CALIFORNIA BAY-DELTA AUTHORITY

650 Capitol Mall, 5th Floor
Sacramento, CA 95814
916.445.5511 FAX 916.445.7297
http://calwater.ca.gov

CONSIDERATION OF A RESOLUTION AUTHORIZING THE DIRECTOR, OR DESIGNEE, TO EXECUTE WORK ASSIGNMENT 17, UNDER TASK ORDER 1, FOR AN AERATION EVALUATION AND FEASIBILITY STUDY FOR SAN JOAQUIN RIVER DISSOLVED OXYGEN
Agenda Item: 10

Meeting Date: 8-14-03

Summary: This resolution would authorize the Director, or designee, to execute a work assignment under an existing contract with Jones & Stokes, to evaluate aeration technologies and complete an aeration feasibility study as steps toward eventual construction of a longer-term pilot demonstration project to improve dissolved oxygen conditions in the San Joaquin River (SJR).

Recommended Action: Adopt Resolution 03-08-43.

Staff Recommendation: Staff recommends the Authority adopt the attached resolution, approving an Aeration Evaluation and Feasibility Study for San Joaquin River Dissolved Oxygen. The Authority and Central Valley Regional Water Quality Control Board (RWQCB) need this information to determine the most cost effective and technically feasible aeration devices suitable for long-term operation of a demonstration aeration project in the Stockton Deep Water Ship Channel.

Background

Dissolved oxygen concentrations in the San Joaquin River (SJR) routinely fall below the water quality objective between June and October and create a migratory block for adult Chinook salmon. Aeration has been identified as a technically feasible and cost effective measure for interim improvement of dissolved oxygen in the San Joaquin River. Approval of the proposed Work Assignment will allow the Ecosystem Restoration Program (ERP) staff and the RWQCB to obtain information on selected aeration technologies and complete an aeration feasibility study. The aeration feasibility study is a necessary step for construction of a longer-term pilot demonstration project which will improve dissolved oxygen conditions in the SJR, meet an interim water quality goal, and to provide performance information for long-term solutions to correct the problem.

A goal of the ERP is to improve and/or maintain water and sediment quality conditions that support aquatic ecosystems in the Bay-Delta estuary and watershed. The Bay-Delta Program in the CALFED Programmatic Record of Decision (ROD) identifies three commitments for steps to

correct the dissolved oxygen problem and assigns the ERP as the responsible program element for carrying out the dissolved oxygen program actions. ERP staff works closely with Central Valley RWQCB staff on the dissolved oxygen project.

Approval of this Work Assignment will provide technical assistance to ERP and RWQCB staffs in advancing progress towards the CALFED Dissolved Oxygen ROD commitments and meet the milestones of the RWQCB regulatory schedule. Expenditure of FY 03/04 Proposition 13 funds for this Work Assignment are contingent on the Authority's approval of the Receivable Interagency Agreement for Proposition 13 funds.

Fiscal Information

Funding Source: Proposition 13 Funds
Term: July 1, 2003 to July 1, 2004
Total Amount: $437,651.81

List of Attachments

Proposed Scope Work

Contact

Name: Dan Castleberry **Phone:** (916) 445-0769

CALIFORNIA BAY-DELTA AUTHORITY
RESOLUTION NO. 03-08-43

CONSIDERATION OF A RESOLUTION AUTHORIZING THE DIRECTOR, OR DESIGNEE, TO EXECUTE WORK ASSIGNMENT 17, UNDER TASK ORDER 1, FOR AN AERATION EVALUATION AND FEASIBILITY STUDY FOR SAN JOAQUIN RIVER DISSOLVED OXYGEN

WHEREAS, the Department of Water Resources, CALFED Bay-Delta Program, executed Contract No. 4600002622 with Jones & Stokes, to provide planning, environmental analysis, scientific, and technical services for oversight and coordination related to the Bay-Delta Program; and

WHEREAS, the Authority is statutorily authorized to conduct oversight and coordination related to the Bay-Delta Program; and

WHEREAS, the Authority will consider accepting assignment of Contract No. 4600002622 from the Department of Water Resources; and

WHEREAS, an Ecosystem Restoration Program objective is to improve and maintain water and sediment quality conditions that support aquatic ecosystems in the Bay-Delta estuary and its watershed; and

WHEREAS, low dissolved oxygen concentrations in the San Joaquin River between June and October create a migratory block for adult Chinook salmon; and

WHEREAS, approval of this Work Assignment will provide technical assistance to ERP staff in advancing progress towards completion of three CALFED Dissolved Oxygen ROD commitments and meet regulatory milestones of the Central Valley Regional Water Quality Control Board;

NOW, THEREFORE, BE IT RESOLVED that the Authority authorizes the Director, or designee, to execute Work Assignment 17, under Task Order 1 of Contract No. 4600002622 for aeration evaluation and feasibility study for San Joaquin River dissolved oxygen, as generally described in the attached proposed scope of work for an amount not to exceed $437, 651.81, subject to appropriation of adequate funds.

CERTIFICATION

The undersigned Assistant to the California Bay-Delta Authority does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the California Bay-Delta Authority held on August 14, 2003.

Dated:

Heidi Rooks
Assistant to the California Bay-Delta Authority

Attachment 1
Dissolved Oxygen Project
Work Assignment 17, Task Order 1
Proposed Scope of Work

1. Description of Work Assignment and Relationship to Task Order

A California Bay-Delta Program peer review of the dissolved oxygen studies was completed in May 2002. The peer review summary report states, "There is a need to develop information on various aeration schemes/technologies, including performance of science-based demonstrations at pilot scale." Aeration is also proposed as one component of the San Joaquin River Dissolved Oxygen Steering Committee Total Maximum Daily Load (TMDL) Implementation Plan (dated Feb. 4, 2003). This work assignment directly relates to Task Order No. 1 as it includes scientific and strategic planning for future environmental water quality investigations and the preparation of a monitoring plan for future water quality actions. A prior Individual Work Assignment (Task Order No. 1, WA No. 5, Agreement No. 4600002622) defined a series of tasks that included the following:

- compile existing aeration data and research
- develop performance and screening criteria to be used in the selection of aeration alternatives
- screen the list of potential aeration technologies
- develop a feasibility study plan
- design a monitoring plan to establish baseline conditions and evaluate the performance of the aeration devices in the feasibility study

The implementation of this Individual Work Assignment will result in the implementation of recommendations made by the previous work assignment.

The main goals of this work assignment are to:

- perform analysis of selected aeration technologies based upon screening criteria
- design conceptual long-term monitoring strategy and adaptive management plan
- facilitate stakeholder input/involvement meetings
- assist in the process of obtaining design/build engineering concept drawings from contractors solicited by a separate process with a Lead Agency
- prepare scope for CEQA documentation and anticipated permit requirements for selected aeration project
- conduct baseline monitoring and continue comprehensive analysis of algae dynamics in the Deep Water Ship Channel (DWSC)
- update model of DWSC hydrodynamics and water quality with RWQCB staff

The consultant provides a level of expertise on these tasks that cannot be duplicated with staff from the CBDA. Their scientists are knowledgeable in all aspects of this program and they have been working intensively on the DO TMDL process for over four years.

2. Scope Of Work

Subtask 1e.17.1. Perform analysis of selected aeration technologies based upon screening criteria.

Consultant will perform a screening of preferred aeration devices that were selected by the previous work assignment (Task Order No. 1, WA No. 5, Agreement No. 4600002622). The screening will systematically rank the various devices relative to their ability to comply with the performance criteria including oxygen transfer efficiency, obstructions to navigation in the Deep Water Ship Channel (DWSC), construction costs, and operations/maintenance costs in light of current and predicted hydrodynamic conditions. The screening will include direct measurements of system performance in an aquatic environment. At the direction of the CBDA and the RWQCB, the consultant will perform these measurements in the DWSC when possible and will perform additional measurements on devices installed at other locations where it is cost prohibitive to relocate the technology to the DWSC. The costs of construction/operations/ maintenance will be estimated by preparing engineering feasibility evaluations by a certified engineer. The evaluations will be performed on three technologies recommended by the consultant as superior alternatives and selected by CBDA and the RWQCB. The consultant and stakeholders will then select a single technology as the superior alternative in light of the results from the screening process. The selected technology will used by a Lead Agency (1e.17.3) as a model when they present a request from contractors to bid on the opportunity to construct/install the device.

The consultants will utilize qualified scientists to define the parameters. Their staff provides a level of expertise required for these tasks. They will define physical, chemical, and engineering parameters that the devices must comply with. It is essential that this subtask is carried out under the guidance of staff provided by this contractor.

Subtask 1e.17.2. Design conceptual long-term monitoring strategy and adaptive management plan.

Based upon the selection of a preferred aeration technology (Subtask 1e.17.1), the consultant will design a preliminary long-term monitoring approach in order to evaluate the quantitative increase to dissolved oxygen concentration in the DWSC that will result from installation and operation of the device. The consultant will prepare an outline that describes all measured parameters, locations of sampling, frequency of sampling, and report format. The outline will also consider methods of adaptive management in order to adjust the monitoring strategy as warranted to better assess the performance of the aeration device. The strategy will be submitted to the CBDA and RWQCB for approval and revision. As described in Subtask 1e.17.1., the use of qualified staff provided by this consultant is critical to defining the methodology in this product.

Subtask 1c.17.3. Facilitate stakeholder input/involvement meetings.

Consultant will facilitate up to six stakeholder input/involvement meetings related to aeration. The purposes of the meetings are:

- solicit stakeholders' input on the viability of various aeration technologies and the screening criteria used in the selection process;
- define stakeholders' support in the form of identifying a Lead Agency that will sponsor a joint venture, solicit bids from contractors, and prepare all necessary CEQA documentation/permit applications;
- develop a mechanism for stakeholders to define their respective participation in the aeration process, which includes aspects of proposed monitoring, joint venture administration, and fiscal/monetary participation.

Consultant will provide technical input and facilitate participation. They will also prepare meeting notices, preparation of agendas, and distribution of applicable handouts. Consultant will provide draft meeting summaries to the CBDA Task Coordinator, RWQCB staff and stakeholders for review within 7 days. Final meeting summaries will be prepared and posted within 14 days. Consultant will distribute summaries to the stakeholders via electronic mail and post on the SJR DO TMDL website. Through continued coordination and evaluation of the DO TMDL Process, the consultant will provide invaluable technical support by maintaining continuity of institutional memory and by providing specialized skills such as scientific understanding of proposed actions, regulatory processes, and facilitation expertise.

Subtask 1e.17.4. Assistance in Obtaining design/build engineering concept drawings from solicited contractors.

The consultant will assist the Lead Agency in the preparation of a Request for Proposals (RFP) at the direction of the CBDA and the RWQCB. The RFP will solicit design/build engineering concept drawings and cost estimates from contractors to construct/install the preferred aeration technology (1e.17.1). The assistance will be in the form of:

- preparation of written materials the agencies can use in developing the RFP;
- identification of appropriate periodicals/distribution methods to widely advertise the RFP;
- assistance with developing responses to inquiries;
- facilitation of a pre-bid meeting.
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Consultant will submit a draft of the requested materials to the CBDA Task Coordinator, RWQCB, Lead Agency/Local Agency for review. Consultant will facilitate one meeting to discuss changes to the draft RFP. Consultant will assist with developing a final version of the materials and provide copies to the CBDA Task Coordinator, RWQCB, Lead Agency/Local Agency. The process of selection will be addressed by the Lead Agency/Local Agency and the CBDA.

Subtask 1e.17.5. Prepare scope for CEQA documentation and anticipated permit requirements.

At the direction of the CBDA Task Coordinator, the consultant will prepare a scope of work and cost estimate that defines the level of effort required by the Lead Agency/Local Agency to comply with CEQA requirements and to prepare all necessary permit applications required by various agencies. The scope will cover the installation and continued operation of the aeration device. The consultant will prepare a draft scope and budget estimate for review by the CBDA Task Coordinator. The consultant will integrate comments and prepare a final draft. The consultant is recognized as the industry expert in the preparation of CEQA documentation and regulatory compliance documents.

Subtask 1e.17.6. Conduct baseline monitoring and continue comprehensive analysis of algae dynamics in DWSC.

The consultant will conduct a baseline monitoring study of DO conditions in the impaired portion of the DWSC. The primary goals of the study are:

- define the circulatory parameters within the DWSC (vertical and horizontal mixing) near the confluence of the San Joaquin River and the DWSC at the City of Stockton;
- examine the rate of dispersion (vertically and horizontally) of oxygenated water in the DWSC at various locations in the impaired portion of the DWSC; and
- define a location of a secondary continuous DO monitoring station upstream of the DWSC and prepare a cost estimate to construct/install the station.
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The consultant will continue with a comprehensive analysis of algae dynamic in the DWSC. The consultant will perform the following procedures during 22 individual sampling events:

- longitudinal water quality surveys with *in situ* water column profiles of temperature, DO, pH, turbidity, fluorescence (chlorophyll *a*) at the following navigational lights (Lt) or stations: Lt 24, Lt 28, Lt 34, Lt 38, Lt 48, Rough and Ready Island (RRI) at the Department of Water Resources (DWR) continuous monitoring station, below the City of Stockton wastewater effluent outfall (near City Station R2A), in French Camp Slough, and above the influence of the City of Stockton effluent discharge (approximately 2 miles above the outfall);
- collect water samples near the surface or at mid-depth to be analyzed in the laboratory for BOD, CBOD, ammonia, nitrate, chlorophyll *a*, and pheophytin *a*.;
- laboratory kinetic rate studies of BOD, CBOD and nitrification;
    - BOD and CBOD decay rates are determined with long-term monitoring of DO in closed reactors maintained at river temperature and 20°C. The CBOD test is performed with a nitrification inhibitor. Duplicate trials are established for selected sampling locations;
    - nitrification rates are quantified by measuring the long-term monitoring of ammonia and nitrate in closed reactors maintained at river temperature and 20°C. Duplicate or triplicate trials are established for selected sampling locations and times;

- algal productivity measurements with field light-dark bottle experiments—this work will help assess the contribution of algae to DO production and provide parameters for future modeling efforts not directly associated with this proposal;
- compilation and analyses of complementary data collected by the City of Stockton, Department of Water Resources, Central Valley Regional Water Quality Control Board, and the U.S. Geological Survey—this data will be used with the longitudinal field data to obtain apparent BOD and nitrification rates;
- set up of a simple finite section model for the DWSC that will permit analysis of the longitudinal concentrations of BOD, CBOD, ammonia, nitrite, and nitrate at different river flow rates—this analysis permits estimation of kinetic rates when they are spatially variable, as has been observed to date with the laboratory trials.
- trend analysis will also be performed to exhibit the relationship between flow and ammonia concentrations, nitrification rates or other parameters.

The consultant will prepare a report that includes an executive summary, background/setting information, methodology, data results, and conclusions.

The consultant will submit the draft report for peer review. After receiving peer review comments, the consultant will prepare a final draft of the report and submit it to the CBDA Task Coordinator, RWQCB, and SJR DO TMDL Stakeholder Process.

The results provided by these studies are fundamental to assuring an accurate representation of the anticipated effects of aeration. Without the results of these studies, there would remain a relatively large margin of uncertainty regarding the potential effects of aeration and upon the predicted volumes of oxygen required to adequately maintain the DO concentration at acceptable levels.

Subtask 1e.17.7. Update model of DWSC hydrodynamics and water quality with RWQCB staff.

Consultant will update model of DWSC hydrodynamic and water quality to reflect updated data collection efforts since the last model update in 2002. The consultant will additionally train RWQCB staff on the fundamentals of model parameters, model software, and uploading source codes. Consultant will prepare documentation and participate in five four-hour training sessions with RWQCB staff at their offices. Consultant will also provide up to 20 hours of on-call support for RWQCB staff to support training. This training is required to provide the RWQCB with the ability to simulate hydrodynamics and variations to water quality.

3. Deliverables

Subtask 1e.17.1.

- Provide 10 hard copies and a pdf version of a report that describes the methodology used in the selection process, list of technologies considered, ranking of technologies, thorough description of the preferred alternative including engineering feasibility drawings, cost estimates for construction and operations/maintenance. A draft version

will be provided for review by the CBDA Task Coordinator, RWQCB, and Stakeholders. Comments will be incorporated and a final draft will be produced.

Subtask 1e.17.2.

- Provide 10 hard copies and a pdf version of a proposed monitoring plan. A draft version will be provided for review by the CBDA Task Coordinator, RWQCB, and Stakeholders. Comments will be incorporated and a final draft will be produced.

Subtask 1e.17.3.

- Six planned meetings, meeting notices, preparation of agendas, and distribution of applicable handouts. Meeting locations would be determined by the workgroup and arrangements would be made by the consultant. Consultant would prepare meeting agendas and necessary handouts.

Substask 1e.17.4.

- Preparation of draft and final written materials related to the Request for Proposals.
- Preparation of one pre-bid meeting materials (agenda, handouts).

Subtask 1e.17.5.

- Provide 10 hard copies and a pdf version of a scope of work and cost estimate. A draft version will be provided for review by the CBDA Task Coordinator, RWQCB, and Stakeholders. Comments will be incorporated and a final draft will be produced.

Subtask 1e.17.6.

- Provide 10 hard copies and a pdf version of a final report that includes an executive summary, background/setting information, methodology, data results, and conclusions.

Subtask 1e.17.7.

- Preparation of one copy of software documentation and training guidelines.

4. Term

The term of this work assignment is one year, commencing on July 1, 2003. The schedule for specific deliverables for subtasks is as follows:

Task 1e.17.1: 7/1/03 – 6/30/04
Task 1e.17.2: 7/1/03 – 6/30/04
Task 1e.17.3: 7/1/03 – 6/30/04
Task 1e.17.4: 10/1/03 – 6/30/04
Task 1e.17.5: 10/1/03 – 6/30/04
Task 1e.17.6: 7/1/03 – 6/30/04
Task 1e.17.7: 7/1/03 – 6/30/04

5. Total Amount

The total amount payable under this work assignment shall not exceed $437,651.81.

6. Invoicing Procedures

Invoices must be submitted in accordance with the Contract's Budget Detail and Payment Provisions and include the Contract Number, Task Order Number, and Work Assignment Number. If a work assignment includes more than one task order, invoices must be submitted for each task order.

7. Contractor Staffing

The Task Coordinator for the CBDA will be Barbara Marcotte. The CBDA Program Manager is Rhonda Reed. Doug Brewer will serve as the principal-in-charge and will be responsible for overall project quality. Tom Trexler will serve as the project manager and will be the day-to-day contact for CALFED staff.

8. Representatives

CBDA Project Manager:

Barbara Marcotte
California Bay-Delta Authority
Ecosystem Restoration Program
650 Capitol Mall, 5th Floor
Sacramento, CA 95814
(916) 445-5196