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JANET K. GOLDSMITH, State Bar No. 065959
jgoldsmith@kmtg.com
DANIELLE R. TEETERS, State Bar No. 210056
dteeters@kmtg.com
STANLEY C. POWELL, State Bar No. 254057
spowell@kmtg.com
KRONICK, MOSKOVITZ, TIEDEMANN & GIRARD
A Law Corporation
400 Capitol Mall, 27th Floor
Sacramento, California 95814
Telephone: (916) 321-4500
Facsimile: (916) 321-4555

THOMAS M. BERLINER (SBN 83256)
tberliner@duanemorris.com
JOLIE-ANNE S. ANSLEY (SBN 221526)
jsansley@duanemorris.com
DUANE MORRIS LLP
One Market, Spear Tower, Suite 2200
San Francisco, CA 94105-1127
Telephone: (415) 957-3000
Facsimile: (415) 957-3001

Attorneys for Applicant James J. Hill III

BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

In the Matter of Water Right Application No. 30166 of James J. Hill, III	**APPLICANT'S CLOSING BRIEF**

The Reporters Transcript is cited as: [day of hearing] RT [page:line] [Witness] (testimony recap).
For example:
"III RT 225:11- 226:3 [Harvey] (no significant residual impact when wells turned off)" cites to the Reporter's Transcript for the third day of hearing (July 8, 2011), from page 225, line 11 to page 226, line 3, where Dr. Harvey testified about residual impacts of pumping.

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I. INTRODUCTION

This Board's decision on Application No. 30166 will decide the fate of the historic El Sur Ranch (the "Ranch" or "ESR"), which has pumped from the underflow of the Big Sur River for over 60 years. Without the continued diversion of water to adequately irrigate its pasture, the Ranch will have to cease operating. Yet, based upon the evidence presented in this matter, there is no scientific or public policy basis that would justify that result. Extensive scientifically-supported evidence presented by the Applicant (also referred to herein as "James Hill," "Ranch" or "ESR") has demonstrated that unappropriated water is available and that the irrigation practices of the Ranch are a reasonable and beneficial use of the water pumped from its wells. Further, the evidence presented by Applicant's consultants and the Water Board's own independent consultants conclusively establishes that the terms and conditions proposed by the Ranch in its Application, including its proposed minimum bypass flow requirements, are protective of the steelhead population and other resources of the Big Sur River ("River" or "BSR"). No evidence was presented by any other party to this proceeding that credibly proved otherwise.

Protestants in this proceeding have speculated that operation of the Ranch wells may, in theory, have an impact on steelhead in the Big Sur River. However, they have failed to provide the Water Board with credible evidence showing ***any impact*** of well operations on the steelhead population. Instead, they have offered conjecture and opinion based on questionable science, including testimony based on invalid assumptions, unreliable data or invalid models or methods, while ignoring the actual site-specific scientific data gathered over the course of three years of study.

Based on the evidence presented to the Board in this proceeding, Application No. 30166 should be granted as requested by the Applicant for the following reasons:

- The Big Sur River remains relatively pristine and supports a healthy, self-sustaining population of steelhead despite 60 years of unregulated pumping by the Ranch.

- No evidence has been offered demonstrating any adverse impact of Ranch well operations on the steelhead population of the Big Sur River, which serves as an indicator for any other species of concern.

- The evidence establishes that the proposed appropriation of water by the Ranch to irrigate its pastures is a beneficial and reasonable use of water and is vital to important public interest values.

- Finally, the terms and conditions proposed by the applicant, including minimum bypass flow requirements, are supported by extensive technical studies based on the best available science.

II. APPLICABLE LEGAL STANDARDS AND BURDEN OF PROOF

The public interest is the primary statutory standard guiding the Water Board in its consideration of applications to appropriate water.[1] In acting upon an application, the Water Board must balance the relative benefit to be derived from "all beneficial uses of the water concerned" including preservation of fish and wildlife,[2] taking into account water needed to protect public trust uses, whenever feasible.[3] And in determining what is "feasible," the Board "must determine . . . what level of protection "is consistent with the public interest."[4] The Board's decision must be supported by "substantial evidence in light of the whole record."[5] The Applicant and the proponents of minimum bypass flows "each have the burden of proving the facts to support their own proposals for a minimum bypass flow . . . . by a preponderance of the evidence."[6] Finally, as the Board's decision on Garrapata Water Company's Application No. 29664 demonstrates, permit conditions that embody impact criteria for instream flow are

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[1] ***Bank of America v. State Water Resources Control Board*** **(1974) 42 Cal.App.3d 198, 208.**

[2] **Cal. Water Code § 1257.**

[3] ***National Audubon Society v. Superior Ct.*** **(1983) 33 Cal.3d 419, 416.**

[4] ***State Water Resources Control Board Cases*** **(2006)136 Cal.App.4th 674, 778.**

[5] ***Johnson Rancho County Water District v. State Water Rights Board*** **(1965) 235 Cal.App.2d 863, 866; Cal. Code Civ. Proc. § 1094.5(c).**

[6] **In re Rock Creek Hydroelectric Project Permitted Applications Nos. 26380 and 27353, SWRCB WR Order No. 87-2, at 7; see also Cal. Evidence Code § 500.**

reasonable, implementable and enforceable in situations where diversion is by pumping from a subterranean stream.[7]

III. WATER IS AVAILABLE FOR APPROPRIATION

Water available for appropriation is all water flowing in any natural channel, excepting the quantity reasonably needed for useful, beneficial purposes on riparian lands, or otherwise appropriated.[8] The Big Sur River and its underflow averages over 85,000 acre-feet of water per year.[9] Of this, the Application seeks, at maximum, 1320 afy, about 1.6%, and an average of 1087 afy, 1.3%, of the river's average flow.[10] The Ranch's points of diversion are at the bottom of the watershed – 1300' from the ocean -- and downstream of all other points of diversion.[11] Thus, all water physically available at the Ranch wells is, under the Water Code, unappropriated water available for appropriation.[12]

Over 60 continuous years of diversion for irrigation of the Ranch pasture[13] prove irrefutably that there is sufficient unappropriated water in the Big Sur River to satisfy the request of Application No. 30166.[14] In addition, the evidence in the record consistently showed availability of unappropriated water: a water balance submitted by the Applicant, using the State Board's methodology showed it[15] and the FEIR, agreed, explaining that even in a critical

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[7] SWRCB Order 99-010 denying DFG request for reconsideration of Decision D-99-01.

[8] Cal. Water Code §§ 1201, 1202; SWRCB D-1632 at 20, pdf 30 (Carmel River).

[9] I RT 90:14-15 [Hill]; ESR-2 at 7-3, pdf 27 [Horton].

[10] ESR-40 [Fourth Amended Application 30166 Dated June 14, 2011].

[11] SWRCB-2; Draft Environmental Impact Report (DEIR) at 2-6, pdf 26; DFG-C-10 [Custis](showing the Ranch diversion points are the most downstream on the River).

[12] SWRCB Water Rights Decision D-1632, at 20, (Unimpaired streamflow, less water use under prior rights, constitutes the unappropriated water in the system).

[13] I RT 83:3-20 [Asmus] (water has been pumped to irrigate the "terrace" fields since at least 1946.)

[14] DFG-C-A at 4. [Custis] ("Subject to maintenance of bypass flows that are protective of fisheries and other public trust resources, and recognition of existing prior rights, subterranean stream flow is available for appropriation at the Ranch points of diversion (POD) within the flood plain of the lower Big Sur River.")

[15] SWRCB-2 (DEIR Appendix D – Water Availability Analysis); ESR-4 at 3-22 [Horton] and Tables 3-6A and 3-6B, pdf 190,191; SWRCB-2 [DEIR, at 2-18], PDF 38 ("the data and history of the Big Sur River fishery,

dry year, if only *half* of the flows available at the USGS [Pfeiffer-Big Sur] gage reached the project area "there would still be sufficient supplies to recharge the subterranean portion of the Big Sur River by over 10 times."[16] Even using median monthly flows, rather than the average annual flows prescribed in the Board's methodology, the calculations presented by DFG's hydrologist Kit Custis showed the availability of unappropriated water.[17] In rebuttal testimony, SGI hydrologist, Paul Horton, presented water balance analyses that demonstrated the availability of water.[18]

In sum, *all* the evidence in the record supports the finding that unappropriated water is available. Hence, the question presented for the Board's decision is not whether unappropriated water is available, but what conditions should be imposed in a permit to protect instream resources.

IV. EXTENSIVE HYDROLOGIC STUDIES HAVE FULLY CHARACTERIZED THE MAXIMUM PUMPING IMPACT ON BIG SUR RIVER SURFACE FLOWS AND WATER QUALITY

Utilizing the best scientific methodologies, SGI and its principal hydrogeologist, Paul Horton spent hundreds of hours in field investigation and hundreds more hours analyzing the thousands of data points it collected and also reviewed all available prior studies.[19] Data was collected in the driest portions of all three year types.[20] This comprehensive data set was the

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flows, and diversions support a conclusion that water is available for the diversions sought by Application No. 30133.")

[16] SWRCB-1 (Final Environmental Impact Report (FEIR) at 3 -121, pdf 196.).

[17] See DFG-C-13 [Custis] (all calculations of Cumulative Flow Impairment Index as percentage of median monthly flow show unappropriated water, per D-1362 and Water Code § 1202. Mr. Custis's legal conclusion to the contrary ignored the statutory definition of unappropriated water; was based on a flawed alternative analysis using inapplicable models; incorrect data; and ignored actual data collected in the Study Area).

[18] IV RT 29:1-40:6 and corresponding PowerPoint presentation ESR-61, slides 10 through 14.[Horton] (explaining water balance),

[19] ESR-2 [Horton] at pp 3-1 (pdf 12) (describes other key studies), 3-3 to 3-4 (pdf 13-15) (summarizing SGI's work), 11-1 through 11-5 (pdf 35- 39) (references reviewed by SGI); ESR-37 [Horton] slides 2, 5-7 and I RT 106:14-108:7 [Horton] (testimony summarizing data collection during study periods).

[20] ESR-2, p. v [Horton]; I RT 105:3-15 [Horton].

basis of Mr. Horton's conclusions concerning the essential attributes of the Big Sur River, its underflow, and the interrelation of irrigation pumping to the river's characteristics:

- The alluvium is unconfined, with high conductivity, reaching full drawdown and full recovery within a matter of days (80% in first 12 hrs; 90% in first 24 hours) and stabilizing within 3 to 4 days.[21]

- The zone of influence ("ZOI") of the Ranch wells -- the cone of depression increasing the gradient of the groundwater -- was calculated to extend no farther than approximately 1000' from the New Well.[22] The stretch of the River above the ZOI where the River *naturally* loses water to the aquifer is not (and cannot be) affected by pumping.[23]

- Pumping impacts stabilize in a matter of days and do not expand over time.[24] No significant "residual impact" of pumping occurs after wells are shut off.[25] No areal expansion of cone of depression occurs.[26]

- A "colmation layer" at the bottom of the stream retards percolation;[27] the layer is stable and reestablishes itself after disruption.[28] Percolation through the colmation layer is an order of magnitude slower than the groundwater flow in the alluvium.[29]

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[21] I RT 119:11-23 [Horton] and corresponding ESR-37, slide 22 (showing and discussing drawdown and recovery); see also IV RT 21:1 – 23:19 [Horton] and corresponding ESR-61 slide 4 (groundwater level response to pumping through 2004 irrigation season). ESR-61, slide 4 is attached as Attachment 1 for the convenience of the Board..

[22] I RT 115:13-22 [Horton] and corresponding ESR-37, slides 12 & 13 (showing 1,000' ZOI); See also: II RT 224:14-20; 226:18-22 [Custis] (DFG expert, Custis, estimates upstream edge of ZOI is between P5 and P6); ESR-10 (video presentation at counter numbers 6169-6700).

[23] IV RT 33:20 - 24 [Horton] (changes in water exchange between surface and groundwater can only occur within the ZOI); IV RT 33:13-22, 37:11-14, and corresponding ESR 61, slides 12, 13 [Horton].

[24] I RT 119:11-23 [Horton] and corresponding ESR-37, slide 22 (showing and discussing drawdown and recovery); IV RT 21:1 – 23:19 and corresponding ESR-61, slide 4 [Horton] (groundwater level response to pumping through 2004 irrigation season). ESR-2 at 7-2, pdf 26 [Horton].

[25] III RT 225:11- 226:3 [Harvey] (no significant residual impact when wells turned off); IV RT 44:6 - 22 [Horton] (no significant residual impacts because recovery occurs quickly when pumping stopped); III RT 264:13 – 265:6 [Harvey] (residual effects cease in about same time it took cone of depression to form).

[26] III RT 225:11- 226:11 [Harvey] (no areal expansion of ZOI when wells turned off).

[27] ESR-2, at 8-1 [Horton] (describing colmation layer); ESR-10 (Video at counter no. 7100-8850, and transcribed at I RT 111:3-11).

• At most 30% of pumping is sourced from surface flows; the maximum impact in reduction of surface flow within the ZOI is 1.2 cfs while pumping 5.02 cfs.[30] The greatest impact on water depth occurs at lowest edge of ZOI (head of the lagoon) and is not measureable, but is calculated to be, at most, 0.04 ft (about half an inch).[31] "Aquifer depletion" does not occur.[32]

• Where does the water come from? This question, asked repeatedly during the hearing, was answered definitively by Mr. Horton in rebuttal testimony:

> What we saw in 2007, again the critically dry year, at the driest portion of the year, . . . the average losses between that [USGS Pfeiffer-Big Sur] gage and VT1 was three cfs. So if I have ten [cfs] at the gage, [then] in the river surface flow when I come around this corner [to VT1], I have seven cfs on average. . . . [w]e know our underflow within the subterranean portion is around 3 1/2 cfs. . . . So for water balance, when I combine these, I have 10 1/2 cfs coming into the system. How can I have more [here] than the gage? There's streams also entering the river. There's people pumping out. Clearly, we still have a total increase over the 6 miles [between the gage and VT1]. . . As we move from the VT1 gage down to the top of this, my zone of influence -- . . . between these two zones, we've measured the average loss again in 2007. . . of three cfs that came out of surface flow and went into underflow. So it's exited the [surface] stream. The key thing about this part of the river is it's outside of our zone of influence. We cannot change what the river is doing. [naturally] . . . So now when I get ... to my zone of influence, I've got 6 1/2 cfs in groundwater now, and I've got 4 in the river, still [the]10 1/2 total water balance is adding up. I also have an estimated .6 cfs coming into the groundwater system from these terrace deposits. They're not totally impermeable, but relatively so. Now I have a total of at this point in time [of] 11.1 cfs that's got to move out through this system. ... When we're pumping the average pumping rate of El Sur Ranch, that's 2.9 cfs . . . . And so what

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[28] I RT 210:7-25 [Horton] (Colmation layer redevelops every spring); I RT 309:6-18 [Horton] (Colmation layer definitely developed during low flow periods).

[29] ESR-2 at 8-1 [Horton] (it is approximately 35 times easier for water to flow horizontally through the aquifer than vertically through the river bed to the aquifer); ESR-10 (video at counter numbers 8100 to 8850, and transcribed at I RT 111:12-18 [Horton]).

[30] ESR-2 at 8-2 [Horton]; IV RT 39:20 – 40:6 [Horton]; see also I RT 52:2-53:3 [Cook] (only a fraction of water pumped comes from surface flow of River); IV RT 31:8 – 35:10; 37:6-40:6 and corresponding ESR 61, slides 12-14 [Horton] (Explaining water balance).

[31] I RT 46:19-25 [Cook] (Correcting FEIR – "change in water surface elevation . . . [is] actually 0.04 ft, which translates to about .1 inch per cfs pumped."); I RT 105:14 – 105:6 [Horton], ESR-37, slide 4).

[32] I RT 119:25-120:11 [Horton] (groundwater elevations when irrigation operations ended for the critically dry 2007 season were, in fact, higher than those measured prior to the start of irrigation in 2004); ESR- 37 slide 23 [Horton]; IV RT 18:20-23:19, and corresponding slides ESR 61, slides 2-4 [Horton].

does that leave me? That leaves some 8.2 cfs that is getting out to the ocean in this case.[33]

Thus, whether the Ranch pumps operate at their [lagoon and] average rate of 2.9 cfs [34] or at 5.8 cfs, [35] surface outflow to the lagoon and ocean is maintained.[36]

- Hydrologic impact arguments presented by Protestants are not supported by credible evidence. DFG presented a water balance and impact analysis framed as a "bathtub model" using a Jenkins/Hunt modified SDF model.[37] As explained by both Dr. Harvey and Mr. Horton, that model is fatally flawed because it relies on inapplicable assumptions.[38] Mr. Custis admitted that it was not calibrated, and produced results that overestimated pumping by 14%.[39] Such erroneous reliance makes his analyses untrustworthy.

- Regarding the alleged one-to-one rate of impact between the rate of pumping and reduction of surface flow in the river assumed by Mr. Custis and Mr. Dettman, neither DFG nor Center for Biological Diversity[40] provided any field data, and the record is void of any data,

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[33] **IV RT 31:8 – 35:10; 37:6-40:6; ESR 61, slides 12-14 [Horton] (Explaining water balance as showing that whether pumping at average or maximum rates, outflow to the ocean and lagoon is maintained). Slides 12 and 14 are attached hereto as Attachment 2 for the convenience of the Board.**

[34] **IV RT 34:20-22 and ESR-62, slide 12 [Horton] (average Ranch pumping rate is 2.9 cfs).**

[35] **I RT 186:21-187:2, III RT42:21-44:4 [Horton]; SWRCB-1 (DEIR at 4.2-48, pdf126); ESR-61, slide 3 and corresponding testimony, IV RT 43:20-44:4 (Uncontradicted testimony showed that, due to varying elevation of the irrigated fields and in light of salinity limitations, pumping at 5.84 cfs could not be sustained for more than a few days). ESR-61 slide 3 is attached hereto as Attachment 3 for the convenience of the Board.**

[36] **IV RT 37:6-38:7 and corresponding slide ESR-61, slide 14 [Horton] (explaining water balance at 5.8 cfs pumping).**

[37] **II RT 116:7-22 [Custis].**

[38] **IV RT 26:13-27 [Horton] (Hunt model invalidly assumes river is always higher than groundwater elevation, thus dictating an incorrect conclusion that all pumped water must come from the surface flow of the river); ESR-61, slides 5-9; IV RT 23:22-28:12 [Horton] (explaining the problems with use of the Jenkins/Hunt model relied on by Custis); IV 27:17-28:11 [Horton] (Jenkins/Hunt model ignores recharge boundaries); see also ESR-61, slides 10-14; IV RT 222:23 – 224:1 [Harvey] (SDF and "bathtub" models ignore recharge boundaries "particularly important for the Big Sur River").**

[39] **II RT 96:11- 97:20 [Custis].**

[40] **The California Sport Fishing Alliance, Center for Biological Diversity and the Ventana Wilderness Alliance presented witnesses collectively. They are collectively referred to herein as "CBD".**

supporting the assumption.[41] Additionally, Mr. Custis and Mr. Dettman's analysis of pumping impacts relied on the clearly invalid assumption that maximum rates of pumping could be continued indefinitely.[42] As the maximum rate of pumping cannot be sustained for more than a few days due to salinity and field elevation issue, this assumption is also clearly erroneous.[43]

Mr. Dettman's speculation that pumping may "potentially" affect DO levels in the river was devoid of any suggested mechanism to explain potential impacts outside of the pumps' ZOI, and was based on measurements of dissolved oxygen ("DO") in surface water far upstream of the ZOI[44] and on uncritical acceptance of DO measurements of questionable accuracy taken from ESR irrigation records not certified or used by any hydrologist, while completely ignoring the DO measurements taken and recorded by the expert hydrogeologists from SGI.[45]

V. APPROVAL OF THE APPLICATION WILL NOT RESULT IN ANY SIGNIFICANT ADVERSE IMPACTS TO PUBLIC TRUST RESOURCES OF THE RIVER OF LAGOON

A. After 60 Years Of Pumping, The Big Sur River Remains Relatively "Pristine" And Supports A Healthy, Self-Sustaining Population Of Steelhead

Widely acknowledged as being relatively "pristine," including by the DFG, the lower River hosts a healthy and self-sustaining population of steelhead trout, a federally-listed

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[41] I RT 51:5 – 13 [Cook]. (DFG submitted no information supporting a one-to-one correspondence); I RT 53:12-22 [Cook] (no evidence of a one-to-one correspondence between pumping rate and surface flow impact).

[42] IV RT 42:21-44:5 [Horton] (Explaining that the maximum pumping rate cannot be sustained for more than 4-5 days due to salinity issues and the fact that maximum pumping rates occur only when irrigating the lower fields); I RT 284:21-285:2 [Hill] (field elevation determines the delivery rate and therefore diversion rate).

[43] *Joerger v. PG&E* (1929) 207 Cal.8, 23, "... it is not reasonable to suppose that one would destroy or impair the valve of his land by the use of an excessive amount [of water].

[44] CSPA/CBD-110 at 6:19-25 [Dettman] (Dettman concludes without an evidentiary basis that DO is "likely" impacted by ESR well pumping, and he merely speculates that greater pumping than actually occurred would be needed to show a "clear impact of well operations").

[45] IV RT 248:1-250:12 [Dettman] (does not know if DO data he relied on was properly collected); IV RT 251:10-15 [Dettman] (did not note that the DO data he relied on was not used by SGI or Hanson).

threatened species.[46] In a 2008 assessment, the National Marine Fisheries Service ("NMFS") characterized the River as one of the best preserved and least altered watersheds for South-Central California Coast steelhead.[47] Independent investigations have shown steelhead habitat on the River is highly functional [48] and supports good growth.[49] The upper River would support 1000's of additional steelhead.[50] Both Dr. Titus and Mr. Dettman pointed to studies alleging a recent significant decline in steelhead abundance on the River; however, neither of the sources cited provides actual evidence of a significant population decline.[51]

B. Ranch Well Operations Have No Impact On Habitat In The 50 Miles Of Upstream River And An Impact Within The Zone Of Influence That Can Only Be Inferred.

Located approximately 1300 ft. upstream of the mouth of the River,[52] El Sur Ranch ("Ranch") operations impact only a relatively small zone of influence ("ZOI") in the immediate vicinity of the wells.[53] The impact is so small that it cannot be directly measured, but only calculated from other measurements. Outside this ZOI, in the more than 50 miles of river upstream, well operations have no impact at all. In 2008, NMFS identified five threats to

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[46] DFG-T-A at 3; [Titus] (". . . not dependent upon intervention from hatchery production or rearing facilities...") DFG-T-1 at 3 [Titus] ("The Big Sur was selected as a study site because of it's relatively pristine, unregulated condition. . . .") and DFG-T-3 at 111 [Titus] ("The Big Sur River drainage is currently among the largest . . . that remains mostly pristine"). DFG-T-3 at 111 [Titus] (Only the lower seven miles is open to anadromy due to an upstream naturally-occurring barrier.)

[47] ESR-34, pdf 38-39 [NMSF] (Big Sur Coast BPG section).

[48] DFG-T-3 at 114-115 [Titus] ("Recent study of juvenile steelhead use in the lower Big Sur River shows the entire area, from the lagoon to the gorge, remains highly functional for steelhead production.").

[49] *See* ESR-32 at 33-37 [Collin (1998)] (BSR smolts are significantly larger than those in Waddell Creek, Jacoby Creek and the Alsea River).

[50] DFG-T-23 at 21 [Titus] (The River above the barrier has been characterized as excellent habitat and could result in a 1000% increase in the steelhead population.); DFG-T-3 at 113. [Titus] (At least 34 miles of high quality spawning and rearing habitat could be available above the blockage.)

[51] DFG-T-A, at 5 citing DFG-T-6 [Titus] and CPSA/CBD 100 at 4-5 [Dettman] citing a CEMAR 2008 report. *See also* III RT 98:22-101:9 [Dettman] (discussion of CEMAR 2008 report). There does not seem to be definitive evidence of population change. The situation is further clouded by the DFG's stocking program of catchable rainbow trout from 1953 until 1975, and planting of fingerlings prior to that time period. DFG-T-3 at 112 [Titus].

[52] ESR-4 at 1-3.

[53] ESR-2 at 7-1 [Horton] (SGI determined that the maximum ZOI of the irrigation wells extends no farther than a radius of 1,000 ft. from the New Well). Moreover, within the ZOI, many factors potentially impacting habitat quality and availability are independent of well operations, such as instream cover, riparian vegetation, substrate and flow coming from upstream. ESR-21: p. 6-7, ¶ 11 [Hanson]; IV RT 285:21-287:8 [Dettman]

steelhead productivity on the River: natural barriers, wildfires, other passage barriers, recreational facilities and roads.[54] Significantly, NMFS did not identify groundwater extraction or surface water diversion as threats, and analogies to other rivers by Dr. Titus and Mr. Dettman are inapposite.[55] Further, Department of Parks and Recreation identified the two key factors limiting steelhead productivity on the River to be the natural barrier and recreational impacts[56]

C. **Fishery Investigations Under Dry (2004), Wet (2006) And Critically Dry (2007) Conditions Showed No Evidence Of Adverse Impact On Habitat Quality Or Availability In The River Or Lagoon As A Result Of Ranch Pumping.**

With input from the SWRCB, DFG and NMFS, the Ranch conducted three years of investigation of instream habitat conditions and the juvenile steelhead population.[57]

1. <u>No Adverse Impact on River Stage</u>. In the critically dry year when the potential impact of pumping was expected to be greatest, no impact of irrigation pumping on river stage was discernible within the natural variations in river conditions and ambient conditions,[58] and could not be detected statistically,[59] though SGI calculated a theoretical

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[54] ESR-34, pdf 38, Table 2 [NMSF] regarding Big Sur River; (All threats were classified as "medium" or "low."). SWRCB 1, Category 1 Vol. 8, October 20, 2005 Letter from NMFS to SWRCB, (Note the NMFS assessment post-dates its 2005 comment letter to the SWRCB on the application).

[55] ESR-34, pdf 38, Table 2 [NMSF] regarding Big Sur River. (Table 2 shows water diversions not a threat); DFG-T-A, at 8 and CBD-100 at 9, 11 (provide no evidence that Carmel, Santa Rosa and Pajaro Rivers are analogous to BSR); *See* ESR-65 pdf 1-2 [Hanson] (comparing threats for rivers identified in NMFS 2008 assessment).

[56] ESR-30 at 14 [Duffy & Assoc., Inc. (2003)]. *See* also ESR-21, ¶¶ 78-79, at 39-40, for Dr. Hanson's discussion of additional potential limiting factors on the BSR. No evidence indicating that well operations were a limiting factor. *Id.* ¶ 79, at 39-40.

[57] ESR-22, ESR-23, ESR-24 and ESR-25 (studies by Dr. Hanson). IV RT 58:25-59:21 [Hanson] (The studies were modified to address DFG concerns and were also reviewed by NMFS). See, SWRCB 1, Category 1 Vol. 8, October 20, 2005 Letter from NMFS to SWRCB, (Note the NMFS assessment post-dates its 2005 comment letter to the SWRCB on the application). Based on agency concerns, steelhead were identified as the primary species of interest for the investigations. ESR-22 at 1-1; ESR-23 at 1-2; ESR-24 § 1.0, pdf 4-9.

[58] ESR-2 at 9-1-9-2, pdf 31-32 [Horton] (Daily evapotranspiration of riparian vegetation causes river fluctuations up to 0.1 ft).

[59] ESR-21, ¶31, at 18; ESR-24, § 3.1, pdf 15-17.

maximum downstream impact of 0.04 ft at the highest pumping rate.[60] A change this miniscule would not result in a detectable adverse impact on the quality or availability of habitat for juvenile steelhead.[61]

2. No Adverse Impact on Water Quality. Temperature,[62] electrical conductivity ("EC")[63] and dissolved oxygen concentrations ("DO")[64] within the river were all within the ranges considered to be suitable for juvenile steelhead at all times during the studies, except for DO levels at the south bank near Creamery Meadow, where naturally-occurring localized groundwater upwelling affected DO within the river at low flows.[65] The DO concentrations during this time were within a range considered to be stressful for juvenile steelhead whether the wells were on or off not statistically attributable to well operations.[66] Thus, the evidence does not support a conclusion that pumping will have any effect on DO under proposed permit conditions.[67]

No significant differences in water quality were detected that could be correlated with or otherwise attributed directly to well operations with the exception of a *de minimis* change of 0.3° C increase in water temperature detected at two locations at the critically low flows of

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[60] I RT 105:14 – 105:6 [Horton], ESR-37, slide 4.

[61] ESR-21 ¶31, at 18 [Hanson].

[62] ESR-21 ¶¶ 34 - 40, at 20-23 [Hanson]; ESR-22 at 4-3 [Hanson]; ESR-23 at 3-8 [Hanson]; ESR-24, § 3.3, pdf 18-22 [Hanson]; IV RT 78:11-19 [Hanson] (Showing suitable average daily and maximum daily temperatures using either an 18°C or 20°C guideline criteria.) Figure 19 of ESR-21 is attached hereto as Attachment 4 for the convenience of the Board.

[63] ESR-21 ¶¶ 44-45, at 25-26 [Hanson]; ESR-22 at 4-4–4-6 [Hanson]; ESR-23, at 3-10 [Hanson]; ESR-24, § 3.5, pdf 24-25 [Hanson] (Showing EC levels above lagoon within range suitable for juvenile steelhead rearing in all years).

[64] ESR-21 ¶¶ 42-43, at 24-25 [Hanson]; ESR-22, at 4-6–4-7 [Hanson]; ESR-23, at 3-13–3-14 [Hanson]; ESR-24, § 3.4, pdf 22-24 [Hanson] (Showing DO in rest of study area within range suitable for juvenile steelhead rearing in all years).

[65] ESR-21, ¶¶ 42-43, at 24-25 [Hanson]; ESR-22 at 4-6 [Hanson] (groundwater upwelling consistent with reduced water temperatures in same area); ESR-24, § 3.4, pdf 22-24 [Hanson] (short term localized reductions in DO under very low flows during 2007 Labor Day weekend).

[66] ESR-21, ¶ 43, at 25 [Hanson]; ESR-24, § 3.4, pdf 22-24 [Hanson].

[67] *Id.* ; SWRCB-1 [FEIR at 3-131,pdf 206] (DO within suitable levels when flow greater than 10 cfs.)

2007.[68] However, this increase was well within the natural daily variation in water temperatures and would not adversely affect habitat quality or availability for juvenile steelhead.[69] No contrary evidence was submitted, thus, all the evidence shows that well operations will have no adverse effect on temperature under proposed permit conditions.[70]

3. No Impact on the Lagoon.[71] SGI determined that natural dynamic water level conditions present in the lagoon prevent pumping from having an effect on riverine conditions within the lagoon.[72] Water quality conditions (temperature, DO and EC) within the lagoon remained within a range suitable for juvenile rearing throughout all three years of investigation.[73] There was no indication of prolonged vertical stratification of temperature or salinity that would adversely affect habitat suitability for juvenile steelhead, though very temporary localized stratification of salinity did occur when waves overtopped the sandbar.[74]

4. No Impact to Passage. Streamflow was sufficient to maintain connectivity among habitat units in the River except for limited periods of time when a sand bar precluded access to the ocean.[75] Based on passage criteria using the Thompson method[76] there was no

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[68] ESR-21 ¶¶ 38 (temperature), 43 (DO), and 45 (EC), pdf 21-22, 25-26 [Hanson]; ESR-22 at 4-2–4-7 [Hanson] (2004 Report); ESR-23 at 3-7–3-14 [Hanson] (2006 Report); ESR-24 §§ 3.3–3.5, pdf 18-25 [Hanson] (2007 Report).

[69] ESR-21 ¶¶ 38-39, at 21-23 [Hanson]; ESR-24, sec.3.3, pdf 18-22 [Hanson].

[70] *Id.*

[71] ESR-21 ¶¶ 67-73, at 35-37 [Hanson]; ESR-25 [Hanson]. *See* IV RT 79:8-21 [Hanson] (Data collected by Dr. Melissa Foley (Stanford University) corroborates findings that well pumping has no detectable impact on the lagoon); *accord* FEIR RTC 2-80 at 3-52

[72] ESR-2 at 9-1 [Horton].

[73] ESR-21 ¶¶ 67-73 at 35-37 [Hanson]; ESR-25, generally [Hanson]; *See* FEIR RTC 1-4 at 3-3 (temperatures in lagoon acceptable to optimal regardless of pumping); ESR-21 ¶75, at 37-38 [Hanson] (habitat conditions within the lagoon not a limiting factor).

[74] II RT 9:10–10:5 [Hanson] (Localized salinity stratification was observed when waves overtopped the sandbar that would mix and dissipate in a matter of days or hours); ESR-21 ¶ 73, at 37 [Hanson] (no evidence of persistent vertical stratification in water quality).

[75] ESR-21, ¶¶ 6, 46 and 48, at 21, 26-27 respectively [Hanson]; ESR-22, at 5-2 [Hanson]; ESR-23, at 4-2 [Hanson]; ESR-24, § 3.6, pdf 25 [Hanson].

[76] ESR-23 at 2-5 [Hanson]; ESR-24, § 2.6 and Tables 3-17 [Hanson] (passage criteria of 0.6 ft. was used for adult steelhead and 0.3 ft. for juvenile steelhead). *See also* III RT 61:16-24, IV RT 293:8-21 [Dettman] (0.3 ft appropriate for juvenile passage); I RT 269:16-23 [Hanson] (depth of 0.5 ft was appropriate for rearing habitat as opposed to passage).

evidence that well operations were a statistically significant factor affecting passage conditions in 2006 and 2007.[77] Even in critically dry 2007, passage opportunities existed for juvenile steelhead within the ZOI (Passage Transects ("PT") 2 through 10)[78] with the exception of the days immediately following the Labor Day weekend under unusually low flows at PT 4 and 10.[79] These shallow water depths were not significantly related to well operations, but appeared to be a response to channel gradient, width and extreme low river flows.[80] Mr. Dettman testified that adult passage was marginal at a riffle at the head of the lagoon (PT 4).[81] However, he used a non-scientific adaptation of the Thompson method, making adjustments to his transects to include shallower water, moving as much as 6 ft. off his transect in some instances.[82] While PT 4 has changed since his investigations, Dr. Hanson found that Mr. Dettman's data indicate sufficient passage for adult steelhead.[83] Additional measurements on July 4, 2011 at a flow of 60 cfs also showed adequate passage for juveniles and passage opportunities for adult steelhead.[84] Mr. Dettman also alleged high flows are needed for adult passage at two other riffles, but did not assess passage with transect measurements.[85]

Instream flow sufficient for providing juvenile steelhead passage and which would help alleviate localized naturally-occurring reduced DO levels was determined to be 8.2 cfs at the

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77 ESR-21, ¶¶ 49-51, at 27-28 [Hanson]; ESR-24 § 3.6, pdf 25-31 [Hanson].

78 II RT 16:2-8 [Horton] (No impact of pumping to surface water detectable at P-4-ul below PT 11) (transcript refers to VT 11 in error, should have said PT 11).

79 ESR-21 ¶¶ 50-51, at 27-28 [Hanson]; ESR-24 § 3.6, pdf pp. 25-31 [Hanson]; ESR-21 ¶ 50, at 27 [Hanson], (On 9-5-2007, the flow at VT 3 was 0.35 cfs).

80 *Id.*

81 CPSA/CBD-100 at 12 [Dettman]; CPSA/CBD-103 at 2 [Dettman]; III RT 130:14–23 [Dettman].

82 III RT 126:23–127:16 [Dettman]; IV RT 305:24–306:10 [Dettman]. He also measured at intervals of 1 ft and 2 ft. respectively on his two transects, whereas Dr. Hanson measured at 0.5 ft. intervals. III RT 126:23-25 [Dettman]; ESR-23, p. 2-4; ESR-24, sec. 2.6, pdf 13 [Hanson].

83 IV RT 66:25-67:23 [Hanson]

84 IV RT 65:19–67:23 [Hanson]; IV RT 14:9-13 [Philipp]. Judgment is needed when applying the Thompson criteria taking into account considerations of fish size and habitat conditions that would influence passage. IV RT 67:11-23 [Hanson]; IV RT 307:1-10 [Dettman].

85 CPSA/CBD-100, at 15 [Dettman]; CPSA/CBD-103, at 6 [Dettman].

USGS gauge.[86] An additional buffer of 1.8 cfs was added to the 8.2 cfs to obtain the proposed bypass flow of 10 cfs for May through October.[87]

Data collected during higher flows in 2006 was used to assess instream flow for adult steelhead passage (November through April) using a conservative depth criteria of 0.7 ft.[88] Initial regression analysis of measurements at Passage Transect 11 estimated sufficient adult passage at 30 cfs.[89] Additional field measurements made on September 1, 2010 found that adult passage conditions existed when flows were 28 cfs at the USGS gauge.[90]

5. No Impact on Juvenile Abundance, Survival or Growth. Consistent with observations of good habitat quality,[91] juvenile steelhead in good health and condition were observed rearing within the lower river and lagoon during 2004 and 2007.[92] In both 2004 and 2007, the highest densities of juvenile steelhead were observed in the lagoon.[93] An analysis of rearing habitat at 10 cfs at the USGS gauge found that 92% of the study area met a 0.5 ft. juvenile rearing criteria.[94]

Juvenile steelhead showed a high summer survival rate (86%) in 2004[95] and a pattern of increased size and high rate of growth over the summer months, compared to other coastal

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[86] I RT 134:5-7 [Hanson]; II RT 15:2-25, [Hanson] (based on 2007 passage measurements at PT 11, a critical riffle for juvenile passage, and water quality data). In *accord* generally, SWRCB-1, category 1, vol. 8, October 20, 2005 NMFS Letter to SWRCB.

[87] II RT 15:2-25, [Hanson].*See also* SWRCB-1 [FEIR at 3-131, pdf 206] (at flows over 10 cfs there appeared to be sufficient water exchange that DO levels were not lethal or stressful for steelhead)

[88] ESR-21 ¶ 52 at 28-29, [Hanson]; *accord* DFG-T-A, p. 15, [Titus] (DFG Expert Dr. Titus also recommended assessing adult steelhead passage using a 0.7-0.8 ft. passage criteria).

[89] ESR-21 ¶ 52, at 28-29 [Hanson].

[90] *Id.*

[91] DFG-T-3, pp. 114-115 [Titus]; ESR-21 ¶ 28, at 16-17 [Hanson]. (Drs. Titus and Hanson both found the lower river and lagoon provided high quality habitat for steelhead migration and rearing.)

[92] ESR-21 ¶¶ 57 and 66, at 30 and 34 [Hanson]; ESR-22, at 4-7, 4-8 [Hanson]; ESR-24, §3.7.1 at 31-32 [Hanson].

[93] ESR-22 at 4-7–4-8 [Hanson]; ESR-24, §3.7.1 at 31-32 [Hanson].

[94] IV RT 62:9-19 [Hanson] (assessing water depths at passage and velocity transects).

[95] ESR-21 ¶ 60, at 31-32 [Hanson]; ESR-22, pp. 4-7- 4-8 [Hanson] (Showing good habitat quality and availability, suitable water quality conditions and good summer base flows).

rivers.[96] High growth rates and a large percentage of age-1 smolts in the River are consistent with findings that seasonal water temperatures are suitable and that food supplies are sufficient to support high rates of juvenile growth and physiological development,[97] completely contradicting and discrediting Dr. Titus's statement that the steelhead in the Big Sur River are "starving."[98]

Despite good habitat conditions, juvenile steelhead densities for the Big Sur River are low compared to other rivers.[99] However, there was no evidence from the 2004, 2006 or 2007 studies that well operations were a limiting factor affecting the ability of juvenile steelhead to successfully rear within the lower River.[100]

Dr. Titus's remarkable statement that fish on the River are "starving"[101] is unsupportable. Evidence submitted by Dr. Hanson of steelhead length-weight relationships for rivers from Alaska to California belies Dr. Titus's generic conclusions about the poor condition of juvenile steelhead on the Big Sur River.[102] These studies showed steelhead population length-weight relationship slopes ranging from 2.58 to 3.31 with Dr. Titus's April 1994 slope of

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[96] ESR-21 ¶ 59, at 31 [Hanson]; ESR-39, slide 36, [Hanson] (comparison of Juvenile Growth Rates), attached hereto for the convenience of the Board as Attachment 12; ESR-32 at 33-37 [Collin (1998)] (Smolts in the BSR were significantly larger than Wadell Creek, Jacoby Creek, and Alsea Creek); ESR-21, ¶ 76, p. 38 [Hanson].

[97] ESR-21 ¶¶ 16, 76, at 11, 38 (Investigations by Hanson, Titus et al. (2003) and Collin (1998) show that growth rates of juvenile steelhead rearing in the lower River are high, with juveniles reaching smolt stage at age 1.); ESR-21 ¶ 17, at 11-12; ESR-22, p. 1-13 (Juvenile steelhead that experience rapid growth may undergo the smolt transition and migrate at age 1.); II RT 194:20-195:3 [Titus] (BSR steelhead enter the ocean primarily as 1-year olds, indicating a size sufficient to support survival in the ocean.). *See also* in accord III RT 34:19–35:4 [Dettman] (acknowledging importance of BSR producing smolts in one year); ESR-30 at 11 [Duffy] (steelhead productivity not limited by food supply or temperature).

[98] II RT 256:19 – 257:16 [Titus].

[99] ESR-21 ¶¶ 75, 77, at 37-39 [Hanson]; IV RT 282:5-21 [Dettman] (acknowledging that density could be low and, yet, habitat quality good.) Regarding the Carmel River, *see* IV RT 76:12 -16 {Hanson].

[100] ESR-21, ¶ 66 at 34 [Hanson]. *See* ESR-21 ¶¶ 76-79 at 38-40 (discussing other potential limiting factors to steelhead productivity on the Big Sur River).

[101] II RT 256:19 – 257:16 (Titus).

[102] IV RT 68:23–69:14 [Hanson] (A slope of 3.0 for a weight-length relationship is a general metric that is non-species specific.); IV RT 69:23-73:7 (Hanson) citing ESR-63 [McLaughlin (2009)], App. A providing information on approximately 100 studies of juvenile steelhead populations on the West Coast; ESR-65 at pdf 7-10 (length-weight relationships for juveniles on the Pacific Coast). ESR-65 is attached hereto as Attachment 5 for the convenience of the Board.

3.31 being the highest recorded of all studies and the rest of his reported slopes generally falling within the upper third of all reported relationships.[103] A separate NMFS study of the Big Sur River found a weight-length relationship slope of 2.994.[104]

Dr. Titus's further contention that appreciable growth occurs only at flows between 20 cfs and 60 cfs is inaccurate and based on a limited and flawed growth study.[105] Dr. Titus suggests that the underlying mechanism is reduction in food availability (drift) at low flows.[106] However, the relationship between flow and drift is not simply 1:1.[107] His analysis underrepresented growth on the River by sampling only in less-productive upstream habitat,[108] by excluding deeper pools which are known to be preferred by larger juveniles[109] and by failing to include the lagoon.[110] Moreover, slowed growth in the summer low-flow months is typical for central coast rivers.[111] Dr. Titus presented no evidence that pumping could have a biologically significant effect on food production in the last 1000 ft. of the River. Indeed while food production can be correlated to reduced growth, Dr. Titus's contention that there is no macroinvertebrate drift ignores basic drift dynamics, to which Dr. Reiser testified.[112]

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[103] **IV RT 69:23-73:7 [Hanson] citing ESR-63, App. A [McLaughlin (2009)].**

[104] ***Id.***

[105] **DFG-T-A at 9-13 [Titus].**

[106] ***See* DFG-T-A, p. 12 [Titus].**

[107] **IV RT 74:11–75:17 [Hanson] (discussing DFG-T-11).**

[109] **DFG-T-1 at 4 [Titus] (pools underrepresented because most too deep to sample). Juvenile steelhead move to deeper pools as they grow. ESR-22 at 2-5 [Hanson]; DFG-T-1 at 6 [Titus]; III RT 70: 8-23 [Dettman]. (Preferred habitat for juvenile steelhead on the lower BSR appeared to be deep water combined with a cover component.) ESR-22 at 5-3 [Hanson]; ESR-24, § 3.7.1, pdf 31-33 [Hanson].**

[110] **DFG-T-1, at 9-10 [Titus] (The lagoon and river outlet were dropped from sampling even though the lagoon appeared to be heavily used by juvenile steelhead); DFG-T-A at 13 [Titus] citing DFG-T-17 [Bond et al. (2008)] and DFG-T-18 [Atkinson (2010)] (Research demonstrates the important growth benefits of juvenile steelhead rearing in lagoons and estuaries).**

[111] **II RT 193:13–21 [Titus]; IV RT 67:24 – 68:14 [Hanson].**

[112] ***See* II RT 311:6–312:1 [Titus]; III RT. 232:9–235:4 [Reiser] (explaining drift dynamics); III RT 284:19-285:15 [Reiser] (Dr. Reiser stated that he has only seen one or two rivers where food was limiting, which were headwater streams where productivity is low. In larger river system, such as the BSR, he wouldn't consider food as being necessarily limiting).**

VI. **PROTESTANTS HAVE FAILED TO ESTABLISH BY A PREPONDERANCE OF EVIDENCE THAT PUMPING BY THE RANCH HAS HAD AN ADVERSE IMPACT ON HABITAT CONDITIONS IN THE LOWER RIVER OR LAGOON.**

A. **DFG Expert Dr. Titus Contended Much, But Proved Nothing Regarding Adverse Impacts To Steelhead Productivity.**

By ignoring site specific data and other analyses, Dr. Titus failed to use the best available science in forming his opinion on the impacts of the Ranch's permit application.[113] For example, Dr. Titus did not (i) review the draft and final Environmental Impact Reports prepared for the Water Board,[114] or (ii) consider or evaluate the investigations performed by Hanson or SGI in 2004, 2006 and 2007.[115] Instead, Dr. Titus mostly relied on data from the early 1990s that was collected for a different purpose.[116] Further Dr. Titus used a generic metric to argue that growth on the river was below normal[117] and, also, used a non-standard, non-scientific wetted perimeter analysis.[118] Dr. Titus's testimony included unsupported speculations regarding the potential impacts of Ranch pumping on the River,[119] but no actual investigation of the impacts of Ranch pumping or evidence of causation.[120]

B. **The DFG's Wetted Perimeter Analysis Is Inherently Unreliable For The Purpose Of Setting A Minimum Bypass Flow.**

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[113] **II RT 196:12-15 [Titus].**

[114] **II RT 196:3-5 [Titus].**

[115] **II RT 196:6-15 [Titus]; *see also* DFG-T-A [Titus' written testimony], generally.**

[116] **II RT 178:17–179:14, 196:9-11 [Titus]; DFG-T-1 at 2-3 [Titus]; II RT 178:7-16, [Titus] (Indeed, Dr. Titus' last work on the mainstem of the Big Sur River was in 1995.)**

[117] **IV RT 68:23–69:14 (Hanson) (A slope of 3.0 for a weight-length relationship is a general metric that is non-species specific.)**

[118] **DFG-T-22 at 1-2 (describing standard methodology); II RT 183:13–188:22 [Titus] (Titus adapted the standard methodology); ESR-53 at 163-164 [Annear et al. (2004)] (describing the standard methodology); ESR-54 at 3-7 [Reiser](Dr. Titus' methods do not conform to standard methodology resulting in unreliable data).**

[119] ***See e.g.,* DFG-T-A, at 2, 5 and 7 [Titus].**

[120] **II RT 177:22-178:5 [Titus] (no investigation or evidence of take); II RT 182:22-183:5 [Titus] (no assessment of whether water quality parameters are affected by pumping); II RT 203-3-19 [Titus] (testimony describes possibilities but not actual impacts and no causation established) II RT. 277:10-14 [Titus] (work on BSR was above Ranch ZOI and not directed towards assessing impact of pumps on passage).**

Dr. Titus's nonstandard methodology[121] produced inaccurate wetted perimeter flow relationships because (i) the original data was not collected for use in a wetted perimeter analysis;[122] (ii) the data sites were well upstream and not representative of the tidally influenced stretch of the river at the ZOI;[123] (iii) fixed transects, critical to developing accurate wetted-perimeter-flow relationships, were not used; instead, Dr. Titus averaged different transects measured at different times along different lengths of the river in habitat units, thereby "mixing apples and oranges" by combining measurements from one location with measurements from different locations, an unreliable approach for developing accurate wetted perimeter-flow relationships;[124] (iv) only one depth and one width measurement was taken at each of transect instead of multiple cross-sectional measurements to accurately measure wetted perimeter;[125] (v) there was no consistency in flow conditions measured at each location such that five of the sites did not include low flow measurements measured at the other 5 sites;[126] and (vi) there was no evidence that the use of a second breakpoint ("incipient asymptote") was warranted;[127] use of the first breakpoint to set a minimum flow is the standard application of the method.[128]

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[121] **II RT 183:13–188:22 [Titus] (Dr. Titus adapted standard methodology); ESR-54 at 3-4 [Reiser] (Dr. Titus' methods do not conform to standard methodology); *See also* DFG-T-22 at 2-4 [Titus] (describing Titus' methods); ESR-53 at 163-164 [Annear et al. (2004)] (describing standard methodology).**

[122] **II RT 178:17–179:14 [Titus]; DFG-T-1, at 2 [Titus]; DFG-T-2 [Titus' field notes].**

[123] **II RT 70:12-19 [Titus]; II RT 190:23 – 191:4 {Titus]. *See* III RT 235:22–236:8 [Reiser] (A wetted perimeter analysis in a tidally-influenced area is problematic because tides can affect the amount of wetted perimeter observed regardless of flow).**

[124] **II RT 184:15-25 [Titus]; II RT 272:14–273:6 [Titus]; DFG-T-22 at 3-4 [Titus]; ESR-54 [Reiser] at 4-5 (explaining the importance of fixed transects).**

[125] **DFG-T-22, at 3-4 [Titus]; ESR-54 at 3 [Reiser] (describing a more robust survey approach).**

[126] **III RT 249:15–251:6 [Reiser]; ESR-54 [Reiser] at 6.**

[127] ***See* III RT 253:9-25 [Reiser] (describing conditions under which further breakpoints might be considered, such as dramatic changes in the relationship).**

[128] **II RT 184:11-14 [Titus]. ESR-53 [Annear et al. (2009)] at 163 (describing the standard methodology and use of the first breakpoint, which has been estimated to protect 50-80% of the maximum wetted perimeter).**

Dr. Titus's wetted perimeter analysis produced inaccurate and anomalous results that should not be relied on or used for determining minimum flow recommendations,[129] because curves were fitted and breakpoints estimated by eye,[130] the initial inflection points were defined by the lowest measured flow indicating that the number and ranges of flows were insufficient to accurately define the wetted-perimeter flow relationships and that the actual breakpoints could have occurred (and actually did occur) at lower flows.[131] As a result, his analysis produced anomalous results impossible in nature with the data showing instances of decreases in wetted perimeter with increasing flows.[132] These anomalies were clearly a function of not having fixed transect locations as well as having different distances measured at each of the times they surveyed.[133]

Finally, Dr. Titus's further wetted perimeter analysis, using data from VT 1, suffers from the same flaws and is as unreliable as his original analysis, since it uses data from upstream of the ZOI,[134] did not use fixed transects,[135] and followed the same procedure as the original analysis.[136]

C. Dr. Titus Improperly Applied The Board's North Coast Stream Policy And Used Regional Formulas As Opposed To Site Specific Data To Formulate Its Winter Bypass Flow Recommendation Of 132 Cfs For The Big Sur River.

Section 2.2.2 of the Board's Policy for Maintaining Instream Flows in Northern California Coastal Streams expressly states that site-specific data supersedes regional criteria. Dr. Titus

[129] ESR-54 at 3-7 [Reiser]; III RT 243:21 – 254:3 [Reiser] (explaining bais for conclusion that Dr. Titus' analysis was not reliable).

[130] II RT 187:2-4 [Titus].

[131] ESR-54, at 6-7 [Reiser]; III RT 249:12–252:22 [Reiser]; ESR-52, slides 26 and 27 [Reiser] (illustrate the difference in percent wetted perimeter protected between sites visited at low flows and not visited at low flows); As an example, Slide 26 is attached hereto as Attachment 6 for the convenience of the Board.

[132] III RT 247:15-248:15 [Reiser]; ESR-52 slides 14-23 [Reiser] (an example of which (slide 14) is attached hereto as Attachment 7 for the convenience of the Board

[133] *Id.*

[134] *See* ESR-24, fig. 2, pdf 48 [Hanson] (showing location of VT 1).

[135] IV RT 17:3-16 [Philipp] (fixed transects not used at VT 1).

[136] IV RT 179:12 – 180:18 [Titus] (same procedure used for both analyses); IV RT 184:6-11 [Titus](data collected was as reliable as original data);

testified that he was aware of Section 2.2.2, but didn't follow it.[137] He neither provided evidence of the applicability of regional formulas derived for northern California streams to the River,[138] nor did he perform any site-specific studies or measurements to validate his bypass flow number or consider the most recent site-specific scientific data for the River collected by SGI and Dr. Hanson.[139]

D. CSPA/CBD Expert Mr. Dettman's Proposed Alternative Bypass Flows Are Based On Allegations Unsupported By The Evidence.

Mr. Dettman's wide-ranging testimony regarding the potential impacts of the Ranch's proposed permit on steelhead habitat is based largely on speculation and a single day's reconnaissance of the Big Sur River.[140] His proposed bypass flow of 15 to 20 cfs for July 20th through November 30th is based on the erroneous conclusions, that flows greater than 15 cfs are need to ameliorate DO,[141] though Dr. Hanson and the FEIR concluded that flows above 10 cfs ameliorated DO issues,[142] and that flows above 10 cfs or 15 cfs are needed to maintain an open outlet between the lagoon and the ocean,[143] ignoring SGI's documentation that the lagoon opened when the USGS gage measured 6.3 cfs in 2007.[144] For the December 1 to

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[137] II RT 206:13-21 [Titus].

[138] *See* DFG-T-A, p. 14 [Titus]; II RT 68:18–69:5 [Titus]; II RT 287:3-13 [Titus] (When questioned by Board staff regarding the factors that made Dr. Titus think that the North Coast policy was applicable, he stated that there is a lot of similarity in terms of precipitation patterns and overall hydrologic cycle that made him believe that the method was appropriate for "minimally ballparking an upstream passage flow.") *See also* SWRCB-1 [FEIR at 3-35, pdf 110] (criticizing DFG's use of the North Coast Policy).

[139] II RT 308:2-8 [Titus] (no site specific studies to confirm or validate the estimated flow); II RT 195:19–196:15 [Titus] (Didn't cite to or assess Hanson studies, SGI studies or the EIR in his testimony); *see* DFG-T-A p 14 [Titus] (stating DFG's December-May proposed bypass flow).

[140] III RT 82:16-18 [Dettman] (single day of field investigation on BSR); IV RT 246:5-7 [Dettman] (only one visit to BSR related to this proceeding).

[141] CPSA/CBD-100, at 16 and fig. 8 at 32 [Dettman].

[142] II RT 15:2-25 [Hanson]; SWRCB-1 [FEIR at 3-131, pdf 206] (At flows over 10 cfs there appeared to be sufficient water exchange that DO levels were not lethal or stressful for steelhead).

[143] CPSA/CBD-100 at 16 [Dettman] (Mr. Dettman's conclusion about flow necessary to keep the lagoon open is based on one-photo); CSPA/CBD-104 at 2 [Dettman].

[144] IV RT 41:18-20 [Horton]; ESR-61, slides 17-19.

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July 19 time period, Mr. Dettman recommends using a generic bypass flow of the median daily discharge, ignoring the extensive site-specific data collected by SGI and Dr. Hanson.[145]

VII. THE WATER BOARD'S DECISION ON AN APPLICATION FOR APPROPRIATION OF WATER MUST CONSIDER THE REASONABLE AND BENEFICIAL USES OF THE DIVERTED WATER, BASED ON THE EVIDENCE IN THE RECORD[146].

In 1928, California voters enacted Article X sec. 2 of the California Constitution which mandates "that the general welfare of the state requires that state water resources be applied to beneficial use to the *fullest extent*, and that waste, unreasonable use, and unreasonable method of use be prohibited."[147] This "rule of reasonable use" is the cardinal principle of California's water law.[148] "What is a reasonable use of water depends on the circumstances of each case, such an inquiry cannot be resolved *in vacuo*. . . ."[149]

Water Code section 1257 provides, in pertinent part, that:

> In acting upon application to appropriate water, the board shall consider the relative benefit to be derived from (1) all beneficial uses of the water concerned including, but not limited to, use for domestic, irrigation, municipal, industrial, preservation and enhancement of fish and wildlife, recreational, mining and power purposes, ...

This Board's role is "aptly described . . . as a 'necessary balancing process' requiring 'maximum flexibility' in considering competing demands of flows for instream purposes and diversions for agricultural, industrial, domestic and other consumptive uses to arrive at the public interest."[150]

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[145] CPSA/CBD-100, Fig. 8, at 32 [Dettman].

[146] See Cal. Code Civ. Proc. § 1094.5(b); *Voices of the Wetlands v. State Water Resources Control Board* (2011) 52 Cal.4th 499.

[147] Samantha K. Olson & Erin K.L. Mahaney, "Searching for Certainty in A State of Flux: How Administrative Procedures Help Provide Stability in Water Rights Law," 36 McGeorge L. Rev. 73, 86-87 (2005). See also Cal. Water Code § 100, (waste of water is precluded).

[148] *United States v. State Water Res. Control Bd.* (1986) 182 Cal. App. 3d 82, 98, (citing Cal. Water Code § 100); see generally Rogers & Nichols, 1 Rogers & Nichols, Water for California. (1967) at 20, 26-33, 43-46; W.A. Hutchins, The California Law of Water Rights (1956) at 12–20, 230–234.

[149] *City of Barstow v. Mojave Water Agency* (2000) 23 Cal. 4th 1224, 1242.

[150] *Fullerton v. State Water Resources Control Bd.* (1979) 90 Cal.App.3d 590, 603.

The Ranch puts the water used to irrigate its pasture to beneficial use. The irrigated pasture provides essential nutrient-rich forage in support of a cattle operation that has been in operation for more than 60 years.[151] Coastal ranching, "especially grazing," is clearly a beneficial use,[152] and is established as a priority use of land in the Big Sur Area Local Coastal Plan.[153]

VIII. WATER CODE SECTION 1004 LIMITING WATER DUTY OF UNCULTIVATED LAND IS INAPPLICABLE TO THE RANCH PASTURES

Detailed, site-specific factual evidence needed for determination of the amount of water reasonably needed to irrigate the Ranch pastures was provided only by the Applicant. In contradiction and without evidentiary support the testimony of DFG's witness, Mr. Custis, centered on his unqualified legal interpretation of Water Code section 1004.[154] That Section is inapplicable, however, as the irrigated pasture is considered cultivated pastureland. None of the opposing parties provided a contrary opinion from an agricultural expert or recognized authority.

It is the improvement of land by skill and labor (and investment) that establishes the pasture as "cultivated land."[155] Although the Water Code does not define "cultivated," dictionary definitions of "cultivate" include not just tilling, but planting, tending, and improving by labor and skill.[156]

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[151] ESR-11, p.3; ESR-1, at 1-2 [Hill]. ESR-11 is attached hereto as Attachment 9 for the convenience of the Board.

[152] Water Code § 1254.

[153] ESR-18, Key Policy 3.6.1, at 37, pdf 9.

[154] Section 1004 defines "useful or beneficial purposes" as no more than 2.5 afa for "uncultivated areas of land not devoted to cultivated crops."

[155] Court interpretations of "cultivated" support the conclusion that it includes use of land for the growing of crops (*Quarterman v. Kefauver* (1997) 55 Cal.App.4th 1366, 1373); see also *Reeves v. Shears* 2004 WL 2320358, p. 5 (unpublished): husbandry, improvement of land, increasing land fertility and use of land for production or raising of a crop of any kind (including oysters, microscopic organisms, for example).

[156] OXFORD ENGLISH DICTIONARY (2d Ed. 1989) (cultivation includes "husbandry, improvement of land, increase in fertility for the production or raising of a crop of any kind (as of oysters, microorganisms, etc....); WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 552 (Philip Babcock Gove ed., 2002) ("to prepare for the raising of crops : prepare and use for such a purpose : TILL (the soil); *specif* : to loosen or break

The evidence is undisputed that the Ranch undertook deliberate cultivation of its pastures with substantial skill, labor and expense,[157] including the following measures: consultation with engineers and agricultural experts on the type of crops to be grown; land leveling and construction of graded berms; installation of a buried irrigation system and drainage control improvements; planting and management of non-native forage species for the raising of cattle; annual fertilization of the pasture; appropriate application of herbicides to control invasive species, and restoration and repair of the pastures as necessary.[158]

Both agricultural experts who testified, Dr. Niel Allen and Dr. Orrin Sage, unequivocally agreed that the Ranch pasture constitutes "cultivated land," based on their extensive experience and the site-specific conditions they observed at the Ranch. Contradictory evidence was not offered by any other party.[159] "Improved pasture" is analyzed as a "field crop," one of the "principal irrigated crops" of California in DWR Bulletin 113-3.[160]

In addition, the ESR irrigated pasture falls under the federal definition of cultivated cropland. The definition of cultivated cropland by U.S.D.A. Natural Resources Conservation Service – Natural Resources Inventory includes the classification of pastureland. Its definition

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up the soil about (growing crops or plants) for the purpose of killing weeds and modifying moisture retention of the soil esp. with a cultivator; to protect and encourage the growth; to till or labor over); RANDOM HOUSE DICTIONARY, © Random House, Inc. 2011): "to prepare and work on (land) in order to raise crops; till"; COLLINS ENGLISH DICTIONARY - *Complete & Unabridged 10th Edition.* Retrieved August 24, 2011, from Dictionary.com website):"(1) to till and prepare (land or soil) for the growth of crops, (2) to plant, tend, harvest, or improve (plants) by labour and skill, (3) to break up (land or soil) with a cultivator or hoe".

[157] ESR-1 [Asmus]; ESR-11 [Hill] and Figure 1 thereof; ESR-13 [Video Overview] (showing contrast between the cultivated pastures and the uncultivated land surrounding the pastures).

[158] ESR-1 at 2-3 [Asmus]; ESR-11 at 4-9 [Hill]; ESR-12 at 5-6 [Allen]; I RT 144:11-145:5 [Sage]; I RT 256:5-19 [Allen] II RT 10:9-11:22 [Hill]; II RT 20: 2-21:18 [Hill]. ."

[159] ESR Exhibit at 12 at 4-5 [Allen] (Fields were leveled, planted with legumes and clover.); I RT 256:9-18; II RT 144:11 – 145-9 [Sage]: ("Cultivation" based on type of forage composition, fertilization, weed control, restoration and cattle grazing management.).

[160] SWRCB-7 "Vegetative Water Use in California," DWR Bulletin 113-3 at 23, pdf 35.

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of "pastureland," as grass-legumes mixture, weed control and fertilization, describes the Ranch's irrigated pasture.[161]

DFG witness, Mr. Custis,[162] provided only lay testimony, not based on knowledge of the irrigated pasture, disputing the pastureland's cultivated designation; he failed to take site specific conditions of the irrigated into account.[163]

IX. THE EVIDENCE OVERWHELMINGLY SHOWS THAT THE WATER SOUGHT BY THE APPLICATION IS NEEDED FOR REASONABLE IRRIGATION OF THE RANCH'S PASTURE

An encompassing analysis of the specific conditions of the cultivated pasture by the Ranch's experts, Dr. Niel Allen[164] and Dr. Orrin Sage[165] establish that the water requested in the Application is reasonable in amount, use, and method. Dr. Allen, an irrigation specialist, based his opinion on the type of soil at the Ranch, the specific crops grown in the cultivated pasture, data from the Ranch weather station located on the pasture itself and correlated with long-term climatological records in the area, and the infeasibility of alterative irrigation methods [166] His conclusion that the amount of water reasonably needed for irrigation of the cultivated

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[161] ESR-12, p. 6 [Allen] (the irrigated pasture contains a variety of grasses and non-native legumes; cattle are rotated through the fields to allow the crop to re-establish growth; ESR-11, the fields are fertilized and sprayed with herbicides to control weeds).

[162] Mr. Custis's CV is found at Exhibit DFG-C-A. The CV is devoid of any irrigation experience or academic training.

[163] II RT 167:23 – 170:10, generally; 169:2-12 [Custis] (ESR irrigated pasture management includes controlled grazing, weed control and fertilization.) Notwithstanding these conditions, Mr. Custis opined that the irrigated pasture is "permanent hayland" (and therefore uncultivated); DFG-C-A at 27. Mr. Custis's written testimony is void of any discussion of site-specific factors which he bases his opinion that the irrigated pasture is "permanent hayland."

[164] Dr. Niel Allen, PhD, is an expert in the field of agricultural irrigation with more than 30 years of experience. He specializes in the analysis of irrigation requirements, climate and meteorological data, soil erosion, water use efficiency, conservation and management plans, and irrigation system assessment. His CV is attached to his written testimony ESR-12, Appendix A.

[165] Dr. Orrin Sage is a renowned expert on coastal rangeland ecology and pasture management. He has provided consultation for over three million acres of western rangeland including over 170,000 acres of coastal lands. His CV is attached to his written testimony ESR-26, at 26-45.

[166] ESR-12 at 49-50, pdf 53-54 [Allen] and I RT 162:15-164:3 [Allen] (alternate irrigation methods infeasible); 147:10-18; 148:5-15 [Sage] and ESR-26 at pdf 15 [Sage], (*accord*).

pasture is a maximum of 1320 acre-feet per year[167] was corroborated by Dr. Sage, in light of his own extensive base of knowledge.[168]

Both Dr. Allen and Dr. Sage testified to the good condition of the pasture and its forage crops, and noted the important role that the dense cover plays in preventing erosion.[169] Dr. Orrin Sage also studied the Ranch and its cow-calf operation. He concluded that the Ranch pasture is "very well managed"[170] and presented evidence on the critical importance of the irrigated pasture to the Ranch's economic viability[171] viability concurred with Dr. Allen's calculation of the average water reasonably needed for irrigation of the pasture at ESR[172] was well-founded, based on his own more than 40 years of experience.[173]

Applicant James Hill has refined and narrowed his Application as the information/data gathered over years of Ranch studies and provided to him by his experts have given him increasing confidence in his continued ability to operate the Ranch within the greater limitations proposed.[174]

No opposing party offered any expert testimony contradicting the Applicant's irrigation consultants. The only evidence offered in support of a lower irrigation need was provided by

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[167] ESR-12, at 51, pdf 55 [Allen]; ESR-29, slide 9 [Allen]; I RT 165:16-20 [Allen]. ESR-29 is attached hereto as Attachment 10 for the convenience of the Board.

[168] ESR 12, [Allen] generally.ESR-26, pdf p. 5 [Sage]; I RT 144:11-145:5, 146:10 – 18, 148:5-15 [Sage] ("For irrigated pasture land, usually the average water duty factor or range of water application is somewhere between four and five acre feet per acre per season. And I think Mr. Allen estimated 4.4 acre feet, which is commensurate with my knowledge).

[169] ESR-12 at 10, pdf 14 and at 51, pdf 55 and Appendix B, pdf page 70, generally. [Allen]

[170] I RT 146:10-24. [Sage]

[171] ESR-26 at pdf 20 and 21 [Sage] (irrigated pasture essential); I RT 150:4 – 151:18 [Sage] (explaining imbalance between cow nutritional needs and nutrition offered by non-irrigated rangeland).

[173] I RT 147:10-18; 148:5-15 [Sage] and ESR-26 at pdf 15 [Sage].

[174] In the Third Amended Application, the Applicant, James Hill, proposed summertime and monthly limits on amounts and rate of diversion. The Fourth Amended Application, he further reduced the amounts and rates of diversion sought and also agreed to cease pumping operations during summer holiday periods, when peak irrigation seasonal flows (June – October) fall below 10 cfs and when winter flows (November through May) fall below 30 cfs at the USGS Pfeiffer gauge, unless steelhead passage conditions can be documented. ESR-40.

DFG's witness, Mr. Kit Custis,[175] whose crop needs analysis was fatally flawed. Mr. Custis failed to utilize the available site-specific data, instead utilizing a weather simulation model to estimate crop water requirements,[176] and failed to follow the best scientific method and include important weather factors such as wind and solar radiation in his calculation.[177]

The Board's independent consultant (PBS&J) noted that the soils in the place of use support a conclusion that, contrary to Mr. Custis's assertions, a water application rate of 1 cfs per 50 acres would be reasonable for the pasture.[178] PBS&J further testified that the 2.5 acre feet per acre suggested by DFG is "simply not enough water" to support the irrigated pasture.[179]

X. PUBLIC TRUST AND PUBLIC INTEREST CONSIDERATIONS SUPPORT THE CONTINUED IRRIGATION OF THE RANCH PASTURES.

In addition to considering instream public trust uses, this Board must consider the public interests of the state and local community furthered by the Ranch's continued operation.[180] This Board's decision will decide whether that conjunction of public interests will continue into the future.

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[175] DFG-C-B, Mr. Custis has no background in determining irrigation requirements using climate and meteorological data, soil erosion, water use efficiency, conservation and management plans, or in irrigation system assessment. His CV is <u>VOID</u> of any experience or education in the agricultural irrigation field and the Applicant renews his objection to Custis' opinions in this area; II RT 163:10-14-164:7 [Custis] (Mr. Custis indicated that he wasn't "quite" sure whether solar radiation is taken into account when calculating crop water requirements); II RT 163:10-14 [Custis] ("when you're trying to operate on a day-to-day basis and you're trying to figure out . . . how much water . . . then you want to look at the site-specific conditions."); II RT p. 163:25 – 164:7 [Custis]; DFG-C-1, p. 29-34; II RT 162:16 – 164:20, [Custis].

[176] DFG-C-1, p. 29-34 [Custis]; II RT 162:16 – 164:20 [Custis].

[177] *Id.*

[178] SWRCB-1; FEIR at 3-31, pdf p. 106, RTC 2-34 – 2-37(the applicable [water] duty in section 697(a)(1) varies depending on conditions throughout the state. . . . "Section 697(a)(1). . . also provides that 'where . . . the land to be irrigated is of a porous sandy or gravelly character, a continuous flow allowance of one cubic foot per second to each 50 acres may be considered reasonable.' It merits noting that the majority of the POU (78 percent) is Santa Ynez soils, which are about 65 percent sand in the surface horizon. . . ."); See also FEIR RTC 2-97.

[179] I RT 56:14-25 [Cook]

[180] Water Code §§ 1253, 1257.

In making its decision, the Board must keep in mind Article X, Section 2, which embodies the state's mandate that "the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable,"[181] and the admonition of the Supreme Court that "[a]ll uses of water, including public trust uses, must now conform to the standard of reasonable use." [internal cites omitted][182] Approval of the Ranch's Application under conditions that allow its continued operation will fulfill both of these imperatives.

The Big Sur Coast Land Use Plan identifies aesthetic and scenic values of the coast as "probably the most significant and far reaching" quality of the area,[183] and specifically recognizes cattle grazing as contributing to those values. The Land Use Plan notes that cattle grazing has been the "primary agricultural activity on the coast," and finds that "[t]he presence of livestock enhances the rural western feeling of Big Sur and adds to visitors' enjoyment of the area," an observation echoed in the Policy Statement of the Big Sur River Inn.[184] The Ranch is one of the last of the historic cattle ranches on the coast. A permanent Conservation and Scenic Easement covers the vast majority of the public viewshed lands of the Ranch, including the irrigated pasture, and allows for no economic activity other than continued agriculture and ranching.[185]

The Big Sur Coast Land Use Plan recognizes cattle grazing as "helping to maintain open grasslands characteristic of the scenic landscape" and provides "lands that have been traditionally used for grazing use should be preserved for such use."[186] It identifies cattle

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[181] California Constitution, Article X, sec. 2, emphasis added.

[182] *National Audubon Soc. v. Superior Court* (1983) 33 Cal. 3d 419, 443 (Emph. added.).

[183] ESR-18 at 14, pdf 4 [Big Sur Coast Land Use Plan Adopted by the Monterey County Planning Commission on February 11, 1981].

[184] See also ESR-26 at 9-14 [Sage] and ESR-10 [Hydrogeology Video].

[185] Exh. ESR-20 [Conservation Easement]; I RT 101:11-102:9 [Hill]; ESR-26 at pdf 16, 17, 23-24 [Sage].

[186] ESR-18 at 37, pdf 9 [Big Sur Coast Land Use Plan].

grazing as a "preferred use of coastal lands."

The soils of the Ranch pastures are considered Prime Farmland and Farmland of Statewide Importance by the State and Federal governments, and a significant agricultural resource of the state.[187] The Ranch is the largest remaining working cattle ranch on the coast between San Simeon and Monterey[188] and would be lost if irrigation of its pastures cannot be assured. As testified by Dr. Orrin Sage, a renowned expert in coastal rangeland management and environmental protection, unirrigated coastal rangeland is nutritionally deficient for cattle during the five to seven summer months,[189] and the pasture cannot survive without irrigation.[190] The diversion limits proposed by the Department of Fish and Game would "basically turn the pasture into a weed patch," according to Dr. Sage[191] and "guarantee the demise of the Ranch."[192] Beyond its aesthetic value, cattle grazing also serves another important function also recognized by the Big Sur Coast Land Use Plan – it keeps the coastal grasslands free of brush.[193] The availability of the brush-free cultivated pasture is important in enabling airborne response to critical medical emergencies and safe staging of aerial and land-based fire-fighting operations; it is highly valued by local and state fire agencies, as attested to by the numerous policy statements submitted in support of the Application.[194] The continuation of the Ranch as a viable operation is essential to such services.[195] In addition a financially viable Ranch has been able to offer support to both environmental and historical

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[187] ESR-26 at pdf 18 [Sage].

[188] FEIR, p. 1-10, pdf 20.

[189] (ESR-26 at pdf 20-21 and Figs. 2, 5.

[190] I RT 148:20-149:3 [Sage] (Carrying capacity of the pasture would drop by 85% without irrigation.) (I RT 146:15-16; 150:5 – 151:18 [Sage])

[191] I RT 152:13-22 [Sage]; see also I RT 153:8-22 [Sage].

[192] I RT 100:17-101:7 [Hill].

[193] ESR-26 and I RT 145:21 – 146:9 [Sage].

[194] See, e.g. ESR-13 at 00:33:14 – 00:39:13 [Video Overview]; ESR-11 at 1[Hill] (The policy statements are not cited as evidence of their content, which is supported elsewhere in the record. They are, however, indicative that the local community values the Ranch's continued existence).

[195] I RT 152:13-22 [Sage]; also see Policy Statements of Big Sur Volunteer Fire Brigade, Cal Fire, Coast Property Owners Association.

resources of the Big Sur.[196]

This panoply of public interest values supported by the Ranch's diversions must be given full weight by the Board, particularly in contrast to the absence of any documented harm to the instream resources of the Big Sur River over the past sixty years of the Ranch's operations.

As shown on ESR-36, higher summer "bypass" requirements than those proposed in the Fourth Amended Application will eliminate critical summertime irrigation and spell the end of this historic and valuable coastal treasure.[197] The flows proposed by DFG and CBD would eliminate summer pumping in critically dry, dry, most normal and above normal years, and even in some wet years. Given the proof that passage, rearing and holding habitat exists for juvenile and adult steelhead under the flows recommended by Dr. Hanson, and the presence of upstream holding pools for oversummering, the Applicant's pro[posed bypass flows and other conditions meet both public trust needs and provide adequate water for continued irrigation.

XI. CONCLUSION

Where diversion of the water is needed to maintain viable economic production without harm to instream resources, limiting the amount of irrigation water to a water duty less than that needed for beneficial use violates the Constitutional instruction that "the water resources of the State be put to beneficial use to the fullest extent of which they are capable."[198] The overwhelming evidence in the record shows that the River's instream resources are not adversely affected by Ranch pumping. The only competent evidence as to the amount of

[196] I RT 218:14-219:9 [Hill] (financial support of local fire department); see also, Policy Statements of Central Coast Lighthouse Keepers, Big Sur River Inn, Coast Property Owners Association, Kirk Gafill and Ventana Wildlife Society.

[197] ESR-11 at 13 [Hill]; ESR-26 at pdf 20-24 [Sage]. ESR-36 is attached hereto as Attachment 11 for the convenience of the Board.

[198] California Constitution, Article X, sec.2

irrigation water necessary to meet crop demands was that of Drs. Allen and Sage; protestants submitted only lay opinion in opposition. Further, as was discussed in the hydrology section of this brief, the ESR wells are located within the last 1300 feet of the River before it reaches the ocean. Water available for appropriation but not beneficially used is the very definition of "waste" that the California Constitution prohibits. Without use by the ESR, the water in the underground aquifer will be lost to the ocean.[199]

This Board has heard the scientific information – based on actual field data -- necessary to grant the Application with the bypass conditions requested by the Applicant, with full confidence that the Big Sur steelhead fishery will continue to thrive. The evidence presented conclusively establishes that the terms and conditions proposed by the Ranch in its application, including the proposed 10 cfs summer and 30 cfs winter minimum bypass flow requirements, are protective of the steelhead population and other resources in the Big Sur River.[200] No evidence was presented by any party to this proceeding that credibly indicated otherwise.

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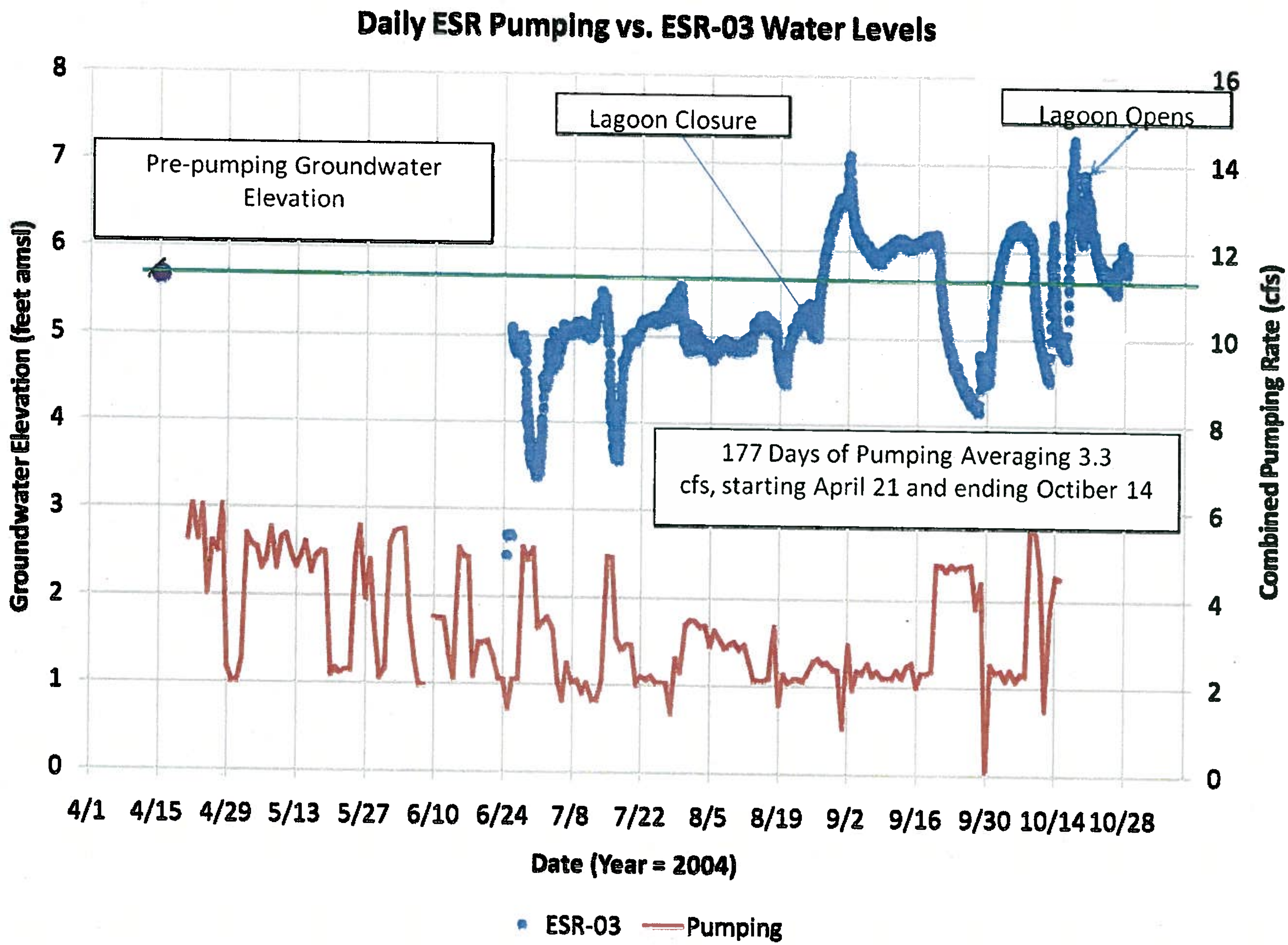
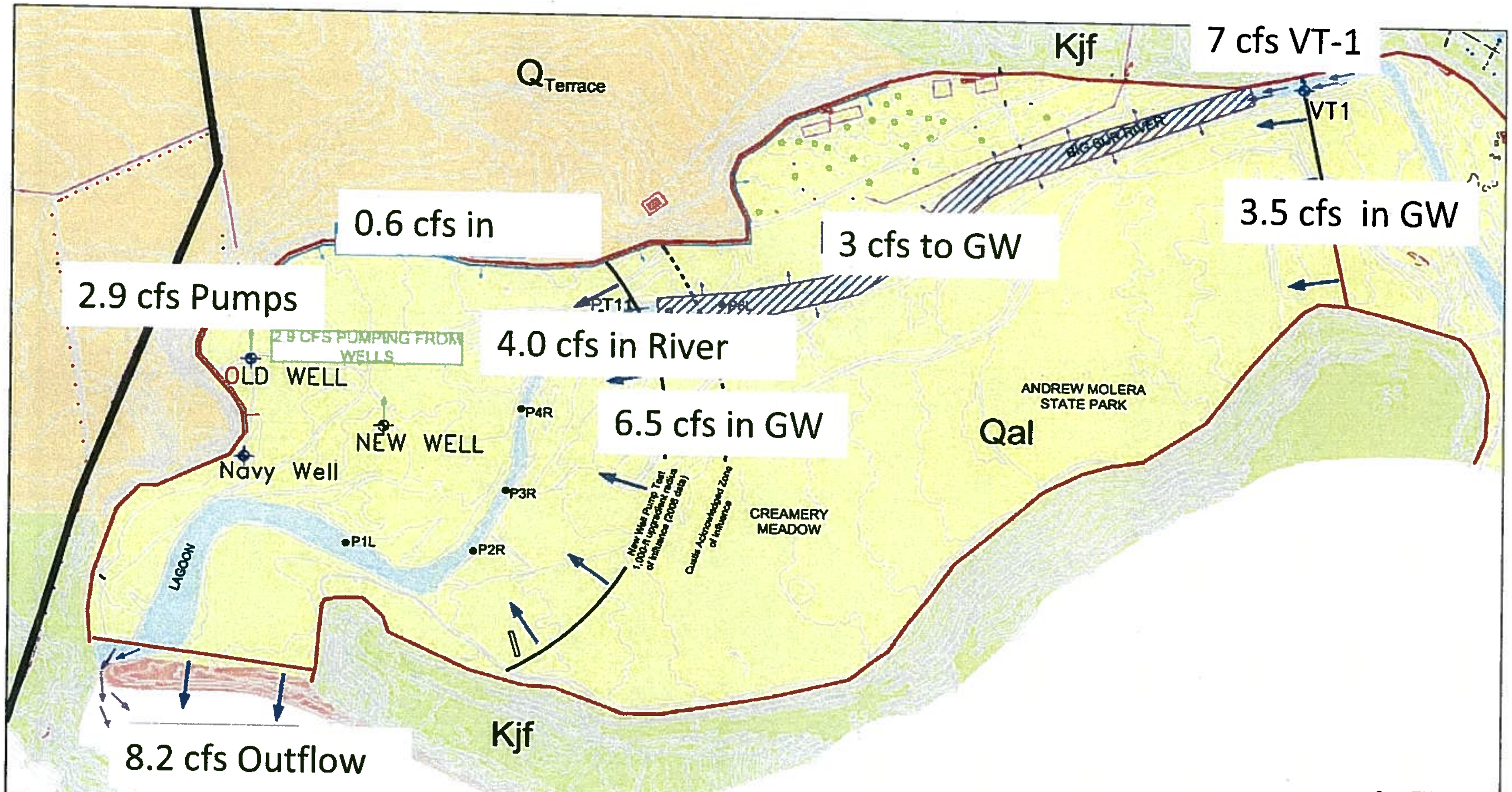
[199] No party offered any evidence of beneficial use of river outflow in the ocean waters offshore.

[200] A draft of proposed permit conditions is attached hereto for the convenience of the Board as Attachment ___



Daily ESR Pumping vs. ESR-03 Water Levels
Pre-pumping Groundwater Elevation
Lagoon Closure
Lagoon Opens
177 Days of Pumping Averaging 3.3 cfs, starting April 21 and ending Octiber 14
Groundwater Elevation (feet amsl)
Combined Pumping Rate (cfs)
0
1
2
3
4
5
6
7
8
0
2
4
6
8
10
12
14
16
4/1
4/15
4/29
5/13
5/27
6/10
6/24
7/8
7/22
8/5
8/19
9/2
9/16
9/30
10/14
10/28
Date (Year = 2004)
ESR-03
Pumping

Water Balance, 2.9 cfs Pumping



SGI The Source Group, Inc.	EL SUR RANCH BIG SUR, CALIFORNIA				STUDY AREA WATER BALANCE (10 CFS FLOW AT USGS GAUGE) AVERAGE WATER PUMPING
	PROJECT NO. 01-ESR-007	DATE 7/1/11	DR. BY JP	APP. BY PH	

Water Balance, 5.8 cfs Pumping

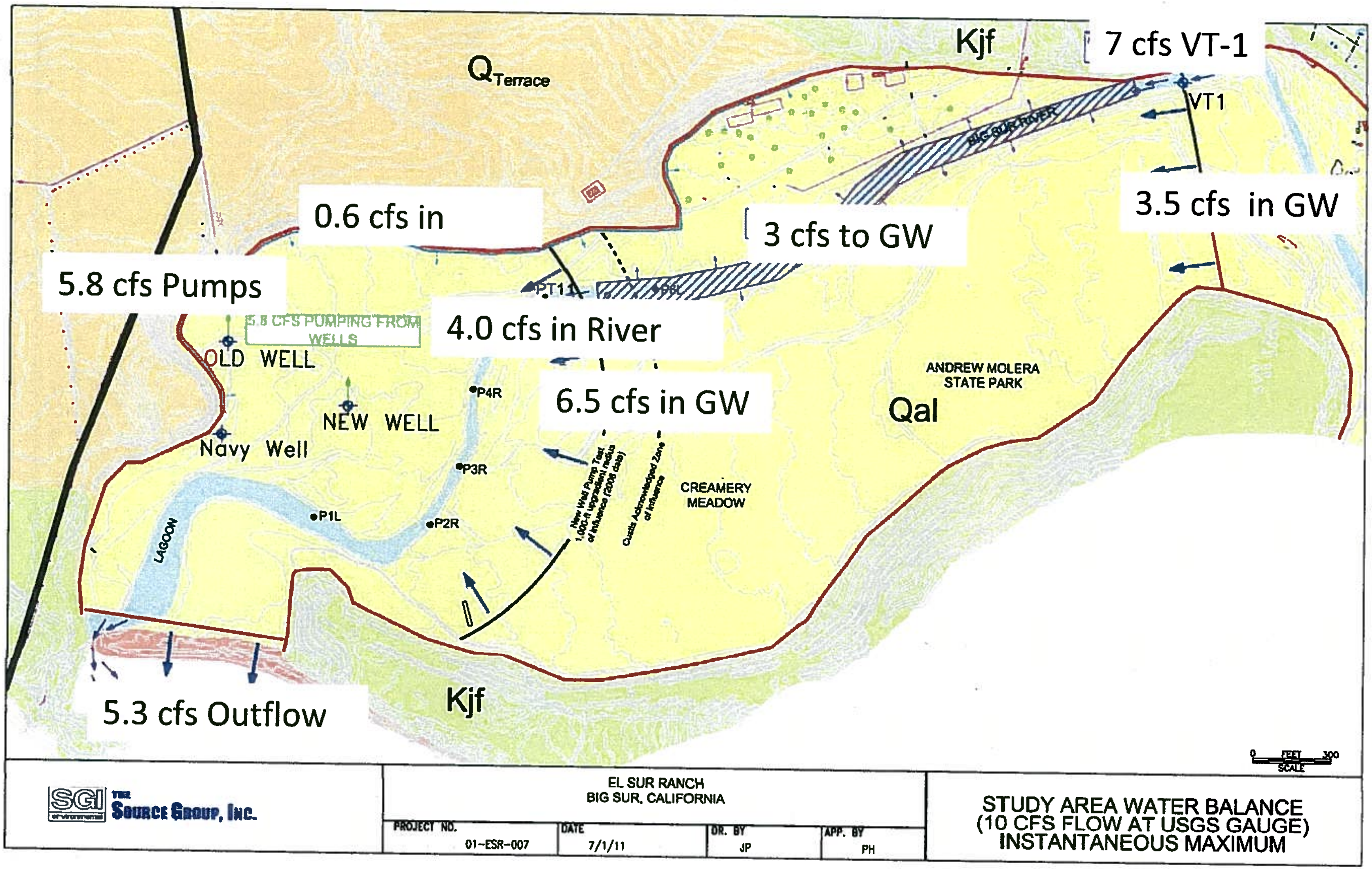
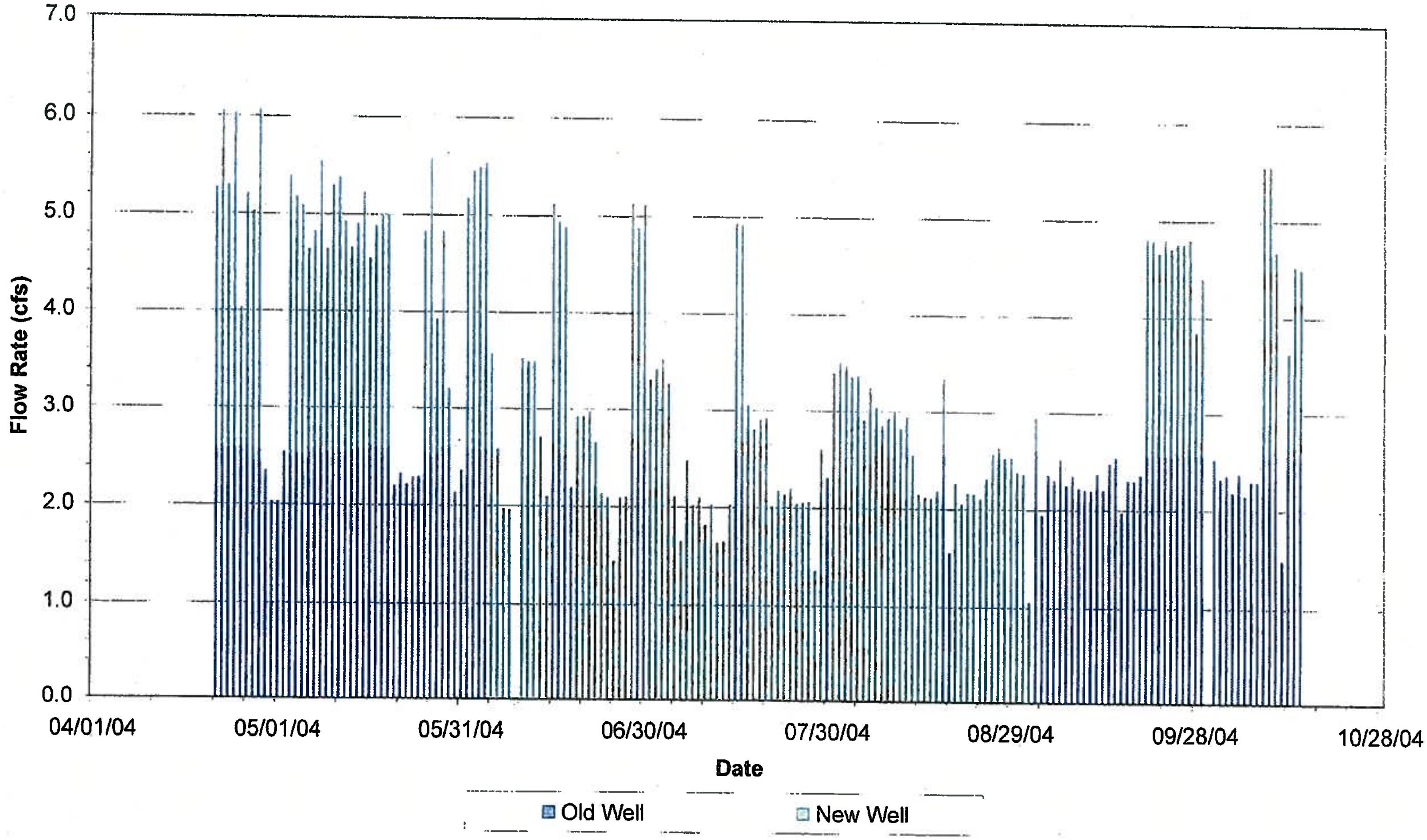


Figure 3-30
Daily Pumping Rate for El Sur Ranch
El Sur Ranch



THE SOURCE GROUP, INC. SGI environmental

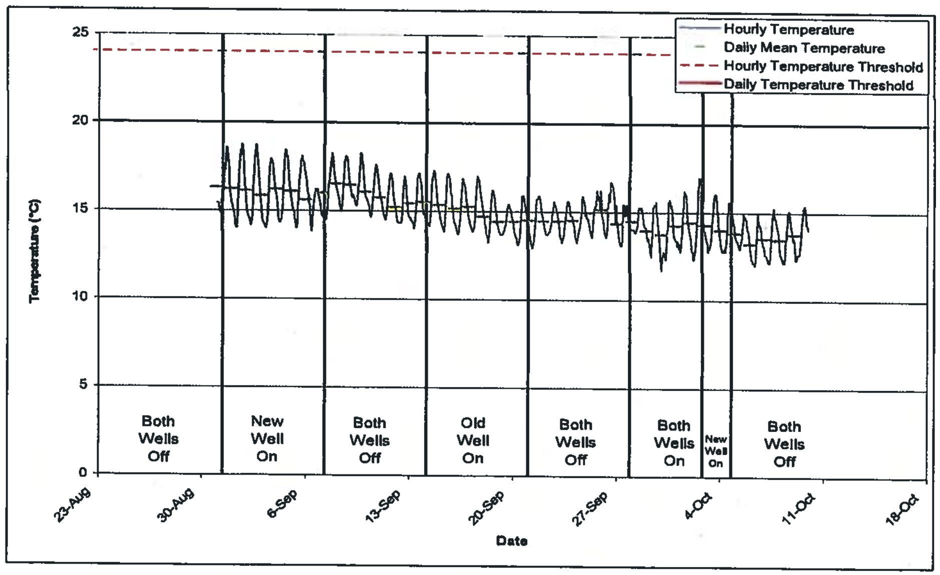
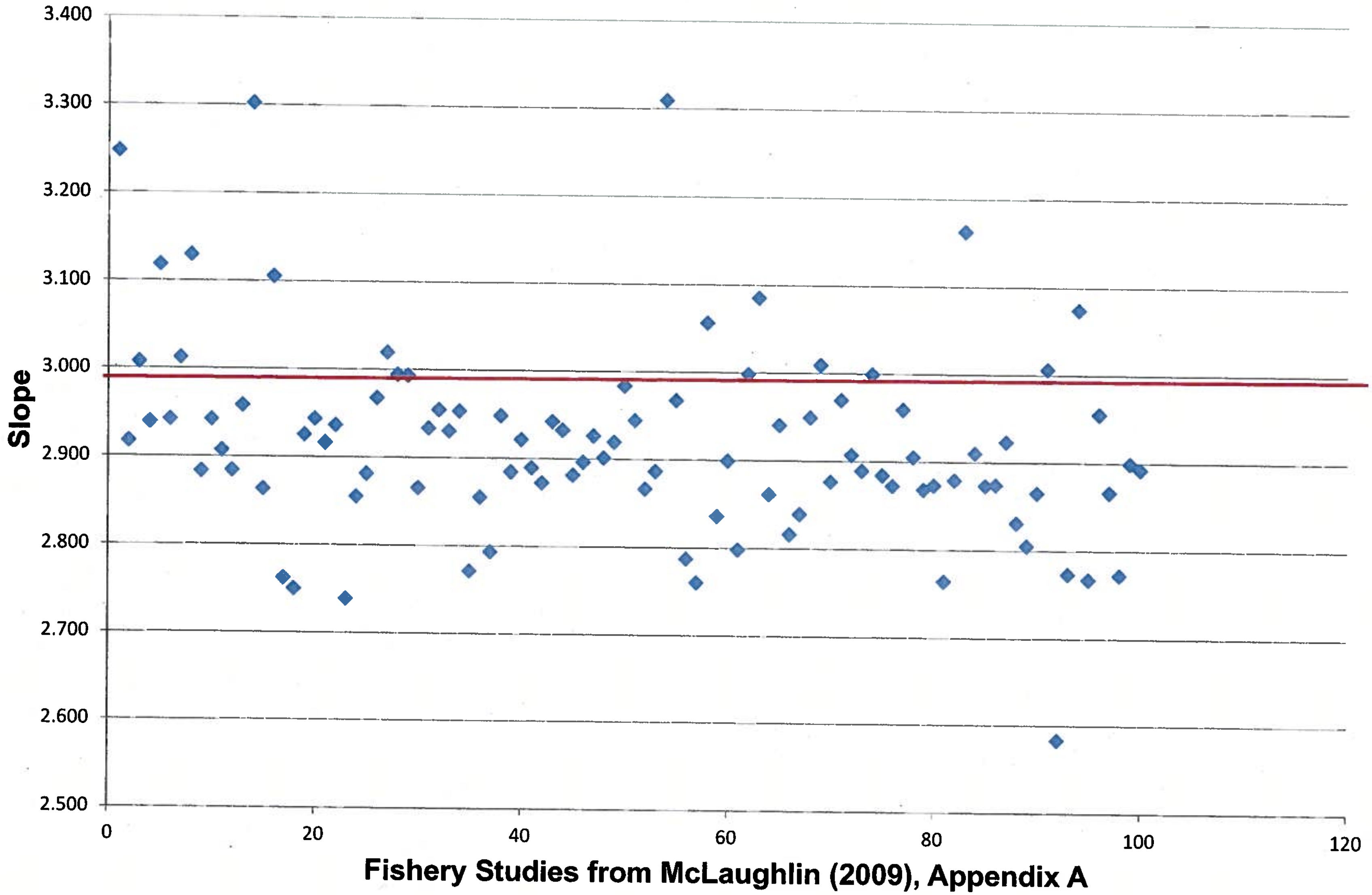
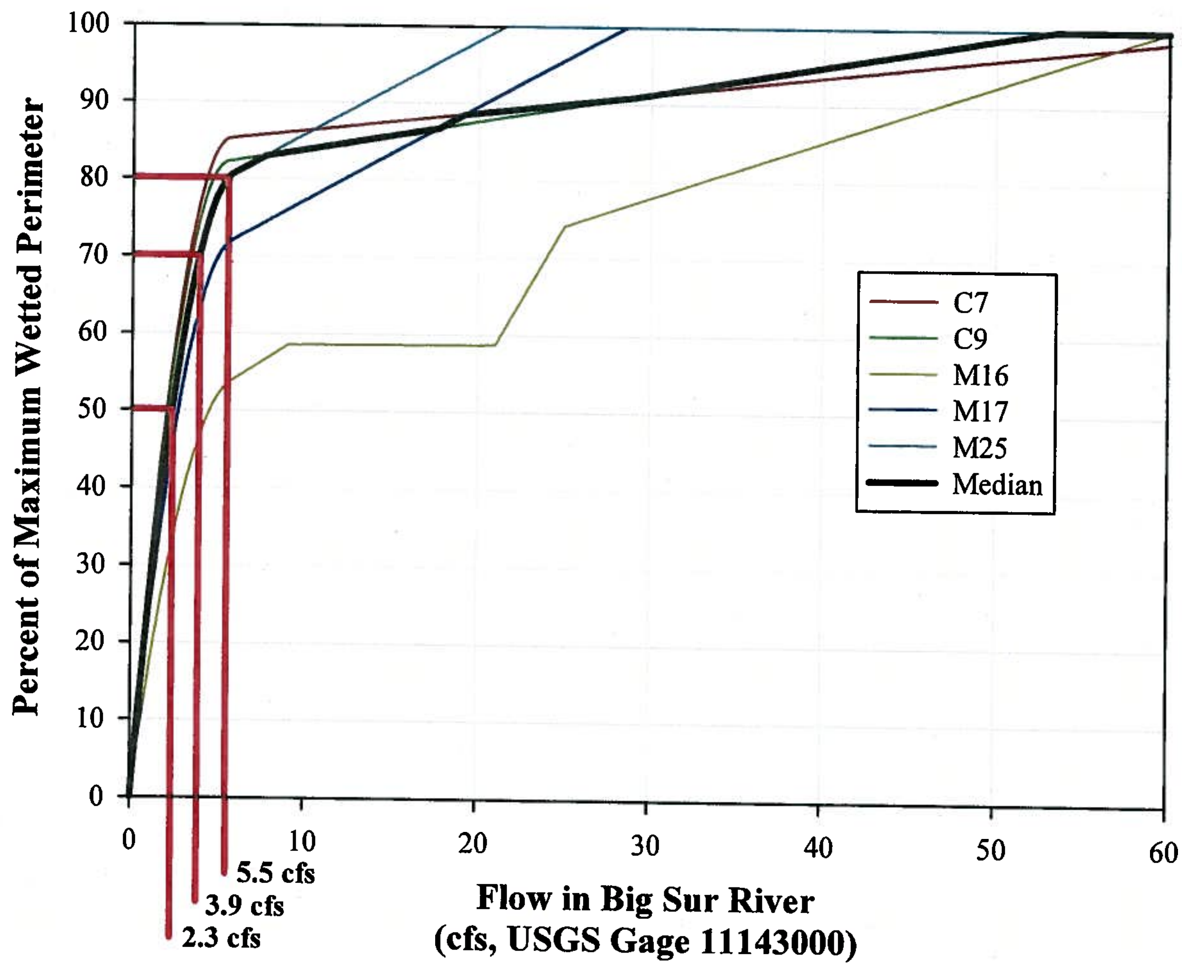


Figure 19. **Hourly and average daily water temperatures recorded during 2007 in the lower Big Sur River at PT 1, right bank**

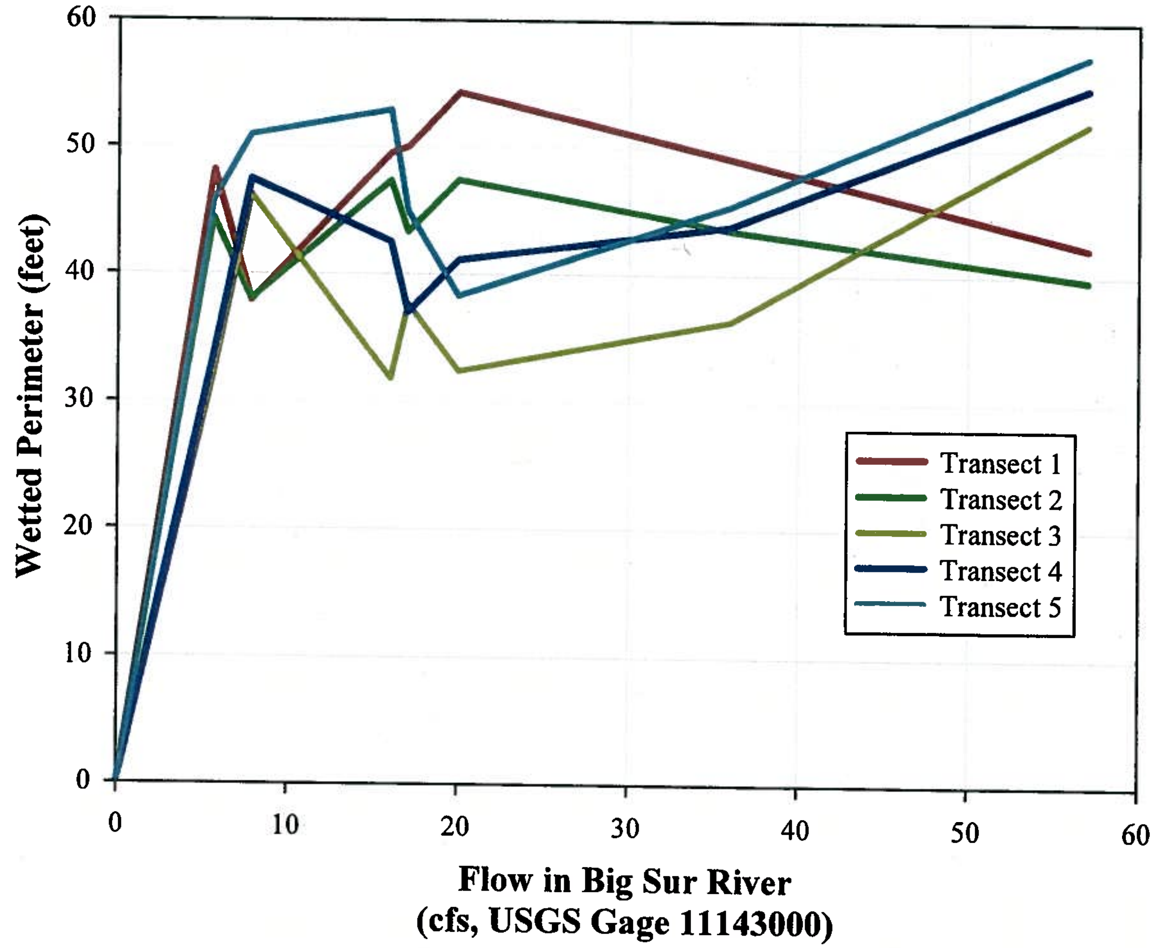
Length-Weight Relationships for Wild Pacific Coast Steelhead (NMFS Relationship for Big Sur Steelhead Shown in Red)



Sites Visited Under Low Flow Conditions (September 1994)



Wetted Perimeter/Flow Relationships for Each Transect at Site C7



ESR -- 11

Irrigation Diversion

El Sur Ranch Estimated Annual Diversion Requirement for 246 acres

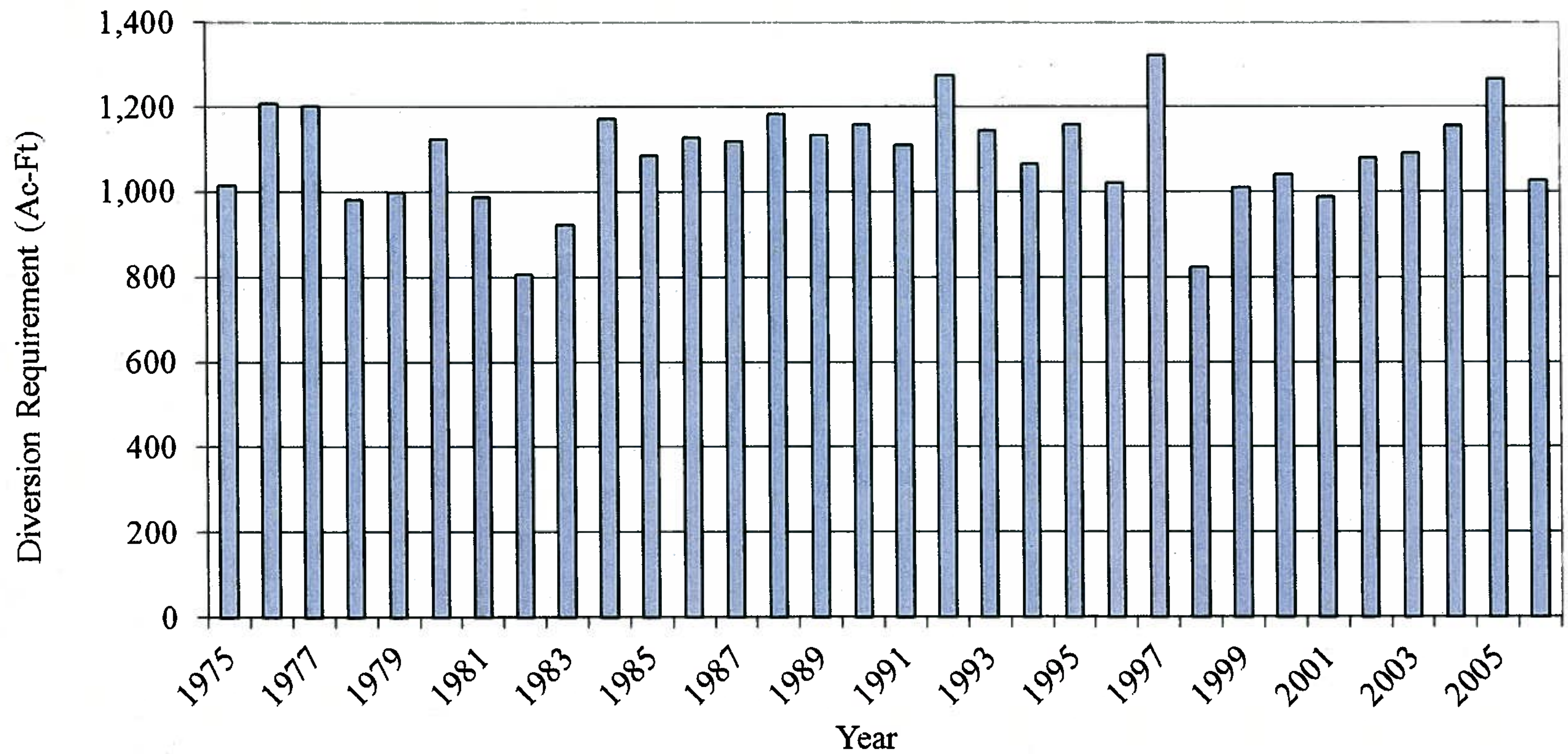


Exhibit DFG-C-4

Big Sur Gage - USGS#11143000

Daily Discharge Summary Statistics by Month in cfs
April 1950 to August 2009

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average	238.9	275.0	222.5	146.6	67.3	37.1	23.8	17.5	15.3	17.7	42.2	104.1	99.7
Median	130.7	180.4	154.[illegible]	79.1	52.5	31.6	20.9	15.6	13.8	15.7	22.1	56.9	75.6
High	1,047.0	1,329.0	964.1	842.5	332.5	119.3	71.4	43.0	39.4	86.8	302.2	449.1	323.4
Low	8.3	11.4	16.8	9.2	8.7	6.2	4.9	3.8	4.5	5.1	5.0	7.5	14.3

Exceedance Probability - flows greater than value % of time, cfs

	Percentage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
Critically Dry	95	24.4	29.1	28.0	24.9	15.4	10.3	6.6	6.0	6.0	7.7	10.2	13.9	20.3	Critically Dry
	90	25.9	52.6	38.1	28.5	18.0	11.7	8.4	7.4	7.3	8.5	11.3	17.7	25.0	
	85	33.8	68.1	55.3	37.0	21.8	14.6	10.0	7.7	7.8	9.1	13.4	21.2	36.5	
	80	37.4	80.2	65.7	40.7	27.0	16.8	11.8	8.9	8.1	10.1	14.4	24.7	42.7	
Dry	75	47.1	84.8	67.6	45.6	30.3	18.9	13.0	11.0	10.5	11.4	17.3	28.9	45.3	Dry
	70	64.3	89.4	79.7	51.3	32.9	20.4	14.9	11.6	11.1	13.1	18.0	35.7	49.6	
	65	83.4	100.7	98.4	58.7	36.2	23.9	15.5	12.2	11.7	13.2	18.9	30.8	62.0	
Normal	60	104.9	113.2	102.6	65.2	38.6	25.5	16.7	13.2	11.9	13.8	19.8	42.1	72.5	Normal
	55	118.3	141.4	113.3	73.2	46.6	28.4	20.1	14.2	12.2	14.6	21.0	46.6	73.6	
	50	130.7	186.4	154.3	79.1	52.5	31.6	20.9	15.6	13.8	15.7	22.1	56.9	77.1	
	45	145.7	202.7	174.1	93.2	60.4	35.1	23.1	17.1	15.0	17.5	23.6	66.9	87.0	
	40	179.9	237.1	242.7	107.1	65.2	41.0	26.0	18.7	17.0	18.7	24.6	90.2	101.0	
Above Normal	35	240.8	265.6	250.0	123.6	71.9	44.4	27.4	19.8	17.9	19.4	28.4	101.5	112.4	Above Normal
	30	263.2	289.3	316.2	147.6	81.2	46.8	28.5	22.1	18.9	20.3	36.0	114.9	139.1	
	25	331.6	359.4	374.8	167.4	85.2	50.4	32.3	23.6	20.0	21.0	41.8	132.0	148.1	
Wet	20	386.0	465.1	366.9	176.5	91.3	54.6	34.3	24.6	20.7	22.5	53.1	172.3	156.3	Wet
	15	543.8	530.4	393.9	211.9	106.9	60.2	38.5	26.4	21.1	24.0	75.0	197.9	174.3	
	10	698.7	699.2	454.4	342.8	135.1	70.4	44.2	31.3	23.1	25.4	106.0	227.3	193.9	
	5	759.5	823.2	589.6	512.3	159.6	75.0	46.0	35.2	29.2	29.5	132.5	326.8	204.3	

Bold line drawn along interim bypass flow recommendation; December to May at 132 cfs, June to November at 29 cfs

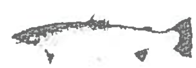
River System	Period	Relative Growth Rate	Growth Rate (mm/day)
Lower Big Sur	*July-October*		0.48
Navarro	*September-October*		0.61
Navarro estuary	*July-September*		0.53
Mattole	*September-October*		0.40
Artificial channel	*July-September*		0.34
Navarro	*June-November*		0.33
Mattole	*July-October*		0.24
Eel experiment	*June-August*		0.23
Navarro	*July-August*		0.13
Navarro tributaries	*July-September*		0.09
Mattole	*August-September*		-0.02

Figure 21. Side-by-side comparison of juvenile steelhead growth rates in coastal streams. (See Table 3 for details).

Proposed Permit Conditions

1. The Place of Use shall be 246 net acres within 292 gross acres shown on the map accompanying Application No. 30166.

2. The purpose of use shall be limited to the irrigation of forage crops for cattle.

3. The season of diversion shall be from January 1 through December 31.

4. The maximum rate of diversion shall be an instantaneous rate of 5.84 cfs from both Points of Diversion identified in Application No. 30166, provided that the rate of diversion shall not exceed an average of 5.34 cfs for any thirty day period from July 1 through October 31 of each year.

5. Diversions shall not exceed 1320 acre-feet in any calendar year, nor 1087 acre-feet on a twenty-year running average under all claims of right.

6. Diversions under all claims of right shall not exceed a total of 676 acre-feet for the period from July 1 through October 31 of any year.

7. Diversions under all claims of right shall not exceed 203 acre-feet per month for July, August, September, October.

8. Diversion pursuant to this Permit shall not occur from 6:00 a.m. July 3 through 8:00 p.m. July 5, nor from 6:00 a.m. of the Sunday before Labor Day until 8:00 p.m. of the Tuesday following Labor Day, unless flow at USGS gage no. 1114300 (Big Sur River near Big Sur) is 16 cfs or greater at the time of diversion.

9. Diversion pursuant to this Permit shall not occur during the period from May 1 through October 31 of any year when flow in the river, as measured at the USGS gage no. 11143000 is less than 10 cfs, unless Permittee documents, on a weekly basis using a protocol approved by the Deputy Director, Water Rights, that juvenile fish passage criteria (0.3' or greater over 25% of the channel cross-section and 10% of the contiguous cross-section) are met at the most critical riffle within 1000 ft of each POD.

10. Diversion pursuant to this Permit shall not occur during the period from November 1 of an of any year through April 30 of the following year when flow in the river, as measured at USGS Gauge No. 11143000, is below 30 cfs unless the Permittee documents, on a weekly basis using a protocol approved by the Deputy Director, Water Rights, that adult fish passage criteria (0.7' or greater

over 25% of the channel cross-section and 10% of the contiguous cross-section) are met at the most critical riffle within 1000 ft of each POD.

11. At Permittee's option, if flows necessary to provide equivalent fish passage to that provided in paragraphs (8) through (10) hereof are determined using flow measurements at USGS Gauge No. 11143010 in Andrew Molera State Park, such flows shall be substituted as the operative diversion restriction, and upon such substitution the numerical flow limitations in paragraphs (8) through (10) hereof shall be of no further effect.

12. In lieu of compliance with conditions 8, 9 and 10 hereof, Permittee may elect to augment river flow and dissolved oxygen through the addition of a minimum of 3 cfs of aerated alluvial groundwater to the river at a point [Transect 11] or such downstream location as may be agreed to in writing by the Permittee, the California Department of Fish and Game and the California Department of Parks and Recreation. Permittee shall provide documentation to the Deputy Director of the Division of Water Rights that this streamflow augmentation measure has been implemented, shall record the augmentation flows on a continuous flow meter and shall provide records of such augmentation to the Division of Water Rights on a yearly basis. This performance standard for this measure shall be that flow augmentation increases river flow to a level sufficient to meet applicable passage criteria or to fully offset to the river surface flow impacts associated with Permittee's pumping, as documented by flow or applicable depth measurements as set forth in Condition (8) (9) and (10) above. The performance standard for Dissolved Oxygen shall be 6 mg/l in the surface stream within 1000 ft of the points of diversion.

13. Permittee shall install and properly maintain a meter on each point of diversion, satisfactory to the Deputy Director of the Division, which is capable of measuring the instantaneous rate of irrigation diversions in gallons per minute and the cumulative quantity of irrigation water diverted in gallons. The meters shall be conveniently located so as to be accessible for reading by the SWRCB or its designated representative.

Permittee shall record the cumulative meter readings approximately the first of each month. Meter readings shall be supplied to the SWRCB with the annual progress report submitted to the SWRCB by Permittee.

14. The Applicant shall prepare an Erosion Control and Operations Management Plan (ECOMP) and submit it to the Deputy Director, Water Rights, for review and approval. This ECOMP shall incorporate operations and management protocols to minimize surface runoff and erosion potential arising from irrigation. The Applicant shall incorporate protocols for excess irrigation applications and to prevent on- and off-site erosion because of increased application rates or volumes, intensification of grazing, or other conditions attributable to diversion under the Permit. The ECOMP shall include management practices to avoid bare soil conditions and to limit grazing intensification over existing levels on land with

less than 50-percent ground cover. Areas disturbed by grazing or other operational activities attributable to diversion under the Permit shall be re-vegetated. Vegetation shall be maintained on areas adjacent to drainage ways. Erosion and sediment transport BMPs shall be implemented as necessary.

The ECOMP shall also include a site inspection and maintenance program. Site inspection shall occur at the beginning of each irrigation season to evaluate erosion and runoff control devices (e.g., embankments, flow control structures, vegetated ground cover, and others). Irrigation-related erosion or erosion hazards conditions shall be repaired prior to the beginning of the irrigation season. Monthly inspections shall be performed during the irrigation season and repair and maintenance of any runoff or erosion control structures shall be performed as necessary. A final inspection and maintenance of structures shall occur at the end of the irrigation season or by no later than October 15.

Inspection and maintenance reports shall be kept on file by the Permittee or their operations manager and be made available to the SWRCB upon request. The ECOMP shall designate the responsible party(s) for completing inspections, maintenance, and training. Operations and management protocols and operator training on effective irrigation and irrigation management shall be incorporated into the ECOMP to minimize the potential for excessive project irrigation and irrigation runoff.