Water Intake Screening and Intake Modifications at Coleman National Fish Hatchery

Project Information

1. **Proposal Title:**

   Water Intake Screening and Intake Modifications at Coleman National Fish Hatchery

2. **Proposal applicants:**

   Mona Jefferies-Soniea, US Bureau of Reclamation
   Scott Hamelberg, U.S.Fish and Wildlife Service

3. **Corresponding Contact Person:**

   Scott Hamelberg
   U.S Fish and Wildlife Service
   Coleman Natioonal Fish Hatchery 24411 Coleman Fish Hatchery Road Anderson, CA. 96007
   530 365-8622
   Scott_Hamelberg@fws.gov

4. **Project Keywords:**

   Fish Management
   Fish Passage/Fish Screens
   Fish, Anadromous

5. **Type of project:**

   Fish Screen

6. **Does the project involve land acquisition, either in fee or through a conservation easement?**

   No

7. **Topic Area**:

   Fish Screens

8. **Type of applicant:**

   Federal Agency

9. **Location - GIS coordinates:**

   Latitude: 40.398

   Longitude: -122.179

   Datum:

Describe project location using information such as water bodies, river miles, road intersections, landmarks, and size in acres.

Coleman National Fish Hatchery (Hatchery) is located in Shasta County, California, on a relatively flat parcel of land on the north bank of Battle Creek approximately 3 miles east of the Sacramento River and 17 miles southeast of the city of Redding. Battle Creek, a tributary of the upper Sacramento River, flows along the southern edge of the Hatchery property. Battle Creek flows into the Sacramento River at river mile 272 near the town of Cottonwood and forms the border between Shasta and Tehama counties. Battle Creek is approximately 45 miles long and encompasses a watershed of 357 square miles, fed by rainfall and snowmelt on the western slopes of the Cascade Range. Battle Creek is made up principally of two forks; North Fork Battle Creek and South Fork Battle Creek. The two forks converge about 11 creek miles upstream of the Hatchery, while the confluence of Battle Creek and the Sacramanto River is located about 6 creek miles downstream of the Hatchery.

10. **Location - Ecozone:**

    3.1 Keswick Dam to Red Bluff Diversion Dam, 4.4 Battle Creek

11. **Location - County:**

    Shasta, Tehama

12. **Location - City:**

    Does your project fall within a city jurisdiction?

    No

13. **Location - Tribal Lands:**

    Does your project fall on or adjacent to tribal lands?

    No

14. **Location - Congressional District:**

    2nd

15. **Location:**

    California State Senate District Number: 4

    California Assembly District Number: 2

16. **How many years of funding are you requesting?**

    2

17. **Requested Funds:**
    a) Are your overhead rates different depending on whether funds are state or federal?

       No

If no, list single overhead rate and total requested funds:

Single Overhead Rate: 80

Total Requested Funds: 5,970,300

b) Do you have cost share partners already identified?

No

c) Do you have potential cost share partners?

No

d) Are you specifically seeking non-federal cost share funds through this solicitation?

No

If the total non-federal cost share funds requested above does not match the total state funds requested in 17a, please explain the difference:

18. **Is this proposal for next-phase funding of an ongoing project funded by CALFED?**

No

Have you previously received funding from CALFED for other projects not listed above?

No

19. **Is this proposal for next-phase funding of an ongoing project funded by CVPIA?**

Yes

If yes, identify project number(s), title(s) and CVPIA program (e.g. AFRP, AFSP, b(1) other).

Rehabilitation of Coleman National Fish Hatchery 3406 b(11)

FWS-CVPIA-503 Coleman NFH Interim Fish Screens 3406 b(11)

Have you previously received funding from CVPIA for other projects not listed above?

Yes

If yes, identify project number(s), title(s) and CVPIA program.

FWS-CVPIA-1011	**Initial development of installation of a picket weir in PG&E powerhouse tailracepicket weir installation**	**3406 b(11)**

FWS-CVPIA-504 Coleman NFH Ozone facility 3406 b(11)

FWS-CVPIA-506 Coleman NFH raceway rehabilitation 3406 b(11)

Keswick Dam Fish trap modification 3406 b(11)

20. **Is this proposal for next-phase funding of an ongoing project funded by an entity other than CALFED or CVPIA?**

No

Please list suggested reviewers for your proposal. (optional)

Ken Lentz	**US Bureau of Reclamation--Sacramento**	**916.978.5035**	**klentz@mp.usbr.gov**

21. **Comments:**

Environmental Compliance Checklist

Water Intake Screening and Intake Modifications at Coleman National Fish Hatchery

1. **CEQA or NEPA Compliance**
   a) Will this project require compliance with CEQA?

      Yes
   b) Will this project require compliance with NEPA?

      Yes
   c) If neither CEQA or NEPA compliance is required, please explain why compliance is not required for the actions in this proposal.

2. **If the project will require CEQA and/or NEPA compliance, identify the lead agency(ies).** *If not applicable, put "None".*

   CEQA Lead Agency: California State Water Resources Control Board
   NEPA Lead Agency (or co-lead:) US Bureau of Reclamation
   NEPA Co-Lead Agency (if applicable): US Fish and Wildlife Service

3. **Please check which type of CEQA/NEPA documentation is anticipated.**

   CEQA
   -Categorical Exemption
   XNegative Declaration or Mitigated Negative Declaration
   -EIR
   -none

   NEPA
   -Categorical Exclusion
   XEnvironmental Assessment/FONSI
   -EIS
   -none

   If you anticipate relying on either the Categorical Exemption or Categorical Exclusion for this project, please specifically identify the exemption and/or exclusion that you believe covers this project.

4. **CEQA/NEPA Process**
   a) Is the CEQA/NEPA process complete?

      No

      If the CEQA/NEPA process is not complete, please describe the dates for completing draft and/or final CEQA/NEPA documents.

      Draft = Spring 2002 Final = fall 2002

b) If the CEQA/NEPA document has been completed, please list document name(s):

5. **Environmental Permitting and Approvals** (*If a permit is not required, leave both Required? and Obtained? check boxes blank.*)

LOCAL PERMITS AND APPROVALS

Conditional use permit

Variance

Subdivision Map Act

Grading Permit

General Plan Amendment

Specific Plan Approval

Rezone

Williamson Act Contract Cancellation

Other

STATE PERMITS AND APPROVALS

Scientific Collecting Permit	
CESA Compliance: 2081	Required
CESA Compliance: NCCP	Required
1601/03	Required
CWA 401 certification	Required
Coastal Development Permit	
Reclamation Board Approval	
Notification of DPC or BCDC	
Other	

FEDERAL PERMITS AND APPROVALS

ESA Compliance Section 7 Consultation	Required
ESA Compliance Section 10 Permit	
Rivers and Harbors Act	Required
CWA 404	Required
Other	

PERMISSION TO ACCESS PROPERTY

Permission to access city, county or other local agency land. Agency Name:	
Permission to access state land. Agency Name: California Department of Fish and Game	Required
Permission to access federal land. Agency Name: US Bureau of Land Management	Required
Permission to access private land. Landowner Name:	

6. **Comments.**

Permission to access property. No access to California Department of Fish and Game property may actually be required.

Land Use Checklist

Water Intake Screening and Intake Modifications at Coleman National Fish Hatchery

1. **Does the project involve land acquisition, either in fee or through a conservation easement?**

   No

2. **Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?**

   No

3. **Do the actions in the proposal involve physical changes in the land use?**

   Yes

   If you answered yes to #3, please answer the following questions:

   a) How many acres of land will be subject to a land use change under the proposal?

      <5 acres

   b) Describe what changes will occur on the land involved in the proposal.

      some road development

   c) List current and proposed land use, zoning and general plan designations of the area subject to a land use change under the proposal.

Category	Current	Proposed (if no change, specify "none")
Land Use	**Agriculture (cattle grazing)**	**none**
Zoning	**Agriculture**	**none**
General Plan Designation	**Agriculture**	**none**

   d) Is the land currently under a Williamson Act contract?

      No

   e) Is the land mapped as Prime Farmland, Farmland of Statewide Importance, Unique Farmland or Farmland of Local Importance under the California Department of Conservation's Farmland Mapping and Monitoring Program?

      No

   f) Describe what entity or organization will manage the property and provide operations and maintenance services.

Bureau of Land Management and U.S. Fish and Wildlife Service

4. Comments.

Conflict of Interest Checklist

Water Intake Screening and Intake Modifications at Coleman National Fish Hatchery

Please list below the full names and organizations of all individuals in the following categories:

- **Applicants listed in the proposal who wrote the proposal, will be performing the tasks listed in the proposal or who will benefit financially if the proposal is funded.**
- **Subcontractors listed in the proposal who will perform some tasks listed in the proposal and will benefit financially if the proposal is funded.**
- **Individuals not listed in the proposal who helped with proposal development, for example by reviewing drafts, or by providing critical suggestions or ideas contained within the proposal.**

The information provided on this form will be used to select appropriate and unbiased reviewers for your proposal.

Applicant(s):

Mona Jefferies-Soniea, US Bureau of Reclamation
Scott Hamelberg, U.S.Fish and Wildlife Service

Subcontractor(s):

Are specific subcontractors identified in this proposal? No

Helped with proposal development:

Are there persons who helped with proposal development?

Yes

If yes, please list the name(s) and organization(s):

Kevin Niemela USFWS

Jim Smith USFWS

Steve Thomas NMFS

Shirley Witalis NMFS

Bill Dutton BOR

Mike Lee BOR

Comments:

Proposal reviewers (continued from above) Harry Rectenwald (CDFG)

Budget Summary

Water Intake Screening and Intake Modifications at Coleman National Fish Hatchery

Please provide a detailed budget for each year of requested funds, indicating on the form whether the indirect costs are based on the Federal overhead rate, State overhead rate, or are independent of fund source.

Federal Funds

Year 1												
Task No.	Task Description	Direct Labor Hours	Salary *(per year)*	Benefits *(per year)*	Travel	Supplies & Expendables	Services or Consultants	Equipment	Other Direct Costs	Total Direct Costs	Indirect Costs	Total Cost
1	Project Management	160	13000	5962	1000			500	50	20512.0	5962	26474.00
2	Public Involvement	80	2754	1288	500	15000		300	500	20342.0	3234	23576.00
3	Environmental Compliance	80	2154	1008	10		50000		500	53672.0	2529	56201.00
4	Permitting	40	1077	504	100					1681.0	1265	2946.00
5	Designs and Specifications	757	174692	81739	3080	5000				264511.0	205144	469655.00
6	Construction contract award -Phase I, Intake 1	40	1058	495						1553.0	1242	2795.00
6.a	Construct new control gate with operators						49000			49000.0		49000.00
6.b	Construct new trash rack with fish barrier and wing walls						350000			350000.0		350000.00
6.c	securitry fencing						1000			1000.0		1000.00
7	Construction Contract Award Phase II, Intake 3									0.0		0.00
7a.	Fish Screen						2000000			2000000.0		2000000.00
7b.	Remove Existing Building						50000			50000.0		50000.00
7c.	Bank Improvements						25000			25000.0		25000.00
7d.	Install Electrical						25000			25000.0		25000.00
7e.	Remove Existing Intake and Building						150000			150000.0		150000.00
10a.	Hydraulic and Biologocal Monitoring Plan	1000	50,000	21,000						71000.0	14,000	85000.00
		2157	244735.00	111996.00	4690.00	20000.00	2700000.00	800.00	1050.00	3083271.00	233376.00	3316647.00

Year 2												
Task No.	Task Description	Direct Labor Hours	Salary *(per year)*	Benefits *(per year)*	Travel	Supplies & Expendables	Services or Consultants	Equipment	Other Direct Costs	Total Direct Costs	Indirect Costs	Total Cost
8	Construction Contract Award Phase III, Intake 2									0.0		0.00
8a.	Foot bridge						200000			200000.0		200000.00
8b.	Building						150000			150000.0		150000.00
8c.	Screen Structure						1500000			1500000.0		1500000.00
8d.	Bank Improvement						25000			25000.0		25000.00
8e.	Sill Dam						150000			150000.0		150000.00
8f.	Control Gate with Structure						150000			150000.0		150000.00
8g.	Electrical						25000			25000.0		25000.00
8h.	Roadway						50000			50000.0		50000.00
9.	Construction Adminsitration/Inspection	375	86538	40491	5000	25000		45000	15000	217029.0	101624	318653.00
10b.	Hydraulic an Biological Monitoring Plan	1000	50,000	21,000						71000.0	14,000	85000.00
		1375	136538.00	61491.00	5000.00	25000.00	2250000.00	45000.00	15000.00	2538029.00	115624.00	2653653.00

Year 3												
Task No.	Task Description	Direct Labor Hours	Salary *(per year)*	Benefits *(per year)*	Travel	Supplies & Expendables	Services or Consultants	Equipment	Other Direct Costs	Total Direct Costs	Indirect Costs	Total Cost
										0.0		0.00
		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grand Total=5970300.00

Comments.

Budget Justification

Water Intake Screening and Intake Modifications at Coleman National Fish Hatchery

Direct Labor Hours. Provide estimated hours proposed for each individual.

Project Manager- 160 Public Affairs Officer - 40 Design Team Leader - 100 Designers (Electrical, mechanical, Civil, ect.)- 1415 Natural Resource Planner - 40 Environmental Specialist - 80 Design Team - 757 Contracting Officer - 40 Construction Adminsitration/Inspection Team - 375 Biologist/Engineer Hydraulic and Biological Monitoring -2000

Salary. Provide estimated rate of compensation proposed for each individual.

Unit = Price-day: Project Manager- $253 Public Affairs Officer - $275 Design Team Leader - $226 Designers (Electrical, mechanical, Civil, ect.)- $238 Natural Resource Planner - $215 Environmental Specialist - $226 Contracting Officer - $275 Construction Adminsitration/Inspection Team - $230 Biologist/Engineer--Hydraulic and Biological monitoring-$250 The regional office overhead rate is 80%.

Benefits. Provide the overall benefit rate applicable to each category of employee proposed in the project.

Benefits include leave additive (26% of base salary);benefits additive is 16.5% of base salary.

Travel. Provide purpose and estimate costs for all non-local travel.

Travel costs would be incurred for making presentaions to governmental and interested groups. The estimated cost is $3080.

Supplies & Expendables. Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

$25,800 for field supplies; $25,800 for office supplies, software, and other computing equipment.

Services or Consultants. Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate.

Consulting Services will be acquired to support project for tasks such as: - Environemtnal compliance activities - 100 days @ $500/day These activities include preparation of the draft and final NEPA/CEQA documents, and ESA consultation and compliance. - Construction acitivities. Hourly or daily rates are subject to competitive bid proposals.

Equipment. Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than $5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

generators, flowmeters, motiorized gate operators, screen cleaning systems.

Project Management. Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation of costs, report preparation, giving presentatons, reponse to project specific questions and necessary costs directly associated with specific project oversight.

Project Planning - Develop and maintain project documents ($2,000) Project Budgeting and Tracking($2,000) Leading Teams - $5,000 Activities iclude intiating, planning, executing, controlling, and closing the project. The Project Manager will lead the project interdisciplinary teams to ensure work production and products are acceptable. The Project Manger will balance competing demands for scope, time, cost, risk and quality. Public Involvment and Outreach - $ 1,6474 to develop mailing lists, ensure stakeholder participation, develop project information sheets, brochures and fact sheets. The Project manager will provide specific areas of knowlegde totaling $5,000 in: - Project integration management to ensure various work elements are coordinated. - Project time managment which include activity definition, sequencing, duration estimating, and scheduling. - Project Cost Managment to include resource planning, cost extimating, budeting and cost control - Project quality management which entails planning, assuring and controling project quality. - Project Human resource management which addresses the organizaiton planning and acquiing of staff. - Communication Management which includes giving presentations, and performance reporting. - Risk managment or contingency planning. - Project procurement management which includes procurement and solicitation planning, contract administration and closeout.

Other Direct Costs. Provide any other direct costs not already covered.

Direct costs not already covered would include costs for document printing, brochures, mailouts and presentation material.

Indirect Costs. Explain what is encompassed in the overhead rate (indirect costs). Overhead should include costs associated with general office requirements such as rent, phones, furniture, general office staff, etc., generally distributed by a predetermined percentage (or surcharge) of specific costs.

The overhead rates include costs associated with general office requirements such as rent, phone, furniture, general office staff, utilities and, vehicles.

Executive Summary

Water Intake Screening and Intake Modifications at Coleman National Fish Hatchery

This proposal is for funding of a project to construct fish screens and modify water intake structures at the Coleman National Fish Hatchery (NFH), in Shasta County, California, on the north bank of Battle Creek. The project consists of Planning, Environmental Compliance and Construction. The total cost of the Project is estimated be $5,970,300. The Coleman NFH water delivery system has three water intakes (one located in the tailrace of Pacific Gas & Electric Company's Coleman Powerhouse {Intake #1} and the other two (Intakes #2 and #3) located directly on Battle Creek. Intakes #1 an #3 are the primary intakes, while Intake #2 is an emergency intake. The project calls for Intake #1 to remain essentially as it is currently configured with minor modifications to improve reliability, while Intakes #2 and #3 are reconstructed to meet current fish protection requirements. General tasks include: 1) completing minor structural repairs to the primary Intake #1, 2) Construction of a fish screen and associated modifications at the site of existing Intake #2 (33cfs delivery capability), 3) Construction of a diversion sill below Intake #2; 4) Construction of access way to Intake # 2; 5) Construction of a fish screen and associated modifications at the site of existing Intake #3 (50 cfs delivery capability). Coleman NFH has a total water right of 122 cfs. In completing the project scope, no additional water rights for the Coleman NFH will be sought. The main project goal, and expected outcome includes the elimination and/or minimization of entrainment and impingement of naturally-produced juvenile salmon and steelhead while delivering adequate quantities (up to 122 cfs) of high quality water for Coleman NFH operations. The proposed project is highly related to CALFED and CVPIA goals, and is an important component to successful restoration of naturally reproducing salmonids in the Battle Creek watershed. The need for this modification/screening project is identified in the Anadromous Fish Restoration Program Plan (AFRP) action #8 (USFWS 2001). CALFED has also recognized this action as a priority action associated with Battle Creek Restoration (Sacramento Region Priority Action #6; CALFED Draft Stage 1 Implementation Plan 2001). Also, as the Coleman NFH was constructed as a mitigation feature of the CVP, modification/improvement of this facility is consistent with CVPIA efforts designed to modify CVP features and operations to reduce impacts on naturally-reproducing salmon and steelhead.

Proposal

US Bureau of Reclamation

Water Intake Screening and Intake Modifications at Coleman National Fish Hatchery

Mona Jefferies-Soniea, US Bureau of Reclamation
Scott Hamelberg, U.S.Fish and Wildlife Service

Project Title: Water Intake Screening and Intake Modifications at Coleman National Fish Hatchery.

A. Project Description: Project Goals and Scope of Work

Implementing the fish screen and intake modification project at Coleman National Fish Hatchery (NFH) is an important step in the overall restoration of Battle Creek. This project is one of a number of projects currently underway to integrate Coleman NFH operations with Battle Creek restoration efforts by minimizing or eliminating adverse impacts to naturally-produced salmonids. The need for the proposed action is based on the fact that the existing water diversions do not meet current criteria for fish screening as required by the National Marine Fisheries Service (NMFS 1997a) and the California Department of Fish and Game (CDFG 1997). Screening and modification of the Coleman NFH intakes is necessary to achieve compliance with federal regulations and is an essential complement to the basin-wide restoration projects currently underway in the Battle Creek watershed. Screened intakes and other modifications are needed to protect outmigrating salmon and steelhead juveniles resulting from increased levels of natural production that are expected to result from the restoration activities.

Project Goal: Achieve reliable environmental protection for aquatic life (i.e., anadromous salmonids) and general ecosystem function/integrity, while providing a reliable water supply for the Coleman NFH.

Project Objectives:

- Eliminate take (impingement and entrainment) of listed and non-listed anadromous salmonids through application of appropriate screening criteria.
- Provide a reliable high quality water supply in sufficient quantity to meet hatchery operational needs, while assuring sufficient quantity of water below diversions.
- Provide adequate access with minimal response time to intake structures to assure proper operation and maintenance of the intake structures and the water delivery system.

Project Scope: Work includes tasks and costs associated with screening and/or modifying the existing water intake structures for the Coleman NFH, located on Battle Creek. The water delivery intake system at the Coleman NFH consists of three intake structures (Intake #1, #2, and #3). The basic scope of the project calls for Intake #1 (located in the tailrace of Pacific Gas & Electric's Coleman Powerhouse tailrace) to remain essentially as it is currently configured with minor modifications to improve reliability, while Intakes #2 and #3 (located directly on Battle Creek) are reconstructed largely "in-place" to meet current fish protection requirements. General tasks include: 1) completing minor structural repairs to the primary Intake #1, 2) construction of a fish screen and associated modifications at the site of existing Intake #2 (33 cfs delivery capability), 3) construction of a diversion sill below Intake #2; 4) construction of access way to Intake # 2; 5) construction of a fish screen and associated modifications at the site of existing Intake #3 (50 cfs delivery capability). Specific aspects of the project are detailed below. Conceptual designs and drawings are available upon request.

Proposed Intake #1 Modifications- The proposed modifications at and around Intake #1 are intended primarily to improve the long-term reliability of the intake. This intake is the

hatchery's primary intake. The maximum flow through the intake will be 72 cfs during normal operation of PG&E, Coleman Powerhouse. This site has the advantage of providing high quality, anadromous fish free water available from PG&E's Coleman Powerhouse tailrace. Following the completion of the Battle Creek Restoration project all water entering the PG&E hydropower system will be properly screened (general details of the current Battle Creek restoration project are presented in Section A1 of this document). Therefore the presence of the powerhouse at the upstream end of the tailrace, and a new fish barrier (picket weir[1]) at the downstream end will exclude fish from the tailrace and thus eliminates the need to provide fish screening protection at Intake #1. Modifications for Intake #1, as described in this proposal, enhance the reliability to divert water at this point therefore providing maximum protection to anadromous fish within the system.

Proposed modifications to Intake #1 include: 1) replace existing steel trash racks, guardrails, fences, and the water control gate; 2) construct new concrete wing walls on either side of the intake structure to connect the intake to the new weir and to prevent the water from flowing around the intake structure; 3) install a chainlink fence around the intake structure to provide security and prevent injury to visitors. Other features of Intake #1 modifications consist of replacing the existing stoplog weir adjacent to the intake. The existing obsolete weir structure is fabricated of steel members and includes wood stop logs for water level control and a walkway grating and guardrail. The new weir will be a concrete structure adjacent to the existing intake with a fixed concrete overflow weir. Since water level control adjustments are not made at the structure, fixed weirs will be acceptable. A sluice gate in the weir structure will allow the water level upstream of the structure to be lowered for maintenance of the intake structure. A walkway across the weir will be constructed to provide access to Intake #1 on the far side of the tailrace. To accommodate fluctuating tailrace elevations and prevent local flooding caused by changes in hatchery intake operations and Powerhouse discharges, the embankments around the pool will be raised slightly.

Proposed Intake #2 modifications:
1) Rehabilitation of intake structure– The flap gate, installed as an interim fish protection measure under the Anadromous Fish Restoration Program, will be removed, the water control gate will be replaced with a motor operated control gate, and the steel debris rack on the front of the structure will be replaced.
2) Construct a new fish screening structure and transition channel– The total flow diverted into Intake #2 will be 33 cfs. Flow into the structure will be controlled by an automated control

[1]A temporary picket weir to prevent adult salmonids from entering the powerhouse tailrace was installed in the spring of 2001. The U.S. Fish and Wildlife Service completed a scope of work for a permanent picket weir structure in mid-2001, and has secured about $210,000 of the ~$380,0000 necessary to construct the permanent picket weir structure. The U.S. Fish and Wildlife Service and the Bureau of Reclamation are working with PG&E to secure the remaining necessary funds (~$170,000). This action is identified as Battle Creek Action Item #5 in the Final Restoration Plan for the Anadromous Fish restoration Program (AFRP; USFWS 1997, 2001)

gate at the intake structure to maintain the design flow through the structure at higher river stages. Normally, the control gate will be closed since Intake #2 is an emergency backup for Intake #1. The on-channel screening structure will be a single-face vertical plate fish screen in a concrete structure. Structure design will be consistent with appropriate screen approach velocities and screen sweeping velocities criteria as required by NMFS (1997) and CDFG (1997). A horizontally moving multi-arm vertical brush bar system will sweep debris off the screen face. The discharge pipe from the screening structure will be connected to the existing 46-in. supply pipeline from Intake #1 to the hatchery canal.

3)Construct weir structure in Battle Creek–Performance of Intake #2 as a reliable backup intake is dependent upon maintaining the existing creek bed elevations in Battle Creek. In the past, Intake #2 has functioned successfully due in part to the annual construction of a gravel "push up" berm in Battle Creek by a private landowner who operates an existing diversion downstream of Intake 2. The gravel berm functions by forming a pool which extends upstream of Intake 2, thus ensuring a consistent and reliable water elevation Annual high flow events wash the gravel berm out necessitating near yearly reconstruction. Other Battle Creek planning processes may consider disallowing annual construction of the push-up berm. If this occurs, Battle Creek will no longer be stabilized at Intake #2 and the creek bed is likely to degrade (lower) over time. A scour study conducted as part of the Intake Alternative Study estimated that Battle Creek is highly erodible in the vicinity of Intake #2 following either a bankfull or 100-year flood event (Sverdrup and Tetra Tech/KCM, Inc. 1999). The study estimated that as much as 4 ft of downgrading could occur at Intake #2 following 10 years of bankfull (2.3-year recurrence interval) floods. Degradation of the creek bed would result in lower water surfaces in the creek and thus an insufficient diversion capacity at Intake #2. Final design will allow upstream fish passage across the entire width of the new weir structure, and will consider aesthetics (i.e., the weir may be constructed to appear semi-natural and may be constructed out of boulders/rock).

4) Construct foot bridge/ access road to Intake #2– Access to Intake #2 currently requires a vehicle trip of 30 minutes or more from the hatchery. Although this situation is tolerable for the existing intake, the addition of a fish screen and the increased level of maintenance required by it necessitates improved access. A new bridge and connecting roads are proposed across Battle Creek in the vicinity of the Coleman Powerhouse, and will span across the river at an elevation sufficiently high to allow flood waters and debris to pass safely underneath. A new gravel road will extend from the existing paved road at the Powerhouse to the bridge and new paved path will continue from the opposite side of the bridge to Intake #2. Roads/paths/footbridges will not be open for public access.

5) Construct small equipment building–A small (approximately 20-ft x 20-ft) building will house a small diesel engine emergency generator, the electrical control systems, and various tools/parts. The generator will be sized (likely less than 40 kW) to handle loads from the screen cleaning systems at the intake, other small motors, lighting, and gate actuators during loss of commercial power. Physical security for the building and its contents is a primary concern, however, the exterior of the building will be given an architectural finish to make it appear more like a farm out building than a concrete bunker. The building will be located near the intake and fish screen structure outside the floodway.

6) Improve Electrical power distribution– Commercial power for operating electrical equipment at the intake will be required. Power will be extended from the existing power lines

at the irrigation diversion screen structure approximately 300 ft downstream of Intake #2. The new power line will be underground to minimize visual impacts.
7) Bank stabilization – The right bank of Battle Creek opposite the intake and both banks at the weir will be protected with riprap on the upstream and downstream sides of the structure. The riprap will be covered with a layer of soil and planted to reestablish native vegetation.

Proposed Intake #3 Modifications:
1) Partial demolition of existing Intake #3: Portions of the existing intake structure will be demolished to allow construction of the new transition channel to the fish screen structure. A portion of the existing 48-in. pipeline to the hatchery will also be removed as will the existing control gates, the debris racks, and the interim fish screens. New steel debris racks will be installed.
2) Construct a new off-stream fish screening structure and transition channel –From the existing intake, a transition channel will be constructed to a new off-stream fish screening structure. The total flow diverted into the intake will be 50 cfs. The off-channel screen structure will be a single-face vertical plate fish screen in a concrete structure. The new fish screening structure will roughly follow the alignment of the demolished 48-in. pipe section. Structure design will be consistent with appropriate screen approach velocities and screen sweeping velocities criteria as required by NMFS (1997) and CDFG (1997). A horizontally moving multi-arm vertical brush bar system will sweep debris off the screen face and down the fish bypass pipe. The fish bypass pipe outfall location will be based on the need to ensure that there is sufficient hydraulic drop to operate the bypass under all design conditions. Design of the system will determine the optimum location for the outfall taking into consideration predation from other fish, water depth, and velocity requirements. A 48-in. diameter discharge pipe from the screening structure will be connected to the existing 48-in. supply pipeline to the sand settling basins.
3) Modification of the existing right bank sediment sluice–Integral with the existing intake, weir and fish ladder is a sluicing section located adjacent to the entrance of the intake. This sluice will be modified by filling the sump below the floor screens in front of the intake with concrete. Modifications will also include replacement of the existing vertical sluice gate to allow water to flow over the top of it at low river flows. This is to allow downstream migrants an opportunity to pass by the intake entrance.
4) Modification of the existing air-compressor/equipment building–The existing building will be modified to remove unneeded equipment and to improve its appearance. The building will house the emergency electrical generator, electrical power distribution panels, control systems required for the new screening system, and various tools/parts. If possible, the existing propane fueled emergency generator will be reused. The electrical loads include the screen cleaning systems at the intake, other small motors, lighting, and gate actuators at this intake as well as the water control gate on the hatchery canal water control structure described earlier. Architectural improvements will include the application of an exterior finish to give the building the appearance of a farm or ranch out building rather than the current “bunker” look.
5)Bank stabilization–The bank of Battle Creek upstream of the intake will be re-contoured to provide a more uniform approach to the intake structure. The bank will be protected with riprap upstream and downstream of the intake. The riprap will be covered with a layer of soil and planted to reestablish native vegetation. Fill is needed to maintain access to the intake and fish

screening structures during flood events. The fill areas will be limited to areas immediate to the screen structure, equipment building and intake control gate.

Project location

Battle Creek is the source of water for all fish culture activities at Coleman NFH. Battle Creek flows into the Sacramento River at river mile 272 near the town of Cottonwood and forms the border between Shasta and Tehama counties. The proposed intake screening and modification project is within the Sacramento Valley Region as identified by CALFED. More specific coordinates are, North Sacramento Valley, latitude 40 23' 54" N, longitude 122 8' 43" W (USGS Quad - Ball's Ferry, California).

Other Project Details

In completing the project scope, no additional water rights for the Coleman NFH will be sought. However, changes in points of diversion may be sought. For example, as water diverted from Intake #1 is anadromous fish free, all water diverted from that location will likely reduce potential impacts on outmigrating juvenile salmonids. In any final configuration, the diversion and water intake system will be designed to fully utilize the hatchery's existing water rights, while not seeking additional rights over the existing 122 cfs total right (including the 13.13 cfs downstream right(s)). Although the water right modification will likely require additional time to be resolved, this potential point of diversion modification will not affect the timeline for the application of the screening components and the existing diversion rights at Intakes #2 and #3.

A1. Problem

Existing water diversions for Coleman NFH do not meet current criteria for fish screening as required by National Marine Fisheries Service (NMFS 1997a) and California Department of Fish and Game (CDFG 1997). The Coleman NFH, located on Battle Creek in Shasta County, is a federal facility built in 1942 as a fishery mitigation feature for the construction of Shasta Dam and Reservoir. Its founding purpose was to help preserve significant runs of chinook salmon threatened by the loss of natural spawning areas on the Sacramento River. Facility modifications and fish screening of the Coleman NFH water diversion intakes are an important component to successful restoration of naturally reproducing salmonids in the Battle Creek watershed, and have been identified in the Anadromous Fish Restoration Program Plan (AFRP) Actions #8 (USFWS 2001a). CALFED also recognizes this action as a priority action associated with Battle Creek Restoration (Sacramento Region Priority Action #6; CALFED 2001).

Since the early 1900's, anadromous fish runs in Battle Creek have been negatively affected ed by irrigation diversions, hatchery operations, and, primarily, hydroelectric development. Hatchery operations in Battle Creek began in 1895 with the construction of the Battle Creek Egg Taking Station operated by the U.S. Bureau of Fisheries. This facility was phased out of operation following the construction of Coleman NFH in 1942. Prior to Battle Creek restoration efforts, passage of anadromous fishes upstream of the Coleman barrier weir was intentionally blocked on a seasonal basis for various reasons including: 1) broodstock collection; 2) preventing disease-infected fish from entering the hatchery's water supply; 3) spatially separating fall and spring chinook to maintain stock integrity; 4) preventing fish from entering degraded habitat;

and, 5) preventing fish from entering and spawning in areas of unscreened hydropower diversions. Also located in the Battle Creek watershed is a State-run hatchery facility located at Darrah Springs on Baldwin Creek, and several private trout rearing facilities.

Hydroelectric development in the Battle Creek watershed began in 1901 with the construction of the Volta Powerhouse by the Keswick Electric Power Company. Water diversions for hydroelectric power production have caused the largest impacts to habitats of anadromous salmonids in Battle Creek. Upstream of the Coleman Powerhouse, hydropower diversions have historically routed nearly all of the water from Battle Creek during the months from June until the rains began in the fall. Hanson et al. (1940) reported that "Battle Creek above the Coleman Powerhouse is not suitable for salmon because ditches remove practically all of the water from its bed and the little water remaining becomes very warm in the summer."

As it exists today, the Battle Creek Hydroelectric Project is operated by PG&E and consists of eight small dams that divert a portion of the water from both the North and South forks of Battle Creek, as well as several tributaries and underground springs (see Ward and Kier 1999 for a more complete description). Current minimum release requirements as stipulated in Federal Energy Regulatory Commission (FERC) licence #1121 are 3 cfs in the North Fork and 5 cfs in the South Fork Battle Creek. These minimum in-stream flow provisions are inadequate to support healthy runs of anadromous fish. The majority of water diverted for hydropower projects is returned to Battle Creek through the Coleman powerhouse tailrace, located approximately 1.6 miles upstream of Coleman NFH.

Battle Creek is recognized as a Sacramento River tributary capable of supporting natural reproduction of spring and winter chinook salmon, and steelhead trout and a major restoration project restore chinook salmon and steelhead in this watershed is currently underway. Since 1997, the Battle Creek Working Group, Pacific Gas and Electric Company (PG&E), state and federal resource agencies, and other interested parties have been working on solutions to problems in the watershed. In early 1999, the Battle Creek Restoration Project was negotiated, that will result in removal of five PG&E diversion dams, improve 3 existing hydropower facilities with fish screens and fish ladders, and increase the minimum flow rates above Coleman NFH (MOU among NMFS, USFWS, CDFG, USBR, and PG&E dated June 10, 1999). Increased flows in Battle Creek will benefit anadromous salmonids by improving conditions for emigration, migration, holding, spawning and rearing. As part of the Battle Creek Restoration Project, 5 dams will be removed, and 3 existing hydropower facilities improved with fish screens, fish ladders, and flow improvements Changes associated with the Battle Creek Restoration Project will open access and contribute toward the restoration of approximately 42 miles of anadromous fish habitat in Battle Creek that have primarily been affected by hydropower and hatchery operations.

The 1999 Annual Report for the CALFED Bay-Delta Program documents the importance of the Battle Creek Project in improving fish passage to historical habitats (CALFED 1999). In support of the Battle Creek restoration efforts, two projects were recently funded by CALFED's Ecosystem Restoration Projects and Program: (1) Improving the Upstream Ladder and Barrier Weir at Coleman National Fish Hatchery to Facilitate Fisheries Restoration in Battle Creek

($1,663,400 over 3 years); and Proposed Battle Creek Chinook Salmon and Steelhead Restoration Project ($28 million over 8 to 10 years).

While all aspects of Battle Creek restoration have not been determined, much of the visioning, research, and planning have been completed (e.g., TRPA 1998a through 1998d, Ward and Kier 1999, Sverdrup and Tetra Tech/KCM, Inc. 1999). A draft EIS/EIR has been prepared with proposed modifications to the Battle Creek Hydroelectric Project (SWRCB 2000), and new minimum release requirements have already been agreed upon (MOU among NMFS, USFWS, CDFG, USBR, and PG&E dated June 10, 1999). The new minimum flow agreements, as renegotiated under the umbrella of the Battle Creek restoration project, include releasing 35 cfs and 40 cfs from the Eagle Canyon and Inskip dams respectively. These flows reflect an effort to balance power production needs with fish habitat requirements at various life-stages, and take into consideration water quality (e.g., temperature) and habitat availability. Stream flows reallocated under the Battle Creek restoration project are designed to satisfy the life history requirements (e.g., upstream migration, spawning, egg incubation, rearing, and emigration) of priority species (winter[2] and spring chinook salmon and steelhead trout) within restored stream reaches. A remaining issue linked with the watershed restoration effort is adequately screening other existing diversions within Battle Creek such as the Coleman NFH water intake structures. To successfully integrate Coleman NFH with Battle Creek restoration the hatchery's water supply must be properly screened to avoid diversion, entrainment, and impingement of naturally-produced juveniles.

Current Water Intake description

The intake structures and associated conveyance facilities at Coleman NFH combine to create a highly complex water delivery system. The intake structures are used to divert and convey water directly from Battle Creek and the Coleman Powerhouse tailrace (Figure 1). Water from all three intakes can be shunted to a state-of-the-art ozone water treatment facility or sent directly to various fish rearing and holding areas. Additionally, the highly complex water delivery system at Coleman NFH has numerous piping interconnections between areas and facilities. These complex interconnections allow water to be diverted from the canal to the sand traps, to bypass the water treatment system, and to be reused from the 15-foot x 150-foot raceways to the 8-foot x 80-foot raceways. A general description of the Coleman NFH water delivery system is given below (See Sverdrup and Tetra Tech/KCM, Inc. (1999) for additional technical information on the existing Coleman NFH water delivery system).

[2]The restoration of Battle Creek provides a unique opportunity to restore a population of the State and Federally listed winter-run chinook salmon in a watershed that is resistant to drought. These actions are designed to facilitate reintroduction of winter-run chinook salmon into Battle Creek, and present the opportunity for the development of a founder population (NMFS 1997b). This action is significant on a population level because winter-run chinook salmon may be subject to catastrophic loss on Sacramento River spawning grounds during periods of extreme drought.

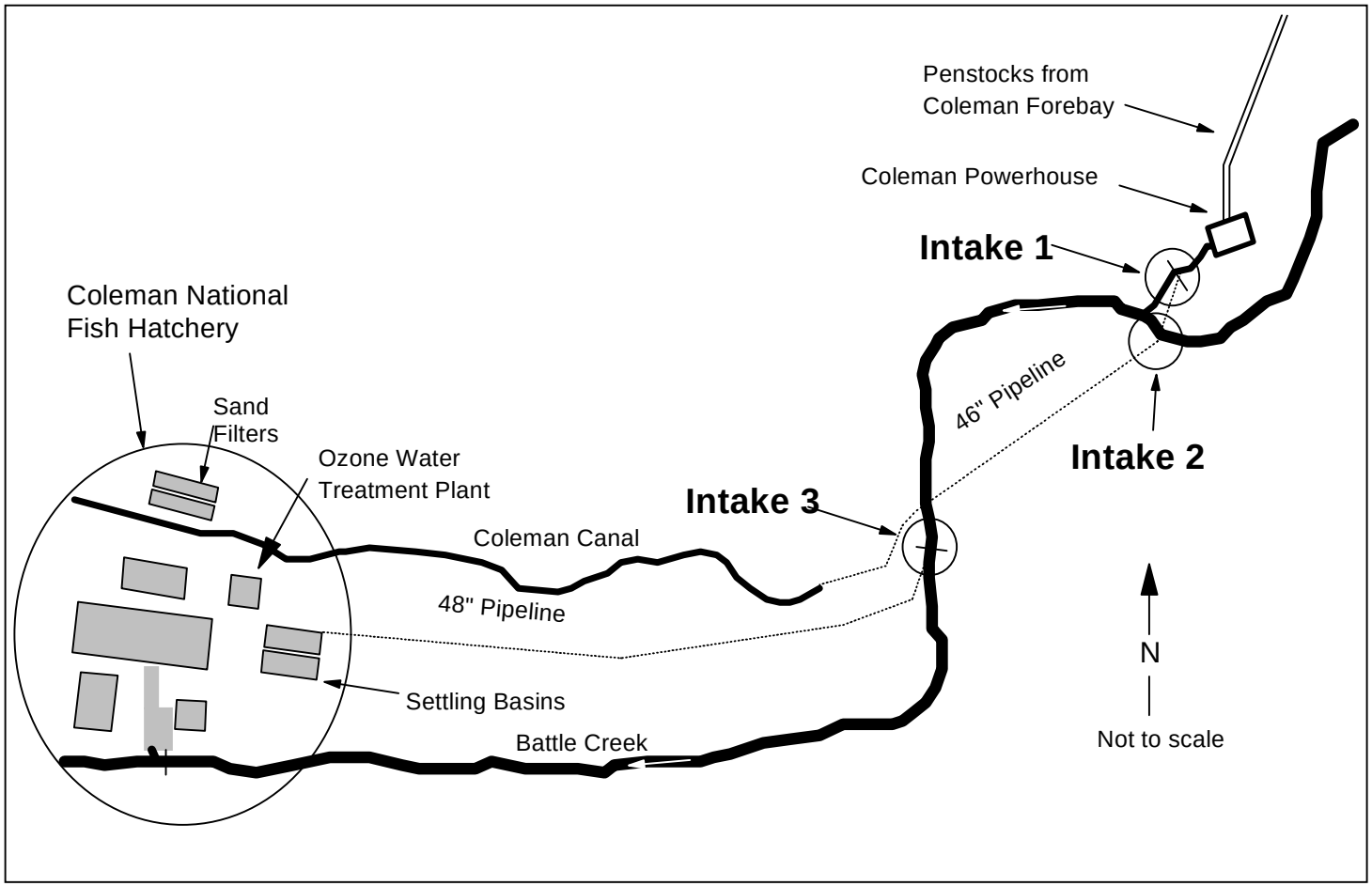


Figure 1. Existing water diversion and delivery system at Coleman National Fish Hatchery, Battle Creek, California.

Intake #1--The hatchery's primary intake (Intake #1) is an unscreened intake located in the tailrace of Pacific Gas and Electric's (PG&E) Coleman Powerhouse, on the north bank of Battle Creek. The tailrace empties into Battle Creek approximately 1.6 miles upstream of the hatchery property. Intake #1 provides the highest quality surface water available to the hatchery, and provides the greatest level of protection for naturally-produced anadromous salmonids. The extensive canal and reservoir system which delivers water to PG&E's Coleman Powerhouse settles out a major portion of the solids which naturally occur in any surface water system. This lower initial load of settleable solids results in reduced on-station sand trap and sand filter maintenance and higher efficacy of the water treatment facility. Additionally, water available in the Coleman Powerhouse tailrace is also slightly cooler than surface water available through intakes #2 or #3. This site also has the advantage of providing anadromous fish free water available from PG&E's Coleman Powerhouse tailrace. Following the completion of the Battle Creek Restoration project all water entering the PG&E hydropower system will be properly screened (general details of the current Battle Creek restoration project are presented in Section A1 of this document). Therefore the presence of the powerhouse at the upstream end of the tailrace, and a new fish barrier (picket weir; See Footnote 1) at the downstream end will exclude fish from the tailrace and thus eliminates the need to provide fish screening protection at Intake #1. The structure was built in 1942 and is need of repairs to assure continued reliability.

Water taken through Intake #1 is conveyed through a 46-inch diameter conveyance pipe to an open canal system. A canal pump station lifts water to a state-of-the-art water treatment system for filtering and ozone disinfection. Water exiting the filter/disinfection system can be delivered to any of the various juvenile rearing or adult holding facilities on station (e.g., hatchery incubation building, 8 x 80-ft and 15 x 150-ft juvenile rearing raceways, spawning building and associated adult holding ponds). Water not pumped to the water treatment facility can be delivered to the incubation building and the 15 x 150-ft raceways. Water from the canal is also delivered to the downstream users to satisfy a 13.1 cfs downstream water right.

Intake # 2--Intake #2 is an unscreened intake located on the south bank of Battle Creek, opposite of Intake #1. Intake #2 draws water directly from Battle Creek, and is used as an emergency back-up to Intake #1. The Intake #1 and Intake #2 system was constructed in 1942. The design of Intake #2 prevents diversion of water simultaneous with Intake #1. Intake #2 supplies water to the hatchery only during periods when water cannot be supplied through Intake #1 (e.g., failure of canal or powerhouse maintenance). Delivery options for water diverted at Intake #2 are the same as Intake #1 as Intake #2 shares the 46-inch conveyance pipe with Intake #1 (see description above). Planned and unplanned diversions through Intakes #2 and #3 are also required for routine maintenance and emergency situations that interrupt water supply to Intake #1. The normal operating condition of PG&E's Coleman powerhouse involves discharge of flow from the Coleman forebay, through the penstocks and turbine, then discharge into the tailrace where the hatchery's Intake #1 is located. Occasionally, water is blocked from the Coleman powerhouse to perform routine maintenance of the PG&E canals and turbine. Maintenance activities of this sort are typically scheduled during May and June, to correspond with decreased water needs at Coleman NFH. However, unplanned events such as turbine trip or canal failure can also disrupt the water supply to Intake #1 at any time. When water is not available at Intake #1 because of maintenance or emergency situations, Intake #2 on Battle

Creek automatically opens and diverts water to supply the hatchery. Over a ten year period (1991 - 2000), the average amount of time that hatchery water could not be supplied through Intake #1 was 412 hours (17.2 days) annually.

Intake #3--Intake #3 is a partially screened intake that draws water directly from Battle Creek, approximately 0.4 miles downstream of Intake #2 (1.2 miles upstream of the hatchery). Built in 1963, the original structure was an open box structure, with a trash rack on the front of the box to exclude larger debris. In 1990, a horizontal screen system was constructed in front of the intake to prevent the entrainment of juvenile fish, and steel plates were bolted to the face of the trash rack to prevent unscreened water from entering the trash rack. An air burst cleaning system was also installed. Unfortunately, hydraulic conditions rendered the air burst system ineffective in keeping the screen clean, and the screen is also too small and therefore cannot meet fish protection criteria. In 1998, along with other interim intake modifications (see following section on the interim intake fixes), the course trash rack on the front of the original intake box was retrofitted with perforated screen panels. Even with this modification, the screen slots are larger than that of criteria for the protection of steelhead trout fry, and the submerged screen area generally exceeds the required 0.33 fps approach velocity. Water diverted through Intake #3 is conveyed to the hatchery through a separate 48-inch diameter pipeline. The 48-inch pipeline carries the diverted water approximately 4,600 feet to a sand trap which is designed to remove course settleable solids. Exiting the sand traps water can be 1) pumped the filtration/disinfection system (raw water pump station) for potential distribution throughout the facility (see above), 2) pumped to the spawning building and adult holding ponds (spawning building pump station), or 3) gravity fed to the 8 x 80-ft raceways.

Water Rights and Water Discharge

The U.S. Fish and Wildlife Service holds Battle Creek water rights for up to122 cubic feet per second (cfs) to conduct fish propagation activities at Coleman NFH (Table 1; USFWS 1987). Coleman NFH water rights were obtained by appropriation (See Luken et al. (1981) for legal descriptions of water rights owned by the Government). Seventy-two cfs are associated with Intakes #1 and #2, while 50 cfs is associated with Intake #3. By design, Intake #1 and Intake #2 cannot operate simultaneously, and Intake #2 is the designated “emergency” intake (i.e., only operated in the event of a water delivery problem at Intake #1; refer to previous discussion under the “Current Water intake description and Project Location section of this document). For purposes of clarification, within this proposal, the diversion flow at Intake #2 will be limited to 33 cfs commensurate with the existing point of diversion right at that location. No additional rights are being sought, although changes in points of diversion may be sought but not to exceed the 122 cfs total right. Any flow related impacts associated with potential changes in points of diversion will be fully analyzed through the NEPA process.

Intake #1 is the preferred point of diversion for Coleman NFH because it offers improved protection of naturally produced anadromous fish and superior water quality for fish culture operations. For example, water diverted from intake #1 is anadromous fish free, therefore, all water diverted from that location will likely reduce potential impacts on outmigrating juvenile salmonids. Additionally, water diverted from intake #1 also is generally of higher quality (i.e., lower turbidity and cooler temperature). Lower turbidities enhance the efficacy of the ozone

Table 1. Coleman National Fish Hatchery Water Rights on Battle Creek (Service 1987).

Appropriation Number	Permit Number	License Number	Priority Date	ft^3/s	Purpose
13540	8838	4472	01/12/50	61	Fish Culture
17862	11615	6591	10/25/57	11	Fish Culture
20288	13384	7993	07/03/61	30	Fish Culture
22277	15046	9561	07/19/65	20	Fish Culture
Total				122	

water treatment plant, and lower water temperatures promote a less stressful rearing environment. In combination, water that is less turbid and slightly cooler reduce the potential for on-station disease outbreaks, and thus limit the potential for disease transmission following the release of hatchery-origin juveniles.

Water use at the Coleman NFH is non-consumptive. No changes in water discharge locations are associated with this project. All water diverted from Battle Creek for use at Coleman NFH is returned to the creek through an overflow channel, the fish ladder, a separate wastewater ditch, or the outfall of the pollution abatement pond. The total distance over which water is diverted is 1.2 miles (from Intake #3) to 1.6 miles (from Intakes #1 and #2). The facility discharges an average of 40.8 million gallons per day (mgd), of which, approximately 3.3 mgd of hatchery wastewater is passed through the pollution abatement pond prior to discharge into Battle Creek. The pollution abatement pond is used primarily to reduce the discharge of settleable solids (i.e., fish fecal material, unconsumed food, algae, and silt) associated with raceway cleaning. All water discharged from the Coleman NFH is regulated by National Pollution Discharge Elimination System (NPDES) permit issued by the California Regional Water Quality Control Board.

Estimated Impacts of the operation of the existing Coleman NFH water deliver system.
Based on current and estimated salmonid populations in Battle Creek over the next several years, annual take of juvenile salmonids resulting from unscreened/unimproved Coleman NFH water diversions are approximately 19,600 fall chinook salmon, 3,600 late fall chinook salmon, 7,000 winter chinook salmon, 900 spring chinook salmon, and 7,600 steelhead trout (USFWS 2001b).

Existing water diversions for Coleman NFH likely result in take of juvenile ESA-listed and non-listed salmonids from Battle Creek (see above). The primary intake for Coleman NFH is located in the tailrace of the Coleman powerhouse (an area inaccessible to anadromous salmonids), therefore, the risk of take of juvenile salmonids at that location is low to non-existent. However, water diversions at Intakes 2 and 3 may impinge or entrain juvenile salmonids because these intakes are either unscreened (Intake #2) or do not meet NMFS (1997a) screening criteria (Intake #3).

The number of juvenile salmonids entrained or impinged at Intakes #2 and #3 is a function of: 1) the proportion of Battle Creek flow diverted into the hatchery; 2) the magnitude and timing of diversions at improperly screened intakes; and, 3) the magnitude and timing of salmonid emigrations past the Coleman NFH intake structures in Battle Creek. The proportion of Battle Creek flow diverted at Coleman NFH is a function of water requirements for fish propagation at Coleman NFH and Battle Creek flow. The amount of water diverted into Coleman NFH varies throughout the year (approximately 35 to 122 cfs; Table 2), depending on the water demands for fish culture activities associated with various cycles of collecting, spawning, and rearing three stocks of anadromous salmonids. The total diversion through the Coleman NFH intakes also includes the 13.13 cfs to be delivered to downstream water users without being used at the hatchery (Sverdrup and Tetra Tech/KCM, Inc. 1999). Total water use at the hatchery is highest from October through early-March (generally less than100 cfs) when broodstock collection, spawning, egg incubation, and rearing all occur simultaneously. Lowest water use at Coleman NFH occurs in May (approximately 34 cfs) following the release of fall chinook salmon. Average monthly flow in Battle Creek ranges from a low of 255 cfs during September to a high of 727 cfs during January (Table 2; USGS website: http://waterdata.usgs.gov/nwis-w/ca/ as summarized by Ward and Kier (1999)). Therefore, on average, water diversion at Coleman NFH is considerably less than 30% (range = 6 to 39%) of the available flow in the 1.6 mile reach of Battle Creek between the water diversion structures and the water return sites (the 1.6 mile reach represents only 4% of the 42 miles identified in the Battle Creek restoration project). Additionally, on average, this diversion will not result in an impact to the recommended minimum flow requirements in that 1.6 mile reach (Table 2).

Salvage Operations, Interim Intake Fixes, and a brief history of current efforts to modify the Coleman NFH water delivery system.

Because of the screen deficiencies of the existing intakes, the Coleman NFH conducts periodic salvage operations to rescue fishes entrained in the hatchery's water delivery system. Previous attempts at salvaging entrained juveniles from the hatchery's canal or settling basin using seining, dip nets, cast nets and electro-shocking techniques have been moderately successful. From May 24 to July 13, 2000, 782 salmon and 749 rainbow trout were collected following diversion into the hatchery's water supply system and returned to Battle Creek. In 2001, over 5,000 rainbow trout/steelhead juveniles, and approximately 500 juvenile salmon were salvaged. Salvage protocols were developed in consultation with NMFS. The timing of salvage operations is limited to periods when the hatchery's water needs are reduced. For example, salvage of fishes entrained in the Coleman canal is limited to May when the hatchery's water demand is low and can be fully supplied by Intake #3. Salvage of fishes in the hatchery's settling basins requires draining the basins, and therefore must be conducted when Intake #3 is not in use.

In attempting to reduce negative impacts to natural salmonids in Battle Creek, in 1998, interim measures were implemented at the existing intakes (USBR 1998). However, these are not considered long-term solutions and some of the protective measures have been only marginally successful. During 1998, interim intake upgrades were implemented to reduce fish entrainment. The general nature of the interim fixes are described below. A status report of these interim fixes is in progress.

Table 2. Average monthly discharge for Battle Creek (BC), recommended minimum flows after Battle Creek restoration, monthly water requirements for Coleman National Fish, and average flows in excess of minimum flows and Coleman NFH water requirements.

	Water Flow (cfs)											
	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
Average monthly flows for BC[a]	727	693	713	625	578	457	318	256	255	296	420	559
Recommended minimum BC flows[b]	137	137	137	107	80	80	80	80	80	80	80	137
Coleman NFH water requirements[c]	122	104	111	86	34	45	59	60	89	115	115	117
Percent of available flow diverted for use at Coleman NFH	17	15	16	14	6	10	19	23	35	39	27	22
Average flow in excess of minimum recommended flows and Coleman NFH water requirements	468	452	465	432	464	332	179	116	86	101	225	305

a Average monthly flows for battle Creek were taken from Kier and Ward (1999) and are based on data from 1961 through 1996 (USGS gaging station 11376550).

b Minimum flows are based on agreed upon minimum releases from hydropower facilities after Battle Creek restoration (MOU among NMFS, USBR, USFWS, CDFG, and PG&E dated June 10, 1999) and estimated accretions (~5 cfs) from small tributaries. Implementation of the minimum releases is pending (anticipated start date late 2001 or early 2002).

c Coleman NFH water requirements include approximately 13 cfs delivered to downstream water users without being used at the hatchery.

Intake #1: Coleman NFH Intake #1 is not screened, however, water entering Intake #1 originates from the upper reaches of Battle Creek (Inskip Powerhouse), an area which is currently inaccessible to anadromous fish. Intake #1, therefore, poses little threat for "take" (i.e., impingement or entrainment) of listed salmonids. Following the Battle Creek Restoration project although anadromous fish are expected to be present in the upper watershed, properly screened PG&E diversions will continue to result in anadromous fish free water available at the site of Intake #1.

***Intake #2*:** A flap gate at Intake #2 serves to block this unscreened intake except under emergency conditions. Intake #1 and Intake #2 cannot operate at the same time. In its current configuration, when operating, this intake poses the largest risk to juvenile salmonids as it is a completely unscreened diversion.

Intake #3: In the fall of 1998, a smaller-mesh, emergency, removable, perforated-plate fish screen was added to Intake #3. In addition, an experimental stream-bed mounted auxiliary fish screen was constructed at Intake #3 (Universal Submersible Bottom Retrievable fish screen; USBR). Due to inadequate reliability, the USBR screen was subsequently removed in August 2000. Although the existing intake structure is screened, and thus poses a lesser direct entrainment risk than Intake #2, the configuration does not meet current fish screening criteria.

All existing water intakes for Coleman NFH are currently under evaluation for modification in conjunction with Battle Creek restoration efforts. In the future, all water entering the PG&E canal system will be screened with structures meeting NMFS's screening criteria (February 1999 MOU among NMFS, USBR, USFWS, CDFG, and PG&E). In 1998, discussions were initiated to determine a long-term solution for the Coleman NFH water delivery system, emphasizing water supply reliability and protection of all naturally-produced fish. A technical subcommittee of the BCWG, including representatives of the resource agencies (NMFS, CDFG, USBR, and USFWS) and design engineers, was formed to resolve issues associated with Coleman NFH's unscreened diversions. Ten alternatives were developed by this subcommittee and each alternative was assessed in terms of its effectiveness in relation to eight criteria: water quality and quantity, system reliability, redundancy, access, fish protection, maintenance, long term performance, and water rights (Sverdrup and Tetra Tech/KCM, Inc., 1999). The list of potential alternatives was subsequently narrowed to four feasible alternatives through a decision matrix using weighting factors and relative effectiveness (Sverdrup and Tetra Tech/KCM, Inc., 1999). Recently, an additional alternative (Alternative 11) was forwarded by the Battle Creek Watershed Conservancy. With the addition of a new intake alternative, a new analysis is underway to rank the potential alternatives prior to formally beginning the National Environmental Policy Act (NEPA) process. The evaluation and NEPA process will continue in order to determine the best solution for intake screening and modification. For this proposal, the only alternative considered will be basically a "screen only" alternative. Therefore, work described in this proposal considers tasks and costs associated with screening and/or modifying the existing intakes.

A2. Justification
Although this Section not required for this type of project as per PSP preparation and submission instructions Page 60 (CALFED PSP 2001), it is important to note that implementation of the fish screen and intake improvement project at Coleman NFH is an important component in the overall effort to restore the Battle Creek watershed for anadromous salmonids.

A3. Approach
The basic scope of the project calls for Intake #1 to remain essentially as it is currently configured, while Intakes #2 and #3 are reconstructed largely "in-place" to meet current fish protection requirements. General tasks include: 1) completing minor structural repairs to the primary Intake #1, 2) Construction of a fish screen and associated modifications at the site of existing Intake #2 (33 cfs delivery capability), 3) Construction of a diversion sill below Intake #2; 4) Construction of access way to Intake # 2; 5) Construction of a fish screen and associated modifications at the site of existing Intake #3 (50 cfs delivery capability). (See Section A1. for all proposed project components).

In completing the project scope, no additional water rights for the Coleman NFH will be sought. However, changes in points of diversion may be sought. For example, as water diverted from Intake #1 is anadromous fish free, all water diverted from that location will likely reduce potential impacts on outmigrating juvenile salmonids. Although the water right modification will likely require additional time to be resolved, any potential point of diversion modifications will not affect the time line for the completion/construction of the screening components and the existing diversion rights at Intakes #2 and #3. In any final configuration, the diversion and water intake system will be designed to fully utilize the hatchery's existing water rights, while not seeking additional rights over the existing 122 cfs total right (which includes the 13.13 cfs downstream right(s)).

Planning Process and Screen Design
The construction of fish screens at Coleman NFH is unique to other fish screen construction project in the Central Valley. Instead of screening a diversion that provides water for agricultural purposes, this project provides water to on one the few remaining mitigation features for Shasta Dam -- Coleman NFH. This project, therefore, differs from other fish screening projects in regard to water delivery reliability as, unlike agricultural diversions, even short-term complete water delivery interruption (greater than 30 minutes) at Coleman NFH can lead to substantial losses of juvenile and/or adult salmon.

The project complements watershed restoration efforts in Battle Creek to reintroduce naturally reproducing salmonids in the upper watershed, and will facilitate survival of migrating and resident fish in Battle Creek. Due to the presence of and/or reintroduction of federally listed species in the Battle Creek watershed, protection measures at the Coleman NFH intakes must encompass fishery objectives at both the population and individual level. Protective methods for the intake facilities other than screening have not been pursued under this project, due to a lack of scientific information on alternative methods, and current regulatory requirements that specify screening as the only recognized method of fish protection.

Screening of water intakes for fish and debris has historically been approached by a variety of different methods. Debris screening is accomplished to preclude floating or entrained organic material from entering water supply systems where it can clog filter systems, pipes, and other critical components. Criteria to meet project goals for screen design and intake configuration previously and currently used in ongoing planning processes include, but are not limited to:

Water quality and quantity: The quality and quantity of water delivered from the intake system shall meet the operational requirements of the hatchery.

System reliability: The intakes shall have a high degree of reliability for all reasonably anticipated environmental and operational conditions, including anticipated changes to the water supply configurations in the upper watershed due to the Battle Creek restoration efforts, changes to the hydropower systems and other water resource management actions.

Redundancy: The water system shall have alternative intakes to allow for redundancy of operation (including emergency backup*).*

Access: The intakes should be located within a reasonable response perimeter from the Hatchery and shall be easily accessed for maintenance.

Fish Protection: The intakes should provide minimum risk to anadromous salmonids and resident species where these are anticipated to be present. Fish screening criteria shall meet or exceed 1997 CDFG and NMFS requirements.

Maintenance: Both regularly scheduled annual maintenance and minor routine maintenance activities of either the intake or water conveyance facilities should be easily accommodated and reasonably accomplished.

Water rights: The diversion and water intake system should be designed to fully utilize the hatchery's existing water rights, while not seeking additional rights over the existing 122 cfs total right (including 13.13 cfs downstream right). Consolidation or relocation of water rights can/should be considered.

The screening design under consideration in this proposal is a single-face vertical plate fish screen in a concrete structure (See Section A1). Structure design will be consistent with appropriate screen approach velocities and screen sweeping velocities criteria as required by NMFS (1997a) and CDFG (1997). A horizontally moving multi-arm vertical brush bar system will sweep debris off the screen face. Conceptual designs are available for all screen structures and associated fish by-pass facilities upon request.

A4. Feasibility

The intake screening project defined in this proposal is highly feasible, and planning processes will continue to assure the best remedy is advanced for final implementation. With funding from CALFED through this proposal not expected until late 2002, ample time is available to proceed with additional essential planning and initiation of NEPA. Some of the funds requested through

this proposal will be used for advanced planning, project administration, and preparation of environmental documentation.

Many setbacks have been previously encountered in this planning/implementation process. For example, based on a previous planning effort, a draft Environmental Assessment was expected to be completed by September 2000. Setbacks have largely resulted in the inability to meet previously expected time lines for project implementation and have resulted in many increased costs associated with the project (much additional expenditures in the planning process and increases in eventual construction costs due to inflation over time). Previous setbacks have largely been the result of: 1) stakeholder concerns surrounding the purpose and need of the project including project objectives and criteria; 2) previously described scopes of the project which alluded to an expansion of Coleman NFH water delivery capability, and 3) the continuance of the Coleman NFH Reevaluation Process and analysis of other hatchery management alternatives that may reduce the overall water need at the facility.

The "screen only" project described in this proposal was chosen based on its fish protection benefits, as well as its overall feasibility, acceptance, and expedient time line for implementation. For example: 1) the proposal focuses on the fish protection aspects of the screening project consistent with the integration of Coleman NFH operations with Battle Creek restoration as identified in the CALFED priority action; 2) the June 11, 2001, letter drafted by the Battle Creek Watershed Conservancy suggested Coleman NFH pursue an intake modification to simply screen existing intakes–perhaps even as an interim measure; 3) no direct water right changes are necessary to implement the construction described in this proposal; 4) all construction associated with this proposal could be completed without the need to access privately owned lands; 5) the time line associated with actual receipt of funds from this proposal will allow the execution of additional planning processes to identify/advance a final preferred solution and the construction time line will allow an additional year to finalize the design/remedy for modification of the emergency intake (Intake #2); 6) the time line associated with actual receipt of funds will also allow development of a decision making process following the analysis of the hatchery management alternatives developed during the Coleman NFH reevaluation process to further the integration of Coleman NFH activities with Battle Creek restoration, and help tie other potential facility modifications to modifications associated with the intake screening project; and 7) level of funding sought through this proposal is within the range of most all alternatives previously/currently being examined, and will be fully applicable as final designs are approved/permitted.

A major point of clarification for this project revolves around previous misunderstandings of water rights versus intake capacity. As a general rule, the capacity of the existing Coleman NFH water intakes (220 cfs) and water conveyance system is greater than the water right associated with the intakes (total right equals 122 cfs). Due to the extreme importance of uninterrupted water delivery, the existing system was engineered/designed/constructed to reliably operate under a wide variety of environmental and physical conditions. Likewise, for any final design/construction associated with his project, the water intake structures may have a design capacity which exceeds the water right to assure reliable delivery of the water right under diverse prevailing environmental conditions. To document water use, and to assess changes in the water

delivery system associated with this project, the U.S. Fish and Wildlife Service will develop on-station water flow monitoring protocol to document water use (See Section A5 Performance Measures below).

Construction could be complicated by the limitations of the in-river work period (potentially June through September) and the requirement that the hatchery be able to meet its water demand at all times. Construction timing, therefore, needs to be well scheduled/coordinated to take advantage of specific construction windows

Environmental compliance and permit processes expected to be completed prior to or in conjunction with project construction include:

- Section 7 of the federal Endangered Species Act (ESA)
- Section 404 of the Clean Water Act
- Section 106 of the National Historic Preservation Act (NHPA)
- Fish and Wildlife Coordination Act (FWCA)
- Section 401 of the Clean Water Act
- Federal Energy Regulatory Commission (FERC) License Amendment (if necessary)
- Section 2080.1 and Section 2081 of the California Endangered Species Act (CESA)
- California Department of Fish and Game Streambed Alteration Permit
- California State Regional Water Control Board Permit
- NPDES permit
- Corps of Engineers Permit

A5. Performance Measures

The most obvious performance measures associated with this project will be in regard to the projects ability to avoid impingement and entrainment of naturally-produced juvenile salmon and steelhead, while reliably providing appropriate quantities of high quality water for Coleman NFH operations. A hydraulic and biological monitoring plan[3] will be developed as part the project to assure regulatory compliance with screening standards and monitor fish screen effectiveness, using a number of the metrics identified below (e.g., numbers of juvenile salmon, approach and sweeping velocities, and water quantity delivered) to assess Project Outcomes (e.g., elimination of juvenile salmonid entrainment, and reliable delivery of water). Other associated monitoring activities will also assist in measuring the performance of this project through Environmental Indicators (e.g., increased abundance estimates of naturally-produced juvenile salmon and steelhead).

[3]Although entrainment monitoring is described as a performance metric, NMFS has previously been waiving entrainment monitoring at diversions with new fish screens designed to NMFS standards that are inspected in the dry by a NMFS engineer prior to initial operation of the diversion (Steve Thomas, NMFS, Santa Rosa, Personal Communication, September 2001).

In documenting numbers of juveniles salmon entrained pre- and post-project, salvage operations (consistent with or similar to those previously described in this proposal) will be continued for a number of years post-project completion to document the number of juveniles entrained. A performance measure to document successful project implementation would be to confirm that numbers of juveniles entrained per year post-project are less than the number of juveniles entrained per year pre-project, with actual post-project entrainment numbers expected to be at or near zero.

The likelihood for juvenile impingement would be assessed through in situ measurements of screens as constructed and installed and hydraulic measurements under operation at the screen face. Actual measured values of approach and sweeping velocity are to be consistent with screening criteria requirements outlined in NMFS (1997a) and CDFG (1997), at a variety of environmental conditions. The ability for the intakes to adequately deliver appropriate/expected quantities of high quality water under a variety of environmental conditions must also be evaluated as a measure of overall system performance and reliability. Flow meters and flow measuring devices will be installed on-station to document water delivery/use.

Measurement of juvenile salmonid abundance generated from Battle Creek monitoring programs funded through CALFED/AFRP will also be used as a tool to assess the relative effectiveness of multiple restoration actions within the Battle Creek watershed which includes this water diversion screening project.

A6. Data Handling and Storage

As this proposal is for project planning and construction, data handling and storage is not specifically addressed. However, a biological monitoring plan will be developed as part the project to assure regulatory compliance with screening standards and monitor fish screen effectiveness (See Section A5).

A7. Expected Products/Outcomes

As described in Section A5. (Performance Measures) the expected outcomes of this project include the elimination and/or minimization of entrainment and impingement of naturally-produced juvenile salmon and steelhead associated with the Coleman NFH water delivery system. Likewise, the expected outcome of the project is the ability to deliver appropriate quantities of high quality water for Coleman NFH fish production operations. The following items are expected direct work products associated with bid solicitation, construction, construction management, and other tasks:

- NEPA documents
- Final plans and specifications
- Bid documents
- As-built drawings
- Final inspection report
- Monthly construction progress reports published by the USBR, Mid-Pacific Construction Office, Willows, CA
- Construction of fish screens and intake modifications

, Hydraulic and Biological monitoring plan for the newly constructed fish screens, USFWS, Red Bluff Fish and Wildlife Office, Red Bluff, California.

A8. Work Schedule

Following completion of the construction specification package, the project would be opened for bidding by contractors resulting in a contract award for construction. It is assumed that the contracting and award process would require approximately 4 months.

Construction could be complicated by limitations of the in-river work period and the requirement that the hatchery be able to meet its water demand at all times. In-river work items must generally be performed between June and September. Additional items which would not require in-river work, but would require the hatchery to temporarily operate on a single intake, would be performed between May 1 and August 31.

Attempting to perform work items in a single season would be an expensive and risky undertaking for the hatchery. Complicating this would be the need to keep one intake operating throughout the entire construction period. Therefore, the construction schedule (see Table 3) assumes that the work would be spread over two in-river work periods with out-of-river work being performed in the interim. During year one (2003), construction tasks at Intakes #1 and #3 would take place. Modifications to Intake #2 would occur during year two (2004). This two year spread also allows the additional time necessary associated with the planning process for the modification of the emergency intake (#2). The implementation of the scope of work in this manner would also lend itself to the ability to receive incremental funding for the project (i.e., funds necessary to complete proposed modifications for Intakes #1 and #3 could be received in FY 2002, while funding to complete work on Intake #2 could be received in FY 2003.

The entire construction period would be about 20 months, extending from about May 1, 2003 to near the end of 2004. Additionally, there would likely be some time before and after this period for contractor's mobilization, demobilization and clean-up. The entire project from a decision to proceed to end of final construction would be approximately two years. This assumes that the decision to proceed is timely and that schedules are adhered to, otherwise the in-river work period restrictions could force the project to slip an additional year.

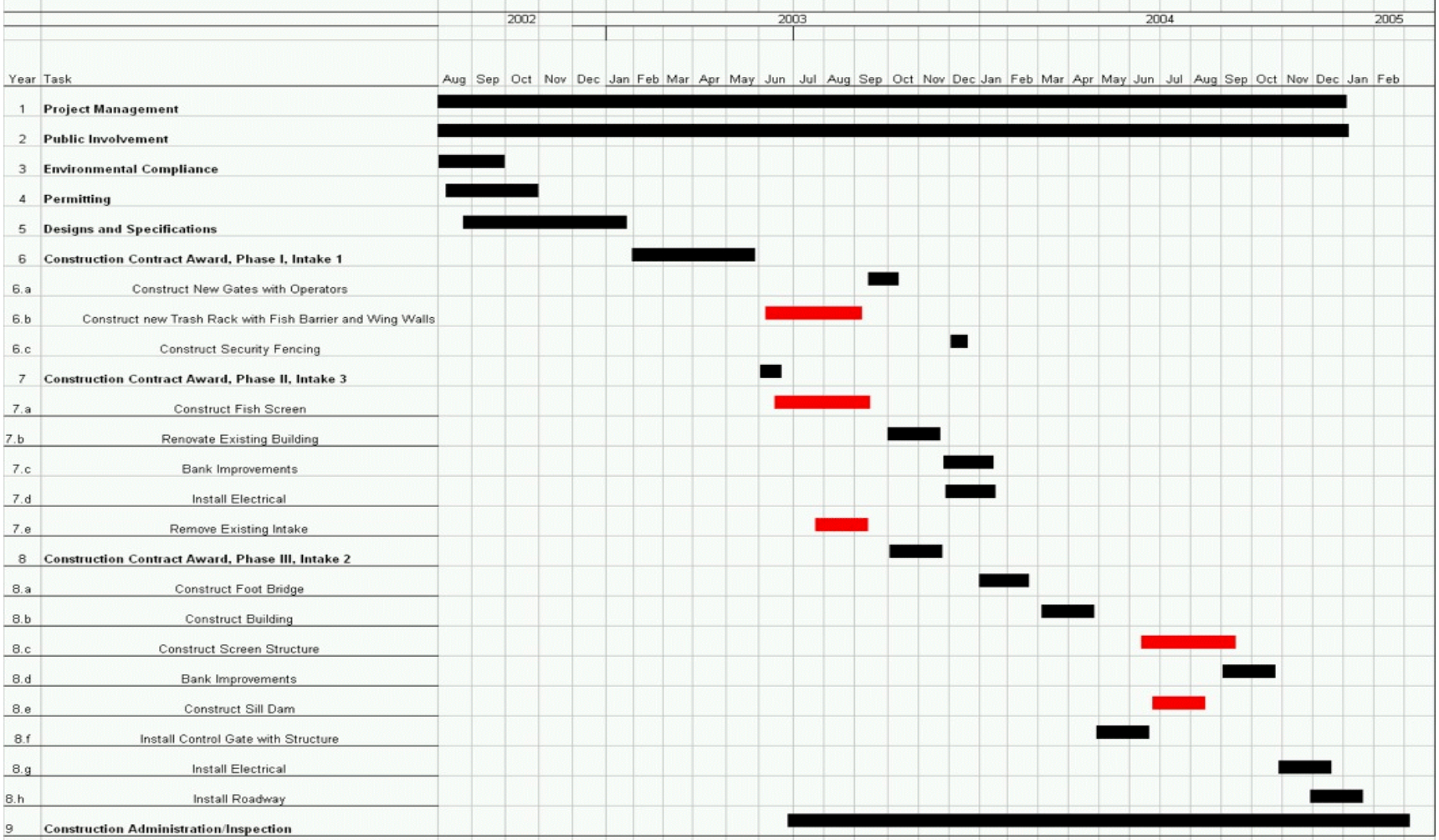
B. Applicability to CALFED ERP and Science Program Goals and Implementation Plan and CVPIA Priorities

B1. ERP Goals and CVPIA Priorities

Modifications and fish screening of the Coleman NFH water diversion intakes are an important component to successful restoration of naturally reproducing salmonids in the Battle Creek watershed, as intake screening/modification is expected to prevent entrainment and subsequent loss of naturally-produced juvenile chinook salmon and steelhead. The need for this modification/screening project is identified in the Anadromous Fish Restoration Program Plan (AFRP) action #8 (USFWS 1997; 2001a). CALFED has also recognized this action as a priority action associated with Battle Creek Restoration (Sacramento Region Priority Action #6; CALFED 2001). Also, as the Coleman NFH was constructed as a mitigation feature of the CVP,

Fish Screen and Intake Improvements to Coleman National Fish Hatchery on Battle Creek
U.S. Bureau of Reclamation, Mid-Pacific Region

Table 2. Work Schedule



Year	Task
1	**Project Management**
2	**Public Involvement**
3	**Environmental Compliance**
4	**Permitting**
5	**Designs and Specifications**
6	**Construction Contract Award, Phase I, Intake 1**
6.a	Construct New Gates with Operators
6.b	Construct new Trash Rack with Fish Barrier and Wing Walls
6.c	Construct Security Fencing
7	**Construction Contract Award, Phase II, Intake 3**
7.a	Construct Fish Screen
7.b	Renovate Existing Building
7.c	Bank Improvements
7.d	Install Electrical
7.e	Remove Existing Intake
8	**Construction Contract Award, Phase III, Intake 2**
8.a	Construct Foot Bridge
8.b	Construct Building
8.c	Construct Screen Structure
8.d	Bank Improvements
8.e	Construct Sill Dam
8.f	Install Control Gate with Structure
8.g	Install Electrical
8.h	Install Roadway
9	**Construction Administration/Inspection**

NOTES:

Indicates in-river work constraints (approximately June 15 - September 15). Exact dates will be determined through ESA consultation.

modification/improvement of this facility is consistent with CVPIA efforts designed to modify CVP features and operations to reduce impacts on naturally-reproducing salmon and steelhead.

B2. Relationship to Other Ecosystem Restoration Projects

As described above (See Section A and A1) this project compliments watershed restoration efforts in Battle Creek to reintroduce naturally reproducing salmonids in the upper watershed, and will facilitate survival of migrating and resident fish in Battle Creek Other associated activities in the watershed funded by CALFED, CVPIA, AFRP or others are shown in Table 4.

B3. Requests for Next-Phase Funding

Previously funded activities associated with this project include: planning and implementation of the Interim Intake Fixes, and the planning process associated with a long-term solution. Funds for this previous work has largely been from CVPIA/AFRP. See Attachment A for additional information on 'Next Phase Funding.'

B4. Previous Recipients of CALFED or CVPIA Funding

In FY 98 and 99 AFRP funds amounting to $301,174 were received. These funds were used for interim intake improvements and development of the long-term intake alternatives (i.e., three components 99LB1 $8,174; 98LC1a $224,000; and 98LC1b $69,000). See also Section B2, Table 4, Section B3 and Attachment A.

B5. System-Wide Ecosystem Benefits

This project is an expected component of the on-going efforts to improve environmental conditions in Battle Creek. The current primary limiting factor to anadromous fish restoration in Battle Creek is impeded passage. All flow and passage related modifications associated with efforts to improve habitat for anadromous salmonids will provide an overall benefit ecosystem function. The protection of outmigrating juvenile salmon and steelhead resulting from this proposed screening project and other restoration actions in the watershed is expected to result in increased abundance of salmon and steelhead in the entire Central Valley.

B6. Additional Information for Proposals Containing Land Acquisitions

Not Applicable to this proposal.

Table 4.--Projects on Battle Creek-- DRAFT Sept 17, 2001

Program/Number	Project Title	Amount Obligated	Status
CALFED/96-M12	Salmon and Steelhead Restoration Study	306,000	Project Completed
CALFED/96-M25	Establish Watershed Conservancy	50,000	90% complete
CALFED/97-M02	Screens and Fish Passage	395,000	Work in progress
CALFED/98-B16	Screens and Fish Passage	395,000	Work in progress
CALFED/98-C14	Monitoring in Battle Creek	150,000	Work in progress
CALFED/98-E06	Battle Creek Watershed Stewardship	145,000	Additional funding provided by AFRP
CALFED/99-B01	Battle Creek Restoration Project	28,000,000	Work in progress
CALFED/99-B08	Improve Upstream Ladder and Barrier Weir at Hatchery	2,500,000	Work in progress
CALFED/99-B12	Riparian Corridor Acquisition and Restoration-Bloody Island	2,240,250	Planning and designing restoration
CALFED/01-N45	Battle Creek Monitoring Projects	1,576,152	Contract in development
CVPIA/AFRP	Hatchery Management Alternatives Analysis (integrate CNFH operations with restoration of naturally produced salmonid populations).	69,578	Work in progress
CVPIA/AFRP	Conservation Easement: Eagle Canyon area	421,700	Project nearing completion
CVPIA/AFRP	Community-based plan for restoration and preservation of the Battle Creek watershed	63,985	Project nearing completion
CVPIA/AFRP	Environmental Education	28,733	Work in progress
CVPIA/AFRP	Continue to develop a long-term solution for screening CNFH water intakes	301,174	Report completed

Table 4 (continued)-			
Program/Number	**Project Title**	**Amount Obligated**	**Status**
CVPIA/AFRP	Survey and monitor adult winter and spring-run chinook salmon on Battle Creek	80,000	Project Completed
CVPIA/AFRP	Battle Creek Watershed Stewardship, Phase II	268,817	Agreement in place
CVPIA/AFRP	Genetic analysis of winter-run chinook salmon (Sacramento River project)	900,000	Work in progress
CVPIA Water Acquisition (b)(3)	Increase flows in Battle Creek by decreasing hydropower diversions	1,835,000	Underway
CVPIA Coleman NFH (b)(11)	Competitive Interaction Study (Sacramento River)		Work underway
CVPIA Coleman NFH (b)(11)	Assist P.B.&E. with constructing a picket weir on the Coleman Powerhouse Tailrace	210,000	Known that this is USBR money, unknown if this is CVPIA money.
CVPIA Coleman NFH (b)(11)	Ozone Water Treatment Facility	13,000,000	Project completed.
CVPIA Coleman NFH (b)(11)	Ozone efficacy assessment (tagging fall chinook	0	Underway
CVPIA CAMP (b)(16)	Juvenile salmonid monitoring 1998-2001	489,000	Funds shown reflect the amount allocated.
DFG	Battle Creek Wildlife Area	1,371,000	466 Acres. Project complete.
DFG	Fish Screens on Battle Creek	200,000	Complete. Operated by DFG
BLM/Packard Foundation	Vaseck Property purchase	1,67,000	Complete

C. Qualifications

U.S. Fish and Wildlife Service:

Red Bluff Fish and Wildlife Office-- The Red Bluff Fish and Wildlife Office (RBFWO) was established in 1978 as part of the U.S. Fish and Wildlife Service's (Service) federal leadership responsibility to facilitate restoration of Pacific salmonids. Goals of the RBFWO are to: 1) Stabilize or increase the runs of anadromous salmonids in the Sacramento River system; 2) Improve the effectiveness of federal fish propagation facilities in California and Nevada; 3) Protect and restore the productivity of natural habitats in the Sacramento River system; and 4) Continue development of information and strategies for protecting the natural habitats of the Sacramento River system as migration routes, spawning areas, and nursery areas for anadromous salmonids. Efforts in the Battle Creek Watershed include conducting surveys to obtain adult life history information on spring and winter chinook salmon since 1995, and monitoring juvenile salmonid outmigration since1998. Biologists with this office will be providing environmental oversight and biological monitoring for all phases of the fish screen and intakes improvement project. Contact: Jim Smith, Project Leader, RBFWO, Red Bluff, CA.

Coleman National Fish Hatchery--The Coleman NFH located on Battle Creek in Shasta County, is a federal facility built in 1942 as mitigation for the construction of Shasta Dam and Reservoir. The founding purpose of the hatchery was to help preserve significant runs of chinook salmon threatened by the loss of natural spawning areas on the Sacramento River. Successful fish propagation programs have been executed at the facility for nearly 60 years. Facility management and staff will be involved in all phases of project development and eventual operation and maintenance of the fish screen and intake structures to assure long-term efficient operation of the structures. Contact: Scott Hamelberg, Project Leader, and Mike Keeler, Assistant Manager–Maintenance.

U.S. Bureau of Reclamation: The Bureau of Reclamation, Mid-Pacific Region will provide engineering services and project management for all phases of the project, and construction administration and management for Phase III (Construction). USBR is currently managing the tasks of environmental compliance and design data collection. Experienced staff from the Mid-Pacific Regional Office, Construction Office, Northern California Area Office, and Denver Technical Services Center (TSC) will be directing or assisting in tasks associated with Phases I, II, and III. The Denver TSC has a wide range of experience in providing concept studies, final designs, model studies, and construction support for fish related facilities, and is currently under contract for engineering support associated with the Battle Creek Watershed Restoration Project. Contact: Mona Jefferies-Soniea, Sandy Osborn, or Denise Stotts.

National Marine Fisheries Service: NMFS is the federal trustee for anadromous fish and critical habitat affected by this project. The Santa Rosa or Sacramento Field Office of the NMFS Southwest Region will be the contact point for NMFS. NMFS staff will participate in technical review of drafts and final design of the facility improvements and the preparation of required environmental documents, (including conducting Federal Endangered Species Act section 7 (a) (2) consultations required for actions authorized, funded, or carried out by federal agencies). Contact: Shirley Witalis and Mike Tucker.

D. Cost

D2. Budget

The total cost for this project is estimated at $5,970,300. See the web form for the complete budget breakdown.

D3. Cost-Sharing

Funding commitments to date are described in Sections B2, B3, B4 and Attachment A.

E Local Involvement

Representatives from the local Battle Creek Watershed Conservancy have been involved with the planning process for this project. The resource agencies are currently working with the Watershed Conservancy to maintain the Conservancy's overall support of Battle Creek restoration efforts and activities such as this screening project for the Coleman NFH water intake system.

Third party adverse impacts are anticipated to be minimal and will be mitigated in compliance with all applicable regulations and necessary permits. Positive short-term third party economic impacts for the local communities (primarily Manton), are anticipated during construction. All public concerns will be addressed and analyzed during the environmental compliance phase of the project.

F.Compliance with Standard Terms and Conditions

The Bureau of Reclamation takes exception to several of the standard terms and conditions outlined in Attachment D, however, will comply with applicable replacement terms negotiated with the Department of Water Resources and formalized in DWR 4247 (Rev. 9/95), Standard Clauses -- Contracts with the United States Bureau of Reclamation.

The Bureau of Reclamation further takes exception to Attachment D, Item 2. Payment Schedule and Item 3. Performance Retention, as it implies that payment for all work under the grant will be made on a reimbursable basis. Reclamation requires advances of funds in whole or part from non-Federal funding entities seeking services that do not fall within the rules and regulations promulgated in Office of Management and Budget Circular A-97.

G. Literature Cited

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Sverdrup Civil, Inc., and Tetra Tech/KCM, Inc. 1999. Final report, Coleman National Fish Hatchery, California, Intake Alternative study. Prepared for the Department of the Interior, U.S. Fish and Wildlife Service, Portland, Oregon. May 25, 1999.

SWRCB. 2000. Draft EIS/EIR on the proposed modifications to the Battle Creek Hydroelectric project.

USBR 2000. Interagency Agreement 00AA200031 [with USFWS] for Improving the Upstream Ladder and Barrier Weir at Coleman National Fish Hatchery (CALFED Action #99-B08).

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USFWS, 1987. Coleman National Fish Hatchery Station Development Plan. U.S. Fish and Wildlife Service Division of Engineering Region 1. Portland, Oregon.

USFWS. 1997. Revised Draft Restoration Plan for the Anadromous Fish Restoration Program. May 1997.

USFWS. 2001a. Final Restoration Plan for the Anadromous Fish restoration Program.

USFWS. 2001b. Biological Assessment of artificial propagation programs at Coleman National Fish Hatchery: program description and incidental take of chinook salmon and steelhead trout. U.S. Fish and Wildlife Service, Red Bluff Fish and Wildlife Office, Red Bluff, California.

Ward, M.B., and W.M. Kier. 1999. Battle Creek Salmon and Steelhead Restoration Plan. Prepared for the Battle Creek Working Group by Kier and Associates, Sausilito, California.

Attachment A

Next Phase Funding

Project Summary: This proposal requests funding for the continuation of the final planning, final design, preparation of environmental documentation and construction phases for the screening and modification of Coleman National Fish Hatchery (NFH) water intake structures. Coleman NFH is located on Battle Creek in Shasta County, California. Modifications to the Coleman NFH's water intake structures are necessary to avoid entrainment or impingement of outmigrating naturally-produced juvenile salmonids in the watershed. Planning and/or interim modifications associated with this project have been ongoing since 1997. Short-term improvements/modifications have been implemented for existing intake structures, and long-term solutions are currently remain under investigation.

Current Status of the Project: Interim measures to modify and screen existing intake facilities, are thoroughly described within the proposal and include:

- Repair/modification of the Intake #3 fish screen and self-cleaning mechanism (1999). Cost: $10,000; Funding Source: CVPIA, AFRP

- Installation of submerged fish screen and diversion at Intake #3 (1999). Cost: $150,000; Funding Source: CVPIA, AFRP

- Installation of a flapgate in Intake #2 (1999). Cost: $30,000; Funding Source: CVPIA, AFRP

- Install a picket weir to exclude upstream migrating adult salmon and steelhead from entering Pacific Gas and Electric's Coleman Powerhouse tailrace (1999). Cost: $20,000; Funding Source: CVPIA, AFRP.

- Operation, repair and removal of submerged fish screen and components at Intake #3 (2000). Estimated Cost $200,000; Funding Source; Bureau of Reclamation, U.S. Fish and Wildlife Service, CVPIA.

Planning, environmental compliance and permitting activities for a long-term solution have also been underway. Previously funded activities associated with this project include:

- A previous engineering investigation that identified and analyzed 10 alternatives to improve the Hatchery's water delivery system and meet current fish protection standards. The *Coleman National Fish Hatchery Intake Alternatives Study*, published in June 1999, identified four alternatives for further study, Cost: $250,000; Funding Source: CVPIA, AFRP

- Previous preparation of environmental planning documents, critical analysis of state-of-

the-art fish screen designs, and engineering designs (includes the cost of the *Coleman National Fish Hatchery Intakes: Value Engineering–Final Report* October 2000). Cost: $450,000; Funding Source: USBR, CVPIA.

- Additional costs associated with the process during FY 2000 and FY 2001 include: 1) facilitating services for EA Engineering services on environmental documents and permitting; 2) engineering, designs and specification development; 3) engineering geology (e.g., sedimentation on & river hydraulics); and 4) project management. Estimated Cost $350,000; Funding Source, CVPIA, U.S. Fish and Wildlife Service and Bureau of Reclamation.