

Banta Carbona Irrigation District Fish Screen Monitoring and Evaluation Plan

Project Information

1. Proposal Title:

Banta Carbona Irrigation District Fish Screen Monitoring and Evaluation Plan

2. Proposal applicants:

David Weisenberger, Banta Carbona Irrigation District

3. Corresponding Contact Person:

David Weisenberger
Banta Carbona Irrigation District
3514 West Lehman Road P.O. Box 299 Tracy, CA 95378-0299
209 835-4670
bcid@inreach.com

4. Project Keywords:

**At-risk species, fish
Fish Passage/Fish Screens
Monitoring**

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:

Local Agency

9. Location - GIS coordinates:

Latitude: 37.725

Longitude: -121.298

Datum:

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

The Banta-Carbona Irrigation District diversion canal is located on the San Joaquin River approximately five miles north of Vernalis, CA, at River Mile 63.5

10. Location - Ecozone:

1.3 South Delta

11. Location - County:

San Joaquin

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:

11

15. Location:

California State Senate District Number: 12

California Assembly District Number: 26

16. How many years of funding are you requesting?

3

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: n/a

Total Requested Funds: 510000

b) Do you have cost share partners already identified?

Yes

If yes, list partners and amount contributed by each:

Banta Carbona Irrigation District 93,231

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?

Yes

If yes, identify project number(s), title(s) and CALFED program (e.g., ERP, Watershed, WUE, Drinking Water):

1997-A101	Banta Carbona Fish Screen	California Urban Water Agencies' Category III Account
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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).

5-FG-20-12940	Banta-Carbona Irrigation District Fish Screen Project--Feasibility Study	AFSP
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Have you previously received funding from CVPIA for other projects not listed above?

No

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

Yes

If yes, identify project number(s), title(s) and funding source.

6-FG-20-13960	Banta Carbona Irrigation District Fish Screen	California Department of Fish and Game, Prop 204
FG-6053-IF	BCID Fish Screen - Supplemental Study for Smelt Criteria and Design & Construction	California Department of Fish and Game, Prop 70

Please list suggested reviewers for your proposal. (optional)

21. **Comments:**

**#17a. All work will be performed by subcontractors; therefore BCID does not have a
overhead rate. #17b. Estimated Annual Cost to Maintain Pump and Fish Screen Facility**

Environmental Compliance Checklist

Banta Carbona Irrigation District Fish Screen Monitoring and Evaluation Plan

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: Banta-Carbona Irrigation District

NEPA Lead Agency (or co-lead:) U.S. Bureau of Reclamation

NEPA Co-Lead Agency (if applicable):

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

CEQA

-Categorical Exemption

☒ Negative Declaration or Mitigated Negative Declaration

-EIR

-none

NEPA

-Categorical Exclusion

☒ Environmental 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?

Yes

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

Banta Carbona Irrigation District Environmental Assessment/Initial Study Finding of No Significant Impact (March 2001)

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 Obtained

STATE PERMITS AND APPROVALS

Scientific Collecting Permit

CESA Compliance: 2081

CESA Compliance: NCCP

1601/03 Obtained

CWA 401 certification Obtained

Coastal Development Permit

Reclamation Board Approval Obtained

Notification of DPC or BCDC

Other

FEDERAL PERMITS AND APPROVALS

ESA Compliance Section 7 Consultation

ESA Compliance Section 10 Permit Obtained

Rivers and Harbors Act

CWA 404 Obtained

Other

PERMISSION TO ACCESS PROPERTY

Permission to access city, county or other local agency land.

Agency Name:

Permission to access state land.

Agency Name:

Permission to access federal land.

Agency Name:

Permission to access private land.

Landowner Name:

6. Comments.

#4. The draft EA/IS is a joint document for CEQA and NEPA because the project is a discretionary action of a local agency with federal participation through funding and permitting processes

Land Use Checklist

Banta Carbona Irrigation District Fish Screen Monitoring and Evaluation Plan

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?**

No

If you answered no to #3, explain what type of actions are involved in the proposal (i.e., research only, planning only).

The fish screen facility is certainly under construction. The post-construction evaluation and biological monitoring proposed will not require physical changes in the land use.

4. **Comments.**

Conflict of Interest Checklist

Banta Carbona Irrigation District Fish Screen Monitoring and Evaluation Plan

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):

David Weisenberger, Banta Carbona Irrigation District

Subcontractor(s):

Are specific subcontractors identified in this proposal? Yes

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

As needed Montgomery Watson Harza

Helped with proposal development:

Are there persons who helped with proposal development?

Yes

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

Amy Wade Montgomery Watson Harza

Neil Schild Montgomery Watson Harza

Michelle Treinen Montgomery Watson Harza

Chris Leininger Ducks Unlimited

Comments:

The subcontractors listed above are firms that will have several employees working on the project.

Budget Summary

Banta Carbona Irrigation District Fish Screen Monitoring and Evaluation Plan

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.

Independent of Fund Source

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						30,000			30000.0		30000.00
2	Construction Management						50,000			50000.0		50000.00
3	Operation and Maintenance Manual Preparation						30,000			30000.0		30000.00
4	Hydraulic Evaluation						90,000			90000.0		90000.00
5	Biological Monitoring						270,000			270000.0		270000.00
		0	0.00	0.00	0.00	0.00	470000.00	0.00	0.00	470000.00	0.00	470000.00

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
1	Project Management						5,000			5000.0		5000.00
4	Biological Monitoring						40,000			40000.0		40000.00
		0	0.00	0.00	0.00	0.00	45000.00	0.00	0.00	45000.00	0.00	45000.00

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
1	Project Management						5,000			5000.0		5000.00
4	Biological Monitoring						30,000			30000.0		30000.00
		0	0.00	0.00	0.00	0.00	35000.00	0.00	0.00	35000.00	0.00	35000.00

Grand Total=550000.00

Comments.

Budget Justification

Banta Carbona Irrigation District Fish Screen Monitoring and Evaluation Plan

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

N/a. Banta-Carbona Irrigation District will not be performing the work as described in the proposal. All work will be contracted out.

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

N/a. Banta-Carbona Irrigation District will not be performing the work as described in the proposal. All work will be contracted out.

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

N/a. Banta-Carbona Irrigation District will not be performing the work as described in the proposal. All work will be contracted out.

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

N/a. Banta-Carbona Irrigation District will not be performing the work as described in the proposal. All work will be contracted out.

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

N/a. Banta-Carbona Irrigation District will not be performing the work as described in the proposal. All work will be contracted out.

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.

Subcontractors will perform all work as described in the proposal. The estimate amount of time is 2500 hours, which will be split among the team members accordingly. The hourly rate ranges from \$70 per hour for an Associate Engineer to \$150 per hour for a Principal Engineer. Biological monitoring costs also include equipment required for monitoring including platform and live box, fyke net, fyke net support system, and suspension system.

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.

N/a. Banta-Carbona Irrigation District will not be performing the work as described in the proposal. All work will be contracted out.

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 presentations, response to project specific questions and necessary costs directly associated with specific project oversight.

Project Management subtasks and costs are: Prepare Work Plan, \$5,000 Project Meetings and General Oversight, \$20,000 Distribute project info and reports (local involvement), \$15,000 Institute QA/QC Program, \$10,000

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

N/a. Banta-Carbona Irrigation District will not be performing the work as described in the proposal. All work will be contracted out.

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.

N/a. Banta-Carbona Irrigation District will not be performing the work as described in the proposal. All work will be contracted out.

Executive Summary

Banta Carbona Irrigation District Fish Screen Monitoring and Evaluation Plan

The Banta-Carbona Irrigation District is applying for \$550,000 in CALFED grant funds to complete the post-construction evaluation, biological monitoring, and construction management for the positive barrier fish screen facility at the Banta-Carbona main diversion canal. The diversion is located at River Mile 63.5 on the San Joaquin River, and is currently under construction to upgrade the facility to prevent the entrainment of all fish species including anadromous fish. This proposal is a request for next-phase funding for the fish screen facility. Banta-Carbona Irrigation District requests funding for the project management, construction management, operation and maintenance manual preparation, post-construction evaluation, and biological monitoring necessary. Banta-Carbona Irrigation District will be responsible for the additional funding necessary for the long-term operations and maintenance of the facility. Banta-Carbona Irrigation District will appoint subcontractors to perform the construction management, post-construction evaluation, and biological monitoring aspects of the project. By constructing, monitoring, and evaluating the fish screen facility, Banta-Carbona Irrigation District anticipates benefits to the fishery endemic to the Sacramento-San Joaquin Rivers Delta, including the spring run Chinook salmon, delta smelt, steelhead trout, American shad, sturgeon, and striped bass. Through consultation with the Department of Fish and Game and the U.S. Fish and Wildlife Service, chinook salmon and delta smelt have been accepted as the target species for establishing screening criteria for this project. The proposed monitoring and evaluation is necessary to ensure the fish screen facility is in good operating condition, produces water velocities capable of conveying the fish through the bypass system without harm, and provides enough diversion water to supply the agricultural land in the Banta-Carbona Irrigation District. This project addresses CALFED ERP Strategic Goal 1: At-Risk Species and Goal 4: Habitats-Fish Passage; and Delta and Eastside Tributaries Restoration Priority DR-1. This project also meets Central Valley Project Improvement Act goals in Section 3406(b)(21) by improving habitat for all stages of anadromous fish, improving survival rates of juveniles at diversions, and improving the opportunity for adult fish to reach their spawning habitat.

Proposal

Banta Carbona Irrigation District

Banta Carbona Irrigation District Fish Screen Monitoring and Evaluation Plan

David Weisenberger, Banta Carbona Irrigation District

**BANTA-CARBONA IRRIGATION DISTRICT
FISH SCREEN PROJECT
MONITORING AND EVALUATION PLAN**

CALFED PROPOSAL

Submitted by

Banta-Carbona Irrigation District
3514 West Lehman Road
P.O. Box 299
Tracy, CA 95378-0299

October 2001

A. PROJECT DESCRIPTION: PROJECT GOALS AND SCOPE OF WORK

1. Problem

Anadromous fish rear in fresh water and migrate to estuarine water in their early life stages. During the adult life stage spent in the ocean or estuary, sexual maturation occurs and the anadromous species migrate to their natal fresh water streams to spawn. Several anadromous species use Central Valley streams for some portion of their life cycle. These anadromous species include chinook salmon, steelhead trout, sturgeon, striped bass, and American shad (CDFG, 1994). The Delta smelt is another species found in this area. Delta smelt habitat encompasses the area within the boundary of the Delta, extending up the San Joaquin River to Vernalis.

Anadromous fish and other fish species from Central Valley streams have declined in numbers since 1967. According to CDFG (1994), this decline is partially due to water management activities, habitat degradation, poor water quality, and catastrophic natural events. Chinook salmon and striped bass are the predominant anadromous species in the San Joaquin drainages of the Central Valley. Since the entrainment of the juveniles in the diversion canals has contributed to the population decline of these species, a fish screen facility is needed to keep the fish in the main stream of the river.

The Banta-Carbona Irrigation District's (BCID) primary source of water is a surface water diversion on the San Joaquin River at River Mile 63.5 (See **Figure 2.1** in Appendix for location map). The diversion is located in Ecozone 1: Sacramento-San Joaquin Delta, 1.3: South Delta. The District holds water rights at this location dating back to the early 1900s. The construction of a fish screen facility at the Banta-Carbona Irrigation District is currently underway to prevent entrainment of fish species into the diversion works. The target species used for the establishment of the design criteria are the chinook salmon and the delta smelt.

This fish screen facility will consist of a vee-shaped screen located within the leveed canal as close to the river as possible and 18 panel screens installed vertically in a vee configuration with 9 panels to a side. Each panel will be 6'-1" tall and 11'-6" wide. Fish will pass the screens and be pumped through a Hidrosta fish pump to the fish return pipeline on the north levee. This pipeline will return fish back to the river downstream of the diversion point. See **Figure 2.2** in the Appendix for the proposed fish screen design.

Banta-Carbona Irrigation District will be maintaining the facility and controlling the diversion use and frequency of diversion. A post-construction performance evaluation and monitoring plan and long-term operations and maintenance plan are necessary to monitor and ensure the effectiveness of the fish screen facility.

Relevant reports of past solutions to similar situations include *Browns Valley Irrigation District Fish Screen Monitoring and Evaluation Plan (1999)*, and *Gorrill Fish Screen and Ladder Project Performance Evaluation and Monitoring Plan (1999)*.

2. Justification

The justification including conceptual model, hypotheses and selection of project type is not required for Fish Screen and Ladder Construction proposals.

3. Approach

Banta-Carbona Irrigation District will perform a post-construction performance evaluation and monitoring plan, and also a long-term operations and maintenance plan for the fish screen facility. The applicant is requesting funds from CALFED for project management, construction management services, preparation of the O&M Manual, hydraulic evaluations, and the biological monitoring.

3.1 Project Management. The project management task will span all other tasks. Project management includes preparing a work plan, participating in project meetings and presentations, distributing project information and progress reports, and instituting and maintaining a QA/QC Program. Project Management will also include meetings with local agencies, AFSP Technical Team, water users, landowners, and other interested parties to inform them of the progress of the project. (See Performance Measures #1 and #2)

3.2 Construction Management. The construction management task will include the day-to-day administration of the project's construction contract. This will include the close-out of construction and final report aspects of the project. This task is necessary because the date of completing the construction of the fish screen facility has been extended from April 2002 to November 2002, plus any time extensions.

3.3 Operations and Maintenance Manual. A comprehensive operation and maintenance manual will be prepared for the fish screen and pump station. The manual will include data on all the equipment and will include recommendations for the operation and maintenance procedures for the fish screens. (See Performance Measure #3)

3.4 Post-construction Evaluation. The post-construction evaluation will include facility startup and hydraulic evaluation. The evaluation will be made as outlined in the agency criteria. This task will be performed within the first year after the fish screen facilities are constructed (Refer to Performance Measures #4 and #5).

3.4.1 Facility Startup. During the facility startup, all components will be inspected to ensure that they are ready for operation. The fish screen will be tested for the following conditions:

- Screen - smoothness, gaps in sides and bottom (under dry conditions).
- Screen sweep
 - Full range of motion (set limit switches to insure all screens are uniformly swept).
 - Brush sweeps are achieving the selected speed.

- No hang ups on brushes as they move along the fish screens.
- “Timer”, “Manual”, and “Auto” settings work properly.
- Run the screen sweep through a number of complete cycles after water-up and test head differential on the fish screens.
- Control Baffles
 - Free movement at start-up inspection.
 - Clamped tight for future inspections.
 - Initial settings are made and clamped in position.
- Sediment control piping
 - Sediment control headers work properly.
 - Pumps and valves work properly.

3.4.2 Hydraulic Evaluation. The hydraulic evaluation program will measure the flows and velocities at the fish screen and compare the results against the project design criteria as specified by the California Department of Fish and Game (CDFG) and National Marine Fisheries Service (NMFS).

The primary objectives of hydraulic testing are:

1. To hydraulically balance the facility by adjusting the control baffles behind the screen panels to optimize the hydraulic operation of the facility.
2. To document the final hydraulic conditions at the screens and bypass to show compliance with the functional design criteria established for this project.

During project development, a design flow condition of 250 cfs was established. This condition produces the greatest flow through the screens at the lowest associated water level resulting in the highest approach velocities and lowest sweeping velocities. Hydraulic testing will be performed at diversion flows of up to 250 cfs as conditions permit.

Data will be collected to evaluate or establish the following items that directly affect the travel of fish passing through the system and back to the river:

- Velocities at screens
- Transport Time in Bypass
- Velocities and Depths at Bypass Inlet and Outlet
- Water Surface Measurements
- Debris Test

A calibrated Son-tek meter will be used to measure the approach velocities normal to the screens and sweeping velocities parallel to the screens simultaneously. Approach and sweeping velocity measurements (three at a time) will be taken at six points on each screen panel. The velocity measurement unit will be mounted 4 inches from the face of the screen, or as close as possible without interfering with the screen. Each point will be assumed to be representative of the velocity through that screen area. Analog signals of velocity measurements will be output to a portable computer (PC) or a data-logger for

statistical analysis. The control baffles will be adjusted until the velocity measurements on the screens are uniform. The set-up to balance the screen flow will require a minimum of three days, and the balancing procedures will take up to seven days.

The bypass system is designed to convey fish from the screening structure back to the river in a constant designed flow volume. Transport time through the screens and through the bypass will be estimated using simple, neutral buoyant floats or drogues. This will be done by establishing the canal flow and level near the high design limit. The transport time test will be completed in ½ day.

One-dimensional velocity measurements and water depths will be collected at the entrance and outlet of the bypass pipeline. Velocities will be collected using a Son-tek meter and a fixed-point average of instantaneous readings over a 10 second period will be obtained. By averaging the instantaneous meter readings, the meter error and transient velocities will be offset so the reading is representative of the flow velocity at that point. Analog signals of velocity measurements will be output to a portable computer (PC) or a data-logger for statistical analysis. Depths and velocities will be recorded in ½ day.

Water surface elevations will be surveyed along the canal flowline to develop an actual hydraulic profile in the canal and through the screen structure. The hydraulic profile will be used to establish the following:

- Full flow channel headloss in the project area
- Trashrack headloss (clean)
- Fish Screen headloss (clean)
- Hydraulic profile upstream of the screens and through the bypass
- Hydraulic profile downstream of the screens

Water surface elevations will be surveyed using an auto-level. Spot elevations will be taken at the edge of the channel and at representative locations in the screen structure starting upstream of the diversion structure and ending approximately 100 ft downstream of the canal gate. Water surface elevations will be taken for ½ day.

After the hydraulic testing is completed, the cleaning efficiency of the facility will be tested by introducing debris into the canal. Observers will record the accumulation and cleaning action using a video camera. Underwater video will be used if possible. Debris testing will take one day.

3.5 Biological Monitoring. As part of the long-term operations and maintenance plan, it is necessary to monitor the effectiveness of the fish screen facility in terms of fish protection. Prior to the monitoring procedures, a monitoring plan needs to be prepared to outline the procedures and equipment, and to ensure optimum biological performance for fish passage and their safe return to the San Joaquin River. Biological monitoring will include (1) entrainment of fish at the diversion facility; (2) biological efficacy of the fish bypass system; and (3) predatory fish habitat survey. (See Performance Measure #6)

Biological monitoring will include representative sampling of fish entrained into project facilities. A sieve-net should be placed in front of the fish screen and immediately behind the trash rack of the fish screen facility to determine how many fish are passing through the diversion facility. The net mesh size used should be efficient for capturing the targeted life stage of the species of concern (Chinook salmon, delta smelt, Sacramento splittail, and steelhead). Measurements of diversion volume should be made, to establish a relationship between diversion volume and entrainment rates.

A fyke net will be placed at the discharge end of the fish bypass pipe system to determine how many fish are progressing through the bypass. A barge will be used to access the bypass discharge. The fyke net will be engineered for relatively easy insertion and removal, and guides have been built into the end of the bypass. The fyke-net will be attached to the discharge opening of the bypass to sample the entire bypass flow. A live box will be constructed of PVC pipe. An attached rope will facilitate retrieval of the net for fish processing. Retrieval will occur from the island adjacent to the discharge opening in the main channel of the San Joaquin River or from a barge.

Contents of the nets should be removed, identified, and recorded. Fish should be identified by species and a representative sample of target species should be measured. The fish will be grouped according to injuries, and compared to a control group. If the amount of fish captured in the fyke/sieve nets is not sufficiently high, the agencies involved may choose to make releases of marked juveniles to determine the efficiency of the diversion facility.

Fish screen entrainment monitoring will be performed up to three times the first year, three times the second year, and one time the third year. Monitoring of the biological efficacy of the bypass will be performed once per year for up to three years. For both of the tests, each monitoring time will take one day, and three days will be required during the first year to set up the sampling devices.

The fish screen and bypass facility may cause potential predators to concentrate at particular locations. Therefore, it is necessary to conduct a habitat survey to determine whether favorable habitat conditions have been created. The hydraulic evaluation will provide data concerning the mean water velocity and water depths that can be used for the survey. Instream cover, overhead cover, and substrate will be recorded in the vicinity of the new fish screen and in the vicinity of the bypass discharge. The predatory fish survey will be conducted for 3 days soon after construction has been completed.

4. Feasibility

The feasibility of the fish screen project has been described in the *Banta-Carbona Irrigation District, Final Report, Fish Screen Feasibility Study* (January 1996), and the *Banta-Carbona Irrigation District Supplemental Report for Fish Screen Feasibility Study* (March 1999). The feasibility of completing the monitoring and maintenance aspects of the project in terms of the procedures and schedule has been shown in similar projects

(M&T/Parrott Pumping Station and Fish Screen Project, and Gorrill Fish Screen and Ladder Project).

The positive barrier fish screen is fully consistent with the fish screen criteria of the regulatory agencies including the National Marine Fisheries Service, California Department of Fish and Game, and the U.S. Fish and Wildlife Service. If any defects are found in the facility startup inspection, repairs will be made so that the facility can operate effectively.

This phase of the project is dependent on the successful completion of the construction aspect of the project. Construction of the fish screen is currently underway, and will be completed by November 2002. The only known constraints that may affect the construction of this facility are weather and flood type flows on the San Joaquin River. Excessive rain or flood flows on the river during the proposed construction time period could delay construction.

The following required environmental documentation and permits have been completed:

- Environmental Document for CEQA and NEPA – EA/IS FONSI/Mitigated Neg. Dec.
- Army Corps of Engineers “404” Permit
- Regional Water Quality Control Board Storm Water Permit “401” Certification
- Archaeology – Field Survey and Record Search
- Endangered Species Act – Listings
- 1603 – Streambed Alteration, Department of Fish and Game
- San Joaquin County Permits
- State Reclamation Board - DWR

A memorandum of understanding with the Department of Fish and Game is required for handling of delta smelt under the CESA and needs to be obtained prior to any sampling. No other permits are necessary to obtain.

No physical changes to the land will be necessary. The facility is built on property that is owned by the district, as are the access roads; and therefore, no written permission is required for the execution of this project. The district will require anyone visiting the facility check-in at the District office either in person or make arrangements by phone. The Anadromous Fish Screen Program Technical Team members will be allowed to visit the fish screen and ladders facility with at least 24 hours prior notice.

5. Performance Measures

For this aspect of the project, several performance measures are identified in terms of performance measures, metric, target, and baseline in **Table 1** (See Attachment G of the 2001 CALFED PSP for description of project performance evaluation).

Table 1. Performance Measures

Performance Measure	Metric	Target	Baseline
1) Participation by landowners and key resource managers at project planning/ coordination meetings	Number of representatives from interested agencies.	Full Participation for duration of the project.	Not Applicable
2) Establishment and implementation of QA/QC program	Steps to establish QA/QC program.	Successful implementation of QA/QC program by all involved in the project for the duration of the project.	Not Applicable
3) Completion and distribution of O & M Manual.	Steps to establish O&M Plan.	Successful completion of manual and full understanding of procedures by BCID staff	N/A
4) Inspection at Startup	Number of operating components of fish screen facility.	Successful operation of all components.	N/A
5) Hydraulic Evaluation	Approach and sweeping velocities	Meet all hydraulic design criteria established by NMFS and CDFG	Velocities at unscreened diversion
6) Protection of fish species	Number of fish entrained in fish screens or injured by fish bypass system	No injuries to fish due to the diversion facility	Number of fish injured at unscreened diversion

6. Data Handling and Storage

The facility startup record and hydraulic testing report will be submitted to the AFSP Project Manager within 30 days after testing is complete. Results of periodic inspections will be submitted in annual reports on facility operations to the AFSP Project Manager for the duration of the short term monitoring plan, i.e. until the screen and bypass facility is accepted as complete and effective by the AFSP Project Manager.

For the long-term operations and maintenance plan, a log of operations and maintenance activities will be maintained and shall be made available upon written request of appropriate federal and state agencies. The log-book will be stored at the Banta-Carbona Irrigation District office and will include the following:

- One copy of the operating procedures list.

- One copy of the periodic maintenance schedule.
- Dated records of regularly scheduled maintenance procedures performed.
- Dated records of unscheduled maintenance procedures performed.

The Project Manager should be notified in the event of serious problems with the fish screen or bypass. Other appropriate agency personnel should also be notified.

7. Expected Products/Outcomes

- Construction management final report
- Operation and maintenance manual
- Efficiency data for the fish screen facility in terms of hydraulics and operations
- Biological monitoring plan
- Efficiency data for fish screen facility in terms of entrainment, bypass efficacy, and predatory habitat
- Annual reports of facility operations to be submitted to the AFSP and made available to other interested agencies pursuing the implementation of similar facilities
- Protection of fish species from entrainment in diversion facilities

8. Work Schedule

The work schedule below gives approximate duration times for the project management, construction management, O&M Manual preparation, post-construction evaluation, and biological monitoring. The schedule for the inspection and monitoring depends on the completion of construction, the allocation of CALFED funds, and the available flow in the river for the hydraulic testing. Each of the tasks is considered inseparable and will occur throughout the project as indicated in **Table 2**.

Table 2: Durations for monitoring procedures

Task/Subtask No.	Description Title	Duration		
		Year 1	Year 2	Year 3
Task 1	Project Management	Throughout Project		
Task 2	Construction Management	5 months		
Task 3	Operation and Maintenance Manual	8 months		
Task 4	Post-Construction Evaluation	3 months		
Subtask 4.1	Facility Start-up	60 days		
Subtask 4.2	Hydraulic Evaluation	120 days		
Task 5	Biological Monitoring	6 months	1 month	1 month
Subtask 5.1	Prepare Monitoring Plan	4 months		
Subtask 5.2	Fish Screen Entrainment Monitoring	30 days	15 days	15 days
Subtask 5.3	Biological Efficacy of Fish Bypass	10 days	5 days	5 days
Subtask 5.4	Predatory Fish Survey	30 days		

B. APPLICABILITY TO CALFED ERP GOALS AND IMPLEMENTATION PLAN AND CVPIA PRIORITIES

1. ERP and CVPIA Priorities

Ecosystem Restoration Program Strategic Goals:

GOAL 1: At-Risk Species- This project will promote the recovery of at-risk species, in particular chinook salmon, steelhead trout, sturgeon, striped bass, delta smelt, and American shad. The project will contribute to the reversing of downward population trends of non-listed native species, by reducing or eliminating delay and injury to migrating adult fish by improving passage conditions and reducing entrainment in diversion for juvenile and larval fish. This phase of the project will optimize the velocities in the facility, and ensure that fish are not being injured in the fish screen and bypass facility.

GOAL 4: Habitats-Constructing, monitoring, and maintaining the positive barrier fish screen will protect the habitat of the target species by decreasing the likelihood of entrainment in diversion facilities.

Regional Implementation—Delta and Eastside Tributaries

DR-1) Restore habitat corridors in the San Joaquin River

- *Protect and restore habitat for at-risk species* – Constructing, monitoring, and maintaining the fish screen facility should increase the number of at-risk species present in the San Joaquin River.

Central Valley Project Improvement Act Goals

Applicability to the Central Valley Project Improvement Act Section 3406(b)(21) Anadromous Fish Screen Program:

- *Improve habitat for all life stages of anadromous fish by providing flows of suitable quality, quantity, and timing, and improved physical habitat.* This project improves fish passage and flow management in the San Joaquin River, thus greatly increasing the spawning success and survival of anadromous fish.
- *Improve survival rates by reducing or eliminating entrainment of juveniles at diversions.* The fish screen at the Banta-Carbona Irrigation District diversion will result in the elimination of a source of mortality to spring and winter-run chinook salmon. By inspecting, monitoring, and evaluating the facility, the juvenile fish are protected from harm. Specifically, the biological monitoring ensures that the juveniles are not threatened by predatory fish in the vicinity of the fish screen and the

bypass outlet. The biological monitoring also ensures that they are not entrained on the fish screen structure.

- *Improve the opportunity for adult fish to reach their spawning habitat in a timely manner.* The installation of a fish screen at the Banta-Carbona Irrigation District diversion greatly increases the opportunity for adult anadromous fish to reach their natural spawning and rearing habitat. The number of out-migrants will increase with the screening of this diversion. The surviving out-migrants will in turn produce additional adults to return to the river and spawn.

2. Relationship to Other Ecosystem Restoration Projects

When the Banta-Carbona Irrigation District and other lower San Joaquin River diverters screen their intakes, it is anticipated that fall-run Chinook Salmon and other depleted fish species' populations will increase in number and no longer be threatened or endangered. In addition to the ecosystem benefits to other areas of the San Joaquin River, the BCID intake channel is located below three San Joaquin River watersheds, the Stanislaus River, the Tuolumne River, and the Merced River watersheds. Ecosystem restoration projects in these watersheds will also benefit from this project.

3. Requests for Next-Phase Funding

The Banta-Carbona Irrigation District has received funding from several different sources throughout the feasibility, design, and construction phases of the project, including CALFED and CVPIA. The project is currently in the construction phase which was scheduled to be completed in April 2002, but has been changed to November 2002. This would allow the applicant to begin this phase of the project soon after the grant is awarded. **Attachment 1** in the Appendix of this proposal gives a description of the progress of the current-phase of funding, and its relationship to the construction management, monitoring, and operations and maintenance aspects of the project. Some of the tasks which are listed for funding from CALFED were also included in previously funded allocations. Due to numerous construction problems, additional funds are required.

4. Previous Recipients of CALFED or CVPIA Funding

A list of the funding received for previous phases of the project is shown in **Attachment 1**. Banta-Carbona Irrigation District has received no CALFED or CVPIA funding for other projects.

5. System-Wide Ecosystem Benefits

The project is expected to result in a net benefit to the environment by preventing the entrainment and loss of special-status fish species, including delta smelt (federally listed as threatened); Sacramento splittail (federally listed as threatened); fall-run chinook salmon (federal candidate species); and steelhead (federally listed as threatened).

Monitoring the effectiveness of the fish screen facility will complement other restoration projects that are underway or completed on the watersheds above this diversion.

6. Additional Information for Proposals Containing Land Acquisitions N/A

C. QUALIFICATIONS

Montgomery Watson Harza, MWH, is a full service civil and environmental engineering firm specializing in a variety of services including water and wastewater engineering, energy and infrastructure engineering, flood control, waste remediation, fisheries design, and environmental assessment and mitigation. The firm also works in a number of other industry sectors such as construction, finance, information technology, applied research, project management, laboratory services and government relations.

MWH - the result of a recent merger between Montgomery Watson and Harza Engineering Company – brings to the industry expertise in fish screen and water structure design and construction. With more than \$721 million in revenue, MWH has 5,500 specialists in more than thirty nations and more than 231 years of combined experience. MWH is successful in delivering progressive environmental solutions that reflect the latest scientific and technological developments while recognizing the importance of protecting the environment and the quality of life in local communities. MWH is a recognized leader in water resources and environmental planning. MWH has been present in Northern California for many years and continues to provide engineering service to many local private and public clients. The company has expertise and the capability to perform all phases of a project from the planning phase to the construction and operation of the completed project.

Dennis E. Dorratcague is a Principal Engineer and the water resources director in Montgomery Watson's Northwest Region. He earned a B.S. from University of Notre Dame and his M.S. in Civil Engineering at Colorado State University. He is a Professional Civil Engineer in Washington, Oregon, Alaska, and California. He has been working in the field of hydrology and hydraulics since 1972, primarily concentrating on hydraulic structures and fisheries engineering. He has served as Technical Manager for the Banta-Carbona Irrigation District Fish Screen Feasibility Study and for the preliminary and final design for a fish screen, ladder, and tailrace barrier in Western Oregon. Mr. Dorratcague was also Project Manager for the development of the Feature Design Memorandum for the Surface Bypass Spillway Project; the hydraulic modeling, preliminary and final designs, and construction services of a fish screen on the White River in Western Washington; the preliminary and final design of a fish screen facility for Pacific Power and Light Company; and the Salmon Falls Fish Passage Project.

Clint W. Smith is a Supervising Engineer with extensive experience in civil, environmental, and water resource engineering. He received a B.S. in Civil Engineering from Washington State University and is a Professional Civil Engineer in Washington, Oregon, and Idaho. His background includes the planning, analysis, and design of water intake facilities; fish transport, passage and screening facilities; municipal water, wastewater and storm drainage conveyance and treatment systems; and hydrologic and

meteorological instrumentation data collection systems. He has served as Project Engineer on several major water resources projects including the Banta–Carbona Fish Screen Project on the San Joaquin River; Ducks Unlimited/M&T Chico Ranch Pump Station and Fish Screen Project; Walthamville Fish Screen Facility; White River Fish Screen Project; and Naches Fish Screen Facilities. Mr. Smith has also served as Project Manager for the final design and construction of new fish screens at a hydropower diversion dam on the South Fork of the Rogue River, Oregon and for the design of a saltwater intake and fish screen in San Francisco Bay.

Dana E. Postlewait is a Principal Engineer in MWH’s Bellevue office, and was Harza’s Fisheries Engineering Business Line Manager prior to the recent merger. He earned a B.S. from University of Washington, and is registered as a Professional Civil Engineer in Washington. Mr. Postlewait has specialized in the planning, design and construction management of fisheries related facilities since 1985, including fish passage, fish screening, fish hatcheries and fish monitoring/sampling facilities. He has worked on assignments of various scales, from 20 cfs irrigation diversions to the 200,000 cfs Columbia River and the 400,000 cfs Paraná River in Argentina. He is currently Project Manager for the Harza’s Bonneville Power Administration Fish Facility Design and Construction Indefinite Delivery Contract. Two relevant BPA delivery orders include the design of irrigation diversion intake consolidation projects with new fish screens and upstream passage improvements. Mr. Postlewait was also Project Manager for two Corps of Engineers Fish Passage Improvement Studies for the Surface Bypass Improvements for the Corp’s three Lower Columbia River Projects, and a Bonneville Dam High Flow Screening Study. He was Technical Manager for the Cowlitz Falls Fish Passage Project, and has held lead engineer roles on over 10 FERC relicensing assignments responsible for developing conceptual designs for fish passage projects at hydroelectric facilities.

Private Environmental Consultant:

Steve Clifton has a wildlife consulting background with an emphasis on the ecology and conservation of special-status plant and wildlife species endemic to California. He received a Bachelor of Arts Degree in Wildlife Biology/Zoological Concentration in 1985 from California State University. Mr. Clifton has worked as a sub-consultant conducting field surveys in Plumas National Forest of California in accordance to present survey protocol. He has served as project biologist for the Endangered Species Recovery Program collecting genetic samples, monitoring movement patterns, and providing technical expertise concerning the San Joaquin kit fox, giant kangaroo rat, riparian brush rabbit, riparian woodrat, and other species. He served as Field Investigator for the Habitat Assessment and Finding of No Significant Impact for the proposed Tracy O&M Facility Relocation Site. Mr. Clifton is the Principle Field Investigator conducting pipeline alignment clearance surveys for the Delta-Mendota Canal and California Aqueduct right-of-way in San Joaquin, Stanislaus, Merced, Fresno, Kings, and Tulare counties, CA.

D. COST

1. Budget

A detailed budget for this project is included in the application portion of the proposal.

2. Cost-Sharing

Banta-Carbona Irrigation District will be contributing funds for the long-term operations and maintenance aspects of the project. All monitoring and maintenance procedures not described in this proposal will be provided by the Banta-Carbona Irrigation District. Estimated annual costs of the screening facility were developed in the BCID Supplemental Report for Fish Screen Feasibility Study (1999). These estimated costs include routine inspection and monthly maintenance, annual maintenance, power consumption for the screen cleaning system, site power, and bypass pumping. The estimated annual cost is \$93,231.

E. LOCAL INVOLVEMENT

Local government entities and other local agencies are aware of the construction of the fish screen facility. There has been no local opposition to the construction of the facility.

The Banta-Carbona General Manager has provided written status reports to the Grants and Cooperative Agreements Officer's Representative (GCAOR) to document the project's progress and expenditures throughout the project completion. Also, at critical milestones of the project, BCID has conducted briefings for the USFWS, USBR, DFG, CALFED, and other regulatory agencies to ensure that all regulatory and procedural policies, and biological, engineering, and cost factors were understood by the participants.

USBR and BCID issued a public notice regarding the availability of the draft EA/IS that was circulated for public and agency review and comment. A public hearing was held at BCID offices on March 15, 2000. No comments were received at the public hearing, and written comments were responded to in the final EA/IS.

Future Involvement: Local government agencies will continue to be updated on the proceedings of this phase of the project. The facility startup record and hydraulic testing report will be submitted to the AFSP Project Manager within 30 days after testing is complete. Results of periodic inspections of the facility operations will be submitted in annual reports to the AFSP Project Manager. These annual reports will be available to other local agencies upon request.

F. COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

Banta-Carbona Irrigation District is willing to accept the standard terms and conditions for the state and federal contracting. The applicant has reviewed the terms and conditions and is agreeable to the language used in Attachment D and E.

G. LITERATURE CITED

Browns Valley Irrigation District, Fish Screen Monitoring and Evaluation Plan, 1999.

CALFED Bay-Delta Program, Ecosystem Restoration Program 2002 Proposal Solicitation Package, 2001.

Department of California Fish and Game, Projects Upstream on Merced and San Joaquin Rivers, Personal knowledge of Fish and Game staff.

Ducks Unlimited, Inc., Gorrill Fish Screen and Ladder Project Performance Evaluation and Monitoring Plan, 1999.

Schild, Neil W., M&T/Parrott Pumping Station and Fish Screen. Presented at Fish Passageway Workshop, Sacramento, California, March 26, 1998.

Montgomery Watson, Banta-Carbona Irrigation District, Final Report, Fish Screen Feasibility Report, 1996.

Montgomery Watson, Banta-Carbona Irrigation District Supplemental Rept for Fish Screen Feasibility Study, 1999.

U.S. Bureau of Reclamation, and Banta-Carbona Irrigation District, Banta-Carbona Irrigation District Fish Screen Project Environmental Assessment/Initial Study Findings of No Significant Impact, 2001.

APPENDIX

ATTACHMENT 1

Summary of Existing Project Status: Banta-Carbona Irrigation District Fish Screen Project

Banta-Carbona Irrigation District is in the process of completing the construction phase of the fish screen project. A Feasibility Study was completed in January 1996, and a supplemental report was completed March 18, 1999. The design and environmental documentation and permitting are completed, including the EA/IS Findings of No Significant Impact (March 2001).

The construction phase of the project began in May 2001. The construction of the facility is approximately 20% complete at this time. As of September 2001, the structural steel piles and sheet piles have been completed, the concrete form-work is completed, and the contractor is in the process of placing the concrete for the facility. The projected completion date was originally April 2002, but has been changed to November 2002.

The applicant has received funding from several different sources throughout the feasibility, design, and construction phases of the project. Banta-Carbona Irrigation District received funding from CALFED in 1997 under the California Urban Water Agencies' Category III Account (Project #1997-A101). The following table gives a summary of the project budget and funding sources through the construction phase of the project.

Table 1.1: BCID Fish Screen Project Budget and Funding Sources

Description	Cost Estimate
1. Project Management and Coordination	\$62,000
2. 30 Percent Design	\$173,700
3. Final Design	\$271,800
4. Environmental Documentation and Permitting	\$113,200
5. Bid Services	\$39,700
6. Construction Management	\$411,000
7. Post Construction Services	\$154,400
8. Construction – Fish Screen Structure	\$6,843,000
9. Construction – Fish By-pass Pumps	\$287,000
10. Construction – Electric Power Service	\$459,400
Central Valley Project Improvement Act	
USBR Agreement	\$1,916,750
Amendment Request USBR and CALFED Funds	\$980,000
California Department of Fish and Game Prop 204 Funds	\$4,431,400
California Dept. of Fish and Game, Prop. 70	\$55,800
CALFED, Cal. Urban Water Agencies' Category III Acct.	\$988,875
Banta-Carbona Irrigation District	\$442,575
Total	\$8,815,400

The funding agreements listed above show amendments for additional funds to redesign the facility in order to reduce the capital costs of the facility. A thorough review of the construction bids accepted on January 30, 2001, was completed in February 2001 and indicated that the bids were substantially above the estimated costs. In studying the design of the facility and talking to bidders, the parts of the facility that led to higher level of costs were identified. It appeared that there may be considerable savings if certain changes to the design were made. The sheet pile walls, de-watering scheme, horizontal drilling and water bypass were the primary causes for the higher costs. The consulting engineer felt the suggested changes in the barrier walls and construction methods on the pipeline were reasonable, and therefore additional funds were needed to redesign the facility and re-bid the project.

The construction phase of the project is directly related to the proposed next-phase of the project: construction management, the operation and maintenance manual preparation, post-construction performance evaluation, and biological monitoring. The proposed grant is dependent upon the timely completion of the construction phase. The CALFED grant will be awarded in August or September 2002, and the construction management and O&M Manual Preparation can begin shortly. Excessive rain or flood flows during the construction time period could delay construction. No outstanding regulatory or implementation issues are present at this time. The facility startup, hydraulic evaluation, and biological monitoring will be implemented when the construction is completed.

ATTACHMENT 2

FIGURES

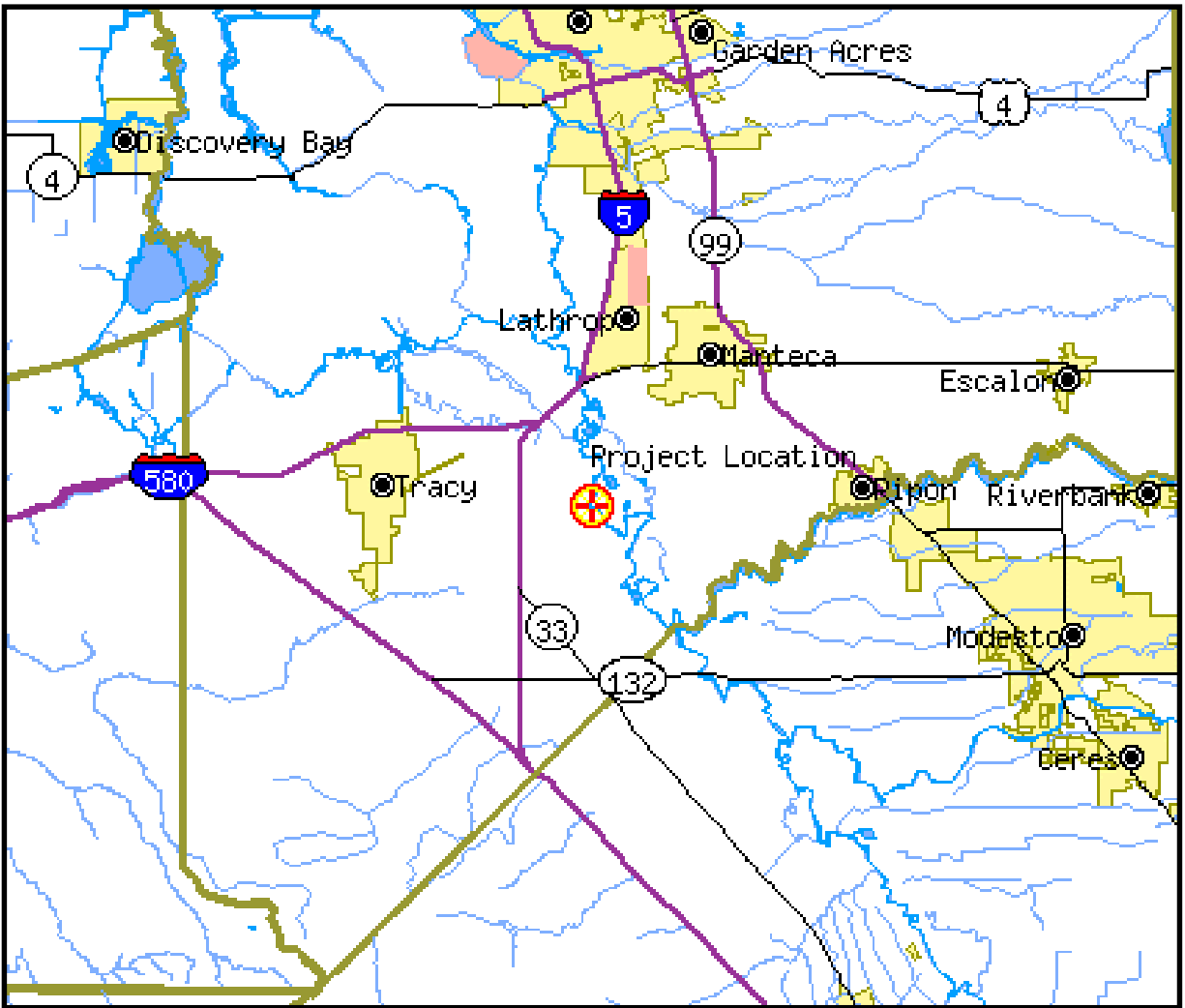


Figure 2.1 : Project Location

