

FI-319

EXECUTIVE SUMMARY

Fish Screen Feasibility Study (Phase I)

JUL 28 1997

Applicant
Boeger Family Farms

Project Description & Primary Biological/Ecological Objectives:

Anadromous fish use the mainstem Sacramento River as the thorough-fare between their spawning grounds in the upper reaches of the river to the Pacific Ocean where they grow to full-adult size. Two years later, as full-size adults, they return to the river to spawn and die. Species such as steelhead and chinook salmon spawn in gravel beds near Redding and outmigrate down the Sacramento River as juveniles and smolts. During their period of outmigration, hundreds of agricultural farmers are diverting water from unscreened or poorly screened diversions. Unscreened diversions have been suspected of being a significant source of mortality for steelhead and chinook salmon.

Boeger Family Farms recognizes the importance of screening diversions and proposes to install fish screens on its pumping plant on the Sacramento River near Colusa. The fish screen would reduce entrainment of priority species at the Boeger Family Farms pumping plant; priority species that include steelhead and various chinook salmon runs, including winter-run, spring-run, and late-fall run.

Approach/Tasks/Schedule:

The completion of the proposed project would involve two phases. The first phase of the project is a feasibility report consisting of the following studies:

- Technical Study - Nov. 1997 to Jan. 1998
- Biological Study - Nov. 1997 to Mar. 1998

Fish screen alternatives would be developed, from which a preferred alternative would be chosen for Phase II, construction. Phase II consists of the following tasks:

- Engineering & Design - Jan. 1998 to Apr. 1998
- Biological Consultation - Jan. 1998 to Apr. 1998
- Regulatory Permits & Consultation - Jan. 1998 to Apr. 1998
- Construction - Apr. 1998
- Post-Project Monitoring - Apr. 1998 to Nov. 2001
- Maintenance - Aug. 1998 to Nov. 2001

Justification:

The proposed project addresses one of CALFED's stressor categories, benefits multiple species, is consistent with CALFED's long-term objectives, and has no-third party or redirected impacts.

Budget Costs:

Funding is requested at this time for the Phase I-Feasibility Study as follows:

Technical Study	-	\$8000
Biological Study	-	<u>\$19000</u>
Total Project Cost		\$27000

Phase II -- Construction funding would be requested at later time should Boeger Family Farms proceed with construction. It is estimated that \$175,000 would be needed to complete phase two, based on past experience at similar size diversions. Funding sources would be CALFED, CVPIA Unscreened Diversion Program and other funding possibilities.

Third Party Impacts:

There are no anticipated third party impacts associated with the proposed project.

Applicant Qualifications:

This proposal is submitted by Murray, Burns and Kienlen, Consulting Civil Engineers of Sacramento, California, on behalf of Boeger Family Farms. MBK has been retained to secure CALFED funding, prepare technical and biological studies, engineering design, post-project monitoring and procurement of any subcontracts.

Murray, Burns and Kienlen (MBK) has provided consulting services to Boeger Family Farms, and its predecessor for over 20 years. MBK has been involved in over eight fish screen projects on the Sacramento River and in the Sacramento/San Joaquin Delta. Their experience in screening facilities and familiarity with the site make them uniquely qualified to manage this project.

Monitoring and Data Evaluation

Should the fish screen be constructed, the project would be monitored for biological effectiveness and mechanical performance of the fish screen. A technical report would be prepared after each irrigation season to document mechanical performance of the fish screen and cleaning system. Biological monitoring would focus on both hydraulic and biological criteria

If the proposed project proceeds to phase two, the final design and specifications of the fish screen would incorporate advice from Department of Fish & Game, and National Marine Fisheries Service for expedient permit approval. Permits or approvals will be obtained from the Corps of Engineers, Department of Fish & Game Streambed Alteration Agreement, and the Central Valley Regional Water Quality Control Board. Cost share by Boeger Family Farms would be means of long-term operation and maintenance of the fish screen and in-kind services during post-project monitoring.

FISH SCREEN FEASIBILITY STUDY (PHASE I) - BOEGER FAMILY FARMS

Prepared for:

**CALFED BAY-DELTA PROGRAM
1416 Ninth Street, Suite 1155
Sacramento, California 95814**

Applicant:

**Boeger Family Farms
c/o Matt Boeger
891 Hazel Street
Gridley, California 95948
Telephone: (916) 846-6203 Fax: (916) 846-3118**

**Applicant Type: Private
Tax I.D. 68-017-9833**

Technical and Financial Contact:

**Gilbert Cosio Jr.
Murray, Burns and Kienlen
Consulting Civil Engineers
1616 29th Street Suite 300
Sacramento, California 95816**

Telephone: (916) 456-4400 FAX: (916) 456-0253

RFP Project Group Type: Construction

I. PROJECT DESCRIPTION:

Boeger Family Farms proposes to install fish screens on its slant pump diverting water from the Sacramento River in Colusa County (Sheet 1). The slant pump irrigates approximately 640 acres along the left bank of the Sacramento River near river mile 149 and has a pumping capacity of approximately 22 cfs (Sheet 2). Located approximately 4 miles upstream of the Colusa Weir on the outside of a bend, the slant pump consist of 16-inch intake pipe with a diesel motor mounted to a platform built on the floodplain. Levees in the area were constructed in the 1950's as part of the Sacramento River Flood Control Project and are today, maintained by the Department of Water Resources.

Since installation of the slant pump, Boeger Family Farms has encountered no major problems with the operation of the pump. Problems such as channel siltation, river meander and major bank erosion have been nonexistent in the area. Located on the outside of a bend, the higher channel velocities carry silt past the pumps yet cause erosion at times. Any erosion that occurs is minor and is repaired with conventional fill and riprap.

The principal objective of this project is to reduce entrainment losses of chinook salmon and other priority species in the Sacramento River. To accomplish this objective, the existing slant pump would be outfitted with a passive fish screen system and a conventional cleaning system.

The proposed project (Phase I) would investigate the technical and biological feasibility of installing a passive fish screen on the existing slant pump. A technical study would be conducted to determine the most effective and economical passive fish screen system suitable for the location. Conventional passive fish screens system such as cylindrical screens with conventional cleaning systems would be evaluated, from which two or three alternatives would be developed. The biological study would characterize the habitat (terrestrial and aquatic) in the vicinity of the diversion site, and identify the potentially affected fish, wildlife, and plant resources. Possible impacts of fish screen construction and operation at the site will be evaluated, and appropriate CEQA documentation drafted for the project.

The technical and biological studies will aide Boeger Family Farms on a decision to screen the diversion or not. Should Boeger Family Farms proceed with construction, the screen design and specifications would comply with criteria described in "*Fish Screen Criteria for Anadromous Salmonids*" National Marine Fisheries Service, Southwest Region (January

1997) and developed in consultation with staff from Department of Fish & Game (DFG) and National Marine Fisheries Service (NMFS).

TECHNICAL JUSTIFICATION:

Successful installation of fish screens requires that the type of screen be suitable for the size, location and type of diversion, and be appropriately designed for the physical and hydraulic conditions at the site. In addition, the screen must be effective for the size and species of fish that are vulnerable to entrainment. The alternatives developed in the technical study will take the above factors in consideration and any others deemed necessary for successful installation of a fish screen at the proposed location. Alternatives developed would also adopt sound technical and proven passive fish screen methods and cleaning systems.

BIOLOGICAL JUSTIFICATION:

Entrainment of fish into agricultural diversions along the mainstem of the Sacramento River is suspected of being a significant source of mortality for chinook salmon, since many of the diversions are unscreened or poorly screened. The large number of diversions represents a potential threat to steelhead and chinook salmon populations during the rearing and smolt outmigration periods, particularly since the irrigation season overlaps with periods when juvenile salmonids are liable to be present and most vulnerable to entrainment. In addition, the siting of diversion intakes may sometimes increase entrainment risk if the intake is located in near-shore, shallow areas that many fish species tend to use as rearing habitat. Installation of a fish screen at the Boeger Family Farms pumping plant would have tangible benefits to the ecosystem by reducing mortality of priority species that include steelhead and various chinook salmon runs, including winter-run, spring-run, and late-fall run.

EXPECTED BENEFITS:

The proposed project will address one major ecosystem stressor category ("Alteration of Flows and Other Effects of Water Management") and will specifically address the stressor subcategory of entrainment. Fish screens are an effective and proven mechanism for reducing entrainment losses. Installation of the fish screen at the Boeger Family Farms would lead to greater protection of priority fish species identified in the RFP. Fish species that will benefit from the project include steelhead and all runs of chinook salmon. This proposal is consistent with CALFED's long-term restoration objectives, benefits multiple species, has no third-party or redirected impacts and is compatible with CALFED objectives for water supply reliability, water quality, and levee system integrity.

SCOPE OF WORK:

To complete the project, two phases are being proposed. Funding is being requested for the Phase I--feasibility study.

Phase I--Feasibility Study:

1. **Technical Study** — document existing facilities and capacities, survey existing diversion locations, investigate hydraulic conditions at the site, perform hydraulic analysis as needed, evaluate different passive screening systems and develop alternatives, prepare conceptual design and cost estimates.
2. **Biological Study** — document existing habitat conditions, evaluate existing data on affected fish and wildlife species, CEQA documentation.

When completed, both technical and biological reports will be submitted to CALFED and all interested parties. Boeger Family Farms will decide to progress with construction based on these reports and will inform CALFED staff accordingly. If the results of the feasibility study indicate that construction is technically feasible, economical, and environmentally sound, additional funding will be sought from a variety of sources for Phase II--Construction. The construction phase is described below:

Phase II--Construction:

1. **Engineering Design** — final design of fish screen and civil works, plans and specifications for construction, contract administration and project inspection/monitoring.
2. **Biological Consultation** — biological evaluation of fish screen design, consultation with resource agencies, site assessment, refinement of technical and biological monitoring.
3. **Regulatory Permits and Consultation** — prepare regulatory permit applications, oversee permit process.
4. **Construction** — construct fish screen and civil works.
5. **Post-project Technical and Biological Monitoring (3 years)** — evaluate and report on performance and effectiveness of the fish screen.

Should the construction phase proceed, financial and progress reports would be submitted quarterly prior to construction. After construction, technical and biological monitoring reports would be provided once a year after the irrigation season for three years. Financial reports would include an itemization of all incurred cost per task as described above. Reports would be submitted to CALFED and all interested parties.

MONITORING:

Technical monitoring of the fish screen would focus on the mechanical performance of the screen. Daily or weekly inspection logs would be prepared during the operation of the screen. Inspection during operation would document river conditions, debris load, pumping rate, and cleaning cycle timing. After each irrigation season, a technical report will be prepared to report the performance of the screen during the irrigation season.

The biological monitoring program for the fish screen at the Boeger Family Farms will be focused on evaluating both hydraulic and biological criteria. These criteria include the following: 1) does the hydraulic performance of the screen match design/regulatory requirements? ; and 2) is the screen successfully excluding/diverting the species of concern from the water diversions?

Hydraulic performance will be assessed by evaluating approach velocities and sweeping velocities under a range of flow conditions. Acceptable approach velocities at the screen are expected to be ≤ 0.33 feet per second. Maintaining a suitably low approach velocity is important to avoid impingement of fish on the screen. Approach velocity will be measured by an electromagnetic (Marsh-McBirney) meter or acoustic meter along grid pattern, perpendicular to the screen face and approximately three inches in front of the screen surface.

Sweeping velocities across the face of the screen are important to move fish away from the diversion as quickly as possible, thereby providing little opportunity for entrainment or impingement. Sweeping velocities should be twice the approach velocity, and will be measured with the same current meter used for approach velocities. Measurements will be conducted parallel and adjacent to the screen face. A range of measurement locations will be used in order to depict velocity isopleths in the vicinity of the screen.

Biological sampling will be conducted behind the fish screen during the spring and summer diversion period for three years, and any captured species identified, counted, and measured. Sampling during the first spring and summer of screen operation will occur on a

monthly basis. Biological sampling will utilize a fyke net and live box that can be attached directly to the downstream end of the diversion. The net will be continuously operated during water diversion over 2-3 days for each sampling period.

IMPLEMENTABILITY:

Depending on the extent of the preferred fish screen, approval for the project would be required from the U. S. Army Corps of Engineers individual permit or General Permit #34. A streambed alteration agreement would also have to be obtained from the California Department of Fish & Game. It is anticipated that the preferred fish screen would have no significant impacts upon vegetative and aquatic resources, or water quality; therefore no mitigation is planned or required. Should the preferred fish screen design require work on or within the levee, a Reclamation Board Enchroachment Permit would have to be obtained. Guidelines and specifications recommended by the Reclamation Board would be followed to ensure approval of the permit.

The preferred fish screen will adopt technically sound and proven passive fish screen methods and cleaning systems. Expedient permit approval is expected by coordinating the final design and specification of the fish screen with staff from DFG and NMFS. If construction funding is approved, construction could begin as early as April 1998 and no later than April 1999.

II. COST AND SCHEDULE:

Table 1 shows the estimated cost of the tasks described above in "Scope of Work." Funds are requested from CALFED for 100% of the cost for the Phase I feasibility study. Construction funds would be requested from CALFED and other parties for the construction phase of the project during the next funding cycle should the Boeger Family Farms proceed with construction. Based on construction cost at Pelgar Mutual Water Company's fish screen and other similar size diversions, it is estimated that \$175,000 would be needed to complete Phase II construction. It is anticipated that funds would also be sought from CVPIA Unscreened Diversion Program and other funding possibilities for construction costs. Boeger Family Farms proposes to cost share in the project by providing long-term operation and maintenance of the fish screen. In addition, Boeger will provide in-kind services during the monitoring periods.

Table 1

Cost Breakdown							
Project Phase and Task	Direct Labor Hours	Direct Salary & Benefits	Overhead Labor	Service Contracts	Material & Acquisition Contracts	Miscellaneous & other District Costs	Total Cost
Technical Study	—	—	—	\$ 8,000	—	—	\$ 8,000
Biological Study	—	—	—	19,000	—	—	19,000
TOTAL	—	—	—	\$27,000	—	—	\$27,000

If construction funding is secured, the project can be constructed before the 1998 irrigation season by adopting the following schedule:

Phase I--Feasibility Study:

Technical Study — Nov. 1997 - Jan. 1998
 Biological Study — Nov. 1997 - Mar. 1998

Phase II--Construction:

Engineering & Design — Jan. 1998 to Apr. 1998
 Biological Consultation — Jan. 1998 to Apr. 1998
 Regulatory Permits & Consultation — Jan. 1998 to Apr. 1998
 Construction — Apr. 1998
 Post-project Monitoring — Apr. 1998 to Nov. 2001
 Maintenance — Apr. 1998 to Nov. 2001

III. APPLICANT QUALIFICATIONS:

Consistent with Government Code §4525, Murray, Burns and Kienlen (MBK), was selected by Boeger Family Farms to provide engineering and financial services in connection to obtain CALFED funding and construction of project. The selection was made on the basis of qualifications and demonstrated competence for the requested services, including documentation of fair and reasonable prices.

MBK is a consulting civil engineering firm whose main emphasis is water resources. Its three main areas of specialization include water supply planning, flood control and water rights. MBK represents many water diverters located in the Sacramento/San Joaquin Delta watershed. This association has resulted in MBK personnel's involvement in many existing and planned fish screening facilities. The services provided include feasibility design and environmental/regulatory. The list of projects includes Pelger Mutual Water Company, Deseret Farms Wilson Ranch, Maxwell Irrigation District, Lower Joice Island, Thousand Acre Ranch, Browns Valley Irrigation District, Grizzly Island and King Island. In particular, the Pelger Mutual Water Company screen is nearly identical to the Boeger diversion.

In addition, MBK has provided consulting services to Boeger Family Farms, and its predecessor, at the project site for over 20 years. Services provided over the years include all aspects of water supply planning. Their experience includes work in regard to the pumping plant and distribution system, as well as administering water supply contracts.

Consistent with Government Code §4525, EA Engineering, Science, and Technology, Inc., was selected by Murray, Burns and Kienlen to provide environmental services in connection with project development and permit processing. The selection was made on the basis of qualifications and demonstrated competence for the requested services, including documentation of fair and reasonable prices.

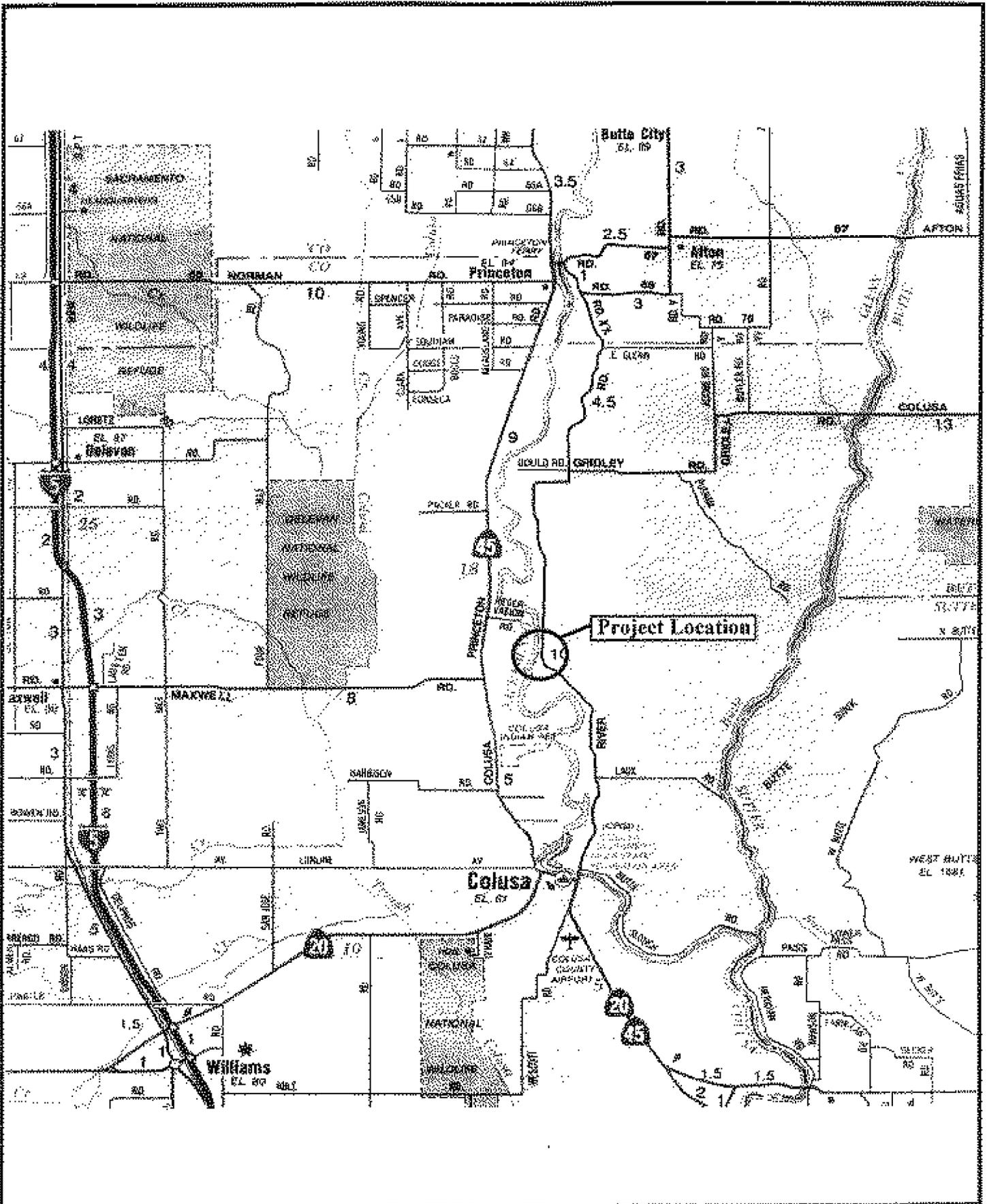
Pursuant to California Government Code §1090, EA Engineering, Science, and Technology, Inc., is disclosing a remote interest in proposals submitted for funding under CALFED's 1997 Category III program. EA staff, as third tier subcontractors to the Bureau of Reclamation, have provided technical and administrative support to CALFED agency staff in the Restoration Coordination Program. In this capacity, EA staff have assisted with documentation of public meetings of the Ecosystem Roundtable, and compiled technical team meeting information for distribution to Roundtable members and the public. EA's legal counsel has determined that EA's participation as a subconsultant in contracts that may be

awarded under the Category III program does not constitute a violation of California Government Code §1090.

EA is a multidisciplinary environmental consulting firm with a staff of Northern California scientists who specialize in environmental analyses related to water resources. EA's staff have been conducting aquatic studies in the Delta and its tributary watersheds for over 20 years, and have completed entrainment studies on dozens of facilities during that time.

Scott Wilcox of EA Engineering, Science, and Technology is a senior fisheries biologist whose role will involve technical oversight and management of tasks related to biological monitoring and environmental compliance. His areas of technical expertise include aquatic and terrestrial resource impact assessment, fish screen evaluation, and fisheries analyses in riverine and estuarine systems. His 17 years of experience includes biological investigations for approximately 30 projects within or tributary to the Central Valley and the Delta. Many of these projects involved planning of aquatic habitat restoration actions and characterization of fish populations and habitat conditions. Relevant project experience includes biological consultation, design, and monitoring plan development for fish screens on hydro projects; fish population sampling in riverine and estuarine systems; CEQA compliance for habitat restoration and mitigation projects; and TES species surveys. Professional references for similar projects include John Kessler (916-644-1960) of El Dorado Irrigation District and Steve Onken (916-534-1221) of Oroville-Wyandotte Irrigation District.

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Location Map

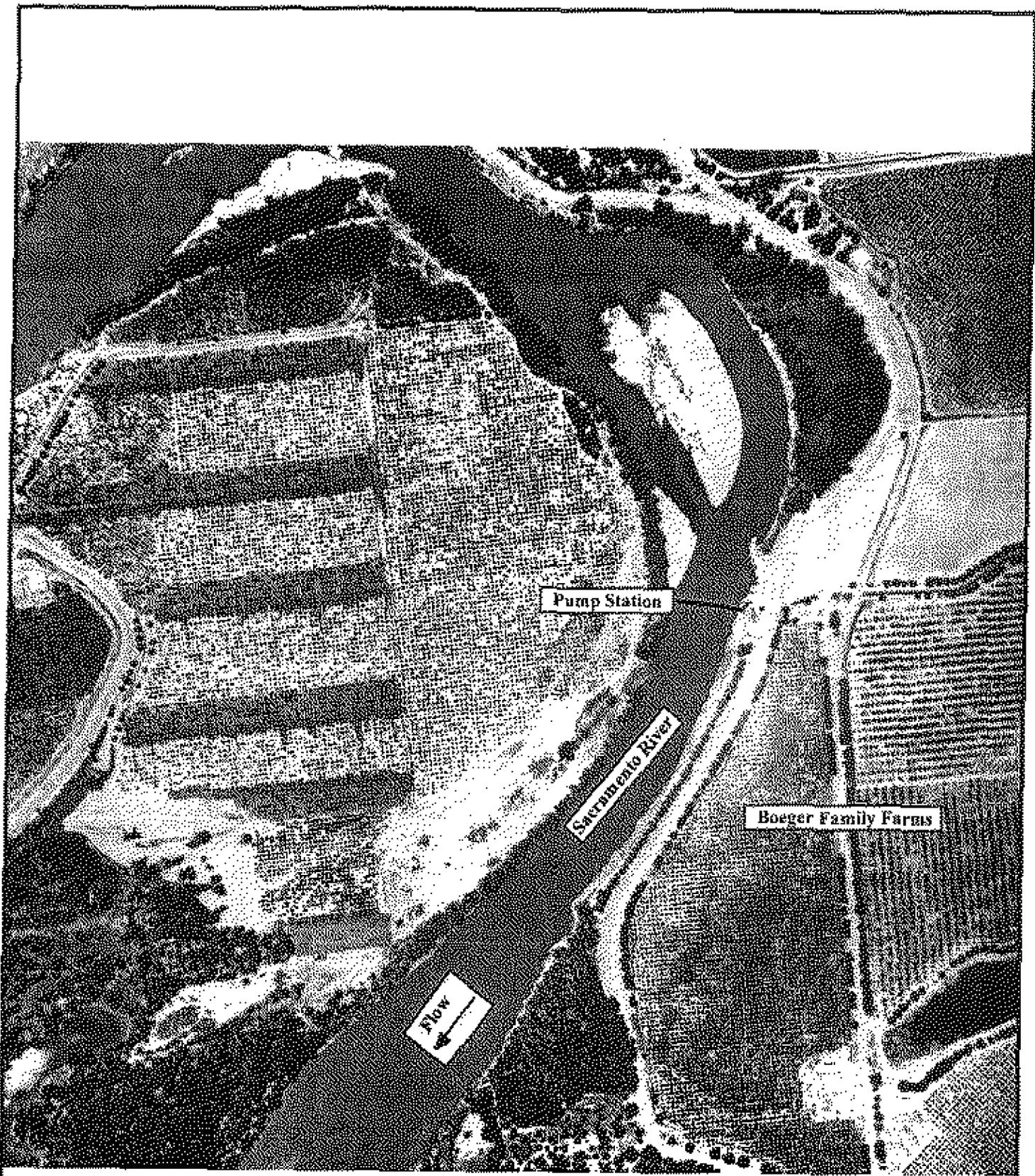
**Boeger Family Farms
Fish Screen Project**

Date
July 1997

Sheet
1 of 2



MURRAY, BURNS & KJENLEN - Consulting Civil Engineers
1616 29th Street Ste 300, Sacramento CA 95816 - (916) 456-4400



Site Map	Boeger Family Farms Fish Screen Project	Date July 1997
 MURRAY BURNS & KIENLEN - Consulting Civil Engineers 1616 24th Street Ste. 300, Sacramento CA 95816 • (916) 456-1400		Sheet 2 of 2

NONDISCRIMINATION COMPLIANCE STATEMENT

COMPANY NAME

Boeger Family Farms

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME

Matt Boeger

DATE EXECUTED

7-22-97

EXECUTED IN THE COUNTY OF

Butte

PROSPECTIVE CONTRACTOR'S SIGNATURE

PROSPECTIVE CONTRACTOR'S TITLE

Partner

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

Boeger Family Farms

Agreement No. _____

Exhibit _____

**NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY
BIDDER AND SUBMITTED WITH BID FOR PUBLIC WORKS**

STATE OF CALIFORNIA)
)ss
COUNTY OF Butte)

Matt Boeger being first duly sworn, deposes and
(name)

says that he or she is Partner of
(position title)

Boeger Family Farms
(the bidder)

the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

DATED: 7.22.97 By [Signature]
(person signing for bidder)

Subscribed and sworn to before me on



(Notarial Seal)

July 24 1997
[Signature]
(Notary Public)

MURRAY, BURNS & KIENLEN

A Corporation
1616 29th Street, Suite 300
Sacramento, California 95816
Tel. (916) 456-4400
FAX (916) 456-0253

F1-319

TRANSMITTAL MEMORANDUM

July 28, 1997

TO: CALFED Bay-Delta Program
1416 Ninth Street, Suite 1155
Sacramento, California 95814

FROM: Gilbert Cosio, Jr.
Murray, Burns and Kienlen

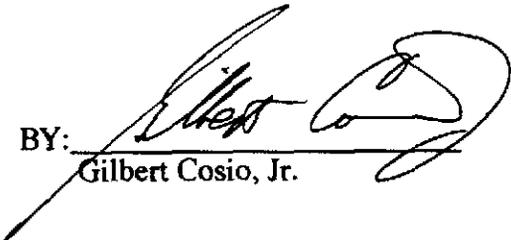
JUL 28 1997

**SUBJECT: Transmittal of 1997 Category III Proposal --
Boeger Family Farms**

In accordance with specifications described in the "Request for Proposals, 1997 Category III, Ecosystem Restoration Projects and Programs", transmitted on behalf of Boeger Family Farms, are the enclosed ten (10) copies of their Proposal regarding the "Fish Screen Feasibility Study (Phase I)".

If you have any questions, or require additional information, please call me at (916)456-4400.

Sincerely,
MURRAY, BURNS & KIENLEN

BY: 
Gilbert Cosio, Jr.

cc:
Boeger Family Farms

7/28/97
3:10 PM