water temperatures at or below 20°C year-round in the Rock Creek and Cresta reaches. The SWRCB's modeling results also showed potential for certain measures to diminish cold-water habitat in Lake Almanor, negatively affecting ecological life supported in the lake.

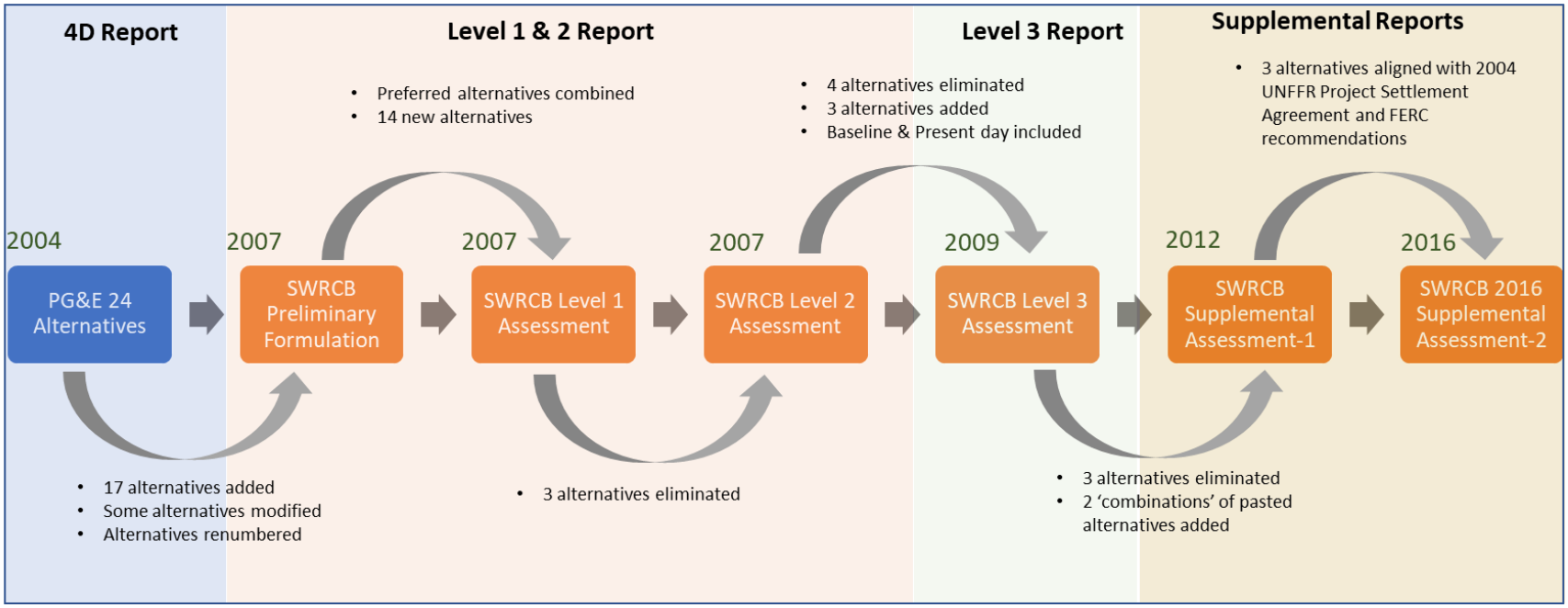


Figure 9: Progression of the State Water Resources Control Board's evaluation of water temperature control measures (alternatives) for the NFFR

6.3 INTERIM WATER TEMPERATURE CONTROL MEASURES

6.3.1 Background

In a letter to FERC dated April 30, 2012 (PG&E 2012), PG&E requested an extension of time to file an updated 4.D Report, as in previous years since 2009. As part of this request, PG&E submitted a proposal, developed with the ERC and Forest Service, to implement five IWTCMs, four of which were directly related to water temperature control. FERC approved this proposal on July 18, 2012 (FERC 2012). PG&E implemented the IWTCMs in part to determine their effectiveness in reducing water temperature in the Rock Creek and Cresta reaches and to inform the ERC and Forest Service of their potential as permanent control measures. PG&E has implemented the IWTCMs since 2012 and annually reported the results to the ERC, the Forest Service, and FERC. PG&E is required to continue to implement the IWTCMs until FERC makes a final determination after reviewing this 4.D Report.

A detailed assessment of the four measures' temperature impacts is included in Appendix E.

6.3.2 Alternatives Implemented

The four measures that have been implemented by PG&E since 2012 are summarized below:

Measure 1

When the mean daily water temperature in the Rock Creek or Cresta reach exceeds the 20ºC criterion for 2 consecutive days, PG&E maximizes the release of the minimum instream flow requirement at the Rock Creek and Cresta Reservoirs through the low-level outlet (LLO) located approximately 30-feet below the invert of the radial gates.

Measure 2

PG&E preferentially operates the Caribou 1 Powerhouse over the more efficient Caribou 2 Powerhouse once the temperature criterion is exceeded. To preserve the finite amount of colder water in Butt Valley Reservoir, PG&E attempts to maintain Butt Valley Reservoir at maximum pool and minimizes the operation of Caribou 1 until July 15 or until the first occurrence of mean daily water temperatures exceeding 20ºC for 2 days in either the Rock Creek Reach (NF-57) or Cresta Reach (NF-56), whichever occurs sooner. During this special operation of Caribou 1, Caribou 2 operation is reduced as much as reasonably possible to minimize mixing the colder water with surface water. This operation lasts 5 days because effective cold-water withdrawal from Caribou 1 diminishes after this period.

Measure 3

PG&E operates the Bucks Creek Powerhouse in a manner that helps reduce mean daily water temperatures both in the lower Rock Creek Reach (between Bucks Creek and Rock Creek powerhouses) and the Cresta Reach. Bucks Creek Powerhouse discharges to the NFFR approximately 1 mile upstream of Rock Creek Powerhouse.

Measure 4

During critically dry years, after implementing Measures 1 through 3 and when mean daily water temperatures at NF-57 or NF-56 are above 20ºC, PG&E increases the minimum instream flow from the Rock Creek (150 cubic feet per second [cfs]) and Cresta (140 cfs) dams to 200 cfs.

6.3.3 Evaluation Results

Measure 1, which calls for flows from the LLO outlets in Rock Creek and Cresta dams is ineffective, because no cooler pool of water exists in either reservoir because of the small size of each reservoir and the mixing that occurs in them.

Measure 2, which involves using the cold-water pool in Butt Valley Reservoir, has the potential to temporarily reduce the water temperature in the Rock Creek and Cresta reaches early in the summer (i.e., before mid-July). However, the cold-water pool is relatively small and temperature reductions occur for a short period (i.e., 1–4 days). Further, this is not a guaranteed source of cooling later in the summer because the cold-water pool in Butt Valley Reservoir becomes increasingly susceptible to warming.

Measure 3, using the Bucks Creek Project to provide cooler water, is effective in significantly reducing the water temperature in approximately 0.8 miles of Rock Creek Reach and to a lesser extent in the Cresta Reach. This measure relies on the operation of Bucks Creek Powerhouse, which is likely to run during the warm periods when water temperatures in the NFFR are high.

Measure 4, increasing flows from 150 cfs to 200 cfs during Critically Dry years, resulted in no clear indication that this measure could reduce water temperatures in the Rock Creek and Cresta reaches. Some potential exists for the intended results to occur in June, but the data also show the opposite effect during the latter part of summer, with higher flows sometimes aligning with larger increases in water temperature downstream. This phenomenon suggests that PG&E's operation (diverting water through granitic tunnels and penstocks) maintains cooler water downstream than releasing more water at the dam through MIFs.

None of the 4 IWTCMs can maintain mean daily water temperatures of 20ºC in the Rock Creek and Cresta reaches. Measures 1 and 4 are ineffective at reducing water temperatures in the Rock Creek and Cresta reaches. Measure 2 can provide a short-term (approximately 3 days) reduction in temperature in the Rock Creek and Cresta reaches, but at the cost of reducing the limited coldwater pool of Butt Valley Reservoir. Measure 3 provides a relatively clear but very localized benefit to approximately 0.8 miles of the Rock Creek Reach but is reliant on the continuous operation of the Bucks Creek Hydroelectric Project during the summer which is challenging as maintenance and repairs of Bucks Hydroelectric Project typically occur during the summer months due to the project's elevation.

7. DISCUSSION

PG&E's monitoring of water temperatures in the Rock Creek and Cresta reaches from 2002 to present confirms that this section of the NFFR consistently exceeds 20°C during the summer months even with the implementation of the RCC Project license-required reasonable control measures (higher MIF flows) and the IWTCMs. Results from PG&E's and the SWRCB's studies completed over the last 40 years indicate that, even with significant manipulations to flows in the NFFR, no feasible option is available for maintaining mean daily water temperatures at or below 20°C.

As stated in the RCC Project License, Condition No. 4.D tasks PG&E to "prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available." PG&E and the SWRCB have investigated over 60 potential additional control measures within the basin over the last two decades. Per the analysis of all available information related to water temperature control, there are no reasonable water temperature control measures that have been identified that could maintain mean daily water temperatures of 20^0C or less in the Rock Creek and Cresta reaches. In addition, those alternatives analyzed require changes to infrastructure and operations that were analyzed during the FERC Project No. 2105 relicensing proceedings and not recommended by PG&E for a variety of reasons including cost. Based on these analyses, no additional reasonable control measures are available to maintain daily mean water temperatures of 20°C or less in the Rock Creek and Cresta reaches.

Operation of adjacent hydroelectric projects were analyzed in the existing studies and show that no alterations to those projects would result in maintaining mean daily water temperature at or below 20°C in the Rock Creek and Cresta reaches. The water temperature studies and FERC's Final EIS for the UNFFR Project show that implementation of control measures involving increased releases from Lake Almanor Dam LLO with commensurate reductions from the Butt Valley powerhouse, will increase Butt Valley reservoir temperatures during the summer, degrading the coldwater fishery (FERC 2005). Additionally, using cold water from Lake Almanor to cool the Rock Creek and Cresta reaches could degrade the cold-water fishery in Lake Almanor by reducing the lake's coldwater pool. The impacts of pulling cold water from Butt Valley Reservoir via preferential summer use of the Caribou #1 Intake has not been fully evaluated but are presumed to also have potential negative effects on the fishery in the reservoir.

Further, certain measures identified to have potential to reduce temperatures in the Rock Creek and Cresta reaches involve capital projects (e.g., thermal curtains and modifications to the Lake Almanor Dam intake tower) and changes to project operations of the UNFFR Project, which PG&E did not recommend during the relicensing proceedings of the UNFFR Project. These modifications would involve costs that far exceed the total financial commitments required under Condition No. 4.D and 4.E. See Appendix B and C-2 for details on cost analyses of selected water temperature control measures.

The IWTCMs PG&E has implemented since 2012 have not been found to maintain mean daily water temperature at or below 20°C in the Rock Creek and Cresta reaches. PG&E's evaluation of the IWTCMs shows that two of the four measures (Measures 1 and 4) result in no reduction of water temperature, while the other two (Measures 2 and 3) have limited spatial and temporal benefits, with no tangible benefits to the trout habitat.

Measures 1 and 4 are based on the incorrect assumption that the LLOs at Rock Creek and Cresta dams release cooler water. The LLOs do not access a cooler pool of water because the reservoirs above these dams are not thermally stratified. Additionally, the LLOs have a limited capacity (< 150 cfs) and any additional flow requirements above that are met via the radial gates on each dam, which can only access the uppermost (and warmest) portions of the reservoir. Therefore, introducing higher MIFs does not lower water temperatures. At most, higher flows could result in less thermal loading, which was not observed to be the case in the Rock Creek and Cresta reaches.

The preferential release of flows from the Caribou 1 Powerhouse (IWTCM #2) can sometimes provide 2–4 days of suppressed water temperature early in the summer, before high water temperatures dominate for a period of 6–8 weeks. However, this temperature suppression is not guaranteed because high air temperatures during this period of Caribou releases can overwhelm any cooling that this measure provides.

The operation of the Bucks Creek Hydroelectric Project (IWTCM #3) has shown that the potential exists for the approximately 0.8-mile-long lower section of the Rock Creek Reach to remain at or below 20°C but is dependent on the continuous operation of Bucks Creek Powerhouse during the summer months, which is not always feasible because of geographic and operational constraints that limit access and maintenance to the summer months.

All additional information corroborates the conclusions presented in the 2005 Informational Report that no additional reasonable measures exist to maintain daily water temperatures at or below 20°C in the Rock Creek and Cresta reaches.

Further, there is no water quality objective in the Basin Plan that supports or requires maintaining daily mean water temperature of 20°Cor less in the Rock Creek and Cresta reaches. The Rationale Report for the Rock Creek-Cresta Relicensing Settlement Agreement (Rationale Document) is inconclusive on preferred temperatures for trout. Some appendices in the Rationale Document suggest that trout are capable of acclimating to temperatures as high as 24°C (PG&E et al. 2000b). The trout population in the East Branch of the NFFR, which is much warmer than the RCC Project reaches during the summer, corroborates these studies. Over the last 20 years of RCC Project License-required biological monitoring during the test-flow period have shown no evidence of detrimental effects to trout and other native fish species from the observed water temperature regimes in the Rock Creek and Cresta reaches. The data collected by PG&E indicate this section of the North Fork Feather River is a transitional zone with regards to water

temperature due to the elevation of the Rock Creek and Cresta reaches. The fish community in these reaches reflect this transitional zone, as it is composed of warm-water and cold-water species (PG&E 2020). Native fish species that were recorded in these reaches during the 15-year Rock Creek-Cresta license required study include hardhead (*Mylopharodon conocephalus*; Forest Service sensitive species), California pikeminnow (*Ptychocheilus grandis*), and Sacramento sucker (*Catostomus occidentalis*), which all prefer warmer water temperatures, and riffle sculpin (*Cottus gulosus*; California species of special concern), prickly sculpin (*Cottus gulosus*), and rainbow trout (Oncorhynchus mykiss), which prefer cooler water. The data collected showed that biomass for all species varied from year to year with no one dominant species, this together with the minimal presence of non-native water fishes (bass species [*Micropterus dolomieu*], and brown trout [*Salmo trutta*]) indicates a relatively balanced and healthy community. The observed natural variability could not be attributed to the Rock Creek-Cresta operations.

8. RECOMMENDATIONS

The past two decades of water temperature monitoring, implementation of control measures and the IWTCMS, and the analysis of potential additional reasonable control measures have demonstrated the inability of any reasonable control measures to maintain mean daily water temperatures of 20°C or less. While the requirement to maintain daily mean water temperatures of 20°C or less have not been achieved in the RCC Project reaches, aquatic resource monitoring of the Rock Creek and Cresta reaches have shown no substantial evidence of physiological stress to the coldwater fishery.

Given the exhaustive list of potential additional water temperature control measures identified, vetted, and analyzed PG&E concludes that none of the potential control measures are reasonable and meet the objective of Condition No. 4.D. PG&E strongly recommends investing no additional efforts or customer resources to maintain water temperatures at or below 20°C in the Rock Creek and Cresta reaches.

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ENCLOSURE 2

Comment Number	Section	Page No.	Commenting Agency	Comment	PG&E Response
1	Discussion	30	CDFW	***Statement 1: Page 30 of the Draft Report states, "The goal in the [Project] Settlement Agreement to maintain temperatures below 20°C is an arbitrary, negotiated metric. There is no scientific consensus on the optimum temperature for trout populations."*** It was recognized by PG&E in their Water Temperature Objectives in the Rock Creek-Cresta Collaborative Process (PG&E 2000) that maintaining water temperatures of 20°C or less in the Basin is important, as it is, "within the generally accepted preferred range for trout. Temperatures near 20°C (68°F) have been broadly used in various literature reviews as a cut-off point in describing suitable trout habitat." PG&E goes on to state, "a review by Bell (1986) concluded, 'generally, all cold-water fish cease growing at temperatures above 68°F because of the increased metabolic rate.' According to Griffith (1999) summer stream temperatures for most coldwater fishes do not exceed 22°C, and that growth for most salmonids declines rapidly above 20°C. Moyle (1976) described optimum temperatures for rainbow trout growth as seeming to be between 13 and 21°C. Scott and Crossman (1973) suggested that rainbow trout are most successful in habitats with temperatures of 70°F (21.1°C). Rich (1987) established 68°F (20°C) as the upper limit of a "low temperature stress" category. Raleigh et al. (1984) assigned water temperatures between 9-20°C suitability indices of 0.8 or greater; within this range, temperatures between 11-19°C were assigned a suitability index of 1." Accordingly, the Department disagrees with PG&E's above Statement 1 and requests that PG&E remove this language from the Draft Report.	PG&E will modify the report to address this comment.
2	Executive Summary	1	CDFW	***Statement 2: PG&E language within the Draft Report assumes the need for temperature control measures to demonstrate continuous improvements capable of achieving constant water temperatures at or below 20°C within the Basin. There are two statements within the Executive Summary on page 1 of the Draft Report that demonstrate PG&E's interpretation that temperature improvements must continuously achieve 20°C or they are unfit solutions. The first statement being, "As described in the 4.D. Report, PG&E collected data between 2002 and 2021 and verified that water temperature is not continuously contained at or below 20°C within the Rock Creek and Cresta reaches." The second statement declares, "While several alternatives could reduce water temperature in the Rock Creek and Cresta reaches, the assessments show that they do not achieve year round temperature below 20°C in the Rock Creek and Cresta reaches."*** The PG&E assumption that proposed water temperature improvement measures are only acceptable solutions if they achieve year-round temperatures of 20°C throughout the length of the Rock Creek and Cresta Reaches is neither explicitly or implicitly stated anywhere within the Project Settlement Agreement or FERC license. Therefore, this assumed criteria that water temperature control solutions must achieve a constant 20°C is a false assumption about both the intent and final language of the water temperature control measures that was not shared by other Settlement Agreement parties or relicensing stakeholders during the development of the FERC license. The Department requests that PG&E revisit this assumption with relicensing stakeholders to clarify that the measure of success for temperature improvement controls is not an all-or-nothing adoption of the 20°C threshold at all times and for all reaches, but rather a meaningful, if not incremental, improvement in temperature for the benefit of aquatic habitat and species within Project-affected reaches.	In the report, 'improvements' with regards to water temperature are not discussed as there is no targeted 'improvements' in the Condition No. 4.D reporting requirements. As required by the Rock Creek-Cresta License Condition No. 4.D: "Within five years of the date when the Commission approves the water temperature monitoring plan, the licensee shall prepare a report that evaluates whether **mean daily temperatures of 20 degrees Celsius or less have been and will be achieved** in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available. The report shall include recommendations for the implementation of any such measures." PG&E has edited the Condition 4.D Report to include the exact language of the requirements from the FERC license.
3	General	NA	CDFW	***Statement 3: PG&E language within the Draft Report discusses the need for water temperature control measures to solely originate from the Rock Creek-Cresta Project and not the Upper North Fork Feather River (NFFR) Project or other projects within the Basin. For example, the Executive Summary on page 1 of the Draft Report states, "While several alternatives could reduce water temperature in the Rock Creek and Cresta reaches, the assessments show that they require changes to infrastructure and operations associated with facilities that are not part of the Rock Creek-Cresta Project."***	Temperature control measures outside of the Rock Creek-Cresta Project boundary were analyzed as part of the Project No. 2105 relicensing proceeding and reviewed in the report. Per the Final Environmental Impact Statement (EIS) for the UNFFR FERC stated the following: "PG&E evaluated numerous potential measures to reduce water temperatures in the Belden reach and the lower NFFR reaches to

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				Preempting this narrow interpretation, FERC envisioned the need to potentially coordinate operations between the hydroelectric projects within the Basin. Language within in the existing Project license describing the FERC reservation of authority states, "the Commission reserves authority to reopen for cause the new project license to protect beneficial uses of the NFFR through coordinated operations of this project, North Fork Feather Project No. 2105 and Poe Project No. 2107. Such reopening may occur in conjunction with the relicensing proceedings for Project Nos. 2105 and 2107." Several sections of the Rationale Report for the Rock Creek-Cresta Relicensing Settlement Agreement (SA Rationale Report), to which PG&E is a signatory, point to the allowance of temperature control measures outside of the Project boundary. Page 21 of the SA Rationale Report states, "If an effective temperature control device can be built at the Prattville intake at Lake Almanor (see Section 8.6), the temperature modeling by WCC (1986) suggests that any of the summer base flows would be adequate to maintain mean daily water temperatures of 20°C or less." Page 32 of the SA Rationale Report states, "the Settlement also **provides a watershed context for other temperature control measures**, because the Settlement fund may be combined with funds from other sources, **including the Licensee's other relicensing proceedings on the NFFR**. The Fund may also be used to undertake other measures that directly enhance cold freshwater habitat and fishery in the Rock Creek and Cresta reaches, if the ERC/FS determine that future expenditure on temperature control measures will not be effective in maintaining mean daily water temperatures of 20°C or less in these reaches." The Department concludes that PG&E should not artificially constrain the geography of potential temperature control solutions to the Rock-Creek Cresta Project boundaries and instead requests PG&E consider solutions within the Basin, for which there is clear language precedent in the Project license and Settlement Agreement.	make these reaches more suitable for coldwater fish…While we do not recommend modifying the Prattville intake to provide cooler water to downstream reaches, PG&E's proposed, and our recommended, minimum instream flows generally would reduce water temperatures in July and August by about 0.5 to 2.0°C in the Belden reach, and also, albeit to a lesser degree, in the lower NFFR bypassed reaches." PG&E has updated the report to address this comment.
4	General	NA	CDFW	***Statement 4: Throughout the Draft Report, PG&E notes that some temperature control measures were not recommended as they could have a negative impact to fisheries in Lake Almanor and Butt Valley Reservoir due to a reduction of coldwater fish habitat and fish production.*** The Draft Report neither assesses the magnitude of impacts to fish populations in either Lake Almanor or Butt Valley Reservoir nor provides the analysis used to reach such a conclusion. In the case of Butt Valley Reservoir, the Draft Report acknowledges that, "the impacts of pulling cold water from Butt Valley Reservoir have not been evaluated" and "the water temperature studies" only "suggest that using cold water from Lake Almanor to cool the Rock Creek and Cresta reaches could degrade the cold-water fishery in Lake Almanor." To validate these claims, the Department requests PG&E provide quantitative estimates of the potential impact to the fishery in Lake Almanor and Butt Valley Reservoir due to cold-water removal, including habitat loss and any resultant losses to fish populations, and the analysis used to reach such a conclusion.	PG&E has revised the report to address this comment by including references.
5	General	NA	CDFW	***Statement 5: PG&E notes in their Draft Report that the Upper North Fork Feather River (FERC #2105) State Water Resources Control Board (State Water Board) water quality certification was waived by FERC in 2020, thus relieving PG&E of the additional mandatory temperature control measures contained within that certification.***	The reference to the waiver of the UNFFR WQC was included as background information in the report. Temperature control measures outside of the Rock Creek-Cresta Project boundary were analyzed as part of the Project No. 2105 relicensing proceedings and reviewed in the report. Per the Final

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				The 2004 Upper NFFR Settlement Agreement (signed by PG&E, the Department, and others) detailed agreed-upon flows for the Almanor FERC license, but specifically stated that temperature was an unresolved issue (Section 2.3 and Table 2) that would be dealt with later (presumably in the CEQA/401 water quality certification process). Table 2 of the Upper NFFR Settlement Agreement summarizes unresolved issues and lists specifically: *Water Temperature: Feasibility studies are currently underway to determine Project 2105 controllable factors associated with attainment and protection of cold freshwater habitat, a designated Beneficial Use of the North Fork Feather River. All parties await additional information in early 2004 from on-going modeling efforts related to the potential Prattville Intake Modifications, re-operation, or other structural changes (Canyon Dam Intake structure modification, modification to Caribou 2, etc.) to inform [protection, mitigation, and enhancement measure] development and agreement on appropriate water temperature conditions. [California Sportfishing Protection Alliance] has unresolved issues with temperature impacts on aquatic resources resulting from the continued operation of the Hamilton Branch and Project 2105 features including the Prattville outlet, Butt Valley Powerhouse, Butt Valley Reservoir, the Caribou 2 Powerhouse and Belden Reservoir in the Project vicinity and in downstream reaches of the North Fork Feather River to Oroville Reservoir.* The Basin Plan for the Sacramento River and San Joaquin River Basins designates beneficial uses of the NFFR which include: Municipal and domestic supply, power, contact recreation (including canoeing and rafting), non-contact recreation, cold freshwater habitat, cold water spawning, and wildlife habitat. Designated uses of the NFFR do not include warm freshwater habitat. In its 2005 Final Environmental Impact Statement (FEIS), FERC acknowledges that operations at the Project affect temperatures in the NFFR. Direct effects of the Upper NFFR Project are seen in changes to the thermal regimes of the Belden, Rock Creek, Cresta, and Poe reaches of the NFFR, and that daily mean water temperatures of greater than 20°C generally occur more than 20 percent of the time from June through September throughout the Belden reach; in near-surface waters of Lake Almanor and Butt Valley reservoir; and in discharges from the Butt Valley, Caribou No. 1, Caribou No. 2, and Belden powerhouses (FEIS Page 3-55). State Water Board staff, in comments to Scoping Document I (June 19, 2003) and various other letters (December 20, 2002, August 14, 2003) submitted to the Commission for this Upper NFFR proceeding, have emphasized the need to take measures that will restore and protect a cold freshwater habitat in the Belden reach and in other reaches of the NFFR impacted by features and operations of the Upper NFFR Project. The State Water Board was the lead agency for CEQA and addressed the water temperature in the 303(d) listed sections of the NFFR through specific monitoring and adaptive management measures in their 401 water quality certification. The measures in the 401 certification which specifically address temperature impairment are Measures 6A-6D. Measure 6A (Canyon Dam Supplemental Flows) states that, "the Licensee shall release supplemental flows up to a total release of 250 cfs from the low-level Canyon Dam outlet to reduce water temperature." This measure was additionally coupled with Measures 6B-6D which allow for additional monitoring of fisheries in Lake Almanor and the NFFR to ensure that fisheries are not negatively impacted in Lake Almanor, and that fisheries goals are met in the NFFR with the supplemental flows. PG&E now uses FERC's procedural waiver of the 401 water quality certification, in	Environmental Impact Statement (EIS) for the UNFFR FERC stated the following: "PG&E evaluated numerous potential measures to reduce water temperatures in the Belden reach and the lower NFFR reaches to make these reaches more suitable for coldwater fish…While we do not recommend modifying the Prattville intake to provide cooler water to downstream reaches, PG&E's proposed, and our recommended, minimum instream flows generally would reduce water temperatures in July and August by about 0.5 to 2.0°C in the Belden reach, and also, albeit to a lesser degree, in the lower NFFR bypassed reaches." The requirements of Condition No. 4.D are for PG&E to "prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available." Per the analysis of all available information related to water temperature control, there are no additional reasonable water temperature control measures that could achieve mean daily water temperatures of 20^0C in the Rock Creek-Cresta reaches

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				combination with a new interpretation of the settlement language of this 4.D. condition, to avoid implementing any "reasonable control measures." The Department believes this reliance on a waived 401 water quality certification undercuts the intentions of the FERC process to otherwise mitigate fisheries impacts via implementation of viable water temperature control measures as mandated by the license and Settlement Agreement. Accordingly, the Department recommends revising the Draft Report such that it does not procedurally deflect water temperature obligations, but instead focuses on substantive and achievable	
6	Appendix E	NA	CDFW	***Statement 6: In Appendix E - Evaluation of Interim Water Temperature Control Measures (2022), PG&E concludes that "two of the measures (preferential releases from Caribou 1 Powerhouse and increased cold-water releases from Bucks Creek Powerhouse) have the potential to reduce water temperature, but these reductions are temporally and/or spatially limited."*** The Draft Report and accompanying Evaluation of Interim Water Temperature Control Measures do not analyze how the effective interim control measures can be combined with additional measures for incremental benefit in the NFFR. As stated above, the Department disagrees with PG&E's conclusion of the need to continuously meet 20°C throughout the Basin and believes that this Draft Report should focus on, as stated in the Settlement Agreement language, any reasonable control measures that can be implemented to improve water temperatures that exceed 20°C in the Project reach. The Department believes PG&E should re-analyze the effective interim control measures coupled with additional measures, including additional releases of water from Canyon Dam as contemplated by the State Water Board, to evaluate reasonably additive or compounding control measures that may benefit fisheries in the Upper NFFR.	The requirements of Condition No. 4.D are for PG&E to "prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available." Per the analysis of all available information related to water temperature control, there are no additional reasonable water temperature control measures that could achieve mean daily water temperatures of 20^0C in the Rock Creek-Cresta reaches, including releases from Bucks Creek and Caribou 1 powerhouse.
7	General	NA	CSPA/AW	**The Draft 4.D Report unilaterally and falsely changes the objective of prospective temperature control measures in favor of a binary, all-or-nothing objective, which it then rejects as arbitrary.** From the beginning of the 4.D Report, PG&E attempts to rewrite the objective of Condition 4.D. The 4.D Report begins: > Condition No. 4.D requires PG&E to prepare a report that evaluates whether mean daily water temperatures of 20 degrees Celsius (ºC) or less have been or will be achieved within the Rock Creek and Cresta reaches of the North Fork Feather River (NFFR), and if not, whether additional reasonable water temperature control measures are available ***to achieve this goal***. 5 In fact, neither the license Condition 4.D nor the Settlement says that. The Draft 4.D Report ***adds the language highlighted above***. Condition 4.D reads, verbatim: > [T]he licensee shall prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available.6 Settlement Appendix A, Section 1 ("Water Temperature"), Subsection 4 ("Additional Reasonable Control Measures"), uses exactly the same words, neither more nor less.7 In short, PG&E's document has added the phrase "to achieve this goal" to the language in the License Order and the Settlement to change the meaning of the requirement. The Draft 4.D	The additional language did not affect the objective that PG&E "**evaluates whether mean daily temperatures of 20 degrees Celsius or less have been or will be achieved in Rock and Cresta Reaches."** PG&E will update the report to remove the "to achieve this goal" from the description of the requirements of Condition No. 4.D. The results remain the same, the analysis of all available information related to water temperature control show that there are no additional reasonable water temperature control measures that could achieve mean daily water temperatures of 20^0C in the Rock Creek-Cresta reaches.

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				Report, consistent with the position of PG&E's management, has thus redefined the objective: from determining whether reasonable control measures are available to the binary question of determining whether measures are available to achieve 20ºC or less ***at all times***.8 Moreover, PG&E apparently counted under the category of 'failed to achieve' any day that the 20ºC "goal" was not achieved throughout ***the entire length*** of the Rock Creek and Cresta reaches of the North Fork Feather River. *See* caption to Draft 4.D Report, Figure 6 ("measurements are from multiple locations in both the reaches.") In this additional way, the Draft 4.D Report diminishes the potential value benefits of water temperature improvement by inflating the number of days the objective was exceeded.9 The Draft 4.D Report thus weaponizes the perfect as the enemy of the good. The deception is not innocent. In 2000, as the Rock Creek – Cresta Settlement was being negotiated, PG&E staff sent an email to the "Rock Creek – Cresta Collaborative" entitled "RE: Rock Creek Cresta Water Temperature Issue."10 Attached to that email was a memorandum entitled "Water Temperature Objectives in the Rock Creek-Cresta Collaborative Process, Prepared by Pacific Gas and Electric Company, May 2000" (hereinafter, PG&E 2000 Temp Memo) describing PG&E's position on water temperature improvements.11 The PG&E 2000 Temp Memo clearly stated that PG&E believe that 20ºC was an appropriate objective, but that it should not become a regulatory requirement: > 20^0C is widely used as a criterion for describing the upper limit of good salmonid habitat and has been supported in both field and laboratory studies. … PG&E believes that the temperature criterion should remain at 20^0C, and that it should be evaluated in the context of adaptive management, rather than the context of license compliance. … [T]he licensee shall provide an annual monitoring report [that] will evaluate the effect of important uncontrollable factors such as water year type and heat storm events on the heat budget of the river.12 The PG&E 2000 Temp Memo concluded with PG&E's recommendations: Proposed "Single Text" Temperature Language for "Temperature Objectives" Seek to maintain mean daily water temperatures of 20^0C or less at Rock Creek-Cresta Hydroelectric Project. … Some variation in daily mean temperature is expected to occur as a result of non-controllable factors, such as heat storms and drought. Etc. …13 Thus, PG&E's negotiators two decades ago did not see the 20ºC objective as either inviolable or as without benefit if not always achieved. It is PG&E's current management that is promoting a revisionist interpretation of Condition 4.D in order to escape responsibility for ***any*** water temperature improvements in the North Fork Feather River. The Draft 4.D Report correctly reports that PG&E's monitoring from 2000-2021 has "verified that water temperature is not continuously contained at or below 20ºC within the Rock Creek and Cresta reaches."14 That should be the impetus to make improvements. It should not be used to reinforce the red herring that "year-round" achievement of that objective that is not possible.	
8	General	NA	CSPA/AW	**The Draft 4.D Report makes a 20-year-*post-festum* collateral attack on the 20ºC temperature objective it accepted in both the License Order and the Settlement, in contradiction with PG&E's evaluation in 2000.**	The requirement of Condition No. 4.D is for PG&E to "prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control

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				Further, the Draft 4.D Report argues: "The goal in the RCC SA to maintain temperatures below 20°C is an arbitrary, negotiated metric. There is no scientific consensus on the optimum temperature for trout populations. Further, there is no water quality objective in the Basin Plan that supports or requires attainment of water temperature in the Rock Creek and Cresta reaches below 20°C."15 But the objective is not "arbitrary." Such a claim is in direct contradiction to the literature review in the PG&E 2000 Temp Memo.16 Moreover, the claim that there is no basis in the Central Valley Basin Plan for temperature improvements in the North Fork Feather River is also incorrect. First, the Basin Plan requires: "At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature."17 As CSPA and AW previously demonstrated using data from PG&E's 2003 water temperature modeling, the operation of Project 2105 exceeds this metric in almost all summer months in all flow scenarios where the discharge from the Caribou powerhouses re-enters the North Fork Feather River.18 In addition, the Basin Plan requires protection of designated ("beneficial") uses. In *PUD No. 1 of Jefferson Cty. v. Washington Dept. of Ecology*, 511 U.S. 700, 713 (1994) the Supreme Court has previously held that a water quality certification must protect such uses as well as meet numeric standards: "We think the language of §303 is most naturally read to require that a project be consistent with *both* components, namely the designated use *and* the water quality criteria. Accordingly, under the literal terms of the statute, a project that does not comply with a designated use if the water does not comply with the applicable water quality standards." As CSPA and AW previously described in January 5, 2021 comments on necessary license conditions for Project 2105, Recreation is such a designated use of the North Fork Feather River under the Basin Plan.19 When water temperatures exceed 20ºC, recreational angling is diminished because the mortality of trout that are caught and released increases. The Rock Creek and Cresta reaches of the North Fork Feather River are limited to catch-and-release angling. Several guidance documents recommend against fishing when water temperatures exceed 20ºC.20 The California Department of Fish and Wildlife recommends limiting angling during high water temperature conditions: "CDFW is requesting that anglers voluntarily avoid fishing after 12:00 p.m. on select waters throughout California. This approach directs anglers to focus their angling during the cooler "hoot owl" periods of the day when water temperatures are lowest. … When these select fisheries begin to achieve sustained afternoon water temperatures exceeding 67° Fahrenheit, CDFW will add the water(s) to a "Hoot Owl" watchlist …"21 Finally, in the Final Environmental Impact Statement for Project 2105, FERC also adopted the 20ºC objective "We agree with CDFG [California Department of Fish and Game] and continue to base our evaluation of water temperatures for the Seneca, Belden, and Butt Creek bypassed reaches on an upper limit of 20ºC and changes from the existing condition."22 The Draft 4.D Report is objectively wrong to disparage the 20ºC water temperature objective. The bad faith in reneging on the agreed-to objective is both regrettable and self-evident.	measures are available." Per the analysis of all available information related to water temperature control, there are no additional reasonable water temperature control measures that could achieve mean daily water temperatures of 20^0C in the Rock Creek-Cresta reaches. CSPA and AW's comments concerning the Central Valley Basin Plan temperature objective appear to be addressing FERC Project No. 2105, not the subject of the Condition No. 4.D Report, which is the Rock Creek-Cresta Project.
9	General	NA	CSPA/AW	**Contradicting the License Order and the Settlement, the Draft 4.D Report unreasonably cites the need to modify operations upstream of the Rock Creek – Cresta Project as support for the argument that improving water temperatures in the Rock Creek and Cresta reaches is not reasonable.**	Temperature control measures outside of the Rock Creek-Cresta Project boundary were analyzed as part of the Project No. 2105 relicensing proceedings. Per the Final EIS for the UNFFR, FERC stated the following:

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				In discussions with the ERC and the Forest Service over the last two years, PG&E staff, at the acknowledged direction of management, has steadfastly refused to consider reoperating Project 2105, immediately upstream of the Rock Creek – Cresta Project, to improve water temperatures in the Rock Creek and Cresta reaches. Consistent with this arbitrary, self-serving management position, the Executive Summary of the Draft 4.D Report, in declaring no measures to improve water temperatures in these reaches to be "reasonable," cites to the need to "[r]equire changes to infrastructure and operations associated with facilities that are not part of the Rock Creek-Cresta Project" in support of its argument.23 That reoperation of the upstream Project 2105 is needed to improve water temperatures in the Rock Creek – Cresta Project is no surprise. The Rock Creek – Cresta Settlement and License Order both explicitly contemplated this outcome. Both the Settlement and the License Order contain the following language: **F. Reservation of the Commission's Authority.** The Commission reserves authority to reopen for cause the new project license to protect beneficial uses of the NFFR through coordinated operations of this project, North Fork Feather Project No. 2105 and Poe Project No. 2107. Such reopening may occur in conjunction with the relicensing proceedings for Project Nos. 2105 and 2107.24 The Settlement and License Order both explicitly contemplate modifications to the Prattville Intake at Lake Almanor, part of upstream Project 2105. The PG&E 2000 Temp Memo flatly states: "The only significant source of cold water for the Rock Creek-Cresta Project is Lake Almanor."25 The Draft 4.D Report is deficient in that it rejects out of hand what it includes as "Category 2" measures: "Alternatives with cold water sourced from Lake Almanor and obtained by increasing the magnitude of seasonal water releases using the low-level gates in the existing Canyon Dam outlet structure located in the lake …"26	"PG&E evaluated numerous potential measures to reduce water temperatures in the Belden reach and the lower NFFR reaches to make these reaches more suitable for coldwater fish…While we do not recommend modifying the Prattville intake to provide cooler water to downstream reaches, PG&E's proposed, and our recommended, minimum instream flows generally would reduce water temperatures in July and August by about 0.5 to 2.0°C in the Belden reach, and also, albeit to a lesser degree, in the lower NFFR bypassed reaches."
10	General	NA	CSPA/AW	**The Draft 4.D Report provides perfunctory, opaque conclusions regarding the water temperature monitoring and modeling data that understate the water temperature benefits of increasing the magnitude of seasonal water releases using the low-level gates in the existing Canyon Dam outlet structure.** The Draft 4.D Report analyzes the benefits of prospective water temperature improvement measures only in gross summary form. It does not call attention to particular data or analyses that provide more granularity. For instance, Appendix D, PG&E's summary table of the State Water Board's analyses, is a biased presentation because it includes a column entitled "Meets 20ºC Objective?". The answer PG&E provides is universally "No," because Appendix D assumes the all-or-nothing approach described in these comments, above: PG&E gives a failing grade to any measures that do not meet the objective at all times, all summer long, in all years. In contrast, Appendix C4, the State Water Board's 2016 summary, more fairly presents the frequency with which the objective is achieved and, on average by summer month, the number of river miles for which the objective is achieved. Overall, Appendix C4 is the most detailed and the most fairly presented analysis that the Draft 4.D Report cites.27 First of all, Appendix C4 provides explicit, stand-alone analysis of the water temperature reduction measure proposed measure recommended by the State Water	PGE provided a detailed analysis of the water temperature data and summarized the modeling that had been done and already reported. The report provides all the relevant documents for the reader to evaluate. The summaries are included to guide the reader to the appropriate reports. Based on the review of the best scientific information available (i.e., results of 20 years of water temperature monitoring and modeling by PG&E and the SWRCB in the North Fork Feather River), the existing data and analysis supports that there are no additional reasonable control measures that could be implemented to achieve mean daily temperatures of 20 degrees Celsius or less in the Rock and Cresta Reaches. PG&E notes that the ERC and Forest Service has been actively involved in reviewing PG&E's analysis of the modeling and monitoring data over the last two years. To facilitate discussions, PG&E created a library holding all the data and presented on the conclusions of the data during its regular ERC and Forest Service meetings.

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				Board in the (waived) 2020 Water Quality Certification (WQC) for Project 2105: a supplemental flow release from Canyon Dam as needed from June 15 through September 15 each year, up to a total Canyon Dam release of 250 cfs.28 In contrast, Appendix B is PG&E's earlier 2005 analysis of a series of alternatives, frequently a combination of many elements and a range of proposed flows over a range of potential annual time periods.29 PG&E never conducted an explicit analysis of the State Water Board's 2020 proposal, and the Draft 4.D Report makes no effort to refine or update the earlier work or draw conclusions from that work relative to the WQC. The reader is left to perform a treasure hunt for relevant data and thereafter extrapolate from the closest values in the 2005 analysis to the State Water Board's 2020 recommended measure. The Draft 4.D Report also reproduces without explanation Appendix B's methodology of piling trout habitat (PHABSIM) modeling on top of water temperature modeling to achieve some kind of metric for increase in trout habitat.30 Thus, rather than describing the number of days and river miles for which the 20ºC objective could be achieved by the State Water Board's recommendation (or some other recommendation), the Draft 4.D Report describes only the conclusion, which was opaque and an obfuscation in the original: "Further, reductions in water temperature would increase the cold-water trout habitat in the Rock Creek Reach by about 3 to 8 percent and in the Cresta Reach by about 0.5 to 2 percent in July and August of normal water years."31 The only thing transparent about this exercise in 2022 is that its goal is the same as it was in 2005: to diminish the resulting statistic in the analysis. The Draft 4.D Report's uncritical reliance on earlier, flawed methodology infects the entire document.	
11	Discussion	NA	CSPA/AW	**The Draft 4.D Report provides perfunctory, unsupported conclusions regarding prospective costs of increasing the magnitude of seasonal water releases using the low-level gates in the existing Canyon Dam outlet structure.** The Draft 4.D Report offers no detail on the prospective costs of increased summer flow releases from Canyon Dam. Instead, the Draft 4.D Report offers only vague generalities: "All potential water temperature control alternatives were found to have substantial costs (i.e., in the range of tens of millions of dollars), which, if implemented, would be borne by PG&E's customers."32 As it does with the prospective temperature benefits, the Draft 4.D Report does not cite to and analyze specific passages from the cost analysis in the secondary references provided as appendices. Rather, the Draft 4.D Report leaves the reader to do a treasure hunt to find relevant data and then to analyze that data's applicability. The Draft 4.D Report provides no analysis of the cost of power foregone for the State Water Board's 2020 recommended measure or any other measure. It improperly states the Condition 4.E Cold Water Fund as a cost cap on measures that would improve water temperature. It also improperly allocates to the cost of Condition 4.D the costs of needed infrastructure improvements at Canyon Dam. Finally, it does not state the basis on which it finds the cost of power foregone to be unreasonable, considering the combined capacity and revenue of the Rock Creek – Cresta Project and Project 2105.	Per Condition No. 4.D of the Rock Creek-Cresta License, FERC provides clear language on the cost requirements if additional reasonable control measures were recommended. No measures were recommended.
12	General	NA	CSPA/AW	**The Draft 4.D Report provides no up-to-date analysis of power foregone, for the State Water Board's recommended measure to improve water temperature or for any other prospective measure.** The Draft 4.D Report relies on Appendix B and Appendix C2 for its cost estimate of power foregone under a "Category 2" scenario (increased releases from Canyon Dam). Appendix B	Correct, there was no new cost analysis created for the existing measures, as all those measures were found to be unable to achieve the objective of maintaining mean daily water temperatures of 20 degrees Celsius or less in the Rock Creek and Cresta reaches.

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				approximates the annual cost of power foregone at $2 to $2.6 million.33 The apparent methodology is an average cost per MWh times the estimated reduction in generation hours. Appendix C2 estimates the power-foregone cost of a 250 cfs release from Canyon Dam in July and August of $1.715 million.34 The FEIS estimated $1.8 million, using a similar methodology.35 Appendix J1 of the State Water Board's Revised Draft Environmental Impact Report (DEIR, 2020, not included in the Draft 4.D Report) used a better methodology for evaluating power foregone in that it made the effort to evaluate the hours of the day during which power would be foregone. This is the type of analysis that PG&E should have combined with analysis of sub-daily variation in power prices in order to more accurately assess the value of that lost power.36 In 2019 comments on the Draft Environmental Impact Statement for relicensing of the Bucks Creek Hydroelectric Project whose powerhouse is located on the North Fork Feather River in the Rock Creek reach, CSPA and AW called out the need for sub-daily analysis of project economics more generally. > Use of an average assumes that the facility will be generating equally during high and low pricing conditions or that prices show little fluctuation. Such an assumption conflicts with the licensees' description on how they operate the project and with the reality of current power market conditions. … A more realistic approach would be to calculate a weighted average of the power prices by using plant factor for each day of generation. > It is an odd place for conservation groups to argue that the developmental analysis in an EIS is undervaluing the hydropower value of a project. Our main point is that FERC needs to develop improved methodologies for determining the power value in its environmental analysis across the board. … > The value of power is foundational in the balancing determination that FERC uses to accept or reject any measure that results in forgone power generation.37 The Rock Creek – Cresta Ecological Resources Committee (ERC) and the Forest Service requested a more granular economic analysis similar in methodology to that of the 2020 DEIR, but using more up-to-date power values. PG&E declined. FERC staff declined to order it.38 The Draft 4.D Report thus must rely on outdated, gross approximation to evaluate the cost of power that would be foregone in implementing the State Water Board's recommendation for water temperature improvements in the North Fork Feather River. This same deficiency infects the 2005 FEIS for Project 2105. This economic methodology likely does not meet the requirement for substantial evidence upon which the Commission will make its decision.	
13	General	NA	CSPA/AW	**The Draft 4.D Report improperly states the Condition 4.E Cold Water Enhancement Fund as a "cap" on the cost of operations that would improve water temperatures in the Rock Creek and Cresta reaches.** The "Discussion" section of the Draft 4.D Report claims that re-operation of Project 2105 is constrained by a cost cap on "total financial commitments" in Section (E) of Condition 4.D of the License Order:	PG&E has revised the report to clarify that, pursuant to the requirements of Condition No. 4.D of the Rock Creek-Cresta Project License, there is a cost cap for any recommended additional reasonable control measures, which is set forth in Condition 4.E. As stated in the Condition 4.D and 4.E in the Rock Creek-Cresta FERC license:

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				Further, certain measures identified to have potential to reduce temperatures in the Rock Creek and Cresta reaches involve capital projects (e.g., thermal curtains and modifications to the Lake Almanor Dam intake tower) and changes to project operations on the UNFFR Project. These modifications would involve costs that far exceed the total financial commitments required under Condition No. 4.E. See Appendix B and C-2 for details on cost analyses of selected water temperature control measures.39 The License Order Condition 4.E contains no such cost cap. It is just not there. There is language ***in the Settlement Agreement***, Appendix A, Section 1 that addresses cost. In this regard, paragraphs (2), (4) and (5) of Appendix A, Section 1 must be read together to understand the limitations and the intent. Paragraph 2 refers to the potential construction of a thermal curtain or similar device at Lake Almanor's Prattville intake to Butt Valley Powerhouse. That alternative is moot, supported by no one. Paragraph 4 refers to "Additional Reasonable Control Measures." It requires PG&E, based on water temperature monitoring, to evaluate "whether additional reasonable control measures are available. The report shall include recommendations for the implementation of any such measures." Paragraph (5) requires PG&E to establish a Cold Water Enhancement Fund of $5 million; under certain circumstances, PG&E may be required to add another $2 million. Part of paragraph (5) states: "All temperature control measures identified pursuant to Paragraphs 2 and 4 of this section shall be funded from the Fund." However, paragraph (5) continues to explain that if a "Submerged Curtain/Skimmer Wall" at the Prattville intake is chosen, PG&E may use $3 million to pay for it. But there is a caveat: "Any design and construction costs in excess of $3,000,000 and future operation and maintenance costs will not be debited from the Fund." This last sentence suggests that there is a cost cap on how much PG&E can deduct from the Fund for the capital improvement of constructing a thermal curtain, and that PG&E would have to provide from other sources any amount in excess of $3 million for such a project. The answer is not that PG&E would then be absolved of all responsibility for such a capital improvement. In addition, paragraph (5), concludes: "Funding under this paragraph may be used in conjunction with funds that may be available from other sources, including but not limited to Licensee's other relicensing proceedings on the NFFR." This further suggests that there is no cost cap on reasonable control measures. Additionally, it recognizes that there may be obligations established in the new licenses for Project 2105 (or Project 2107) that require mitigation in their own right, such as mitigation for thermal impairment of the Belden reach of the North Fork Feather River in Project 2105. These obligations are separate from the reasonable control measures to improve temperatures on the Rock Creek and Cresta reaches, and would not be covered by a paragraph (5) cost cap even if it did exist.	"Subject to the provisions of Paragraph 5 [Condition 4.E] below which sets forth the licensee's total financial commitment for reasonable control measures as set forth in this condition…" Condition No. 4.E and the Settlement Agreement requires that PG&E "establish a Coldwater Habitat and Fishery Mitigation and Enhancement Fund (Fund) to be used to fund the water temperature control measures as described in Condition 4.D," and that PG&E "establish the fund with $5,000,000 (current dollars) and an interest on the fund balance that accrues at the 90-day commercial paper rate as published by the Federal Reserve Bank... add to the Fund an additional amount not to exceed $2,000,000…provided that the Commission makes a determination, based on the water temperature monitoring report required by Condition 4.D, that further measures would be necessary for the licensee to maintain a mean daily water temperature of 20 degrees Celsius in the project reaches and that additional funding would be appropriate for this purpose" Additionally, the rational report for the Rock Creek-Cresta Settlement Agreement states that the goal and objective of the temperature requirements is: "In order to reasonably protect cold freshwater habitat, maintain mean daily water temperatures of 20°C or less in the Rock Creek and Cresta Reaches up to the funding and flow limits specified in the Settlement"
14	General	NA	CSPA/AW	**The Draft 4.D Report improperly counts the costs of ongoing and future improvements to Canyon Dam that are needed for dam safety as costs to mitigate water temperature.** PG&E's suggestion (as cited, above) that capital costs of "modifications to the Lake Almanor Dam intake tower" are somehow limited by the cost cap on reasonable control measures is doubly wrong. It is wrong because there is no cost cap. It is also wrong because it seeks to budget the necessary repair of decaying infrastructure to expenses for temperature control. The Canyon Dam outlet works and tunnel lining to those works need to be rehabilitated in their own right. Indeed, PG&E is at present undertaking repair of the tunnel lining on an accelerated,	PG&E maintains its facilities in compliance with its FERC License, DSOD requirements, and its Dam Safety program. The cost cap is relevant as it relates to the Rock Creek-Cresta License and Settlement Agreement. Any improvements required for facility safety at Lake Almanor Dam and its appurtenant facilities would not be attributed to the cost cap

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				if not emergency, basis.40 In addition, FERC staff described in a March 2022 letter how the low-level outlet at Canyon Dam was deteriorated and that PG&E planned to repair it; that repair has either been completed, is underway, or is planned in the near future.41 Also, PG&E has promised to submit to the Commission an analysis of the adequacy of the spillway at Canyon Dam as part of "Pacific Gas and Electric Company's (PG&E) plan to conduct a screening-level portfolio risk analysis (SLPRA) to prioritize nine spillways for large capital improvement projects."42 The far larger issue is that PG&E is operating a 1.3 million acre-foot reservoir whose spillway is under active evaluation and whose dam outlet works are currently, apparently, not reliable. The Commission should reject any effort by PG&E to attribute the need to maintain its infrastructure in good working order, particularly as it relates to dam safety, to environmental mitigation.	and Cold Water Enhancement Fund in the Rock Creek-Cresta reaches.
15	General	NA	CSPA/AW	**D. The cost of power foregone for the State Water Board's recommended measure to improve water temperature in the North Fork Feather River is reasonable considering the combined revenues from the Rock Creek – Cresta Project and Project 2105.** Together, PG&E's Rock Creek – Cresta Project and Project 2105 comprise some of PG&E's largest and most lucrative hydropower generation assets. In water year 2022, a Dry water year that followed a Critically Dry water year, the two projects had a combined gross generation of over 1,198,641 MWH.43 Both projects are operated to generate during peak and super-peak hours. FERC staff estimated net revenues for Project 2105 at $43.8 million44 and for RCC of $19.3 million.45 Estimates of the cost of power foregone to make supplemental summer releases from Canyon Dam, as discussed above, range from $1.7 to $2.2 million annually. Recognizing that these dollar figures are 20 years old and are approximations for many reasons, and need to be updated, as also discussed above, these figures if remotely accurate or proportional suggest that the cost of power foregone to implement the water temperature is about 3.3 % of the average annual net revenue of the two projects. CSPA and AW maintain that such cost would be reasonable mitigation for the severe impacts of the projects and their operation on water temperatures in the North Fork Feather River.	The requirement of Condition No. 4.D is for PG&E to "prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available." Per the analysis of all available information related to water temperature control, there are no additional reasonable water temperature control measures that could achieve mean daily water temperatures of 20^0C in the Rock Creek-Cresta reaches. Temperature control measures outside of the Rock Creek-Cresta Project boundary were analyzed as part of the Project No. 2105 relicensing proceedings and not recommended for a variety of reasons, including cost.
16	General	NA	CSPA/AW	**The Draft 4.D Report alleges impacts of supplemental Canyon Dam releases to Lake Almanor's cold water fishery that contradict cited studies and ignore the importance of dissolved oxygen, and can only support the allegation of such impacts by arbitrarily and capriciously accepting the same 20ºC temperature metric whose application to the North Fork Feather River the Draft 4.D Report disparages.** The Draft 4.D Report makes vague but sweeping generalizations regarding the potential impacts to cold-water fisheries in Lake Almanor of supplemental summer flow releases from Canyon Dam. For instance, the Draft 4.D Report states: > PG&E and SWRCB … studies also show that measures that briefly reduce water temperature in the Rock Creek and Cresta reaches rely on consuming the finite cold-water pools in Butt Valley Reservoir and Lake Almanor Reservoir. The impacts of pulling cold water from Butt Valley Reservoir have not been evaluated; however, the water temperature studies suggest that using cold water from Lake Almanor to cool the Rock Creek and Cresta reaches could degrade the cold-water fishery in Lake Almanor.46	The requirement of Condition No. 4.D is for PG&E to "prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available." Per the analysis of all available information related to water temperature control, there are no additional reasonable water temperature control measures that could achieve mean daily water temperatures of 20^0C in the Rock Creek-Cresta reaches. Temperature control measures outside of the Rock Creek-Cresta Project boundary were analyzed as part of the Project No. 2105 relicensing proceedings and not recommended for a variety of reasons, including cost.

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				Even Appendix B, PG&E's own 2005 Report, does not claim that impacts to the cold water fishery in Lake Almanor stem from "consuming the finite cold-water pool" in Lake Almanor. Instead, the 2005 Report more accurately describes the limitation of cold-water fish habitat in Lake Almanor to a lack of sufficiently oxygenated cold water. The 2005 Report states: > Lake salmonid habitat must have sufficient DO [dissolved oxygen] and cold enough water temperatures for fish survival and growth. Fish are unable to live in water with zero DO concentrations, and low DO concentrations can lead to the release of undesirable anaerobic chemicals. The existing summertime anoxic hypolimnion and warm epilimnion both limit the available habitat to the transition between the two layers, the thermocline. Cold water fish in Lake Almanor are confined to the portions of the lake that have the appropriate combination of sufficiently low water temperature and high DO concentrations. In some cases, this zone of suitable habitat may be confined to a relatively narrow band near the bottom of the mixed surface layer of the lake (Jones and Stokes 2004). The existing summertime conditions currently stress the salmonid populations.47 The issue with Lake Almanor fisheries is not a simple lack of cold water or Lake Almanor's "finite" cold-water pool. It is the annual squeezing of cold-water fish into Lake Almanor's thermocline under existing conditions. Neither PG&E nor the State Water Board nor FERC has proposed to mitigate this condition. CSPA and AW, in contrast, have called since 2015 for a facility to oxygenate Lake Almanor near Canyon Dam, which is where most of the reservoir's cold water is located.48 Appendix C4 to the Draft 4.D Report is the State Water Board's most up-to-date (2016) analysis of the impacts of existing conditions and several alternatives, including "Present Day" conditions, which reflect flows agreed to in the Project 2105 partial settlement agreement, and Alternative 3, which would add to the Project 2105 partial settlement agreement flows a supplemental release from Canyon Dam of up to a total of 250 cfs, from June 15 through September 15 each year. Alternative 3 is effectively Condition 6(A) of the Project 2105 water quality certification. Results are shown in figures on pdf pages 762-776, showing the amount of habitat for cold water fish in Lake Almanor over the course of a year.49 Suitable habitat is defined as having a dissolved oxygen (DO) level greater than 5 mg/liter and meeting a certain water temperature. Scenarios were run considering suitable temperature as 20ºC, 21ºC, and 22ºC. Using a 20ºC temperature objective, Lake Almanor under Alternative 3: • shows a short low point of about 40,000 AF of habitat in a modeled Normal water year; • shows about one month below 40,000 AF of habitat in a modeled Dry water year, with one day showing no habitat; • shows about one month below 40,000 AF of habitat in a modeled Critically Dry water year, with nine days showing no habitat.50 In each 20ºC scenario, the amount of habitat shown for "Present Day" conditions (without supplemental Canyon Dam release) shows either the same or very slightly more habitat than is shown for Alternative 3. Using a 21ºC temperature objective, Lake Almanor under Alternative 3: • shows a low point of about 60,000 AF of habitat in a modeled Normal water year;	

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				• shows a two-week low of about 40,000 AF of habitat in a modeled Dry water year, with one day showing no habitat, with the very low point being about 10,000 AF less under Alternative 3 than under the Existing Condition; • shows about ten days below 40,000 AF of habitat in a modeled Critically Dry water year, with the very low point being about 20,000 AF of habitat.51 In each 21ºC scenario, the amount of habitat shown for "Present Day" conditions (without supplemental Canyon Dam release) shows either the same or very slightly more habitat than is shown for Alternative 3. Using a 22ºC temperature objective, Lake Almanor under Alternative 3: • shows a low point of about 120,000 AF of habitat in a modeled Normal water year and is below 200.000 AF of habitat for about one a week; • shows a low point of about 150,000 AF of habitat in a modeled Dry water year and is below 200.000 AF of habitat for about four days; • shows a low point of about 150,000 AF of habitat in a modeled Critically Dry water year, and is below 200.000 AF of habitat for about two weeks.52 In each 22ºC scenario, the amount of habitat shown for "Present Day" conditions (without supplemental Canyon Dam release) shows either the same or very slightly more habitat than is shown for Alternative 3, except that in the modeled Critically Dry water year the Alternative 3 habitat volume after the low point is 10,000-40,000 AF less than the Present Day value for about 3 weeks. In sum, the Draft 4.D Report's reliance on the State Water Board's analysis of impacts of supplemental Canyon Dam on the Lake Almanor cold-water fishery is also reliance on the 20ºC temperature metric. This is the same metric whose application to the North Fork Feather River the Draft 4.D Report disparages. Without using the 20ºC metric for Lake Almanor, the 4.D Report has little support for its allegation that mitigation of temperature impacts in the river has substantial adverse impacts to fish in Lake Almanor. The Draft 4.D Report's selective reliance on the 20ºC temperature metric to allege impacts to the Lake Almanor fishery is arbitrary and capricious. The Draft 4.D Report's deliberate avoidance of feasible oxygenation mitigation, to mitigate both existing, acknowledged habitat impacts of Project 2105's operation on the cold-water fishery in Lake Almanor and the limited additional impacts of supplemental Canyon Dam flows on that fishery, is also arbitrary and capricious	
17	General	NA	CSPA/AW	The Draft 4.D Report ends by stating: > The failure of all the measures analyzed and the ineffectiveness of the IWTCMs [interim water temperature control measures] strongly suggests that natural environment factors prevalent in the system (e.g., ambient air temperatures and seasonal sun exposure) are responsible for the observed water temperatures in the Rock Creek and Cresta reaches. This is utter deflection. There is nothing natural about the water temperatures in the North Fork Feather River from Caribou Powerhouse to Poe Reservoir. Attributing these water temperatures to "natural environment [sic] factors" is like saying that a pet that was left for five hours in the summer in a car in the direct sun died because it was a hot day. As CSPA and AW have stated previously:	PG&E has edited the report to address this comment.

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				It is fair to say that Project 2105 and associated PG&E projects in the North Fork Feather River watershed could not have been designed to heat up water more efficiently than they do under their present-day configuration. Project 2105's storage reservoir, Lake Almanor, is located about 25 miles southeast of Mount Lassen, the southern-most peak in the Cascade Range. Because of the region's volcanic geology, Lake Almanor is substantially spring-fed, and surface water tributaries to Lake Almanor are also largely spring-fed. Before hydropower development on the Feather River, the "big meadows" that were inundated by Lake Almanor typically discharged 800 cfs or more of cold water. Prior to blockage of fish passage downstream, the North Fork Feather River supported a large run of spring-run Chinook salmon. Today, at the top of the system, PG&E's Mountain Meadow Reservoir east of Lake Almanor heats up a substantial portion of Lake Almanor's inflow, and PG&E's Hamilton Branch Project further heats water in one of Lake Almanor's major tributaries. Lake Almanor, the largest of PG&E's storage reservoirs at 1.3 million acre-feet, has large surface area for its volume, and substantially heats water throughout the summer. Under the current flow requirement, PG&E releases about 2-3% of total outflow to Lake Almanor into the Seneca reach of the North Fork Feather River, the river reach immediately downstream of Lake Almanor's Canyon Dam. PG&E routs the vast majority of water from Lake Almanor through its mid-level intake at Prattville, which withdraws water that during the summer mixes cool and hot water in the power tunnel leading to Butt Valley Powerhouse. From Butt Valley Powerhouse, water is discharged into Butt Valley Reservoir, a large shallow reservoir that further heats up water during summer months. Water from Butt Valley Reservoir enters the penstocks that lead to the Caribou 1 and Caribou 2 powerhouses located back on the North Fork Feather River. The most often used Caribou 2 Powerhouse has its intakes located to pull warm surface water from the reservoir. The powerhouses discharge this water into Belden Forebay, where the water thus warmed by the project overwhelms the tiny amount of cold flow from the Seneca reach. The Final Environmental Impact Statement for the Project 2105 relicensing (FEIS) describes the temperatures of discharges from the Caribou powerhouses in the months of July, August and September: "Daily average temperatures exceeded 20.0°C for 35 percent of the days monitored at the Caribou No. 1 powerhouse and 65 percent of the days monitored at the Caribou No. 2 powerhouse." PG&E operates Caribou 2 Powerhouse preferentially over Caribou 1 Powerhouse. Water that enters the Belden power tunnel from Belden Forebay is typically slightly warmer than water that is discharged from a lower elevation in Belden Reservoir into the Belden reach of the North Fork Feather River. Temperatures at the Belden power intake are greater than 20°C 52% of the time in June-September, with the greatest frequency in July and August. In the summer, the already-warm water that discharges from Belden Powerhouse enters the North Fork Feather downstream of the confluence with the East Branch Feather River. From Belden Powerhouse, it is a short distance to Rock Creek Reservoir, a forebay that has substantially silted in and that in the summer further heats water before it enters the Rock Creek power tunnel or the Rock Creek reach of the North Fork Feather River. Thus, toward the bottom of the system, "[w]ater temperature in the Rock Creek and Cresta reaches is primarily a function of the temperature of the water withdrawn from Lake Almanor, flow from the East Branch NFFR, and minimum flows within the project reaches." In late 2020, CSPA and AW proposed to PG&E that the ERC (including PG&E) and the Forest Service parse issues to evaluate which factors influencing water temperature were controllable and to then evaluate which measures to improve water temperatures were reasonable. CSPA and AW still believe this is the appropriate approach. PG&E rejected this approach, in our view because PG&E did not want to admit that operation (and potentially, reoperation) of Project 2105, and specifically the temperature of water entering Belden Forebay, was a controllable factor. Instead of analysis, PG&E moved the goal posts, arguing then, as in the Draft 4.D Report as discussed above, that reoperation of Project 2105 was by definition unreasonable.	

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				PG&E's modeling in 2003 demonstrated that reoperation of Project 2105 to release 250 cfs from Canyon Dam in July and August could reduce the release temperatures from Belden Dam in those months in Dry years by 2-3ºC.61 Tables E2.6-14 and E2.6-15 demonstrating this benefit are attached to these comments as Attachment 4. Release temperatures from Belden Dam are, to a point, a controllable factor. The benefit of reoperating Project 2105 consistent with the State Water Board's WQC Condition 6(A) is clear. It is a good solution, not a perfect solution. CSPA and AW believe there are four criteria for determining whether Condition 6(A) is reasonable: 1) The extent of the impact of PG&E's hydropower operations on the North Fork Feather River in general, and on water temperature in particular 2) The benefit of the measure 3) The cost of the measure 4) That the impact of the measure on Lake Almanor's cold-water fishery is mitigated by appropriate improvements to the existing dissolved oxygen impairments, thus improving that fishery. The Draft 4.D Report provides no analysis of these issues. Instead, the Draft 4.D Report ignores the extent of the impact, offers conclusory statements and approximations regarding benefits and costs, and is silent on mitigation of the lack of oxygenated cold-water habitat in Lake Almanor. The Draft 4.D Report substitutes talking points for analysis, in the apparent hope of PG&E's managers that they can avoid responsibility for the water temperature impacts of their hydropower operations on the North Fork Feather River altogether. CSPA and AW request that the Forest Service reject the 4.D Report unless the final report corrects the deficiencies described and analyzed in these comments. CSPA and AW request that the Commission direct PG&E to produce a Final 4.D Report that corrects the deficiencies described and analyzed in these comments. Specifically, the Final 4.D Report should: • Respect the agreed-to 20ºC water temperature objective established in the license; • Evaluate Condition 6(A) of the Final Water Quality Certification on the merits, and leave the Commission to work out legal mechanisms as appropriate; • Conduct an up-to-date economic analysis of the power value of the Rock Creek – Cresta Project and Project 2105; • Evaluate opportunities to improve cold-water habitat in Lake Almanor and to simultaneously avoid negative impacts of supplemental Canyon Dam flows to Lake Almanor's cold-water fisheries; • Cite to specific passages and information in reference documents and support conclusions with analysis, throughout the document. CSPA and AW also request that the Commission direct staff to issue a supplemental EIS for the relicensing of Project 2105. As CSPA and previously described, the Supplemental EIS should at minimum analyze the following elements: • An oxygenation system near Canyon Dam to oxygenate the hypolimnion of the most extensive area of Lake Almanor's coldwater resources; • An analysis of the how such oxygenation system would mitigate or reduce any adverse effects that might otherwise occur due to the implementation WQC Condition 6(A).	

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				While the Commission should prepare the analysis of an oxygenation facility in its own right and on a stand-alone basis, such a facility would likely mitigate the loss of cold-water habitat due to supplemental summer releases of cold water from Canyon Dam. The Commission should also conduct an analysis of both elements implemented together; and • A re-evaluation of the economics of Project 2105, with an up-to-date analysis of the value of power foregone, and a more granular analysis of intra-day and inter-day power values.62 The Commission, in short, should conduct the analysis that PG&E has declined to do, both in the Draft 4.D Report and in two decades of strategic obfuscation.	
18	Discussion	NA	USFWS	Quantify how ERC preferred alternatives could reduce water temperatures in Project stream reaches, regardless if the water temperature objective is achievable every day of every year.	The requirements of Condition No. 4.D are for PG&E to "prepare a report evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available." Per the analysis of all available information related to water temperature control, there are no additional reasonable water temperature control measures that could maintain mean daily water temperatures of 20^0C in the Rock Creek-Cresta reaches. During the regular ERC (which PG&E is a member of) meetings related to Condition No. 4.D, no new preferred alternatives were identified by the ERC. All the alternatives that were discussed with the ERC have already been reviewed and were found not to meet the objective of the 4.D requirement and are included in Appendix B, C1-C4, and D of the 4.D Report.
19	Discussion	NA	USFWS	Quantify how ERC preferred alternatives could impact cold water habitat within Lake Almanor and how the alternatives could be adjusted to reduce this impact.	The requirements of Condition No. 4.D are for PG&E to "prepare a report evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available." Per the analysis of all available information related to water temperature control, there are no additional reasonable water temperature control measures that could maintain mean daily water temperatures of 20^0C or less in the Rock Creek-Cresta reaches.
20	Discussion	NA	USFWS	Quantify how impacts to cold water habitat could impact the cold water fishery of Lake Almanor and what measures can be implemented to reduce this impact or potentially result in a net gain for the fishery.	The requirements of Condition No. 4.D are for PG&E to "prepare a report evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available." Per the analysis of all available information related to water temperature control, there are no additional reasonable water temperature control measures that could maintain mean daily water temperatures of 20^0C or less in the Rock Creek-Cresta reaches.
21	Discussion	NA	USFWS	Provide an updated cost analysis for the ERC preferred alternatives that includes the current energy market trends. This analysis should include operational alternatives that utilize appropriate time-of-day energy trends to reduce cost to the greatest extent practicable.	The requirements of Condition No. 4.D are for PG&E to "prepare a report evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and

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					Cresta Reaches, and if not, whether additional reasonable control measures are available." Per the analysis of all available information related to water temperature control, there are no additional reasonable water temperature control measures that could maintain mean daily water temperatures of 20^0C or less in the Rock Creek-Cresta reaches.
22	Discussion	NA	USFWS	Remove the reference that PG&E is not permitted by the Federal Energy Regulatory Commission to make changes to facilities within the P-2105 project to benefit the P-1962 Project (both P-2105 and P-1962 license conditions allow this).	PG&E has clarified the language in the discussion that this comment is associated with.
23		1	Forest Service staff level (Plumas NF and Regional Hydropower Team)	PG&E incorrectly states that assessments completed by both PG&E and the SWRCB conclude that no reasonable water temperature control measures are available to achieve reductions of water temperature at or below 20 degrees C. To the contrary, supporting documents cited within the report, clearly demonstrate that there are a variety of measures that could reduce summertime water temperatures in the NFFR, specifically in the RC and Cresta reaches, below 20 degrees C to varying degrees. Moreover, the SWRCB reports reach an opposite conclusion, to find that feasible measures exist to reduce water temperatures that would improve compliance with cold water basin plan objectives.	While the Forest Service does not identify which measures it is referring to, PG&E assumes the Forest Service is referring to the SWRCB Level 3 Report, which analyzed a variety of measures related to the UNFFR Project. There are a number of issues related to the reasonability of these measures, specifically, the estimated cost of these measures, their scope (UNFFR vs. Rock Creek-Cresta), and their objective. The Rock Creek-Cresta Project is in compliance with the Sacramento River Basin and San Joaquin Water Quality Plan (Basin Plan), which does not require a 20^0 C temperature objective.
24		1	Forest Service staff level (Plumas NF and Regional Hydropower Team)	PG&E states that interim water temperature control measures employed since 2012 have not lowered water temperatures, and under certain conditions the measures could increase water temperatures. The measures described in this sentence are assumed to be flow increases (new flow schedule), however such "measures" are not aimed at reducing the water temperature in RCC reaches below 20 degrees C, rather their effect or benefit is in buffering against atmospheric summer warming in these reaches, which if coupled with low bypassed flows (as was the previous operation), can hit the upper thermal tolerances for cold water dependent salmonids.	The Forest Service does not identify which Interim Control Measures it is referring to in this comment, but we assume this is in reference to Interim Control Measure #4, which required that in Critically Dry Water years from June through October the base flow in the Rock Creek and Cresta reaches shall be increased to 200 cfs when mean daily water temperatures exceed 20 degrees Celsius for two days in a row. PG&E notes that as part of the ongoing final Minimum Instream Flow negotiations and Forest Service 4(e) amendment for the Rock Creek-Cresta Project, PG&E agreed to raise the MIFs for both the Rock Creek and Cresta reaches during Critically Dry years during the summer, effectively removing the trigger requirements of Interim Control Measure #4. The rationale for this flow change was to increase available habitat for fish. However, PG&E noted in the Condition 4.D Report that this measure has not reduced temperatures in the Rock Creek and Cresta reaches. PG&E's analysis has shown that buffering thermal loading by way of flow increases in the Rock Creek and Cresta reaches does not provide an advantage during the summer months with respect to containing temperatures (see appendix E).
25		2	Forest Service staff level (Plumas NF and Regional Hydropower Team)	PG&E states that the Settlement Agreement parties agreed to evaluate a negotiated temperature of 20 degrees C and this metric is not based on any prior or approved water quality objective. While it clearly acknowledged on page 2 that the 20 degree C threshold is not a specific objective, throughout the rest of the document PG&E utilizes this metric as an absolute value that must be obtained or met under all circumstances for water temperature reduction measures to be deemed "effective."	A mean daily water temperature of 20^0C is not a water quality objective in the Basin Plan. PG&E, as part of the Rock Creek-Cresta Settlement Agreement negotiations, agreed to investigate the ability to "maintain mean daily water temperatures of 20 degrees Celsius or less in the Rock Creek and Cresta Reaches to the extent that PG&E can reasonably control such temperatures." However, 20 years of studies has shown that there are no additional reasonable control measures to meet this objective.
26		3	Forest Service staff level	PG&E quotes various documents and directives that established the objectives and goals of the 4D report. Here it states that, the 4D report shall include recommendations for implementing	The Rock Creek-Cresta License states that "the licensee shall prepare a report that evaluates whether mean daily temperatures of 20 degrees

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			(Plumas NF and Regional Hydropower Team)	additional reasonable control measures to achieve mean daily temperatures of 20 C or less in the Rock Creek and Cresta reaches. And, [That the ERC and Forest Service] shall make an affirmative determination [to expend funding set aside for control measures] whether additional temperature control measures shall be implemented. This affirmative determination shall be based on the best information available, the use of sound scientific methods, consideration of the relative cost of different control measures, and other relevant factors. Unfortunately, the 4D report fails to meet any of these stated objectives. Further, it does not provide any recommendations to achieve lower water temperatures, nor does it consider or evaluate various control measures based upon the metrics of cost, temperature reduction benefit, or other factors it was created to do.	Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available. The report shall include recommendations for the implementation of any such measures." Based on the review of the best scientific information available (i.e., results of 20 years of water temperature monitoring and modeling by PG&E and the SWRCB in the North Fork Feather River) and concluded that there are no alternatives to reasonably maintain mean daily water temperatures of 20^0C or less in the Rock Creek and Cresta reaches. PG&E notes that the ERC and Forest Service have played an active role in reviewing PG&E's analysis of the modeling and monitoring data over the last two years. To facilitate discussions, PG&E created a library holding all the data and presented on the conclusions of the data during its regular ERC and Forest Service meetings.
27		20	Forest Service staff level (Plumas NF and Regional Hydropower Team)	PG&E notes that there have been serial disagreements among the ERC/SA parties regarding the scope of potential water temperature control measures associated with this report. The 4D Report does not attempt to bridge any of these differences or offer evaluation criteria to weigh various options. Rather the 4D "report" supports PG&E's opinion or preference to avoid any measures to reduce water temperatures in the NFFR.	The evaluation criteria, as specified by the Rock Creek-Cresta License, is to "prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available. The report shall include recommendations for the implementation of any such measures." In the context of the requirements of the Rock Creek-Cresta license, none of the alternatives reviewed met the objectives in terms of scope, cost, or temperature objectives.
28		22	Forest Service staff level (Plumas NF and Regional Hydropower Team)	Tables 5, 6, & 7 summarize various "alternatives" for evaluation, however these tables are not useful for comparison purposes because they contain measures that were eliminated from other studies for a variety of technical reasons, contain some hypothetical proposals with limited to zero supporting data, or lack standard measurement criteria to compare measures against one another.	These tables were created to summarize the results of the voluminous data from the analysis of modeling studies in the 2005 Reasonable Control Measures Report as required (appendix B of the 4.D Report).
29		23	Forest Service staff level (Plumas NF and Regional Hydropower Team)	Under evaluation results, PG&E creates a criteria that an alternative's performance is based upon its ability to contain water temperature at or below 20 degrees C for the duration of the summer. PG&E thus dismisses all measures because they are unable to fully meet this goal under all scenarios. However, such a view ignores the relative compliance of various measures, which come very close to meeting this artificial threshold. Further, the report suggests that alternatives were found to decrease cold-water fish habitat in Lake Almanor and fish production in Butt Valley using the same temperature metric of 20 degrees C that the 4D report also states is not meaningful as a surrogate for cold water dependent fishery health. Lastly, PG&E concludes that there is no reasonable control measure for achieving a year-round water temperature of 20 degrees C or less in the Rock Creek and Cresta reaches. The report is internally inconsistent in the application of the temperature criteria and how its utilized to justify PG&E's preferred actions. First PG&E states that this was a negotiated surrogate to evaluate temperature reduction alternatives (and not a specific water quality objective), then it states that alternatives must meet or exceed the criteria during the summer, and finally PG&E concludes that measures must meet or achieve full compliance year-round in order for them to be deemed reasonable or effective. In redefining the criteria each time, the Report's suggests that none are effective, when in fact many would significantly reduce water temperatures in RCC. This explanation is completely lacking from the narrative provided in the report.	The evaluation criteria, as specified by the Rock Creek-Cresta License, is to "prepare a report that evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available. The report shall include recommendations for the implementation of any such measures." In the draft 4.D Report, PG&E did not use a 20 degree metric when discussing the potential loss of habitat in Lake Almanor and Butt Valley, it simply noted that the SWRCB found during its analysis that a potential for reduced cold-water fish habitat during the summer exists if control measures related to the UNFFR were implemented.

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30		25	Forest Service staff level (Plumas NF and Regional Hydropower Team)	PG&E states that the SWRCB's modeling showed certain measures, significantly diminish cold-water habitat in Lake Almanor, negatively affecting ecological life supported in the lake. This statement is inaccurate or suppositional. The SWRCB's modeling found that various modeled conditions (including existing baseline operations) resulted in "zero" habitat availability if using specific criteria of 20 degrees C and 5mg/O2. From this analysis, the SWRCB used different metrics to evaluate habitat and found limited potential but not specific impacts to cold water pools at Lake Almanor. This analysis is consistent with the conclusion that the use of a binary water quality temperature threshold does not fully explain or can be used to show impacts to the aquatic ecological community.	This is a mischaracterization of PG&E's statement in the Draft 4.D Report. A review of the available modeling studies shows that there is the potential for some of the water temperature alternatives to deplete the coldwater pool in Lake Almanor, and by doing so, have potential negative effects to the existing cold-water fishery at Lake Almanor. The SWRCB Level 3 Report Analysis of Water Temperature Control Measures (Appendix C-2) states the following: "If the suitable cold freshwater habitat is defined as the water layer that has water temperature $\leq 20°C$ and DO $\geq$ 5mg/L, then, compared to Baseline conditions, the three water temperature reduction alternatives selected for analysis (Alternatives 3x, 4a, and 4c) reduce the suitable cold freshwater habitat volume of Lake Almanor in August of the normal hydrologic year 2000 and in July, August, and early September of the critical dry year 2001." To prevent any potential confusion concerning the subject, PG&E will remove the word "significantly" from the statement concerning impacts to the Lake Almanor cold-water fishery.
31		29	Forest Service staff level (Plumas NF and Regional Hydropower Team)	PG&E states the SWRCB's studies result or conclude that no feasible option is available for attaining water temperatures below 20 degrees C. This statement is misleading and attempts to utilize the 20 degree evaluation criteria as a specific objective, which PG&E previously said it cannot be held to. It is also contrary to the SWRCB's findings that various alternatives exist that would meet water quality objectives for cold water beneficial uses. There are many inaccurate or misleading statements regarding previous reports conducted by the SWRCB regarding the performance of various alternatives in achieving cooler summertime water temps in the RCC reaches.	It is unclear why the Forest Service perceives this statement as misleading because the standard has not changed. The requirements of Condition No. 4.D are for PG&E to "prepare a report evaluates whether mean daily temperatures of 20 degrees Celsius or less have been and will be achieved in the Rock Creek and Cresta Reaches, and if not, whether additional reasonable control measures are available." Per the analysis of all available information related to water temperature control, there are no additional reasonable water temperature control measures that could maintain mean daily water temperatures of 20^0C or less in the Rock Creek-Cresta reaches. The Rock Creek-Cresta Project is in compliance with the requirement of the Basin Plan temperature objectives.
32			Plumas County	**NO REASONABLE CONTROL MEASURES AVAILABLE** Plumas shares the concerns of PG&E and recognizes the Executive Summary of the DRAFT Report concludes that "no reasonable control measures are available…" and that "PG&E recommends ceasing implementation of the interim water temperature control measures and investing no further effort or resources to address this objective." Plumas firmly agrees with PG&E's recommendation to cease implementation of the interim water control measures and that no additional time or money should be spent on water temperature monitoring or evaluating further measures or alternatives. Plumas does not support in any way the implementation of additional water temperature control measures that are scientifically unproven or have the potential to negatively impact ecological life and/or significantly diminish aquatic resources, including the cold freshwater habitat and fisheries and recreational and economic values of Lake Almanor and Butt Valley Reservoir.	Noted.

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				Moreover, Plumas emphatically rejects any water temperature control measure alternatives that would involve capital projects such as the use of thermal curtains or other means or modifications at the Prattville intake structure or increasing the magnitude of seasonal water releases using the low-level gates in the Canyon Dam outlet structure and any changes to project operations on the Upper North Fork Feather River FERC Project No. 2105.	
33			Plumas County	**ECONOMIC IMPACT CONSIDERATIONS** While the DRAFT Report does state PG&E evaluated economic factors, such as construction and implementation costs and potential impacts to water quality and fisheries, the analysis falls short of the complete consideration of economic impacts to the Plumas County economy, and specifically the Lake Almanor Basin FERC Project No. 2105 area, in evaluating whether additional temperature control measures are reasonable. Plumas cannot underscore enough the dire economic consequences should the degradation of Lake Almanor occur due to the loss of cold freshwater habitat, fisheries, wildlife habitat, and recreation. The Lake Almanor Basin represents 42% of all assessed secured properties in Plumas County worth approximately $1.85 billion dollars, with residential secured properties representing 93% of this value. Should property tax revenues decrease between 30% and 40%, and tax revenues, including transit occupancy taxes, from business activities driven by fisheries and tourism-related industries decrease between 40% and 50%, it would represent a significant decrease of between $5 to $6.5 million dollars annually for Plumas County, or a 10% percent decrease in annual County revenue. Forty-one percent of those employed in the Basin work in industries directly dependent and affected by the quality of the environment and the ecology of Lake Almanor, and peak recreation-based tourism employment is in the summer months.	Noted.
34			Plumas County	**LANGUAGE CLARIFICATION** Appendix A to the Rock Creek-Cresta Relicensing Settlement Agreement, dated December 6, 2020, provides the Water Temperature Requirement, as follows: “In order to reasonably protect cold freshwater habitat, Licensee shall maintain mean daily water temperatures of 20 degrees Celsius or less in the Rock Creek and Cresta Reaches, to the extent that Licensee can reasonably control such temperatures.” Throughout the DRAFT Report, Plumas notes the word “contain” or a form thereof is used instead of the word “maintain” and suggests tying the language directly and accurately to the Water Temperature Requirement. Additionally, the Water Temperature Requirement states, “mean daily water temperatures” and Plumas notes this phrase is also sometimes mischaracterized in the DRAFT Report.	PG&E will update the water temperature requirement language in the report to be consistent with the language in License Condition Nos. 4.A and 4.D.
35			Plumas County	**LANGUAGE CLARIFICATION** Plumas notes the last sentence of the first paragraph in the Executive Summary, as follows: “The purpose of achieving a mean daily water temperature of 20^{o}C or less is to enhance cold-water fish habitat, primarily for trout.” Although, the Water Temperature Requirement reads: “In order to reasonably protect cold freshwater habitat.”	PG&E will change the language in the last sentence of the first paragraph of the summary to match the language in the Rock Creek-Cresta License.