

No. 454

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454-1

Letter from Alan Abbs, Dated November 8, 2002



TEHAMA COUNTY / CITY OF RED BLUFF
LANDFILL MANAGEMENT AGENCY

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November 8, 2002

Mr. Art Bullock
Tehama-Colusa Canal Authority
P.O. Box 1025
Willows, CA 95988

FISH PASSAGE IMPROVEMENT PROJECT AT THE RED BLUFF DIVERSION
DAM, TEHAMA-COLUSA CANAL AUTHORITY, STATE CLEARINGHOUSE NO.
2002042075

Dear Mr. Bullock,

The following comments relate to the EIS/EIR for the Fish Passage Improvement Project. The comments are neither for nor against any particular alternative, but rather provide additional information regarding alternatives 1A, 1B, 2A, 2B and 3, and its potential effect on residents of Tehama County.

The fish screen and pumping station proposed in the various alternatives are superimposed over two distinct parcels of land near Red Bank Creek, referred to as the "mill site." The parcel nearest to Red Bank Creek, represented more or less by a gravel road encompassing the parcel, is an active industrial landfill currently operated by the Pactiv Corporation. This landfill is used for disposal of paper sludge generated by Pactiv's wastewater treatment facility at its molded fiber manufacturing plant. Primarily, the waste is dried paper sludge, although the waste may also include oil and chemical residues, plastics, metal, and ash. The EIS/EIR relates that the landfill will be "closed" prior to the project, and the superimposed pump station covers roughly half of the surface area of the landfill.

According to the Fish Passage Improvement Project EIS/EIR (Section 2.3.1), construction and excavation at the "mill site" could require the removal of 750,000 yards of material. Of this amount, 580,000 yards could be "stored" on site, while the remainder (170,000 yards) would be hauled to a disposal facility. The EIS/EIR is not specific as to how many cubic yards the Pactiv landfill accounts for in the 750,000 yard excavation estimate, although 170,000 yards is implied.

Of the 750,000 yards of material, my specific interest is only in the 170,000 yards proposed for off site disposal. Although there are several possible destinations for the waste, the Tehama County/Red Bluff Landfill would appear to be the closest. The EIS/EIR is not specific regarding the final destination location, or if "off site" only means away from the proposed construction area, but still on Pactiv property. This amount, at

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To clarify, the DEIS/EIR assumed 580,000 yards could be stored onsite without further treatment or special handling requirements. It was assumed that some percentage of the remaining 170,000 yards would need to be treated or located to a specially designed waste cell onsite. Using sampling procedures yet to be determined, likely, another smaller percentage would be trucked to an appropriate offsite landfill, depending on the results of the laboratory testing. As of November 2007, it is estimated that the selected project would require approximately 84,000 cubic yards of material to be sampled, treated, and properly disposed of. In the event that the Tehama County Landfill is the appropriate destination for this waste, timing, volumes, and fees will be negotiated with Tehama County and CIWMB in accordance with appropriate legal requirements.

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Letter from Alan Abbs, Continued

1200 pounds per yard (assuming the waste was compacted to industry standards upon original landfilling), equates to approximately 102,000 tons of waste. As a comparison, the Tehama County/Red Bluff Landfill annually receives about 50,000 tons of waste from businesses and residents of Tehama County.

Without knowing the planned fate of the waste, I will present two possible scenarios, and their affects on Tehama County, the Landfill, and the two Agencies.

Re-disposal off-site (and not at Tehama County/Red Bluff Landfill)- Transporting the waste off-site to a facility regulated by the California Integrated Waste Management Board (CIWMB), could result in a significant penalty to the Agencies as a result of Assembly Bill 939, which requires the county to divert 50% of it's waste from landfill disposal by 2000. Although technically the waste was previously disposed, the waste could count against the county for diversion purposes unless the CIWMB is aware of the waste history and circumstances that have led to its excavation and re-disposal. If the waste is disposed at a non-Tehama County run landfill, the Agencies may not have the opportunity to take action to remove the waste from the annual disposal reports. If this option will be pursued, I would ask that the CIWMB be provided with a background of the Pactiv landfill and the Fish Passage Project, so that the Agencies and Tehama County can avert potential penalties due to AB939 violations. Fines can be up to \$10,000 per day over the violation period.

Re-disposal off-site (at the Tehama County/Red Bluff Landfill)- If this option is being contemplated, the same concern regarding AB939 would apply, although the Agencies may be able to be more proactive in addressing AB939 issues. In addition, please consider the following:

1. The Landfill is currently undergoing several permit revisions through the CIWMB. I am relatively confident that the permit revision will allow a maximum of 400 tons of waste per day for daily operations. On average, the landfill receives nearly 140 tons of waste per day from normal operations, although the amount varies significantly from day to day. This leaves 260 tons per day (on average), for short-term disposal events. In operating within our permit limitations, this would result in continuous maximum tonnage disposal of 392 days, which could conflict with the stated construction period of mid-May to mid-October. This time period would require significant coordination to minimize the possibility of exceeding permit limitations on a daily basis, as well as not unduly disrupting other public disposal. Legally going above the permitted disposal rate would require a new CEQA study, in addition to going through the re-permitting process. Again, potential fines are \$10,000 per day for violations.
2. The Landfill is also currently running out of space in our Phase 1 portion of the landfill, and we will soon begin disposing of waste in the Phase 2 portion. This change is scheduled to happen sometime in early 2004, although the date could be affected by the permitting process and by our efficiency in resource recovery operations. The beginning of the Fish Passage Improvement Project could affect

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CIWMB has been apprised of the background at the landfill and the needs of the Fish Passage Improvement Project via separate correspondence.

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See Response to Comment 454-1. The lead agencies intend to follow applicable laws and coordinate with Tehama County and CIWMB to best manage disposal of waste from the project excavation, as necessary.

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the eventual starting date of Phase 2 disposal or initial Phase 2 operations, which could result in added costs or lack of available disposal space prior to final construction of this phase.

Without a doubt, disposal of Pactiv's waste at the Tehama County/Red Bluff Landfill would provide a significant short-term source of revenue to the Agencies and their contractor, GreenWaste of Tehama, provided that the waste was acceptable for disposal at a Class III facility. It could also, however, provide several challenges that could result in significant regulatory action, including fines. As the Solid Waste Director, I only wish to make you aware of the effects of the proposed project as it relates to solid waste operations in Tehama County. The letter is not meant to preclude waste disposal from any specific site, but rather to ask that future project managers communicate their intentions in a timely matter, so that potential regulatory problems can be averted. Ultimately, any decisions regarding large-scale disposal operations at the Tehama County/Red Bluff Landfill may be brought before the Directors of the Tehama County/Red Bluff Landfill Agency, or the Directors of the Tehama County Sanitary Landfill Agency, for approval.

By copy of this letter, I am also informing the CIWMB and Tehama County Environmental Health of my concerns, so that regardless of the alternative chosen and disposition method of waste from the mill site, they have early notice of possible issues. If you have any questions regarding this letter, or solid waste operations in Tehama County, feel free to contact me at 530-528-1102. Thank you for allowing me the opportunity to comment.

Sincerely,

Alan Abbs
Solid Waste Director

CC: Directors, Tehama County/Red Bluff Landfill Management Agency
Directors, Tehama County Sanitary Landfill Agency
Rick Robinson, County of Tehama, Chief Administrator
Susan Price, City of Red Bluff, City Manager
Christine Karl, CIWMB, Permitting and Enforcement
Waste Analysis Branch, CIWMB
Allan Fleming, Tehama County Environmental Health
Michael Gross, GreenWaste of Tehama
Mike Urkov, CH2Mhill
Roger Hillstrom, Pactiv Corporation

No. 455

Letter from Lisa B. Hanf, Dated November 18, 2002

11/25/02 MON 14:20 FAX 916 529 3885

USBR RED BLUFF

CH2M HILL

002



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 REGION IX 75 Hawthorne Street
 San Francisco, CA 94105

November 18, 2002



Michael J. Ryan
 Area Manager
 Northern California Area Office
 Bureau of Reclamation
 16349 Shasta Dam Boulevard
 Shasta Lake, CA 96019-8400

Dear Mr. Ryan:

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the Fish Passage Improvement Project, Red Bluff Diversion Dam, Tehama, Glenn, Colusa, Yolo Counties, CA (CEQ Number: 020376, ERP Number: IBR-K39075-CA). Our review is pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act. This letter provides a summary of EPA's concerns. Our detailed comments are attached.

The Tehama-Colusa Canal Authority (TCCA) and US Bureau of Reclamation (Bureau) propose to implement modifications to Red Bluff Diversion Dam (RBDD) to reduce or minimize the impacts of the RBDD on upstream and downstream migration of juvenile and adult anadromous fish, while improving the reliability of agricultural water supply in the Tehama-Colusa and Coming Canal systems.

Fish passage and agricultural water diversion needs at the RBDD currently conflict. When the RBDD gates are lowered into the Sacramento River, the elevation of the water surface behind the dam is raised, allowing gravity diversion of water into the Tehama-Colusa and Coming Canals for delivery to seventeen irrigation districts and creating Lake Red Bluff. Raising the gates (gates-out position) allows the river to flow unimpeded but precludes gravity diversion into the canals. When the gates are lowered (gates-in position) to facilitate diversions, RBDD presents a barrier for both upstream- and downstream-migrating fish. Fish ladders included in the original dam design are inefficient at certain flows. Additionally, the tailrace and lake created by the dam provide for species that prey on juvenile salmon, reducing their overall survival rates. Fish passage at the RBDD is crucial because more than 75 percent of naturally spawning chinook salmon in the Sacramento River spawn in the reach upstream of RBDD.

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11/25/02 MON 14:21 FAX 916 529 3895

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Thank you for your comment. Your comment has been noted.
No response is required.

This project is part of the CALFED Program. The feasible alternative approaches involve various RBDD gates-in and gates-out scenarios, accompanied by improvements to existing facilities and construction of new fish ladders, fish screens, and pumping facilities. Current operations and facilities provide for a 4-month gates-in period from May 15 to September 15, three fish ladders (two permanent fish ladders on each side of RBDD, one temporary fish ladder in the center of RBDD), and operation of a Research Pumping Plant which is testing fish friendly screw and helical pumps.

Five action alternatives and the No Action alternative are evaluated in detail. Alternative 1A, 4-Month Improved Ladder Alternative, provides for a four-month gates-in period, new fish ladders, and an increase of pumping capacity to 1700 cubic feet per second (cfs) from 320 cfs. Alternative 1B, 4-Month Bypass Alternative, would also provide for a four-month gates-in period, modified right bank fish ladder, increased pumping capacity to 1700 cfs, and a new 1000 cfs bypass channel around the left abutment of RBDD. Alternative 2A, 2-Month Improved Ladder Alternative, would reduce the gates-in period to two months, July 1 through August 31, modify both the left and right fish ladders, and increase pumping capacity to 2000 cfs. Alternative 2B, 2-Month with Existing Ladders Alternative, would use the existing fish ladders, reduce the gates-in period to 2 months, and increase pumping capacity to 2000 cfs. Alternative 3, Gates-Out Alternative, would eliminate the gates-in period and increase pumping capacity to 2500 cfs. The Gates-Out Alternative would eliminate Lake Red Bluff and would provide run-of-the-river fish passage throughout the year.

TCCA has identified the Gates-Out Alternative as their preferred alternative because it maximizes pumping capacity and agricultural water supply reliability. The Bureau has not identified a preferred alternative. The US Fish and Wildlife Service (FWS), California Department of Fish and Game (CDFG), National Marine Fisheries Service (NMFS), and California Department of Water Resources (DWR) have identified the Gates-Out alternative as the alternative which would provide the greatest benefits to fish passage. Reduced gates-in alternatives, Alternatives 2A and 2B, are identified as the next best alternatives for providing increased fish passage.

The Red Bluff-Tehama County Chamber of Commerce and local citizens have expressed strong objections to any alternative that would eliminate the seasonal creation of Lake Red Bluff due to the significant adverse impacts to local recreation opportunities and revenue. Their preferred alternative would be to maintain the current 4-month gates-in period. The citizens of Red Bluff have also supported a bypass channel alternative. TCCA and the Bureau included the 4-Month Bypass Alternative in the detailed evaluation of alternatives due to this intense local interest.

EPA commends the joint goals of improved fish passage and agricultural water supply reliability. We believe the DEIS presents alternatives which provide a mutually beneficial balance between these two goals. EPA concurs with TCCA, FWS, CDFG, NMFS and DWR that the Gates-Out or 2-month gates-in alternatives best meet the purpose and need of improving fish passage, while improving the reliability of agricultural water supply in the Tehama-Colusa and

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Letter from Lisa B. Hanf, Continued

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Coming Canal systems. The DEIS clearly demonstrates that only these alternatives would provide measurable fish passage benefits (Tables 3.2-6 to 3.2-11).

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Bypass alternatives have been formally reviewed in at least three previous public documents. All three documents have resulted in recommendations that the bypass alternatives not be considered further (Appendix A, pg. A-20). The bypass channel is considered experimental, with a significant risk of failure to achieve fish passage improvements. As currently designed, the 4-Month Bypass Alternative, would have significant adverse effects on the Sacramento River Discovery Center, US Forest Service campground, and the Red Bluff Recreation Area (Appendix A). Mitigation for these adverse effects may not be feasible. Given the severe land use conflicts and untested, experimental nature of the bypass alternative, EPA concurs with the US Forest Service, FWS, CDFG, NMFS, DWR and the DEIS evaluation, that Alternative 1B, 4-Month Bypass Alternative, is the alternative which would provide the least fishery benefits (Appendix G).

We acknowledge the potential adverse recreation and economic impacts which could occur with the loss of Lake Red Bluff or reduction of its presence from four months to two months. We note the extensive mitigation measures provided in the DEIS to offset these impacts (Section 3.5 Recreation, Section 3.10 Socioeconomics). For instance, the promoters of the Nitro National Drag Boat Festival, which provides significant local economic benefits, have expressed interest in moving the race date to July, during the gates-in period for the 2-Month Alternatives (pg. 3-212). Furthermore, the primary project purposes of the RBDD are irrigation, flood control, and power production (pgs. 1-4 to 1-7). Therefore, RBDD must first be managed and operated to fulfill these chief project purposes. In fact, the US Forest Service acknowledged in their 1991 Lake Red Bluff FEIS that the use of Lake Red Bluff and RBDD could change and has postponed lake dependent development until resolution of the fish passage issue (pg. 3-208). Recreation is recognized as a beneficial use of the RBDD facilities even though recreation beneficiaries have not taken part in the management, funding, or repayment of these facilities. The DEIS shows that it should be possible to avoid, minimize, and offset adverse recreation and economic impacts caused by the permanent loss of Lake Red Bluff or its absence for an additional two months. We urge TCCA, the Bureau and the City of Red Bluff to work collaboratively and creatively to minimize potential adverse recreation and economic impacts.

No! } 455-2

? secondary purposes only

While EPA supports the Gates-Out or 2-Month Alternatives, we have concerns regarding hazardous materials and air quality. We are also concerned about water quality impacts. These concerns relate to temperature effects of alternatives which would retain the dam for a four-month period; the soil contaminant hot spots on the Mill Site; and the rise of groundwater, caused by creation of Lake Red Bluff, in the unlined Class III landfill owned and operated by the Pactiv Corporation (pg. 3-247). Although Pactiv intends to close the landfill, elimination of Lake Red Bluff or a reduction in its presence, would help reduce the rise of groundwater into the landfill and potential contamination of this groundwater.

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Based upon our review, we have rated the document EC-2 Environmental Concerns - Insufficient Information. Please refer to the attached "Summary of Rating Definitions for further details on EPA's rating system.

455-2

The commentor is incorrect in her assertion regarding the designated purpose of RBDD. Although, the overall CVP purpose includes consideration of flood control and power generation, RBDD does not. See DEIS/EIR Section 1.2.3 for a description of the Legislative and Management History surrounding the facilities at RBDD. The lead agencies have worked diligently and cooperatively with representatives of the Red Bluff area to avoid adverse impacts, and will continue to do so.

455-3

The Pactiv landfill site is privately held and has been subject to additional investigations regarding its status as a non-permitted landfill. However, these investigations are subject to confidentiality provisions in the agreements between the lead agencies and the landowners. As the project moves forward, these investigations will become part of the public record, as appropriate, and will serve as the basis for proper handling of waste materials excavated from the landfill during construction.

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Letter from Lisa B. Hanf, Continued

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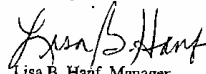
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We appreciate the opportunity to comment on the DEIS. Please send two copies of the Final EIS to the address above (Mail Code: CMD-2) when it is filed with EPA's Washington, D.C. office. If you have any questions, please feel free to contact me or Laura Fujii, the primary point of contact for this project. Laura Fujii can be reached at 415-972-3852 or Fujii.Laura@epa.gov.

Sincerely,



Lisa B. Hanf, Manager
Federal Activities Office

Attachments: Summary of EPA Rating Definitions
Detailed Comments

cc: Buford Holt, Northern California Area Office, Bureau of Reclamation
Max J. Stodoiski, Red Bluff Division, Bureau of Reclamation
Art Bullock, Tehama-Colusa Canal Authority
Jim Smith, US Fish and Wildlife Service
Mike Tucker, National Marine Fisheries Service
Mike Van Dame, Mendocino National Forest
Harry Rectenwald, California Dept. of Fish and Game
Dwight P. Russell, California Dept. of Water Resources

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Letter from Lisa B. Hanf, Continued

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SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

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Letter from Lisa B. Hanf, Continued

11/25/02 MON 14:23 FAX 918 529 3885 USBR RED BLUFF +--+ CH2M HILL 007

US EPA Detailed Comments: DEIS Fish Passage Improvement Project, Red Bluff Diversion Dam, November 18, 2002

DETAILED COMMENTS

Hazardous Material Comments

1. All action alternatives include construction of a new pumping station on the Mill Site. Soil borings and test pits have shown motor oil in several soil samples, chromium exceeding state hazardous waste criteria in one soil sample, and polychlorinated biphenyls above the EPA industrial preliminary remediation goal in one sample (pg. 3-111). Mitigation for construction-related impacts states that the construction contractor will follow applicable federal, state, and local regulations if contaminated soil is encountered. EPA is concerned with the soil contaminant hot spots on the Mill Site. We believe the process of remediation and disposal of contaminated soil should be determined and fully disclosed prior to construction.

Recommendation:

EPA recommends that more specific information on the remedial and disposal process for contaminated soil be included in the final EIS (FEIS). Include Tehama-Colusa Canal Authority's and the Bureau's most current assessment for the areas having known or suspected contamination and the proposed schedule for remediation, if remediation is required. The FEIS should briefly describe applicable State and Federal requirements.

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2. We are concerned with the rise of groundwater, caused by creation of Lake Red Bluff, in the unlined Class III landfill owned and operated by the Pactiv Corporation. At times when the groundwater level is high, elevated levels of inorganic constituents are detected in groundwater collected from site wells. Total dissolved solids, turbidity, iron, and manganese concentrations have exceeded the secondary maximum contamination levels in the well downgradient of the landfill. The DEIS states that Pactiv has completed a corrective action plan and intends to close the landfill, possibly by capping the landfill with a geosynthetic clayliner or designating a containment zone (pg. 3-247 to 3-248). We note that capping the landfill would not necessarily resolve the encroachment of groundwater from below or address groundwater encroachment and contamination caused by the creation of Lake Red Bluff.

Recommendation:

The FEIS should fully address the potential effects of the action and no action alternatives on the groundwater contamination situation at the Pactiv Class III landfill. For instance, elimination of Lake Red Bluff, a reduction in its elevation, or a reduction in the number of months the lake is created, could reduce or eliminate the rise of groundwater into the landfill and subsequent groundwater contamination.

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455-4

A new estimate of the volume of excavated material has been added to the EIS/EIR. See Response to Comment 454-1 for additional information on soils handling.

455-5

See DEIS/EIR Section 3.3.3 for a discussion of groundwater and groundwater quality issues in the project area. It is anticipated that construction of the selected project would isolate groundwater at the Mill Site from the Sacramento River by forming a barrier between shallow groundwater and the river.

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Letter from Lisa B. Hanf, Continued

11/25/02 MON 14:24 FAX 916 529 3685

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US EPA Detailed Comments: DEIS Fish Passage Improvement Project, Red Bluff Diversion Dam, November 18, 2002

Air Quality Comments

EPA believes that it is important and appropriate that the FEIS address the new eight-hour ozone standard and the new "fine" particulate matter standard (PM_{2.5}). The DEIS states that the project site is not in attainment for the state PM₁₀ and ozone standards. The area is also expected not to be in attainment for the 8-hour Federal ozone standard (pg. 3-455). PM_{2.5} is not addressed in the DEIS. Although EPA has not designated nonattainment areas for either eight-hour ozone and PM_{2.5} standards, we believe these standards may have bearing on the proposed actions. Because the eight-hour ozone standard is more stringent than the one-hour ozone standard, it is likely that parts of the project area would be designated as a nonattainment area for the eight-hour ozone standard, possibly within the time frame of the proposed action. Therefore, it would be useful, and appropriate under the public disclosure requirements, to include a discussion of the implications of the new eight-hour ozone standard with respect to the execution of this project. EPA recognizes the serious health effects that "fine" particulates can cause, and, therefore, urges project proponents to reduce particulate emissions to the greatest extent possible. This is particularly important where the project will impact sensitive receptors, such as children and the elderly. We note that the Sacramento River Discovery Center, US Forest Service Campground, and Red Bluff Recreation Area are close to proposed construction sites and are heavily used by school children and recreationists.

Recommendations:

In its discussion of air quality impacts the FEIS should include a discussion of the new eight-hour ozone standard, as well as the new PM_{2.5} standard. To the extent that monitoring data is available on these two criteria pollutants, include that information in the FEIS. In addition, we urge the Co-Lead Agencies to commit to a detailed discussion of measures to reduce construction and operational generation of PM_{2.5}.

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Water Quality Comments

Data suggest that RBDD has a warming effect on the Sacramento River (pg. 3-92) and, in fact, the temperature objective for this reach of the Sacramento River is frequently violated at the RBDD. Thus, a reduction of the gates-in period from four months to two months, as well as the gates-out alternative, could lower the temperature of the Sacramento River water. Despite the discussion of temperature issues with the current gates-in regime (pg. 3-91), the DEIS does not appear to fully assess the water temperature impacts of the alternatives. In addition, the installation of cofferdams to enable construction could increase turbidity and sedimentation in the river.

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Letter from Lisa B. Hanf, Continued

11/25/02 MON 14:24 FAX 916 529 3895 USBR RED BLUFF CH2M HILL 009

US EPA Detailed Comments: DEIS Fish Passage Improvement Project, Red Bluff Diversion Dam, November 18, 2002

Recommendation:

The FEIS should evaluate in more detail the potential effects of the alternatives on water quality. This evaluation should examine potential effects to river temperatures of continued periods of water impoundment at the dam. Construction-related impacts should be described in more detail, and Best Management Practices and mitigation measures to avoid or minimize adverse effects should be described and implemented.

455-7

General Comments

1. A total of 17 water districts contract with the federal government for water deliveries from the Tehama-Colusa and Corning canals. These districts have contracts totaling 325,000 acre-feet (af) of water each year. The DEIS states that the total maximum diversion from RBDD would not change from the cumulative Central Valley Project (CVP) service contract amount (pg. 3-268). However, all the action alternatives appear to provide a maximum diversion total of 667,260 af to 757,350 af (Tables 3.8-2 to 3.8-6).

Recommendation:

We recommend the FEIS describe in more detail the CVP water service contract held by TCCA, especially diversion limitations and requirements. It would also be helpful to include a short description of other water sources for TCCA, how water supply shortfalls are met, and the diversion schedules from RBDD during normal, dry, and wet years. Describe the relationship between the total contract amount of 325,000 af and the maximum diversion potential of the action alternatives. For example, describe the conditions when TCCA would be able to utilize the maximum diversion potential of the pumps.

455-8

2. The Socioeconomic evaluation does not appear to include a description of the significance criteria. The significance criteria is especially important for the socioeconomic effects analysis because, although the difference between effects of the alternatives is quite small, the DEIS concludes that some alternatives have no significant impacts while other alternatives do have significant impacts.

455-9

Recommendation:

The FEIS should include a full description of the significance criteria used for socioeconomic impacts. We are especially interested in why the DEIS concludes that the 2-month alternatives have no significant impacts while the Gates-Out alternative does. Data in the DEIS states that impacts of the 2-month gates-in alternatives would result in a total loss of \$3.5 million dollars per year to Tehama County out of a revenue base of \$1.7 billion and 1.1 percent loss of sales and tax revenues to the City of Red Bluff. The loss under the Gates-Out alternative would

455-9

455-7

455-8

See the mitigation outlined in DEIS/EIR Section 3.3.2, pages 3-102 and 3-103, for a discussion of means to protect water quality.

The TCCA does not hold a water service contract with Reclamation. Instead, the member districts of TCCA hold individual water service contracts for water that is conveyed via the TC Canal. Individual farms within each of the member districts respond to shortfalls in different ways, depending on soil conditions, access to groundwater, availability of transfer water, and terms of each district's water service contract. Individual contracts are available for review at Reclamation's Mid-Pacific Web site at: http://www.usbr.gov/mp/cvpia/3404c/lc_contracts/2005_exec_cts_water_serv/index.html. Maximum capacity and maximum volume diversions are dependent on numerous factors, including agricultural markets, individual farm cropping patterns, weather patterns, and water-year type. Historically, maximum-capacity diversions have occurred in drought years, following extended periods of conservation by the member water districts. Essentially, individual farms all restrict deliveries for as long as possible, then respond almost in unison to a hot spell. Maximum-volume diversions occur in normal rainfall years that happen to correspond with unusually warm growing seasons, and are subject to changes in market conditions. Also see DEIS/EIR Section 3.8 for a discussion of agricultural resources in the TCCA service area.

Thank you for your comment. The requirements to evaluate socioeconomic impacts differ between NEPA and CEQA. Under CEQA, social and economic changes are not considered environmental impacts unless they are anticipated to result in a significant physical change to the environment (CEQA Guidelines Section 15064). NEPA requires that an EIS consider social and economic effects if they are related to effects on the natural or physical environment, and the NEPA definition of effects includes social and economic factors (40 Code of Federal Regulations 1508.8, 1508.14). The Socioeconomic section analysis contains both a social and an economic component that is difficult to evaluate in a purely quantitative manner; thus, quantitative significance criteria were not developed. Assumed adverse impacts are identified in DEIS/EIR Section 3.10.2, Environmental Consequences, under "Methodology" as "Negative Impacts" on pages 3-304 and 3-305, which served as the basis for evaluating potential socioeconomic impacts. Table ES-4

No. 455

Letter from Lisa B. Hanf, Continued

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US EPA Detailed Comments: DEIS Fish Passage Improvement Project, Red Bluff Diversion Dam, November 18, 2002

be \$4.2 million per year to Tehama County out of \$1.7 billion revenues and a 1.9 percent loss of sales and tax revenues to the City of Red Bluff (pg. 3-321).

3. A cost analysis for each alternative does not appear to be included in the DEIS. Given the potential high costs of some of the facilities, such an evaluation would be helpful to the public and decision maker.

Recommendation:

The FEIS should include a table with the relative cost of each action alternative. If specific values are not available, an estimate should be used to at least provide a comparison of the financial feasibility of the alternatives.

} 455-10

4. We commend TCCA and the Bureau for the proposed mitigation ratios of 3:1 for impacts to waters of the U.S. It appears that the 2-month gates-in alternatives and Gates-Out alternative have lower impacts to both water of the U.S. and to listed species.

Recommendation:

The discussion about wetland delineation on page 5-6 should be under the Section 404 discussion, not Section 10 discussion. Authorization under Section 10 will be required since the Sacramento river is considered navigable to the Kewick Dam. We request a copy of your mitigation plan for review when it is available to the public.

} 455-11

5. The DEIS does not appear to evaluate the seismic risk to the Mill Site, pumps, fish screen or conveyance pipes.

Recommendations:

The FEIS should include a short evaluation of seismic risks, if any, at the proposed construction sites. For instance, would liquefaction be a concern?

} 455-12

6. Loss of Lake Red Bluff or a reduction of the months it is created would have a significant impact on public and private boat docks and ramps which are sized to the lake elevations. The DEIS states that these impacts cannot be mitigated. EPA believes there are means to mitigate these impacts such as extending the docks and ramps to the river shoreline or providing floating docks and facilities. Such measures have been used on water supply reservoirs to mitigate for an increase in reservoir elevation fluctuations.

Recommendation:

TCCA and the Bureau should pursue mitigation measures to address the potential impacts to boat docks and ramps, currently dependent on Lake Red Bluff elevations. For instance, the FEIS should evaluate the feasibility of extending existing boat docks, replacing or modifying existing public docks and ramps, or

} 455-13

455-9,
cont'd

summarizes the difference in potential impacts between Alternative 3 (significant) and the other alternatives (less than significant). DEIS/EIR Section 3.10 states that several components must be considered in the social and economic impacts analysis, including loss of income and jobs from lake-dependent recreation and tourism, loss of the Nitro National boat races, reduction in property values resulting from loss of the lake, fiscal impacts to the City of Red Bluff, and loss of quality of life and community cohesion. DEIS/EIR page 3-320 indicates that the City would see a reduction in sales and use tax revenue of 1.1 percent under a 2-month Gates-in Alternative and 1.9 percent under the Gates-out Alternative. As the commentor indicates, there is a relatively small change in the anticipated economic effect between Alternative 3 (Gates-out) and the 2-month Gates-in Alternatives (\$4.2 million versus \$3.5 million). However, Alternative 3 would result in a much greater social impact associated with the complete loss of the lake, as well as a potential decrease in property values as identified on pages 3-313 through 3-315. These potential impacts associated with Alternative 3 when evaluated in total with the assumed other negative impacts result in the anticipated socioeconomic effect of implementing this alternative to be significant under NEPA.

455-10

The DEIS/EIR has been amended to include the construction cost estimates used during preparation of the DEIS/EIR (Table A-11). These estimates will be updated prior to implementation of any action alternative. Following are the costs that were used at the time of alternative development:

Alternative	Construction	Operation
No Action	--	\$370,000
Alternative 1A	\$85,000,000	\$470,000
Alternative 1B	\$90,000,000	\$470,000
Alternative 2A	\$94,000,000	\$400,000
Alternative 2B	\$79,000,000	\$400,000
<u>Alternative 3</u>	<u>\$88,000,000</u>	<u>\$360,000</u>

455-11

Your comment had been noted. Text has been revised to address this to comment. See text change in Section 2.0 of this FEIS/EIR.

455-12

See DEIS/EIR page 3-241 for a discussion of seismology. No major seismic concerns were identified.

No. 455

Letter from Lisa B. Hanf, Continued

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US EPA Detailed Comments: DEIS Fish Passage Improvement Project, Red Bluff Diversion Dam, November 18, 2002

providing other facilities which could offset the loss of existing boat docks and ramps.

} 455-13,
cont'd

7. The DEIS states that the 4-Month Improved Ladder alternative and 4-Month Bypass alternatives would have the same volume of excavated material, 800,000 cubic yards of soil (pg. 3-249). However, the Bypass alternative includes improvement to one fish ladder plus excavation of a large bypass channel.

455-13

Replacement of boat docks and other possible mitigation measures were considered to offset impacts to recreation; however, after in-depth consultation with stakeholder groups, such measures were determined to be undesirable. Essentially, the stakeholders asserted that a reduction in gate operations would make boat docks undesirable.

455-14

The landfill volumes have been updated. See Thematic Response No. 4.

Recommendation:

The FEIS should re-evaluate the estimate of excavated material for the two alternatives above and correct the volume values, if necessary.

} 455-14

Letter from Brad Helser, Dated November 21, 2002

11/22/02 FRI 10:53 FAX 916 529 3895

USBR RED BLUFF

+++ CH2M HILL

No. 456



Mr. Art Bullock, General Manager
 Tehama-Colusa Canal Authority
 P.O. Box 1025
 Willow, CA 95988

RE: Written Comment on the Draft EIS/EIR for the Fish Passage Improvement Project published in the Federal Register on August 30, 2002

DATE: November 21, 2002

Dear Mr. Bullock:

On behalf of the 400 plus members of the Red Bluff-Tehama County Chamber of Commerce, I am writing to endorse the resolution #37-2002 of the City of Red Bluff (May 7, 2002) and to share with you the regional support for the continuation of the Red Bluff Diversion Dam in its current 4 months gates-in operating regimen.

Of the 6 alternatives proposed, the Chamber supports Alternative 1a which retains a gates-in operation for 4 months, improves the fish ladders, and provides for a pumping facility to meet the water needs of the TCCA into the future.

In support of this position, the Chamber of Commerce, for the past 6 months, circulated the following petition to submit as public comment on:

Draft Environmental Impact Statement/Environmental Impact Review for the Tehama Colusa Canal Authority Fish Passage Improvement Project at the Red Bluff Diversion Dam published in July 2002 (projected)

We, the undersigned, endorse the resolution of the Red Bluff City Council, No. 37-2002 which says in part:

"Be it Resolved that the City Council of the City of Red Bluff hereby expresses its strong, unequivocal support for leaving the gates in at the Red Bluff Diversion Dam from May 15th to September 15th of every year thus preserving Lake Red Bluff and its economic and recreational benefits for the community."

We further state that the selection of any alternative that reduces the operation of the Diversion Dam below 4 months is an unacceptable economic and community development loss extending well beyond the local community and includes: loss of tourism and the benefit of tourism expenditures that generate sales tax and occupancy tax revenue to the city and in transit; loss of recreational benefits including community events such as the Memorial Day Boat Drags, boat launching and shoreline leisure; loss of property value; degradation of parks

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Letter from Brad Helser, Continued

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and community gathering amenities; negative impacts to the Red Bluff Downtown Revitalization process that included lake front attributes, amenities and pedestrian/trail access plans, and other significant impacts.

We further endorse the alternative 1-A 4-month Improved Ladder Alternative and accept the solution that includes adding pumping capacity determined to be necessary to provide reliable water to the TCCA.

We further request that any Adaptive Management Program include a provision for peer review of the recommendations of the Adaptive Management Science Team (AMST) and that the Policy Review Board be required to evaluate the AMST recommendations after peer review analysis and before recommendations are implemented.

} 456-1

To date, the Chamber has, and will provide if so requested, petitions with 6642 individual names. An additional 478 names are illegible and are not counted in the total of individual names. Of the total, 3,190 (48%) are from residents of Tehama County, 561 (8.4%) are from Redding and areas to the north, 346 (5.2%) are from Chico and areas to the south, 318 (4.8%) are from the San Francisco Bay Area, 198 (3%) are from the Sacramento area, 1,437 (21.6%) are from all other areas of California and 594 (8.9%) are residents from out of the State of California.

We feel it is important to recognize that concern over the loss of Lake Red Bluff goes well beyond the interests of local individuals and businesses. The regional use of this Lake cannot be minimized and its loss affects persons and businesses well beyond the local community. What analysis does the DEIS/EIR provide to demonstrate the impacts outside of the local community? Elimination or reduction in the gates operating period of the Red Bluff Diversion Dam must address the regional impacts, not just the local impacts. Please explain what measures to mitigate regional losses are contemplated? How will these losses be measured and what resources will be used to compile the record?

} 456-2

} 456-3

Thank you for the opportunity to comment on this DEIS/EIR.

Sincerely,

Brad Helser,
President, Red Bluff-Tehama County
Chamber of Commerce

cc: Max Stodolski, Bureau of Reclamation
Marshall Pike, The California Parks Company

456-1 The design of the AMP and the roles, responsibilities, guidelines, and processes of the AMPC, which will have oversight of and direct any adaptive management technical committee, will be provided in an MOU between the cooperating resources agencies and TCCA as outlined in Appendix H to the DEIS/EIR. Any provisions, including peer review of Technical Committee recommendations, would need to be included in the organizing MOU and agreed upon by the signers of the MOU as stated in the DEIS/EIR.

456-2 Thank you for your comment. DEIS/EIR Section 3. 10, page 3-299, states that impacts to the City of Red Bluff as well as Tehama County were a key consideration in the impact assessment. See Section 3.10 of the DEIS/EIR for additional information.

456-3 DEIS/EIR Table ES-4 lists the potential impacts to socioeconomics. There is no proposed mitigation at this time. CEQA requires mitigation for economic impacts only if secondary effects will be realized. NEPA does not require mitigation.

No. 457

Letter from David A. Vogel, Dated November 30, 2002

Comments on the August 2002 Public Draft
Red Bluff Diversion Dam
Environmental Impact Statement/Environmental
Impact Report

November 30, 2002

Prepared by:

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No. 457

Letter from David A. Vogel, Continued

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No. 457**Letter from David A. Vogel, Continued****SUMMARY**

This report provides a technical peer review of the August 2002 Public Draft Red Bluff Diversion Dam (RBDD) Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) as related to fishery resources. Based on an extensive review of information provided in the DEIS/EIR and a thorough review of numerous documents, data, and highly relevant information pertinent to upstream and downstream fish passage at the dam, it was determined that the DEIS/EIR is deficient, inadequately serves its original intended purpose, and is fatally flawed. The document does not provide a fair, impartial, scientifically balanced assessment to allow comparisons of project alternatives. The DEIS/EIR is incomplete and misleads the reader by suggesting incorrect or invalid cause and effect biological relationships on fish. These circumstances are attributable to a wide variety of reasons described in this detailed critique and include the following:

- 1) Fish passage conditions are not based on current RBDD operations
- 2) Misrepresentation of existing information
- 3) Lack of technically relevant references
- 4) Subjective conjecture leading to a preferred alternative

The DEIS/EIR provides its version of an analysis of alternative approaches and measures to improve fish passage at RBDD while concurrently improving water delivery reliability into the Tehama-Colusa and Corning irrigation canals. The DEIS/EIR uses a computer spreadsheet model to invoke an unscientific and arbitrary "ecological cost" and, more importantly, is used as the primary method to describe and compare each of the alternatives presented in the document. Unfortunately, the model possesses numerous defects in its assumptions, data, and computational procedures that invalidate the outputs. These flaws include:

- 1) Inconsistent logic in its analytical approach
- 2) Model structure proves a bias to one alternative
- 3) Methodology is nebulous, speculative, and arbitrary

There is clearly inconsistent logic in the analytical approach used to assess alternative effects on fishery resources. The analytical method is artificially structured to ensure that none of the gates-in alternatives with improved fish ladders can surpass the alternative with the largest pumping plant. This takes place because the computer spreadsheet model and assumptions lack a scientifically sound foundation. There is so much speculation built into the fishery analysis methodology, that one cannot use it to assess impacts or benefits of the various alternatives in the DEIS/EIR. The document uses an inconsistent standard between alternatives then provides criteria for RBDD, without supporting scientific justification, dissimilar to other fish passage facilities elsewhere in North America. The analytical approach employed in the DEIS/EIR is not only counter-intuitive and invalid, but is contrary to accepted scientific principles, standards, and practices. Critically important conclusions drawn in the DEIS/EIR are not supported by empirical evidence. Much of the best available data and information is contrary to speculative assumptions used in the DEIS/EIR, but was not used or was disregarded.

No. 457**Letter from David A. Vogel, Continued**

Recommendations are provided to improve the final EIS/EIR. However, the technical defects are so severe and numerous that an entire re-analysis of project alternatives and re-write of the document are warranted. The final EIS/EIR needs to provide full consideration of all relevant information. The re-write should follow well-established scientific rules and objectivity. Impartial individuals with expertise on upstream and downstream fish passage studies and facilities should be involved in the formulation of the final document. Because of the numerous technical errors in the August 2002 draft, it is highly recommended that a second draft be submitted for public review prior to finalizing the document.

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Letter from David A. Vogel, Continued

457-1

The analysis used an average-value (21 days) passage delay. The data were obtained from recent (1998-2000) USFWS radio-tagging studies at RBDD under a 4-month gates-in operation. The Red Bluff Fish and Wildlife Service office was contacted on October 17, 2007, regarding the status of this report. As of this time, a technical report summarizing the 1999-2000 adult salmon telemetry study has not been prepared (Kisanuki, 2007). The range of delay (1.6 days to 34 days) from the recent radio-tagging results were found to be relatively similar to delay times determined from previous studies at RBDD. The previous studies, conducted during 12-month gates-in operations by Hallock (1982) determined mean delays from 3.5 days for fall-run up to 19.2 days for winter-run Chinook. Vogel (et al., 1988) determined mean delays from 3.25 days for fall-run up to 13.3 days for spring-run Chinook. Other "relevant" delay-of-passage studies cited by Vogel were from the Columbia River Basin, not the Sacramento River at RBDD and, therefore, not directly pertinent to the passage problem at RBDD.

INTRODUCTION

This report provides a technical peer review of the Draft Red Bluff Diversion Dam Environmental Impact Statement/Environmental Impact Report (DEIS/EIR) as related to fishery resources. This review is based on a thorough examination of the DEIS/EIR, its Appendices, and data and studies cited. It is also based on an extensive review of the scientific technical literature concerning upstream and downstream fish passage research and the author's past long-term experience directing and conducting studies at RBDD and elsewhere throughout California which include 28 years working as a fishery scientist (15 years for the federal government and 13 years in the private sector). The following discussion describes the topics requiring major revision in the DEIS/EIR and the reasons why those corrections are necessary.

TOPICS REQUIRING MAJOR REVISION IN THE FINAL EIS/EIR

Problems/Errors with the DEIS/EIR Assumptions on Upstream Fish Passage

Overstatement of Existing Fish Passage Delay and Blockage

The problems associated with insufficient flow and attraction of adult salmon into the RBDD fish ladders were recognized nearly 30 years ago. In 1981, the U.S. Fish and Wildlife Service (USFWS) reported:

"The efficiency of the fishways can be increased significantly if appropriate modifications to the attraction flow diffuser chambers are provided. The necessary improvements were identified in 1975 [citing NMFS 1975] and modifications were made in 1978. However, due to mechanical failure, the corrective features have not functioned and fishway operation basically remains unimproved." (USFWS 1981)

A variety of studies to evaluate upstream fish passage at RBDD were performed from the 1970s to the mid-1980s when the RBDD gates were in 12 months a year. In the 1970s, the California Department of Fish and Game (CDFG) conducted a radio tagging study of adult chinook at the dam. Those results are reported in Hallock et al. 1982 but are only selectively included in the DEIR/EIS. Additional studies of upstream fish passage were conducted by the USFWS during the 1980s when the RBDD gates were in 12 months a year and are reported in Vogel et al. (1988). Once again, those studies are briefly mentioned in the DEIR/EIS, but relevant data and results were not included.

The DEIS/EIR provides highly misleading information on fish passage at RBDD by citing results from these experiments performed when the gates were in 12 months a year¹ to suggest those data are reflective of current dam operations when the gates are in

457-1

¹ "Vogel et al., (1988) determined from salmon tagging studies conducted from 1983 through 1988 that between 8 percent and 44 percent of adult chinook salmon, depending on run, were blocked from passing upstream of RBDD. Similarly, Hallock et al., (1982) determined that passage of 15 percent to 43 percent of adult chinook salmon, depending on run, were blocked by RBDD". . . . "Vogel et al., (1988) determined

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Letter from David A. Vogel, Continued

only 4 months a year. The significance of this major error in the DEIS/EIR is that the studies referred to were performed in the 1970s to the mid-1980s *prior* to implementation of major fish passage improvements (discussed in a later section of these comments). Furthermore, those earlier studies found that the highest recorded fish passage delays and blockage at RBDD occurred during the winter or early spring months when high river flow conditions were known to delay fish migration. The DEIS/EIR is deceiving in this regard because it suggests that this situation is reflective of the current mode of RBDD operations when river flows are naturally much lower and fish passage is much more efficient. The DEIS/EIR is written such that an uninformed reader could not distinguish this highly relevant fact and be misled. The earlier studies determined that the adult salmon delay problems with high flow at RBDD were attributable to insufficiently sized and configured fish ladders on the dam (more details in a later section of these comments); these circumstances are of high importance to this DEIS/EIR.

Additionally, the DEIS/EIR ignored other relevant peer-reviewed reports on earlier studies performed in conditions similar to current RBDD operations. These reports found fish passage problems that were not nearly as severe as portrayed in the DEIS/EIR. For example, Hallock et al. (1982) found that radio-tagged fall-run salmon passing RBDD were delayed only 3.5 days downstream of the dam. Additionally, Vogel et al. (1988) found that fall-run salmon were delayed only 3.75 days below the dam.

The DEIS/EIR used raw data obtained from the USFWS on a radio-tagging study performed in 1999-2001 that presumably shows extremely severe delays of fall-run chinook downstream of RBDD when the gates are in.² Those data have not been published nor has the USFWS endorsed the DEIS/EIR's interpretation of those raw data (Tom Kisanuki and Kurt Brown, USFWS, personal communication). I obtained those data sets and concluded that the DEIS/EIR's use of the data may signify one or more circumstances:

- 1) the DEIS/EIR could have correctly analyzed the data which means that something has severely negatively impacted adult fish passage at RBDD since the period when the dam gates were in 12 months of the year;
- 2) the DEIS/EIR incorrectly analyzed the USFWS data;
- 3) the data cannot be appropriately analyzed using solely the data sets provided (e.g., data interpretation would require more extensive understanding of the study design, etc.);
- 4) something is wrong with the experimental design or methods used to develop the data; or
- 5) combinations of the above.

457-1,
cont'd

that the mean time of delay in passage of adult chinook salmon at RBDD was greater than 3 to greater than 13 days, depending on the run." DEIS/EIR Pages B-5 and B-6

² Radio telemetry investigations conducted from 1999 to 2001, using adult fall-run Chinook salmon, indicate that delay in passage, under existing conditions at RBDD, may average approximately 21 days (USFWS, unpublished data)." DEIS/EIR Pages B-5 and B-6

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Letter from David A. Vogel, Continued

If the data truly indicates that fish passage is as severe as portrayed in the DEIS/EIR (option 1), it would be very easy to rectify those problems based on experience acquired when the dam gates were in year-round and passage delays were measured as only about an average of 3.5 to 3.75 days in two separate extensive research projects. I concluded that option 3 is the more likely scenario.³ Until that scenario is pursued, the other options cannot be determined.

However, it is useful to compare the DEIS/EIR interpretation of adult salmon delay below RBDD with other studies to place the issue in context. Table 1 shows the DEIS/EIR implication that fish passage at RBDD is now much more severe under the current mode of dam operations than it was during the 1970s to mid-1980s. The DEIS/EIR also suggests that adult salmon delay at RBDD is much more severe than recorded at the Columbia River dams (Figure 1, Table 1)

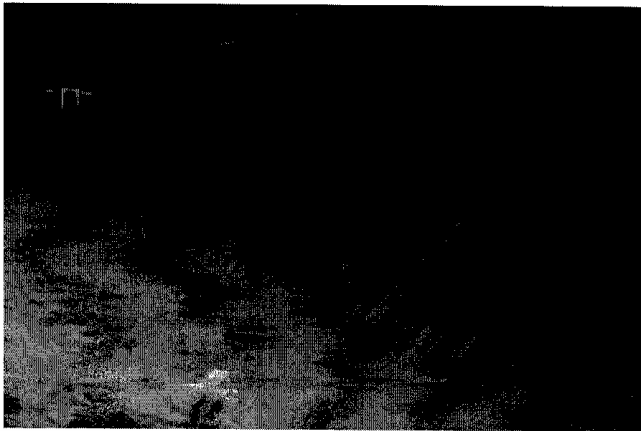


Figure 1. The RBDD DEIS/EIR suggests that adult passage at RBDD under current dam operations is more severe than fish passage at Columbia River dams shown above.

457-1,
cont'd

³ For example, I cannot determine if the DEIS/EIR accounted for the known delay caused by temporary fish trauma associated with fish capture, tagging, transport, and release. For example, in their radio tagging study at RBDD, Hallock et al. (1982) found that for adult salmon captured, tagged, and released approximately 2.5 miles downstream of the dam, only 59% approached the dam, a phenomenon attributed to tagging. Further substantiation of this artifact of tagging is notable from their study in the finding that, for those salmon released 2.5 miles downstream of the dam, it took an average of 5.3 days for the fish to migrate from the release site to the dam, uncharacteristically much slower migration rate than expected for non-tagged fish.

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Letter from David A. Vogel, Continued

Table 1. Delay in hours of tagged adult chinook salmon below Columbia and Snake River Dams (after Haynes and Grey 1980) and Red Bluff Diversion Dam (adapted from Vogel and Smith (1984)).

Dam	Study Year(s)	Citation	Tag Type ^{1/}	Number of Fish	Time ^{2/}
					(Hours/Fish) Average Delay
Bonneville	1948	Schonning and Johnson (1956)	NT	35	67
Bonneville	1972	Monan and Liscom (1973)	R	20	141
Bonneville	1973	Monan and Liscom (1974)	R	52	96 ^{3/}
Bonneville	1974	Monan and Liscom (1975)	R	42	54
The Dalles	1972	Monan and Liscom (1973)	R	30	33
Rock Island	1954-56	French and Wahle (1965)	NT	2,217	72
Lower Monumental	1973	Monan and Liscom (1974)	R	20	62
Lower Monumental	1975	Gray and Haynes (1976)	R	20	18
Little Goose	1975	Gray and Haynes (1976)	R	10	139
Little Goose	1976	Haynes and Grey (1980)	R, NT	45	216
Little Goose	1977	Haynes and Grey (1980)	R, NT	48	90
Lower Granite	1975	Liscom and Monan (1976)	R	30	78
Lower Granite	1976	Haynes and Grey (1980)	R	3	50
Lower Granite	1977	Haynes and Grey (1980)	R	18	58
RBDD	1979-1981	Hallock et al. (1982) fall-run chinook salmon	R	17	84
RBDD	1983-1988	Vogel et al. (1988) fall-run chinook salmon	R	60	90
RBDD	2002	RBDD DEIS/EIR fall-run chinook salmon	R	?	504

^{1/} R = radio transmitter, NT = nontelemetering fish tag.
^{2/} Values averaged over all fish used in a study.
^{3/} Time from release 6.4 km downstream to dam passage.

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Letter from David A. Vogel, Continued

457-2

The existing conditions scenario in the EIS/EIR assumed and included all improvements made to RBDD to date. This included the 10-Point Action Program, cited by the commentor, and any other improvements that have been made to RBDD, including the 8-month gates-out operation dictated by the 1993 BO for Winter-run Chinook salmon.

Failure to Account for the Upstream Fish Passage Improvements

The following is a description of significant actions or features implemented that improved upstream fish passage at RBDD. However, the DEIS/EIR is implying that, for reasons unexplained, fish passage is now more severe than ever before.

} 457-2

Raising the RBDD Gates on a Seasonal Basis

The most significant improvement in upstream fish passage occurred as a result of a 10-Point Action Program for Winter-Run Chinook developed by this author and John Hayes of CDFG in June 1986. The first point was raising the RBDD gates from December 1 to April 1 annually "to allow more than two-thirds of the annual winter run to spawn in the upper reaches of the Sacramento River without delay or blockage at RBDD" (Vogel and Hayes 1986). In 1993, as a result of a revised National Marine Fisheries Service (NMFS) Biological Opinion, the RBDD gates were raised 8 months of the year (i.e., September 15 – May 15). The USFWS reported that *"the practice of raising the gates for extended periods of time during the fall, winter and spring months was found to have many beneficial effects, and continues today* [Tucker et al. (1998)]. Although the DEIS/EIR mentions this measure, its analytical technique inadequately accounts for the fish passage benefits (discussed in a later section).

Improved RBDD Fish Ladder Maintenance

The diffuser grates and diffuser cleaner pump intakes leading into the fish ladders at RBDD (critically important for attraction of fish into the ladders) were commonly found to be plugged with debris requiring manual cleaning by SCUBA divers (Vogel 1985a, 1985b, 1987b, 1987c, 1988a). Much of the prior fish passage research at RBDD (e.g., Hallock et al. 1982) measured fish passage at RBDD when fish ladder maintenance was less than optimal. During the 1980s, the USFWS and the U.S. Bureau of Reclamation (USBR) incrementally and methodically improved fish ladder maintenance, a measure believed to enhance fish passage at the dam. In 1989, the USFWS reported:

"Because of inadequate trash racks, the grates between the lower section of the fish ladders and the supplemental water diffuser bay often become clogged with debris. This not only reduces the amount of fish attraction flows exiting the ladder mouth but also periodically causes the grates to blow out under the increased water pressure. The ladders then have to be shut down for a minimum of five days and sometimes up to three weeks until repairs can be completed. Repair of the blown-out grates usually costs several thousand dollars but more importantly, adult fish passage is severely compromised." Vogel (1989)

In 1989, the USFWS initiated a monthly preventative maintenance schedule using commercial divers to inspect and clean debris from the fish ladder diffuser grates (Vogel 1989).

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Letter from David A. Vogel, Continued

Eliminating Adult Salmon Delay and Mortality at the Louver Bypass Terminal Box

During the early 1980s, USFWS SCUBA divers discovered a major problem that caused physical injury, mortality, and delay of adult salmon downstream of RBDD. Adult fish were attracted into the high velocity structure of the old fish louver bypass system (Figure 2) where they rammed their heads into the 4-inch spaced grates, gilling the larger fish (Figure 3) and entrapping the smaller fish swimming inside the structure (called the bypass terminal box) (Figure 4). Smaller-sized adult live fish observed inside the structure had severe abrasions on their sides, obviously a result of wiggling through the steel grates. At my request, the USBR cut out alternate grates, making effective 8-inch openings which eliminated physical injury and allowed escape routes for salmon after entering the structure (Figure 5). Alternating grates on the fish louver bypass outfall structure were removed in 1985 (verified by Vogel 1985d).

Although adult salmon were commonly attracted to the old fish louver bypass outfall structure (Vogel 1987a), subsequent underwater observations demonstrated the fish did not delay for extended periods or suffer injury after modification of the grates and determined that the corrective measure was beneficial (Vogel 1983a, 1983b, Vogel 1983c, 1991a). Although some delay of fish inside the modified structure was noted, it was believed that it was not nearly as severe as it was prior to the modification. The biological significance of this circumstance is that physical injury, mortality, and delay to adult salmon had been occurring year-round for over 20 years since dam construction without anyone's knowledge (Vogel 1991a).

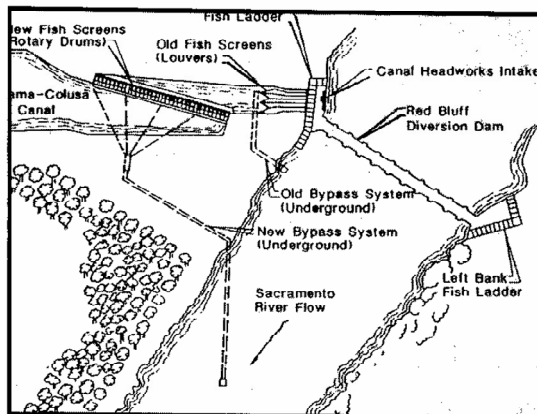


Figure 2. Plan view of RBDD showing the locations of the old fish louvers and bypass system and the new, angled rotary drum screens and bypass system (from Vogel et al. 1990).

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Letter from David A. Vogel, Continued

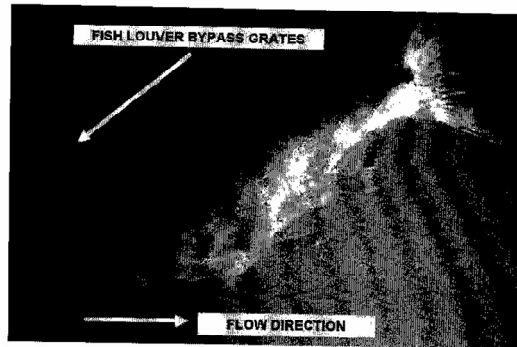


Figure 3. Underwater photograph taken by the author showing a dead salmon gilled inside the grates on the old fish louver bypass terminal box.



Figure 4. Underwater photograph taken by the author of a chinook salmon trapped inside the bypass terminal box prior to modification of the structure.

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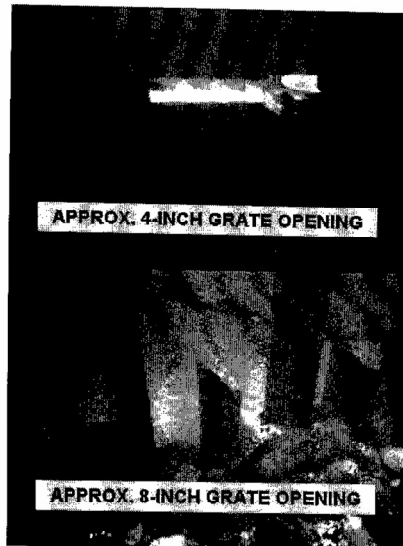


Figure 5. Underwater photographs taken by the author before and after modification to the RBDD fish louver bypass terminal box.

Installation of the Training Wall at the Right-Bank Fish Ladder

On January 29, 1984 USFWS SCUBA divers noted a large, pronounced back eddy at the fish entrance to the right bank (southwest) fish ladder at RBDD (Vogel 1984). The large eddy was believed to adversely impact adult fish attraction into the ladder.⁴ Based on my recommendation, this was eliminated to improve physical configuration to the ladder with the USBR's installation of a sheet pile training wall adjacent to the ladder entrance (est. 1985 by Vogel 1985d). As an added benefit, the retaining wall also eliminated predatory fish holding habitat (Vogel and Smith 1984).

⁴ "The presence of tailwater eddies near the fishway entrance can significantly increase delay. Eddies may cause fish to become confused and disoriented. A downstream retaining wall configuration has effectively damped eddies near the fishway while providing a guide wall for fish to move along the shoreline and directly into the entrance." Rainey (1991)

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Letter from David A. Vogel, Continued

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Relocation of the Fish Screen Bypass Outfall

As previously described, close proximity of the old fish screen bypass outfall just downstream of the dam attracted adult fish (delay and physical injury). Although removing the grates eliminated the physical injury problem, concern remained that the structure still caused some undesirable delay. A feature of the new fish screens installed in 1990 was the design and relocation of the outfall further downstream of the dam to solve the problem (Figure 2). Additionally, the new structure was designed with no grates to avoid the previously observed fish mortalities.

Miscalculation of Predicted Fish Passage Timing Due to Historical Migration Delays

The DEIS/EIR provides highly misleading information on the timing of salmon past RBDD and compounds errors associated with that information by using it in the DEIS/EIR's analysis.⁵ When the RBDD gates are out, the DEIS/EIR admits there is difficulty in precisely characterizing the true run timing for spring-run chinook salmon.⁶ Nevertheless, it proceeds with an analysis of run timing known to be incorrect.

The salmon run timing used is based on observations of salmon inside the fish ladders. Using the assumption in the DEIS/EIR that fish are delayed below the dam before the fish gets into the ladder, the "true" run timing of the fish passing Red Bluff would have been earlier. However, the DEIS/EIR does not account for that delay in its analysis. In other words, both instances cannot be correct. One cannot assume that by the time a salmon has entered the fish ladders at RBDD the fish was delayed "X" number of days downstream of the dam **and then use the same run timing determined from fish ladder counts** that the fish was not delayed "X" days below the dam. If the run timing is based on historical fish counts in the fish ladders when the RBDD gates are in (as the DEIS/EIR has assumed)⁷, and the dam delays fish before entering the ladders (as the DEIS/EIR has assumed), then one has to conclude that the fish would have passed the dam earlier if the gates had been out of the water (as the DEIS/EIR *has not* assumed).

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The best historical timing information available from RBDD ladders counts (from 1982 to 1986 for fall-, late-fall-, and winter-run Chinook salmon) and professional judgment from fishery professionals working at RBDD were used to predict adult passage at RBDD. Using these distributions, with the exception of Alternative 3, none of the remaining project alternatives provided substantial benefit to those species of Chinook salmon. For spring-run Chinook salmon, the most recent ladders counts at RBDD (1995 to 2000) using CDFG's multiple criteria of morphological appearance and time of presence at RBDD was synthesized and used to predict passage timing for the analysis. When compared to the historical timing distribution provided in the 1998 CDFG Status Review for spring-run Chinook salmon prior to construction of RBDD, the timing distribution used for this species for the analysis was virtually identical, if not slightly more conservative for the 4-month gates-in period of operation.

⁵ The passage timing for adult salmonids was obtained from data collected from fish ladder counts conducted at RBDD from 1982 to 1986 for fall, late-fall, and winter chinook salmon and steelhead (USFWS/CDFG, unpublished data). For spring chinook salmon, some of which may pass RBDD prior to installation of the RBDD dam gates, the current (1995 through 2000) ladder counts were used to estimate passage timing (USFWS/CDFG, unpublished data). For ladder counts made during 1995 and 2000, the average monthly percent (44) of spring Chinook passing RBDD during May were distributed equally between the before gates-in (<May 15) and after gates-in (>May 15) periods." DEIS/EIR Page B-5 and B-6

⁶ "Currently, it is difficult to precisely characterize the temporal distribution of spring-run chinook salmon as they pass RBDD. This is because prior to mid-May the gates-out operations at RBDD preclude the use of the fish ladders and therefore the enumeration of adults as they pass RBDD. However, once the RBDD gates go in during in May, spring run chinook are identified as they pass." DEIR/EIS Page B-7

⁷ "Approximately 72 percent of the annual adult spring chinook spawners passing through the project area must do so during the current gates-in operation (Figure B-7). The approximate average percentages of the annual population passing RBDD are listed by month as follows: Late May -- 22 percent, June -- 38 percent, July -- 9 percent, August -- 2 percent" (DEIS/EIR Page B-6)

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I performed an analysis of run timing about a decade ago. Using the winter-run chinook salmon as an example, I determined that the "true" or natural run timing of winter-run chinook past Red Bluff is actually earlier than had been previously surmised (Figures 6 and 7). This phenomenon was attributable to the high flow conditions at RBDD and poor fish ladder attraction during the period winter-run salmon attempted to migrate past the dam. Examining years of low flow past the dam demonstrated that winter run migrated sooner than high flow years. These results were also corroborated by the radio-tagging studies previously described. The DEIS/EIR is defective in not accounting for this in the analysis.

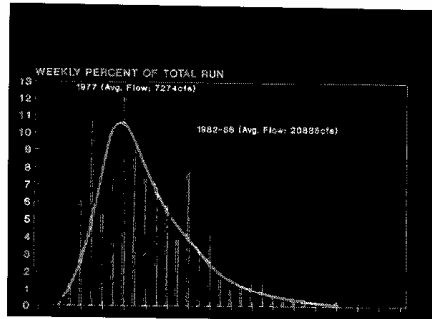


Figure 6. The timing of winter-run chinook past RBDD by week showing earlier run timing when delay and river flow is less. (from Vogel 1991b)

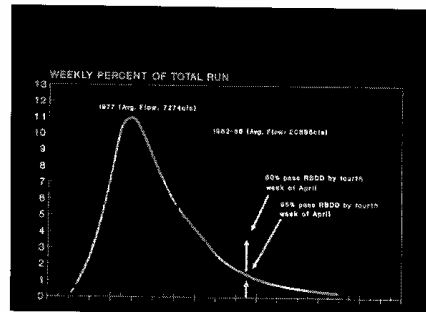


Figure 7. The timing of winter-run chinook past RBDD by week showing earlier run timing when delay and river flow is less. (from Vogel 1991b)

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The DEIS/EIR erroneously concluded that RBDD effects are the same for all runs and all species evaluated, a statement well known to be incorrect. The DEIS/EIR contradicts itself by stating that fish passage effects at RBDD varies by salmon run⁸, but then uses an analysis that assumes fish passage effects at RBDD are equal, not only among salmon runs, but also among fish species.^{9,10}

457-3,
cont'd**Incorrect Assumptions on Flow Attraction and New Fish Ladders*****Fish Attraction***

The DEIS/EIR erroneously assumed that fish passage at RBDD is not flow related.¹¹ This is a major error and results in a fatal flaw to the document's analyses. Interestingly, the DEIS/EIR contradicts itself by assuming that fish passage is flow dependent¹² and concluding that run timing is not affected by flow. The all-important analysis portion of the document does not account for this flow dependency factor.¹³

As a result of the Hallock et al. (1982) RBDD adult salmon radio-tagging study, researchers found that delay of salmon downstream of the dam was a function of flow (the greater the flow, the longer the delay) (Hallock and Fisher 1985) and the correlation was statistically significant (Figure 8). Additionally, Hallock et al. (1982) found that adult salmon delay was a function of the number of gates partially opened on the dam. Furthermore, researchers found a strong relationship between the flow through, and adjacent to, the fish ladders and the delay of adult salmon downstream of the dam (Figure 9). All of these facts invalidate much of the subsequent analyses in the DEIS/EIR which are essential to the document's findings and conclusions.

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⁸ "Vogel et al., (1988) determined from salmon tagging studies conducted from 1983 through 1988 that between 8 percent and 44 percent of adult chinook salmon, depending on run, were blocked from passing upstream of RBDD. Similarly, Hallock et al., (1982) determined that passage of 15 percent to 43 percent of adult chinook salmon, depending on run, were blocked by RBDD". . . . "Vogel et al., (1988) determined that the mean time of delay in passage of adult chinook salmon at RBDD was greater than 3 to greater than 13 days, depending on the run." DEIS/EIR Page B-5 and B-6

⁹ Due to a limited set of actual field data, the delay values for any structural facility other than existing fish ladders that were used in the analysis were assumed to be the same among all of the species. DEIS/EIR Page B1-3

¹⁰ "As with delay days in Table 2, values for delay-related passage efficiencies are the same among all of the species, due to the scarcity of available field data." DEIS/EIR Page B1-5

¹¹ "As there are no empirical data to develop a curve of passage delay versus time (efficiency), a linear relationship was assumed." DEIS/EIR Page B1-5

¹² "Factors that may affect the timing adult passage include water-year type, river flows, weather events, and RBDD operations." DEIS/EIR Page B-4

¹³ "It is important to note that these delays are not flow-based (flow-weighted) (i.e., varying time of delay depending on the proportion of the ladder flow to river flow during any month). Flow-weighted delay relationship data was omitted for two reasons: 1) flow specific delay data are not available; and 2) the use of flow-weighted delay values without supporting empirical data increases the complexity of the (End of DEIS/EIR Page B1-13) analysis methodology without a concomitant increase in precision.

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The factors of flow and attraction to ladders was considered in the earliest stages and development of the analysis. However, the relative contribution of attraction flow on the increment of change to the annual adult passage index was found not nearly as great as that for other factors in the analysis and, therefore, was not carried forward into subsequent analyses. The principal factors affecting the model results were species timing (presence) and gate operations; therefore, attraction flow was removed as an input parameter for subsequent versions of the analysis. Relevant and important information was considered and included in the redesign of the new fish ladder components of the New Ladder Alternative (through interaction of Reclamation, NMFS, CDFG, and CH2M HILL fish-passage engineers).

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Letter from David A. Vogel, Continued

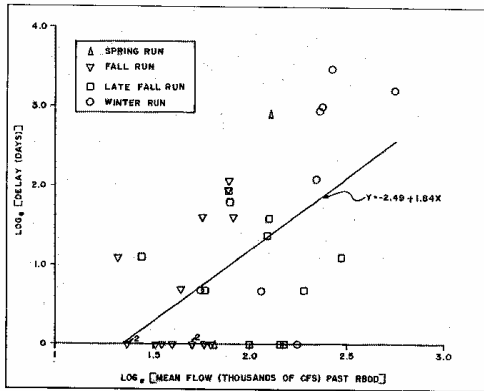


Figure 8. Relationship between mean delay (in Area 1) of radio-tagged salmon that passed RBDD and mean flow (all data transformed to natural logarithms) (from Hallock et al. 1982)

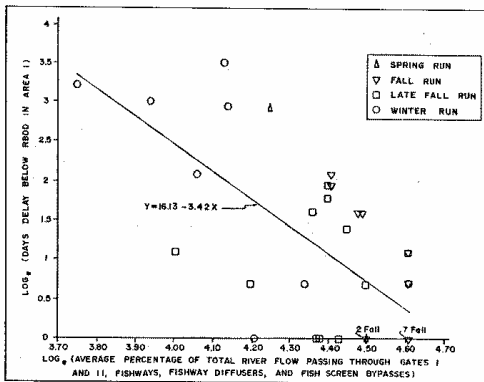


Figure 9. Relationship between delay (in Area 1) of radio-tagged salmon that passed RBDD, and mean proportion of the total river flow passing through or near the fishways (all data transformed to natural logarithms) (from Hallock et al. 1982).

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Letter from David A. Vogel, Continued

I analyzed the Hallock et al. (1982) data and found that there was a strong, exponential relationship between the proportion of the flow through the RBDD fish ladders and delay of salmon below the dam. Those results are shown in Figure 10. Additionally, Vogel (1982) noted a strong relationship between attraction flow provided from Coyote Creek (10 miles downstream of RBDD) and adult salmon attraction into the creek (Figure 11). The DEIS/EIR again failed to include this research.

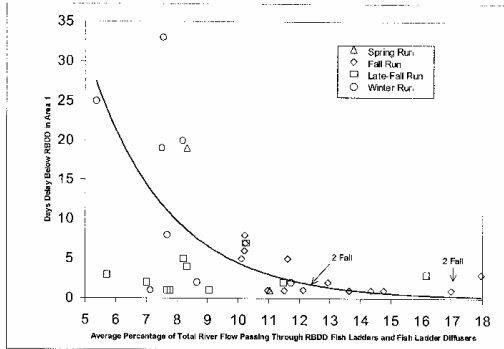


Figure 10. Relationship between delay of radio-tagged salmon that passed RBDD and mean proportion of the total river flow passing through the fishways [data derived from Hallock et al. (1982)].

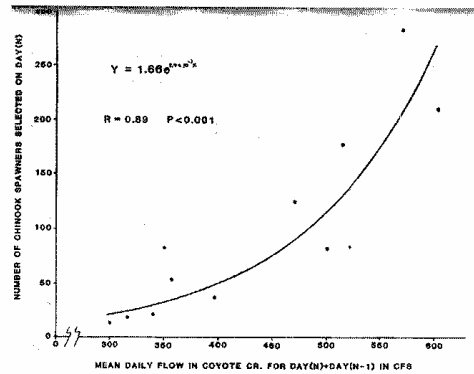


Figure 11. Relationship between attraction flow provided in Coyote Creek and numbers of chinook salmon entering the Tehama-Colusa spawning channels [from Vogel (1982)].

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New Fish Ladders

Based on the foregoing information and extensive research by USFWS and CDFG, Vogel et al. (1990) stated: *“Increased flow through new fishways was recommended to reduce delay and blockage of upstream migrants.”* Recommendations by USFWS to improve upstream fish passage included: *“constructing a new large-scale fish ladder on the left (northeast) bank, enlarging the size and flow capacity of the existing ladders, raising the dam gates during the non-irrigation season, and establishing a permanent program to ensure proper operation and maintenance of all fish passage facilities.”* (USFWS 1988). At that time, there was momentum toward construction of a new large left bank fish ladder that prompted Brown (1991) to report: *“It appears that a new fishway will be constructed on the east side of the dam.”* Of all the features at RBDD that were identified and recommended for improvement, the one item that has languished for decades is the need for new and improved fish ladders. Problems with the existing facilities have been known for about 3 decades and no significant improvements have taken place. It is unknown why this action was not pursued further.

One of the more surprising aspects of the DEIS/EIR is the lack of relevant and important information concerning the design features and improvement in upstream fish passage facilities. The DEIS/EIR concludes that very little benefit would be derived from new and improved fish passage facilities at RBDD. The best available technical information on the topic demonstrates otherwise. The following discussion in “Fish Passage Technologies: Protection at Hydropower Facilities” (1995) is enlightening:

“Vertical slot fishways have had considerable application across the country with wide success. These fishways seem to work well for a variety of species. In the Pacific Northwest, vertical slot fishways were constructed at 21 tributary sites in the 1980s. Radio telemetry studies showed that fish moved past these facilities in less than a day.”

This reference provides a wealth of valuable information that not only describes the “how and why” fish ladders such as the existing RBDD ladders fail to work properly, but also how modern-day fish ladders should be designed (e.g., attraction flows, entrance configurations, etc.).

Additionally, expertise on fish ladder design standards is demonstrated in “Fishways: An Assessment of Their Development and Design” by Powers et al. (1985) for the Bonneville Power Administration, Rainey (1991), Clay (1995), Bell (1991), and numerous other documents. These documents provide very useful design criteria applicable to greatly improved RBDD fish ladders but are too lengthy to print here.

The DEIS/EIR ignores, without reference, the vast amount of experience and benefits derived from large fish ladders elsewhere and failed to include or discuss this highly relevant information.

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See Response to Comment 457-3. The information sources for timing and distributions of species in the Sacramento River are clearly articulated in the DEIS/EIR. The analysis conducted calculates "...an average annual index of fish passage efficiency at RBDD" (DEIS/EIR page 3-33 and page B1-1 of Attachment B1 of Appendix B). The statements of the species' distribution focused the analysis and the results discussed in the DEIS/EIR to those portions of the fish populations as they are affected by RBDD and not the entire population of the species, as intimated by the commentor.

Misleading Information on Spring-Run Chinook Salmon

The DEIS/EIR provides misleading information on the populations of spring run chinook upstream of RBDD.¹⁴ The document adds to the misrepresentation by suggesting that the majority of Sacramento River basin spring-run exist upstream of RBDD¹⁵ and implies that RBDD affects the entire population. The following statement in the DEIS/EIR describing the methodology for analyzing alternative effects on fish demonstrates this error:

"The index values represent the approximate portion of the species and life stage that is unaffected by operations of the RBDD facilities for the entire calendar year. For example, an adult passage index of 89 indicates that approximately 89 percent of the entire annual population would pass RBDD and Lake Red Bluff without blockage, delay, or some loss or injury because of the operation of RBDD." DEIS/EIR Page 3-33 (emphasis added)

Conversely, the USFWS has stated:

"Presently, viable populations exist only in 2 tributaries of the Sacramento River, Mill and Deer creeks." USFWS (1992) (Mill and Deer creeks are located downstream of RBDD.)

Since 1992, the populations of spring-run chinook have increased significantly in Butte Creek (also located downstream of RBDD).

Furthermore, on the topic of mainstem spring-run chinook, the USFWS and CDFG stated:

"There is some doubt, however, that the present-day spring run spawning in the mainstem upper Sacramento River is a true genetically distinct stock because of a significant overlap in the timing of their spawning period with fall-run chinook which may have resulted in significant transfer of genetic material between stocks (Slater 1963)." ... "The two main remaining areas where significant numbers of genetically pure

¹⁴ "Spawning escapement of Central Valley spring-run chinook salmon has also varied since 1970 (Table B-2). The annual spring-run Chinook salmon escapement upstream of RBDD in the last 30 years has averaged less than 7,000 spawners and has ranged from greater than 25,000 in 1975 to less than 200 adults in 1998. Since 1990, spring-run chinook salmon spawning escapement upstream of RBDD has not exceeded 1,000 adults (Figure B-5)." DEIS/EIR Page B-3

¹⁵ "Impedance of these adult spring chinook by RBDD operations may adversely affect their ability to successfully pass upstream into and through the Sacramento River and into tributary streams and headwater reaches (CDFG, 1998). It is in these headwater reaches in the tributaries and the most upstream portion of the mainstem Sacramento River that the majority of spring-run chinook salmon must hold throughout the summer months before spawning in the early fall." DEIS/EIR Page B-6

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strains of spring-run chinook exist are in Mill and Deer Creeks.” (Vogel and Rectenwald 1987).

Another example (among many) of how the DEIS/EIR distorts the available information is provided in the following:

“There is a measurable improvement for adult spring-run chinook salmon (16 percent). While the percent improvement in the passage index for adult spring-run chinook salmon seems relatively large (16 percent), the overall annual passage index for this species remains a rather low 61 out of a possible 100 (Table B-7).

These small improvements in adult passage are a result of increased efficiencies in attraction to and passage within the new fish ladders featured in this alternative. Except for spring-run chinook, the magnitude of these improvements however, is generally not sufficiently beneficial to be considered a measurable improvement for adult passage of NAS species. Rather large components (approximately 39 percent) of threatened adult spring-run salmon would continue to be blocked or impeded under this alternative.” DEIS/EIR Page B-32

These statements and many others¹⁶ are extremely misleading.

The DEIS/EIR implies that its analysis evaluates the entire spring run population, instead of the very small component of the Sacramento River spring run that may intermittently use a tributary, such as Cottonwood Creek upstream of Red Bluff. To simply determine the proportion of spring-run chinook upstream and downstream of RBDD, I obtained the annual spring-run chinook population estimates from CDFG. I used data collected since 1989 and included those Sacramento River tributaries from Butte Creek and upstream. The average annual proportional distribution of spring-run chinook is shown in Figure 12. These data clearly indicate that only a very small amount (about 3 percent) of the spring run population migrate up past Red Bluff. If one includes Feather River spring-run chinook, the percent upstream of Red Bluff would be much less than 3 percent. Of that small percent, an even smaller percent migrate past RBDD after May 15. In other words, the DEIS/EIR is assessing the fish passage of a “percent of a percent” of spring run, and not the “entire population” as stated in the DEIS/EIR.

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¹⁶ E.g.: “The small improvement in passage index for adult rainbow trout for this alternative is a result of slight increases in efficiencies of attraction and passage in the new right bank fish ladder. There may also be some small but uncertain increase in passage through the bypass channel featured in this alternative. However, the magnitude of these improvements is generally not sufficient to be considered a measurable improvement for adult passage of rainbow trout. A rather large component (24 percent) of adult rainbow trout remains blocked or impeded by the gates at RBDD under this alternative (Figure B-20).” DEIS/EIR Page B-37

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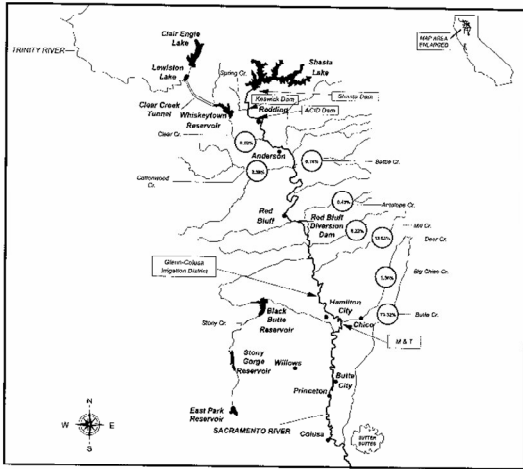


Figure 12. The upper Sacramento River basin showing the distribution of spring-run chinook salmon, 1989-2001.

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There is reason to believe that green sturgeon populations might be imperiled. When the DEIS/EIR was prepared, this species had been petitioned for consideration as threatened under ESA. Since that time, the species was listed federally threatened in 2006. See Response to Comment 464-7 for more information regarding the listing of green sturgeon as federally threatened. The original listing petition stated that the only remaining reproducing populations of North American green sturgeon are in the Sacramento and Klamath Basins in California, and possibly the Rogue River in Oregon. The DEIS/EIR states that this species is routinely observed congregating below RBDD and that recent trapping activities downstream at RBDD have captured juveniles of this species. This information indicates that green sturgeon adults have some desire to and do pass upstream of RBDD prior to the gates-in operation. In fact, according to acoustic tracking observation presently being conducted in the Sacramento River watershed, adults of this species migrate and apparently are attempting to spawn upstream of RBDD prior to gates-in operations. Historically, several large (50+ pound) adult green sturgeon were caught by sports fishermen on the Sacramento River in Red Bluff upstream of RBDD. Whether or not the upstream habitat is preferable to this species and it prefers to spawn upstream of RBDD is unknown, but indications are that the species will apparently migrate upstream if allowed passage above RBDD. The analysis and the statements in the DEIS/EIR focus the analysis conducted and the results discussed to those portions of the green sturgeon's population as they are affected by RBDD, not the entire population of the species, as intimated by the commentor.

457-5, cont'd

Misleading Information on Green Sturgeon

Although the DEIS/EIR admits there is no evidence of a declining trend in Sacramento River green sturgeon populations, it nevertheless provides statements suggesting the green sturgeon are imperiled. To the contrary, available information indicates that green sturgeon populations are **larger** than suggested in the DEIS/EIR.¹⁷ For example, CDFG recently reported:

“Green sturgeon abundance estimates have varied substantially in the Sacramento-San Joaquin Estuary (Table 10). Aside from the high estimated abundance in 2001 of 3,580 fish (based on September and October catches only, to be comparable with estimates in earlier years), the largest estimate was 1,906 in 1979 and the lowest was 198 in 1954. Even without the low estimate in 1954 and the high estimate in 2001, there

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¹⁷ “...green sturgeon populations (fish greater than 101 cm) in the San Francisco Bay estuary are approximately 200 to 1,800 fish (Moyle et al., 1995).”