

## 4.5 PSP Cover Sheet (Attach to the front of each proposal)

Proposal Title: Merced River Water Temperature Feasibility Study  
 Applicant Name: Merced Irrigation District  
 Mailing Address: P. O. Box 2288, Merced CA 95344-0288  
 Telephone: (209) 722-5761  
 Fax: (209) 722-6421  
 Email: tseib@mercedid.org

Amount of funding requested: \$ 460,000 for two years

Indicate the Topic for which you are applying (check only one box).

- |   |   |
|---|---|
| <input type="checkbox"/> Fish Passage/Fish Screens                    | <input type="checkbox"/> Introduced Species       |
| <input type="checkbox"/> Habitat Restoration                          | <input type="checkbox"/> Fish Management/Hatchery |
| <input type="checkbox"/> Local Watershed Stewardship                  | <input type="checkbox"/> Environmental Education  |
| <input checked="" type="checkbox"/> Water Quality (Water Temperature) |   |

Does the proposal address a specified Focused Action?        yes   X   no

What county or counties is the project located in? Merced County

Indicate the geographic area of your proposal (check only one box):

- |   |   |
|---|---|
| <input type="checkbox"/> Sacramento River Mainstem                        | <input type="checkbox"/> East Side Trib: _____                  |
| <input type="checkbox"/> Sacramento Trib: _____                           | <input type="checkbox"/> Suisun Marsh and Bay                   |
| <input type="checkbox"/> San Joaquin River Mainstem                       | <input type="checkbox"/> North Bay/South Bay: _____             |
| <input checked="" type="checkbox"/> San Joaquin Trib: <u>Merced River</u> | <input type="checkbox"/> Landscape (entire Bay-Delta watershed) |
| <input type="checkbox"/> Delta: _____                                     | <input type="checkbox"/> Other: _____                           |

Indicate the primary species which the proposal addresses (check all that apply):

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> San Joaquin and East-side Delta tributaries fall-run chinook salmon | <input type="checkbox"/> Spring-run chinook salmon |
| <input type="checkbox"/> Winter-run chinook salmon  | <input type="checkbox"/> Fall-run chinook salmon   |
| <input type="checkbox"/> Late-fall run chinook salmon   | <input type="checkbox"/> Longfin smelt             |
| <input type="checkbox"/> Delta smelt  | <input type="checkbox"/> Steelhead trout           |
| <input type="checkbox"/> Splittail  | <input type="checkbox"/> Striped bass              |
| <input type="checkbox"/> Green sturgeon   | <input type="checkbox"/> All chinook species       |
| <input type="checkbox"/> Migratory birds  | <input type="checkbox"/> All anadromous salmonids  |
| <input type="checkbox"/> Other: _____   |  |

Specify the ERP strategic objective and target (s) that the project addresses. Include page numbers from January 1999 version of ERP Volume I and II:  
Flow and temperature regimes (v. 1, p. 60, p. 63; v. 2, pp 424-425)

Indicate the type of applicant (check only one box):

- |  |  |
|--|--|
| <input type="checkbox"/> State agency                    | <input type="checkbox"/> Federal agency                                      |
| <input type="checkbox"/> Public/Non-profit joint venture | <input type="checkbox"/> Non-profit  |
| <input type="checkbox"/> Local government/district       | <input type="checkbox"/> Private party                                       |
| <input type="checkbox"/> University                      | <input checked="" type="checkbox"/> Other: <u>Public Agency - Tax Exempt</u> |

Indicate the type of project (check only one box):

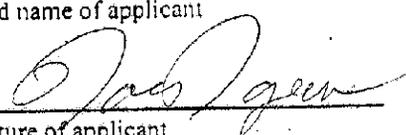
- |                                     |  |
|-------------------------------------|--|
| <input type="checkbox"/> Planning   | <input checked="" type="checkbox"/> Implementation (Feasibility) |
| <input type="checkbox"/> Monitoring | <input type="checkbox"/> Education                               |
| <input type="checkbox"/> Research   |  |

By signing below, the applicant declares the following:

- 1.) The truthfulness of all representations in their proposal;
- 2.) The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- 3.) The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Ross Rogers, General Manager

Printed name of applicant

  
Signature of applicant

**TITLE PAGE**

**Title of Project**

Merced River Water Temperature Feasibility Study

**Name of Applicant**

Merced Irrigation District  
P.O. Box 2288  
720 W. 20<sup>th</sup> Street  
Merced, CA 95344-0288  
Phone: (209) 722-5761  
FAX: (209) 722-6421  
E-mail: [tselb@mercedid.org](mailto:tselb@mercedid.org)  
Contact Person: Edward C. Selb, Assistant General Manager

**Participants and Collaborators**

Merced River Technical Advisory Committee (Merced TAC)  
Merced Irrigation District (Merced ID)  
California Department of Fish and Game (CDFG)  
U.S. Fish and Wildlife Service (USFWS)  
National Marine Fisheries Service (NMFS)  
Natural Resource Scientists, Inc. (NRS, Inc.)  
Merced River Stakeholder Group  
Engineering firm to be selected by competitive bid

**Type of Organization and Tax Status**

Irrigation District organized and governed by the California State Water Code

Public Agency - Tax Exempt

**Tax Identification Number**

94-6000911

**EXECUTIVE SUMMARY**

**PROJECT TITLE:** Merced River Water Temperature Feasibility Study

**APPLICANT:** Merced Irrigation District

**PROJECT DESCRIPTION AND PRIMARY ECOLOGICAL/BIOLOGICAL BENEFITS:**

This proposal addresses the ecosystem management questions associated with managing man-made alterations of riverine physical processes compatible with desired future ecosystem-state conditions for Central Valley salmon production on the Merced River. Although water released into the Merced River is released from the hypolimnion at the bottom of Lake McClure, complex hydraulics and thermodynamics in the three downstream reservoirs from New Exchequer Dam significantly affect the ultimate water temperature regime in the salmon spawning and rearing reach of the lower Merced River. Effective conservation measures that avoid the impacts of warm water temperatures in the lower Merced River and at Merced River Hatchery have the potential to measurably improve chinook salmon production. Existing records, data, and modeling efforts addressing water temperature issues for the Merced River are not sufficient at this time to allow comprehensive quantitative analysis of the potential for impacts of proposed conservation/restoration actions on Merced River temperatures. This water temperature feasibility study will focus on the lower Merced River and the four upstream dams and reservoirs up to New Exchequer Dam and Lake McClure (RM 62). Temperature management at the Merced River Hatchery is also an important element of this study. These objectives will be addressed by the following tasks:

- 1) Compile and summarize pertinent physical project specifications, operating strategies and requirements, related agreements, and existing thermal and flow information and biological monitoring activities in the four Merced River reservoirs and the lower Merced River.
- 2) Develop potential alternatives and recommend one to three alternatives that may improve temperature management for chinook salmon (a) in the Merced River and (b) at Merced River Hatchery.
- 3) Develop a joint Merced ID/CDFG proposal for seeking and securing funds to design, permit, construct and operate the preferred temperature management alternative(s).

**COSTS AND THIRD PARTY IMPACTS:**

The requested funding is \$460,000 for the period October 1999 to September 2002. This project

will benefit all parties interested in the restoration of anadromous salmonids in the San Joaquin River basin and Bay-Delta. Impacts to third parties are not anticipated from this project. The proposal includes coordination and collaboration with the Merced TAC, including the CDFG, USFWS, and NMFS. In addition, Merced ID, as a key stakeholder in the recently established Merced River Stakeholder Process, will keep other Merced River stakeholders apprised on the activities for this project.

**APPLICANT QUALIFICATIONS:**

Merced ID staff will manage the project and administer the budget because of their expertise in Merced River water project operations. The CDFG, USFWS, and NMFS will provide technical assistance with data acquisition and resource guidance. NRS, Inc. will assist in the data acquisition and analyses, project coordination, bio-engineering components of the project, project reporting requirements, including technical report writing. Merced ID selected NRS, Inc. for this project because of the firm's expertise on water project operations interrelationships with aquatic resources. In addition, a qualified engineering firm will be selected by competitive bid to assist in the project.

**MONITORING AND DATA EVALUATION:**

A draft monitoring program will be developed under Task I in coordination with the California Department of Fish and Game, U.S. Fish and Wildlife Service, and the National Marine Fisheries Service.

**LOCAL SUPPORT/COORDINATION WITH OTHER PROGRAMS/COMPATIBILITY WITH CALFED:**

This project is supported by the Merced River Technical Advisory Committee (refer to "Local Involvement" for details on this committee). Water temperature management in the Merced River watershed was identified as a high priority issue in the recent CalFed San Joaquin Regional Meeting. This project specifically contributes to the ERPP Strategic Objective for creating flow and temperature regimes in regulated rivers that favor native aquatic species (ERPP v.1, p. 63). In addition, the USFWS's AFRP identifies water temperature management in the Merced River as a high priority. The biological and physical evaluations and feasibility assessment tasks of this proposed project will provide information that is expected to be useful to the Merced River Corridor Restoration Planning Project of Merced County that was funded by CalFed during 1998. Coordination with this latter effort will be maintained by Merced ID's co-sponsorship and participation in that project's Stakeholder Group process.

## PROJECT DESCRIPTION

Existing records, data, and modeling efforts addressing water temperature issues for the Merced River are not sufficient at this time to allow comprehensive quantitative analysis of the potential for impacts of proposed conservation/restoration actions on Merced River temperatures. The storage level of Lake McClure is a primary factor affecting temperature of water released into the Merced River at New Exchequer Dam. Reservoir levels affect the temperature of water at the dam's outlet along with season of the year, annual runoff pattern, and air temperature variations. The level of the reservoir affects the volume of cold water in the hypolimnion which forms in the deepest layers of the reservoir upon thermal stratification during the late spring, summer, and early fall months. Surface water warmed by the air and solar radiation during the spring and summer "floats" on top of the cooler, denser water of the hypolimnion. The depth of this warmer surface layer can vary but is generally 5 and 10 meters deep (about 15 and 30 feet) in most California reservoirs. Once thermal stratification breaks down during the early fall months, the warmer surface and cooler hypolimnion waters mix and reservoir temperature becomes almost uniform throughout its depth and comes to a dynamic equilibrium with inflow and air temperatures until stratification reoccurs in spring. Unlike other Central Valley reservoirs that are relatively easy to model and control water temperatures in downstream salmon reaches (e.g., Shasta Reservoir), the three re-regulating reservoirs downstream of Lake McClure significantly increase the complexity for controlling water temperatures to benefit salmon in the Merced River.

### **Proposed Scope of Work:**

The following tasks address water temperature management in the Merced River that will be implemented.

**Task 1: Compile and summarize pertinent physical project specifications, operating strategies and requirements, related agreements, and existing thermal and flow information and biological monitoring activities in the four Merced River reservoirs and the lower Merced River.**

Task 1 is the first step in development of comprehensive temperature management for the lower Merced River. This initial task will compile all pertinent physical and biological data and analyses regarding Merced ID's Merced River Development Project and water temperature in the fall, winter, spring, and summer months. As a portion of Merced ID's cost-sharing for this project, Merced ID will continue and expand its data collection efforts to calibrate CDFG's water temperature model. Information developed for CDFG's water temperature model, Merced

ID's reservoir characteristics and operations plan(s) and models, and all associated physical information, requirements and agreements that need to be considered will be compiled into a Reconnaissance Study Report. Any additional information needs that will hinder progress in the subsequent Task 2 (described below) will be identified in this report. Task 1 will be conducted within a one-year period and could be separable from Tasks 2 and 3; portions of Task 4 and 5 applicable to Task 1 are not separable from Task 1.

**Task 2: Develop potential alternatives and recommend one to three alternatives that may improve temperature management for chinook salmon (a) in the Merced River and (b) at Merced River Hatchery.**

Task 2 is the second step in the development of improved temperature management on the lower Merced River and at Merced River Hatchery. Task 2 will require 1¾ years following the initial study (Task 1). Depending on results from analyses, the report will provide a basis for Merced ID and other involved agencies (e.g., CDFG) to jointly pursue funding to ultimately construct and operate facilities to improve water temperature management. A contractor familiar with reservoir operations to improve temperature management would be retained by Merced ID following review of "Request for Proposals" by the Merced TAC and selection by the Management Committee (described in "Local Involvement"). This process will solicit at least 3 competitive bids according to guidelines presented in the CalFed February 1999 Proposal Solicitation Package. Information gathered in Task 1 will be considered in the development of a range of specific temperature management improvement alternatives. Details for each alternative will be developed in sufficient detail to select one to three of the best alternatives for further development in the later phase of this study. It is possible that one alternative may satisfy a portion of the temperature management needs in the Merced River and the Merced River Hatchery. However, other alternatives may treat these two issues separately during all or a portion of certain water year types. A final Feasibility Report will identify one or more preferred alternatives, define any additional work necessary or problems associated with these alternatives, and provide preliminary costs estimate(s) for design plans, permitting, construction and operation of the preferred alternative(s).

**Task 3: Develop a joint Merced ID/CDFG proposal for seeking and securing funds to design, permit, construct and operate the preferred temperature management alternative (s).**

In the event that effective and reasonable alternatives exist, Task 3 is the next logical step following Tasks 1 and 2. Task 3 is the process of developing a comprehensive solution to temperature management on the Merced River should effective and reasonable alternatives

emerge from the preceding tasks. A contractor would be retained (using the same competitive bidding process to that in the previous task) to prepare a detailed proposal and assist the parties in pursuing and securing the necessary funding to proceed. The desired end result would be funding to permit and construct the preferred project(s). The parties could then proceed in an expeditious manner to construct and operate projects that improve temperature management for salmon on the lower Merced River. Task 3 will take 3 months to complete.

**Task 4: Development of a Monitoring Plan.**

A monitoring plan according to CalFed guidelines will be developed with CDFG, NMFS, and the USFWS within the first month of this project. Additional detail is provided in the "Monitoring and Data Collection Methodology" section of this proposal. Development of the monitoring plan is included in this proposal's budget.

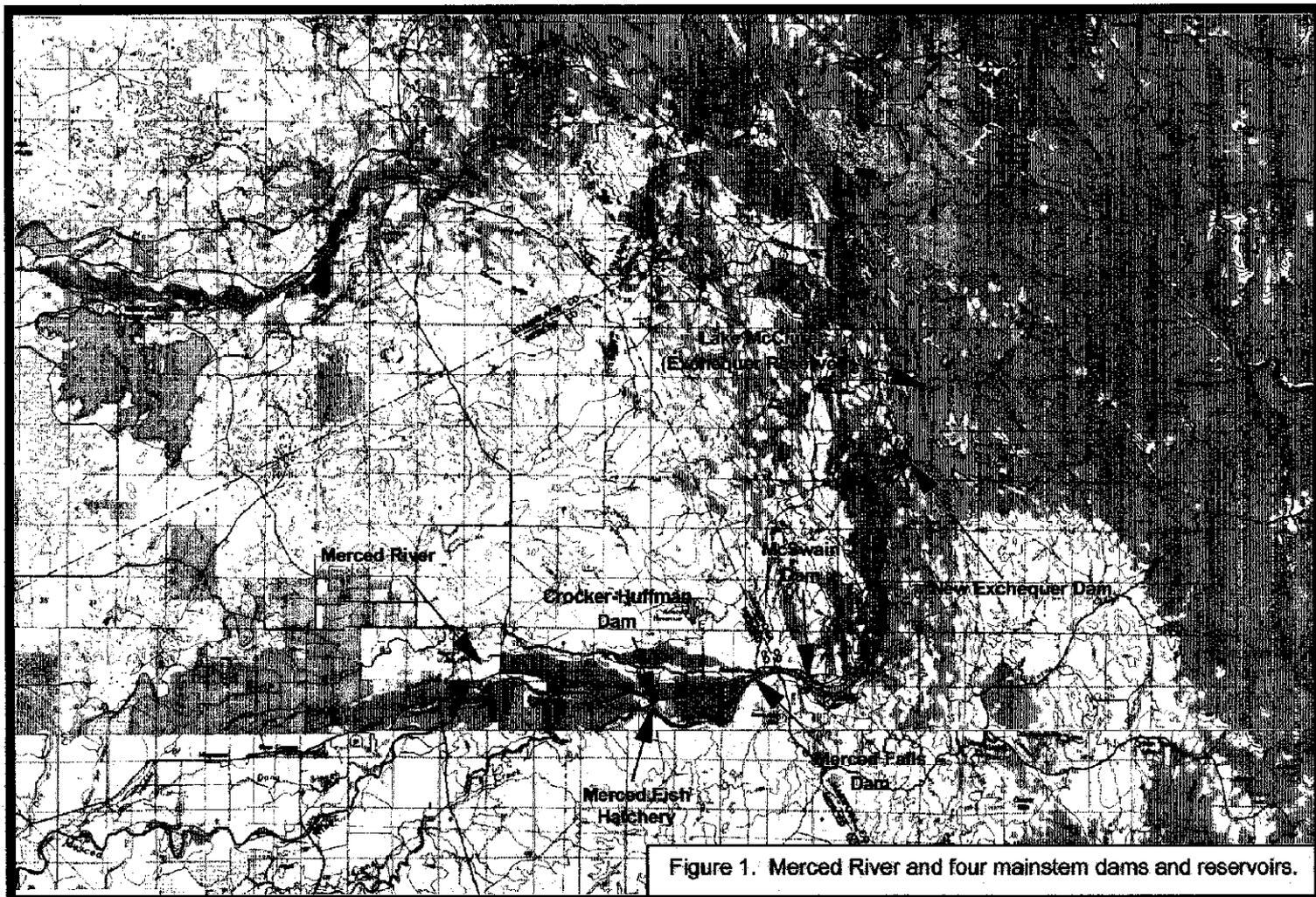
**Task 5: Project Management**

Merced ID will manage the project cost and schedule, administer grant funds, develop work plans, coordinate with other related activities, coordinate and oversee the activities of the project team, communicate with agency staff, and provide financial reports to CalFed or the CalFed contract administrator. The applicant will prepare quarterly reports summarizing degree of completion, activities during the reporting period, costs incurred, project milestones, and additional information described in the February 1999 CalFed Proposal Solicitation Package. The budget for project management is included in this proposal.

**Location and/or Geographic Boundaries of the Project:**

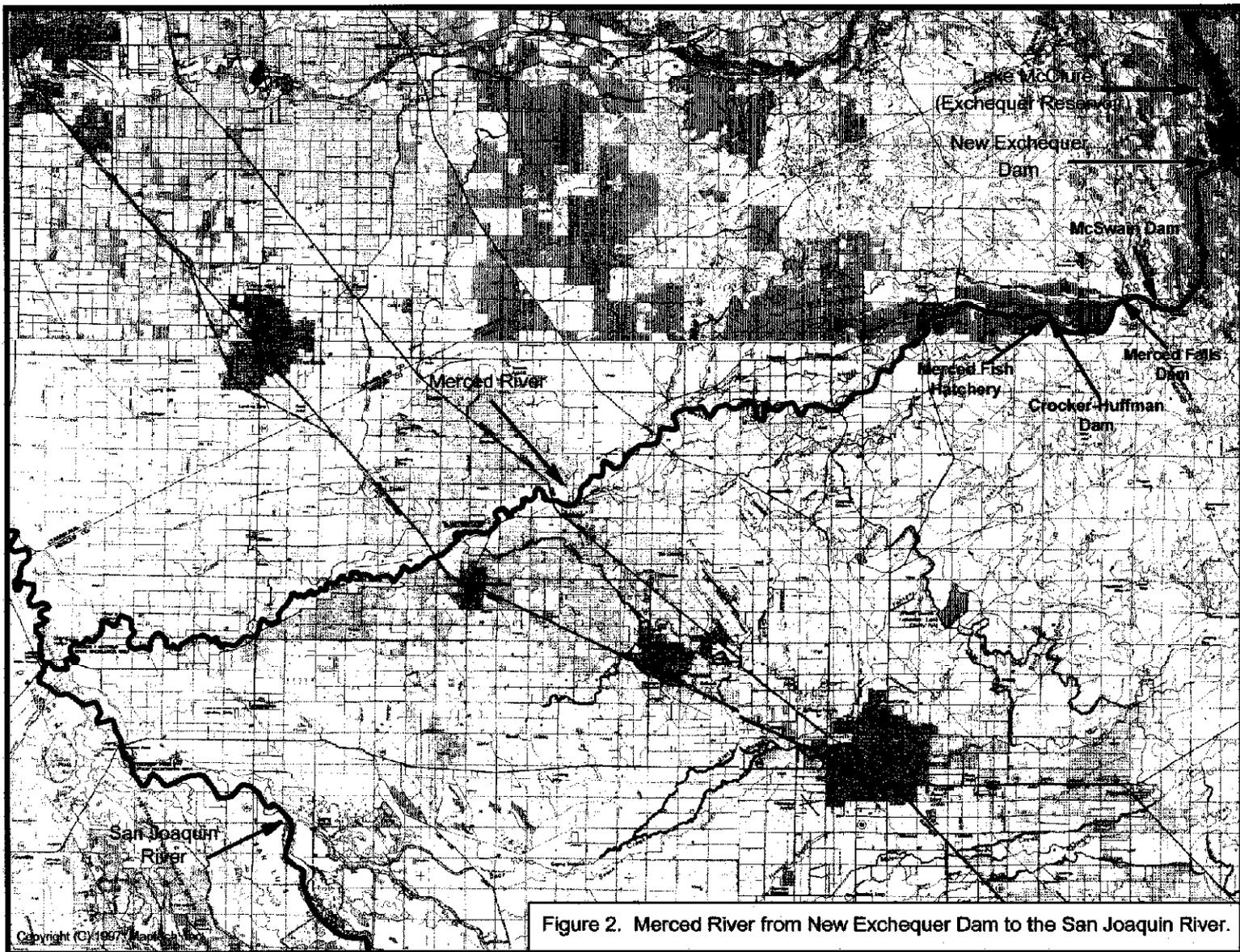
This water temperature feasibility study will focus on New Exchequer Dam and Lake McClure (RM 62), McSwain Re-regulation Dam and Lake McSwain (RM 56), the impoundment at Merced Falls Diversion Dam (RM 55), the impoundment at Crocker-Huffman Diversion Dam (RM 52), and the lower Merced River to its confluence with the San Joaquin River (Figures 1 and 2). The Merced River Hatchery is also an important element of this study's focus since its water supply is drawn from the impoundment at Crocker-Huffman Dam (Figure 2). Each of the Merced River Project elements that are the focus of this study are located in the Merced River ecological management unit of the East San Joaquin Basin Ecological Management Zone. Features of the Merced River Project upstream of RM 55 are located in Mariposa County, while those downstream of RM 55 are located in Merced County.

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## ECOLOGICAL/BIOLOGICAL BENEFITS

### Ecological/Biological Objectives:

This proposal addresses the ecosystem management questions associated with managing man-made alterations of riverine physical processes compatible with desired future ecosystem-state conditions for Central Valley salmon production. The Merced River is a highly altered riverine ecosystem which is attributable to dam construction and operations, water diversions, mining, levee construction, and land use practices. The Merced River's flow is regulated by four mainstem dams which functionally isolate the lower, valley reach of the Merced River from its upstream watershed in the foothills and mountains of the Sierra Nevada. Dam construction has altered the water temperature regime in river reaches downstream of the four mainstem dams on the Merced River. These alterations have changed the river's natural ecological processes and affected the habitat available for salmonids.

Elevated water temperatures in the lower Merced River may result in delayed salmon spawning, decreased egg survival, and increased juvenile mortality. Stream temperatures in some portions of the spawning reach and at Merced River Hatchery can exceed widely recognized temperature tolerances for salmon spawning and egg incubation in October and early November. Elevated water temperature can affect spawning migration rates, alter the incidence of disease, and delay or accelerate spawning to the detriment of reproductive performance. In recent drought years, salmon have not spawned until after the first week in November, when water temperatures have cooled, through the effect of declining ambient air temperatures, to suitable levels for egg incubation. In more-recent wet years, spawning occurred in October. In late April and May, water temperature often exceeds recognized stressful levels for emigrating smolts. Elevated spring time temperatures are a more frequent and significant problem on the lower Merced River than other chinook salmon streams, even in the San Joaquin River basin, because of its most southerly latitude in the range of chinook salmon and consequent higher air temperatures. Warm water temperatures create conditions in the natural and hatchery environment that are conducive to many salmon pathogens resulting in many types of diseases or infections that reduce fitness or cause mortality. This is most evident in hatchery populations but can occur in the Merced River as well. In many years, production at Merced River Hatchery is impaired by warm water temperatures in the fall, late spring and summer months.

### Linkages:

This project specifically contributes to the ERPP Strategic Objective for creating flow and temperature regimes in regulated rivers that favor native aquatic species (ERPP v.1, p. 63). It

focuses on systematic evaluation of the Merced River Project to design an implementation strategy to fulfill the general ERPP Vision: "...Sustaining adequate temperatures below reservoirs and power diversion dams is needed to provide coolwater anadromous fish habitat within the existing Central Valley multipurpose water resources management framework. Flexibility in managing stream temperatures will be an important ingredient in the successful restoration of Central Valley natural resources" (ERPP v. 1, p.60). This project directly addresses the ERPP Vision for Ecological Processes in the East San Joaquin Basin Ecological Management Zone related to stream temperatures in the Merced River: "... Improving water temperatures in the three rivers (Stanislaus, Tuolumne, and Merced) below the major reservoirs in this zone can contribute to the overall ecological health of the system and promote sustainable fisheries. ...The vision for water temperatures in these rivers is to provide sufficient summer and early-fall base flows in the river channels and restore the riparian corridors and natural stream channel characteristics that limit heating of the rivers. Storing sufficient coolwater in the reservoirs during drought will also help maintain a minimum coolwater habitat in the rivers." (ERPP v.2, pp. 424-425). In addition, the USFWS's AFRP has identified water temperature management on the Merced River as a high priority resource management issue.

The biological and physical evaluations and feasibility assessment tasks of this proposed project will provide information that is expected to be useful to the Merced River Corridor Restoration Planning Project of Merced County that was funded by CalFed during 1998. Integration of the shaded riparian habitat and channel maintenance benefits expected from stream corridor restoration projects with options for improved stream temperature management that emerge from this project's assessments will be ultimately important for achieving a coordinated temperature management solution for the lower Merced River.

This proposal serves to support these ecosystem objectives through comprehensive evaluation of options to assure compatible, balanced management of improved flow and water temperature regimes on the Merced River.

**System-Wide Ecosystem Benefits:**

Habitat and water quality degradation exacerbated by reduced flows in the lower San Joaquin River and the Delta along with the effects of the large CVP and SWP water diversions and numerous local diversions throughout the Delta have been attributed to declines in a number of fish species that inhabit or migrate through the Delta. The 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, Delta Smelt Biological Opinion, and CVPIA's Revised Draft Anadromous Fish Restoration Plan call for increased instream flows on the lower San Joaquin River with specific seasonal flow objectives at Vernalis where the San

Joaquin River enters the Delta.

The CVPIA requires that all reasonable efforts to ensure that by the year 2002 natural production of anadromous fish in Central Valley rivers will be sustainable on a long-term basis, at levels not less than twice the average levels attained during the period 1967-1991. One element of the CVPIA, the Anadromous Fish Restoration Program, has need for provision of water of the appropriate temperature from the San Joaquin tributaries to increase flows on the lower San Joaquin River at times to benefit fish and wildlife. The AFRP also specifically identifies the water temperature management on the Merced River as a high priority. The CVPIA authorizes the Bureau of Reclamation to obtain additional flows on the Stanislaus, Tuolumne, Merced, and lower San Joaquin rivers that will facilitate migration, attraction, production, and survival of anadromous fish on these river in accordance with specific fish, wildlife, and habitat restoration purposes of the Act. The Bureau of Reclamation proposes to contract water on the San Joaquin River and tributaries to meet the needs of fish and wildlife within the San Joaquin Valley while pursuing to achieve a reasonable balance among competing demands for CVP water for all authorized uses including fish and wildlife. The provision of Merced River water to downstream areas will contribute, in part, to these multi-purpose beneficial uses while concurrently ensuring that in-basin needs are met, including the appropriate thermal regime.

**Compatibility with Non-Ecosystem Objectives:**

Merced Irrigation District is a signatory to the San Joaquin River Agreement which, among other things, implements the Vernalis Adaptive Management Plan (VAMP). Under the VAMP, effects of flow and export from the Sacramento/San Joaquin River Delta upon salmon will be investigated. As part of that agreement, increased flows in the spring and fall will be provided in the Merced, Tuolumne, and Stanislaus Rivers, more than 50 percent of which is to be supplied by Merced Irrigation District. Such flows are to be provided during an April/May pulse flow and during October. This proposed project will provide integral information to the VAMP that will allow Merced Irrigation District to manage their water supplies in an optimal and flexible manner to meet VAMP while concurrently fulfilling other ecosystem process objectives as envisioned in the ERPP.

There are no identified third party impacts that will result from this proposed feasibility study. Since the objective of this proposed project is to improve the options for stream temperature management on the Merced River, it will contribute toward optimization of water supply management and water quality for fish habitat. This is compatible and integral to CalFed objectives for water quality and water supply reliability.

### TECHNICAL FEASIBILITY AND TIMING

Although water released into the Merced River is released from the hypolimnion at the bottom of Lake McClure, complex hydraulics and thermodynamics in the three downstream reservoirs from New Exchequer Dam significantly affect the ultimate water temperature regime in the salmon spawning and rearing reach of the lower Merced River. Effective conservation measures that avoid the impacts of warm water temperatures in the lower Merced River and at Merced River Hatchery have the potential to measurably improve chinook salmon production. And, with planned flow augmentation in the Merced River to potentially meet the needs of early returning salmon into the Merced River, it will be important to assess if water temperatures are suitable for those fish that spawn early in the season.

Cooperation and coordination for water resource management on the Merced River have been facilitated through several recent interagency negotiations. All parties with the facilities ownership and operations and resource management authorities necessary to address water temperature management in the Merced River will collaborate on this project. All work will be coordinated between the Merced ID, CDFG, USFWS, and NMFS through the Merced TAC. Access to the necessary water project facilities' physical and operations specifications, related agreements, existing temperature data, stream flow records, and biological data and monitoring information is available through these originating parties. Additionally, coordination with the parties currently funded through CalFed to develop a Merced River Corridor Restoration Plan, Merced County Planning and Community Development Department, will be accomplished through the Stakeholder Group process of that project and the Merced TAC. No permits will be required for the tasks to be performed by this proposed project.

The project team has the expertise and support services necessary to perform the proposed tasks within the proposed time line.

### MONITORING AND DATA COLLECTION METHODOLOGY

#### **Biological/Ecological Objectives:**

The primary objective of this feasibility study is to develop and evaluate effective options for water temperature management in the Merced River to ensure that flow and water temperature management can be managed to favor the native aquatic species in terms of seasonal timing, duration, and geographic scope, as well as evaluating flexibility to meet other desired ecosystem objectives.

**Monitoring Parameters and Data Collection and Evaluation Approach:**

Included in this proposal's scope of work and budget is the development of a project monitoring plan that will be developed in collaboration with CalFed, CDFG, USFWS, and NMFS staff. As a feasibility study, this project does not include specific monitoring methodologies. It will, however, compile and evaluate existing biological and physical data and information collected through current biological monitoring projects on the Merced River. Data and results from CDFG's water temperature model, Merced ID's reservoir characteristics and operations plan(s) and models, and all associated physical information, requirements and agreements will be compiled. Biological monitoring projects include the CVPIA's Comprehensive Assessment and Monitoring Program juvenile salmonid emigrant trapping data collected by CDFG on the lower Merced River, as well as other ongoing biological surveys and monitoring overseen by CDFG and the Merced River TAC. Daily water operations data will also be compiled as part of this evaluation. The feasibility study will also include an evaluation of pertinent historical water project operations information, stream flows, and water temperature data collected by Merced ID, CDFG, and the California Department of Water Resources. The Merced TAC will provide technical assistance and peer review of analyses and draft reports.

The primary hypothesis evaluated in this proposal is to determine if water temperatures in the lower Merced River and at Merced Hatchery can be effectively managed to benefit chinook salmon through operational and/or structural measures in the four mainstem Merced River reservoirs and dams. As a feasibility study that is expected to ultimately lead to implementation, engineering analyses will be performed on data and information to be compiled in this project. The specific nature of those analyses will not be known until Task 1 (Reconnaissance) is completed. After Task 1 is completed, a specific monitoring plan will be developed with the agencies to monitor and evaluate the project's milestones and report.

## LOCAL INVOLVEMENT

Merced ID and CDFG have jointly developed and agreed upon a 10-year study program to determine the potential factors that may limit salmon production in the Merced River. This program is designed to evaluate the habitats necessary for increased salmon production by assessing the needs for each freshwater salmon life stage (i.e., upstream migration, spawning, egg incubation, fry and juvenile rearing, and outmigration). The joint study program defines the objectives, basic experimental design, and the responsibilities for study implementation. The studies and instream flow scheduling will be coordinated with other studies throughout the San Joaquin basin and the Delta. Components of this program are presently underway. The completion of the 10-year program is intended to identify the long-term instream flow and other needs of salmon in the Merced River. To facilitate the studies, CDFG and Merced ID have established the Merced Management and Technical Advisory Committees; the latter committee establishes and coordinates study protocols, study amendments, funding issues, and information sharing and exchange. Merced ID and CDFG have been meeting as this committee over the past two years. In addition, USFWS and NMFS have begun participating in the Merced Technical Advisory Committee in the past year on an ad-hoc basis until the committee is expanded and formalized to include a significantly broader stakeholder group. This committee has endorsed this Merced River Water Temperature Feasibility Study.

With funding from the U.S. Fish and Wildlife Service Anadromous Fish Restoration Program and the CalFed Bay-Delta Program, the Merced County Planning and Community Development Department, with cooperation from Merced Irrigation District, have embarked on a collaborative effort to develop a restoration strategy for the Merced River corridor. This program will seek to join input from community stakeholders with a scientifically-based understanding of current river conditions and processes to identify a feasible corridor restoration strategy. Public involvement will play a key role in the restoration planning process, and public coordination will continue through the life of the project. To establish this role, the County, with Merced Irrigation District's assistance, has convened a Merced River Stakeholder Group. The Stakeholder Group represents a broad array of public and private interests, including local business and property owners; state, local, and federal agencies; fish and environmental groups; and other groups or individuals. In addition to working with his Stakeholder Group, the County will also conduct regular workshops to keep the public informed of the project's progress. As a key stakeholder in this process, Merced ID will provide these groups with regular updates on the Merced River Water Temperature Feasibility Study. Merced ID has notified the Merced County Board of Supervisors (Lydia Beiswanger) and the County Planning Department (Bob Smith) of this proposal. Copies of these notification letters are attached to this proposal.

## Merced River Water Temperature Feasibility Study

Additionally, water temperature management in the Merced River watershed was identified as a high priority issue in the recent CalFed San Joaquin Regional Meeting.

No third-party impacts are anticipated. Land use changes will not occur as a result of this project. Those parties who support restoration of San Joaquin fall-run chinook salmon that would benefit from the proposed project would also benefit.

### COST AND SCHEDULE

#### Budget:

<b>Task</b>	<b>Direct Labor Hours</b>	<b>Direct Salary and Benefits</b>	<b>Service Contracts</b>	<b>Material and Acquisition Costs</b>	<b>Miscellaneous and other Direct Costs</b>	<b>Overhead and Indirect Costs</b>	<b>Total Cost</b>
<b>Task 1</b>	250	\$12,500	\$25,000	\$500	---	\$2,000	\$40,000
<b>Task 2</b>	500	\$25,000	\$285,000	\$2,500	\$2,500	\$5,000	\$320,000
<b>Task 3</b>	80	\$4,000	\$25,000	---	---	\$1,000	\$30,000
<b>Task 4</b>	80	\$4,000	\$5,000	\$500	---	\$500	\$10,000
<b>Task 5 Project Management</b>	770	\$38,500	\$15,000	\$1,000	\$500	\$5,000	\$60,000

**Merced River Water Temperature Feasibility Study**

**Table 2. Quarterly Budget for the Merced River Water Temperature Feasibility Study (in thousands of dollars).**

<b>Task</b>	<b>Oct-Dec 1999</b>	<b>Jan-Mar 2000</b>	<b>Apr-Jun 2000</b>	<b>Jul-Sep 2000</b>	<b>Oct-Dec 2000</b>	<b>Jan-Mar 2001</b>	<b>Apr-Jun 2001</b>	<b>Jul-Sep 2001</b>	<b>Oct-Dec 2001</b>	<b>Jan-Mar 2002</b>	<b>Apr-Jun 2002</b>	<b>Jul-Sep 2002</b>	<b>Total Budget</b>
1	5	10	10	15									40
2					45	45	45	45	45	45	50		320
3												30	30
4	5				5								10
5	5	5	5	5	5	5	5	5	5	5	5	5	60

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**Schedule:**

The schedule for implementation of the Merced River Water Temperature Feasibility Study is given in Table 3. Task 1 would be implemented within a one-year period followed by a final report for Task 1. Task 1 and the applicable portions of Tasks 4 and 5 could be separately funded from Tasks 2 and 3 if funding for these latter tasks was not available. Task 2 would be implemented over a 1&3/4 year period followed by a final report. Task 3 would be implemented over a 3-month period immediately following Task 2 followed by a final report. Task 4, development of a project monitoring plan, would be implemented in the first month of Tasks 1 and 2. Task 5, Project Management would occur continuously for the duration of the entire project. Quarterly reports would be completed and submitted to CalFed each month following the quarterly periods.

**COST SHARING**

Merced ID will provide \$50,000 of in-kind contributions to this project. The contributions will include Merced ID support staff work and overhead costs beyond that budgeted in this proposal. Merced ID will also continue and expand its water temperature data collection program in the Merced River watershed to provide empirical data for calibration of CDFG's water temperature model. In addition, CDFG, USFWS, and NMFS will provide in-kind technical assistance with data acquisition and resource guidance for the project.

**APPLICANT QUALIFICATIONS**

Merced ID staff will manage the project and administer the budget. The CDFG, USFWS, and NMFS will provide technical assistance with data acquisition and resource guidance. Merced ID will collaborate and coordinate with the latter three agencies throughout the project. NRS, Inc. will assist in the data acquisition and analyses, project coordination, bio-engineering components of the project, and project reporting requirements, including technical report writing. Merced ID selected NRS, Inc. for this project because of the firm's expertise on water project operations interrelationships with aquatic resources. NRS personnel have worked extensively throughout the western United States on investigations into freshwater habitat requirements and factors limiting fish populations and the development of measures to improve river and stream conditions for fishery resources.



**Edward C. Selb III, Project Manager**

*Merced ID Assistant General Manager, Water Resources*

*B.S., Business Administration, California State University, Sacramento*

Mr. Selb will serve as Project Manager for this project because of his extensive direct knowledge and expertise in Merced ID's water project operations. Mr. Selb currently manages three major departments of the Merced Irrigation District: the Merced River Development Project (New Exchequer and McSwain dams, powerhouses and reservoirs), the engineering department and the irrigation operations department. Mr. Selb has been employed with MID since July 1972. In 1991, Mr. Selb was named Assistant Manager/District Engineer, being placed in charge of the administration of the District's engineering and reservoir control operations. In 1996, Mr. Selb was appointed to his current position of Assistant General Manager, Water Resources. Mr. Selb has represented the District by serving on the Water Management & Environmental Committee of the Association of California Water Agencies (ACWA), and currently serves on the ACWA Groundwater Committee. Among his accomplishments, Mr. Selb played a major role in the successful development and preparation of a regional groundwater management plan for the Merced groundwater basin, involving 15 public agencies and private water companies. Mr. Selb also was instrumental in the development and preparation of the Merced Water Supply Plan, a three-year cooperative study with the City of Merced. Mr. Selb served as Vice Chairman of the Merced Water Supply Plan Technical Advisory Committee, and currently is a member of the Merced Water Supply Plan Implementation Task Force. With his 27+ years of experience in water resources with the District, Mr. Selb is very knowledgeable and familiar with all aspects of the District's water operations.

**David Vogel, Assistant Project Manager**

*Natural Resource Scientists, Inc. Senior Scientist*

*M.S., 1979, Natural Resources (Fisheries), University of Michigan*

*B.S., 1974, Biology, Bowling Green State University*

Mr. Vogel will serve as Assistant Project Manager for this project because of his expertise and knowledge of the interrelationships of Merced ID's water project operations and fishery resources. Mr. Vogel specializes in aquatic resource assessments and resolution of fishery resource issues associated with land and water development. His 24 years of work experience in fisheries has included large-scale assessments in river systems, lakes and reservoirs, and estuaries. Most of his experience has been associated with restoration of western United States fishery resources. Mr. Vogel has worked as a biological consultant for the U.S. Bureau of Reclamation to define interrelationships of salmon resources and Central Valley Project water project operations. He was the Task Manager for the Biological Assessment of the 1992

operations of the Central Valley Project (CVP) and was the principal biologist in charge of developing the long-term Biological Assessment for the CVP. Mr. Vogel has been working on Central Valley fishery resource research and management projects and interrelationships with water project operations for 18 years.

**Keith R. Marine, Project Ecologist**

*Natural Resource Scientists, Inc., Aquatic Ecologist*

*M.S., 1997, Ecology, University of California, Davis*

*B.S., 1983, Wildlife and Fisheries Biology, University of California, Davis*

Mr. Marine will serve as Project Ecologist for this project because of his expertise in ecological and thermal requirements of native fishes. Mr. Marine specializes in the ecological sciences with emphasis on fisheries science, aquatic and marine biology, and physiological ecology. He has extensive experience in ecological and biological assessment and conducting research directed at resolving natural resource management problems. Mr. Marine has designed and conducted ecosystem-level investigations on fish migration and behavior associated with operation of large Central Valley Project facilities, including fish responses to stream temperature alterations resulting from project operations. His expertise includes a comprehensive research background in thermal requirements and tolerances of California's native fishes, including Pacific anadromous salmonids. He has designed and performed temperature tolerance investigations and experiments for all the freshwater life phases of chinook salmon while working for the University of California, the U.S. Fish and Wildlife Service, and several water management agencies. Mr. Marine has performed evaluations of fish populations, fish habitat requirements, stream flow assessments and stream temperature modeling in support of fishery conservation and restoration programs.

Merced ID and NRS, Inc. staff will provide additional support for this project as necessary.

**COMPLIANCE WITH STANDARD TERMS AND CONDITIONS**

The terms and conditions discussed in Section 4.4 of the February 1999 CalFed Proposal Solicitation Package are acceptable to the applicant. Forms 4100 (Contracts with Public Entities) and 4099a (Additional Standard Clauses) are attached.

**MID** MERCED IRRIGATION DISTRICT

April 13, 1999

Lydia Beiswanger  
Merced County Board of Supervisors  
2222 'M' Street  
Merced, CA 95340

Re: Intent to Submit a Proposal for CALFED Funding

Dear Board Members,

In February, 1999, the CALFED BAY-DELTA PROGRAM solicited proposals for ecosystem restoration programs and projects to improve the health of the Bay-Delta ecosystem. The proposal submittals are due on April 16, 1999.

In an effort to keep the Merced County Board of Supervisors informed of project applications of this nature, it is my great pleasure to announce that the Merced Irrigation District (MID) intends to submit a proposal for a proposed study to be performed in Merced County, entitled: "Merced River Water Temperature Feasibility Study".

If you have any questions, please feel free to contact MID Assistant General Manager, Water Resources, Ted Selb, who has been designated as Project Manager for this important study.

Sincerely,



Ross Rogers  
General Manager

cc: Ted Selb, Assistant General Manager, Water Resources  
Ken Robbins, MID General Counsel  
Dave Vogel, Natural Resource Scientist  
Marc Van Camp, Murray, Burns & Kienlen

**MID** MERCED IRRIGATION DISTRICT

April 13, 1999

Bob Smith, Planning Director  
Merced County  
2222 "M" Street  
Merced, CA 95340

Re: Intent to Submit a Proposal for CALFED Funding

Dear Mr. Smith,

In February, 1999, the CALFED BAY-DELTA PROGRAM solicited proposals for ecosystem restoration programs and projects to improve the health of the Bay-Delta ecosystem. The proposal submittals are due on April 16, 1999.

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If you have any questions, please feel free to contact MID Assistant General Manager, Water Resources, Ted Selb, who has been designated as Project Manager for this important study.

Sincerely,



Ross Rogers  
General Manager

cc: Ted Selb, Assistant General Manager, Water Resources  
Ken Robbins, MID General Counsel  
Dave Vogel, Natural Resource Scientist  
Marc Van Camp, Murray, Burns & Kienlen

## STANDARD CLAUSES - CONTRACTS WITH PUBLIC ENTITIES

**Workers' Compensation Clause.** Contractor affirms that it is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor affirms that it will comply with such provisions before commencing the performance of the work under this contract.

**Nondiscrimination Clause.** During the performance of this contract, the recipient, Contractor and its subcontractors shall not deny the contract's benefits to any person on the basis of religion, color, ethnic group identification, sex, age, physical or mental disability, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, mental disability, medical condition, marital status, age (over 40), or sex. Contractor shall insure that the evaluation and treatment of employees and applicants for employment are free of such discrimination. Contractor shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.), the regulations promulgated thereunder (California Administrative Code, Title 2, Sections 7285.0 et seq.), the provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code (Government Code Sections 11133 - 11139.5), and the regulations or standards adopted by the awarding State agency to implement such Article. Contractor or recipient shall permit access by representatives of the Department of Fair Employment and Housing and the awarding State agency upon reasonable notice at any time during the normal business hours, but in no case less than 24 hours' notice, to such of its books, records, accounts, other sources of information and its facilities as said Department or Agency shall require to ascertain compliance with this clause. Recipient, Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. The Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

**Availability of Funds.** Work to be performed under this contract is subject to availability of funds through the State's normal budget process.

**Audit Clause.** For contracts in excess of \$10,000, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the contract. (Government Code Section 8546.7).

**Payment Retention Clause.** Ten percent of any progress payments that may be provided for under this contract shall be withheld per Public Contract Code Sections 10346 and 10379 pending satisfactory completion of all services under the contract.

**Reimbursement Clause.** If applicable, travel and per diem expenses to be reimbursed under this contract shall be at the same rates the State provides for unrepresented employees in accordance with the provisions of Title 2, Chapter 3, of the California Code of Regulations. Contractor's designated headquarters for the purpose of computing such expenses shall be: \_\_\_\_\_

**Drug-Free Workplace Certification.** By signing this contract, the Contractor or grantee hereby certifies under penalty of perjury under the laws of the State of California that the Contractor or grantee will comply with the requirements of the Drug-Free Workplace Act of 1990 (Government Code Section 8350 et seq.) and will provide a drug-free workplace by taking the following actions:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations.
2. Establish a Drug-Free Awareness Program to inform employees about all of the following:
  - (a) The dangers of drug abuse in the workplace.
  - (b) The person's or organization's policy of maintaining a drug-free workplace.
  - (c) Any available counseling, rehabilitation and employee assistance programs, and
  - (d) Penalties that may be imposed upon employees for drug abuse violations.
3. Every employee who works on the proposed contract or grant:
  - (a) Will receive a copy of the company's drug-free policy statement, and
  - (b) Will agree to abide by terms of the company's statement as a condition of employment on the contract or grant.

This contract or grant may be subject to suspension of payments or termination, or both, and the Contractor or grantee may be subject to debarment if the department determines that: (1) the Contractor or grantee has made a false certification, or (2) the Contractor or grantee violates the certification by failing to carry out the requirements noted above.

**Americans With Disabilities Act.** By signing this contract, Contractor assures the State that it complies with the Americans With Disabilities Act (ADA) of 1990, (42 U.S.C. 12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA.

**Former State Employees:** a) For the two-year period from the date he or she left State employment, no former State officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements or any part of the decision-making process relevant to the contract while employed in any capacity by any State agency. b) For the twelve-month period from the date he or she left State employment, no former State officer or employee may enter into a contract with any State agency if he or she was employed by that State agency in a policy-making position in the same general subject area as the proposed contract within the twelve-month period prior to his or her leaving State service.

Agreement No. \_\_\_\_\_

Exhibit \_\_\_\_\_

**ADDITIONAL STANDARD CLAUSES**

**Recycled Materials.** Contractor hereby certifies under penalty of perjury that \_\_\_\_\_ (enter value or "0" here) percent of the materials, goods and supplies offered or products used in the performance of this Agreement meets or exceeds the minimum percentage of recycled material as defined in Sections 12161 and 12200 of the Public Contract Code.

**Severability.** If any provision of this Agreement is held invalid or unenforceable by any court of final jurisdiction, it is the intent of the parties that all other provisions of this Agreement be construed to remain fully valid, enforceable, and binding on the parties.

**Governing Law.** This Agreement is governed by and shall be interpreted in accordance with the laws of the State of California.

**Y2K Language.** The Contractor warrants and represents that the goods or services sold, leased, or licensed to the State of California, its agencies, or its political subdivisions, pursuant to this Agreement are "Year 2000 compliant." For purposes of this Agreement a good or service is Year 2000 compliant if it will continue to fully function before, at, and after the Year 2000 without interruption and, if applicable, with full ability to accurately and unambiguously process, display, compare, calculate, manipulate, and otherwise utilize date information. This warranty and representation supersedes all warranty disclaimers and limitations and all limitations on liability provided by or through the Contractor.

**Child Support Compliance Act.** For any Agreement in excess of \$100,000, the Contractor acknowledges in accordance therewith, that:

1. The Contractor recognizes the importance of child and family support obligations and shall fully comply with all applicable state and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing with Section 5200) of Part 5 of Division 9 of the Family Code; and
2. The Contractor, to the best of its knowledge, is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.