



Pacific Gas and
Electric Company

Land & Environmental Management

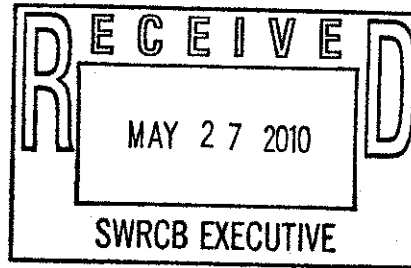
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6/15/10 Board Meeting
2010 Integrated Report 303(d)
Deadline: 5/28/10 by 12 noon

Jeanine Townsend
State Water Resources Control Board
Division of Water Quality
1001 I Street
Sacramento, CA 95814
commentletters@waterboards.ca.gov
Fax: (916) 341-5620



May 28, 2010

RE: PG&E's Comment Letter – 2010 Integrated Report / Section 303(d) List

Dear Ms. Townsend (clerk to the Board):

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to provide additional comments on the development of this important document. PG&E also appreciates the responsiveness of both the Central Valley Regional Water Quality Control Board (CVRWQCB) and the State Water Resource Control Board (SWRCB) for considering the re-designation of the North Fork Feather River (NFFR) listings for mercury and unknown toxicity based on available information and data.

These new listing designations are provided in the SWRCB's *Draft 2010 Integrated Report-Category 5 List of Water Quality Limited Segments* (SWRCB 2010a); however, the individual fact sheets for NFFR mercury and NFFR unknown toxicity do not include this new information (CVRWQCB 2009a, SWRCB 2010b). Therefore, PG&E recommends that the decision fact sheets for these listings (NFFR mercury and NFFR unknown toxicity) be revised to indicate the specific water segment (from Poe Reservoir Dam to Lake Oroville) that is being addressed. PG&E believes that naming the specific reach that is being considered for impairment in the *Conclusion Section* of the respective decision fact sheets will reduce any potential confusion on behalf of the public.

PG&E is also re-submitting detailed comments to the SWRCB's *Draft California 2010 Integrated Report (303(d) List/305(b) Report)* for specific water bodies that PG&E believes require further consideration by the SWRCB.

PG&E did submit similar comments to the CVRWQCB March 16, 2009; however, PG&E believes some of the responses to comments provided by the CVRWQCB were inadequate or incorrect based on the available data and information for specific listed water bodies. Therefore, PG&E is re-submitting to the SWRCB the original comments that were provided to the CVRWQCB for these specific water bodies and a summary of our specific concerns is provided in this letter.

PG&E's fact sheet comments are being re-submitted to the SWRCB for the following:

- Water Segment Delineation (original Attachment A)
- Sullivan Guideline (original Attachment B)
- Feather River, North Fork (below Lake Almanor) – for water temperature (original Attachment F)
- Willow Creek (Madera County) – for water temperature (original Attachment G)
- Yuba River, South Fork (below Lake Spaulding to Englebright Reservoir) – for water temperature (original Attachment H)
- South Fork Yuba River (below Lake Spaulding to Englebright Reservoir) – for mercury (original Attachment I)
- Bear River (Amador County) – for copper (original Attachment J)

Summary of PG&E's Specific Concerns

Attachment A: Water Segment Delineation

- In the current 303(d) list there is no discussion of determining water segments, rather entire river reaches spanning as much as 50 or more miles are listed as one continuous segment.
- It is not clear that the current water body delineations were based on altitude, physical, biological or chemical conditions.
- The U. S. Environmental Protection Agency (USEPA) recommends that states partition waters to represent homogeneity in physical, biological or chemical conditions.
- PG&E believes for a river that flows through various environments including high elevation and different climates, the river should be split into appropriate river reaches or water segments (e.g., for assessing water temperature conditions).
- PG&E believes that known sensitive warm or cold water species would be more adequately protected under a scenario that utilizes water segment delineation factors (altitude, physical, biological, or chemical).

Attachment B: Sullivan Guideline

- SWRCB and the CVRWQCB state that the Sullivan report should be used as an evaluation guideline for water temperature for California surface waters in the fact sheets used to determine listing or delisting of water segments under the Clean Water Act Section 303(d).

- However, the SWRCB's use of binomial distributions to determine listing status with this guideline (in the SWRCB's Water Quality Control Policy or Listing Policy) implies that the report is being used as an objective rather than an evaluation guideline.
- Appropriate use of the Sullivan report would be to use it strictly as an evaluation guideline (i.e., screening tool) in conjunction with available biological data or other lines of evidence to determine the health of California surface waters.
- Binomial distributions do not apply to guidelines and are meant for use with objectives. In addition, there are a number of technical issues associated with the Sullivan report, which reinforce that it should be used strictly as an evaluation guideline or screening tool.

Attachment F: Feather River, North Fork (below Lake Almanor) listing for Water Temperature

- PG&E's original comments apply with the intent of demonstrating that there is insufficient evidence to list the NFFR for water temperature and the available current data show that water temperature alone is not a good measure of the health of water segments as displayed by the available biological data.
- In addition, the elevation and climatic influences on the waters in the lower elevation reaches are much greater compared to the waters originating at Canyon Dam and these influences should be accounted for in any assessments of the health of the water segment.
- One standard cold water temperature criterion should not be applied directly to all reaches without consideration of other influencing factors such as elevation, biological assemblage (warm versus cold water species), and climate.

Attachment G: Willow Creek (Madera County) listed for Temperature

- PG&E's original comments apply with the intent of protecting known sensitive species (hardhead) that have been documented in Willow Creek and which require warmer water temperatures that are representative of the current conditions in Willow Creek and do not warrant listing.
- Willow Creek from the confluence of Whiskey Creek to the San Joaquin River is considered Critical Habitat for hardhead by the Sierra National Forest.
- It is inappropriate to base water temperature criteria only on the cold water species listed in the Sullivan guideline. The 21°C Sullivan criterion is administered for salmonid species (Steelhead) and does not correlate with the status of a species that has been documented in Willow Creek and known to prefer warmer water temperatures (hardhead).
- Monitoring results from the ongoing water temperature monitoring program indicate that water temperatures in lower Willow Creek are in an optimal range for use by Hardhead and other warm water species present such as Sacramento pikeminnow and Sacramento sucker.

Attachment H: South Fork Yuba River (from Lake Spaulding to Englebright Reservoir) listed for Water Temperature

- PG&E's original comments demonstrate that there is insufficient evidence to list the South Fork Yuba River for water temperature; and the available data show that water temperature alone is not a good measure of the health of water segments.
- Biological data suggest that historically the upper South Fork Yuba River supported cold water species, primarily rainbow trout and brown trout (introduced); and the lower South Yuba River transitions into a warm water fish assemblage of native Sacramento pikeminnow and hardhead (Gast et. al. 2005).
- The natural climatic influences on the waters in the lower elevation reaches are much greater compared to the waters originating at Lake Spaulding and these influences should be accounted for in any assessments of the health of the water segment.
- One standard cold water temperature criterion should not be applied directly to all reaches without consideration of other influencing factors such as elevation, biological assemblage (warm versus cold water species), and climate.
- Annual maximum water temperature could not be met naturally in many points along the South Fork Yuba River below Lake Spaulding to Englebright Reservoir as demonstrated by unimpaired hydrology for this river.
- Existing water temperature data do not support the use of a 21°C annual maximum water temperature because regulated flows in the South Fork Yuba River (below Lake Spaulding to Englebright Reservoir) in the summer (July-September) are virtually identical to the unimpaired flows in the summer.

Attachment I: South Yuba River (from Lake Spaulding to Englebright Reservoir) listed for Mercury

- PG&E believes that the TMDL process will be more effective if truly impaired water segments are addressed by adopting a water segment delineation process when determining the list of 303(d) impaired waters.
- There are no data to indicate impairment from below Lake Spaulding to Washington Creek. The listing should be revised to list only from Washington Creek to Englebright Reservoir based upon the available data and information within those reaches.

Attachment J: Bear River below Lower Bear River Reservoir listing for Copper

- Many samples were collected prior to 2005 before the FERC required flow conditions for the Bear River had been fully implemented, therefore the sample results are obsolete and do not accurately represent the ambient water quality conditions under the new FERC flow requirements.
- The new FERC required flow releases had not been fully implemented until early 2005; and the only data that should be used to make a listing determination are data from 2005 to the present.

- Dissolved copper levels at station BR1 were reduced during the monitoring program from 2005 to the present due to completion of facility modification and implementation of the new FERC-required flow regime and are now consistent with unaffected background measurements collected at the inflow to the project.

References

Central Valley Regional Water Quality Control Board (CVRWQCB). 2009a. *Final 2008 California 303(d)/305(b) Integrated Report Supporting Information – Appendix F: Decision Fact Sheets for Region 5*, Final September 2009.

Central Valley Regional Water Quality Control Board (CVRWQCB). 2009b. *Clean Water Act Section 305(b) and 303(d) Integrated Report for the Central Valley Region – September 2009 Final Staff Report, Appendix J – Response to Public Comments*, September 2009.

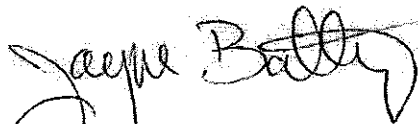
Gast, Tom, Mark Allen, and Scott Riley. 2005. *Middle and South Yuba Rainbow Trout (Onchorhynchus mykiss) Distribution and Abundance Dive Counts, August 2004*. Included as Appendix G of CDWR 2006.

State Water Resources Control Board (SWRCB). 2010a. *Draft California 2010 Integrated Report (303(d) List/305(b) Report) Category 5 List of Water Quality Limited Segments*, Draft April 19, 2010.

SWRCB. 2010b. *Draft California 2010 Integrated Report (303(d) List/305(b) Report) Supporting Information – Decision Fact Sheets and Associated Lines of Evidence*, Draft April 19, 2010.

If you have any questions please contact Brian Frantz at 925-415-6351.

Sincerely,



Jayne Battey

Director, PG&E Land and Environmental Management

Attachment A

PG&E's Recommendation for the Water Segment Delineation Issue

CVRWQCB STAFF APPLICATION:

In the Central Valley Regional Water Quality Control Board's (CVRWQCB) current proposed 303(d) list there is no discussion of determining water segments, rather entire river reaches spanning as much as 55 or more miles are listed as one continuous segment. It is not clear that the segment delineations were based on altitude, physical, biological or chemical conditions. In some cases data is only available at one or two locations within the entire listed segment.

US EPA RECOMMENDATION:

The U. S. Environmental Protection Agency (US EPA) recommends that states partition waters to represent homogeneity in physical, biological or chemical conditions. This segmentation may reflect an *a priori* knowledge of factors such as flow, channel morphology, substrate, riparian condition, adjoining land uses, confluence with other waterbodies, and potential sources of pollutant loadings (both point and nonpoint). Although there is no single default dimension for a segment size, states should utilize these or similar principles when they define the segments used in their water quality standards (US EPA 2006).

PG&E's RECOMMENDED APPLICATION:

PG&E believes for a river that flows through various environments including high elevation and different climates, the river should be split into appropriate river reaches (water segments). These reaches should be based on climates, be elevation dependent, and generally should not be longer than 10-12 miles.

The US EPA also recommends a transparent process of delineation of water segmentation based on environmental, biological and physical. PG&E believes if this were followed that the 303(d) and TMDL process will be more reflective of current conditions and truly impaired water segments may be addressed more efficiently. Additionally, river segments, which have no evidence of impairment (i.e., no known data available within the reach to indicate impairment), will not be incorrectly identified as impaired.

A state should assign a discrete "address" to each water segment, and document the process used for defining water segments in their methodologies. The physical boundaries (beginning and end points) of a segment should be defined in such a manner that a scientifically valid assessment of each and every water segment can be made. The individual size of a water segment will vary based upon methodologies. Water segments should, however, be larger than a sampling station but small enough to

represent a relatively homogenous parcel of water (with regard to hydrology, land use influences, point and nonpoint source loadings, etc.).

Other factors may include the following:

- The expected natural variability of the measured criteria associated with the Water Quality Standards.
- The type of water (e.g., a small stream, a wide river, a tidal and stratified estuary, and coastal shoreline).
- Time of travel of a parcel of water in the waterbody or segment or the magnitude of any tidal excursions.
- The amount of and type of data and information necessary to provide a reasonably accurate characterization of the criteria (or core indicators) associated with the designated uses in the segment or waterbody.
- Any expected changes in significant influences in the watershed (land use, point or nonpoint sources of pollutants).
- Any site-specific concerns such as patchy or unique habitat distribution patterns or biological population distributions.

PG&E Recommendations for Segmentation of Long River Reaches in the Current Proposed CVRWQCB 303(d) List

PG&E recommends that the CBRWQCB break the North Fork Feather River (NFFR) listings for water temperature, mercury, unknown toxicity, PCBs, and any other future determinations of health or impairment into separate water segments based upon knowledge of factors such as elevation, flow, channel morphology, substrate, riparian condition, adjoining land uses, confluence with other waterbodies, and potential sources of pollutant loadings as suggested in Figure A-1. The CVRWQCB should then review the known available data for each individual water segment to determine whether listing or delisting is appropriate for that specific water segment only based upon known available data or other evidence from that specific water segment or river reach.

Six water segments are proposed for the NFFR between Lake Almanor and Lake Oroville and include Seneca Reach, Belden Reach, Rock Creek Reach, Cresta Reach, Poe Reach, and Big Bend Reach (Figure A-1). PG&E has provided individual factsheets for each water segment for the water temperature, mercury, unknown toxicity, and PCB listings for the NFFR and the factsheets include PG&E's recommendations for each water segment based upon the known available data for the specific water segments (river reaches).

PG&E also recommends that the CVRWQCB break the South Yuba River (from Lake Spaulding to Englebright Reservoir) listings for water

temperature and mercury, and any other future determinations of health or impairment into separate water segments based upon knowledge of factors such as elevation, flow, channel morphology, substrate, riparian condition, adjoining land uses, confluence with other waterbodies, and potential sources of pollutant loadings as suggested in Figure A-2. The CVRWQCB should then review the known available data for each individual water segment to determine whether listing or delisting is appropriate for that specific water segment only based upon known available data or other evidence from that specific water segment or river reach.

Six water segments are proposed for the South Yuba River between Lake Spaulding and Englebright Reservoir and include Jordan Reach, Rucker Reach, Fall Reach, Canyon Reach, Poorman Reach, and Humbug Reach (Figure A-2). PG&E has provided individual factsheets for each water segment for the water temperature and mercury listings for the South Yuba River and the factsheets include PG&E's recommendations for each water segment based upon the known available data for the specific water segments (river reaches).

Reference

US Environmental Protection Agency (USEPA). 2006. *Guidance for 2006 Assessment, Listing, and Reporting Requirements Pursuant to Sections 303(d), 305(b), and 314 of the Clean Water Act [2006 Integrated Report Guidance (IRG)]*, available at USEPA website:
<http://www.epa.gov/owow/tmdl/2006IRG/>

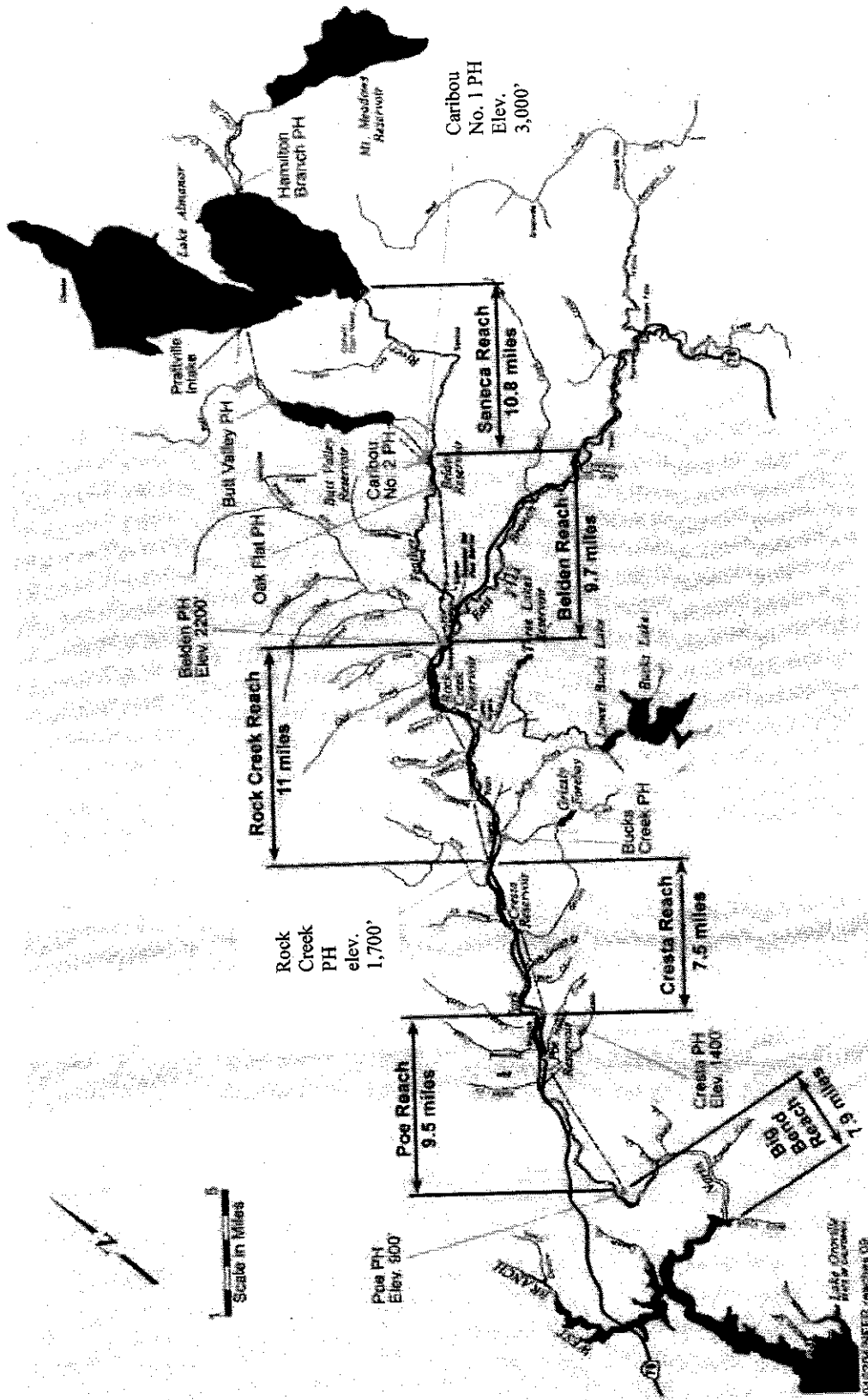


Figure A-1. Water Segment Delineation for the North Fork Feather River between Lake Almanor and Lake Oroville

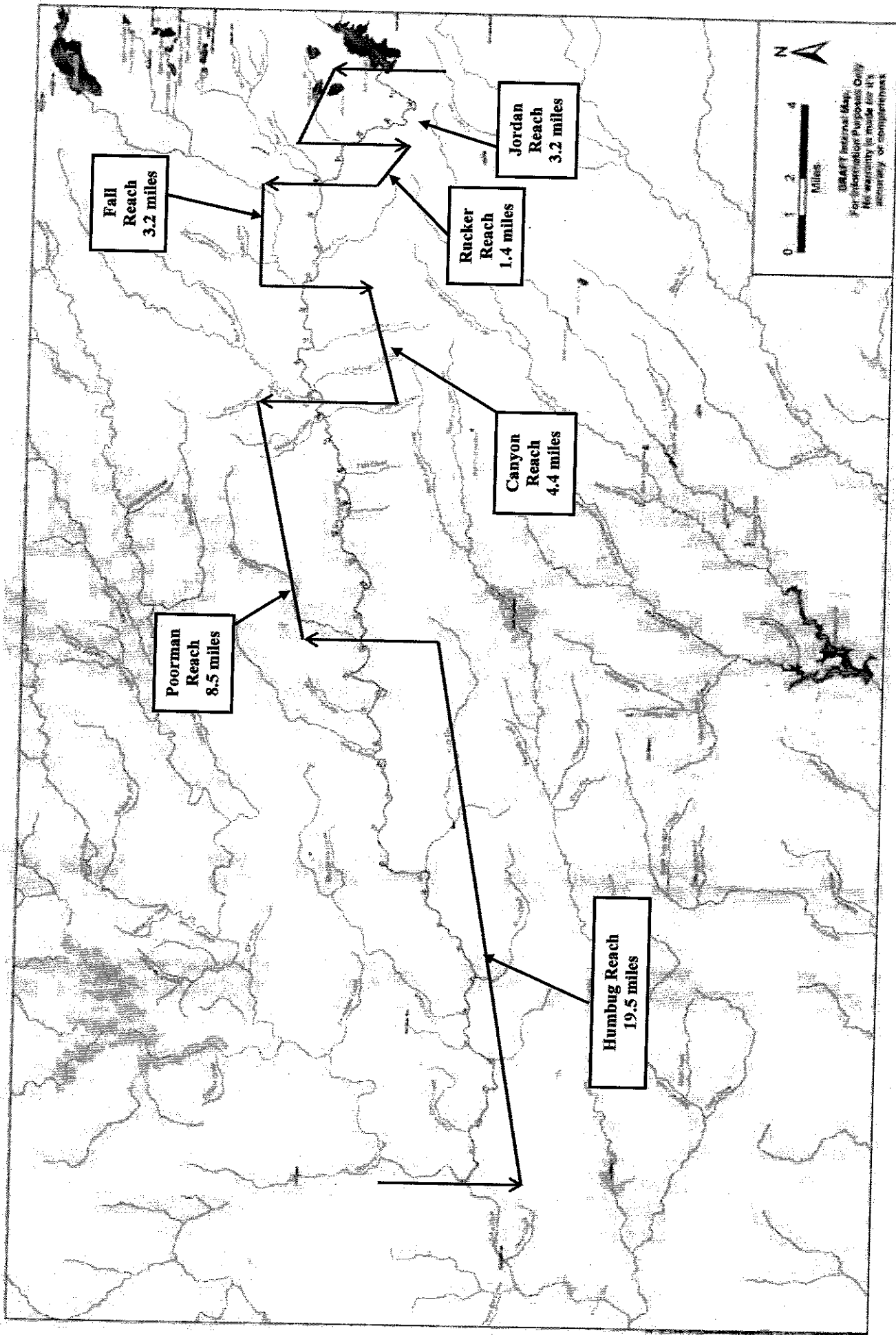


Figure A-2. Water Segment Delineation of the South Yuba River below Lake Spaulding to Englebright Reservoir.

Attachment B
PG&E's Recommended Use of the Sullivan Report

**CVRWQCB CITED
REPORT:**

Sullivan, K., D. J. Martin, R. D. Cardwell, J. E. Toll, and S. Duke. 2000. *An analysis of the effects of temperature on salmonids of the Pacific Northwest with implications for selecting temperature criteria*. Sustainable Ecosystems Institute. Portland, OR. 192 pp.

REPORT TOPIC:

Water Temperature

**SWRCB & CVRWQCB
STAFF APPLICATION:**

The State Water Resources Control Board (SWRCB) and the Central Valley Regional Water Quality Control Board (CVRWQCB) state that the Sullivan report should be used as an evaluation guideline for water temperature for California surface waters in the factsheets used to determine listing or delisting of water segments under the Clean Water Act Section 303(d). However, the SWRCB's use of binomial distributions to determine listing status with this guideline (in the SWRCB's Water Quality Control Policy or Listing Policy) implies that the report is being used as an objective rather than an evaluation guideline.

**PG&E'S RECOMMENDED
APPLICATION:**

Appropriate use of the Sullivan report would be to use it strictly as an evaluation guideline (i.e., screening tool) in conjunction with available biological data or other lines of evidence to determine the health of California surface waters. Binomial distributions do not apply to guidelines and are meant for use with objectives. In addition, there are a number of technical issues associated with the Sullivan report, which reinforce that it should be used strictly as an evaluation guideline or screening tool.

PG&E'S RESPONSE:

The objective of the Water Quality Control Policy (adopted September 2004) is to establish a standardized approach for developing California's section 303(d) list (SWRCB 2004). This approach is to achieve the overall goal of maintaining water quality standards and beneficial uses in all of California's surface waters.

In order to achieve this goal, the SWRCB and the CVRWQCB supported use of a water temperature guideline from Sullivan et al. (2000). The report calculated the Annual Maximum (instantaneous maximum observed during the summer) upper threshold criterion for steelhead trout as 21°C. The risk assessment approach used by Sullivan et al. (2000) suggests that an upper threshold for the Annual Maximum of 21°C for steelhead will reduce average growth 10% from optimum.

There are many technical issues associated with the Sullivan et al. (2000) report and a number are discussed below.

1. **The criteria were developed to protect a specific species, Pacific Northwest salmonids.**

The steelhead occurring in Sierra streams are significantly different populations that exhibit different life history strategies and growth dynamics than Northwest populations. Northern steelhead are generally acclimated to colder stream temperatures. Consequently, they spend relatively longer time in their native streams, grow slower to out-migrant size, and return at an older age to spawn than their southern counterparts. Adopting "Annual Maximum upper threshold criteria" from these northern species (based on the Sullivan et al. report) and applying them to southern Sierra populations, without some field validation efforts is problematic.

2. **Most California or Sierra streams do not meet the Sullivan guideline under natural conditions.**

Historic data does not support the use of a 21°C annual maximum water temperature because water temperatures in the 1940-1963 period were likely comparable to, if not warmer than, the current water temperatures in the North Fork Feather River (NFFR) and other California streams based upon historic PG&E data. In addition, water temperature data collected in 1985 and 2001 by PG&E indicates that release water temperatures from the present intake structure of Lake Almanor for the NFFR ranged from 20-22°C (daily mean) for July and August. The lake water surface levels in these two years were comparable to the peak water surface levels during the period 1940-1963. Ms. Sullivan also stated that many streams and rivers in California are probably not going to be able to achieve the suggested 21°C guideline water temperature naturally, and trying to would be difficult (SWRCB hearing transcript, *Consideration of a Resolution to Approve the 2002 Federal Clean Water Act Section 303(d) list of Water Quality Limited Segments*, dated February 4, 2003, on page 141 (lines 22-25). Therefore, the Sullivan guideline should be used as guidance or as a screening tool that should be used to indicate whether additional review of biological data or other lines of evidence are necessary to determine if the water segment is impaired.

3. **The report uses risk-based methods applicable to evaluation of contaminants but unproven as a management tool for the development of water temperature criteria.**

The method modifies an approach taken from laboratory studies that estimate the length of time it takes to observe 50% mortality in a population exposed to a given temperature (LT50); it then proposes (with little documentation and no field testing) that an LT10 curve (the temperature where 10% mortality is observed) is more ecologically relevant. Natural variability in a sample can be well above 10% of the mean.

The report stated that the data from the U. S. Environmental Protection Agency (USEPA), used to document the relationship between LT50 and LT10, did not provide sufficient data to statistically test differences in the two curves. Nonetheless, Sullivan et al. (2000) used Chinook salmon data to develop a conversion factor from LT50 and LT10, and then applied that to steelhead without any field or laboratory validation. Using the acute temperature analogy (LT10 curves), the report then applied the same 10% criteria to "Reduction In Maximum Growth" (RMG) to obtain the threshold water temperatures for "Sub-lethal" effects. Sullivan et al. (2000) even stated that, "The criteria above assume 10% growth loss as the acceptable level of risk. There is uncertainty associated with this number, since there are relatively few quantitative data to base it on. Further research could help confirm acceptable risk levels."

4. **Using a 10% reduction in growth as a guideline is arbitrary.**

It should also be noted that Ms. Sullivan states that a 10% growth loss from the optimal conditions was arbitrarily chosen. She further states that this 10% condition is a very good condition and a very safe number. Ms. Sullivan states that in her evaluation she found that no stream had optimal temperatures all of the time for the fish from the time they emerge from the gravels to the time they meet the winter months. The best stream she noted had a 5% growth reduction. She concludes that the 10% limit is, in fact, a very good number for fish and it would be difficult to actually ascertain that there is impairment at this level (SWRCB Hearing Transcript, page 140, lines 9-25).

Finally, Ms. Sullivan states on page 141, lines 6-13 in the above transcript, that while growth is an important aspect of the life of the fish it is not clear from scientific research how to pick the threshold number that would indicate impairment. There is no scientific research at this time that would indicate that 10%, 12%, 13%, or 14% is the ideal number and there is no scientific evidence that would allow one to pick with confidence one of these threshold numbers. In conclusion, Ms. Sullivan states that you could easily pick a number at 20% reduction in maximum growth with a great deal of confidence.

5. **Ms. Sullivan's testimony supports the concept that USEPA's target of a 20% reduction in maximum growth provides adequate protection from impairment.**

Consequently, the Sullivan et al. (2000) report makes reference to a USEPA document from 1977, which also supports the selection of a higher threshold number (24.0°C) for the protection of steelhead trout with an associated reduction in growth of 20%. PG&E believes that both the Sullivan and USEPA threshold numbers should be used as guidelines for comparison to temperatures as part of a screening process to evaluate

stream temperatures and to determine whether additional assessment of biological data or other lines of evidence is needed. These are not lethal temperatures and an Annual Maximum of 24°C was reported as acceptable to the USEPA in their 1977 report and is also supported by Ms. Sullivan's testimony statements from the February 4, 2003 hearing.

6. **Application of a single water temperature guideline to waters in a highly variable environmental setting is problematic.**

According to research conducted by Don Essig of the Idaho Division of Environmental Quality, Water Quality Assessment and Standards Bureau in November 1998, use of a fixed or single water temperature criterion applied uniformly (all places, all times, or pre-defined time periods) does not reflect the range in stream temperatures one would expect, based on climatic variability. In addition, single value criteria do not account for environmental preference or tolerance differences between species, or within species throughout its range (Essig 1998). One must account for a number of variables in the application of surface water temperature criteria. These include natural spatial and temporal climate variation (i.e., elevation differences), types of species or organisms present in the system (including species of concern) and their response to water temperature. The behavioral response of aquatic organisms needs to be accounted for in water temperature metrics and criteria and in how stream water temperatures are assessed (Essig 1998).

In a letter titled, *Proposed 303(d) Listing for the North Fork Feather River*, from Mr. James Pedri (RWQCB, Redding Branch Office) to Mr. Joe Karkoski (RWQCB, TMDL Unit) dated December 1, 2005; Mr. Pedri acknowledges that use of a single water temperature criteria is not appropriate for listing water segments on the 303(d) list and that additional lines of evidence based on current available data should be assessed to substantiate or disprove impairment. In addition, Mr. Pedri states that exceedence of an instantaneous daily maximum water temperature guideline as basis for listing grossly oversimplifies water temperature and cold water species relationships in California rivers and streams. There are several different metrics that can be used for assessing the implications of temperature to aquatic species. He concludes that understanding water temperature/cold water species relationships and determining 'impairment' in the real world of modified rivers and streams is a very complex process and cannot rely on a single water temperature criterion or single line of evidence, nor can it rely on strictly historical data. Listings must be well founded and substantiated not only in differences from suggested water temperature guidelines, but must also consider all known current available biological data or other lines of evidence when assessing the health or impairment of a water segment.

PG&E's CONCLUSION

PG&E believes that the Sullivan threshold number (10% growth reduction) should be used as a *guideline or screening tool* in conjunction with other available temperature guidance such as the USEPA threshold number (20% growth reduction). In testimony that Ms. Sullivan provided to the SWRCB back in February 2003, she indicated that the 10% growth reduction was an arbitrary number that is actually indicative of a very good number for fish and that it would be difficult to ascertain that there is impairment at this level. In addition, she stated that the associated water temperature of 21°C would likely not be met in many Sierra streams. Finally, she stated that one could easily pick a number at 20% reduction in maximum growth with a great deal of confidence.

These values (Sullivan and USEPA guidelines) should be used to provide a preliminary screening of stream water temperatures which would then indicate whether a closer look at additional current and available data or lines of evidence (biological indicator data and elevation or climatic influences, etc.) would be warranted to determine the overall health of the stream. The exceedance of the guideline provided by Sullivan is not the same as exceeding a water temperature objective included in the Basin Plan and a single criterion does not accurately reflect the dynamic nature of any river system.

Ultimately, if the other lines of evidence such as biological data indicate a healthy stream or lack of impairment, then the water segment should not be listed on the 303(d) list -- even if there are exceedances of either the Sullivan or USEPA guidelines. All of these factors (screening water temperature guidelines and current biological data or other lines of evidence) must be considered to determine validity of listing.

A listing cannot be based solely on one factor such as the Sullivan guideline to determine listing status, and listings cannot rely on outdated historical anecdotal data.

References

- Essig, Don A., 1998. *The Dilemma of Applying Uniform Temperature Criteria in a Diverse Environment: An Issue Analysis*, Idaho Division of Environmental Quality, Water Quality Assessment and Standards Bureau, Boise, Idaho, November 1998.
- Regional Water Quality Control Board (RWQCB) 2005. Letter to Mr. Joe Karkoski (RWQCB, TMDL Unit) from James Pedri (RWQCB, Redding Branch Office) titled, *Proposed 303(d) Listing for North Fork Feather River*, December 1, 2005.
- State Water Resources Control Board (SWRCB) 2003. *Consideration of a Resolution to Approve the 2002 Federal Clean Water Act Section 303(d) List of Water Quality Limited Segments*, USEPA Hearing Transcript Notes from February 4, 2003, prepared by Capitol Reporters.

SWRCB. 2004. *Water Quality Control Policy (Listing Policy) for Developing California's Clean Water Act Section 303(d) List*. September 2004.

Sullivan, K., D. J. Martin, R. D. Cardwell, J. E. Toll, and S. Duke. 2000. *An Analysis of the Effects of Temperature on Salmonids of the Pacific Northwest with Implications for Selecting Temperature Criteria*. Sustainable Ecosystems Institute. Portland, OR. 192pp.

Attachment F

PG&E's Comments on the North Fork Feather River Listing for Water Temperature

WATER SEGMENT:	North Fork Feather River below Lake Almanor to Lake Oroville (The proposed 2008 listing included the entire 56+ mile stretch – without any segmentation)
POLLUTANT:	Water temperature
SOURCE:	Flow Regulation/Modification Hydromodification
STATUS of Proposed 2008 303(d) LISTING:	Listed
CVRWQCB STAFF BASIS:	After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.
PG&E's RECOMMENDATION:	Address potential for listing by water segment delineation and Do Not List based upon available data for each water segment.
PG&E's COMMENTS:	<p>The CVRWQCB listed the entire North Fork Feather River (NFFR) from the Seneca Reach through the Big Bend Reach due to exceedances of water temperature guidelines found in Sullivan et. al. (2000) and various reports on fish population/community degradation, as interpreted from the data reported in Wales et. al (1952), Rowely (1955), Gerstung (1973), and Wixom (1989), along with other anecdotal information (historical photos). Arguments provided in the Water Segment Delineation Factsheet (Attachment A) explain the necessity for determining appropriateness of listing or Do Not List by defined river segments based upon environmental, biological, and physical differences. PG&E believes that the TMDL process will be more reflective of current conditions and truly impaired water segments may be addressed more efficiently if water segment delineation were followed when determining the list of 303(d) impaired waters.</p> <p>First, the Feather River changes substantially as it moves from its headwaters into the Sacramento Valley due to changes in elevation (from over 4,500 ft to 900 ft), gradient (from ≥ 140 ft/mile to ≤ 45 ft/mile), climate (up to a summer time average diurnal difference of 10°F), and river flow (average of less than 35 cfs to more than 250 cfs between sections). Thus, the Feather River should be evaluated by segment and below we have outlined the specific segments</p>

and the data correlated with each segment. Factsheets for each reach of the NFFR (Seneca, Belden, Rock Creek, Cresta, Poe, and Big Bend) are provided in this submission and include information regarding the health of each river segment based upon the most recent readily available data from the specific water segments (see Figure F-1).

Second, as outlined in Attachment B, PG&E believes that the guidelines in the Sullivan report should be utilized as *guidelines*, not as specific objectives. Thus, the existence of a number of exceedances of the guidelines should not automatically require the river segment to be listed. These exceedances should be evaluated along with other biological data to determine if the actual basin plan objectives for water temperature are being met. Further, there are numerous concerns with using the Sullivan report guideline in this context, including the fact that the annual maximum water temperature could not be met naturally in many points along the river.

Finally, the six lines of biological degradation evidence use old, out of date reports with data no later than the 1980s. These reports generally do not reflect current flow conditions in the river system and should not be used. Much more recent data has been collected during the various relicensing and FERC compliance processes on the Feather River and this data has been submitted to the agencies (including the CVRWQCB and the State Water Resources Control Board [SWRCB]) for review.

A number of reference documents have been cited in the factsheets that support the conclusions presented by PG&E in each factsheet. Of particular interest for the Feather River are the following: EA Engineering, Science, and Technology (2001), ECORP (2003, rev. 2004), PG&E (2003), and PG&E (2006). Specifically, information on angler creel surveys are provided in EA Engineering, Science, and Technology (2001) (tables 3-5 and 3-7) for the Belden reach; fisheries assemblage, composition, and population estimates are provided in ECORP Consulting, Inc.(2003) (fish assemblage, tables 6, 8, and 10; relative composition, figures 7, 9, and 11; and total population estimates, tables 18, 19, and 20) for the Seneca and Belden reaches; angler creel surveys, fish population and assemblage in PG&E (2006) (pages 9&10) for the Rock Creek and Cresta reaches; and fish community, distribution, and abundances in PG&E (2003) (section E3.1.3, pages E3.1-10 -62) for the Poe Reach. These data show that the water segments are biologically healthy; therefore, this water body should not be listed for water temperature on the 303(d) list.

Factsheets for each reach of the NFFR (Seneca, Belden, Rock Creek, Cresta, Poe, and Big Bend) are provided below and include information regarding the health of each river segment based upon the most recent readily available data.

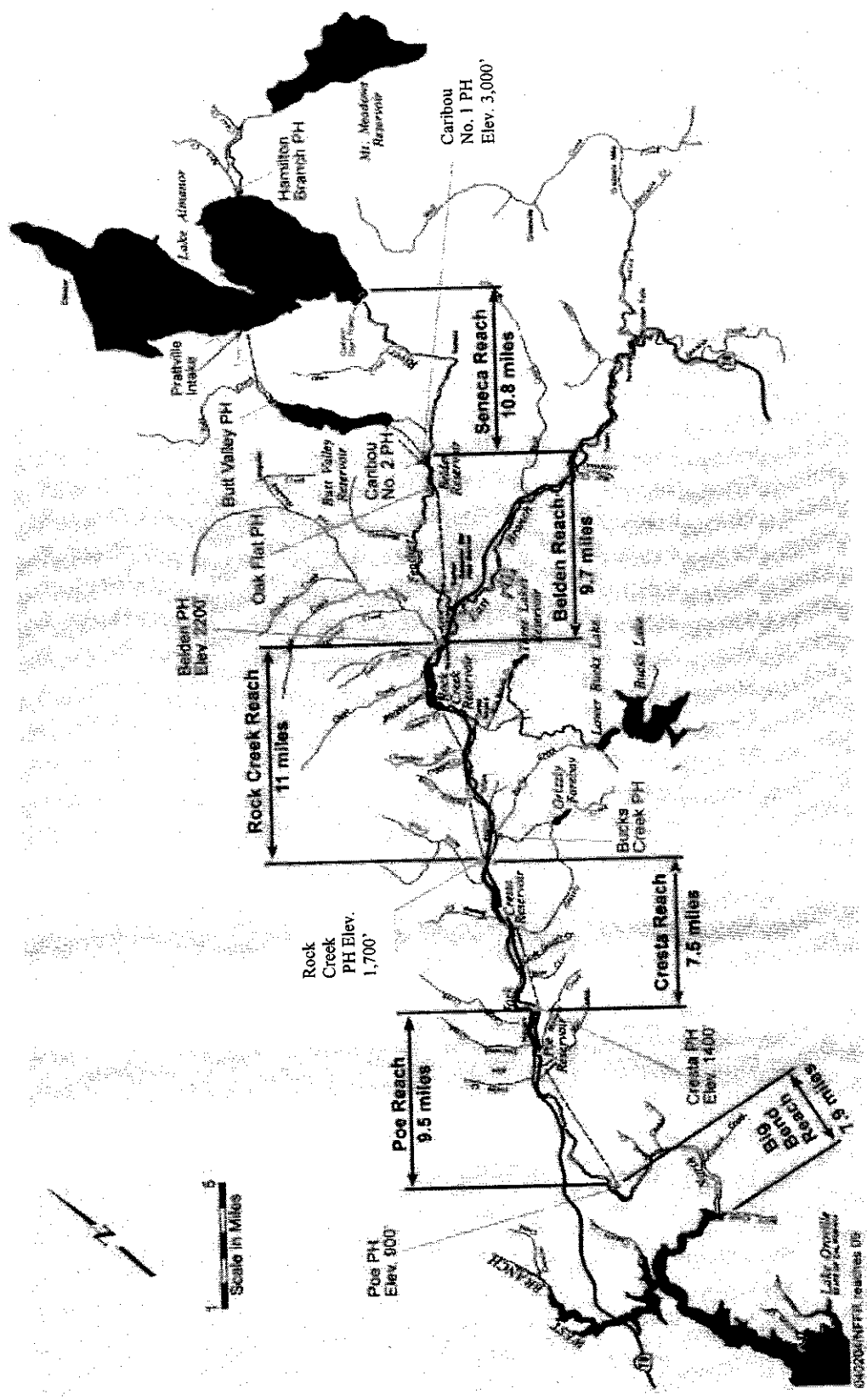


Figure F-1. Water Segment Delineation for the North Fork Feather River for Water Temperature Assessment

FACTSHEETS

**EVALUATION OF NORTH FORK FEATHER RIVER
BY SEGMENT OR REACH**

WATER SEGMENT: North Fork Feather River – Seneca Reach (between Canyon Dam and Caribou 1 and 2 powerhouses)

POLLUTANT: Water temperature

SOURCE: Flow Regulation/Modification | Hydromodification

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.

**PG&E's
RECOMMENDATION:** Do Not List

PG&E's COMMENTS: Available receiving water temperature data and aquatic biological data show that the water segment does not exceed the Sullivan guideline under normal operations and that the water segment is biologically healthy; therefore, this water body should not be listed for water temperature.

The CVRWQCB listed the NFFR, including this river segment due to exceedances of water temperature guidelines found in Sullivan et. al. (2000) and evidence of fish population/community degradation, as interpreted from the data reported in Gerstung (1973). Refer to the Water Segment Delineation Factsheet for discussion regarding the importance of reviewing available data by water segment to determine listing status for specific water segments on the 303(d) list (Attachment A). In addition, appropriate use of the Sullivan report would be to use it strictly as an evaluation guideline (i.e., screening tool) in conjunction with available biological data to determine the health of the water segment (Attachment B).

Under normal operations in the Seneca Reach there are no water temperature data that exceed the Sullivan guideline or the US EPA guideline and the biological data show that the water segment is not impaired and therefore should be removed from the 303(d) list.

Water temperature data for this reach, which originates at the base of Canyon Dam (elev. 4500 ft) 10.8 miles upstream, was presented in PG&E (2003) in tables E.2.4-2 and E.2.5-4 at up to four locations: below Canyon Dam, at Seneca Bridge, above Butt Creek, and above Caribou 1 PH for summer months of 1985, 1986, 1999, 2000, and 2001. The highest average daily

temperature of 20.1°C was recorded in August of 1996 and was due to a dam safety required seismic retrofit of Canyon Dam resulting in instream releases made from the upper gate rather than using the lower release gate as under normal operations. Under normal operations, typical water temperatures reported from 2001 indicate a maximum daily mean of 16.0°C and a maximum daily temperature of 17.2°C. These actual temperatures for this 10.8 mile segment of the NFFR show that under normal operations the temperature guideline from Sullivan (2000) is not exceeded.

Additionally, the available biological data supports the conclusion that this segment is biologically healthy. PG&E believes that because the data presented in Gerstung (1973) is pre-1973, it does not accurately reflect current biological conditions. There are significant newer data collected as part of the recent relicensing of the Upper North Fork Feather River Project (UNFFRP) that should be evaluated in making a listing determination. The most recent data on fish species present (tables 6, 8, and 10), relative composition (figures 7, 9, and 11), and total population estimates (tables 18, 19, and 20) for this reach are presented in ECORP Consulting, Inc. (2003) (see Table 2). During three years of fishery studies, rainbow trout made up between 28 to 40% of the total fish population. A comparison of catchable adult trout per mile of stream reach relative to other California streams based on Table 2 in Gerstung (1973) is presented in Table 34, ECORP (2003), and shows that the average sampling site in the Seneca Reach was in either the top 2% (800+ trout/mile) or 17% (400-799 trout/mile) category for each sampling effort (2000 – 2002).

Conclusion

Based on the fact that under normal operating conditions, water temperatures in this reach do not exceed the Sullivan guideline or the US EPA guideline and typically both daily average and daily maximum temperatures are less than 20.0°C, that the fish population has a relatively high percentage of rainbow trout, and catchable sized trout are in the upper ranges relative to other California streams presented in Gerstung (1973), this stream reach should be considered biologically healthy and should be removed from the 303(d) list of impaired waters.

WATER SEGMENT: North Fork Feather River – Belden Reach (between Belden Forebay and Belden Powerhouse)

POLLUTANT: Water temperature

SOURCE: Flow Regulation/Modification | Hydromodification

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.

**PG&E
RECOMMENDATION:** Do Not List

PG&E COMMENTS: Available receiving water temperature data and aquatic biological data show that the water segment is biologically healthy; therefore, this water body should not be listed for water temperature.

The CVRWQCB listed the NFFR, including this river segment due to exceedances of water temperature guidelines found in Sullivan et. al. (2000) and evidence of fish population/community degradation, as interpreted from the data reported in Rowely (1955). Refer to the Water Segment Delineation Factsheet for discussion regarding the importance of reviewing available data by water segment to determine listing status for specific water segments on the 303(d) list (Attachment A). In addition, appropriate use of the Sullivan report would be to use it strictly as an evaluation guideline (i.e., screening tool) in conjunction with available biological data to determine the health of the water segment (Attachment B).

While there are periodic exceedances of the Sullivan guideline and few exceedances of the US EPA guideline in the Belden Reach, there are no other biological indicators to support listing of this water segment on the 303(d) list.

PG&E believes that because the biological data presented is pre-1955, it does not accurately reflect current biological conditions. There is significant newer data collected as part of the recent hydro relicensing of the UNFFRP that should be evaluated in making a listing determination. The most recent data on fish species present (tables 6, 8, and 10), relative composition (figures 7, 9, and 11), and total population estimates (tables 18, 19, and 20) for this reach are presented in ECORP Consulting, Inc., (2003) (see Table 2) and was

collected as part of the relicensing of the UNFFRP. Rainbow trout made up between 21 to 27% of all of the fish collected for this river segment.

Angler surveys conducted in this reach in 2000 by EA Engineering, Science, and Technology (2001) reported a catch rate of 0.66 trout per hour, in which 100% of all fish caught were rainbow trout, and that 20% of the trout caught were equal to or greater than 11 inches long (Figure F-2. In general, these were all greater than the data reported by Rowely (1955), and are shown in Table F-1 and in Figure F-2 below.

Adult catchable trout per mile of stream reach relative to other California streams based on Table 2 in Gerstung (1973) is presented in Table 34, ECORP (2003), and show that the average sampling site in the Belden Reach was in either the top 17% or 46% for each sampling effort (2000 – 2002). Based on the relatively high composition percentage of rainbow trout and catchable sized trout relative to Gerstung (1973), this stream reach should be considered biologically healthy regardless of periodic exceedances of annual maximum temperature guideline presented in Sullivan et. al. (2000).

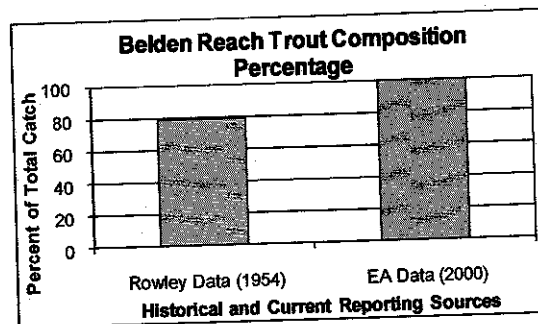


Figure F-2. Historical and Current Trout Composition Percentage for Belden Reach .

Table F-1. Comparison of trout caught per hour, catch composition, and size of trout between Rowely (1955) and EA (2001)

	Rowely (1955)	EA (2001)
Number of trout caught per hour	0.33	0.66
Percent of fish caught that were trout	80%	100%
Size of trout	Average length = 10.17"	20% > 11"

Conclusion

While there are some exceedances of the Sullivan and US EPA guidelines in this reach, the available current data show that water temperature alone is not a good measure of the health of water segments as displayed by the healthy

fish populations in Belden Reach. Therefore, this water segment should be removed from the 303(d) list of impaired water bodies.

WATER SEGMENT: North Fork Feather River – Rock Creek Reach (between Rock Creek Reservoir and Rock Creek Powerhouse)

POLLUTANT: Water temperature

SOURCE: Flow Regulation/Modification | Hydromodification

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.

**PG&E
RECOMMENDATION:** Do Not List

PG&E COMMENTS: Available receiving water temperature and aquatic biological data show that the water segment is biologically healthy; therefore, this water body should not be listed for water temperature.

The CVRWQCB listed the NFFR, including this river segment due to exceedances of water temperature guidelines found in Sullivan et. al. (2000) and evidence of fish population/community degradation, as interpreted from the data reported in Wixom (1989). Refer to the Water Segment Delineation Factsheet for discussion regarding the importance of reviewing available data by water segment to determine listing status for specific water segments on the 303(d) list (Attachment A). In addition, appropriate use of the Sullivan report would be to use it strictly as an evaluation guideline (i.e., screening tool) in conjunction with available biological data to determine the health of the water segment (Attachment B).

While there are periodic exceedances of the Sullivan guideline and very few if any exceedances of the US EPA guideline, there are no other biological indicators to support listing of this water segment on the 303(d) list.

PG&E believes that because the data presented is from 1946-1985, it does not accurately reflect current biological conditions under current flows required by the new Federal Energy Regulatory Commission (FERC) hydro license implemented in 2002. There are significant newer data collected as part of the new license compliance monitoring conducted since 2002 (License issued October 2001). In addition, there is at least a 2,300 foot drop in elevation at this reach compared to the elevation of waters originating at Canyon Dam

which would result in greater climatic influences on water temperature in this stream reach.

The most recent data on fish species present, relative composition, and total population estimates for this reach are presented in PG&E (2006; see Table 2 for report references). Seven species of fish were collected in the combined Rock Creek and Cresta reaches during 2005 by electrofish sampling (page 9). Rainbow trout made up 12% of the total catch, Sacramento sucker 34%, Sacramento pikeminnow 8%, hardhead 12%, smallmouth bass 5%, and sculpin (2 species) 30%.

Angler surveys conducted in this reach in 2005 reported that 74% of all fish caught were rainbow trout, with an average length of 12.3 inches and with almost 7% of them being equal to or greater than 17 inches long. Angler catch per hour in 2004, and 2005 for the riverine portion of the Rock Creek reach was 0.90 and 0.91 trout/hour, respectively, which is very close to the 1 fish/hour reported for the pre-project period (1946) by Wixom (1989). Table F-2 and Figure F-3, below, compare all of the trout/hour data presented in the original listing along with the most recent data from 2004 and 2005. Based on the relatively high composition percentage of rainbow trout reported in the angler surveys and success rate (catch /hour), this stream reach should be considered biologically healthy regardless of the periodic water temperature exceedances of the Sullivan guideline.

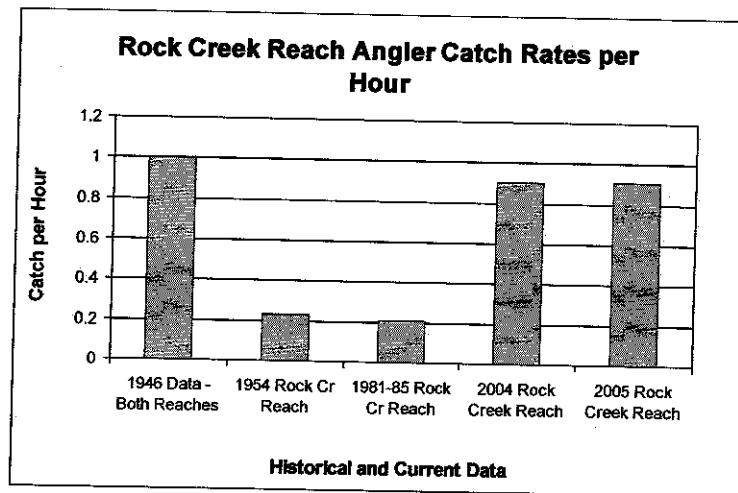


Figure F-3. Number of rainbow trout caught per hour by study year for Rock Creek Reach

Table F-2. Comparison of rainbow catch rates (number of fish per hour) for the Rock Creek Reach of the NFFR.

Year	1946	1954	1981-1985	2004	2005
Rainbow trout caught per hr.	1.0	0.23	0.21	0.90	0.91

Conclusion

The available current data show that water temperature alone is not a good measure of the health of water segments as displayed by the healthy fish populations and catch per hour of rainbow trout in 2004 and 2005 being nearly equal to the highest historical value listed for 1946 for the Rock Creek Reach. While there are some exceedances of the Sullivan guideline in this reach there are very few if any exceedances of the US EPA guideline. In addition, the elevation and climatic influences on the waters in this reach are greater compared to the waters originating at Canyon Dam approximately 20.5 miles upstream and at an elevation approximately 2,800 ft greater than at this end of this reach (at the Rock Creek Powerhouse). Therefore, this water segment should be removed from the 303(d) list of impaired water bodies.

WATER SEGMENT: North Fork Feather River – Cresta Reach (between Cresta Reservoir and Cresta Powerhouse)

POLLUTANT: Water temperature

SOURCE: Flow Regulation/Modification | Hydromodification

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.

**PG&E
RECOMMENDATION:** Do Not List

PG&E COMMENT: Available receiving water temperature and aquatic biological data show that the water segment is biologically healthy; therefore, this water body should not be listed for water temperature.

The CVRWQCB listed the NFFR, including this river segment due to exceedances of water temperature guidelines found in Sullivan et. al. (2000) and evidence of fish population/community degradation, as interpreted from the data reported in Wixom (1989). Refer to the Water Segment Delineation Factsheet for discussion regarding the importance of reviewing available data by water segment to determine listing status for specific water segments on the 303(d) list (Attachment A). In addition, appropriate use of the Sullivan report would be to use it strictly as an evaluation guideline (i.e., screening tool) in conjunction with available biological data to determine the health of the water segment (Attachment B).

While there are periodic exceedances of the Sullivan guideline and few if any exceedances of the US EPA guideline, there are no other biological indicators to support listing of this water segment on the 303(d) list.

PG&E believes that because the data presented is from 1946-1985, it does not accurately reflect current biological conditions under current flows required by the new FERC hydro license implemented in 2002. There are significant newer data collected as part of the new license compliance monitoring conducted since 2002 (License issued October 2001). In addition, there is a 3,100 foot drop in elevation at the end of this reach (at the Cresta Powerhouse) compared to the elevation of the waters originating at Canyon Dam which would result in much greater climatic influences on water

temperature in this stream reach compared to waters upstream at Canyon Dam.

The most recent data on fish species present, relative composition, and total population estimates for this reach are presented in PG&E (2006; see Table 2 for report references). Seven species of fish were collected in the combined Rock Creek and Cresta reaches during 2005 by electrofish sampling (page 9). Rainbow trout made up 12% of the total catch, Sacramento sucker 34%, Sacramento pikeminnow 8%, hardhead 12%, smallmouth bass 5%, and sculpin (2 species) 30%.

Angler surveys conducted in these reaches in 2005 reported that 74% of all fish caught were rainbow trout, with an average length of 12.3 inches and with almost 7% of them being equal to or greater than 17 inches long. Angler catch per hour in 2004 and 2005 for the riverine portion of the Cresta reach was 1.07 and 0.79 trout/hour, respectively, equal to the 1 fish/hour reported for the pre-project period (1946) by Wixom (1989) in 2004 and very close to it in 2005. Figure F-4 and Table F-3 below compares all of the trout/hour data presented in the original listing along with the most recent data from 2004 and 2005. Based on the relatively high percentage of rainbow trout reported in the angler surveys and success rate (catch /hour), this stream reach should be considered biologically healthy regardless of the periodic water temperature exceedances of the Sullivan guideline.

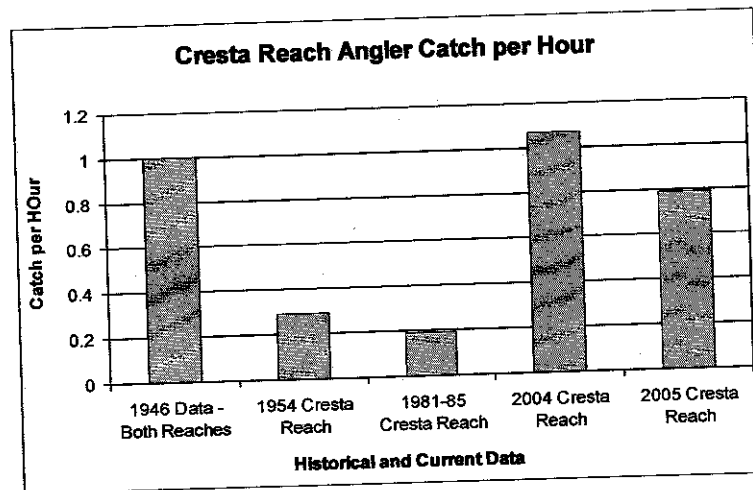


Figure F-4. Number of rainbow trout caught per hour by study year for Cresta Reach.

Table F-3. Comparison of rainbow catch rates (number of fish per hour) for the Cresta Reach of the NFFR

Year	1946	1954	1981-1985	2004	2005
Rainbow trout caught per hr.	1.0	0.29	0.19	1.07	0.79

Conclusion

The available current data show that water temperature alone is not a good measure of the health of water segments as displayed by the healthy fish populations and catch per hour of rainbow trout in 2004 and 2005 exceeding or nearly equal to the highest historical value listed for 1946 for the Cresta Reach. While there are some exceedances of the Sullivan guideline in this reach there are very few if any exceedances of the US EPA guideline. In addition, the elevation and climatic influences on the waters in this reach are greater compared the waters originating at Canyon Dam approximately 31.5 miles upstream and at an elevation approximately 3,100 ft greater than at the end of this reach . Therefore, this water segment should be removed from the 303(d) list of impaired water bodies.

WATER SEGMENT: North Fork Feather River – Poe Reach (between Poe Reservoir and Poe Powerhouse)

POLLUTANT: Water temperature

SOURCE: Flow Regulation/Modification | Hydromodification

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.

**PG&E
RECOMMENDATION:** Do Not List

PG&E COMMENT: Available receiving water aquatic biological data show that the water segment is biologically healthy; therefore, this water body should not be listed for water temperature.

The CVRWQCB listed the NFFR, including this river segment due to exceedances of water temperature guidelines found in Sullivan et. al. (2000) and evidence of fish population/community degradation, as interpreted from the data reported in PG&E (2003). Refer to the Water Segment Delineation Factsheet for discussion regarding the importance of reviewing available data by water segment to determine listing status for specific water segments on the 303(d) list (Attachment A). In addition, appropriate use of the Sullivan report would be to use it strictly as an evaluation guideline (i.e., screening tool) in conjunction with available biological data to determine the health of the water segment (Attachment B).

While there are exceedances of the Sullivan guideline and periodic exceedances of the US EPA guideline, there are no other biological indicators to support listing of this water segment on the 303(d) list.

The CVRWQCB assessment appears to focus on only the gill net surveys from the cited report. This is a very inaccurate representation of this data. A more accurate assessment of the fish assemblage, distribution, and relative composition can be made by reviewing the electrofishing results in Table E3.1-2 (page E3.1-17) and snorkeling results in tables E3.1-4 through 6 (pages E3.1-24 – 26) along with the gillnet survey found at Table E3.1-7. These results show that rainbow trout (all sizes) was the most abundant species observed per 100 ft in the snorkel surveys for all habitats combined

(Table E3.1-4, page E3.1-24). Based on the much greater numbers of rainbow trout reported in the snorkel surveys representing a much broader spectrum of habitat types than the limited gillnet surveys, this stream reach should not qualify as biologically degraded due to the single water temperature guideline presented in Sullivan et. al. (2000).

In addition, end of the Poe Reach (at the Poe Powerhouse) is located at approximately 900 feet in elevation, an approximate 3,600 foot drop in elevation at this reach compared to the elevation of waters originating at Canyon Dam approximately 48.5 miles upstream, which would result in much greater climatic influences on water temperature in this stream reach compared to higher elevation reaches on the NFFR.

Conclusion

The available current data show that water temperature alone is not a good measure of the health of water segments as displayed by the much greater numbers of rainbow trout reported in the snorkel surveys representing a much broader spectrum of habitat types than the limited gillnet surveys for the Poe Reach. Additionally, the climatic influences (average diurnal differences of 10°F) resulting from the lower elevation of this stream reach (900 feet) are far greater than in higher elevation reaches and should be accounted for in any assessments of the health of the water segment. Therefore, this water segment should be removed from the 303(d) list of impaired water bodies.

WATER SEGMENT: North Fork Feather River – Big Bend Reach (between Big Bend Reservoir and Lake Oroville)

POLLUTANT: Water temperature

SOURCE: Flow Regulation/Modification | Hydromodification

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.

**PG&E
RECOMMENDATION:** Do Not List

PG&E COMMENT: Available receiving water aquatic biological data show that the water segment is biologically healthy; therefore, this water body should not be listed for water temperature.

The CVRWQCB listed the NFFR, including this river segment due to exceedances of water temperature guidelines found in Sullivan et. al. (2000) and evidence of fish population/community degradation, as interpreted from the data reported in PG&E (2003). Refer to the Water Segment Delineation Factsheet for discussion regarding the importance of reviewing available data by water segment to determine listing status for specific water segments on the 303(d) list (Attachment A). In addition, appropriate use of the Sullivan report would be to use it strictly as an evaluation guideline (i.e., screening tool) in conjunction with available biological data to determine the health of the water segment (Attachment B).

While there are exceedances of the Sullivan guideline and periodic exceedances of the US EPA guideline, there are no other biological indicators to support listing of this water segment on the 303(d) list.

The CVRWQCB assessment appears to focus on only the gill net surveys from the cited report. This is a very inaccurate representation of this data. A more accurate assessment of the fish assemblage, distribution, and relative composition can be made by reviewing the electrofishing results in Table E3.1-2 (page E3.1-17) and snorkeling results in tables E3.1-4 through 6 (pages E3.1-24 – 26) along with the gillnet survey found at Table E3.1-7. These results show that rainbow trout (all sizes) was the most abundant species observed per 100 ft in the snorkel surveys for all habitats combined

(Table E3.1-4, page E3.1-24). Based on the much greater numbers of rainbow trout reported in the snorkel surveys representing a much broader spectrum of habitat types than the limited gillnet surveys, this stream reach should not qualify as biologically degraded due to the single water temperature guideline presented in Sullivan et. al. (2000).

In addition, the Poe Reach is located at approximately 900 feet in elevation, and this represents approximately a 3,600 foot drop in elevation at this reach compared to the elevation of waters originating at Canyon Dam which would result in much greater climatic influences on water temperature in this stream reach compared to higher elevation reaches on the NFFR.

Conclusion

The available current data show that water temperature alone is not a good measure of the health of water segments. Additionally, the climatic influences (average diurnal differences of 10°F) resulting from the lower elevation of this stream reach (900 feet or less) are far greater than in higher elevation reaches and should be accounted for in any assessments of the health of the water segment. Based upon the elevation of this reach it is unlikely that it would have ever supported COLD beneficial uses under unimpaired hydrology and it is more likely that this river segment is indicative of WARM beneficial uses. Therefore, this water segment should be removed from the 303(d) list of impaired water bodies.

References

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Attachment G

PG&E's Comments on the Willow Creek Listing for Water Temperature

WATER SEGMENT: Willow Creek (Madera County)

POLLUTANT: Water Temperature

SOURCE: Source Unknown

**STATUS of Proposed
2008 303(d) LISTING:** Listed

SWRCB STAFF BASIS: After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.

**PG&E's
RECOMMENDATION:** Do Not List

PG&E's COMMENTS: The CVRWQCB states that the readily available data and information contained in their factsheet is sufficient to justify listing of Willow Creek for water temperature. However, all of the data used by the CVRWQCB for the 2008 determination is from 2002 and earlier (1986-1996) and does not represent all of the readily available and relevant data and information that is needed to make a justifiable evaluation of water temperature for this water segment.

In addition, the two lines of evidence that the CVRWQCB references in support of listing this water segment are in direct opposition to each other. Furthermore, as discussed in the Sullivan factsheet (Attachment B), the use of a single annual maximum water temperature is not appropriate for listing water bodies, it should be used as a screening tool used "in concert" with other lines of evidence as described in the State Water Resources Control Board (SWRCB) Listing Policy (SWRCB 2004).

Use of Historical and Outdated Water Temperature and Biological Data to Determine Listing Status

The CVRWQCB used two lines of evidence to determine status of listing for this stream reach. The first line of evidence was based upon historic and pre-license daily water temperature data collected at various times of day during the monitoring period 1986-1996 at two locations, North Fork Willow Creek below Bass Lake and South Fork Willow Creek below the Forest Service Road (PG&E 2001). The second line of evidence was based upon historic

and pre-license fish population/community degradation, as interpreted from data collected in 1964, 1970, 1984, and 2000 reported in Price (2002).

Any listing analysis must assess the current river flow regime. PG&E believes that because the data used by the CVRWQCB to determine listing status is pre-2003 (i.e., pre-license) the historical data do not accurately reflect current water quality and biological conditions and are no longer relevant based on the new FERC License conditions (PG&E obtained a Federal Energy Regulatory [FERC] License for the Crane Valley Project September, 2003).

In addition, more recent and relevant data has been collected since establishment of the FERC License and this data has been provided to the resource agencies per the licensing conditions. A six-year water temperature monitoring program was initiated in 2005. Additional biological monitoring to determine which native aquatic species are using the water segment occurred in 2007, and will continue every five years for the term of the License. These assessments are necessary under the current federally mandated flow regime and operating conditions to determine whether the water body can be considered healthy or impaired.

PG&E Six-Year Water Temperature Monitoring Program Initiated in 2005

PG&E initiated a six-year water temperature monitoring study beginning in 2005 that has provided valuable information regarding existing water temperatures under current federally licensed operating conditions for this water body (PG&E 2006, 2007, 2008, and 2009). An evaluation of current water temperature conditions in this stream reach is ongoing and incomplete to date (four of six years have been collected [2005-2008]).

Listing of this stream reach is premature until these new water temperature studies have been completed and assessment of the stream under the new FERC Licensed conditions and current operating procedures can be completed. Upon completion of the six-year study, a summary report will be prepared that will discuss best management practices based upon the six years of data (2005-2010) and will compare various operating conditions for the project under the new FERC flow requirements.

Monitoring results from the first 4 years of the water temperature monitoring program indicate that water temperatures in lower Willow Creek are in an optimal range for use by Hardhead and other warm water species such as Sacramento pikeminnow and Sacramento sucker.

PG&E Conducted New Biological Monitoring in 2007

Beginning in 2007 and continuing every five years for the term of the federal license, biological monitoring for native aquatic fish, amphibian, and reptile

species and their habitat associations within Willow Creek will be conducted (data for 2007 was reported in July 2008 [Jones & Stokes 2008]). A major focus of the planned research is to determine if hardhead use this reach for reproduction and the critical parameters for its survival.

The primary species of interest listed in the CVRWQCB's factsheet (second line of evidence) for Willow Creek is the hardhead. Hardhead is a sensitive fish species that may use Willow Creek primarily for spawning and early season rearing (Price 2002, Jones & Stokes 2008). Willow Creek from the confluence of Whiskey Creek to the San Joaquin River is considered Critical Habitat for hardhead by the Sierra National Forest. However, no data exist to indicate historical utilization, abundance, or distribution of the species in Willow Creek (Price 2002).

The CVRWQCB factsheet refers to presence/absence data for hardhead in Willow Creek from studies conducted in 1964, 1970, 1984 (Bozemann et al. 1985), and 2000 (Price 2002). The 1964 study indicated that hardhead were found (no specific number given) in most streams of the San Joaquin drainage. In the early 1970s hardhead were found at 9% of sites sampled (exact locations and time of year not given). The Crane Valley Project Fisheries Technical Study conducted on streams of the Crane Valley Project area in 1984 found a small population of hardhead ranging in size from 84 to 130 mm in the lower reaches of Willow Creek (Bozemann et al. 1985). The exact timing (time of year) of this study is not specified. PG&E sampled Willow Creek in October 2000 for hardhead, but none were found (Price 2002).

New data and information collected in 2007 provide a better indication of the presence/absence of hardhead in Willow Creek (Jones & Stokes 2008). Fish survey sites were located in lower Willow Creek (two of the sites used in 2000 were sampled again in 2007). The study found that a natural waterfall approximately 805 m above the confluence of the San Joaquin River precludes upstream migration of hardhead. The total surveyable reach in lower Willow Creek was therefore 0.5 miles (800 m) above the confluence with the San Joaquin River.

A total of 698 fish were captured during the surveys (native species represented 93% of the total catch and were dominated by Sacramento pikeminnow (~73%), Sacramento sucker (~15%), smallmouth bass (~7%), and hardhead (a total of 26 fish or ~4%). Other fish species made up 1% or less of the total catch and included rainbow trout, green sunfish, prickly sculpin, and brown bullhead (Jones & Stokes 2008). Hardhead are typically found in association with Sacramento pikeminnow and usually with Sacramento sucker (Moyle 2002), as was the case with this study. Most hardhead in Willow Creek were caught in May and July and nearly all the hardhead that were captured in 2007 represented ages 0+, 1+, and possibly 2+

fish (Jones & Stokes 2008). Based upon the presence of young-of-the-year juveniles, it appears that hardhead may use Willow Creek primarily for spawning and early season rearing, which may be why no hardhead were found in the October 2000 study. Spawning habitat (riffles, runs, and pools with gravel (Moyle 2002)) is available in Willow Creek for hardhead. It may be that the viable and healthy population of Hardhead from Horseshoe Bend use lower Willow Creek for spawning and early season rearing; and then after some form of environmental cue, the young-of-the-year hardhead move back down into the larger pools in the Horseshoe Bend Reach of the San Joaquin River (Price 2002).

As suggested in the PG&E report (Price 2002), nonnative species could also be a limiting factor for hardhead populations in Willow Creek, not water temperature. Nonnative game species such as bass, bullhead, and sunfish have been introduced into Bass Lake above the survey area for recreational fishing. They could be washed downstream during high winter and spring flows into lower Willow Creek (Jones & Stokes 2008). Brown and Moyle (1993) found hardhead presence in the San Joaquin River and its tributaries was positively correlated with percentage of native species.

CVRWOCB Lines of Evidence in Conflict

Willow Creek supports both warm and cold water species and it is inappropriate to base water temperature criteria only on the cold water species (Sullivan criteria for Steelhead of 21°C) listed in the 303(d) factsheets as the first line of evidence.

It has been documented that the native warm water species (including hardhead) that are found in Willow Creek prefer water temperatures between 25°C and 30°C (Knight 1985). Knight (1985) concluded that the water temperature that fish will select given a range of water temperatures was 26°C for the Sacramento pikeminnow and 28.4°C for the hardhead. Limited data suggest that the Sacramento sucker prefers water temperatures around 26°C (Knight 1985). Insufficient data were available to set a maximum water temperature criterion for all species; however, an instantaneous maximum water temperature of 37°C or more could result in mortality of the Sacramento pikeminnow (Knight 1985) and it is assumed likely to be lethal for the other native species as well.

Therefore, it is apparent that the water temperature regimes in Willow Creek are currently suitable for hardhead and other native species (Knight 1985). During the 2007 study, water temperatures were suitable for hardhead in all survey months (Jones & Stokes 2008); and water temperature data from four years of water temperature monitoring in Willow Creek also indicate that water temperatures in Willow Creek were suitable for hardhead (PG&E 2006, 2007, 2008, and 2009). The Sullivan criterion for Steelhead (21°C) is not

suitable for hardhead and should not be used for determining whether water temperatures in Willow Creek are impaired because this value is not optimal for hardhead. As discussed in PG&E's Sullivan factsheet (Attachment B), the use of a single annual maximum water temperature (for a single fish species) is not appropriate for listing water bodies and cannot be applied to all fish species (Steelhead criterion does not apply to hardhead); it should be used as a screening tool used "in concert" with other lines of evidence as described in the State Water Resources Control Board (SWRCB) Listing Policy (SWRCB 2004).

PG&E's Conclusion

Therefore, the historic water temperature and biological data used to list this water segment are not accurate, not current, and the data collected under the new flow regime should be analyzed prior to making a listing determination. As shown in the discussions above, listing Willow Creek for water temperature is not justified when all the available and relevant data are considered. Further, the two lines of evidence presented by the CVRWCB are in conflict based on the fact that exceedance of the 21°C criterion is administered for salmonid species (Steelhead) and does not correlate with the potential decline of a species that has been documented to prefer warmer water temperatures (hardhead). Based upon evidence presented by Knight (1985), in the absence of sufficient available data to set a maximum water temperature criterion for hardhead; an instantaneous maximum water temperature of 37°C or more could result in mortality of the Sacramento pikeminnow and it is assumed likely to be lethal for the other native species (hardhead) as well. Water temperatures in Willow Creek never exceeded this water temperature and in all years (2005-2008) never exceeded the upper optimal limit for water temperature (28.4°C) for hardhead.

Thus, a complete and accurate listing analysis of Willow Creek for water temperature must include an assessment of current stream conditions (water quality and biological) and therefore the proposed listing is not accurate and since it is based upon obsolete data the listing should be changed to 'Delist'. There is insufficient justification for listing Willow Creek for water temperature based upon the evidence presented in this factsheet.

References

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- Pacific Gas and Electric Company (PG&E) 2001. Crane Valley Project FERC No. 1354 Amended Application for New License, June 2001.
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- State Water Resources Control Board (SWRCB). 2004. *Water Quality Control Policy (Listing Policy) for Developing California's Clean Water Act Section 303(d) List*. September 2004.

Attachment H

PG&E's Comments on the South Fork Yuba River Listing for Mercury

WATER SEGMENT: Yuba River, South (Lake Spaulding to Englebright Reservoir)

POLLUTANT: Mercury

CVRWQCB LISTED SOURCE: Resource Extraction

STATUS of Proposed 2008 303(d) LISTING: List

CVRWQCB BASIS: After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.

PG&E RECOMMENDATION: Do Not List any river segments of the South Yuba River from Lake Spaulding to Englebright Reservoir

Address potential for listing the South Yuba River by water segments (federally recognized individual river reaches) and list or do not list based upon known available data or evidence for each individual river reach (water segment). Based upon the known available data, there is no justification for listing any water segment of the South Yuba River for mercury.

PG&E COMMENTS: The CVRWQCB has proposed listing of the South Yuba River from below Spaulding Reservoir to Englebright Reservoir (a 41+ mile length of river) due to exceedances of the Office of Environmental Health Hazard Assessment (OEHHA) mercury criterion (0.3 ppm) which occurred in one sample from 1980 near Bridgeport in Humbug Reach (most downstream segment, at a concentration of 0.69 ppm) and in one sample from 1993 from downstream of Washington Creek in Canyon Reach (approximately 28 miles upstream of the Bridgeport sample at a concentration of 0.3 ppm). Samples collected from Jordan Reach below Lake Spaulding did not exceed the criteria; and samples collected in Humbug Reach near Edwards Crossing (upstream from Bridgeport and downstream from Washington) did not exceed the criterion.

No known fish tissue samples were collected from Rucker Reach, Fall Reach, or Poorman Reach.

PG&E believes that the TMDL process will be more reflective of current conditions and truly impaired water segments may be addressed more efficiently if water segment delineation were followed when determining the list of 303(d) impaired waters. In addition, all known available data should only be applied to the reach or water segment in which it was collected; possible impairment cannot be inferred to upstream or downstream reaches if known available data for those river reaches do not indicate impairment, are not available, or have not been collected.

Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

Factsheets for each reach of the South Yuba River (Jordan, Rucker, Fall, Canyon, Poorman, and Humbug) are provided in this submission (see Figure H-1). Factsheets for all of the reaches in the South Fork Yuba River demonstrate that these reaches should not be listed for mercury because known available data do not indicate impairment or there are no known data available to make a determination regarding listing. It should also be noted that there are two other short reaches below Lake Spaulding; the "South Yuba below Spaulding Dam Reach" which is 0.2 miles long and goes from Spaulding Dam to Spaulding No. 2 Powerhouse, and the "South Yuba below Spaulding No. 2 Powerhouse Reach" is 0.7 miles and goes from PH #2 to Jordan Creek confluence. However, there are no data available within either of these very short reaches, and they are not included in the factsheets provided by PG&E below.

There is no justification for listing any river segment of the South Yuba River on the 303(d) list of impaired water bodies.

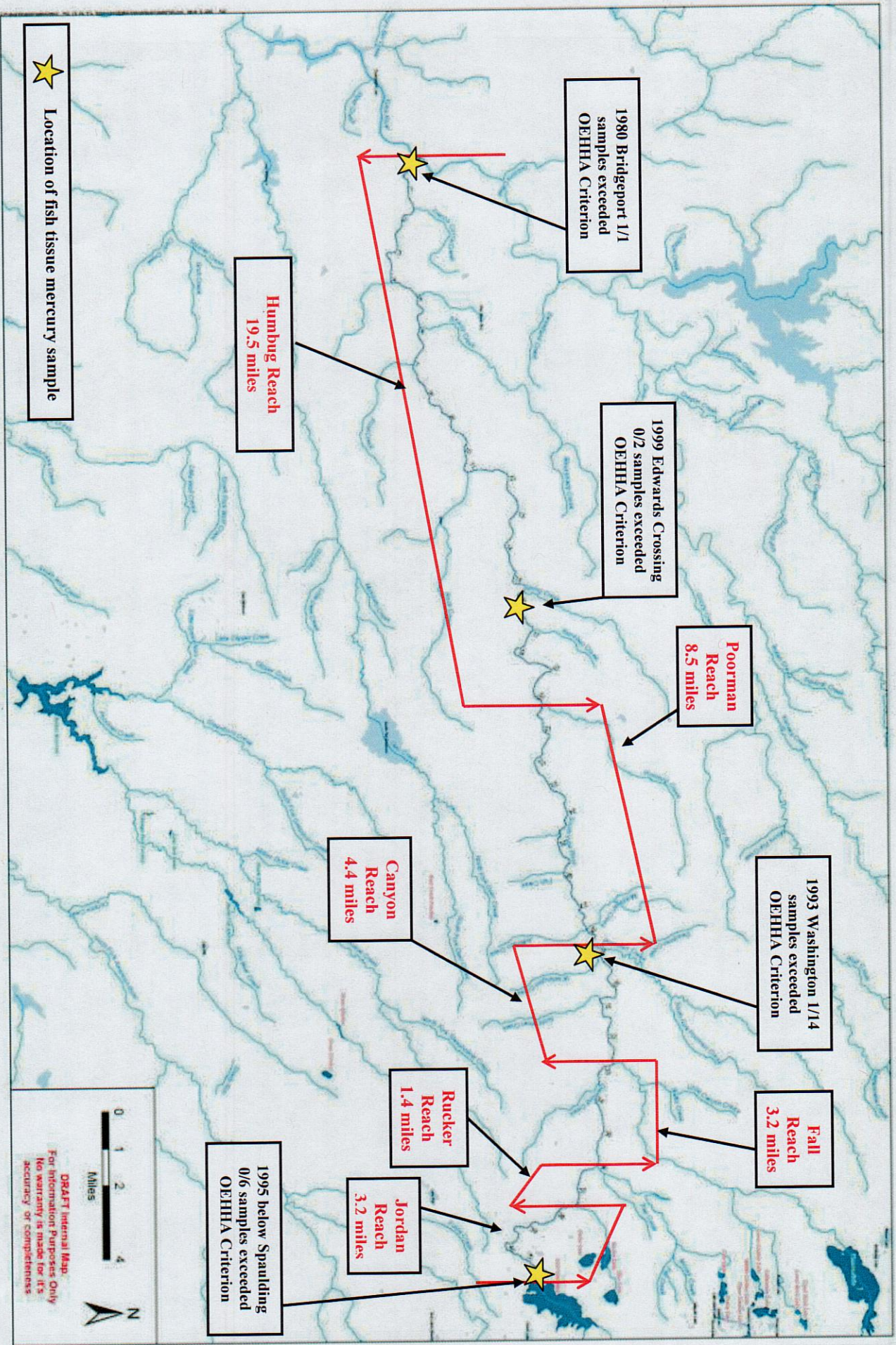


Figure H-1. Water Segment Delineation for the South Fork Yuba River for Mercury (Hg) Assessment in Fish Tissue

FACTSHEETS

EVALUATION OF SOUTH FORK YUBA RIVER

BY SEGMENT OR REACH

WATER SEGMENT: South Fork Yuba River – Reach #1: Jordan Reach (a total of 3.2 River Miles [RM]) from Jordan Creek Confluence (RM 40.2) to Rucker Creek Confluence (RM 37.0)

POLLUTANT: Mercury

SOURCE: None; known available data do not indicate impairment

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB STAFF
BASIS:** After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded.

**PG&E
RECOMMENDATION:** Do Not List

PG&E COMMENT: The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Lake Englebright (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

Fish tissue mercury data have been collected at one location in the Jordan Reach below Lake Spaulding (Reach #1 of the South Yuba River). Data were collected in 1995 in cooperation with the Bureau of Land Management, SWRCB, Nevada County Resource Conservation District, U.S. Department of Agriculture, Forest Service, and the U.S. Environmental Protection Agency (Slotton et al. 1997 Revised).

The CVRWQCB reported in their factsheet that 5 samples had been collected and analyzed for mercury below Lake Spaulding in this river reach. However, the actual number of samples that were collected according to the report referenced above was 6 samples (4 rainbow trout and 2 brown trout). Zero of the 6 fish tissue samples collected from this location were in exceedance of the OEHHA mercury criterion (0.3 ppm). Concentrations ranged from

0.04 ppm to 0.11 ppm and averaged 0.07 ppm. This is well below the OEHHA mercury criterion (0.3 ppm). There is no justification for listing this river segment for mercury impairment.

Therefore, the known available data from Jordan Reach indicate that there is no justification for listing this river segment on the 303(d) list of impaired water bodies for mercury.

References:

Slotton, D. G., S. M. Ayers, J. E. Reuter, and C. R. Goldman. 1997 Revised. *Gold Mining Impacts on Food Chain Mercury in Northwestern Sierra Nevada Streams*. Final Report. Division of Environmental Studies, University of California, Davis. March 1997.

WATER SEGMENT: South Fork Yuba River – Reach #2: Rucker Reach (a total of 1.4 RM) from Rucker Creek Confluence (RM 37.0) to Fall Creek Confluence (RM 35.6)

POLLUTANT: Mercury

SOURCE: None; no known data available, therefore no justification for listing

STATUS of Proposed 2008 303(d) LISTING: Listed

CVRWQCB STAFF BASIS: After review of the available data and information the CVRWQCB staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded.

PG&E RECOMMENDATION: Do Not List

PG&E COMMENT: The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Lake Englebright (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

No known fish tissue mercury data have been collected from the Rucker Reach (Reach #2 of the South Yuba River).

Consequently, there is no justification for listing the Rucker Reach on the 303(d) list of impaired water bodies.

WATER SEGMENT: South Fork Yuba River – Reach #3: Fall Reach (a total of 3.2 RM) from Fall Creek Confluence (RM 35.6) to Canyon Creek Confluence (RM 32.4)

POLLUTANT: Mercury

SOURCE: None; no known data available, therefore no justification for listing

STATUS of Proposed 2008 303(d) LISTING: Listed

CVRWQCB STAFF BASIS: After review of the available data and information the CVRWQCB staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded.

PG&E RECOMMENDATION: Do Not List

PG&E COMMENT: The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Lake Englebright (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

No known fish tissue mercury data have been collected from the Fall Reach (Reach #3 of the South Yuba River).

Consequently, there is no justification for listing the Fall Reach on the 303(d) list of impaired water bodies.

WATER SEGMENT: South Fork Yuba River – Reach #4: Canyon Reach (a total of 4.4 RM) from Canyon Creek Confluence (RM 32.4) to Poorman Creek Confluence (RM 28.0)

POLLUTANT: Mercury

SOURCE: None; known available data do not indicate impairment

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information the CVRWQCB staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded.

**PG&E
RECOMMENDATION:** Do Not List

PG&E'S RESPONSE: The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Lake Englebright (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

Fish tissue mercury data have been collected at one location in the Canyon Reach near Washington Creek (Reach #4 of the South Fork Yuba River). Data were collected in 1993 in cooperation with the Bureau of Land Management, SWRCB, Nevada County Resource Conservation District, U.S. Department of Agriculture, Forest Service, and the U.S. Environmental Protection Agency (Slotton et al. 1997 Revised).

The CVRWQCB reported in their factsheet that 13 samples had been collected and analyzed for mercury near Washington Creek in this river reach. The CVRWQCB then states that 1 of 9 samples exceeded the OEHHA mercury criterion. PG&E would like to clarify that the actual number of samples that were collected according to the report referenced above was a total of 14 samples (all rainbow trout). Concentrations ranged from 0.10 ppm to 0.30 ppm and averaged 0.15 ppm.

Only 1 of the 14 fish tissue samples collected from this location was equal to the OEHHA mercury criterion (0.3 ppm). None of the fish tissue samples exceeded the criterion. This does not exceed the allowable frequency in Table 3.1 of the Listing Policy (which states that for a sample size of 2-24, greater than or equal to 2 exceedances is sufficient justification for listing a water body/pollutant combination), (SWRCB 2004).

Therefore, the known available data from Canyon Reach indicate that there is no justification for listing this river segment on the 303(d) list of impaired water bodies for mercury.

References:

Slotton, D. G., S. M. Ayers, J. E. Reuter, and C. R. Goldman. 1997 Revised. *Gold Mining Impacts on Food Chain Mercury in Northwestern Sierra Nevada Streams*. Final Report. Division of Environmental Studies, University of California, Davis. March 1997.

State Water Resources Control Board (SWRCB). 2004. *Water Quality Control Policy (Listing Policy) for Developing California's Clean Water Act Section 303(d) List*. September 2004.

WATER SEGMENT: South Fork Yuba River – Reach #5: Poorman Reach (a total of 8.5 RM) from Poorman Creek Confluence (RM 28.0) to Humbug Creek Confluence (RM 19.5)

POLLUTANT: Mercury

SOURCE: None; no known data available, therefore no justification for listing

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information the CVRWQCB staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded.

**PG&E
RECOMMENDATION:** Do Not List

PG&E COMMENT: The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Lake Englebright (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

No known fish tissue mercury data have been collected from the Poorman Reach (Reach #5 of the South Yuba River).

Consequently, there is no justification for listing the Poorman Reach on the 303(d) list of impaired water bodies.

WATER SEGMENT: South Fork Yuba River – Reach #6: Humbug Reach (total of 19.5 RM), from Humbug Creek Confluence (RM 19.5) to Englebright Reservoir (RM 0.0)

POLLUTANT: Mercury

SOURCES: None; known data do not indicate impairment

**STATUS of Proposed
2008 303(d) LISTING:** List

**CVRWQCB
STAFF BASIS:** After review of the available data and information, CVRWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

**PG&E
RECOMMENDATION:** Do Not List

PG&E'S COMMENT: The CVRWQCB listed the entire South Fork Yuba River from Lake Spaulding to Lake Englebright (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

Fish tissue mercury data have been collected at two locations (near Edwards Crossing and near Bridgeport) in the Humbug Reach, which is approximately 19.5 RM (Reach #4 of the South Fork Yuba River). Data were collected in 1999 in cooperation with the Bureau of Land Management, SWRCB, Nevada County Resource Conservation District, U.S. Department of Agriculture, Forest Service, and the U.S. Environmental Protection Agency (May et al. 2000) near Edwards Crossing and data were collected in 1980 near Bridgeport as part of the SWRCB Toxic Substances Monitoring Program: Freshwater Bioaccumulation Monitoring (SWRCB 2002).

The CVRWQCB reported in their factsheet that 2 samples near Edwards Crossing (both rainbow trout) and 1 three-fish composite sample (smallmouth bass) near Bridgeport had been collected and analyzed for mercury in the Humbug Reach. Concentrations of

mercury in the fish tissue from samples collected near Edwards Crossing were 0.15 ppm and 0.09 ppm. The concentration of the 3-fish composite sample collected near Bridgeport was 0.69 ppm. Only the sample collected near Bridgeport exceeded the OEHHA mercury criterion (0.3 ppm). Therefore a total of 1 of 3 samples from this reach exceeded the criterion and this does not exceed the allowable frequency in Table 3.1 of the Listing Policy (which states that for a sample size of 2-24, greater than or equal to 2 exceedances is sufficient justification for listing a water body/pollutant combination), (SWRCB 2004).

It should also be noted that 6 fish tissue samples were collected from Humbug Creek above and below the falls as part of the study to investigate South Yuba Watershed potential for mercury contamination conducted by May et al. in 1999 (May et al. 2000). Fish tissue mercury concentrations ranged from 0.16 ppm to 0.22 ppm in these samples. None of the samples from Humbug Creek exceeded the OEHHA criterion.

All of the known data presented by May et al. in 1999 supports the conclusion that mercury contamination in fish from the South Yuba River Watershed is low compared to other watersheds that may be affected by historic gold mining activities (all of the samples collected from the South Fork Yuba River Watershed were below the OEHHA mercury criterion of 0.3 ppm), (refer to Figure 9 – Stream Habitat Results - of the study conducted by May et al. 2000).

Therefore, the known available data from this river segment and from a primary tributary that influences this river segment indicate that there is no justification for listing this river segment on the 303(d) list of impaired water bodies for mercury.

References:

May, J.T.; R.L. Hothem; C.N. Alpers; and M.A. Law. 2000. *Mercury Bioaccumulation in Fish in a Region Affected by Historic Gold Mining: The South Yuba River, Deer Creek, and Bear River Watersheds, California 1999*. U.S. Geological Survey Open-File Report 00-367, Sacramento, California. 2000.

Slotton, D. G., S. M. Ayers, J. E. Reuter, and C. R. Goldman. 1997 Revised. *Gold Mining Impacts on Food Chain Mercury in Northwestern Sierra Nevada Streams*. Final Report. Division of Environmental Studies, University of California, Davis. March 1997.

State Water Resources Control Board (SWRCB). 2002. *Toxic Substances Monitoring Program: Freshwater Bioaccumulation Monitoring: TSM Program Data 1978-2000*. State Water Resources Control Board, Division of Water Quality.

SWRCB. 2004. *Water Quality Control Policy (Listing Policy) for Developing California's Clean Water Act Section 303(d) List*. September 2004.

Attachment I

PG&E's Comments on the South Yuba River Listing for Water Temperature

WATER SEGMENT: Yuba River, South (below Lake Spaulding to Englebright Reservoir)

POLLUTANT: Water Temperature

CVRWQCB LISTED SOURCE: Source Unknown

STATUS of Proposed 2008 303(d) LISTING: List (New Decision proposed for 2008 list)

CVRWQCB BASIS: After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the entire 41+ mile section of the South Yuba River between Lake Spaulding and Englebright Reservoir should be placed on the section 303(d) list because applicable water quality standards were exceeded for water temperature.

PG&E RECOMMENDATION: Do Not List any river segments of the South Yuba River between Lake Spaulding and Englebright Reservoir

Address potential for listing the South Yuba River by water segments (federally recognized individual river reaches) and list or do not list based upon known available data or evidence for each individual river reach (water segment). Water temperature assessments should also consider the optimal water temperature regimes for typical fish assemblages that would be expected to occur in the specifically referenced California stream segments. Arguments provided in PG&E's Water Segment Delineation Factsheets explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

FACTSHEET BACKGROUND:

The CVRWQCB has proposed listing of the entire South Yuba River from below Lake Spaulding to Englebright Reservoir (a 41+ mile length of river) due to exceedances of water temperature guidelines found in the US Environmental Protection Agency (US EPA) Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (US EPA 2003) which also references water temperature guidelines developed by Sullivan et al. (2000) for Pacific Northwest Salmonids.

CVRWQCB Line of Evidence Used in the Factsheet

The CVRWQCB's factsheet used one line of evidence in support of their listing decision. The data referenced in the CVRWQCB's South Yuba River Factsheet (below Lake Spaulding to Englebright Reservoir) are from bulb spirit thermometer readings that were collected as part of the South Yuba River Citizens League (SYRCL) River Monitoring Program (SYRCL 2007). Thirteen sites were monitored by SYRCL monthly from 2001 through 2006. The SYRCL referenced steelhead water temperature thresholds presented in a report prepared by Sullivan et al. (2000) and referenced in the US EPA Region 10 guidance (US EPA 2003), which assess the risk of growth loss and suggest water temperatures of 18°C and 21°C for maximum weekly average and the acute threshold, respectively for Pacific Northwest Salmonids. The CVRWQCB factsheet states that 50 of 58 SYRCL water temperature measurements exceeded the 21°C water temperature guideline proposed by Sullivan et al. (2000) and by the US EPA Region 10 guidance document (US EPA 2003).

PG&E COMMENTS:

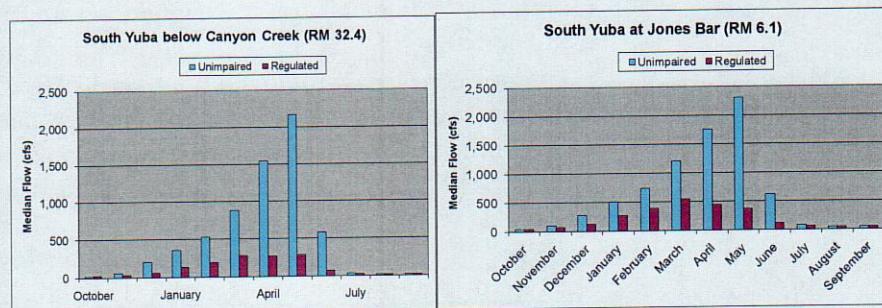
First, the South Yuba River changes substantially as it flows from below Lake Spaulding to Englebright Reservoir due to changes in elevation (from approximately 5,000 feet in the river below Lake Spaulding to approximately 530 feet at Bridgeport near Englebright Reservoir). There is a steep gradient resulting in approximately a 2,000 foot drop in elevation from below Lake Spaulding to a point in the river that is approximately 1 mile below the confluence with Fall Creek at river mile 35 (approximate elevation at this point is 3,000 feet). The river continues to decrease in elevation gradually reaching a final elevation of approximately 530 feet at Bridgeport near Englebright Reservoir.

Changes in elevation also result in changes in relative air temperatures that will be encountered within each reach (i.e., relative air temperatures will increase with decreases in elevation and the influence of these warmer air temperatures will be greater in the downstream reaches). Thus, the South Yuba River (below Lake Spaulding to Englebright Reservoir) should be evaluated by segment, and we have outlined the specific segments and the data correlated with each segment in the following discussion. PG&E has provided factsheets for each reach of the South Yuba River (Jordan, Rucker, Fall, Canyon, Poorman, and Humbug) in this submission. It should also be noted that there are two other short reaches below Lake Spaulding; the "South Yuba below Spaulding Dam Reach" which is 0.2 miles long and goes from Spaulding Dam to Spaulding No. 2 Powerhouse, and the "South Yuba below Spaulding No. 2 Powerhouse Reach" is 0.7 miles and goes from PH #2 to Jordan Creek confluence. However, there are no data available within either of these very short reaches, and they are not included in the factsheets provided by PG&E below. PG&E's factsheets include information regarding the health of each river segment based upon the most recent readily available data from the specific water segments (see Figure I-1).

Second, PG&E believes that the guidelines in the US EPA Region 10 Water Quality Standard document (US EPA 2003) and proposed by Sullivan et al. (2000) do not necessarily apply to the conditions present in California streams. Thus, the existence of a number of exceedances of the guidelines that were developed specifically for Pacific Northwest fish populations should not result in the 303(d) listing of a California stream which exhibits different fish species and native fish assemblages than would be encountered in the Pacific Northwest. Consideration should be placed on the fact that current Basin Plan water use designations are inappropriate and unachievable as demonstrated by unimpaired hydrology for this river. Further, there are numerous concerns with using the US EPA Region 10 and Sullivan guidelines in this context, including the fact that the annual maximum water temperature could not be met naturally in many points along the South Yuba River below Lake Spaulding to Englebright Reservoir.

1. **The US EPA Region 10 Guidance was developed specifically for Pacific Northwest States and Tribes.** *The EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards* was a product of a three-year interagency effort involving data and information gathered from Idaho, Oregon, and Washington specifically. No data or information pertaining to California streams or fish populations were considered in the preparation of this guidance and therefore do not apply.
2. **The criteria were developed to protect specific species of fish (such as Bull Trout and Steelhead)**
Fish populations occurring in Sierra streams are significantly different populations that exhibit different life history strategies and growth dynamics than Northwest populations. Northern fish species are generally acclimated to colder stream water temperatures. Consequently, they spend relatively longer time in their native streams, grow slower to out-migrant size, and return at an older age to spawn than their southern counterparts. Adopting "Annual Maximum upper threshold criteria" from these northern species (based on the US EPA Region 10 and Sullivan et al. report) and applying them to California populations, without considering local species, local hydrology data, and local water temperature data is problematic.
3. **Most California or Sierra streams do not meet the US EPA Region 10 or Sullivan guidelines under natural conditions.**
Existing water temperature data do not support the use of a 21°C annual maximum water temperature because regulated flows in the South Yuba River (below Lake Spaulding to Englebright Reservoir) in the summer (July-September) are virtually identical to the unimpaired flows in the summer as shown in the plots below. Based on the fact that water

temperature data collected under regulated flows are greater than 20°C within approximately 10 miles below Lake Spaulding (PG&E 2008), it is essentially impossible that unimpaired hydrology would result in water temperatures lower than those observed under regulated flows in the summer. Furthermore, water temperatures in the South Yuba River above Lake Spaulding also exceed 20°C (PG&E 2008). Therefore, it is highly unlikely that the South Yuba River (below Lake Spaulding to Englebright Reservoir) under unimpaired hydrology would have ever supported the Basin Plan designation for COLD beneficial uses.



Ms. Sullivan also stated that many streams and rivers in California are probably not going to be able to achieve the suggested 21°C guideline water temperature naturally, and trying to would be difficult [SWRCB hearing transcript, *Consideration of a Resolution to Approve the 2002 Federal Clean Water Act Section 303(d) list of Water Quality Limited Segments*, dated February 4, 2003, on page 141 (lines 22-25)]. Therefore, the Sullivan and/or the US EPA guidelines should only be used as screening tools to indicate whether additional review of biological data or other lines of evidence are necessary to determine if the water segment is impaired.

Finally, the one line of evidence provided in the CVRWQCB's factsheet does not represent all of the known available data that should be considered when making a listing decision for the 303(d) list of impaired water bodies for the South Yuba River (below Lake Spaulding to Englebright Reservoir). PG&E is currently in the process of relicensing the Drum-Spaulding Project and data are being collected between 2007 and 2010 in support of the relicensing effort. Historical data and data collected in 2007 was presented in the Pre-Application Document (PAD) for the project, which is a publicly available document (PG&E 2008).

Table I-1 shows distribution of fish relative to river mile and water temperature observed during 2004 South Yuba River snorkel surveys (Gast et al. 2005 and PG&E 2008). These data show that there are more pikeminnow in the lower section of the South Yuba River and more trout in the upper section of the South Yuba River. These data support the conclusion that the lower South Yuba River is dominated by warm water species while the upper

South Yuba River is dominated by cold water species. Stream fish population studies have also been conducted in 2008 and will also be conducted in 2009 as part of the relicensing effort.

Table I-1. Distribution of fish relative to river mile and stream water temperature observed during 2004 South Yuba River snorkel surveys.

River Mile (beginning at head of Englebright Reservoir) ¹	Tributary Inflow	South Yuba Water Temperature (°C)	Rainbow Trout	Pikeminnow Hardhead ²	Pikeminnow	Hardhead	Suckers	Rainbow (Fry Lane)	Non-game (Fry Lane)
0.0									
3.5		25.1		•*					•
3.9		23.3	•	•*		•			•
4.2	Owl Creek								
5.7		25.1		•*			•		•
6.7		23.1			•		•		
10.4		24.0	•	•*	•				
12.0		20.7	•	•*					•
15.2		22.9	•	•*			•		•
16.0	Spring Creek	21.9	•*	•			•	•	•
18.1		24.5	•*	•			•	•	•
19.7		24.3	•*	•				•	•
20.6	Humbug Creek	22.8	•*				•	•	
23.3		22.6	•*	•			•	•	
24.5		21.4	•*	•				•	•
27.5		20.9	•*				•	•	
28.1	McKilligan Creek								
28.3		20.3	•*	•*			•		•
28.8	Poorman Creek								
35.8		18.1	•*					•	
36.0		17.3	•*					•	
40.6		17.3	•*						

Source: Gast et al. 2005

1 RM from Gast et al. (2005) slightly different than Licensee's RM measurement.

2 Pikeminnow and hardhead less than 4" in length not discernible.

* Higher population levels (Rainbow trout and Pikeminnow/Hardhead only).

Biological data suggest that the upper South Yuba River supports cold water species, primarily rainbow trout and brown trout (introduced); and the lower South Yuba River transitions into more of a warm water fish assemblage of native Sacramento pikeminnow and hardhead (Gast et. al. 2005). These findings are consistent with the observed range of water temperatures that have been documented in the upper and lower portions of the South Yuba River between Lake Spaulding and Englebright Reservoir (i.e., the upper South Yuba supports a COLD beneficial use and the lower South Yuba River supports a WARM beneficial use).

Therefore, it would be premature to list the South Yuba River for water temperature based upon the availability of additional data (such as water temperature data and biological data) that may provide additional support to

the conclusion that this river would never have been able to support the Basin Plan designated COLD water use under unimpaired hydrology.

Factsheets for each reach of the South Yuba River (Jordan, Rucker, Fall, Canyon, Poorman, and Humbug) are provided in this submission (see Figure I-1). Factsheets for all of the reaches in the South Fork Yuba River demonstrate that these reaches should not be listed for water temperature because known available data do not indicate impairment or there are no known data available to make a determination regarding listing. There is no justification for listing any river segment of the South Fork Yuba River on the 303(d) list of impaired water bodies for water temperature.

A listing cannot be based solely on one factor such as the US EPA Region 10 or the Sullivan et al. guideline to determine listing status, and listings cannot rely on a single source of data when there are numerous sources of data that are available and indicate that there is no impairment; nor would there have been impairment under the unimpaired hydrology (i.e., natural conditions).

References

- Gast, Tom, Mark Allen, and Scott Riley. 2005. *Middle and South Yuba Rainbow Trout (Onchorhynchus mykiss) Distribution and Abundance Dive Counts, August 2004*. Included as Appendix G of CDWR 2006.
- PG&E. 2008. *PG&E Pre-Application Document (PAD) for Drum-Spaulding Project*, prepared by DTA for PG&E. June 2008.
- PG&E and NID. 2009 Unpublished Data. *Technical Memorandum 3-1, Stream Fish Populations 2008 Report, prepared for NID's Yuba-Bear Hydro Project (FERC 2266-096) and PG&E's Drum-Spaulding Hydro Project (FERC 2310-173)*, unpublished data 2009.
- PG&E and NID. 2009 Unpublished Data. *Technical Memorandum 2-2, Water Temperature Monitoring 2008 Progress Report, prepared for NID's Yuba-Bear Hydro Project (FERC 2266-096) and PG&E's Drum-Spaulding Hydro Project (FERC 2310-173)*, unpublished data 2009.
- Sullivan, K., D. J. Martin, R. D. Cardwell, J. E. Toll, and S. Duke. 2000. *An analysis of the effects of temperature on salmonids of the Pacific Northwest with implications for selecting temperature criteria*. Sustainable Ecosystems Institute. Portland, OR. 192pp.
- U.S. Environmental Protection Agency (US EPA). 2003. *EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards*. EPA 910-B-03-002. Region 10 Office of Water, Seattle, WA.

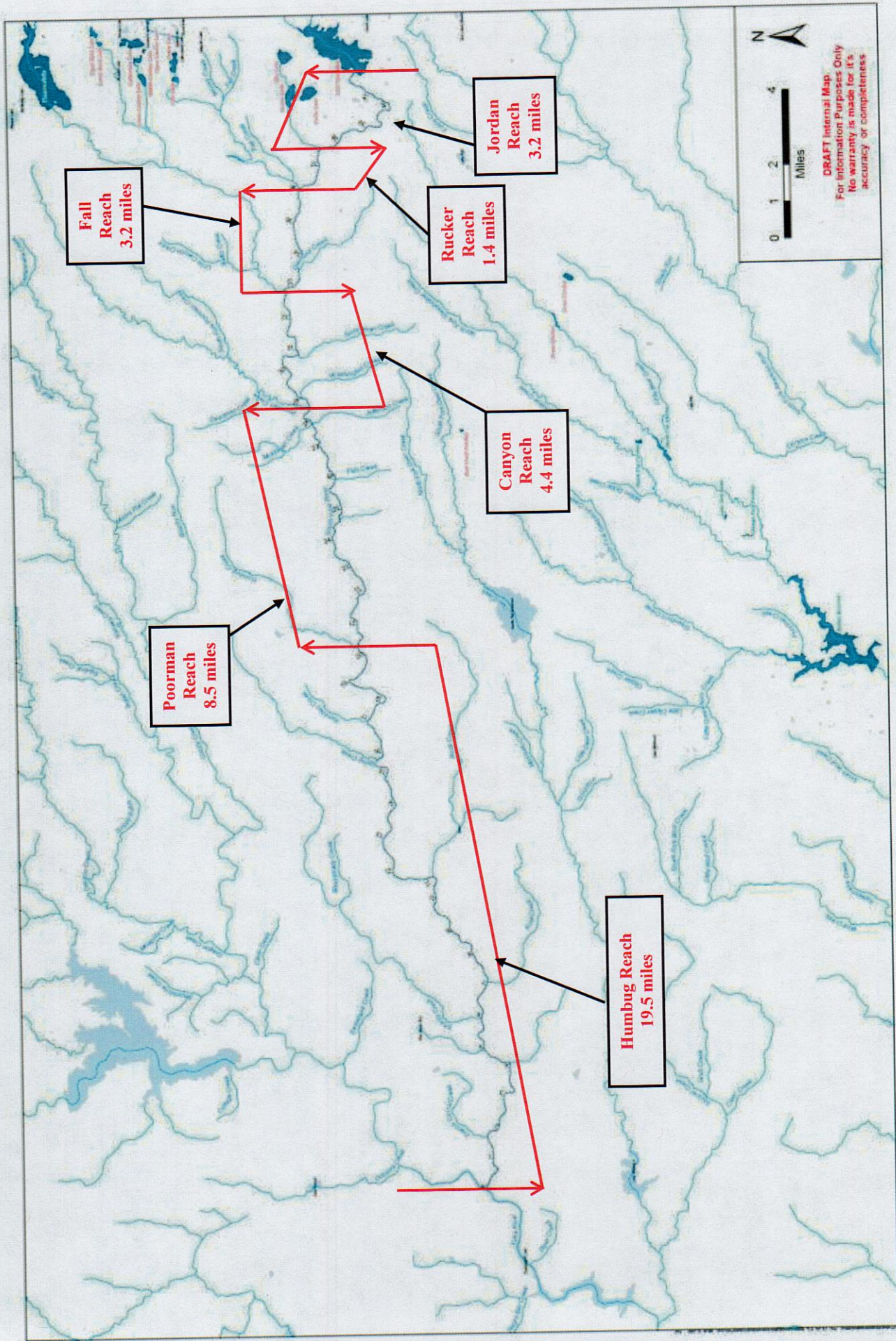


Figure I-1. Water Segment Delineation for the South Yuba River for Water Temperature Assessment

FACTSHEETS

**EVALUATION OF SOUTH YUBA RIVER (BELOW LAKE SPAULDING TO
ENLEBRIGHT RESERVOIR)**

BY SEGMENT OR REACH

WATER SEGMENT: South Yuba River – Reach #1: Jordan Reach (a total of 3.2 River Miles [RM]) from Jordan Creek Confluence (RM 40.2) to Rucker Creek Confluence (RM 37.0)

POLLUTANT: Water Temperature

SOURCE: No Source Listed; known available data do not indicate impairment

STATUS of Proposed 2008 303(d) LISTING: Listed

CVRWQCB STAFF BASIS: After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded.

PG&E RECOMMENDATION: Do Not List

PG&E COMMENT: Available receiving water temperature data (PG&E 2008) indicate that the water segment does not exceed either the Sullivan et al. (2000) or the US EPA Region 10 (US EPA 2003) guidelines under normal operations and that the water segment is biologically healthy; therefore, this water body should not be listed for water temperature. Average maximum daily average summer water temperatures in this reach occur in August and are less than 17°C for the 2003 and 2004 sampling periods (PG&E 2008).

The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Englebright Reservoir (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

References

PG&E. 2008. Pacific Gas & Electric Company Pre-Application Document (PAD), prepared by Devine Tarbell and Associates (DTA) for PG&E. June 2008.

Sullivan, K., D. J. Martin, R. D. Cardwell, J. E. Toll, and S. Duke. 2000. *An analysis of the effects of temperature on salmonids of the Pacific Northwest with implications for selecting temperature criteria*. Sustainable Ecosystems Institute. Portland, OR. 192pp.

U.S. Environmental Protection Agency (US EPA). 2003. *EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards*. EPA 910-B-03-002. Region 10 Office of Water, Seattle, WA.

WATER SEGMENT: South Yuba River – Reach #2: Rucker Reach (a total of 1.4 RM) from Rucker Creek Confluence (RM 37.0) to Fall Creek Confluence (RM 35.6)

POLLUTANT: Water Temperature

SOURCE: No source listed; no known available water temperature data in this reach

STATUS of Proposed 2008 303(d) LISTING: Listed

CVRWQCB STAFF BASIS: After review of the available data and information the CVRWQCB staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded.

PG&E RECOMMENDATION: Do Not List

PG&E COMMENT: The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Englebright Reservoir (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

There are no known available water temperature data in Rucker Reach, however, water temperature data collected upstream (in Jordan Reach) and downstream (in Fall Reach) indicate that there is no justification for listing this reach on the 303(d) list of impaired water bodies.

Additionally, information contained in PG&E's PAD (2008) indicates that the unimpaired hydrology in September in this reach is only 2.4 cfs (50% exceedance) higher than the regulated hydrology and this would not result in significantly different water temperatures in this reach under natural conditions.

Therefore, there is no justification for listing the Rucker Reach on the 303(d) list for water temperature.

References

PG&E. 2008. Pacific Gas & Electric Company Pre-Application Document (PAD), prepared by Devine Tarbell and Associates (DTA) for PG&E. June 2008.

WATER SEGMENT: South Yuba River – Reach #3: Fall Reach (a total of 3.2 RM) from Fall Creek Confluence (RM 35.6) to Canyon Creek Confluence (RM 32.4)

POLLUTANT: Water Temperature

SOURCE: No source listed

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information the CVRWQCB staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded.

**PG&E
RECOMMENDATION:** Do Not List

PG&E COMMENT: The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Englebright Reservoir (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

Known available water temperature data collected from Fall Reach do show that water temperatures reach 20°C or higher in the summer (PG&E 2008). However, hydrology information contained in PG&E's PAD (2008) indicates that the unimpaired hydrology in September is only 2.4 cfs higher than the regulated hydrology; and this would not result in significantly different water temperatures in this reach under natural conditions in the summer.

Therefore, there is no justification for listing the Fall Reach on the 303(d) list for water temperature.

References

PG&E. 2008. Pacific Gas & Electric Company Pre-Application Document (PAD), prepared by Devine Tarbell and Associates (DTA) for PG&E. June 2008.

WATER SEGMENT: South Yuba River – Reach #4: Canyon Reach (a total of 4.4 RM) from Canyon Creek Confluence (RM 32.4) to Poorman Creek Confluence (RM 28.0)

POLLUTANT: Water Temperature

SOURCE: No source listed

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information the CVRWQCB staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded.

**PG&E
RECOMMENDATION:** Do Not List

PG&E'S RESPONSE: The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Englebright Reservoir (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

Known available water temperature data collected from Canyon Reach show that water temperatures reach 20°C or higher in the summer (PG&E 2008). However, hydrology information contained in PG&E's PAD (2008) indicates that the unimpaired hydrology in August and September is virtually identical to the regulated hydrology in the South Yuba River at the Canyon Creek confluence; and this would not result in significantly different water temperatures in this reach under natural conditions in the summer.

Therefore, there is no justification for listing the Canyon Reach on the 303(d) list for water temperature.

References

PG&E. 2008. Pacific Gas & Electric Company Pre-Application Document (PAD), prepared by Devine Tarbell and Associates (DTA) for PG&E. June 2008.

WATER SEGMENT: South Yuba River – Reach #5: Poorman Reach (a total of 8.5 RM) from Poorman Creek Confluence (RM 28.0) to Humbug Creek Confluence (RM 19.5)

POLLUTANT: Water Temperature

SOURCE: No source listed

**STATUS of Proposed
2008 303(d) LISTING:** Listed

**CVRWQCB
STAFF BASIS:** After review of the available data and information the CVRWQCB staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded.

**PG&E
RECOMMENDATION:** Do Not List

PG&E COMMENT: The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Englebright Reservoir (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

Known available water temperature data collected from Poorman Reach show that water temperatures reach 20°C or higher in the summer (PG&E 2008). However, hydrology information contained in PG&E's PAD (2008) indicates that the unimpaired hydrology in the summer is virtually identical to the regulated hydrology in the summer; and this would not result in significantly different water temperatures in this reach under natural conditions in the summer.

Therefore, there is no justification for listing the Poorman Reach on the 303(d) list for water temperature.

References

PG&E. 2008. Pacific Gas & Electric Company Pre-Application Document (PAD), prepared by Devine Tarbell and Associates (DTA) for PG&E. June 2008.

WATER SEGMENT: South Yuba River – Reach #6: Humbug Reach (total of 19.5 RM), from Humbug Creek Confluence (RM 19.5) to Englebright Reservoir (RM 0.0)

POLLUTANT: Water Temperature

SOURCES: No source listed

**STATUS of Proposed
2008 303(d) LISTING:** List

**CVRWQCB
STAFF BASIS:** After review of the available data and information, CVRWQCB staff concludes that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

**PG&E
RECOMMENDATION:** Do Not List

PG&E'S COMMENT: The CVRWQCB listed the entire South Yuba River from Lake Spaulding to Englebright Reservoir (approximately 41+ RM). Arguments provided in the Water Segment Delineation Factsheet explain the necessity for determining appropriateness of listing or delisting based upon water segmentation of long rivers (30+ miles) with regard to environmental, biological, physical differences, as well as known availability of data within each individual reach (Attachment A).

Known available water temperature data collected from Humbug Reach show that water temperatures reach 20°C or higher in the summer (PG&E 2008). However, hydrology information contained in PG&E's PAD (2008) indicates that the unimpaired hydrology in the summer is virtually identical to the regulated hydrology in the summer; and this would not result in significantly different water temperatures in this reach under natural conditions in the summer.

Therefore, there is no justification for listing the Humbug Reach on the 303(d) list for water temperature.

References

PG&E. 2008. Pacific Gas & Electric Company Pre-Application Document (PAD), prepared by Devine Tarbell and Associates (DTA) for PG&E. June 2008.

Attachment J

PG&E's Comments on the Bear River Listing for Copper

WATER SEGMENT: Bear River (Amador Co, Lower Bear River Reservoir to Mokelumne River, North Fork)

POLLUTANT: Copper

SOURCE: Resource Extraction

**STATUS of Proposed
2008 303(d) LISTING:** Listed

SWRCB STAFF BASIS: After review of the available data and information, Central Valley Regional Water Quality Control Board (CVRWQCB) staff concluded that the water body-pollutant combination should be placed on the section 303(d) list because applicable water quality standards were exceeded and a pollutant contributes to or causes the problem.

**PG&E's
RECOMMENDATION:** List (based upon data from 2005 to the present only)

Pacific Gas & Electric Company (PG&E) believes the CVRWQCB proposed 2008 303(d) listing (CVRWQCB 2009) of the Bear River (Amador Co, Lower Bear River Reservoir [LBRR] to the North Fork Mokelumne River [NFMR]) for copper is based on faulty data that do not meet the listing requirements outlined in the State Water Resources Control Board's (SWRCB), *Water Quality Control Policy (Listing Policy) for developing California's Clean Water Act Section 303(d) List* (SWRCB 2004).

The CVRWQCB based their listing on one line of evidence. The data that the SWRCB used for the proposed 2008 listing was acquired by PG&E under an Annual Water Quality Monitoring Program required as part of the relicensing process required by the Federal Energy Regulatory Commission (FERC). The data were collected during a Supplemental Water Quality Monitoring Program that was conducted from March 2002-September 2003 (PG&E 2004a).

First, all analytical monitoring results for total or dissolved copper analyses that were obtained by PG&E as part of the Mokelumne Annual Monitoring Program or the Supplemental Monitoring Program from the 2000 through January 2003 were below the analytical methods reliability reportable limits (i.e., insufficient analytical detection limits required for comparison to the relevant water quality criteria). Therefore, 50% of the data that the CVRWQCB used for their proposed 2008 listing decision does not meet the

SWRCB's Listing Policy requirements that are described in Section 6.1.4 of the Listing Policy (SWRCB 2004).

Second, these samples were collected before the FERC required flow conditions for the Bear River had been fully implemented, therefore the sample results are obsolete and do not accurately represent the ambient water quality conditions under the new FERC flow requirements. The new FERC required flow releases had not been fully implemented until early 2005 (i.e., water quality monitoring results from 2005 represent Year 1 under the FERC required flow conditions).

PG&E's COMMENTS:

Mokelumne River Project Background

An Ecological Resources Committee (ERC) was established by the Mokelumne Relicensing Settlement Agreement (Settlement Agreement) FERC No. 137 (Project) to facilitate stakeholder involvement in the development and implementation of Project monitoring programs (PG&E 2000). Members of the Mokelumne ERC include the U. S. Forest Service, U. S. Bureau of Land Management, U. S. Fish and Wildlife Service, California Department of Fish and Game, California Department of Boating and Waterways, the Foothill Conservancy, American Whitewater Affiliation (MT), Friends of the River, and the Natural Heritage Institute.

Water quality data have been collected as part of the Mokelumne River Project's (FERC No. 137) license compliance annual water quality monitoring program since 2000. The water quality samples were initially analyzed for total copper content in 2000-01 (PG&E 2002a and 2002b, respectively) due to the historic use of a copper based aquatic pesticide in the Project's diversion canal to control growth of algae from Salt Springs Reservoir to the Tiger Creek Regulator (PG&E 2004b).

After the presence of total copper was identified, dissolved copper was also analyzed in order to compare the concentrations detected with the ambient water quality criteria. Through the analysis of the water samples, elevated copper concentrations were identified below the LBRR in the Bear River (sample station BR1). The identification of these elevated copper concentrations led to the implementation of the Supplemental Water Quality Monitoring Program to identify the source of the copper in the Bear River below the LBRR. Results of this study were given to the ERC the U.S. Forest Service, and to the SWRCB in a report titled, *Supplemental Water Quality Monitoring Program March 2002 through September 2003*, Technical and Ecological Services Report Number 026.11.04.7 (PG&E 2004b).

The data used in the CVRWQCB factsheet does not meet SWRCB 303(d) Listing Policy

Pursuant to California Water Code section 13191.3(a), the State policy for water quality control (Policy) describes the process by which the SWRCB and Regional Water Quality Control Boards (RWQCBs) will comply with the

listing requirements of section 303(d) of the federal CWA. The Policy objective is to establish a standardized approach for developing California's section 303(d) list in order to achieve the overall goal of achieving water quality standards and maintaining beneficial uses in all of California's surface waters (SWRCB 2004).

A binomial distribution is used to determine whether waters shall be placed on the section 303(d) list. If the number of measured exceedances (exceedance of the CTR) supports rejection of the null hypothesis as presented in Table 3.1 of the SWRCB Listing Policy a water segment will be placed on the section 303(d) list (SWRCB 2004). The minimum sample size for this binomial distribution is 16. In the case of the Bear River below LBRR, the SWRCB specifies that 69 samples collected monthly between 2002 and 2003 were used to compare to the CTR criteria for dissolved copper. According to the SWRCB, 67 of the samples exceeded the CTR criteria and according to Table 3.1 of the Listing Policy, that suggests listing on the section 303(d) list. Upon review of the data that the SWRCB sites in their listing, it is unclear where the 69 samples come from. A total of 59 samples were collected on the Bear River (from station BR1 below the LBRR outlet to the Mokelumne River, North Fork). Of these samples, approximately 50% were collected using inadequate sampling techniques and faulty laboratory methods (samples from 2002 through January 2003).

It should be noted that a majority of the samples collected between 2002 and January 2003 were "J" flagged or estimated values and should not be used in this evaluation of the data for listing due to the amount of uncertainty associated with this estimate (60% error). In addition, not all of the reasonably available and relevant information has been considered in regard to placement on the 303(d) list (e.g., inadequate sampling techniques and analytical laboratory methods may have resulted in sample contamination rendering the 2000 through 2003 samples not representative of the true water quality conditions in the water segments; and required FERC instream flow releases had not been fully implemented.

Unreliable Analytical Results

The data collected from March 2000 to January 2003 is unreliable because the total and dissolved copper samples were analyzed by Severn Trent Laboratories (STL) in Pleasanton, California using USEPA Method 220.0. The associated reporting limit (RL) and method detection limit (MDL) for this method are 5 ug/L and 0.3 ug/L, respectively. The MDL is rigorously defined (40 CFR 136) and represents the minimum concentration that can be reported with 95% confidence as different from zero. The RL is generally defined as the minimum concentration of a constituent that, under normal operating conditions, can be reported with relatively good certainty that the result is valid. The RL is set by the analytical laboratory and is generally three to ten times the MDL. Concentrations reported at the MDL can be subject to considerable variability. STL provided estimated (J) values for the sample results with concentrations that fell below the RL but that were above

the MDL. These estimated "J" values had an approximate error of 60%. The percentage of samples that were reported as "J" flag values for total copper during March 2000 to January 2003 by STL was 80 percent.

Concurrent with the initiation of the water quality monitoring program required under the Project license for the Mokelumne Project, the US Environmental Protection Agency (US EPA) published their *40 CFR Part 131, Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; California Toxic Rule (CTR)* (US EPA 2000). The US EPA stated that they were aware that the criteria promulgated in 2000 for some priority toxic pollutants were at concentrations less than many of the US EPA's available analytical detection limits that were being used by most analytical laboratories (US EPA 2000). This was the case for a majority of samples collected as part of the Mokelumne Project from March 2000 through January 2003 (detection limits for STL were not sufficient for comparison to the new US EPA CTR criteria).

As a result, PG&E began using the Department of Fish and Game's Water Pollution Control Laboratory (WPCL) in Rancho Cordova, California in order to be able to measure dissolved copper concentrations at lower levels compared to STL. Both STL and WPCL were used to analyze samples from March 2002 to January 2003 for comparison purposes. The method used by WPCL was American Public Health Association (APHA) Method 3113 (Standard Methods for the Examination of Water and Wastewater, 18th Ed. 1992) which had a RL of 1.0 ug/L. The percentage of dissolved copper samples that were reported as "J" flag values between March 2002 and January 2003 by both STL and WPCL was 61 percent.

WPCL's reporting limit still was not sufficient to analyze water samples in relation to the CTR criteria so PG&E altered the sampling and analytical techniques and began using the Department of Fish and Game's Marine Pollution Studies Laboratory (MPSL) in Moss Landing, California in February 2003 in order to have lower concentrations reported with greater confidence. MPSL is a state certified "Clean Lab" that uses USEPA Method 1638 (*Determination of Trace Elements in Ambient Waters by Inductively Coupled Plasma-Mass Spectrometry*) to analyze the copper samples (USEPA 1996a). The water samples were also collected using method USEPA Method 1669 for Ultra Clean sampling (*Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels*) (USEPA 1996b). MPSL's MDL for copper is 0.01 ug/L and the RL for copper is 0.03 ug/L, these values are well below the concentrations required for adequate comparison to the USEPA CTR ambient water quality criteria. There was no longer a need for estimated (J) values because a majority of the water sample concentrations for copper were above the lower RL achievable by MPSL.

Revised FERC Flow Conditions

As part of the Mokelumne Settlement Agreement, and the Forest Service 4(e) Conditions, minimum streamflows by month and water year type are specified for each stream reach of the Project (PG&E 2000). The minimum streamflow schedules have been separated into five water year types: Wet, Above Normal (AN), Below Normal (BN), Dry, and Critically Dry (CD). Minimum streamflows are required to be maintained in the Bear River below LBRR Dam. The streamflows up to 20 cfs are measured at PG&E gage M49, located about 200 feet downstream from the LBRR Dam. Streamflows above 20 cfs shall be measured at PG&E gage M32, about 3.75 miles downstream from the LBRR Dam.

The new FERC flow requirements for the Mokelumne River Project (FERC No. 137) had not been implemented prior to 2005. The equipment and tools necessary to make the new flows had not been modified/installed prior to 2005 and therefore the water quality data for the Bear River below LBRR prior to 2005 is considered obsolete due to the change in required flows. Water quality data collected in 2005 represent Year 1 under the FERC required new minimum streamflows.

Existing water quality data from March 2002 to April 2004 for dissolved copper concentrations at the Bear River from station BR1 were used to estimate dissolved copper concentrations under the new FERC flow requirements (PG&E 2003, 2004c, and 2005). The study found that in general the dissolved copper concentrations were reduced under the new flow requirements. Water quality data, including dissolved copper concentration measurements, have been collected as part of the Mokelumne River Project Annual Water Quality Monitoring Program in Year 1 (2005), Year 2 (2006), and Year 4 (2008) (PG&E 2006, Stillwater 2007a and 2007b, and Devine Tarbell & Associates [DTA] 2008, respectively). No dissolved copper concentrations were collected as part of the Annual Monitoring Program during Year 3 (2007). Data will continue to be collected as part of the licensed required Mokelumne Annual Water Quality Monitoring Program, and will be provided to the ERC for ongoing review and consultation.

Additional water quality monitoring data were collected during 2006 and 2007 as part of a monitoring program to collect additional information needed to characterize the the Bear River (conducted by CH2M HILL [2007] for PG&E). The purpose of the study was to collect general water chemistry data to evaluate any significant variations in water chemistry between the intake water (reservoir) and the receiving water (river); and to evaluate the potential presence of colloidal solids that may affect dissolved metals concentrations present in the Bear River (CH2M HILL 2007).

Therefore, the water quality results collected from 2000 through 2004 for the Mokelumne Annual Water Quality Monitoring Program are considered obsolete and not representative of the ambient water quality conditions under the new FERC flow requirements because the new flow releases had not been

fully implemented. Full implementation of the flows occurred in 2005 (Year 1).

PG&E Conclusion

Water quality data collected in Year 1 (2005 data), Year 2 (2006 data) and Year 4 (2008 data) from the Mokelumne Annual Monitoring Program do meet the SWRCB's Listing Policy requirements, and these data may be used to make a determination regarding the health or impairment of the Bear River for copper. No analytical data were collected in Year 3 (2007) for the Annual Monitoring Program; however, data are available (2006-2007) from the study conducted by CH2M HILL in 2007 for PG&E (CH2M HILL 2007) and these data also meeting the Listing Policy requirements and may be used to make a listing determination.

All of the known available data that meets the SWRCB Listing Policy are shown in the tables below. Table J-1 shows that a total of 18 samples have been collected in the Bear River below LBRR as part of PG&E's Mokelumne Annual Monitoring Program. Thirteen of the 18 samples exceed the hardness based - CTR for dissolved copper (all calculations of the criteria are based on the individual sample's hardness).

Table J-2 shows that a total of 12 samples have been collected in the Bear River as part of the additional monitoring study conducted by CH2M HILL during 2006 and 2007. Eleven of the 12 samples exceeded the hardness based-CTR for dissolved copper (all calculations of the criteria are based on the individual sample's hardness).

In summary, a total of 24 of 30 dissolved copper concentrations exceeded the CTR hardness based criteria. This does exceed the allowable frequency in Table 3.1 of the Listing Policy (SWRCB 2004).

Table J-1: PG&E's Annual Monitoring Program Results

Mokelumne River Annual Water Quality Monitoring Results for Dissolved Copper at Station BR1 (Bear River below LBRR) for Year 1 (2005), Year 2 (2006), and Year 4 (2008)

Year	Date	Hardness (mg/L)	Dissolved Copper (ug/L)	Hardness based criteria for CTR and USEPA	
				CCC (continuous conc, 4-day avg)	CMC (maximum conc, 1-hr avg)
Year 1	3/23/05	6.2	2.40	0.83	0.98
	5/24/05	9.0	1.20	1.14	1.39
	6/22/05	4.5	0.49	0.63	0.72
	7/21/05	8.9	7.39	1.13	1.38
	8/10/05	5.0	5.80	0.69	0.80
	9/28/05	10.1	1.90	1.26	1.55
	12/7/05	5.9	3.25	0.80	0.93
Year 2	3/21/06	8.2	0.64	1.06	1.27
	5/10/06	18.5	0.65	2.12	2.74
	6/19/06	6.1	0.39	0.82	0.96
	7/18/06	6.6	1.09	0.88	1.04
	8/16/06	5.5	1.02	0.75	0.87
	9/20/06	5.2	0.70	0.72	0.83
	12/18/06	6.5	2.54	0.87	1.02
	2/14/07	19.0	3.98	2.17	2.81
Year 4	3/18/08	9.0	4.46	1.14	1.39
	6/24/08	6.9	4.24	0.91	1.03
	9/24/08	6.2	1.63	0.83	0.98

highlighted cells are above one or both criteria

MDL 0.01 ug/L
RL 0.03 ug/L

CTR = USEPA 40 CFR Part 131, Water Quality Standards; Establishment on Numeric
Criteria for Priority Toxic Pollutants for the State of California, California Toxics Rule (CTR)
USEPA = US Environmental Protection Agency National Ambient Water Quality Criteria,
Freshwater Aquatic Life Protection Recommended Criteria.
CCC = Continuous concentration (4-day average)
CMC = Maximum concentration (1-hour average)

Table J-2: Results of the study conducted by CH2M HILL for PG&E during 2006 and 2007

Date	Hardness (mg/L)	Dissolved Copper (ug/L, filter 0.45 um)	Hardness based criteria for CTR and USEPA	
			CCC (continuous conc, 4-day avg)	CMC (maximum conc, 1-hr avg)
8/17/2006	4.95	1.04	0.69	0.79
9/13/2006	4.37	0.85	0.62	0.70
10/18/2006	4.73	0.81	0.66	0.76
11/15/2006	5.11	1.53	0.71	0.82
12/19/2006	5.01	2.23	0.69	0.80
1/18/2007	4.93	0.61	0.68	0.79
2/13/2007	6.41	3.79	0.86	1.01
3/22/2007	5.14	7.09	0.71	0.82
4/12/2007	4.95	2.6	0.69	0.79
4/25/2007	4.66	4.32	0.65	0.75
5/17/2007	4.35	3.38	0.61	0.70
5/23/2007	4.23	2.78	0.60	0.68

highlighted cells are above one or both criteria

MDL 0.01 ug/L
RL 0.03 ug/L

CTR = USEPA 40 CFR Part 131, Water Quality Standards; Establishment on Numeric
Criteria for Priority Toxic Pollutants for the State of California, California Toxics Rule (CTR)
USEPA = US Environmental Protection Agency National Ambient Water Quality Criteria,
Freshwater Aquatic Life Protection Recommended Criteria.
CCC = Continuous concentration (4-day average)
CMC = Maximum concentration (1-hour average)

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