

F1-275

JUL 28 1997

SECTION I: EXECUTIVE SUMMARY

Project Title: Wetlands Construction at the Port of Sacramento
Applicant: Port of Sacramento

Project Description and Primary Objectives:

The Port of Sacramento is currently conducting a feasibility study to evaluate constructed wetlands as an treatment alternative for its storm water discharges because of it's passive nature, excellent nitrogen uptake characteristics, and relatively low cost to implement compared to other treatment options. This proposed project provides the rationale and preliminary design criteria for increasing the base size of the proposed constructed wetlands for removal of nitrogen from storm water to provide new wetland habitat for wildlife (particularly waterfowl) in the Sacramento River-Bay Delta Region. The primary objective is to increase the available habitat for waterfowl and migratory birds.

Approach/Tasks/Schedule:

The scope of Work for which funding is requested includes the following tasks:

- Task 1. Conceptual design phase.
- Task 2. Feasibility study phase.
- Task 3. Design phase.
- Task 4. Permitting phase
- Task 5. Land subsidy
- Task 6. Construction phase
- Task 7. Monitoring phase

The Port of Sacramento is currently performing the feasibility study for the project, and constructed wetlands is the current preferred alternative. Assuming selection of this alternative, the design phase should begin in late 1997 and be completed in early 1998. Design approval could also occur in early 1998, and construction should begin and be completed during summer of 1988. The monitoring phase would begin following completion of construction.

Justification for Project and Funding by CALFED:

Creation of habitat for waterfowl and migratory birds is one area of focus in the CALFED Ecosystem Restoration program Plan. Many of the projects that will be undertaken to meet this objective are long term habitat restoration efforts. This project is focused directly on the construction of wetlands for habitat in the short term that will result in increased acreage of available habitat for waterfowl and migratory birds in the Bay-Delta. These additional areas of open water/wetland habitat will also be protected from human disturbance (e.g. boating, jet skis, water skis, etc.).

Budget Costs and Third Party Impacts:

The estimated total cost for implementing the proposed project is \$1.7 million. We are requesting funding of \$485,620 from CALFED. No negative impacts to third parties are anticipated with the proposed project. We believe there will be beneficial impacts achieved by reducing storm water loadings to the waters of the Delta and by providing additional habitat for waterfowl and migratory birds in the Delta.

Applicant Qualifications:

The Port of Sacramento will act as the prime contractor on the proposed project. Dr. Richard Gersberg will act as the lead technical advisor. He is currently Professor and Head of the Division of Occupation and Environmental Health in the Graduate School of Public Health at San Diego State University. Dr. Gersberg specializes in water quality and wastewater treatment research. He has over 40 scientific publications in the fields of limnology, wastewater wetlands treatment, and bioremediation of toxic pollutants. McLaren/Hart staff will contribute technically to the engineering design of the constructed wetlands, supervise the construction of the wetlands, assist Dr. Gersberg in selecting and planting vegetation in the wetlands, and preparation of reports. McLaren/Hart has conducted numerous projects that have included qualitative reviews and assessments of wetlands and projected impacts, quantitative delineations with associated permit developments, and the design of wetland reconstruction following dredging and environmental impact statements. Innovative approaches to wetlands restoration with an emphasis on natural recovery and erosion control have provided cost-effective solutions to wetlands restoration and construction issues at industrial properties and Superfund sites undergoing remedial measures.

Monitoring and Data Evaluations:

As part of the proposed project a monitoring program will be developed to provide data to evaluate the wetlands treatment efficiency, wetland function development, and wildlife use of the habitat.

Local Support/Coordination with Other Programs/Compatibility with CALFED Objectives:

The CALFED Ecosystem Restoration Program Plan indicates that over the past 150 years, over 300,000 acres of freshwater emergent wetlands have been lost in the Delta, and less than 15,000 acres remain. Migratory birds, waterfowl (canvasback, mallard, and snow geese), and wading birds have been identified priority species by CALFED. CALFED has indicated that "there have been substantial losses of habitat used by these species." Creation of new habitat will provide additional foraging and nesting areas for these species.

SECTION II: TITLE PAGE

Title of Project: Wetlands Construction at the Port of Sacramento

Applicant: Port of Sacramento

Principal Investigator: Thomas Scheeler, P.E.
Address: Engineering Department
1251 Beacon Boulevard, Suite 210
West Sacramento, CA 95691
Phone: (916) 371-8000

Type of Organization: Public Agency/Special District

Tax Status: Exempt

Tax Identification Number: 94-6001164

Financial Contact: (Contracts): Doug Thompson
Director of Finance
1251 Beacon Boulevard, Suite 210
West Sacramento, CA 95691
Phone: (916) 371-8000

Collaborators:

McLaren/Hart, Inc	Edward Childers, P.E.
Patrick Sheehan, Ph.D.	Chien Ngo, P.E.
William Alsop, M.S.	11101 White Rock Road
1135 Atlantic Avenue	Rancho Cordova, CA 95670
Alameda, CA 94501	Phone: (916) 638-3696
Phone: (510) 521-5200	Fax: (916) 638-2842
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Richard Gersberg, Ph.D.
Professor and Head
Division of Occupation & Environmental Health
Graduate School of Public Health
College of Health and Human Services
San Diego State University
San Diego, CA 92182
Phone: (619) 594-2905

RFP Project Type: Public Works/Construction

SECTION III: PROJECT DESCRIPTION

A. Project Description and Approach

The Port of Sacramento is currently conducting a feasibility study to evaluate treatment alternatives for reducing nitrogen loadings in storm water and the subsequent deposition of nitrogen into the Deep Water Turning Basin and the Deep Water Ship Channel and the Delta. An initial screening of available technologies indicates that a constructed wetlands is currently the preferred alternative because of its passive nature, excellent nitrogen uptake characteristics, and relatively low cost to implement compared to other treatment options.

This proposal provides the rationale and preliminary design criteria for increasing the size of the proposed constructed wetlands for removal of nitrogen from storm water to provide new wetland habitat for wildlife (particularly waterfowl) in the Sacramento River-Bay Delta Region. This incremental addition to the constructed wetland treatment system is the subject of this proposal. We propose to construct approximately five additional acres with open water areas interspersed with emergent vegetation and some upland islands as waterfowl habitat. The land for this treatment system is owned by the Port of Sacramento and is currently not developed. It is located adjacent to Lake Washington, and this is an ideal location for a constructed wetland that would provide water treatment and habitat for waterfowl and migratory birds for decades.

B. Location of the Project

This project is located at the Port of Sacramento in West Sacramento, Yolo County, California as depicted in Figure 1. The proposed site for the constructed wetlands is presented in Figure 2.

C. Expected Benefits

Stressors that have been identified by CALFED include increased contaminants loads caused by runoff and the deleterious input of nutrients. Regardless of the chosen remedial alternative, these stressors will be reduced by the actions of the Port of Sacramento without additional funding support from CALFED. CALFED has also identified population management stressors including migratory pathway changes caused by loss of habitat. The proposed project herein will provide for increasing the available habitat for migratory birds. These additional areas of open water/wetland habitat will also be protected from human disturbance (e.g. boating, jet skis, water skis, etc.). These additional benefits will occur with the selection of constructed wetlands as the preferred remedial approach.

Habitats that have been identified by CALFED include emergent wetland habitats which can be managed to recreate natural processes. The portion of the constructed wetlands designed for treatment can be augmented with open water areas, with emergent vegetation, and with upland islands to provide additional habitat within the emergent wetlands for wildlife and migratory waterfowl to achieve this objective.

Migratory birds, waterfowl (canvasback, mallard, and snow geese), and wading birds have been identified priority species by CALFED. CALFED has indicated that "there have been substantial losses of habitat used by these species." Creation of new habitat will provide additional foraging and nesting areas for these species.

D. Background and Technical Justification

Nationally almost half the 215 million acres of wetlands estimated to have been in the United States when the colonists arrived have been lost (Feierabend, 1997). Approximately 370,000 to 550,000 acres of wetland habitat are being lost each year nationally. The CALFED Ecosystem Restoration Program Plan indicates that over the past 150 years, over 300,000 acres of freshwater emergent wetlands have been lost in the Delta, and less than 15,000 acres remain.

A growing body of evidence now exists that shows wetlands treatment can be a practical approach for communities and other dischargers to meet their treatment needs while being receptive to the environmental, esthetic, and financial benefits of wetlands treatment. Kadlec and Knight (1996) have summarized data on the treatment potential of wetlands of wastewater applied to several types of systems in varying climates. This summary has demonstrated that wetlands can be particularly effective in stripping nutrients and other pollutants. However, in many cases, natural wetlands are unavailable at a particular treatment site, and in this case constructed wetlands have been shown to function similarly as pollutant removal systems (Gersberg et al. 1984, 1985, 1986). These constructed wetlands may range from the creation of a marsh in a natural setting, by merely augmenting the systems with water, to the creation of a totally artificial system which is lined with non-native soils. The vegetation that is propagated in these created wetlands is usually similar to that found in natural wetlands. This project proposes to construct a small fresh water emergent wetland to treat storm water by removing nitrogen and metals and to provide habitat. These are discussed below.

Nitrogen Removal

The most successful procedure for the removal of nitrogen from water is sequential nitrification-denitrification. In this procedure, ammonium is first oxidized to nitrate and then nitrate by nitrifying bacteria. It is then converted to gaseous end products (nitrogen gas or nitrous oxide) by denitrifying bacteria which utilize nitrate or nitrite as electron acceptors in order to carry out the oxidation of organic matter. Gersberg et al. (1986) showed that sequential nitrification-denitrification was the primary mechanism of nitrogen removal in constructed wetlands receiving municipal wastewaters. Ammonia (and total N) removal was greater than 90% in a bulrush wetlands at a 5-6 day hydraulic residence time as compared to only 11% in an unvegetated control plot. High removal efficiencies were explained by the ability of the aquatic plants to translocate oxygen from the shoots to the roots, thereby establishing an oxidized root zone where nitrification could proceed. All available evidence indicates that constructed wetlands provide alternating aerobic-anaerobic micro-environments that are necessary for total nitrogen removal. Observations in a number of treatment scenarios indicate that if dissolved organic matter is

present in sufficient quantities, then ammonia, nitrate, and total N removal efficiencies can be very high.

Metals Removal

There is most data available on the use of wetlands for heavy metal removal. Both salt water and fresh water wetlands have been shown to immobilize trace metals through precipitation-adsorption reactions in the sediments as well as uptake by the marsh plant community (Banus, 1975; Lindau and Hossner, 1982). Gersberg et al. (1986) showed that removal efficiencies of 99 percent, 97 percent, and 99 percent for copper, zinc, and cadmium, respectively were achieved for secondary treated wastewater applied to wetlands. In a small pilot scale study, Hawkins et al. (1997) indicate that removal efficiencies for metals in a constructed wetlands ranged from 33 to 85 percent. These results suggest that constructed wetlands could be designed to remove metals efficiently in addition to the nitrogen removal discussed above.

Habitat Creation

Waterfowl and migratory birds do not necessarily satisfy foraging and nesting requirements in one wetland. Wetlands provide birds with water, food (plants, invertebrates), and cover (nesting, shelter from predators). Wetland diversity and density are required to satisfy specific foraging and nesting requirements, and these requirements may differ in the breeding and non-breeding seasons. We also believe that a project such as this which combines water treatment with restoration of habitat would be a good demonstration project for CALFED in the Sacramento area.

References

- Banus, M.D. 1975. Lead, zinc, and cadmium budgets in experimentally enriched salt marsh ecosystems. *Estuar. Coastal Mar. Sci.* 3:421.
- Feierabend, J.S. 1997. Wetlands: The Lifeblood of Wildlife. In Constructed Wetlands for Wastewater Treatment: Municipal, Industrial and Agricultural. D.A. Hammer, Ed. Lewis Publishers.
- Gersberg, R.M., Elkins, B.V and C.R. Goldman. 1984. The use of artificial wetlands to remove nitrogen from wastewater. *J. Water Pollut. Control Fed.* 56, 152-156.
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- Gersberg, R.M., B.V. Elkins, S.R. Lynn, and C.R. Goldman. 1986. The removal of heavy metals by artificial wetlands. *Water Resource Symposium III. AWWA Research Foundation* 639-648.
- Hawkins, W.B., J.H. Rodgers, W.B. Gillespie, A.W. Dunn, P.B> Dorn, and M.L. Cano. 1997. Design and construction of Wetlands for aqueous transfers and transformations of selected metals.

Ecotoxicol. And Environ. Safety. 36:238-248.

Kadlec, R.H. and R.L. Knight. 1996. *Treatment Wetlands*. Lewis Publishers, New York.

Lindau, C.W. and L.R. and Hossner. 1982. Sediment fractionation of Cu, Ni, Zn, Cr, Mn, and Fe in one experimental and three natural marshes. *J. Environ. Qual.* 11:540.

E. Proposed Scope of Work

The full project will consist of a feasibility study, a design phase, a permitting phase, a construction phase, and an implementation and monitoring phase. The Port of Sacramento is currently conducting the feasibility study.

Task 3. The first task consists of the design phase. Following selection of the constructed wetland as the preferred alternative, the required site characteristics such as climactic conditions, groundwater, slope and soil permeability and the required design features such as loading rate, area, and vegetation will be evaluated.

Preliminary evaluations of loading rates and removal efficiencies for both nitrogen and metals have been performed as discussed above. Since total nitrogen is an integrative function of each of the individual nitrogen transformations which can be approximated by a first-order overall rate expression, the loss of total nitrogen between inflow and outflow of a treatment system can be predicted with a model based on empirical input-output regressions that quantitatively describe surface flow wetlands water quality treatment performance (Kadlec and Knight, 1996). The first-order, area-based nitrogen removal model predicts that approximately five acres of wetlands will yield the desired total nitrogen removal from the storm drain influent. This acreage is necessary for the treatment of storm water. It is proposed that an additional five acres of wetlands be constructed to provide additional habitat for the waterfowl and migratory birds under the CALFED Category III funding program.

The proposed location for the constructed wetland has been identified in Figure 2. The wetlands location adjacent to Lake Washington will supplement the habitat areas present there. A conceptual design for the proposed constructed wetland is presented in Figure 3. This design incorporates areas of dense vegetation to accomplish the treatment objectives and areas of open water, sparse vegetation, emergent vegetation, and islands to accomplish the habitat objectives. An artist's rendering of the proposed treatment system is presented in Figure 4. The first task will build on the preliminary work presented here to provide the engineering design for the constructed wetlands treatment system. In the design phase, site-specific physical and vegetative specifications will be developed to maximize treatment efficiency and optimize the available habitat areas.

Task 4 Permitting phase

The completed designs will be submitted to the Port of Sacramento for their approval then to the appropriate regulatory agencies. During this task the Port will make a final determination of the amount of land necessary for the completion of the project.

Task 6 Construction phase

After the required permits have been obtained, the wetlands will be constructed in accordance with the design. This task includes site preparation, site grading and berm construction, development of cells and associated piping and pumps, and planting vegetation.

F. Monitoring and Data Evaluation

As part of the remedial activities being performed by the Port of Sacramento, water quality measurements for total nitrogen will be made prior to the discharge of treated storm water to Lake Washington. As part of the proposed project a monitoring program will be developed to provide data to evaluate the wetlands treatment efficiency, wetland function development, and wildlife use of the habitat.

G. Implementability

This section deals with potential constraints in the implementation of the proposed project. The project will be completed in compliance with applicable laws and regulations. We are committed to working with appropriate regulatory agencies to assure this compliance. The wetland treatment system is being constructed, in part, to comply with the Port's storm water permit.

One concern raised in the request for proposals is the sensitivity to hydrologic conditions. The proposed system is a constructed treatment wetlands to be built adjacent to Lake Washington. However, the only hydrologic connection between the constructed wetlands and the waters of the State will be through the pumping station. Effluent quality will be monitored prior to discharge.

Another concern raised in the request for proposals is land use conditions and changes that may result from the proposed project. Figure 2 illustrates the area to be considered for the constructed wetlands. It is currently undeveloped industrial property with no potential for providing wildlife habitat. Figure 4 presents an artist's rendering of the proposed constructed wetlands. There are open areas for waterfowl and shoreline areas for wading birds. These are clearly benefits that will result from the implementation of this project.

IV. COSTS AND SCHEDULE TO IMPLEMENT PROJECT

A. Budget Costs

The estimated cost of wetland construction is \$50,000 per acre. This project is based on the assumed construction of five acres for treatment purposes (Port) and an additional five acres for habitat purposes (CALFED). Therefore, the projected costs for construction is \$250,000. We are also requesting funding for Conceptual design, feasibility study, design, permitting, land, first year operation and maintenance, and first year monitoring as indicated on the cost breakdown contained in Table 1 for a total requested funding of \$485,620.

B. Schedule Milestones

September 1, 1997	Feasibility Study complete and submitted to Port.
September 8, 1997	Port Commissioners Meeting
September-October, 1997	Agency negotiation/permitting
December, 1997 - March, 1998	Design
April-May, 1998	Design approval
June -September, 1998	Construction
October, 1998	Operation

C. Third Party Impacts

No negative impacts to third parties are anticipated with the proposed project. We believe there will be beneficial impacts achieved by reducing storm water loadings to the waters of the Delta and by providing additional habitat for waterfowl and migratory birds in the Delta. We hope also to coordinate the project with other funding mechanisms such as the Fertilizer Research and Education Program which would leverage the funding available from CALFED to the greater benefit of users, handlers, transferrers, storers, and importers of bulk fertilizers. We also believe that a project such as this which combines water treatment with restoration of habitat would be a good demonstration project for CALFED in the Sacramento area.

V. APPLICANT QUALIFICATIONS

The Port of Sacramento will act as the prime contractor on the proposed project. The Port will provide interface with the Category III contracting entity. McLaren/Hart will act as the principal subcontractor on the proposed project. McLaren/Hart will provide staff and resources to manage the technical and administrative aspects of the project and will coordinate implementation of the project with Dr. Gersberg, a subcontractor. McLaren/Hart staff will contribute technically to the engineering design of the constructed wetlands, supervise the construction of the wetlands, assist Dr. Gersberg in selecting and planting vegetation in the wetlands, and preparation of reports.

McLaren/Hart and its ChemRisk Division have conducted projects that have included qualitative reviews and assessments of wetlands and projected impacts, quantitative delineations with associated permit developments, and the design of wetland reconstruction following dredging and environmental impact statements. McLaren/Hart prepares a thorough data base to ensure compliance with all wetlands regulations for real estate transfer, for development projects, in preparation of remedial activities in wetland habitats, and in constructing wetlands. McLaren/Hart combines a detailed ecological understanding of wetlands with sound engineering support to develop comprehensive mitigation or construction plans. McLaren/Hart emphasizes construction to support the rapid rebuilding of the wetland structure and function. Innovative approaches to wetlands restoration with an emphasis on natural recovery and erosion control have provided cost-effective solutions to wetlands restoration and construction issues at industrial properties and Superfund sites undergoing remedial measures.

The project organization is shown in Figure 5.

Mr. Thomas Scheeler, P.E. will serve as principal in charge. He is the Director of Engineering of the Port of Sacramento, and he will have direct responsibility for all aspects of the project.

Mr. Ed Childers, P.E. will serve as project manager. He will have direct responsibility for all operational aspects of the project including overall technical direction and ensuring that scheduling and budgetary constraints are met. Mr. Childers is a Senior Engineer in McLaren/Hart's RI/FS group who has directed multiple projects involving storm water/receiving water impacts and ecological restoration and mitigation. His responsibilities include project management, preparation and review of design plans, specifications, contract documents, and engineering reports. Mr. Childers has 10 years experience in environmental restoration and management projects.

Mr. Childers also has been responsible for evaluation, development, and selection of best management practices, site investigation, remedial action, and ecological restoration alternatives and technologies and has analyzed performance criteria of various storm water, groundwater and soil treatment programs.

Mr. Childers has directed regional professional staff and resources on over 70 environmental projects including water resources/quality, remedial investigation/feasibility study, remedial design, and remedial

action for hazardous/toxic substance impacted properties.

Mr. Chien Ngo, P.E. will serve as engineering task manager. He will have direct responsibility for all engineering aspects of the project including design and construction of the wetlands. Mr. Ngo is a chief engineer with McLaren/Hart with 23 years experience in design of water and wastewater treatment facilities. He has specialized in designing and managing/overseeing the design of treatment facilities for removal of volatile organic compounds (VOCs) in groundwater and the design of oil recovery systems to recover large quantities of oil that leaked into the soil. Mr. Ngo is a pioneer in the development and application of the air stripping process used in remediation projects. He also has extensive experience in the advanced oxidation process for groundwater remediation. He is responsible for the technical management of McLaren/Hart's remedial actions in the Western Region of the United States. Mr. Ngo's technical management includes the design and construction of more than 100 remedial projects, with total project values in excess of \$75 million. He was responsible for organizing engineering staffs of 4 offices and 15 subcontractors to carry out projects to their completion, including project schedule implementation, budget tracking, work assignments, and tracking of work plans.

Mr. Ngo successfully managed the design and construction of a \$5.5 million dollar remediation project for the IBM facility in San Jose. This project was selected as a national award winner of HAZMACON 1992. Currently, Mr. Ngo is responsible for the design, procurement and installation of a 3 MGD industrial wastewater treatment system, a 25,000 m³/day demineralization facility and a 26 MGD municipal wastewater treatment plant.

Dr. Richard M. Gersberg will serve as senior technical advisor for the design and vegetation aspects of the constructed wetlands. Dr. Gersberg is currently Professor and Head of the Division of Occupation and Environmental Health in the Graduate School of Public Health at San Diego State University. He has an M.S. degree in biology from the University of Houston and a Ph.D degree in microbiology from the University of California, Davis (1977). Dr. Gersberg specializes in water quality and wastewater treatment research. He was project manager of the EPA-funded project on the use of constructed wetlands for wastewater treatment at Santee, CA from 1979-1986, and as such was one of the pioneering researchers in the area of constructed wetlands for wastewater treatment. He has over 40 scientific publications in the fields of limnology, wastewater wetlands treatment, and bioremediation of toxic pollutants. Currently, Dr. Gersberg is a principal investigator on a contract funded by the U.S. EPA and the State Water Resources Control Board for a microbiological water quality study of the San Elijo Lagoon in San Diego County. Dr. Gersberg is a member of the IAWPRC Specialist Group on the Use of Macrophytes in Water Pollution Control.

Dr. Patrick Sheehan will serve as senior technical advisor. Dr. Sheehan is Practice Area Director for ChemRisk in the Western Region and National Practice Area Director for Ecological Risk Assessment for ChemRisk. He is responsible for developing projects, staff and methods for McLaren/Hart's services practice on a nationwide basis. Dr. Sheehan authored one of the first text books on ecotoxicology and has earned a national and international reputation as an ecotoxicologist and ecological risk assessor. Dr.

Sheehan has directed and provided oversight for human health and ecotoxicological risk assessments at numerous CERCLA and RCRA sites including some of the more high profile sites in the United States. He administers a variety of projects evaluating the risks of chemicals in soil, water, sediments and air. Studies directed by Dr. Sheehan have included benthic community assessments, toxicity testing, toxicity identification evaluations, risk allocation evaluations, wildlife exposure assessments, probabilistic uncertainty analyses and wetland evaluations and restorations. He frequently interacts with local, state and federal regulatory agencies and has testified before government panels on risk assessment issues. Dr. Sheehan's assessments have produced accurate and representative characterization of exposures and risks, and subsequently have supported cost-effective remediation of contaminated sites and the permitting of innovative remediation technologies.

Mr. William Alsop will function as senior technical advisor. He will be responsible for managing the evaluation of risks to fish and wildlife from the proposed wetland treatment options. Mr. Alsop is a Senior Health Scientist with ChemRisk, a McLaren/Hart Division, in Alameda, California. In his position, Mr. Alsop is responsible for managing both human health and ecological risk assessment projects, as well as providing technical expertise on water quality related issues. He has worked on these assessments for hazardous waste sites and permitting efforts including wetlands evaluations. He has over 20 years experience in environmental issues. Mr. Alsop's experience is in providing ecological risk assessment services to the regulated community. He has evaluated the effects of direct and food chain exposures to metals, chlorinated benzenes, pesticides, PCBs, and PAHs. His regulatory experience includes EPA Regions I through X and regulatory agencies in over twenty states including California (DTSC), New York (NYSDEC), Massachusetts (DEP), Minnesota (MPCA), and Louisiana (LDEQ). Mr. Alsop is currently serving on the CALFED Water Quality Technical Group-Parameter Assessment Team.

Mr. Alsop's project management experience ranges from endangered species assessments for a single chemical to a \$1.2 million ecological risk assessment of a 28,000-acre military facility as part of the Base Realignment and Closure (BRAC) process. His site experience includes U.S. Army facilities, pulp and paper mills, industrial manufacturing facilities, port facilities, landfills, Superfund sites, RCRA facilities, and wetlands projects.

VI. COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

McLaren/Hart has reviewed Attachment D, *Terms and Conditions* and requests your consideration of the following proposed changes. Unless otherwise noted below, all other terms and conditions are acceptable as written.

Item 9, Indemnification: In the 5th and 6th lines, insert "Contractor's negligent" between the words "the performance". In the 7th and 8th lines, strike "Contractor in the" and replace with "Contractor's negligent".

Table 1
Cost Breakdown

Project Phase	Port of Sacramento Direct Labor Hours	Port of Sacramento Direct Salary and Benefits	Port of Sacramento Overhead Labor (General, Admin, and Fee)	Professional Service and Construction Labor Contracts	Construction Material Acquisition Contracts	Miscellaneous and other Direct Costs	Total Requested Funding
Conceptual Design	20	\$880	\$435	\$8,000			\$9,315
Feasibility Study	30	\$1,320	\$652	\$10,000			\$11,972
Design	40	\$1,760	\$870	\$25,000			\$27,630
Permitting	20	\$880	\$435	\$12,500			\$13,815
Land	20	\$880	\$435			\$150,000	\$151,315
Construction	80	\$3,520	\$1,739	\$175,000	\$75,000		\$255,259
Operation and Maintenance (Annual)	10	\$440	\$217	\$7,500			\$8,157
Monitoring (Annual)	10	\$440	\$217	\$7,500			\$8,157
Total	230	\$10,120	\$5,000	\$245,500	\$75,000	\$150,000	\$485,620

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

STATE OF CALIFORNIA)

COUNTY OF YOLO)

)ss

THOMAS SCHEELER, being first duly sworn, deposes and
(name)

says that he or she is DIRECTOR OF ENGINEERING of
(position title)

PORT OF SACRAMENTO

(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, consived, 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: 7/28/97By Thomas Scheeler

(person signing for bidder)



(Notarial Seal)

Subscribed and sworn to before me on

June E. GentryJuly 28, 1997

(Notary Public)

NONDISCRIMINATION COMPLIANCE STATEMENT

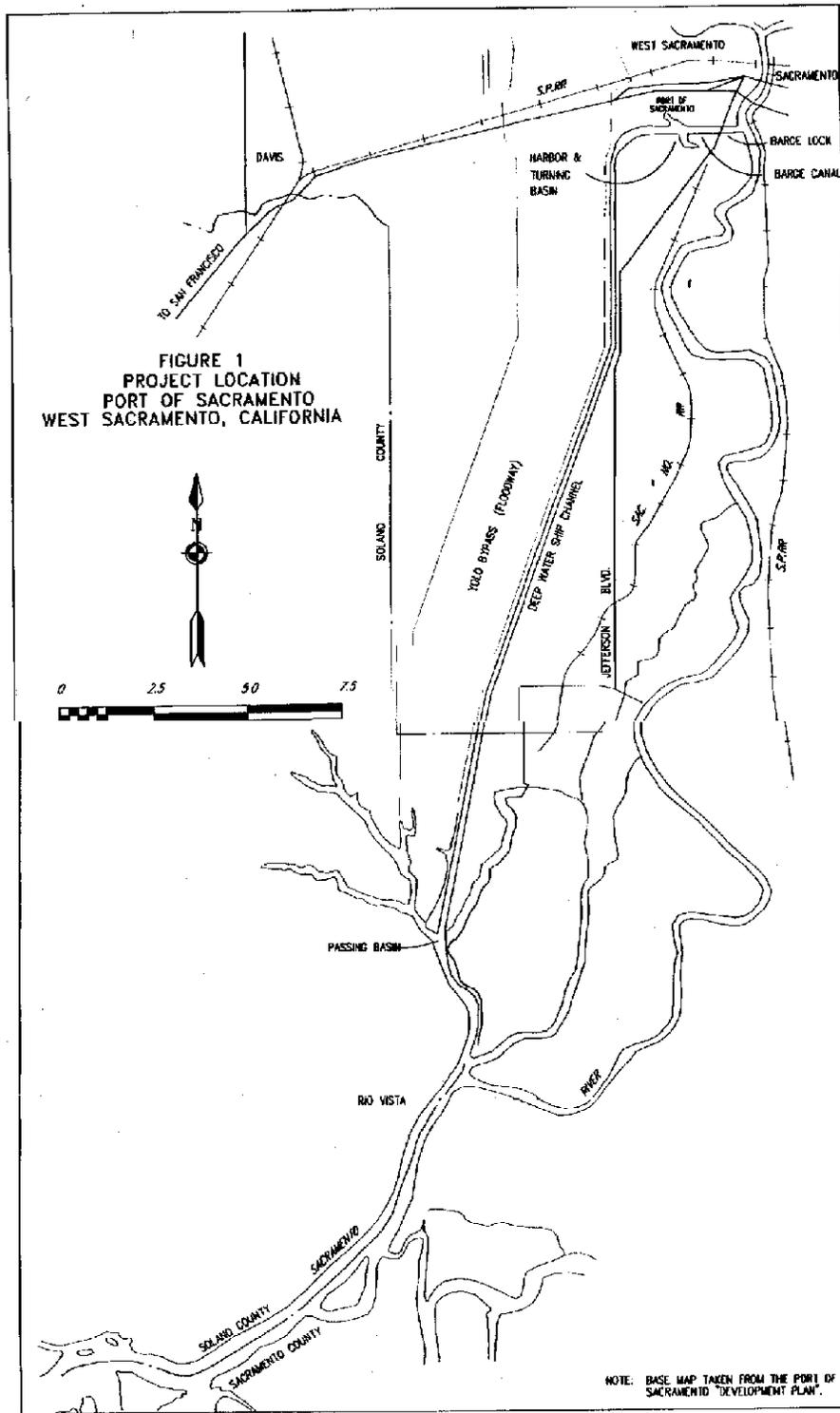
COMPANY NAME
PORT OF SACRAMENTO

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 Thomas SCHEELER	
DATE EXECUTED 7/28/97	EXECUTED IN THE COUNTY OF Yolo
PROSPECTIVE CONTRACTOR'S SIGNATURE Thomas Scheeler	
PROSPECTIVE CONTRACTOR'S TITLE DIRECTOR OF ENGINEERING	
PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME PORT OF SACRAMENTO	



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I-006008

600900-1



WORK SHEET NO. 412
 DASHED LINES REPRESENT PROPOSED CHANGES
 AND MAY NOT MEET NATIONAL MAP ACCURACY STANDARDS.

SPD. CALIFORNIA COORDINATE SYSTEM 1983 ZONE 1
 HORIZONTAL DATUM: NAD 83
 UNIT OF MEASUREMENT: METERS

COMPILED BY: TADANAR ARIAL SURVEYS
 2225 24TH STREET
 SACRAMENTO, CA 95823

WORK SHEET NO. 412
 DASHED LINES REPRESENT PROPOSED CHANGES
 AND MAY NOT MEET NATIONAL MAP ACCURACY STANDARDS.

SCALE 1" = 100'

BY	DATE	REVISION	REVISION DATE
		ISSUED	DEC. 1991
		CHK'D	
		APPROVED	
		CITY ENGINEER	CAT

CITY OF WEST SACRAMENTO
 ENGINEERING DIVISION
 1061 SOUTH RIVER ROAD
 WEST SACRAMENTO, CALIFORNIA 95891

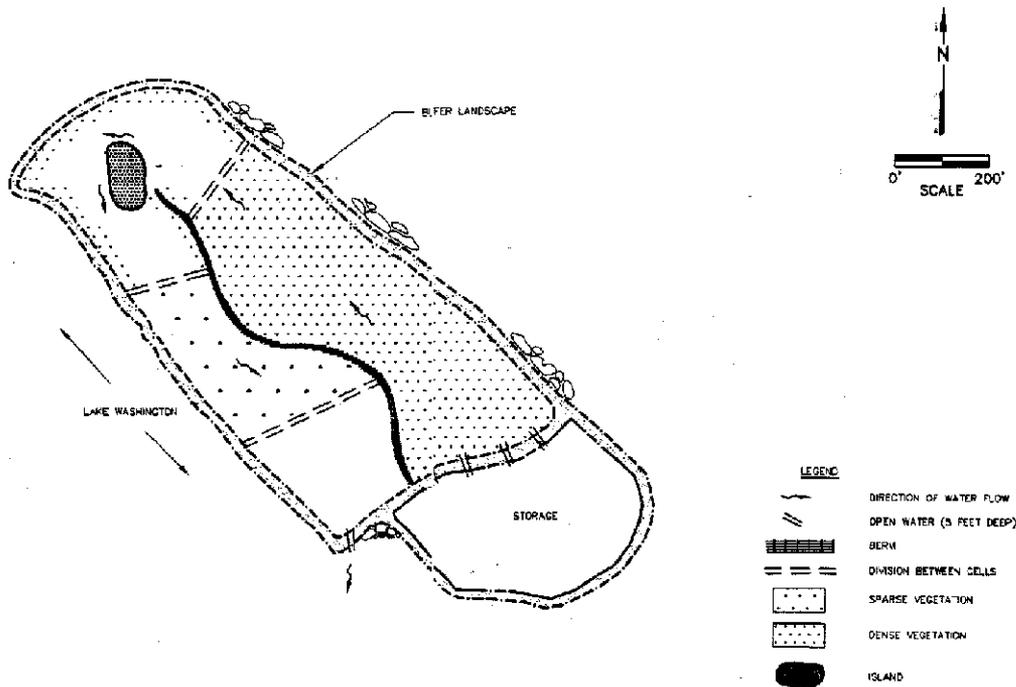


FIGURE 2
 PROPOSED PROJECT SITE
 PORT OF SACRAMENTO
 WEST SACRAMENTO, CALIFORNIA

RA97-0144

600900-1

FIGURE 3
 PROPOSED WETLAND CONCEPTUAL DESIGN
 PORT OF SACRAMENTO
 WEST SACRAMENTO, CALIFORNIA



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FIGURE 5
 PROJECT ORGANIZATION
 PORT OF SACRAMENTO
 WEST SACRAMENTO, CALIFORNIA

