

Meeting Date: 12/10/2013

Report Type: Consent

Report ID: 2013-00829

Title: Agreement: Blankinship Inc. for Water Quality Detention Basin Regulatory Support

Location: Citywide

Issue: A professional services agreement is needed for regulatory compliance support for the City-owned and maintained water quality detention basins.

Recommendation: Pass a Motion 1) authorizing the City Manager, or the City Manager's designee, to execute a professional services agreement with Blankinship, Inc., to provide Water Quality Detention Basin Regulatory Support for an initial term of one-year with up to two one-year extension options, in an amount not to exceed \$225,000 for the maximum three-year term; and 2) authorizing the City Manager, or the City Manager's designee, to approve the one-year extensions, provided that sufficient funds are available for this purpose in the budget adopted for the applicable fiscal year(s).

Contact: Michael Malone, Operations Manager, (916) 808-6226; William Roberts, Utilities Operations & Maintenance Superintendent, (916) 808-6955, Department of Utilities

Presenter: None

Department: Department Of Utilities

Division: Drainage Maintenance

Dept ID: 14001161

Attachments:

1-Description/Analysis

2-Background

3-Exhibit A (RFQ 7-2013_WQ Detention Basin Maintenance and Regulatory Support)

4-Exhibit B (PSA_WQ Detention Basin Regulatory Support)

City Attorney Review

Approved as to Form
Joe Robinson
12/2/2013 2:38:31 PM

City Treasurer Review

Reviewed for Impact on Cash and Debt
Russell Fehr
11/19/2013 10:30:59 AM

Approvals/Acknowledgements

Department Director or Designee: Dave Brent - 12/2/2013 11:20:01 AM

Description/Analysis

Issue: The Department of Utilities (DOU), Operations and Maintenance Division, maintains the City's regional water quality detention basins. Regulatory compliance support services are needed for both a Statewide General National Pollutant Discharge Elimination System (NPDES) permit for aquatic pesticides and weed control and a Routine Maintenance Agreement with the California Department of Fish and Wildlife (DFW).

Policy Considerations: City Council approval is required for professional services agreements in an amount of \$100,000 or more.

Economic Impacts: Not Applicable

Environmental Considerations:

The Community Development Department, Environmental Planning Services has reviewed the project and has determined the project is exempt under the California Environmental Quality Act (CEQA) under Section 15307 of the CEQA Guidelines. The approval of the agreement to provide regulatory support services relative to pesticide and weed control is an action taken as authorized by State law to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for the protection of the environment. This agreement would not result in any substantial changes in the existing operations and processes. The use of aquatic pesticides is regulated by NPDES permit requirements issued by the State Water Resource Control Board (SWRCB), and the State of California. DFW issues a Routine Maintenance Agreement when work within drainage ways could substantially adversely affect fish and wildlife resources.

Sustainability: Not Applicable

Commission/Committee Action: Not Applicable

Rationale for Recommendation: DOU's Operations and Maintenance Division has an ongoing need for regulatory support to remain in compliance with both the Statewide General NPDES aquatic pesticide permit with the SWRCB and the Routine Maintenance Agreement with the DFW. Approval of the agreement with Blankinship & Associates, Inc. is recommended to obtain these support services.

Financial Considerations: The proposed agreement has an initial one-year term, with the option to extend for up to two additional one-year terms, for a total amount not to exceed \$225,000 for the maximum three year term. Sufficient funding for the initial one-year term, in the amount of \$79,000, is available in the Department of Utilities, Operations and Maintenance Division FY2013/14 operating budget. Extensions of the contract in succeeding fiscal years will be subject to funding availability in the adopted budgets for each fiscal year.

Emerging Small Business Development (ESBD): Blankinship & Associates, Incorporated is certified as an emerging business.

Background

The Department of Utilities (DOU), Operations and Maintenance Division, maintains the City's regional water quality detention basins and drainage channels. Efficient and effective management practices to better control reoccurring nuisance conditions (aquatic weeds and odors) within these drainage features are subject to regulations from various state agencies.

DOU issued a Request for Qualifications (RFQ) to provide support services necessary to maintain compliance with these regulations. The following five firms submitted Statements of Qualifications (SOQs) addressing the following main tasks: Aquatic Weed Control NPDES Permit Regulatory Support and DFW Routine Maintenance Agreement (RMA) Regulatory Support.

- McNabb Construction (DBA – DK Environmental); submitted for aquatic weed and RMA work
- Foothill Associates; submitted for RMA work
- Blankinship & Associates, Inc.; submitted for aquatic weed and RMA work
- 2MN Engineering, Inc.; submitted for aquatic weed work
- Nichols Consulting Engineers, Chtd.; submitted for RMA work

An evaluation panel consisting of DOU Engineering Services staff, DOU Drainage Collection staff, and an outside panel member from the City of Folsom reviewed the SOQs and ranked Blankinship & Associates, Incorporated as the top-ranked firm to provide these services. Blankinship & Associates, Inc. is a California firm, based in the Sacramento region. Blankinship & Associates along with their subcontractors had the most experience working with municipalities, NPDES aquatic weed permit compliance, streambed alteration agreements, and routine maintenance agreements.

The Operations and Maintenance Division is requesting approval for a one-year agreement, with the option to renew yearly for an additional two years, for a total of not more than three years.

The agreement includes the following services:

Task 1: Aquatic Weed Control NPDES Permit Regulatory Support

Task 2: DFW Routine Maintenance Agreement Regulatory Support

Optional Task (Year 1 Only): State Implementation Policy (SIP) Exception

Payment for subsequent years is subject to increases or decreases due to maintenance demand and outside forces such as regulatory changes. Any increase in payment for subsequent years requires written justification and is subject to review and approval by City staff. In order to cover any potential changes in scope of work or increases in cost over the next three years, the agreement includes a contingency of approximately 25%, which results in a not-to-exceed amount of \$225,000 for the maximum potential term of three years, as shown below.

Payment Schedule	Year 1	Year 2	Year 3	Contingency Funds	Agreement Total
Tasks 1 & 2	\$50,000	\$50,000	\$50,000	\$46,000	\$196,000
Optional	\$29,000				\$29,000
TOTAL	\$79,000	\$50,000	\$50,000	\$46,000	\$225,000

City of Sacramento Department of Utilities

REQUEST FOR QUALIFICATIONS Q13141431008

Water Quality Detention Basin Maintenance
and Regulatory Support

Issued: July 17, 2013
Due Date: July 31, 2013, 2:00 pm deadline
Submit to: City of Sacramento
South Area Corp Yard
5730 24th Street, Bldg #22
Sacramento, CA 95822

For: Roxanne Dilley, Department of Utilities
Engineering Services

For Information Contact:
Roxanne Dilley
(916) 808-1458 (voice) (916) 808-1497 (fax)
E-Mail: rdilley@cityofsacramento.org



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**REQUEST FOR QUALIFICATIONS
PROFESSIONAL SERVICES
FOR
Water Quality Detention Basin Maintenance and Regulatory Support**

A. Introduction

a. Purpose

The City of Sacramento (City) is requesting qualifications from firms interested in providing maintenance support for the City's regional water quality detention basins, and regulatory compliance support for the City's drainage channels and detention basins. The maintenance support will consist of a condition assessment of sediment accumulation and nuisance algae issues, and to work with City staff to further develop practical maintenance prescriptions for the water quality detention basins. Regulatory compliance support will include assistance with a NPDES aquatic pesticide permit for weed control and a Department of Fish and Wildlife agreement for applicable drainage facilities maintained by the City. The term for the requested services is for up to three fiscal years (2013/2014, 2014/2015 and 2015/2016), but some activities may extend past this term. Firms may submit a Statement of Qualifications (SOQ) for one, two, or all three of the following subject areas: (1) wet detention basin condition assessment and maintenance prescriptions, (2) aquatic weed control regulatory support, and (3) regulatory support for a routine maintenance agreement with Department of Fish and Wildlife (DFW).

Detention basin condition assessment, maintenance prescription support, and regulatory compliance support services will be provided as described in Section C. REQUESTED SERVICES of this Request for Qualifications (RFQ).

Interested firms are invited to submit their SOQs in accordance with the requirements of this RFQ. SOQs shall be submitted in accordance with the format and information listed in Section D. SOQ SUBMITTAL REQUIREMENTS of this RFQ.

b. Deadline

SOQs are to be received by 2:00 pm on July 31, 2013 as described in Section D of this RFQ.

c. Background

Under the federal Clean Water Act, Stormwater discharges are regulated through National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permits. Municipal Stormwater permits require municipalities to regulate and manage the quality of urban runoff throughout their jurisdictions. A Sacramento areawide NPDES permit (No. CAS082597) was originally issued in 1990, and has been reissued several times since then. The current permit was adopted in September 2008, and is anticipated to be reissued in 2014. The City began

conditioning development projects to include Stormwater quality control measures in the mid-1990s, and the construction of water quality detention basins began in the mid to late 1990s. The detention basins conditioned and constructed during this period serve as regional stormwater quality control measures for newly constructed areas of the City. Appendix A contains maps of 18 water quality basins. The City's water quality detention basins provides both stormwater quality treatment and flood control, aesthetic and recreational value, provides wildlife habitat, and are viewed as a public amenity due to their integration into a park or open space.

A stormwater quality detention basin (also called water quality basin or extended detention basin) is designed to capture stormwater in the winter and urban runoff in the summer. Potential features incorporated within the design of a stormwater quality basin include: constructed and/or vegetated channel(s); inflow/outflow structures; a forebay; a permanent pond; low-flow channel(s); micro pool(s); a filter dam; and submerged gravel beds. The North Natomas wet basins were designed to operate with a pumping outfall structure that can control the water surface elevation and regulate discharge. Addressing inspection and maintenance standards of wet detention basins is a major component of controlling runoff volume and mitigating pollution from runoff. An understanding of common maintenance problems is essential in determining practical solutions.

Stormwater quality detention basins and channels detain flow and allow particles and associated pollutants to settle out; additionally, the permanent ponds and micro pools may enhance pollutant removal through biological and chemical processes. Sediment accumulates in stormwater ponds by design and eventually requires removal. Because these water quality treatment features allow for sedimentation and potential biological uptake of certain pollutants, an accumulation of sediments and pollutants need to be periodically evaluated for quality and quantity. The City's water quality detention basins have been in operation for approximately 10 to 20 years (depending on time of construction). Reoccurring nuisance conditions within these basins has triggered a need to evaluate the sediment quantity and quality. The City has identified nutrients such as nitrogen and phosphorus as potential pollutants of concern within these basins. These nutrients are suspected for many of the nuisance conditions experienced by the City. Nutrients that are typically found in stormwater runoff can accumulate in water quality ponds leading to degraded conditions such as low dissolved oxygen, algae blooms, unsightly conditions and odors. Homeowners adjacent to water quality ponds have, on occasion, complained about these issues. These excess nutrients are often the result of human actions. The City wishes to better understand how to maintain these stormwater basins to control nuisance conditions in an environmentally holistic manner while complying with applicable regulations.

Wet detention basins present special design considerations. Selection of appropriate vegetation and nuisance abatement are required in order for it to function properly as a water quality control measure and a public amenity. Because these detention basins provide wildlife habitat and aquatic features, additional regulations dictate how the maintenance of these features are conducted. Wetland plants within the detention basins and associated drainage channels

promote biological uptake of pollutants. Management of vegetation should be conducted in a manner that meets the design goals. Small shallow ponds provide optimal conditions for the proliferation of monolithic stands of cattails. Control of such aquatic plants is required to ensure excessive vegetation does not impact basin capacity or flow. Additionally, plant species known to improve water quality (emergent plants within the channels and ponds and herbaceous trees and shrubs along the outer borders) need to be evaluated to insure invasive species have not eliminated these plants. Management of terrestrial and aquatic vegetation within applicable drainage facilities maintained by the City must comply with regulations. The City currently has a routine maintenance agreement (RMA) with the DFW as well as an aquatic weed control NPDES permit that includes restrictions on aquatic vegetation management. Appendix B and C contains the RMA and the aquatic weed control NPDES permit.

All of the water quality detention basins and associated channels eventually discharge into local waterways. A permit is required to apply aquatic pesticides to waters that discharge into the waters of the United States. Nuisance aquatic vegetation in and along these detention basins and channels requires a Statewide General NPDES permit, #CAG 990005 (herein referred to as the "general permit"), for the discharge of aquatic pesticides used for aquatic weed control. The City obtained coverage under this general permit in September 2012, but a new general permit becomes effective on December 1, 2013. In order to have new general permit coverage, the City will need to have permit documentation updated.

Copies of the following reports and information will be available for review at the City of Sacramento, Department of Utilities, 1395 35th Avenue between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday from July 17,- July 30, 2013:

- Maps of Water Quality Detention Basins
- Routine Maintenance Agreement with Department of Fish and Wildlife
- Aquatic Pesticide General NPDES for Aquatic Weed Control
- City of Sacramento Aquatic Pesticide Application Plan (APAP)
- Geosyntec Technical Memorandums
- City of Sacramento Draft Maintenance Prescriptions

d. Project Budget

The City's budget estimates for the three subject areas noted in section A.a. above are shown below:

Aquatic Pesticide Regulation support is \$30,000 per year
Routine Maintenance Agreement support is \$20,000 per year
Basin Condition Assessment is \$50,000 per year

Available funding may be less or greater, depending on annual budget approvals and other regulatory needs.

B. Selection Process

a. Review Process

After the submittal deadline has passed, a selection committee comprised of at least two representatives from the Department of Utilities and at least one from another City of Sacramento Department and one from another utilities agency will review and rank the SOQs in accordance with the criteria provided in Attachment 1 – SOQ Rating Form, which include experience conducting work for a municipal agency involving regulatory compliance; experience conducting water quality monitoring; experience with biological surveys and training; experience preparing operations and maintenance manuals; staff availability; statement of qualification’s quality and completeness, and references.

A selection of the top ranked firm(s) may be made based solely on the selection committee’s review and ranking of the SOQs, without conducting any interviews.

Interviews may also be conducted with the top ranked firms (minimum of two for each subject area) considered in the selection. Interview evaluation factors, if interviews are held, it will include: an overall demonstration of the project manager’s ability to manage the project; on the project team’s knowledge and expertise in water quality detention basins and associated regulations; on the ability to perform the required tasks; and on the depth and professionalism of the presentation. If interviews are held, the selection committee will select the top-ranked firm(s) based on both the SOQ rankings and the interview results, as indicated in Attachment 1 – SOQ Rating Form.

The City will enter into negotiations for a Professional Services Agreement with the top ranked firm(s). If negotiations are not successful in reaching agreement, the City may enter into negotiations with the next-ranked firm, and so on until an agreement is reached. The City may enter into one agreement with one firm, or multiple agreements with multiple firms, for the different subject areas described herein.

Emerging and Small Business Enterprise (ESBE) participation will be considered during SOQ evaluation as indicated on Attachment 1 – see Attachment 3 for more information.

Local Business Enterprise (LBE) participation will be considered during SOQ evaluation as indicated on Attachment 1 – see Attachments 4 and 5 for more information.

The issuance of this RFQ shall not be interpreted as, and does not constitute, a representation by the City that any specific firm or firms will be retained to perform any of the

services described herein, and a firm shall not acquire any right or entitlement to be retained for such purpose by virtue of submitting a SOQ in response to this RFQ.

The City reserves the right to issue additional RFQ(s) for the performance of these services during the service period specified below. The City may select qualified firms that submit SOQs in response to this RFQ, and/or any subsequent RFQ, to perform all, some or any of the consulting services required by the City. The City also reserves the option to cancel or modify this RFQ and the selection process at any time.

b. Selection Schedule

RFQ issued	July 17, 2013
Non-mandatory Pre-SOQ Meeting	July 24, 2013
Last Day to Ask Questions (if necessary)	July 26 (2:30 p.m.)
Last Addendum Posting Date (if necessary)	July 26, 2013
SOQs due	July 31st by 2:00 p.m.
Selection Panel	Week of August 5th
Informal Interviews (optional)	Week of August 12th
Contract negotiations & preparations	Week of August 29th
City Council approval (if required)	September 10, 2013
Notice to proceed	Approx. September 15, 2013

A non-mandatory pre-SOQ meeting will be held at 9:30 a.m. on July 24, 2013 at the City of Sacramento Department of Utilities Administration building, at 1395 35th Avenue, Sacramento, CA 95822 in the Sacramento River Room.

It is important that the firm(s) selected be able to respond quickly during contract negotiations and initiate work as soon as possible after the contract has been approved.

C. SERVICES REQUESTED

The period during which the services described herein will be performed will extend from approximately September 2013 through approximately June 2016; however, some assignments may need to be completed after this time period. A detailed scope of work will be developed after selection of the most qualified firm(s). The firm(s) selected on the basis of this SOQ process will meet with City of Sacramento staff to identify the specific tasks and schedule to be included in the scope of services and cost estimate for the following subject areas.

Subject Area 1. Wet detention basin condition assessment and maintenance prescriptions.

- Review two Technical Memorandums (TM) developed by Geosyntec Consultants in 2005 for the North Natomas basins. Evaluate findings and recommendations for consideration in the decision making process of the conditions assessment. TMs provided in Appendix E.

- Work with City staff on basin prioritization for condition assessments.
- Recommend a practical strategy for field crews to monitor sediment accumulation over the long term
- Conduct sediment survey on accumulated sediments within selected wet detention basins, and determine if sediment removal is warranted.
- Collect sediment samples and analyze sediment quality for potential nutrient loads that may be adversely impacting water quality
- Establish a strategy for practical algae control methods for all wet basins having a history of nuisance conditions, and identify potential aeration systems (or other suitable algae control) appropriate for these basins
- Provide cost estimations and draft specifications for sediment removal and aeration installation for the purpose of budgeting and planning
- Evaluate conditions of plants known to improve water quality in detention basin areas, and identify areas where replanting or supplemental plantings may be appropriate
- Assist the City in completion of a field manual pertaining to detention basin maintenance prescriptions. Maintenance prescriptions, from several Adaptive Management Plans (AMPs) previously developed when the basins were constructed, have been consolidated into a format that is more user friendly for field crews. Multiple AMPs were developed for many of the basins, and contained some guidance on maintenance prescriptions for the various vegetative zones within the basin. The City is in the process of consolidating applicable maintenance prescriptions into one user-friendly document that can be utilized by field staff. A copy of this draft document is provided in Appendix F.
- Develop quick-reference cards for select special status species identification that can be used by crews out in the field, and that can be easily stored in maintenance vehicles.
- Establish training for field crews on long-term maintenance strategies

Subject Area 2. Aquatic Weed Control Regulatory support

- Revise the Aquatic Pesticide Application Plan (APAP) to incorporate requirements of the NPDES Aquatic Weed Permit effective December 1, 2013. Revised APAP to be submitted to the Regional Board in the early Fall of 2013. See Appendix D for a copy of the City's current APAP.
- Provide APAP training
- Conduct sample collection and analysis according to permit requirements, and perform quality assurance/quality control of data
- Tabulate analytical laboratory and field data, and prepare annual report.

Subject Area 3. Regulatory support on DOU's Department of Fish and Wildlife (DFW) routine maintenance agreement

- Provide training to maintenance staff on special status species
- Conduct biological surveys of work areas according to the requirements of the DFW routine maintenance agreement.
- Assist with agreement renewal negotiations between the City and DFW

The firm(s) selected shall commit key individuals with experience and expertise in the subject area(s) included in their SOQs.

D. STATEMENT OF QUALIFICATIONS SUBMITTAL REQUIREMENTS

Firms or individuals interested in submitting qualifications for this project should respond to this Request for Qualifications (RFQ) by submitting a written SOQ providing all the information requested below. The SOQ will be considered complete only if all of the items listed in this section are included in the submittal.

Five (5) hard copies of the SOQ and one (1) electronic copy of SOQ on CD in PDF format shall be submitted no later than 2:00 PM, July 31, 2013 to:

City Of Sacramento
South Area Corp Yard
5730 24th Street, Bldg # 22
Sacramento, CA 95822

Re: Statement of Qualifications for Water Quality Detention Basin Maintenance and Regulatory Support

For: Roxanne Dilley, Dept of Utilities, Engineering Services

The SOQ must be limited to ten (10) double-sided pages not including introductory letter, resumes, ESBE form (Attachment 3), LBE form (Attachment 5), Business Headquarters Confirmation Form (Attachment 6), and ESBE and LBE documentation (if applicable), and work samples (optional). The submittal must be provided in a sealed envelope or box.

Please provide and present the following information in the order listed, in a clear and concise format:

1. Firm Name.
2. Corporate office and local office address, city, state, zip code, telephone number, fax number, and web site addresses
3. Introductory letter describing firm's basic understanding of the services identified. This letter should also contain an expression of the firm's interest in the work (indicating whether interest is in Subject Area 1, 2, 3, 4 or all subject areas), a statement regarding the qualifications of the firm to do the work, and any summary information that may be useful or informative to the City.

4. Firm brief history, background, specialties, ownership
5. SOQ contact person, address, phone number, e-mail address
6. Office location or locations where the work will be accomplished by the proposing firm and subcontractors.
7. Organizational chart for proposed team, identifying the project manager and task leads. The project manager should be the day-to-day contact for the project and will be expected to communicate with City staff.
8. Describe project team and include specific subject areas that the Project Manager and individual team members would support. Summarize expertise and qualifications of key project team members to provide services described in Section C, above.
9. List the Project Manager and individual project team members' past and ongoing experience in the Subject Areas submitting on. Include three client references, addresses and telephone numbers for key team members. Indicate the roles of project team candidates in the projects listed. Briefly discuss how this past experience relates to the tasks included in the SOQ and affects your project approach.
10. One sealed envelope containing a rate schedule for the term of the project. For consultant team SOQs, the rate schedule should be comprised of agreed-upon common rates that will be used for each task proposed to be completed by the team.
11. Provide an attachment or appendix with resumes including applicable experience for Project Manager and key individuals.
12. Provide information identifying key members of firm/project team who will be assigned to project through completion of the project and their availability. The identification and utilization of specific key personnel through the life of the project are important factors in the City's consideration and selection of a firm/project team. Any changes in identified key personnel after the award of the agreement must be approved by the City in writing before the change is made. Include availability of team to begin work as soon as possible after the selected firm receives the notice to proceed.
13. Provide a disclosure identifying any actual, apparent or potential conflict of interest that may result from the performance of any of the services described in Section C of this RFP. These may include any actual, apparent, direct or potential conflicts of interest that may exist with respect to the firm, employees or other persons relative to the provided service. City policy is described further in Section H. CONFLICT OF INTEREST POLICY of this RFP.

14. Complete the form entitled “Items Requiring Response” (see Attachment 3) and attach copies of Emerging Business Enterprise (EBE) or Small Business Enterprise (SBE) certifications.
15. Complete the form entitled “Local Business Enterprise (LBE) Preference Program” (see Attachment 5) and attach a current copy of the City of Sacramento Business Operations Tax Certificate and/or County of Sacramento Business License if applicable. See Local Business Enterprise (LBE) Preference Program Requirements for more information (Attachment 4).
16. **The firm selected to perform the requested services will be required to execute the “Declaration of Compliance, Equal Benefits Ordinance” form that is part of the City’s standard Professional Services Agreement, attached as Attachment 2. More information regarding the City’s Non-Discrimination In Employee Benefits Code, otherwise known as the Equal Benefits Ordinance (EBO), is provided in Exhibit E to the standard Professional Services Agreement.**

For more information, including Contractor's Q&As, which includes general information on the most important questions about the EBO from the contractor's perspective, see the following website:

<http://www.cityofsacramento.org/generalservices/procurement/ordinances/>

For further questions on the EBO, please contact the Program Administrator at (916) 808-8796.

E. PROFESSIONAL SERVICES AGREEMENT

A copy of the City’s Professional Services Agreement that the selected firm(s) will be required to sign is provided as Attachment 2. Please note that any firm selected will be required to comply with the standard provisions set forth in Exhibit D of the Agreement; section 11.A provides information on minimum scope and limits of insurance coverage, and section 11.B provides information on additional insured coverage.

The selected firm(s) will need to provide insurance certificate(s) for Commercial General Liability, Automobile Liability, Workers’ Compensation and Employer’s Liability, and Professional Liability Insurance for this project. Endorsement(s) signed by an authorized representative of the insurance carrier will also be needed for Commercial General Liability and Automobile Liability insurance, with language included in the endorsement(s) that the City, its officials, employees and volunteers shall be covered as additional insured.

If the insurance certificate(s) and endorsements are provided by an insurance broker, the insurance company will also need to provide verification of coverage.

The selected firm will be required to complete and submit a W-9 form and CA form 587 or 590.

F. ADDENDA AND SUPPLEMENTS TO REQUEST FOR QUALIFICATIONS

The City of Sacramento reserves the right to cancel, postpone, extent or revise this RFQ or the RFQ process at any time. If it becomes necessary to revise any part of this RFQ, an Addendum to the RFQ will be provided on the City's Bid website at <http://www.cityofsacramento.org/generalservices/procurement/bids/index.cfm> .

G. BUSINESS OPERATIONS TAX CERTIFICATE (B.O.T.C.)

Sacramento City Code Chapter 3.08 requires any person or firm conducting business within or with the City of Sacramento to pay a Business Operations Tax and have a current Business Operations Tax Certificate.

To obtain information about the Business Operations Tax Certificate, contact the City of Sacramento Revenue Division, 915 I Street, Sacramento, CA 95814, or telephone 916-808-8500.

H. CONFLICT OF INTEREST POLICY

a. **Generally.** Under the California Political Reform Act, Government Code §§ 81000 et seq., designated employees of the City are required to comply with the City's Conflict of Interest Code. The term "designated employees" is a term of art and includes individuals working for contractors providing services or performing work for the City, if such individuals are considered to be "firms" under the Political Reform Act. The term "firm" generally includes individuals who make, or participate in making, governmental decisions or who serve in a staff capacity. Individuals who perform work that is solely clerical, ministerial, manual or secretarial are not "firms."

The City's Conflict of Interest Code requires individuals who qualify as "firms" to file the following statements of economic interests with the City:

- (1) An "assuming office" statement of economic interests to be filed within 30 days after execution of the agreement between the City and the contractor;
- (2) Annual statements of economic interests while the agreement remains in effect, to be filed not later than April 30 of each year; and
- (3) A "leaving office" statement of economic interests to be filed within 30 days of completion of the contract.

The above statements of economic interests are public records subject to public disclosure under the California Public Records Act.

The City's Conflict of Interest Code also requires individuals who qualify as "firms" under the Political Reform Act to comply with the conflict of interest provisions of the Political Reform Act, which generally prohibit individuals from making or participating in the making of decisions that will have a material financial effect on their economic interests.

b. **Conflict of Interest Statements.** The standard agreement attached to this RFQ indicates whether or not the individual(s) who will provide services or perform work pursuant to the agreement will be considered "firms" within the meaning of the Political Reform Act and the City's Conflict of Interest Code. The submission of a SOQ in response to this RFQ constitutes the submitting firm's acknowledgement and agreement that, if the firm is awarded the agreement by City, the individuals who will provide services or perform work pursuant to the agreement will not have a conflict of interest under the City's Conflict of Interest Code.

In addition, if the firm is awarded the agreement by City, such firm shall cause the following to occur within 30 days after execution of the agreement:

(1) The firm shall identify the individuals who will provide services or perform work under the agreement as "firms" within the meaning of the Political Reform Act and the City's Conflict of Interest Code;

(2) The firm shall cause these individuals to file with the City Representative identified in the agreement the "assuming office" statements of economic interests required by the City's Conflict of Interest Code.

Thereafter, throughout the term of the agreement, the firm shall cause these individuals to file with the City Representative annual statements of economic interests, and "leaving office" statements of economic interests, as required by the City's Conflict of Interest Code. The City may withhold all or a portion of any payment due under the agreement until all required statements are filed.

I. MISCELLANEOUS

All material submitted shall become the property of the City of Sacramento, may be reviewed and evaluated as part of this RFQ process by any persons at the discretion of the City of Sacramento, and may be publicly disclosed as required by law.

ATTACHMENT 1

SOQ Rating Form: Water Quality Detention Basin Maintenance and Regulatory Support

Proposer:

Selection Committee Member:

Date of Review:

Subject Areas

1. Wet detention basin condition assessment and maintenance prescriptions
2. Aquatic Weed Control NPDES Regulatory support
3. DFW routine maintenance agreement support

How the rating form will work:

The individual Selection Committee member will assign points to each applicable Selection Criteria, up to the maximum points available for each criterion, and a total score will be tallied for each subject area. The total score for each subject area will then be averaged amongst all of the Selection Committee members for a final score.

Selection Criteria		Maximum Available Points		
		Subject Area 1	Subject Area 2	Subject Area 3
1.	Experience with the management of water quality detention basins; both wet and dry basins	20	10	5
2.	Experience assessing sediment quantity and quality of water quality detention basins	20	0	0
3.	Knowledge of regulations impacting routine maintenance work within drainage channels	10	10	35
4.	Experience with preparing aquatic pesticide permit documents (NOI, APAP, annual reports etc.) and/or operations and maintenance manuals	10	20	20
5.	Experience collecting sediment/water samples and field data, submitting samples for analysis, performing QA/QC, and tabulating laboratory and filed data for inclusion into an annual report	10	25	0
6.	Prior experience providing similar services and familiarity with relevant standards/regulations	15	20	25
7.	SOQ Quality and Completeness, and references	8	8	8
8.	EBE/SBE 5% pt preference (0 or 5 points. Add 5 points if firm submitting proposal is City certified ESBE or State DGS certified SBE when proposals are due)	5	5	5
9.	LBE 2% pt. preference (0 or 2 points. Add 2 points if firm submitting SOQ us ab LBE when SOQs are due	2	2	2
Total		100	100	100

Interview Criteria (Optional):

Interview Criteria		Available Points	Score
1.	Interview	18.6	
2.	SBE/ EBE 5 % Point Preference	1	
3.	LBE 2% Point Preference	0.4	
Total		20.0	

ATTACHMENT 2

Standard Professional Service Agreement

PROJECT #:
PROJECT NAME:
DEPARTMENT:
DIVISION:

CITY OF SACRAMENTO PROFESSIONAL SERVICES AGREEMENT

THIS AGREEMENT is made at Sacramento, California, as of _____, by and between the **CITY OF SACRAMENTO**, a municipal corporation ("CITY"), and

Name of Contractor
Address
Phone/Fax

("CONTRACTOR"), who agree as follows:

- 1. Services.** Subject to the terms and conditions set forth in this Agreement, CONTRACTOR shall provide to CITY the services described in Exhibit A. CONTRACTOR shall provide said services at the time, place, and in the manner specified in Exhibit A. CONTRACTOR shall not be compensated for services outside the scope of Exhibit A unless prior to the commencement of such services: (a) CONTRACTOR notifies CITY and CITY agrees that such services are outside the scope of Exhibit A; (b) CONTRACTOR estimates the additional compensation required for these additional services; and (c) CITY, after notice, approves in writing a Supplemental Agreement specifying the additional services and amount of compensation therefor. CITY shall have no obligations whatsoever under this Agreement and/or any Supplemental Agreement, unless and until this Agreement or any Supplemental Agreement is approved by the Sacramento City Manager or the City Manager's authorized designee, or by the Sacramento City Council, as required by the Sacramento City Code.
- 2. Payment.** CITY shall pay CONTRACTOR for services rendered pursuant to this Agreement at the times and in the manner set forth in Exhibit B. The payments specified in Exhibit B shall be the only payments to be made to CONTRACTOR for the services rendered pursuant to this Agreement unless pursuant to Section 1, above, CITY approves additional compensation for additional services. CONTRACTOR shall submit all billings for said services to CITY in the manner specified in Exhibit B, or, if not specified in Exhibit B, according to the usual and customary procedures and practices that CONTRACTOR uses for billing clients similar to CITY.
- 3. Facilities and Equipment.** Except as set forth in Exhibit C, CONTRACTOR shall, at its sole cost and expense, furnish all facilities and equipment that may be required for furnishing services pursuant to this Agreement. CITY shall furnish to CONTRACTOR only the facilities and equipment listed in Exhibit C according to any terms and conditions set forth in Exhibit C.
- 4. General Provisions.** The General Provisions set forth in Exhibit D, that include indemnity and insurance requirements, are part of this Agreement. In the event of any conflict between the General Provisions and any terms or conditions of any document prepared or provided by CONTRACTOR and made a part of this Agreement, including without limitation any document relating to the scope of services or payment therefor, the General Provisions shall control over said terms or conditions.
- 5. Non-Discrimination in Employee Benefits.** This Agreement is subject to the provisions of Sacramento City Code Chapter 3.54, Non-Discrimination in Employee Benefits by City Contractors. The requirements of Sacramento City Code Chapter 3.54 are summarized in Exhibit E. CONTRACTOR is required to sign the attached Declaration of Compliance (Equal Benefits Ordinance), to assure compliance with these requirements.

6. **Authority.** The person signing this Agreement for CONTRACTOR hereby represents and warrants that he/she is fully authorized to sign this Agreement on behalf of CONTRACTOR and to bind CONTRACTOR to the performance of its obligations hereunder.
7. **Exhibits.** All exhibits referred to herein are attached hereto and are by this reference incorporated as if set forth fully herein.

Executed as of the day and year first above stated.

CITY OF SACRAMENTO

A Municipal Corporation

By: _____

Print name: _____

Title: _____

For: John F. Shirey, City Manager

APPROVED TO AS FORM:

City Attorney

ATTEST:

City Clerk

Attachments

- Exhibit A - Scope of Service
- Exhibit B - Fee Schedule/Manner of Payment
- Exhibit C - Facilities/Equipment Provided
- Exhibit D - General Provisions
- Exhibit E - Non-Discrimination in Employee Benefits

CONTRACTOR:

NAME OF FIRM

Federal I.D. No.

State I.D. No.

City of Sacramento Business Op. Tax Cert. No.

TYPE OF BUSINESS ENTITY (*check one*):

- _____ Individual/Sole Proprietor
- _____ Partnership
- _____ Corporation (*may require 2 signatures*)
- _____ Limited Liability Company
- _____ Other (*please specify: _____*)

Signature of Authorized Person

Print Name and Title

Additional Signature (*if required*)

Print Name and Title

DECLARATION OF COMPLIANCE

Equal Benefits Ordinance

Name of Contractor: _____

Address: _____

The above named Contractor ("Contractor") hereby declares and agrees as follows:

1. Contractor has read and understands the Requirements of the Non-Discrimination In Employee Benefits Code (the "Requirements") attached hereto as Exhibit E.
2. As a condition of receiving this Agreement, Contractor agrees to fully comply with the Requirements, as well as any additional requirements that may be specified in the City of Sacramento's Non-Discrimination In Employee Benefits Code codified at Chapter 3.54 of the Sacramento City Code (the "Ordinance").
3. Contractor understands, to the extent that such benefits are not preempted or prohibited by federal or state law, employee benefits covered by the Ordinance are any of the following:
 - a. Bereavement Leave
 - b. Disability, life, and other types of insurance
 - c. Family medical leave
 - d. Health benefits
 - e. Membership or membership discounts
 - f. Moving expenses
 - g. Pension and retirement benefits
 - h. Vacation
 - i. Travel benefits
 - j. Any other benefit offered to employees

Contractor agrees that if Contractor offers any of the above-listed employee benefits, Contractor will offer those benefits, without discrimination between employees with spouses and employees with domestic partners, and without discrimination between the spouses and domestic partners of such employees.

4. Contractor understands that Contractor will not be considered to be discriminating in the provision or application of employee benefits under the following conditions or circumstances:
 - a. If the actual cost of providing a benefit to a domestic partner or spouse exceeds the cost of providing the same benefit to a spouse or domestic partner of an employee, Contractor will not be required to provide the benefit, nor shall it be deemed discriminatory, if Contractor requires the employee to pay the monetary difference in order to provide the benefit to the domestic partner or to the spouse.
 - b. If Contractor is unable to provide a certain benefit, despite taking reasonable measures to do so, if Contractor provides the employee with a cash equivalent Contractor will not be deemed to be discriminating in the application of that benefit.
 - c. If Contractor provides employee benefits neither to employee's spouses nor to employee's domestic partners.
 - d. If Contractor provides employee benefits to employees on a basis unrelated to marital or domestic partner status.
 - e. If Contractor submits written evidence of making reasonable efforts to end discrimination in employee benefits by implementing policies that will be enacted before the first effective date after the first open enrollment process following the date this Agreement is executed by the City of Sacramento ("City"). Contractor understands that any delay in the implementation of such policies may not exceed one (1) year from the date this Agreement is executed by the City, and applies only to those employee benefits for which an open enrollment process is applicable.
 - f. Until administrative steps can be taken to incorporate nondiscrimination in employee benefits. The time allotted for these administrative steps will apply only to those employee benefits for which administrative steps are necessary and may not exceed three (3) months from the date this Agreement is executed by the City.
 - g. Until the expiration of a current collective bargaining agreement(s) if employee benefits are governed by such collective bargaining agreement(s).
 - h. Contractor takes all reasonable measures to end discrimination in employee benefits by either requesting that the union(s) involved agree to reopen the agreement(s) in order for Contractor to take whatever steps are necessary to end discrimination in employee benefits or by ending discrimination in employee benefits without reopening the collective bargaining agreement(s).

- i. In the event Contractor cannot end discrimination in employee benefits despite taking all reasonable measures to do so, Contractor provides a cash equivalent to eligible employees for whom employee benefits are not available. Unless otherwise authorized in writing by the City Manager, Contractor understands this cash equivalent must begin at the time the union(s) refuse to allow the collective bargaining agreement(s) to be reopened or not longer than three (3) months after the date this Agreement is executed by the City.
- 5. Contractor understands that failure to comply with the provisions of Section 4(a) through 4(i), above, will subject Contractor to possible suspension and/or termination of this Agreement for cause; repayment of any or all of the Agreement amount disbursed by the City; debarment for future agreements until all penalties and restitution have been paid in full and/or for up to two (2) years; and/or the imposition of a penalty, payable to the City, in the sum of \$50.00 for each employee, for each calendar day during which the employee was discriminated against in violation of the provisions of the Ordinance.
- 6. Contractor understands and agrees to provide notice to each current employee and, within ten (10) days of hire, to each new employee, of their rights under the Ordinance. Contractor further agrees to maintain a copy of each such letter provided, in an appropriate file for inspection by authorized representatives of the City. Contractor also agrees to prominently display a poster informing each employee of these rights.
- 7. Contractor understands that Contractor has the right to request a waiver of, or exemption from, the provisions of the Ordinance by submitting a written request to the City's Procurement Services Division prior to Agreement award, which request shall identify the provision(s) of the Ordinance authorizing such waiver or exemption and the factual basis for such waiver or exemption. The City shall determine in its sole discretion whether to approve any such request.
- 8. Contractor agrees to defend, indemnify and hold harmless, the City, its officers and employees, against any claims, actions, damages, costs (including reasonable attorney fees), or other liabilities of any kind arising from any violation of the Requirements or of the Ordinance by Contractor.

The undersigned declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that he or she is authorized to bind the Contractor to the provisions of this Declaration.

Signature of Authorized Representative

Date

Print Name

Title

EXHIBIT A
PROFESSIONAL SERVICES AGREEMENT
SCOPE OF SERVICES

1. Representatives.

The CITY Representative for this Agreement is:

Name/Title
Address
Phone/Fax/E-mail

All CONTRACTOR questions pertaining to this Agreement shall be referred to the CITY Representative or the Representative's designee.

The CONTRACTOR Representative for this Agreement is:

Name/Title
Address
Phone/Fax/E-mail

All CITY questions pertaining to this Agreement shall be referred to the CONTRACTOR Representative. All correspondence to CONTRACTOR shall be addressed to the address set forth on page one of this Agreement. Unless otherwise provided in this Agreement, all correspondence to the CITY shall be addressed to the CITY Representative.

2. Professional Liability Insurance. Professional Liability (Errors and Omissions) insurance is _____ is not _____ [check one] required for this Agreement. If required, such coverage must be continued for at least _____ year(s) following the completion of all Services and Additional Services under this Agreement. (See Exhibit D, Section 11, for complete insurance requirements.)

3. Conflict of Interest Requirements.

A. **Generally.** Under the California Political Reform Act, Government Code §§ 81000 et seq., designated employees of the CITY are required to comply with the CITY's Conflict of Interest Code. The term "designated employees" is a term of art and includes individuals who are working for contractors who are providing services or performing work for the CITY and who are considered to be "consultants" under the Political Reform Act. The term "consultant" generally includes individuals who make, or participate in making, governmental decisions or who serve in a staff capacity. Individuals who perform work that is solely clerical, ministerial, manual or secretarial are not "consultants."

The CITY's Conflict of Interest Code requires designated employees, including individuals who qualify as "consultants", to file the following statements of economic interests:

- (1) An “assuming office” statement of economic interests to be filed within 30 days after execution of the agreement between the City and the contractor;
- (2) Annual statements of economic interests while the agreement remains in effect, to be filed not later than April 30 of each year; and
- (3) A “leaving office” statement of economic interests to be filed within 30 days of completion of the contract.

The above statements of economic interests are public records subject to public disclosure under the California Public Records Act.

The CITY’s Conflict of Interest Code also requires individuals who qualify as “consultants” under the Political Reform Act to comply with the conflict of interest provisions of the Political Reform Act, which generally prohibit individuals from making or participating in the making of decisions that will have a material financial effect on their economic interests.

B. Conflict of Interest Statements. The individual(s) who will provide services or perform work pursuant to this Agreement are “consultants” within the meaning of the Political Reform Act and the CITY’s Conflict of Interest Code: yes no *[check one]*

If “yes” is checked above, CONTRACTOR shall cause the following to occur within 30 days after execution of this Agreement:

- (2) Identify the individuals who will provide services or perform work under this Agreement as “consultants”;
- (3) Cause these individuals to file with the CITY Representative the “assuming office” statements of economic interests required by the CITY’s Conflict of Interest Code.

Thereafter, throughout the term of the Agreement, CONTRACTOR shall cause these individuals to file with the CITY Representative annual statements of economic interests, and “leaving office” statements of economic interests, as required by the CITY’s Conflict of Interest Code. The CITY may withhold all or a portion of any payment due under this Agreement until all required statements are filed.

4. Scope of Services. *[Describe services to be provided here, or, if scope of services is described in an attachment, label the attachment “Attachment 1 to Exhibit A” and include the following sentence:]*

The services provided shall be as set forth in Attachment 1 to Exhibit A, attached hereto and incorporated herein.

5. Time of Performance. The services described herein shall be provided during the period, or in accordance with the schedule, set forth in the scope of service

EXHIBIT B

PROFESSIONAL SERVICES AGREEMENT

FEE SCHEDULE/MANNER OF PAYMENT

1. **CONTRACTOR's Compensation.** The total of all fees paid to the CONTRACTOR for the performance of all services set forth in Exhibit A, including normal revisions (hereafter the "Services"), and for all authorized Reimbursable Expenses, shall not exceed the total sum of \$ _____.
2. **Billable Rates.** CONTRACTOR shall be paid for the performance of Services on an hourly rate, daily rate, flat fee, lump sum or other basis, as set forth in Attachment 1 to Exhibit B, attached hereto and incorporated herein. *[Attach list of billable rates that apply, labeled "Attachment 1 to Exhibit B".]*
3. **CONTRACTOR's Reimbursable Expenses.** Reimbursable Expenses shall be limited to actual expenditures of CONTRACTOR for expenses that are necessary for the proper completion of the Services and shall only be payable if specifically authorized in advance by CITY.
4. **Payments to CONTRACTOR.**
 - A. Payments to CONTRACTOR shall be made within a reasonable time after receipt of CONTRACTOR's invoice, said payments to be made in proportion to services performed or as otherwise specified in Attachment 1 to Exhibit B. CONTRACTOR may request payment on a monthly basis. CONTRACTOR shall be responsible for the cost of supplying all documentation necessary to verify the monthly billings to the satisfaction of CITY.
 - B. All invoices submitted by CONTRACTOR shall contain the following information:
 - (1) Job Name
 - (2) Description of services billed under this invoice, and overall status of project
 - (3) Date of Invoice Issuance
 - (4) Sequential Invoice Number
 - (5) CITY's Purchase Order Number
 - (6) Total Contract Amount
 - (7) Amount of this Invoice (Itemize all Reimbursable Expenses)
 - (8) Total Billed to Date
 - (9) Total Remaining on Contract
 - (10) Updated project schedule. This shall identify those steps that shall be taken to bring the project back on schedule if it is behind schedule.
 - C. Items shall be separated into Services and Reimbursable Expenses. Billings that do not conform to the format outlined above shall be returned to CONTRACTOR for correction. CITY shall not be responsible for delays in payment to CONTRACTOR resulting from CONTRACTOR's failure to comply with the invoice format described below.

D. Requests for payment shall be sent to:

*Office
Address
Phone/Fax*

Attn: _____

5. **Additional Services.** Additional Services are those services related to the scope of services of CONTRACTOR set forth in Exhibit A but not anticipated at the time of execution of this Agreement. Additional Services shall be provided only when a Supplemental Agreement authorizing such Additional Services is approved by CITY in accordance with CITY's Supplemental Agreement procedures. CITY reserves the right to perform any Additional Services with its own staff or to retain other contractors to perform said Additional Services.
6. **Accounting Records of CONTRACTOR.** During performance of this Agreement and for a period of three (3) years after completing all Services and Additional Services hereunder, CONTRACTOR shall maintain all accounting and financial records related to this Agreement, including, but not limited to, records of CONTRACTOR's costs for all Services and Additional Services performed under this Agreement and records of CONTRACTOR's Reimbursable Expenses, in accordance with generally accepted accounting practices, and shall keep and make such records available for inspection and audit by representatives of the CITY upon reasonable written notice.
7. **Taxes.** CONTRACTOR shall pay, when and as due, any and all taxes incurred as a result of CONTRACTOR's compensation hereunder, including estimated taxes, and shall provide CITY with proof of such payment upon request. CONTRACTOR hereby agrees to indemnify CITY for any claims, losses, costs, fees, liabilities, damages or injuries suffered by CITY arising out of CONTRACTOR's breach of this Section 7.

EXHIBIT C

NONPROFESSIONAL SERVICES AGREEMENT

FACILITIES AND EQUIPMENT TO BE PROVIDED BY CITY

CITY shall [*check one*]

- Not furnish any facilities or equipment for this Agreement; or
- furnish the following facilities or equipment for the Agreement [*list, if applicable*]:

**EXHIBIT D
PROFESSIONAL SERVICES AGREEMENT**

GENERAL PROVISIONS

1. Independent Contractor.

- A. It is understood and agreed that CONTRACTOR (including CONTRACTOR's employees) is an independent contractor and that no relationship of employer-employee exists between the parties hereto for any purpose whatsoever. Neither CONTRACTOR nor CONTRACTOR's assigned personnel shall be entitled to any benefits payable to employees of CITY. CITY is not required to make any deductions or withholdings from the compensation payable to CONTRACTOR under the provisions of this Agreement, and CONTRACTOR shall be issued a Form 1099 for its services hereunder. As an independent contractor, CONTRACTOR hereby agrees to indemnify and hold CITY harmless from any and all claims that may be made against CITY based upon any contention by any of CONTRACTOR's employees or by any third party, including but not limited to any state or federal agency, that an employer-employee relationship or a substitute therefor exists for any purpose whatsoever by reason of this Agreement or by reason of the nature and/or performance of any Services under this Agreement. (As used in this Exhibit D, the term "Services" shall include both Services and Additional Services as such terms are defined elsewhere in this Agreement.)

- B. It is further understood and agreed by the parties hereto that CONTRACTOR, in the performance of its obligations hereunder, is subject to the control and direction of CITY as to the designation of tasks to be performed and the results to be accomplished under this Agreement, but not as to the means, methods, or sequence used by CONTRACTOR for accomplishing such results. To the extent that CONTRACTOR obtains permission to, and does, use CITY facilities, space, equipment or support services in the performance of this Agreement, this use shall be at the CONTRACTOR's sole discretion based on the CONTRACTOR's determination that such use will promote CONTRACTOR's efficiency and effectiveness. Except as may be specifically provided elsewhere in this Agreement, the CITY does not require that CONTRACTOR use CITY facilities, equipment or support services or work in CITY locations in the performance of this Agreement.

- C. If, in the performance of this Agreement, any third persons are employed by CONTRACTOR, such persons shall be entirely and exclusively under the direction, supervision, and control of CONTRACTOR. Except as may be specifically provided elsewhere in this Agreement, all terms of employment, including hours, wages, working conditions, discipline, hiring, and discharging, or any other terms of employment or requirements of law, shall be determined by CONTRACTOR. It is further understood and agreed that CONTRACTOR shall issue W-2 or 1099 Forms for income and employment tax purposes, for all of CONTRACTOR's assigned personnel and subcontractors.

- D. The provisions of this Section 1 shall survive any expiration or termination of this Agreement. Nothing in this Agreement shall be construed to create an exclusive relationship between CITY and CONTRACTOR.

CONTRACTOR may represent, perform services for, or be employed by such additional persons or companies as CONTRACTOR sees fit provided that CONTRACTOR does not violate the provisions of Section 5, below.

2. **Licenses; Permits, Etc.** CONTRACTOR represents and warrants that CONTRACTOR has all licenses, permits, City Business Operations Tax Certificate, qualifications, and approvals of whatsoever nature that are legally required for CONTRACTOR to practice its profession or provide any services under the Agreement. CONTRACTOR represents and warrants that CONTRACTOR shall, at its sole cost and expense, keep in effect or obtain at all times during the term of this Agreement any licenses, permits, and approvals that are legally required for CONTRACTOR to practice its profession or provide such Services. Without limiting the generality of the foregoing, if CONTRACTOR is an out-of-state corporation, CONTRACTOR warrants and represents that it possesses a valid certificate of qualification to transact business in the State of California issued by the California Secretary of State pursuant to Section 2105 of the California Corporations Code.
3. **Time.** CONTRACTOR shall devote such time and effort to the performance of Services pursuant to this Agreement as is necessary for the satisfactory and timely performance of CONTRACTOR's obligations under this Agreement. Neither party shall be considered in default of this Agreement, to the extent that party's performance is prevented or delayed by any cause, present or future, that is beyond the reasonable control of that party.
4. **CONTRACTOR Not Agent.** Except as CITY may specify in writing, CONTRACTOR and CONTRACTOR's personnel shall have no authority, express or implied, to act on behalf of CITY in any capacity whatsoever as an agent. CONTRACTOR and CONTRACTOR's personnel shall have no authority, express or implied, to bind CITY to any obligations whatsoever.
5. **Conflicts of Interest.** CONTRACTOR covenants that neither it, nor any officer or principal of its firm, has or shall acquire any interest, directly or indirectly, that would conflict in any manner with the interests of CITY or that would in any way hinder CONTRACTOR's performance of Services under this Agreement. CONTRACTOR further covenants that in the performance of this Agreement, no person having any such interest shall be employed by it as an officer, employee, agent or subcontractor, without the written consent of CITY. CONTRACTOR agrees to avoid conflicts of interest or the appearance of any conflicts of interest with the interests of CITY at all times during the performance of this Agreement. If CONTRACTOR is or employs a former officer or employee of the CITY, CONTRACTOR and any such employee(s) shall comply with the provisions of Sacramento City Code Section 2.16.090 pertaining to appearances before the City Council or any CITY department, board, commission or committee.
6. **Confidentiality of CITY Information.** During performance of this Agreement, CONTRACTOR may gain access to and use CITY information regarding inventions, machinery, products, prices, apparatus, costs, discounts, future plans, business affairs, governmental affairs, processes, trade secrets, technical matters, systems, facilities, customer lists, product design, copyright, data, and other vital information (hereafter collectively referred to as "City Information") that are valuable, special and unique assets of the CITY. CONTRACTOR agrees to protect all City Information and treat it as strictly confidential, and further agrees that CONTRACTOR shall not at any time,

either directly or indirectly, divulge, disclose or communicate in any manner any City Information to any third party without the prior written consent of CITY. In addition, CONTRACTOR shall comply with all CITY policies governing the use of the CITY network and technology systems, as set forth in applicable provisions of the City of Sacramento Administrative Policy Instructions # 30. A violation by CONTRACTOR of this Section 6 shall be a material violation of this Agreement and shall justify legal and/or equitable relief.

7. CONTRACTOR Information.

- A. CITY shall have full ownership and control, including ownership of any copyrights, of all information prepared, produced, or provided by CONTRACTOR pursuant to this Agreement. In this Agreement, the term “information” shall be construed to mean and include: any and all work product, submittals, reports, plans, specifications, and other deliverables consisting of documents, writings, handwritings, typewriting, printing, photostatting, photographing, computer models, and any other computerized data and every other means of recording any form of information, communications, or representation, including letters, works, pictures, drawings, sounds, or symbols, or any combination thereof. CONTRACTOR shall not be responsible for any unauthorized modification or use of such information for other than its intended purpose by CITY.
- B. CONTRACTOR shall fully defend, indemnify and hold harmless CITY, its officers and employees, and each and every one of them, from and against any and all claims, actions, lawsuits or other proceedings alleging that all or any part of the information prepared, produced, or provided by CONTRACTOR pursuant to this Agreement infringes upon any third party’s trademark, trade name, copyright, patent or other intellectual property rights. CITY shall make reasonable efforts to notify CONTRACTOR not later than ten (10) days after CITY is served with any such claim, action, lawsuit or other proceeding, provided that CITY’s failure to provide such notice within such time period shall not relieve CONTRACTOR of its obligations hereunder, which shall survive any termination or expiration of this Agreement.
- C. All proprietary and other information received from CONTRACTOR by CITY, whether received in connection with CONTRACTOR’s proposal to CITY or in connection with any Services performed by CONTRACTOR, will be disclosed upon receipt of a request for disclosure, pursuant to the California Public Records Act; provided, however, that, if any information is set apart and clearly marked “trade secret” when it is provided to CITY, CITY shall give notice to CONTRACTOR of any request for the disclosure of such information. The CONTRACTOR shall then have five (5) days from the date it receives such notice to enter into an agreement with the CITY, satisfactory to the City Attorney, providing for the defense of, and complete indemnification and reimbursement for all costs (including plaintiff’s attorney fees) incurred by CITY in any legal action to compel the disclosure of such information under the California Public Records Act. The CONTRACTOR shall have sole responsibility for defense of the actual “trade secret” designation of such information.
- D. The parties understand and agree that any failure by CONTRACTOR to respond to the notice provided by CITY and/or to enter into an agreement with CITY, in accordance with the provisions of subsection C, above, shall constitute a complete waiver by CONTRACTOR of any rights

regarding the information designated “trade secret” by CONTRACTOR, and such information shall be disclosed by CITY pursuant to applicable procedures required by the Public Records Act.

8. Standard of Performance. CONTRACTOR shall perform all Services required pursuant to this Agreement in the manner and according to the standards currently observed by a competent practitioner of CONTRACTOR’s profession in California. All products of whatsoever nature that CONTRACTOR delivers to CITY pursuant to this Agreement shall be prepared in a professional manner and conform to the standards of quality normally observed by a person currently practicing in CONTRACTOR’s profession, and shall be provided in accordance with any schedule of performance specified in Exhibit A. CONTRACTOR shall assign only competent personnel to perform Services pursuant to this Agreement. CONTRACTOR shall notify CITY in writing of any changes in CONTRACTOR’s staff assigned to perform the Services required under this Agreement, prior to any such performance. In the event that CITY, at any time during the term of this Agreement, desires the removal of any person assigned by CONTRACTOR to perform Services pursuant to this Agreement, because CITY, in its sole discretion, determines that such person is not performing in accordance with the standards required herein, CONTRACTOR shall remove such person immediately upon receiving notice from CITY of the desire of CITY for the removal of such person.

9. Term; Suspension; Termination.

- A. This Agreement shall become effective on the date that it is approved by both parties, set forth on the first page of the Agreement, and shall continue in effect until both parties have fully performed their respective obligations under this Agreement, unless sooner terminated as provided herein.
- B. CITY shall have the right at any time to temporarily suspend CONTRACTOR’s performance hereunder, in whole or in part, by giving a written notice of suspension to CONTRACTOR. If CITY gives such notice of suspension, CONTRACTOR shall immediately suspend its activities under this Agreement, as specified in such notice.
- C. CITY shall have the right to terminate this Agreement at any time by giving a written notice of termination to CONTRACTOR. If CITY gives such notice of termination, CONTRACTOR shall immediately cease rendering Services pursuant to this Agreement. If CITY terminates this Agreement:
 - (1) CONTRACTOR shall, not later than five days after such notice of termination, deliver to CITY copies of all information prepared pursuant to this Agreement.
 - (2) CITY shall pay CONTRACTOR the reasonable value of Services rendered by CONTRACTOR prior to termination; provided, however, CITY shall not in any manner be liable for lost profits that might have been made by CONTRACTOR had the Agreement not been terminated or had CONTRACTOR completed the Services required by this Agreement. In this regard, CONTRACTOR shall furnish to CITY such financial information as in the judgment of the CITY is necessary for CITY to determine the reasonable value of the Services rendered by CONTRACTOR. The foregoing is cumulative and does not affect any right or remedy that CITY may have in law or equity.

10. Indemnity.

- A. Indemnity: CONTRACTOR shall defend, hold harmless and indemnify CITY, its officers and employees, and each and every one of them, from and against any and all actions, damages, costs, liabilities, claims, demands, losses, judgments, penalties, costs and expenses of every type and description, including, but not limited to, any fees and/or costs reasonably incurred by CITY's staff attorneys or outside attorneys and any fees and expenses incurred in enforcing this provision (hereafter collectively referred to as "Liabilities"), including but not limited to Liabilities arising from personal injury or death, damage to personal, real or intellectual property or the environment, contractual or other economic damages, or regulatory penalties, arising out of or in any way connected with performance of or failure to perform this Agreement by CONTRACTOR, any sub-consultant, subcontractor or agent, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, whether or not (i) such Liabilities are caused in part by a party indemnified hereunder or (ii) such Liabilities are litigated, settled or reduced to judgment; provided that the foregoing indemnity does not apply to liability for any damage or expense for death or bodily injury to persons or damage to property to the extent arising from the sole negligence or willful misconduct of CITY, its agents, servants, or independent contractors who are directly responsible to CITY, except when such agents, servants, or independent contractors are under the direct supervision and control of CONTRACTOR.
- B. Insurance Policies; Intellectual Property Claims: The existence or acceptance by CITY of any of the insurance policies or coverages described in this Agreement shall not affect or limit any of CITY's rights under this Section 10, nor shall the limits of such insurance limit the liability of CONTRACTOR hereunder. This Section 10 shall not apply to any intellectual property claims, actions, lawsuits or other proceedings subject to the provisions of Section 7.B., above. The provisions of this Section 10 shall survive any expiration or termination of this Agreement.

11. Insurance Requirements. During the entire term of this Agreement, CONTRACTOR shall maintain the insurance coverage described in this Section 11.

Full compensation for all premiums that CONTRACTOR is required to pay for the insurance coverage described herein shall be included in the compensation specified for the Services provided by CONTRACTOR under this Agreement. No additional compensation will be provided for CONTRACTOR's insurance premiums.

It is understood and agreed by the CONTRACTOR that its liability to the CITY shall not in any way be limited to or affected by the amount of insurance coverage required or carried by the CONTRACTOR in connection with this Agreement.

A. Minimum Scope & Limits of Insurance Coverage

- (1) Commercial General Liability Insurance, providing coverage at least as broad as ISO CGL Form 00 01 on an occurrence basis for bodily injury, including death, of one or more persons, property

damage and personal injury, with limits of not less than one million dollars (\$1,000,000) per occurrence. The policy shall provide contractual liability and products and completed operations coverage for the term of the policy.

- (2) Automobile Liability Insurance providing coverage at least as broad as ISO Form CA 00 01 on an occurrence basis for bodily injury, including death, of one or more persons, property damage and personal injury, with limits of not less than one million dollars (\$1,000,000) per occurrence. The policy shall provide coverage for owned, non-owned and/or hired autos as appropriate to the operations of the CONTRACTOR.

No automobile liability insurance shall be required if CONTRACTOR completes the following certification:

“I certify that a motor vehicle will not be used in the performance of any work or services under this agreement.” _____ (CONTRACTOR initials)

- (3) Workers’ Compensation Insurance with statutory limits, and Employers’ Liability Insurance with limits of not less than one million dollars (\$1,000,000). The Worker’s Compensation policy shall include a waiver of subrogation for contracts involving construction or maintenance, or if required by the CITY by selecting the option below:

_____ Workers’ Compensation waiver of subrogation in favor of the City is required for all work performed by the CONTRACTOR.

No Workers’ Compensation insurance shall be required if CONTRACTOR completes the following certification:

“I certify that my business has no employees, and that I do not employ anyone. I am exempt from the legal requirements to provide Workers’ Compensation insurance.” _____ (CONTRACTOR initials)

- (4) Professional Liability Insurance providing coverage on a claims made basis for errors, omissions or malpractice with limits of not less than one million (\$1,000,000) dollars if required by the CITY under Exhibit A, Section 2.

B. Additional Insured Coverage

- (1) Commercial General Liability Insurance: The CITY, its officials, employees and volunteers shall be covered by policy terms or endorsement as additional insureds as respects general liability arising out of activities performed by or on behalf of CONTRACTOR, products and completed operations of CONTRACTOR, and premises owned, leased or used by CONTRACTOR. The general liability additional insured endorsement must be signed by an authorized representative of the insurance carrier for contracts involving construction or maintenance, or if required by the CITY by selecting the option below:

_____ Additional insured endorsement must be signed by an authorized representative of the insurance carrier.

If the policy includes a blanket additional insured endorsement or contractual additional insured coverage, the above signature requirement may be fulfilled by submitting that document with a signed declaration page referencing the blanket endorsement or policy form.

- (2) Automobile Liability Insurance: The CITY, its officials, employees and volunteers shall be covered by policy terms or endorsement as additional insureds as respects auto liability.

C. Other Insurance Provisions

The policies are to contain, or be endorsed to contain, the following provisions:

- (1) Except for professional liability, CONTRACTOR's insurance coverage shall be primary insurance as respects CITY, its officials, employees and volunteers. Any insurance or self-insurance maintained by CITY, its officials, employees or volunteers shall be in excess of CONTRACTOR's insurance and shall not contribute with it.
- (2) Any failure to comply with reporting provisions of the policies shall not affect coverage provided to CITY, its officials, employees or volunteers.
- (3) Coverage shall state that CONTRACTOR's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
- (4) CITY will be provided with thirty (30) days written notice of cancellation or material change in the policy language or terms.

D. Acceptability of Insurance

Insurance shall be placed with insurers with a Bests' rating of not less than A:V. Self-insured retentions, policy terms or other variations that do not comply with the requirements of this Section 11 must be declared to and approved by the CITY Risk Management Division in writing prior to execution of this Agreement.

E. Verification of Coverage

- (1) CONTRACTOR shall furnish CITY with certificates and required endorsements evidencing the insurance required. The certificates and endorsements shall be forwarded to the CITY representative named in Exhibit A. Copies of policies shall be delivered to the CITY on demand.

Certificates of insurance shall be signed by an authorized representative of the insurance carrier.

- (2) The CITY may withdraw its offer of contract or cancel this Agreement if the certificates of insurance and endorsements required have not been provided prior to execution of this Agreement. The CITY may withhold payments to CONTRACTOR and/or cancel the Agreement if the insurance is canceled or CONTRACTOR otherwise ceases to be insured as required herein.

F. Subcontractors

CONTRACTOR shall require and verify that all sub-consultants and subcontractors maintain insurance coverage that meets the minimum scope and limits of insurance coverage specified in subsection A, above.

12. Equal Employment Opportunity. During the performance of this Agreement, CONTRACTOR, for itself, its assignees and successors in interest, agrees as follows:

- A. Compliance With Regulations: CONTRACTOR shall comply with the Executive Order 11246 entitled “Equal Opportunity in Federal Employment”, as amended by Executive Order 11375 and 12086, and as supplemented in Department of Labor regulations (41 CFR Chapter 60), hereinafter collectively referred to as the “Regulations”.
- B. Nondiscrimination: CONTRACTOR, with regards to the work performed by it after award and prior to completion of the work pursuant to this Agreement, shall not discriminate on the ground of race, color, religion, sex, national origin, age, marital status, physical handicap or sexual orientation in selection and retention of subcontractors, including procurement of materials and leases of equipment. CONTRACTOR shall not participate either directly or indirectly in discrimination prohibited by the Regulations.
- C. Solicitations for Subcontractors, Including Procurement of Materials and Equipment: In all solicitations either by competitive bidding or negotiations made by CONTRACTOR for work to be performed under any subcontract, including all procurement of materials or equipment, each potential subcontractor or supplier shall be notified by CONTRACTOR of CONTRACTOR’s obligation under this Agreement and the Regulations relative to nondiscrimination on the ground of race, color, religion, sex, national origin, age, marital status, physical handicap or sexual orientation.
- D. Information and Reports: CONTRACTOR shall provide all information and reports required by the Regulations, or by any orders or instructions issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information and its facilities as may be determined by the CITY to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of CONTRACTOR is in the exclusive possession of another who fails or refuses to furnish this information, CONTRACTOR shall so certify to the CITY, and shall set forth what efforts it has made to obtain the information.

E. Sanctions for Noncompliance: In the event of noncompliance by CONTRACTOR with the nondiscrimination provisions of this Agreement, the CITY shall impose such sanctions as it may determine to be appropriate including, but not limited to:

- (1) Withholding of payments to CONTRACTOR under this Agreement until CONTRACTOR complies;
- (2) Cancellation, termination, or suspension of the Agreement, in whole or in part.

F. Incorporation of Provisions: CONTRACTOR shall include the provisions of subsections A through E, above, in every subcontract, including procurement of materials and leases of equipment, unless exempted by the Regulations, or by any order or instructions issued pursuant thereto. CONTRACTOR shall take such action with respect to any subcontract or procurement as the CITY may direct as a means of enforcing such provisions including sanctions for noncompliance; provided, however, that in the event CONTRACTOR becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, CONTRACTOR may request CITY to enter such litigation to protect the interests of CITY.

13. Entire Agreement. This document, including all Exhibits, contains the entire agreement between the parties and supersedes whatever oral or written understanding they may have had prior to the execution of this Agreement. No alteration to the terms of this Agreement shall be valid unless approved in writing by CONTRACTOR, and by CITY, in accordance with applicable provisions of the Sacramento City Code.

14. Severability. If any portion of this Agreement or the application thereof to any person or circumstance shall be held invalid or unenforceable, the remainder of this Agreement shall not be affected thereby and shall be enforced to the greatest extent permitted by law.

15. Waiver. Neither CITY acceptance of, or payment for, any Service or Additional Service performed by CONTRACTOR, nor any waiver by either party of any default, breach or condition precedent, shall be construed as a waiver of any provision of this Agreement, nor as a waiver of any other default, breach or condition precedent or any other right hereunder.

16. Enforcement of Agreement. This Agreement shall be governed, construed and enforced in accordance with the laws of the State of California. Venue of any litigation arising out of or connected with this Agreement shall lie exclusively in the state trial court or Federal District Court located in Sacramento County in the State of California, and the parties consent to jurisdiction over their persons and over the subject matter of any such litigation in such courts, and consent to service of process issued by such courts.

17. Assignment Prohibited. The expertise and experience of CONTRACTOR are material considerations for this Agreement. CITY has a strong interest in the qualifications and capability of the persons and entities that will fulfill the obligations imposed on CONTRACTOR under this Agreement. In recognition of this interest, CONTRACTOR shall not assign any right or obligation pursuant to this Agreement without the written consent of

the CITY. Any attempted or purported assignment without CITY's written consent shall be void and of no effect.

18. **Binding Effect.** This Agreement shall be binding on the heirs, executors, administrators, successors and assigns of the parties, subject to the provisions of Section 17, above.
19. **Use Tax Requirements.** During the performance of this Agreement, CONTRACTOR, for itself, its assignees and successors in interest, agrees as follows:
 - A. Use Tax Direct Payment Permit: For all leases and purchases of materials, equipment, supplies, or other tangible personal property used to perform the Agreement and shipped from outside California, the Contractor and any subcontractors leasing or purchasing such materials, equipment, supplies or other tangible personal property shall obtain a Use Tax Direct Payment Permit from the California State Board of Equalization ("SBE") in accordance with the applicable SBE criteria and requirements.
 - B. Sellers Permit: For any construction contract and any construction subcontract in the amount of \$5,000,000 or more, Contractor and the subcontractor(s) shall obtain sellers permits from the SBE and shall register the jobsite as the place of business for the purpose of allocating local sales and use tax to the City. Contractor and its subcontractors shall remit the self-accrued use tax to the SBE, and shall provide a copy of each remittance to the City.
 - C. The above provisions shall apply in all instances unless prohibited by the funding source for the Agreement.

EXHIBIT E

REQUIREMENTS OF THE NON-DISCRIMINATION IN EMPLOYEE BENEFITS CODE

INTRODUCTION

The Sacramento Non-Discrimination In Employee Benefits Code (the "Ordinance"), codified as Sacramento City Code Chapter 3.54, prohibits City contractors from discriminating in the provision of employee benefits between employees with spouses and employees with domestic partners, and between the spouses and domestic partners of employees.

APPLICATION

The provisions of the Ordinance apply to any contract or agreement (as defined below), between a Contractor and the City of Sacramento, in an amount exceeding \$100,000.00. The Ordinance applies to that portion of a contractor's operations that occur: (i) within the City of Sacramento; (ii) on real property outside the City of Sacramento if the property is owned by the City or if the City has a right to occupy the property; or (iii) at any location where a significant amount of work related to a City contract is being performed.

The Ordinance does not apply: to subcontractors or subcontracts of any Contractor or contractors; to transactions entered into pursuant to cooperative purchasing agreements approved by the Sacramento City Council; to legal contracts of other governmental jurisdictions or public agencies without separate competitive bidding by the City; where the requirements of the ordinance will violate or are inconsistent with the terms or conditions of a grant, subvention or agreement with a public agency or the instructions of an authorized representative of any such agency with respect to any such grant, subvention or agreement; to permits for excavation or street construction; or to agreements for the use of City right-of-way where a contracting utility has the power of eminent domain.

DEFINITIONS

As set forth in the Ordinance, the following definitions apply:

"Contract" means an agreement for public works or improvements to be performed, or for goods or services to be purchased or grants to be provided, at the expense of the City or to be paid out of moneys deposited in the treasury or out of the trust money under the control or collected by the City. "Contract" also means a written agreement for the exclusive use ("exclusive use" means the right to use or occupy real property to the exclusion of others, other than the right reserved by the fee owner) or occupancy of real property for a term exceeding 29 days in any calendar year, whether by singular or cumulative instrument, (i) for the operation or use by others of real property owned or controlled by the City for the operation of a business, social, or other establishment or organization, including leases, concessions, franchises and easements, or (ii) for the City's use or occupancy of real property owned by others, including leases, concessions, franchises and easements.

"Contract" shall not include: a revocable at-will use or encroachment permit for the use of or encroachment on City property regardless of the ultimate duration of such permit; excavation, street construction or street use permits; agreements for the use of City right-of-way where a contracting utility has the power of eminent domain; or agreements governing the use of City property that constitute a public forum for activities that are primarily for the purpose of espousing or advocating causes or ideas and that are generally protected by the First Amendment to the United States Constitution or that are primarily recreational in nature.

"Contractor" means any person or persons, firm partnership or corporation, company, or combination thereof, that enters into a Contract with the City. "Contractor" does not include a public entity.

"Domestic Partner" means any person who has a currently registered domestic partnership with a governmental entity pursuant to state or local law authorizing the registration.

“Employee Benefits” means bereavement leave; disability, life, and other types of insurance; family medical leave; health benefits; membership or membership discounts; moving expenses; pension and retirement benefits; vacation; travel benefits; and any other benefit given to employees. “Employee benefits” shall not include benefits to the extent that the application of the requirements of this chapter to such benefits may be preempted by federal or state.

CONTRACTOR’S OBLIGATION TO PROVIDE THE CITY WITH DOCUMENTATION AND INFORMATION

Contractor shall provide the City with documentation and information verifying its compliance with the requirements of the Ordinance within ten (10) days of receipt of a request from the City. Contractors shall keep accurate payroll records, showing, for each City Contract, the employee’s name, address, Social Security number, work classification, straight time pay rate, overtime pay rate, overtime hours worked, status and exemptions, and benefits for each day and pay period that the employee works on the City Contract. Each request for payroll records shall be accompanied by an affidavit to be completed and returned by the Contractor, as stated, attesting that the information contained in the payroll records is true and correct, and that the Contractor has complied with the requirements of the Ordinance. A violation of the Ordinance or noncompliance with the requirements of the Ordinance shall constitute a breach of contract.

EMPLOYER COMPLIANCE CERTIFICATE AND NOTICE REQUIREMENTS

- (a) All contractors seeking a Contract subject to the Ordinance shall submit a completed Declaration of Compliance Form, signed by an authorized representative, with each proposal, bid or application. The Declaration of Compliance shall be made a part of the executed contract, and will be made available for public inspection and copying during regular business hours.
- (b) The Contractor shall give each existing employee working directing on a City contract, and (at the time of hire), each new employee, a copy of the notification provided as Attachment “A.”
- (c) Contractor shall post, in a place visible to all employees, a copy of the notice provided as Attachment “B.”

Attachment A



YOUR RIGHTS UNDER THE CITY OF SACRAMENTO’S NON-DISCRIMINATION IN EMPLOYEE BENEFITS CODE

On (date), your employer (the “Employer”) entered into a contract with the City of Sacramento (the “City”) for (contract details), and as a condition of that contract, agreed to abide by the requirements of the City’s Non-Discrimination In Employee Benefits Code (Sacramento City Code Section 3.54).

The Ordinance does not require the Employer to provide employee benefits. The Ordinance does require that if certain employee benefits are provided by the Employer, that those benefits be provided without discrimination between employees with spouses and employees with domestic partners, and without discrimination between the spouse or domestic partner of employees.

The Ordinance covers any employee working on the specific contract referenced above, but only for the period of time while those employees are actually working on this specific contract.

The included employee benefits are:

- Bereavement leave
- Disability, life and other types of insurance
- Family medical leave
- Health benefits
- Membership or membership discounts
- Moving expenses
- Pension and retirement benefits
- Vacation
- Travel benefits
- Any other benefits given to employees

(Employee Benefits does not include benefits that may be preempted by federal or state law.)

If you feel you have been discriminated or retaliated against by your employer in the terms and conditions of your application for employment, or in your employment, or in the application of these employee benefits, because of your status as an applicant or as an employee protected by the Ordinance, or because you reported a violation of the Ordinance, and after having exhausted all remedies with your employer,

You May . . .

- Submit a written complaint to the City of Sacramento, Contract Services Unit, containing the details of the alleged violation. The address is:

City of Sacramento
Procurement Services Division
5730 24th Street, Bldg. 1
Sacramento, CA 95822

- Bring an action in the appropriate division of the Superior Court of the State of California against the Employer and obtain the following remedies:
 - Reinstatement, injunctive relief, compensatory damages and punitive damages
 - Reasonable attorney's fees and costs

Attachment B



YOUR RIGHTS UNDER THE CITY OF SACRAMENTO'S NON-DISCRIMINATION IN EMPLOYEE BENEFITS CODE

If your employer provides employee benefits, they must be provided to those employees working on a City of Sacramento contract without discriminating between employees with spouses and employees with domestic partners.

The included employee benefits are:

- Bereavement leave
- Disability, life and other types of insurance
- Family medical leave
- Health benefits
- Membership or membership discounts
- Moving expenses
- Pension and retirement benefits
- Vacation
- Travel benefits
- Any other benefits given to employees

If you feel you have been discriminated against by your employer . . .

You May . . .

- Submit a written complaint to the City of Sacramento, Contract Services Unit, containing the details of the alleged violation. The address is:

City of Sacramento
Procurement Services Division
5730 24th Street, Bldg. 1
Sacramento, CA 95822
- Bring an action in the appropriate division of the Superior Court of the State of California against the employer and obtain reinstatement, injunctive relief, compensatory damages, punitive damages and reasonable attorney's fees and costs.

Discrimination and Retaliation Prohibited.

If you feel you have been discriminated or retaliated against by your employer in the terms and conditions of your application for employment, or in your employment, because of your status as an applicant or as an employee protected by the Ordinance, or because you reported a violation of this Ordinance . . .

You May Also . . .

Submit a written complaint to the City of Sacramento, Contract Services Unit, at the same address, containing the details of the alleged violation.

ATTACHMENT 3

****ITEMS REQUIRING RESPONSE****

NOTE: *Firms submitting SOQs must provide responses to the following items.*

1. SMALL BUSINESS ENTERPRISE (SBE) CERTIFICATION

Is the firm submitting the RFQ certified by the City of Sacramento or the State of California Department of General Services (DGS) as a small business enterprise? Check the appropriate block below:

- YES** - the firm submitting the Statement of Qualifications is certified by _____ the City of Sacramento or the State of California DGS as a small business enterprise.
- NO** - the firm submitting the Statement of Qualifications is not certified by the City of Sacramento or the State of California DGS as a small business enterprise.

If the response to the above is YES, provide the City of Sacramento Certification Number or State of California DGS Certification Number: _____.

2. EMERGING BUSINESS ENTERPRISE (EBE) CERTIFICATION

Is the firm submitting the RFQ certified by the City of Sacramento as an *emerging* business enterprise? Check the appropriate block below:

- YES** - the firm submitting the RFQ is certified by the City of Sacramento as an emerging business enterprise.
- NO** - the firm submitting the RFQ is not certified by the City of Sacramento as an emerging business enterprise.

If the response to the above is YES, provide the City of Sacramento Certification Number: _____.

NOTE: SBE/EBE FIVE PERCENT (5%) EVALUATION PREFERENCE

On February 9, 1999, the Sacramento City Council adopted an Emerging and Small Business Development program to provide enhanced opportunities for the participation of small business enterprises (SBEs) and emerging business enterprises (EBEs) in the City's contracting and procurement activities. A firm that is certified as a SBE or as an EBE by the City of Sacramento or as an SBE by the State of California DGS, will receive a five percent (5%) evaluation preference for the purpose of determining the highest ranked firm. To receive this evaluation preference, a firm must be certified as a SBE or EBE at the time of SOQ opening. Questions regarding eligibility for SBE/EBE certification should be addressed to the City of Sacramento Economic Development, Small Business Services at (916) 808-7223.

ATTACHMENT 4

LOCAL BUSINESS ENTERPRISE (LBE) PREFERENCE PROGRAM REQUIREMENTS

(City Contracts, no Federal Funds Used)

I. LBE PREFERENCE PROGRAM

On April 3, 2012, the Sacramento City Council adopted a Local Business Enterprise Preference (LBE) Program to provide enhanced opportunities for the participation of local business enterprises (LBEs) in the City's contracting and procurement activities.

The LBE Program provides for a two percent (2%) preference on all City procurement opportunities under \$100,000. For professional service contracts only, this preference also applies to procurement opportunities of \$100,000 or more.

A bid or quotation submitted by a firm that is located within Sacramento city and/or the unincorporated county of Sacramento will receive a two percent (2%) bid evaluation preference for the purpose of determining the lowest responsible bidder. If, after applying the 2% bid evaluation preference, the bid of an LBE firm receiving such preference is determined to be the lowest responsible bid, the award will be made for the actual amount bid.

Bidders shall submit proof to the City demonstrating that the businesses in compliance will all applicable laws relating to licensing and is not delinquent on any City of Sacramento or County of Sacramento taxes, permits, or fees.

II. LBE QUALIFICATION

- A. A LBE designated in the bid must be qualified as a LBE prior to the time bids are received.
- B. Local Business Enterprise means a business enterprise, including but not limited to, a sole proprietorship, partnership, limited liability company, corporation, or any other business entity that has a legitimate business presence in the city or unincorporated county of Sacramento. Evidence of legitimate business presence in the city or unincorporated county of Sacramento shall include:
 - 1. Having a current City of Sacramento Business Operation Tax or County of Sacramento Business License; and
 - 2. Having either of the following types of offices or workspace operating legally within

the city or unincorporated county of Sacramento:

- a. The LBE's principle business office or workspace; or
- b. The LBE's regional, branch or satellite office with at least one full time employee located in the city or unincorporated county of Sacramento.

- i. A LBE must provide a physical address for the basis of location. This excludes P.O. Box addresses.
- ii. A LBE must provide a current copy of the City of Sacramento Business Operations Tax Certificate and/or County of Sacramento Business License.

III. APPLICATION OF LBE PREFERENCE

- A. When applying the LBE preference to a Bid, the preference shall apply to the Bid price solely for Bid evaluation purposes such that the total price bid by a Local Business shall be reduced by two percent (2%) of the amount bid by that Local Business, and the reduced Bid amount shall be deemed the amount bid by that bidder. The Contract price shall in all events be the amount Bid by the successful bidder awarded the Contract.
- B. When applying the LBE preference to a Proposal, the preference shall apply in the form of additional points to the Proposal's final score such that the score awarded to a Proposal submitted by a Local Business is increased by two percent (2%) of the total possible evaluation points.
- C. The LBE preference can be applied to Bids and Proposals in addition to the City of Sacramento Emerging and Small Business Development five percent (5%) preference program. Any bid or quotation submitted by a contractor that is certified as a Small Business Enterprise (SBE) or that is certified as an Emerging Business Enterprise (EBE) by the City of Sacramento, receives a five percent (5%) bid evaluation preference for the purpose of determining the lowest responsible bidder.
- D. The LBE preference shall apply to all City procurement opportunities under \$100,000 and professional service contracts of \$100,000 or more

IV. DEFINITIONS

- A. Local Business Enterprise (LBE): A business enterprise, including but not limited to, a sole proprietorship, partnership, limited liability company, corporation, or any other business entity that has a legitimate business presence in the city or unincorporated county of Sacramento.

- B. Emerging Business Enterprise (EBE): The City shall certify EBEs utilizing the small business certification criteria and standards of the State of California, General Services Department, Office of Small Business Certification and Resources, that were in effect on December 1, 1998 provided that the size standard, industry by industry, shall be set at 50% of the State small business certification criteria and standards that were in effect on December 1, 1998.
- C. Small Business Enterprise (SBE): The City shall certify SBEs utilizing the small business certification criteria and standards of the State of California, General Services Department, Office of Small Business Certification and Resources. The City will also accept State certified SBEs.
- D. Proposal: Any response to a City solicitation for Proposals or Qualifications.
- E. Bid: Any response to a City solicitation for bids.

ATTACHMENT 5

LOCAL BUSINESS ENTERPRISE (LBE) PREFERENCE PROGRAM

NOTE: Proposers must provide responses to the following items. Failure to provide a response to each of the items in this section may be grounds for rejection of the proposal.

1. LBE TWO PERCENT (2%) BID EVALUATION PREFERENCE

On April 3, 2012, the Sacramento City Council adopted a Local Business Enterprise Preference program to provide enhanced opportunities for the participation of local business enterprises (LBEs) in the City's contracting and procurement activities.¹ A bid or quotation submitted by a firm that is located within Sacramento city and/or the unincorporated county of Sacramento will receive a two percent (2%) bid evaluation preference for the purpose of determining the lowest responsible bidder. If, after applying the 2% bid evaluation preference, the bid of an LBE firm receiving such preference is determined to be the lowest responsible bid, the award will be made for the actual amount bid. To receive this bid evaluation preference, a firm must be a qualified as a LBE prior to the time bids are received.

Local Business Enterprise means a business enterprise, including but not limited to, a sole proprietorship, partnership, limited liability company, corporation, or other business entity that has a legitimate business presence in the city or unincorporated county of Sacramento. Evidence of legitimate business presence in the city or unincorporated county of Sacramento shall include:

3. Having a current City of Sacramento Business Operation Tax or County of Sacramento Business License; and
4. Having either of the following types of offices or workspace operating legally within the city or unincorporated county of Sacramento:
 - a. The LBE's principle business office or workspace; or
 - b. The LBE's regional, branch or satellite office with at least one full time employee located in the city or unincorporated county of Sacramento.

A. LOCAL BUSINESS ENTERPRISE (LBE)

Is the firm submitting the bid qualified as a local business enterprise? Check the appropriate box below:

YES - the firm submitting the bid is qualified as a local business enterprise.

NO - the firm submitting the bid is not qualified as a local business enterprise.

If the response to the above is YES, provide the City of Sacramento Business Operations Tax Certificate Number and/or County of Sacramento Business License Number:

If the response to the above is YES, provide a current copy of the City of Sacramento Business Operations Tax Certificate and/or County of Sacramento Business License.

If the response to the above is YES, provide business office or workspace address*:

* Address must be a physical address for the basis of location, this excludes P.O. Box addresses.

¹ The LBE Program provides for a two percent (2%) preference on all City procurement opportunities under \$100,000. For professional service contracts only, this preference also applies to procurement opportunities of \$100,000 or more.

TAXABLE YEAR **2013** **Nonresident Withholding Allocation Worksheet**

CALIFORNIA FORM **587**

Part I Withholding Agent
Withholding agent's name

Address (number and street, PO Box, or PMB no.) _____ Apt. no./Ste. no. _____
 City _____ State _____ ZIP Code _____

Part II Nonresident Payee (Complete Part II through Part V and return this form to the above withholding agent)

Payee's name _____ Owner's full name if sole proprietor _____
 Address (number and street, PO Box, or PMB no.) _____ Apt. no./Ste. no. _____
 City _____ State _____ ZIP Code _____
 SSN or ITIN CA Corp. no. FEIN _____ California Secretary of State (SOS) file no. _____ Daytime telephone number _____
 (_____) _____

Nonresident payee's entity type: (Check one)
 Individual/sole proprietor Corporation Partnership Limited liability company (LLC) Estate or trust

Part III Payment Type

Nonresident payee: (Check one)
 Performs services totally outside California (no withholding required, skip to Part V) Provides goods and services in California (see allocation in Part IV)
 Provides only goods or materials (no withholding required, skip to Part V) Provides services within and outside California (see allocation in Part IV)
 Other (Describe) _____

If the payee performs all the services within California, withholding is required on the entire payment for services unless the payee is granted a withholding waiver from the Franchise Tax Board (FTB). For more information, get FTB Pub. 1017, Resident and Nonresident Withholding Guidelines.

Part IV Income Allocation

Gross payments expected from the above withholding agent during the calendar year for:

	(a) Within California	(b) Outside California	(c) Total payments
1 Goods and services:			
Goods/materials (no withholding required)	_____	_____	_____
Services (withholding required)	_____	_____	_____
2 Rents or lease payments	_____	_____	_____
3 Royalty payments	_____	_____	_____
4 Prizes and other winnings	_____	_____	_____
5 Other payments	_____	_____	_____
6 Total payments subject to withholding.			
Add column (a), line 1 through line 5	_____	_____	_____
Nonresident withholding threshold amount: ...	\$1,500.00		
Backup withholding threshold amount:	\$0.00		

Withholding is optional, at the discretion of the withholding agent, on the first \$1,500 in payments made during the calendar year. Withholding must begin as soon as the total payments of California source income for the calendar year exceed \$1,500. If the FTB grants the withholding waiver, attach a copy of the FTB determination letter. See General Information E, Waivers. For backup withholding, there is no threshold amount.

Part V Certification of Payee

Under penalties of perjury, I certify that the information provided on this document is true and correct. If the reported facts change, I will promptly inform the withholding agent.

Authorized representative's signature _____ Title _____ Daytime telephone number _____
 Payee's signature _____ Date _____ Daytime telephone number _____

2013 Withholding Exemption Certificate

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This form can only be used to certify exemption from nonresident withholding under California Revenue and Taxation Code (R&TC) Section 18662. Do not use this form for exemption from wage withholding.

File this form with your withholding agent. (Please type or print)

Withholding agent's name _____

Payee's name _____	Payee's <input type="checkbox"/> SSN or ITIN <input type="checkbox"/> FEIN <input type="checkbox"/> CA corp. no. <input type="checkbox"/> CA SOS file no.
Address (number and street, PO Box, or PMB no.) _____	Apt. no./ Ste. no. _____
City _____	State _____ ZIP Code _____

Read the following carefully and check the box that applies to the payee.

I certify that for the reasons checked below, the payee named on this form is exempt from the California income tax withholding requirement on payment(s) made to the entity or individual.

- Individuals — Certification of Residency:**
I am a resident of California and I reside at the address shown above. If I become a nonresident at any time, I will promptly notify the withholding agent. See instructions for General Information D, Who is a Resident, for the definition of a resident.
- Corporations:**
The above-named corporation has a permanent place of business in California at the address shown above or is qualified through the California Secretary of State (SOS) to do business in California. The corporation will file a California tax return and withhold on payments of California source income to nonresidents when required. If this corporation ceases to have a permanent place of business in California or ceases to do any of the above, I will promptly notify the withholding agent. See instructions for General Information F, What is a Permanent Place of Business, for the definition of permanent place of business.
- Partnerships or limited liability companies (LLC):**
The above-named partnership or LLC has a permanent place of business in California at the address shown above or is registered with the California SOS, and is subject to the laws of California. The partnership or LLC will file a California tax return and will withhold on foreign and domestic nonresident partners or members when required. If the partnership or LLC ceases to do any of the above, I will promptly inform the withholding agent. For withholding purposes, a limited liability partnership (LLP) is treated like any other partnership.
- Tax-Exempt Entities:**
The above-named entity is exempt from tax under California Revenue and Taxation Code (R&TC) Section 23701 _____ (insert letter) or Internal Revenue Code Section 501(c) _____ (insert number). The tax-exempt entity will withhold on payments of California source income to nonresidents when required. If this entity ceases to be exempt from tax, I will promptly notify the withholding agent. Individuals cannot be tax-exempt entities.
- Insurance Companies, Individual Retirement Arrangements (IRAs), or Qualified Pension/Profit Sharing Plans:**
The above-named entity is an insurance company, IRA, or a federally qualified pension or profit-sharing plan.
- California Trusts:**
At least one trustee and one noncontingent beneficiary of the above-named trust is a California resident. The trust will file a California fiduciary tax return and will withhold on foreign and domestic nonresident beneficiaries when required. If the trustee becomes a nonresident at any time, I will promptly notify the withholding agent.
- Estates — Certification of Residency of Deceased Person:**
I am the executor of the above-named person's estate. The decedent was a California resident at the time of death. The estate will file a California fiduciary tax return and will withhold on foreign and domestic nonresident beneficiaries when required.
- Nonmilitary Spouse of a Military Servicemember:**
I am a nonmilitary spouse of a military servicemember and I meet the Military Spouse Residency Relief Act (MSRRA) requirements. See instructions for General Information E, MSRRA.

CERTIFICATE: Please complete and sign below.

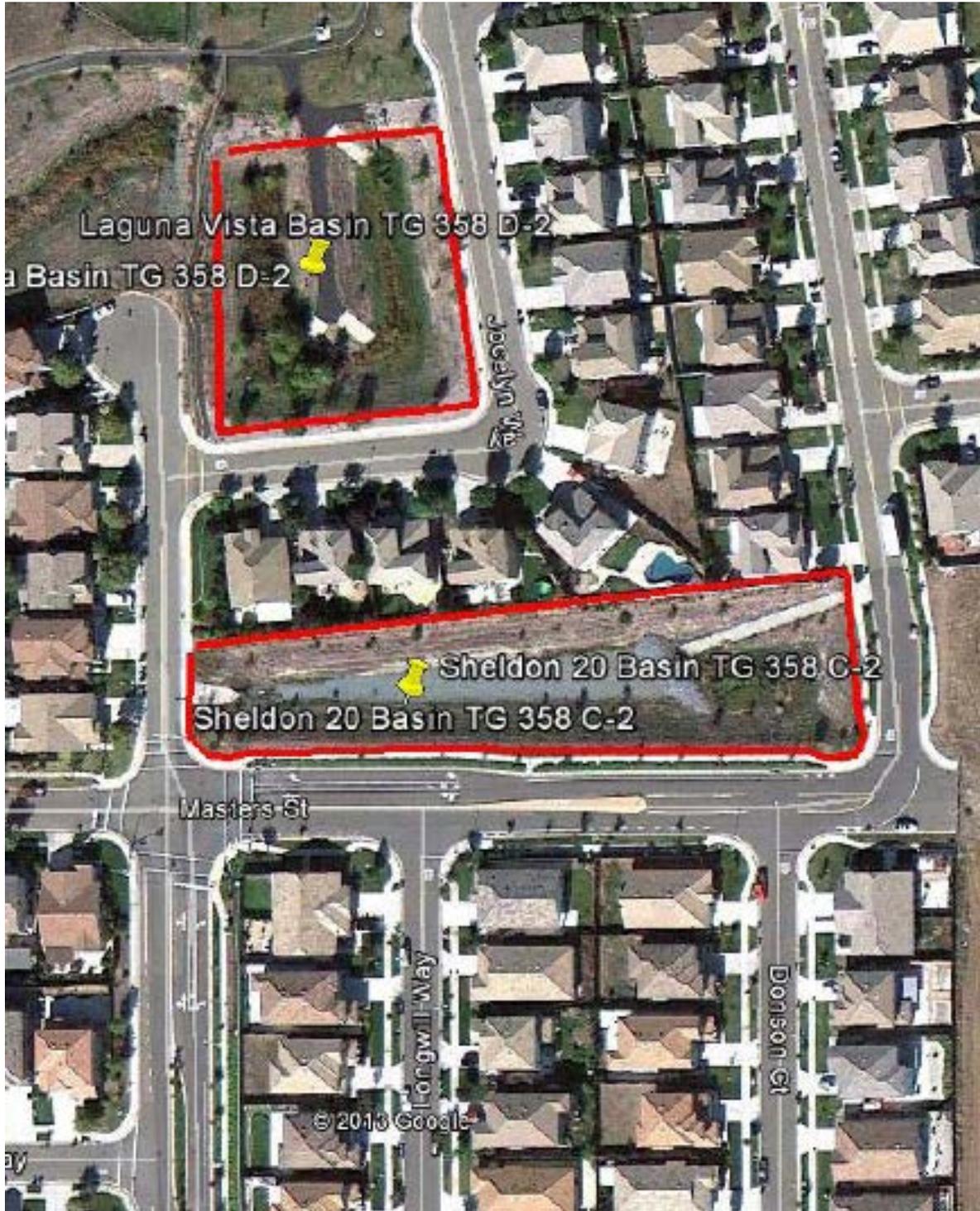
Under penalties of perjury, I hereby certify that the information provided in this document is, to the best of my knowledge, true and correct. If conditions change, I will promptly notify the withholding agent.

Payee's name and title (type or print) _____ Daytime telephone no. _____

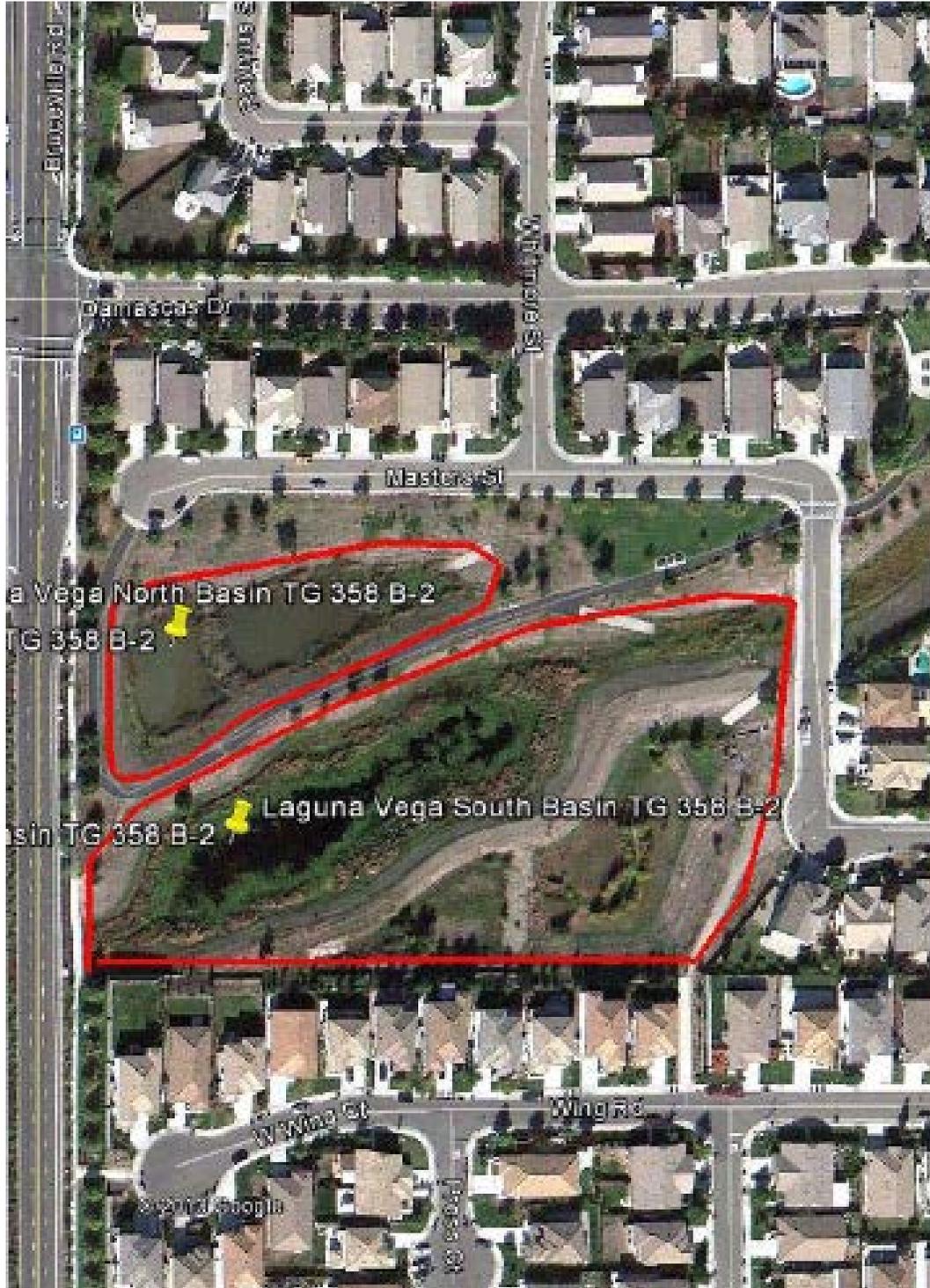
Payee's signature ► _____ Date _____

Appendix A

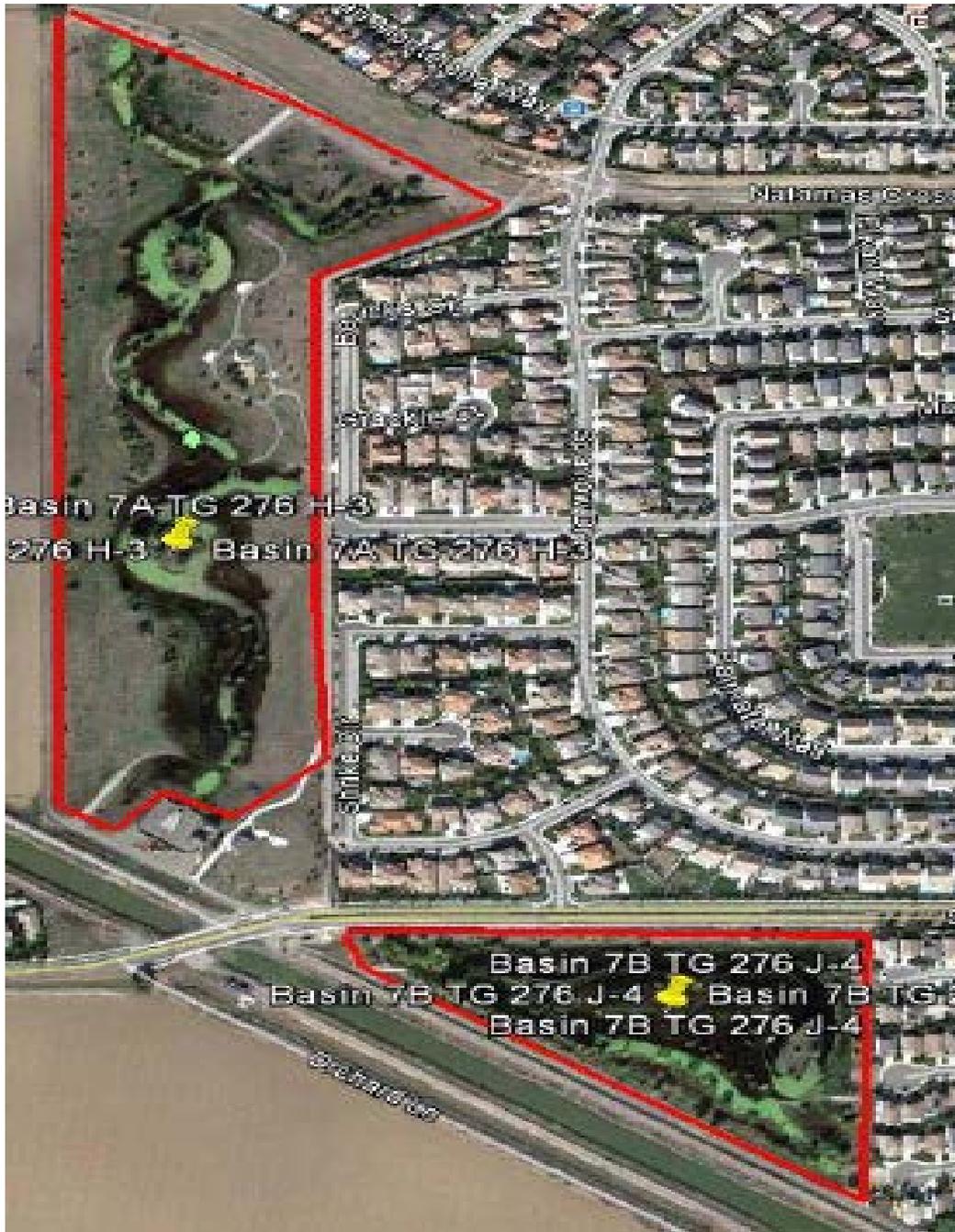
Laguna Vista and Sheldon 20 Basins Sheldon Road to Jocelyn Way at the corner of Masters Street



Laguna Vega Basins North & South Bruceville Road at Center Parkway / Sheldon



Basins 7A & 7B El Centro Road at San Juan Road



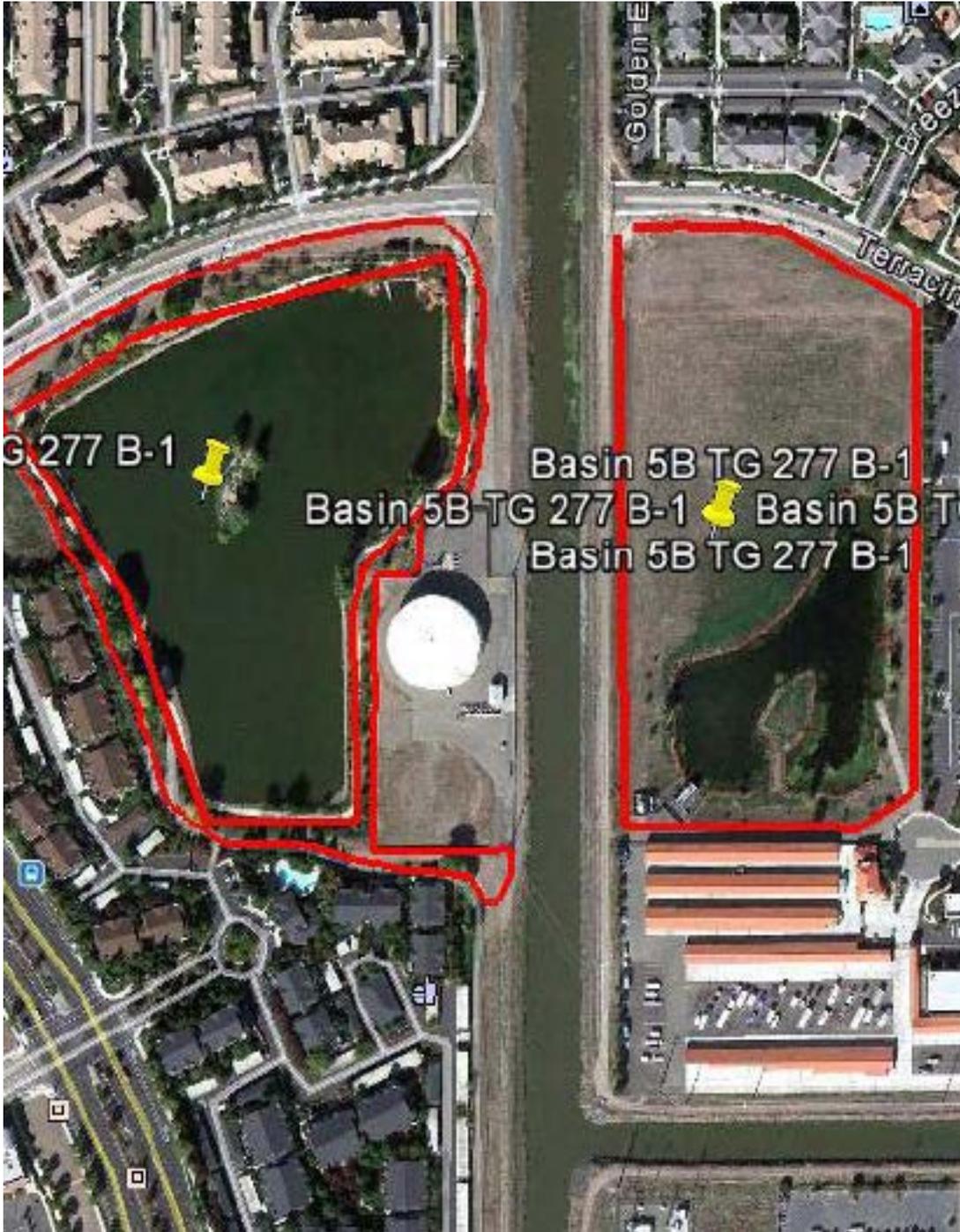
Basin 6A
Highway 80 at Truxell Road



**The Striker Basin
Striker Ave at National Drive**



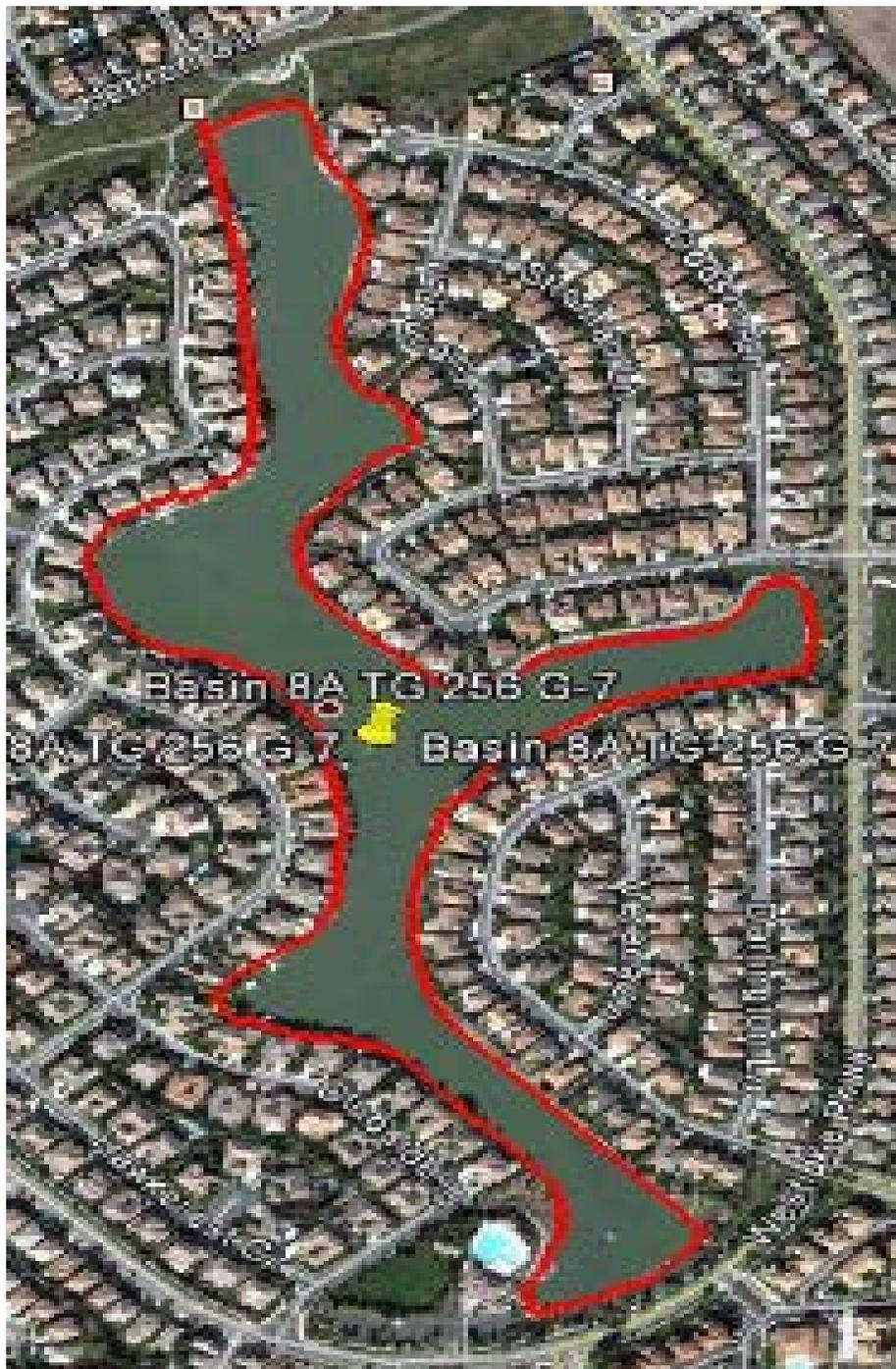
**Basin 5A and 5B
Truxel Road at Terracina Drive**



**Sundance Lake- Basin 8C
Arena Blvd at El Centro Road**



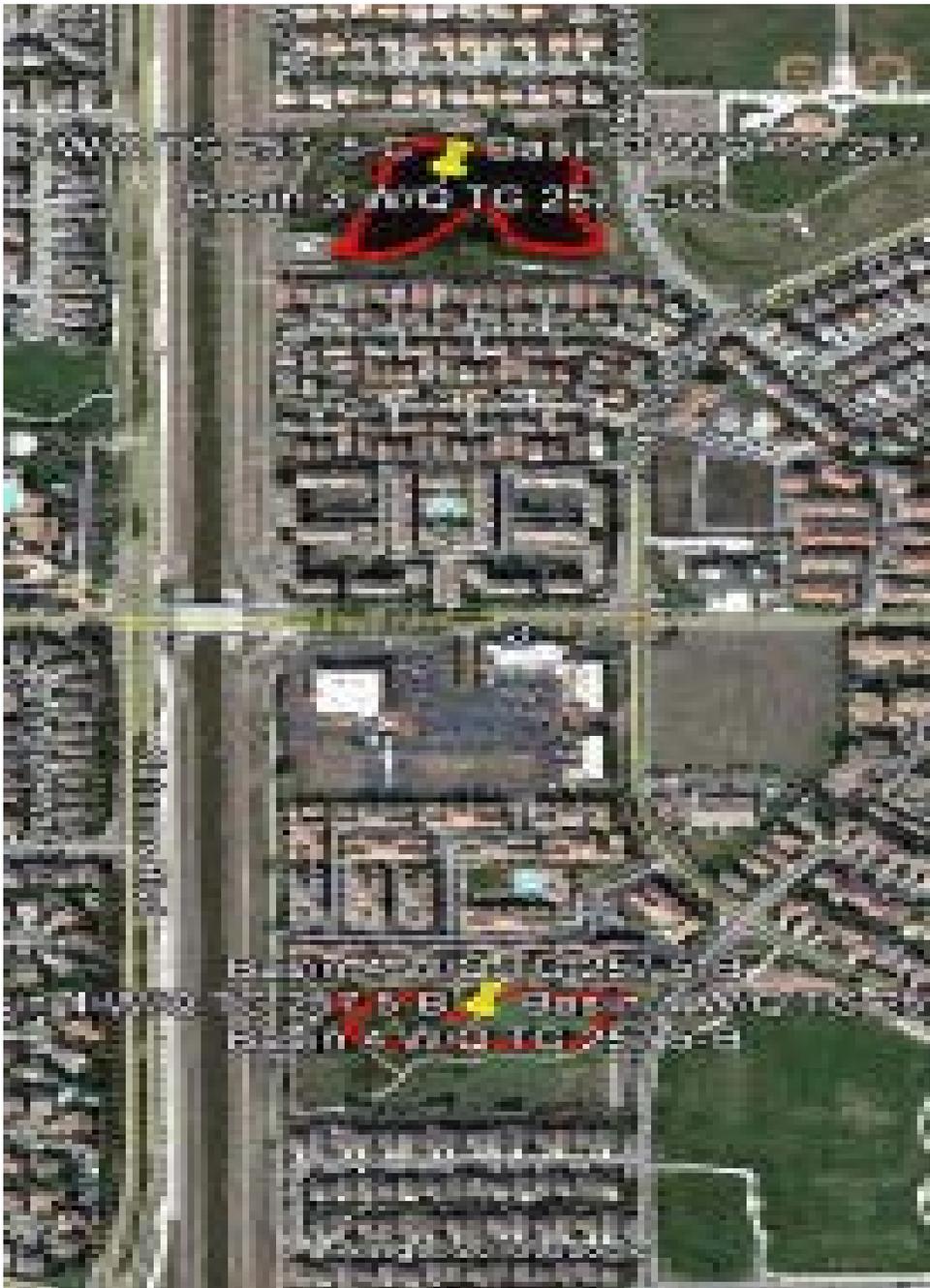
Basin 8-A
Del Paso Road at El Centro Road



Basin 1
Natomas Blvd at N. Park Drive



Basin 3 & 4
Natomas Blvd. at Club Center Drive



APPENDIX B
Routine Maintenance Agreement with DFW



Notification No. 1600-2010-0117-R2

**STREAMBED ALTERATION AGREEMENT
BETWEEN CALIFORNIA DEPARTMENT OF FISH AND GAME
AND THE CITY OF SACRAMENTO UTILITIES DEPARTMENT
FOR ROUTINE MAINTENANCE OF STREAM CHANNELS WITHIN CITY OF
SACRAMENTO**

This Streambed Alteration Agreement ("Agreement") is entered into between the California Department of Fish and Game ("DFG") and the City of Sacramento Utilities Department ("Utilities Department").

RECITALS

WHEREAS, DFG is the trustee for fish and wildlife resources of the State of California; and

WHEREAS, Fish and Game Code section 1602 requires an entity to notify DFG before: 1) substantially diverting or obstructing the natural flow of a river, stream, ; 2) substantially changing the bed, channel, or bank of any river, stream, ; 3) using any material from the bed, channel, or bank of any river, stream, ; 4) depositing or disposing of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or ; and

WHEREAS, Fish and Game Code section 1602 requires DFG to issue a lake or streambed alteration agreement ("agreement") to an entity if DFG determines that the project described in the entity's notification could substantially adversely affect fish and wildlife resources; and

WHEREAS, the purpose of an agreement is to protect fish and wildlife resources by incorporating into the project reasonable measures necessary to protect those resources; and

WHEREAS, the Utilities Department notified DFG about routine maintenance projects it intends to perform in the stream channels in and adjacent to the City to maintain the designed capacity of channels and other physical structures to protect the City's investments, to prevent the loss of life and property; and

WHEREAS, DFG determined that an agreement is required to perform such routine maintenance projects because they could substantially adversely affect fish and wildlife resources in and adjacent to the City ; and to promote the efficient and wise use or disposal of water and

WHEREAS, this Agreement authorizes the Utilities Department to perform specified routine maintenance projects in the City , and requires the Utilities Department

to comply with general and specific measures when performing such projects to prevent any substantial adverse impacts to fish and wildlife resources in the City ; and

WHEREAS, this Agreement does not apply to emergency work the Utilities Department must perform to protect life or property as described in Fish and Game Code section 1610;

NOW, THEREFORE, DFG and the Utilities Department agree that this Agreement satisfies the requirements in Fish and Game Code section 1602, and agree further as follows:

I. DEFINITIONS

"Day" means workday (based on a five day work week), unless otherwise specified.

"Diameter breast height" ("dbh") means the diameter of a tree trunk at a distance measured 4½ feet above grade.

"Emergency" has the same definition as in Public Resources Code section 21060.3, specifically "a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services."

"Heavy equipment work" means work that involves the use of backhoes, front-end loaders, bulldozers, excavators, and other heavy, mechanized equipment used to control vegetation; to remove sediment, large woody debris, and beaver dams; to place large rocks; and to grade.

"Low flow area" means generally the flowing portion of the channel during low flow conditions.

"Routine maintenance work" means work performed regularly (i.e., every one to five years) in the stream zones within those areas identified in Exhibits 1. The Utilities Department performs routine maintenance work to maintain the functional and structural integrity of its facilities. Routine maintenance work, as described in this Agreement and identified in Exhibits 1, includes, but is not limited to, the following: removing debris, sediment, vegetation, rubbish, downed trees, and other material that could obstruct the natural flow; controlling weeds, grasses, emergent vegetation, and woody vegetation; repairing gates, barricades, and small structures; washing and painting bridges; making repairs to control erosion and stabilize banks; repairing culverts; conducting minor geotechnical sampling; and other work necessary to maintain the functional and structural integrity of City streams or Utilities Department facilities.

"Special status species" means any species defined in CEQA Guidelines section 15380 (Cal. Code Regs., tit. 14, § 15380); species that are fully protected under the Fish and Game Code; species protected under the Migratory Bird Treaty Act (16 U.S.C. § 703 et

seq.); and/or species identified by DFG or other state and federal resource agencies as a species of special concern. Such species include, but are not limited to, the following: Swainson's hawk (*Buteo swainsoni*); northern goshawk (*Accipiter gentiles*); western spadefoot (*Spea hammondi*); Yellow warbler (*Dendroica petichia*); Burrowing owl (*Athene cunicularia*); Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*); Loggerhead shrike (*Lanius ludovicianus*); Northern harrier (*Circus cyaneus*); Foothill yellow-legged frog (*Rana boylei*); Western pond turtle (*Clemmys marmorata*); Tricolored Blackbirds (*Agelaius tricolor*); vernal pool tadpole shrimp (*Lepidurus packardii*); Giant Garter Snake (*Thamnophis gigas*).

"Stream" means a channel, seep, pond, waterway, or area in the City where the Utilities Department may perform the routine maintenance projects covered by this Agreement, all of which are identified in Exhibits 1 and 2. "Stream" includes perennial, intermittent, ephemeral streams and man-made channels that deliver or drain water for roadside ditches or agricultural purposes.

"Stream zone" means that portion of the stream channel through which water and sediment flow, have flowed, or are capable of flowing. The stream zone is delineated by the top of the bank or the outer edge of any riparian vegetation, whichever is more landward.

"Thinning" means the selective cutting of smaller individual trees, leaving larger individual trees to provide canopy.

II. NOTIFICATION PROCEDURE

Except as specified in Section II.A or II.B below, the Utilities Department is not required to notify DFG to obtain an agreement or other authorization before beginning any routine maintenance project identified in or authorized by this Agreement.

A. Notification to DFG by the Utilities Department

1. Routine maintenance work: Not less than 10 days prior to commencing routine maintenance work, the Utilities Department shall complete and submit to DFG a Verification Request Form (VRF), attached hereto as Attachment A for routine maintenance work. The Utilities Department shall send the VRF by email to the person(s) specified by DFG provided to the Utilities Department. In addition to the VRF, the Utilities Department shall email supporting documents for the maintenance activity, such as photos, drawings and/or maps. In the event that the Utilities Department delays the project start date specified in the VRF by more than 10 days, the Utilities Department shall submit a revised VRF before beginning the project.
2. Urgent maintenance work: A minimum of 2 days prior to beginning

urgent maintenance work covered by this Agreement, the Utilities Department shall complete a VRF and send it by email to the person(s) specified by DFG. For purposes of this Agreement, "urgent maintenance work" is routine maintenance work the Utilities Department must expedite based on the limited availability of work crews, the need for specialized equipment, anticipated weather conditions, and other limiting factors. In addition to the VRF, the Utilities Department shall email supporting documents for the maintenance activity, such as photos, drawings and/or maps.

3. Emergency work: This Agreement does not apply to emergency work by the Utilities Department. The Utilities Department shall complete any emergency work in accordance with Fish and Game Code section 1610, except that the Utilities Department shall comply with the notice requirement in section 1610 by completing the emergency form found on the Department's website: <http://www.dfg.ca.gov/habcon/1600/Forms.html> and sending it by email to the person(s) specified by DFG within 14 days of beginning the emergency work.
4. Maintenance work not covered by this Agreement: Maintenance work not covered by or consistent with this Agreement shall include any routine maintenance work not identified in Exhibit 1, regardless of whether the work is otherwise consistent with this Agreement. For routine maintenance work not covered by this Agreement and subject to Fish and Game Code section 1602, the Utilities Department shall notify DFG in accordance with that section before beginning the work. See the Department website <http://www.dfg.ca.gov/habcon/1600.html> for instructions and forms for submitting notification to the Department

B. DFG Response to Notification by the Utilities Department

1. Upon receipt of a VRF for routine or urgent maintenance work, DFG shall submit the VRF to appropriate DFG personnel. DFG may acknowledge receipt of any VRF the Utilities Department submits in the form of an email response to the Utilities Department contact person identified in the VRF. However, such acknowledgement shall not be deemed an approval by DFG that the Utilities Department may begin the work described in the VRF.
2. DFG shall determine if the routine maintenance work described in the VRF is covered by and consistent with this Agreement.
3. If DFG determines that the work described in the VRF is consistent with and covered by this Agreement, DFG may either: (a) send by

email a notice of concurrence to the Utilities Department contact person identified in the VRF and all the Utilities Department employees on the email distribution stating that it may proceed with the work described in the VRF, in which case DFG must send the notice prior to the proposed start date in the VRF; or (b) allow the 10 day (for routine maintenance work) or minimum 2-day (for urgent maintenance work) comment period to elapse. Upon receipt of a notice of concurrence, or if DFG does not submit a notice of concurrence within the applicable comment period, the Utilities Department may begin the work described in the VRF, provided it does so in accordance with the terms and conditions in this Agreement.

4. If DFG determines that the routine maintenance work described in the VRF is consistent with and covered by this Agreement, but notwithstanding such consistency additional measures (i.e., measures not included in this Agreement) need to be incorporated into the work to adequately protect fish and wildlife resources, DFG shall specify those measures in its notice of concurrence. Upon receipt of such concurrence, the Utilities Department may begin the work, provided it does so in accordance with this Agreement and the additional measures in the notice of concurrence.

5. If DFG determines that the routine maintenance work described in the VRF is not covered by or consistent with this Agreement, DFG shall send by email a notice of non-concurrence to the Utilities Department contact person identified in the VRF and all the Utilities Department employees on the email distribution, in which case DFG must send the notice within the applicable 10 (for routine maintenance work) or 2 day (for urgent maintenance work) comment period. If DFG submits a notice of non-concurrence within the applicable comment period, DFG shall specify the basis for its inconsistency determination and describe the actions the Utilities Department will need to take before it may begin the work. Such actions DFG may recommend include, but are not limited to, the following:
 - a. augmenting the VRF by submitting to DFG information sufficient to allow DFG to develop additional measures needed to protect fish and wildlife resources;
 - b. working with DFG to augment Exhibit 1;
 - c. separately notifying DFG in accordance with Fish and Game Code section 1602 and Section II.A.4 of this Agreement (above); or

- d. working with DFG to amend this Agreement.

If DFG does not send a notice of non-concurrence within the 10 day (for routine maintenance work) or minimum 2-day (for urgent maintenance work) comment period, the Utilities Department may begin the work described in the VRF upon expiration of the applicable comment period.

C. Field Confirmation of VRF

1. The Utilities Department shall ensure that a copy of any completed VRF is readily available on site, even if DFG did not respond to it before the start date in the VRF. If DFG responded to the VRF before the start date, the Utilities Department shall ensure that a copy of DFG's response is also readily available on site.
2. A copy of a completed VRF and any response to it by DFG shall be presented to any DFG employee upon request.

III. AUTHORIZED MAINTENANCE WORK

The Utilities Department may perform the maintenance work described below without following the notification procedures specified in Section II above or further notifying DFG, or obtaining a separate agreement from DFG, provided that the Utilities Department : 1) limits the work to within those areas identified in Exhibit 1; and 2) completes the work in accordance with the terms and conditions specified herein.

- A. Debris or obstruction removal. The Utilities Department may remove debris, trash, rubbish, beaver dams, flood-deposited woody and herbaceous vegetation, downed trees, dead trees which are in clear danger of falling in or across a channel, branches, and associated debris that substantially obstruct (or could obstruct) water flow, reduce channel capacity, accelerate erosion, damage concrete box culverts, metal culverts, bridge structures, or cause pump damage.
- B. Silt, sand, or sediment removal. The Utilities Department may remove or displace silt, sand, gravel, or sediment in the immediate vicinity (i.e., within 100 feet) of man-made facilities or structures that substantially obstruct water flow, reduce channel capacity, accelerate erosion, damage concrete box culverts, metal culverts, or bridge structures, or could do so. The Utilities Department may remove silt, sand, gravel, or sediment throughout concrete lined channels.
- C. Vegetation control in channels. The Utilities Department may cut, mow, disc, bulldoze, or spray herbicides on grasses, shrubs, and woody growth

to maintain the designed capacity of floodways and to facilitate site inspections. The Utilities Department may cut, trim, or remove the lower branches of large trees to facilitate site inspections and maintain channel capacity. The Utilities Department may remove dead trees, dying trees, and new trees less than 4-inches dbh to maintain channel capacity and prevent erosion. The Utilities Department may remove non-native vegetation (e.g., giant reed (a.k.a. "false bamboo"), Chinese tallow, red sesbania, Spanish bloom, Tree-of-heaven, black locust, tree tobacco, castor bean, pampas grass, eucalyptus, tamarisk, water hyacinth, acacia, parrotfeather, giant Asian dodder, water primrose, water lettuce, and ivy) to maintain channel capacity and improve native habitat.

- D. Repair of previous erosion control work. The Utilities Department may repair previous erosion control work, including, but not limited to, failed rock, sacked concrete, or gabion sections. Such work shall not extend beyond 50 linear feet of the existing revetted area.
- E. Minor erosion control work. The Utilities Department may slope, place earthen fill, install rocks and gabions, or take other necessary measures to control erosion on previously unrevetted areas. Such work shall not exceed 50 linear feet in length.
- F. Bridge washing and painting. The Utilities Department may clean, wash, and paint structures within a stream zone, provided containment measures are used to prevent deleterious material from entering state waters and avoid adverse impacts to fish and wildlife resources.

IV. CONDITIONS

- A. The Utilities Department shall act as the lead agency under CEQA for any maintenance work covered by this Agreement that it undertakes to the extent that such work constitutes a project requiring CEQA review.
- B. The Utilities Department shall complete the maintenance work covered by this Agreement in accordance with the following conditions and time periods, and any other time periods specified in this Agreement:
 - 1. The Utilities Department shall perform the maintenance work at a time and in a manner that minimizes adverse impacts to fish and wildlife resources and provides for the protection and continuance of those resources.
 - 2. The Utilities Department shall time the maintenance work with an awareness of forecast precipitation and other foreseeable events that could increase stream flows.

3. The Utilities Department shall time the maintenance work with awareness of the amount of time and materials necessary to implement erosion control measures. The Utilities Department shall cease the maintenance work and shall make its best efforts to implement all reasonable erosion control measures before all storm events.
4. The Utilities Department shall perform routine maintenance work which includes grading, placement of fill, placement of rock slope protection materials, and restrict other earth moving work within the stream zone within the following time period: April 15 to October 15.
5. The Utilities Department may remove debris in critical locations, such as bridges, gates, culverts, and channels, where such removal is necessary to avoid imminent flooding or damage to the Utilities Department structures and/or public/private facilities at any time.
6. The Utilities Department may control woody and brushy vegetation by using hand tools to selectively trim, "limb-up," or cut-down vegetation and by selectively spraying herbicides to control woody and brushy vegetation only during the following time period: July 15 to March 1.
7. The Utilities Department may control aquatic vegetation using hand tools to selectively trim, limb-up, or cut-down vegetation and by selectively spraying herbicides only during the following time period: August 1 to March 1.
8. The Utilities Department may control woody and brushy vegetation by mechanical means (e.g., by brush hog, excavator, grading, or similar equipment) only during the following time period: August 1 to November 15.
9. The Utilities Department may cut, trim, or remove downed trees and dead or live trees that are in clear danger of falling in or across a channel that will significantly reduce channel capacity, accelerate erosion, or otherwise cause an emergency at any time.
10. Excepted as noted in the sentence below, the **City** may only mow grasses on engineered channel and levee slopes, regularly maintained detention basins, and access roads only during the following time period: August 15 to March 1. The **City** may mow grasses on engineered channel and levee slopes, regularly maintained detention basins, and access roads any time, provided

- the mowing deck is set at a mowing height of 4 or more inches above the ground.
11. The Utilities Department may control vegetation by pre- and post-emergent herbicide spraying on regularly maintained channel slopes and access roads when used in accordance with the labeled instructions.
 12. The Utilities Department may request DFG to allow it to work outside the time periods listed above in paragraphs 1, 2, 3, 4, 6, 7, 8 and 10 by submitting to DFG a written variance request that contains the following information: 1) the work location; 2) the name of the stream or watercourse near or within which the Utilities Department intends to perform the work; 3) a description of the work the Utilities Department intends to perform; 4) the amount of time the Utilities Department will need to complete the work described in the variance request; and 5) the name and telephone number of the Utilities Department contact person for the work. DFG may make approval of a variance request contingent on an agreement by the Utilities Department to complete a biological survey (in accordance with paragraph 13 below); to employ a biological monitor (in accordance with paragraph 14 below); or to incorporate additional measures as part of the proposed work, if DFG determines that the work could adversely affect nesting birds or special status species. DFG shall approve or disapprove a variance request at its sole discretion within 10 days of its receipt, unless DFG has directed the Utilities Department to complete a biological survey (see paragraph 13 below).
 13. If DFG requires the Utilities Department to complete a biological survey before approving a variance request, the Utilities Department shall employ a qualified biologist to survey the work area to verify the presence or absence of nesting birds or special status species. The survey shall be performed no more than 14 calendar days prior to beginning the maintenance work. The biologist shall survey the entire work area and the 50-foot "buffer" adjacent to and around the work area. After the Utilities Department completes the survey, it shall submit a written report to DFG that describes the biologist's survey protocols and findings, together with a copy of its original variance request. Within 10 days of receiving the survey report and variance request, DFG shall notify the Utilities Department by email, fax, or regular mail that it approves or disapproves the variance request. Failure by DFG to notify the Utilities Department within the 10-day period shall not be deemed an approval by DFG of the Utilities Department variance request. In the event DFG does not notify the Utilities Department

within the 10-day period, the Utilities Department should contact DFG to inquire about the status of the variance request.

14. If DFG requires the Utilities Department have a qualified biologist on site to monitor the maintenance work described in a variance request as a condition of approving the request, DFG may require the Utilities Department to have the monitor on site before, during, and after the maintenance work. If a monitor is used, the Utilities Department shall cease any maintenance work if the monitor determines that doing so is necessary to prevent harm to nesting birds, special status species, or any other fish and wildlife resource. The monitor shall notify the DFG employee who approved the variance request of any work stoppage as soon as practicable. The Utilities Department may resume work after the monitor determines that doing so will not cause harm to nesting birds, special status species, or any other fish and wildlife resource. If the Utilities Department wants to employ a monitor when performing the maintenance work described in a variance request, the Utilities Department should indicate its preference in the request.
- C. The Utilities Department shall complete maintenance work on the projects identified in Exhibits 1 in accordance with the descriptions. The Utilities Department may not modify any of the projects identified in Exhibits 1 unless it first notifies DFG and DFG, at its sole discretion, approves the modification. DFG and the Utilities Department shall resolve any disputes regarding any proposed modifications to Exhibits 1 in accordance with Section XII of this Agreement.
- D. Prior to beginning any maintenance work under this Agreement, the Utilities Department maintenance supervisors and crews who will be completing such work shall be trained by a qualified biologist to identify and avoid harm to special status species and their habitat.
- E. Some of the Utilities Department projects this Agreement covers are within the known home range of species that are fully protected under the Fish and Game Code or listed under the California Endangered Species Act ("CESA") (Fish & G. Code, § 2050 et seq.) and/or the Endangered Species Act (16 U.S.C. § 1531 et seq.). The work periods listed in this Agreement are intended to avoid adverse impacts to those species. However, DFG may impose additional measures on any maintenance work covered by this Agreement if DFG determines that such measures are necessary to protect a fully protected or listed species from harm.
- F. If the Utilities Department encounters a fully protected or listed species while performing maintenance work, the Utilities Department shall

suspend all work until the fully protected or listed species has left the work area. The Utilities Department shall notify DFG of all confirmed observations of any fully protected or listed species in or adjacent to any work area covered by this Agreement. This Agreement does not authorize the Utilities Department to take, incidentally or otherwise, any fully protected or listed species, as "take" is defined in the "fully protected" statutes in the Fish and Game Code, CESA, or the Endangered Species Act. DFG may suspend or revoke this Agreement for any unauthorized take by the Utilities Department of a fully protected or listed species while performing any maintenance work authorized by this Agreement.

- G. Notwithstanding this Section IV, in work areas where special status species are likely to occur, the Utilities Department shall have a qualified biologist shall conduct appropriate surveys to determine whether such species are present. The Utilities Department shall not begin work until a qualified biologist determines that the work will not result in the take of such species or otherwise substantially adversely affect them.
- H. The Utilities Department shall not perform any work within $\frac{1}{4}$ mile of a nesting Swainson's hawk between March 1 and September 15 without first consulting with DFG and, if necessary, obtaining an incidental take permit in accordance with CESA. When advised by a DFG or by a biologist retained by the Utilities Department, the Utilities Department shall suspend any maintenance work that could disrupt or otherwise interfere with Swainson's hawk nesting until DFG provides direction on how to proceed.
- I. The Utilities Department shall not perform any work within 250 feet of a burrowing owl nest without first consulting with DFG. When advised by a DFG or by a biologist retained by the Utilities Department, the Utilities Department shall suspend any maintenance work that could disrupt or otherwise interfere with burrowing owl nesting until DFG provides direction on how to proceed.
- J. The Utilities Department shall avoid maintenance work on bridges between February 15 and September 30 if doing such work could disturb known roosting sites for bats.
- K. If the Utilities Department encounters any wildlife during any maintenance work covered by this Agreement, it shall cease the work until the wildlife has left the work area. If necessary, the Utilities Department may attempt to flush, haze, or herd the wildlife in a safe direction away from the work area, provided the wildlife is not a fully protected or listed species. If the wildlife is a fully protected or listed species, the Utilities Department shall comply with paragraph F above.
- L. The Utilities Department shall not disturb any active bird nests until all

eggs have hatched and/or young birds have fledged. Unless otherwise specified herein, the Utilities Department shall operate any equipment at least 50 feet away from active bird nests.

- M. The Utilities Department shall not use heavy equipment in standing or flowing water unless DFG approves such work. If standing or flowing water is present or reasonably anticipated, the Utilities Department shall submit to DFG a detailed water diversion or de-watering plan. De-watering may be accomplished by using gravel bags, port-a-dams, water bladder dams, K-rails, or driven sheet metal coffer dams.
- N. The Utilities Department may cut, trim, spray with herbicides, or remove only that vegetation that obstructs stream flow or significantly reduces channel flood flow capacity. Reasonable precautions shall be taken to avoid other damage to non-target vegetation by persons or equipment. The Utilities Department may not remove roots and stumps of trees with trunk diameters great than 4 " dbh without first consulting with DFG.
- O. The Utilities Department shall clear stream channels in such a manner that it avoids trees greater than 4 inches dbh. The Utilities Department may trim such trees as necessary to gain access to maintenance areas, but it may not remove such trees without first consulting with DFG. The Utilities Department may remove trees less than 4 inches dbh without first consulting with DFG.
- P. Recruitment of single trunk species of trees (e.g., oak, sycamore, cottonwood, Gooding willow, and alders) within or adjacent to stream channels is important for the replacement of trees that die or are removed by natural or man-made causes. Where limited tree growth does not substantially interfere with channel capacity or function, the Utilities Department shall allow young trees to grow. The Utilities Department may thin young trees only where tree density is likely to cause future problems with regard to stream channel capacity and design function of the state highway structure.
- Q. The Utilities Department may trim the lower branches of large trees growing within a stream channel from ground level to a distance of 6 feet above ground level. The 4 inch dbh restriction in paragraph O above shall not apply to low-hanging limbs that block water flow, catch debris, or otherwise compromise the designed flow of the channel.
- R. In areas where small trees growing densely on both sides of the watercourse create water flow passage problems, thinning of those trees might be an appropriate maintenance technique. If the Utilities Department intends to cut trees and shrub brush along a stream, it shall do so in an alternating pattern by cutting on one side of the stream one

year and the other side of the stream the following year, except that in doing so, the Utilities Department shall avoid removing all vegetation along long reaches of a stream bank (i.e., greater than 200 feet long), and shall leave isolated patches of vegetated habitat to serve as nesting and cover material. The Utilities Department shall employ this maintenance technique only with specific notice to and concurrence by DFG.

- S. Elderberry bushes shall be trimmed or removed only in accordance with United States Fish and Wildlife Service protocol.
- T. The Utilities Department may chemically treat or remove the following non-native plants without restriction: giant reed (a.k.a. "false bamboo"), Chinese tallow, red sesbania, Spanish bloom, Tree-of-heaven, black locust, tree tobacco, castor bean, pampas grass, eucalyptus, tamarisk, acacia, parrotfeather, giant Asian dodder, water primrose, water lettuce, and ivy. The Utilities Department may add other invasive non-native plants to this list if approved by DFG.
- U. The Utilities Department may only use herbicides registered with the California Department of Pesticide Regulation. The Utilities Department shall apply herbicides in accordance with regulations established by that department and in accordance with labeled instructions. Upon request, the Utilities Department shall make available to DFG labeled instructions for any herbicides used by the Utilities Department in performing maintenance work. The Utilities Department shall report immediately to DFG the killing of any non-plant aquatic life caused by the use or spilling of any herbicide, pesticide, or other chemical.
- V. During routine maintenance activities, the Utilities Department shall remove all trash and man-made debris collected in the channel. Any organic debris collected in the channel may be cut into appropriate sizes to be chipped and scattered as mulch at maintenance areas, removed from the channel, or burned in stationed debris piles.
- W. During routine maintenance activities, the Utilities Department shall prevent chemicals, paint, oil, gas, and other petroleum products, and other substances that could be deleterious to aquatic life from contaminating the soil and/or entering waters of the state. The Utilities Department shall immediately remove such substances from any place where it could enter waters of the state and/or adversely affect fish and wildlife resources. The Utilities Department shall attempt to contain any releases or spills of such substances, and shall report the release or spill as soon as possible to DFG at (916) 445-0045 and the Office of Emergency Services at 1-800-852-7550
- X. The Utilities Department shall be responsible for providing the Department

entry to any work area. The Utilities Department shall provide DFG keys for all locked gates and fences that restrict public access to maintenance work areas. The Utilities Department agrees that DFG may inspect maintenance work areas at any time without first notifying, or obtaining consent from the Utilities Department. If work is ongoing during the time of the inspection, DFG shall make contact with the supervisor/lead worker so the crew is aware that others are on site. DFG shall report to the Utilities Department any problems it discovers during its inspection.

- Y. If DFG determines that conditions have arisen or changed in such a manner that the work covered by this Agreement could adversely affect fish and wildlife resources, upon notice by DFG, the Utilities Department shall temporarily stop the work until corrective measures are taken in consultation with DFG.
- Z. Vehicles shall be reasonably free of external petroleum residue. Any equipment or vehicles driven and/or operated adjacent to a stream shall be checked and maintained daily to prevent leaks of materials that, if introduced into the water, could be deleterious to aquatic life. Vehicles shall be moved away from the stream prior to refueling and lubricating.
- AA. Staging and storage areas for equipment, materials, fuels, lubricants, and solvents shall be located in areas where such materials if spilled shall not enter the stream zone. Stationary equipment such as motors, pumps, generators, compressors, and welders located within or adjacent to the stream shall be positioned over drip-pans.
- BB. The Utilities Department may sandblast, paint, and chip and use gunite, as necessary, provided that materials are contained or placed where they will not enter or be washed into a stream. Chipped paint and rebound materials shall be removed and disposed of in accordance with local, state, and federal law.
- CC. The Utilities Department and all of its contractors shall be subject to the water pollution regulations found in the Fish and Game Code sections 5650 and 12015.

V. SUBMITTALS

- A. The Utilities Department shall send or deliver all non-VRF submittals (e.g., standard 1602 notifications, annual reports, fees, and photographs) to the following address:

Department of Fish and Game
Sacramento Valley - Central Sierra Region
Attn: Lake or Streambed Alteration Program

1701 Nimbus Road
Rancho Cordova, California 95670
(916) 358-2929 (telephone)
(916) 358-2912 (fax)

- B. The Utilities Department shall send all VRF submittals to the person(s) specified by DFG. DFG and the Utilities Department shall update the distribution list as needed, modify the revision date accordingly, and provide each other with a copy of the most current list.

VI. REPORTING

The Utilities Department shall provide a written report to DFG on or before July 1 each year. The report shall include a brief description of the projects completed and a complete list of each location/facility where the Utilities Department performed routine maintenance work during the previous fiscal year (i.e., July 1 through June 30). To the extent feasible, the Utilities Department shall submit pre- and post-project photographs with the annual report. The photographs shall be labeled and formatted for placement in Exhibit 1. The report shall reference this Agreement by title and by notification number 1600-2010-0117-R2.

VII. FEES

The fees referenced below are based on the current fee schedule. These fees are subject to change. The Utilities Department shall pay the appropriate fee from the existing fee schedule at the time the specific fee is paid.

A. Initial Notification Fee

The Utilities Department shall pay DFG the initial notification fee of \$1,345.25.

B. Subsequent Fees

The Utilities Department shall also pay a lump sum to DFG at the end of each fiscal year when it submits its annual report based on the total number of routine maintenance projects undertaken by the Utilities Department for which VRFs were submitted (which shall be equal to the number of VRFs submitted to DFG during the fiscal year) and the following fee schedule:

\$112.00 for each maintenance project (VRF submitted)

A. Amendment Fee

The Utilities Department may request DFG to make a minor amendment

to this Agreement. A minor amendment is one that would not significantly modify the scope or nature of any project covered by this Agreement or any measure included in this Agreement to protect fish and wildlife resources. The fee for a minor amendment is:

(1) \$168.00

The Utilities Department may request the Department to make a major amendment to this Agreement. A major amendment is one that would significantly modify the scope or nature of any project covered by this Agreement or any measure included in this Agreement to protect fish and wildlife resources, or require additional environmental review pursuant to section 21000 *et seq.* of the Public Resources Code or section 15000 *et seq.* of title 14 of the California Code of Regulations. The fee for a major amendment is:

(1) \$560.25

B. Renewal Fee

The fee to renew (i.e., extend) this Agreement shall be \$224.00.

VIII. OTHER PERMIT REQUIREMENTS

This Agreement does not relieve the Utilities Department or any person acting on behalf of the Utilities Department, including its officers, employees, representatives, agents or contractors and subcontractors, from complying with other applicable statutes in the Fish and Game Code, to the extent applicable, including, but not limited to, sections 2050 *et seq.* (California Endangered Species Act), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5931 (fish passage over/around dam), 5937 (sufficient water for fish), and 5948 (obstruction of stream). The Utilities Department is responsible for obtaining all required permits and authorizations from local, state and federal agencies. The Utilities Department shall notify the Department where conflicts exist between the provisions of this agreement and those imposed by other regulatory agencies. Unless otherwise notified, the Utilities Department shall comply with the provision that offers the greatest protection to water quality, species of special concern and/or critical habitat, provided that this Agreement shall not be interpreted or applied in any way that prevents the Utilities Department or the City of Sacramento from complying with federal or state flood control maintenance regulations, guidelines or requirements or with any terms or provisions of the City's National Pollutant Discharge Elimination System (NPDES) Permit No. CAS082597.

IX. AMENDMENT

- A. This Agreement may be amended or modified at any time by mutual written agreement executed by DFG and the Utilities Department . Any proposal to amend or modify this Agreement shall be submitted for review and approval by the Regional Manager, or the Regional Manager's designee, for DFG and the Utilities Department , unless otherwise specified.
- B. Notwithstanding paragraph A above, upon review and approval by a DFG staff person in the Lake and Streambed Alteration Program, the Utilities Department may add other state highway projects and work areas to Exhibit 1 after the effective date of this Agreement, in which case all provisions of this Agreement shall apply to the added projects. DFG may impose additional conditions on the Utilities Department when performing routine maintenance work on structures in work areas added to Exhibit 1 after the effective date of this Agreement.
- C. Notwithstanding paragraph A above, DFG and the Utilities Department may modify the distribution list at any time, provided that DFG or the Utilities Department indicates on the list the date it was modified, and thereafter provides the other party a copy of the list, as modified.
- D. DFG and the Utilities Department shall meet in each January or at some other mutually agreed to time to discuss this Agreement. Both parties should be prepared to propose any amendments to this Agreement at the meeting.

X. TERMINATION

This Agreement shall remain in effect until it expires or is terminated in writing by DFG or the Utilities Department. Termination shall become effective 30 days after receipt of the termination notice by the other party or on such later date as may be specified in the notice. In the event this Agreement is terminated, the Utilities Department may complete any maintenance work that DFG approved prior to the date of the termination notice.

XI. RENEWALS

This Agreement may be renewed at the end of its term for another period of up to 5 years in accordance with Fish and Game Code section 1605, subdivisions (a) through (e). DFG's decision whether to grant a request to extend this Agreement shall be based in part on a review of the annual reports submitted by the Utilities Department under Section VI of this Agreement. Notwithstanding Fish and Game Code section 1605, subdivisions (a) through (e), DFG may deny a request by the Utilities Department to

renew this Agreement if DFG determines that the Utilities Department has failed to fully comply with one or more material terms and conditions of this Agreement. DFG shall not renew this Agreement until it has complied with CEQA, if such compliance is necessary.

XII. DISPUTE RESOLUTION

DFG and the Utilities Department shall attempt to resolve any alleged violation of Fish and Game Code Section 1600 et seq. or any disagreement between DFG and the Utilities Department regarding this Agreement at the field staff level. If DFG concludes that the Utilities Department is failing, or has failed to, comply with Fish and Game Code section 1600 et seq. or the terms and conditions of this Agreement, DFG shall notify the Utilities Department, either verbally or in writing, of the work constituting the asserted violation and the Utilities Department shall immediately suspend the work, unless the work is emergency work necessary to protect life or property. As expeditiously as possible after the suspension occurs (in the case of an asserted violation) or if field staff cannot resolve an issue (in the case of a disagreement), DFG staff shall inform the Assistant Chief and Regional Manager of the suspension (in the case of an asserted violation), or the Regional Manager only (in the case of a disagreement), and the Utilities Department staff shall inform the Utilities Superintendent. The Regional Manager and the Utilities Superintendent shall thereafter commence the following dispute resolution process:

- A. The Regional Manager shall contact the Utilities Superintendent in an effort to mutually resolve the asserted violation or disagreement. DFG and the Utilities Department shall address whether the Utilities Department was in compliance with Fish and Game Code section 1600 et seq. or this Agreement; whether this Agreement should be modified, suspended, or revoked; whether the Utilities Department should provide restitution for damage caused to fish and wildlife resources, if any damage occurred; and/or any other relevant issues.
- B. If the Regional Manager and the Utilities Superintendent are unable to resolve the asserted violation or disagreement within 7 days of the meeting to discuss the matter, the Regional Manager and Utilities Superintendent shall elevate the matter to a DFG Deputy Director and the Utilities Division Manager.
- C. If the DFG Deputy Director and the Utilities Division Manager are unable to mutually resolve the asserted violation or disagreement within 7 days of the meeting to discuss the matter, they shall refer the asserted violation or disagreement to the DFG Director and the Utilities Director.

DFG shall exercise its authority in a manner intended to encourage resolution, settlement, and compromise of all asserted violations or disagreements in an effort to avoid seeking prosecution. However,

nothing in this Agreement compromises DFG's authority and responsibilities under the Fish and Game Code or other state laws or regulations.

Participation by the Utilities Department in the dispute resolution process specified above shall not be construed as an admission of liability or responsibility nor a waiver of any available defenses on the part of the Utilities Department or the City, and all dispute resolution proceedings, statements, documentation and results shall be inadmissible for any purpose whatsoever in any regulatory or other legal proceeding, unless such admission is otherwise agreed to in writing by both parties.

XIII. ENTIRE AGREEMENT

This Agreement, which includes Exhibits 1 and any other exhibits or attachments referenced herein, constitute the entire Agreement. This Agreement supersedes the following active Streambed Alteration Agreements: Memorandum of Understanding between the Utilities Department and California Department of Fish and Game (1600-2010-0117-R2). These agreements shall terminate upon the effective date of this Agreement.

XIV. EFFECTIVE DATE AND TERM

This agreement shall become effective on the date of last signature below, and shall expire five years from the date of last signature below, unless it is terminated at an earlier date or renewed prior to its expiration.

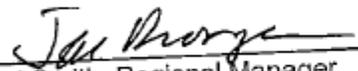
City of Sacramento Department of Utilities



Director of Utilities

Date: 10-6-10

CALIFORNIA DEPARTMENT OF FISH AND GAME



Kent Smith, Regional Manager
Sacramento Valley - Central Sierra Region

Date: 10/28/10

Approved as to form:



City Attorney

Attest:



Dawn Bellunkel
City Clerk

10-13-10

EXHIBIT 1

[Maps listing and describing the Stream and drainage facilities covered by this Agreement. Exhibit 1 will be provided and updated as needed by the Utilities Department.]

Attachment A

VRF-enter name of stream

City of Sacramento

ROUTINE MAINTENANCE AGREEMENT (RMA) #1600-2010-0117-R2
 VERIFICATION REQUEST FORM (VRF)

Date of Request:

- ORIGINAL REQUEST
- REVISION NO.

District Contact Person: [To be Name]

Phone Number: (916) ###-####

Cell Number: (916) ###-####

Email: [to be determined]

- Routine Work 10 Day Notice
- Urgent – minimum 2 day notice (describe urgency below)
- Emergency – work to begin immediately (describe emergency below)

Comments:

Name of Stream:

Location or other identifier (lat/long is preferred):

Project Start Date:

Project End Date:

- Type of Work**
- Cut Bulrush, Cattails or other in-channel vegetation
 - Debris/down and damaged tree removal
 - Tree Trimming
 - Silt removal in or near bridges/culverts/outfall pipes
 - Silt removal beyond in-channel structures
 - Erosion repair/riprap placement
 - Repair Access Roads
 - Concrete Repair at headwalls/outfalls
 - Concrete Panel patch/repair
 - Other:

- Equipment**
- Chainsaw/pruning shears/clippers
 - Wood Chipper
 - Backhoe/Grade-all
 - Excavator with Blade
 - Hand Tools
 - Other:
- Routine Work Requiring Variance**
- Request to Work Outside RMA Dates
 - Other:

Description of Proposed Maintenance Work:

Known environmental issues or other concerns:

Section 2: DFG Approval

In accordance with Section 11 of the Agreement between the California Department of Fish and Game (DFG) and the City of Sacramento for Routine Maintenance in Stream Channels and drainage facilities within the City of Sacramento for the purposes of protecting and maintaining storm and drainage channels. District hereby notifies DFG of its intent to perform routine maintenance work within a stream covered in the Agreement.

DFG Contact Information
 Name: Gary Hobgood

Date DFG Responded to the City:

Phone Number: (916) 983-6920 email: ghobgood@dfg.ca.gov

<input type="checkbox"/> Notice of concurrent
<input type="checkbox"/> Work can begin as scheduled
<input type="checkbox"/> Work can begin immediately
<input type="checkbox"/> Notice of concurrence with conditions (See DFG comments below)
<input type="checkbox"/> Work can begin as scheduled
<input type="checkbox"/> Work can begin immediately
<input type="checkbox"/> Notice of non-concurrence with comments (See DFG comments below)

Comments:

Mapbook

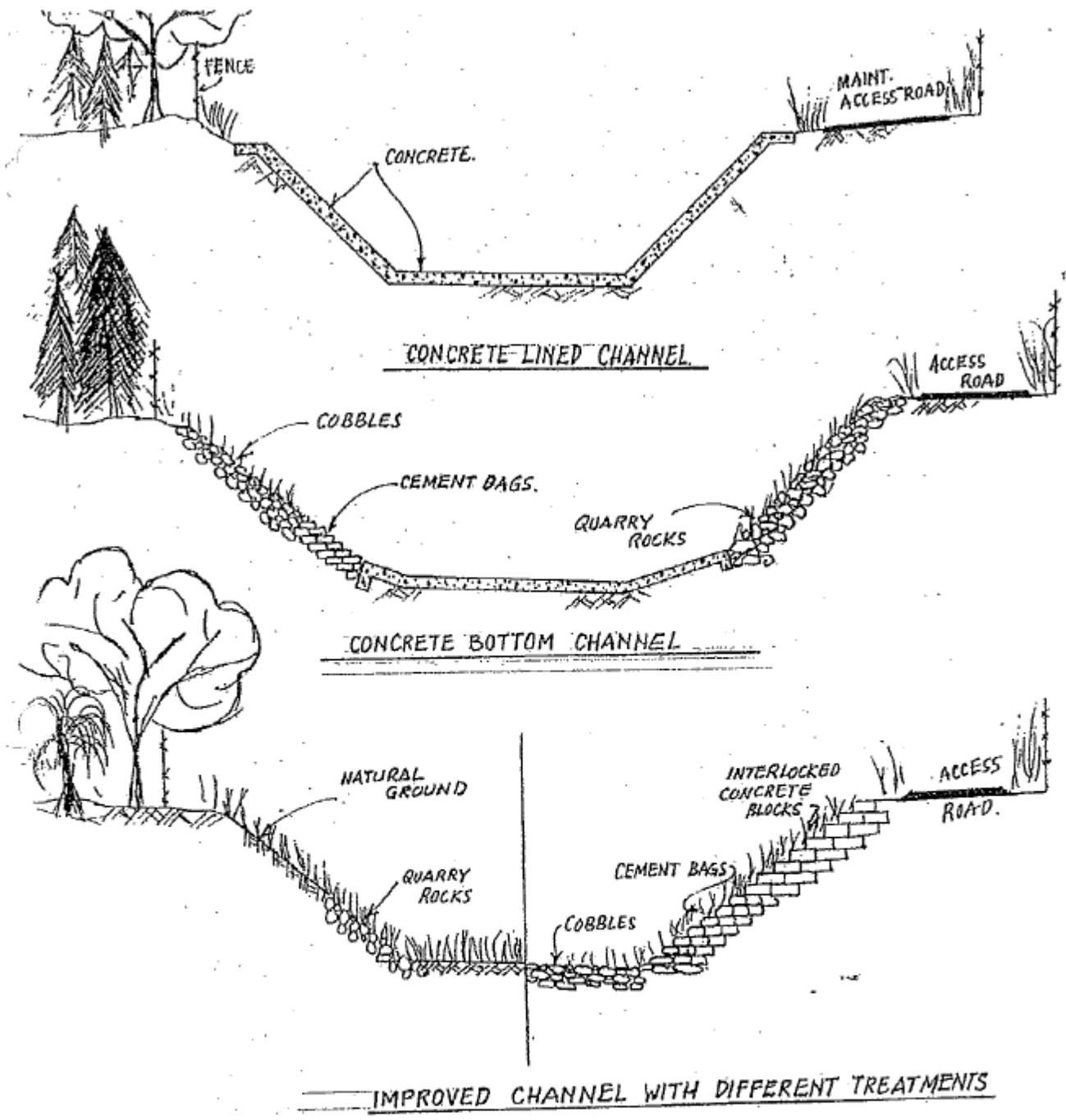
Prepared by

City of Sacramento

Depicting the Location of Streams

Color-coded to Indicate Stream Types

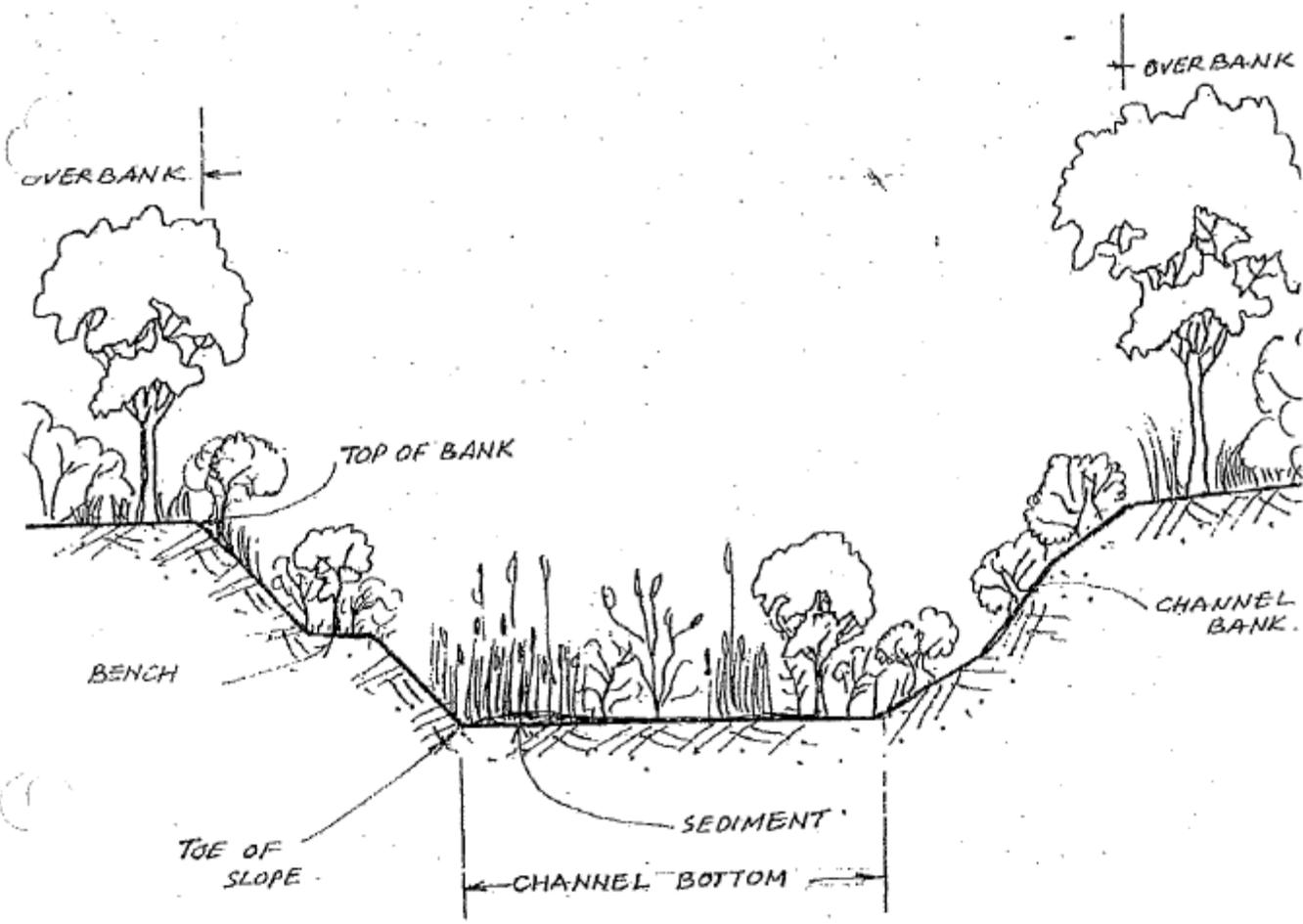
Exhibit 1



CHANNEL TYPE 1 - TYPICAL
 IMPROVED CHANNEL WITHOUT SIGNIFICANT RIPARIAN HABITAT

Memorandum of Understanding
 Routine Stream Maintenance
 County of Sacramento

Exhibit 2

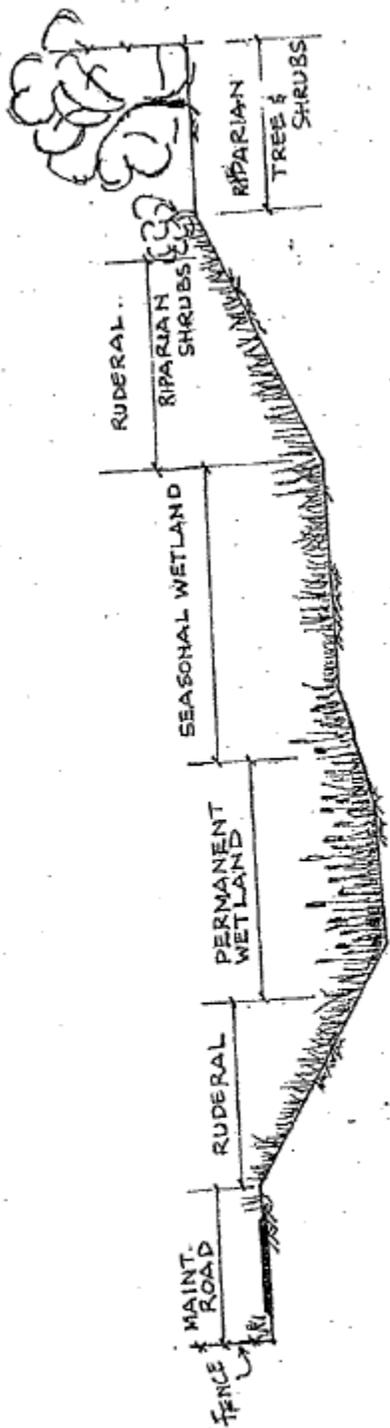
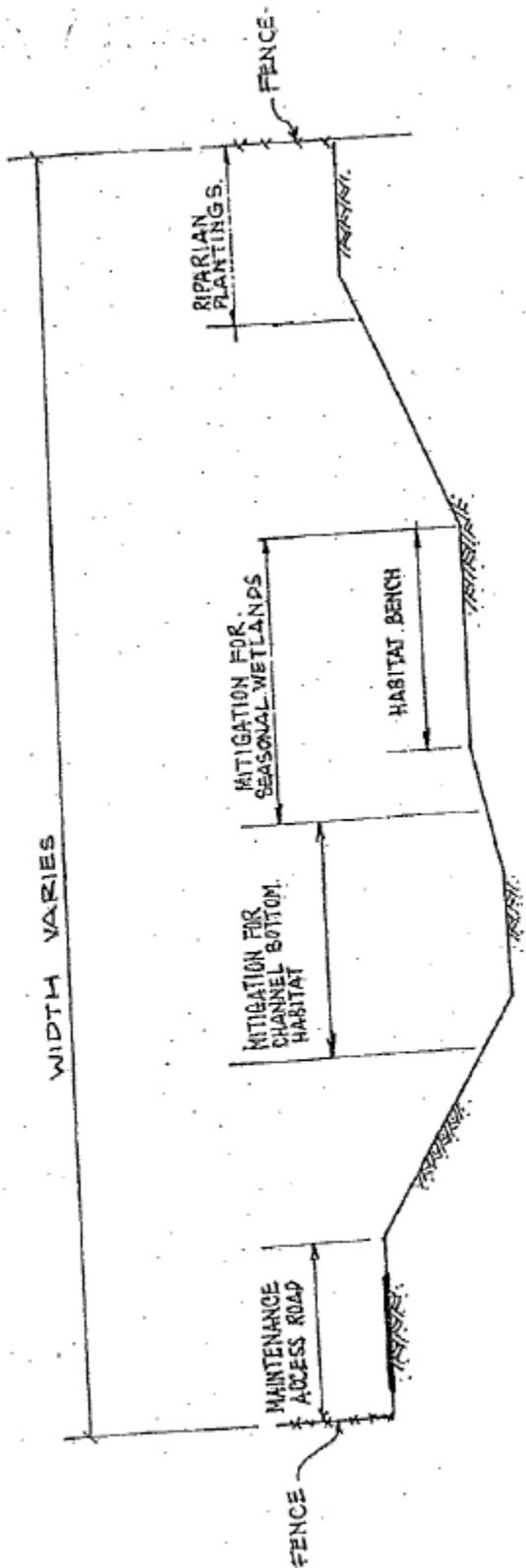


CHANNEL TYPE 2 ~ TYPICAL
 IMPROVED CHANNEL WITH SIGNIFICANT RIPARIAN HABITAT.

Memorandum of Understanding
 Routine Stream Maintenance
 County of Sacramento

Exhibit 3

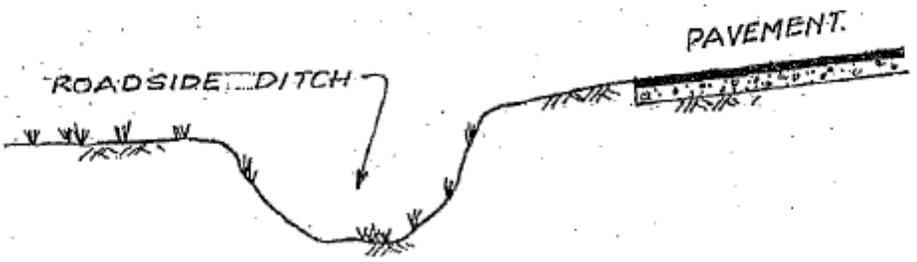
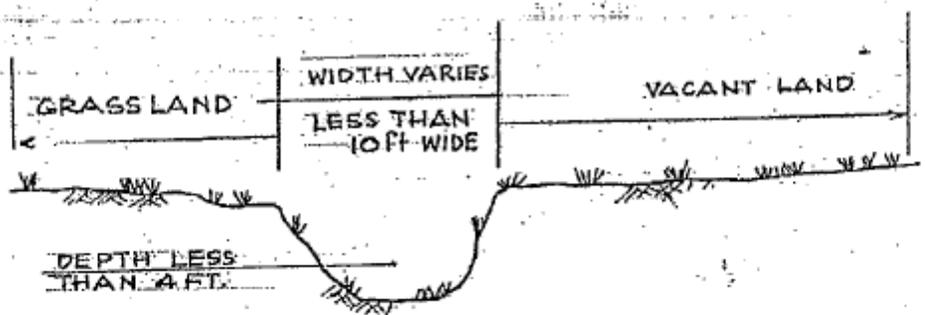
Water Quality Detention Basin Maintenance and Regulatory Support



CHANNEL TYPE 3 - TYPICAL
 IMPROVED CHANNEL WITH MITIGATING RIPARIAN HABITAT

Memorandum of Understanding
 Routine Stream Maintenance
 County of Sacramento

Exhibit 4

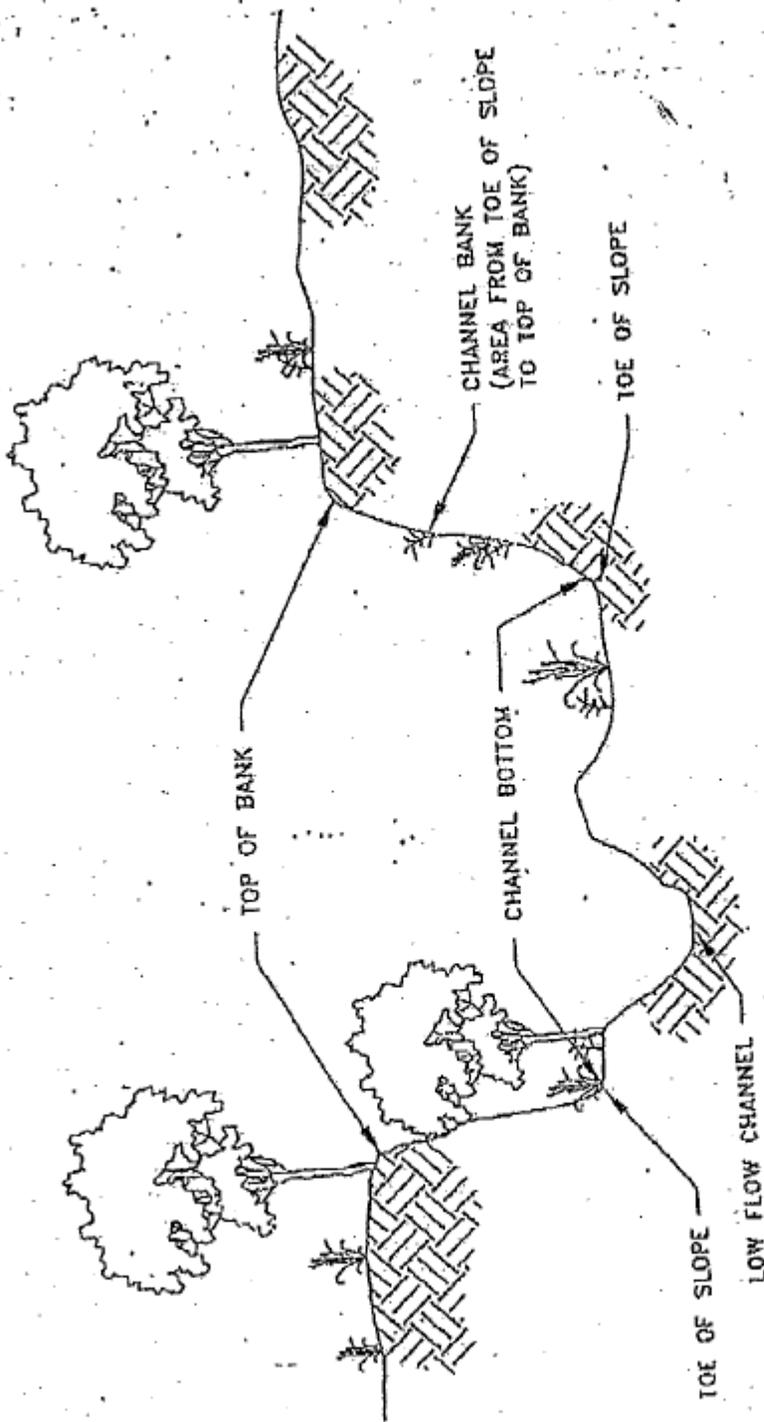


CHANNEL TYPE 4 - TYPICAL.

UNIMPROVED CHANNEL WITHOUT SIGNIFICANT RIPARIAN HABITAT

Memorandum of Understanding
 Routine Stream Maintenance
 County of Sacramento

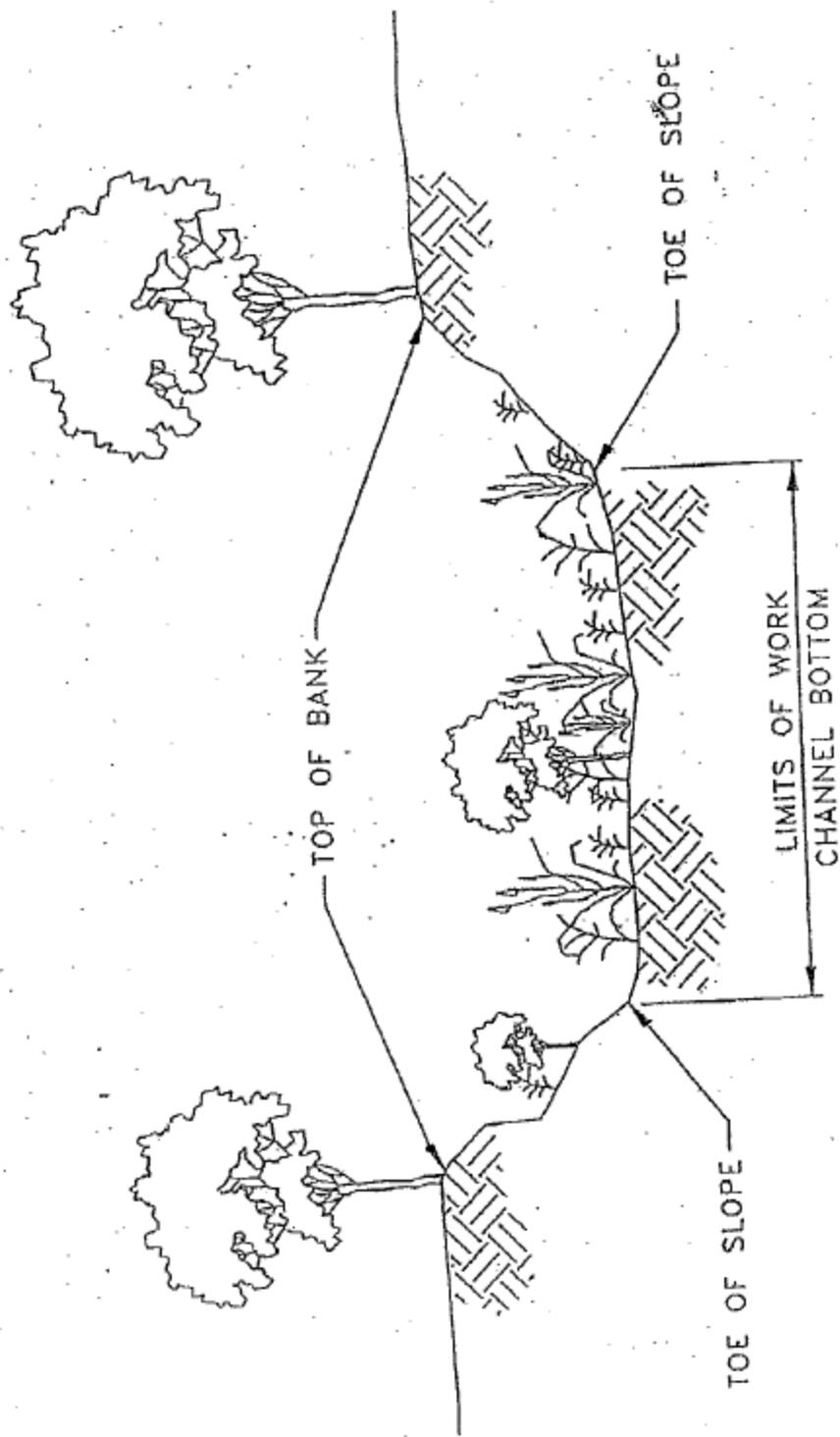
Exhibit 5



— CHANNEL TYPE 5 - TYPICAL
 - - - UNIMPROVED CHANNEL WITH SIGNIFICANT RIPARIAN HABITAT

Memorandum of Understanding
 Routine Stream Maintenance
 County of Sacramento

Exhibit 6



**EXHIBIT 7
CONTROL OF AQUATIC
AND WOODY GROWTH**

Exhibit 7

Memorandum of Understanding
Routine Stream Maintenance
County of Sacramento

Memorandum of Understanding
Routine Stream Maintenance
County of Sacramento

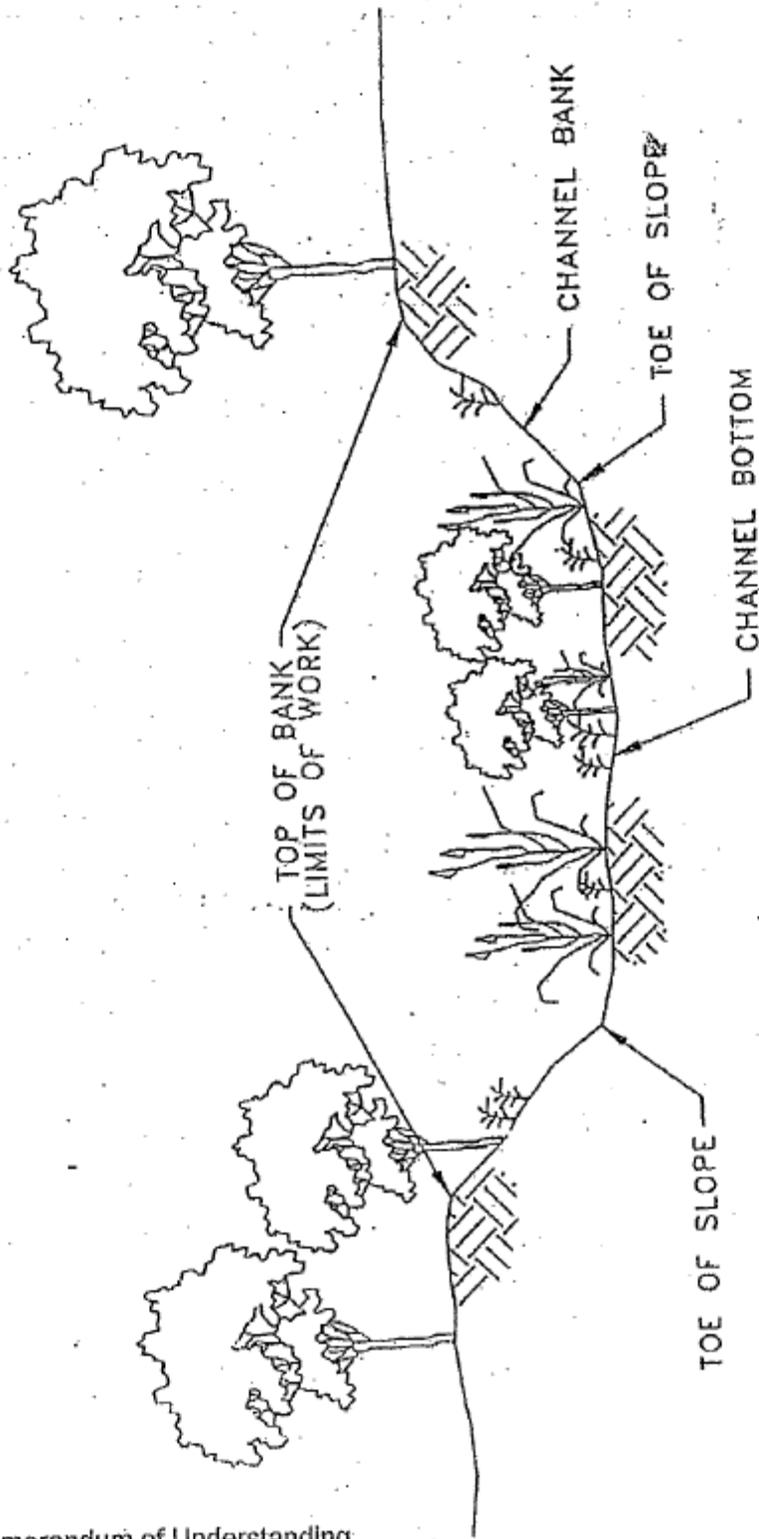


EXHIBIT 8
CONTROL OF NON-NATIVE VEGETATION

Exhibit 8

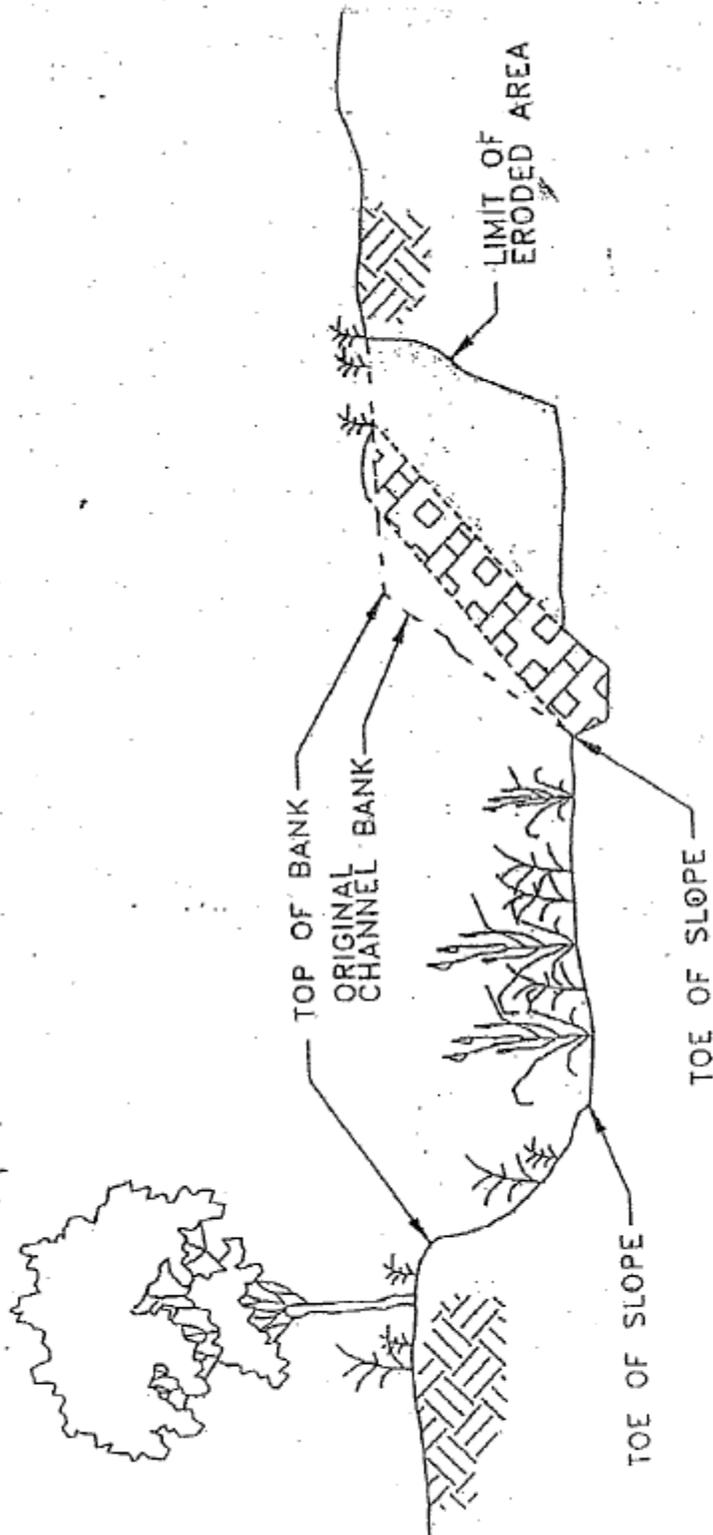


EXHIBIT 9
MINOR EROSION CONTROL WORK

Memorandum of Understanding
Routine Stream Maintenance
County of Sacramento

Exhibit 9

Memorandum of Understanding
Routine Stream Maintenance
County of Sacramento

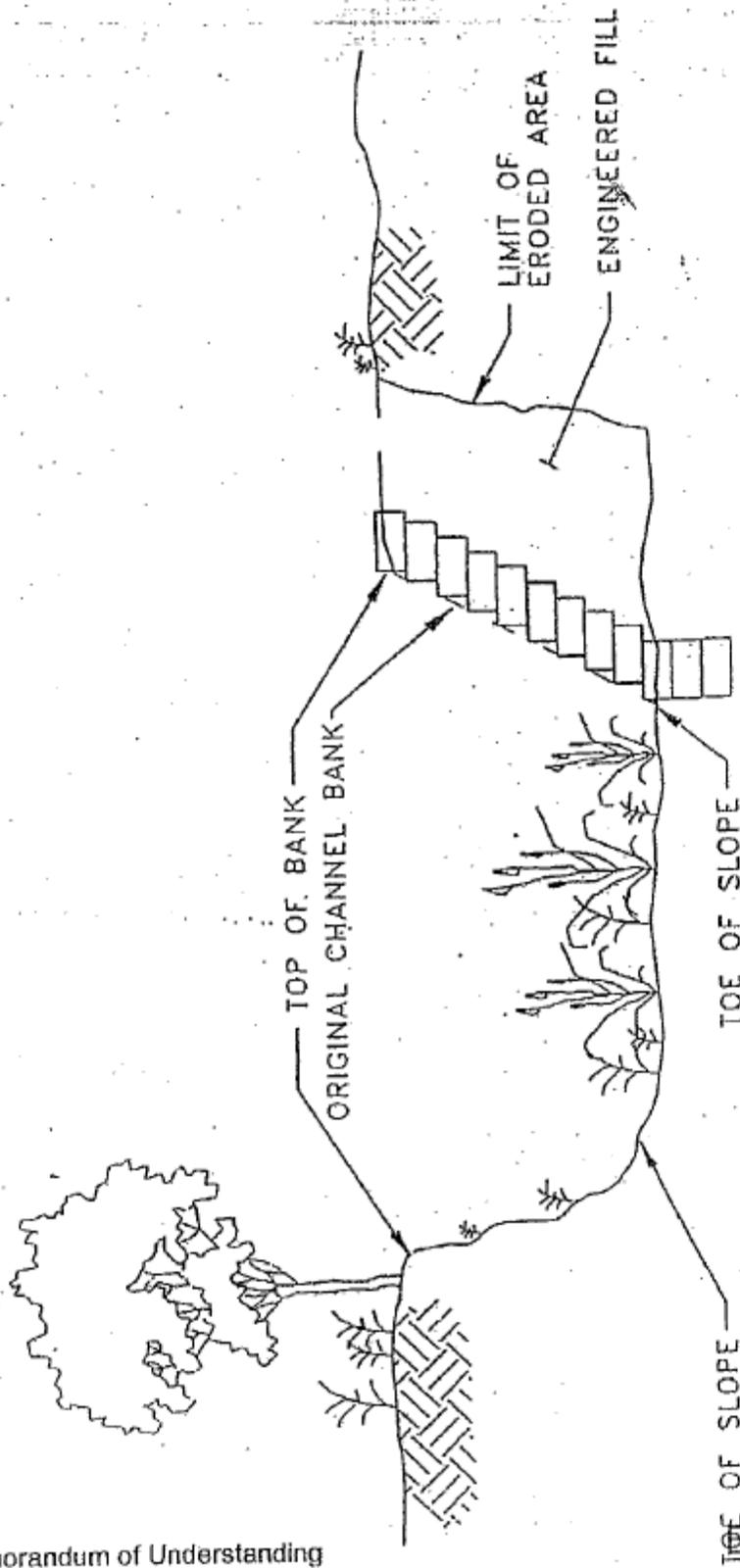


Exhibit 10

EXHIBIT 10
MINOR EROSION CONTROL WORK

APPENDIX C

Aquatic Pesticide General NPDES for Aquatic Weed Control

STATE WATER RESOURCES CONTROL BOARD

1001 I Street, Sacramento, California 95814

http://www.waterboards.ca.gov/water_issues/programs/npdes/aquatic.shtml

**WATER QUALITY ORDER NO. 2013-0002-DWQ GENERAL PERMIT
NO. CAG990005**

**STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
(NPDES) PERMIT FOR RESIDUAL AQUATIC PESTICIDE DISCHARGES TO WATERS OF
THE UNITED STATES FROM ALGAE AND AQUATIC WEED CONTROL APPLICATIONS**

The following Dischargers may apply for coverage under this General Permit in compliance with the waste discharge requirements as set forth in this General Permit:

Table 1. Discharger Information

Dischargers	Any entity that discharges residual algacides and aquatic herbicide and their degradation byproducts to waters of the United States* from algae and aquatic weed control applications.
--------------------	--

Table 2. Administrative Information

This General Permit was adopted by the State Water Resources Control Board (hereinafter State Water Board) on:	March 5, 2013
This General Permit shall become effective on:	December 1, 2013
This General Permit shall expire on:	November 30, 2018
The U.S. Environmental Protection Agency (U.S. EPA) and the State Water Board have classified this discharge as a minor discharge.	

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this General Permit with all attachments is a full, true, and correct copy of the General Permit adopted by the State Water Board on March 5, 2013.

AYE: Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc Board Member
Steven Moore Board Member Felicia Marcus

NAY: None

ABSENT: None

ABSTAIN: Chairman Charles R. Hoppin

Jeanine Townsend

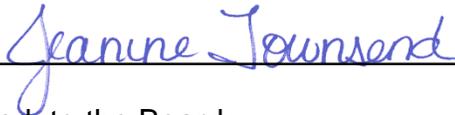

Clerk to the Board

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Attachment G – Exception List G-1

I. DISCHARGE INFORMATION

Pesticide formulations may include “active ingredients”^{*} and “inert ingredients.”^{*} Adjuvants^{*} or surfactants may be added to the ingredients in the application equipment used in delivery of the pesticide. As part of the registration process of pesticides for use in California, U.S. EPA and the California Department of Pesticide Regulation (DPR) evaluate data submitted by registrants to ensure that a product used according to label instructions will cause no harm or adverse impact on non-target organisms that cannot be reduced or mitigated with protective measures or use restrictions. The Clean Water Act (CWA) section 301(a) broadly prohibits the discharge of any pollutant to waters of the United States, except in compliance with an NPDES permit. Residual pesticides^{*} discharged into surface waters constitute pollutants within the meaning of the CWA even if the discharge is in compliance with the registration requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Therefore, coverage under an NPDES permit is required.

The discharge of algaecides and aquatic herbicides and their residues to surface waters for algae and aquatic weed control throughout the State of California may pose a threat to existing and potential beneficial uses of waters of the United States if not properly controlled and regulated.

This General Permit regulates the discharge of aquatic pesticides^{*} (algaecides and aquatic herbicides) used for algae and aquatic weed control to waters of the United States. These are algaecides and aquatic herbicides with registration labels that explicitly allow direct application to water bodies.

II. PERMIT COVERAGE AND APPLICATION REQUIREMENTS

A. General Permit Coverage

Except for discharges on tribal lands that are regulated by a federal permit, this General Permit covers the point source^{*} discharge to waters of the United States of residues resulting from pesticide applications using products containing 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, and triclopyr-based algaecides and aquatic herbicides, and adjuvants containing ingredients represented by the surrogate nonylphenol. This General Permit covers only discharges of algaecides, and aquatic herbicides that are currently registered for use in California, or that become registered for use and contain the above-listed active ingredients and ingredients represented by the surrogate of nonylphenol.

^{*} An asterisk means the term is defined in Attachment A. This applies to all sections of this General permit.

This General Permit does not cover agricultural storm water discharges or return flows from irrigated agriculture because these discharges are not defined as “point sources” and do not require coverage under an NPDES permit. This General Permit also does not cover other indirect or nonpoint source discharges from applications of algaecides and aquatic herbicides, including discharges of pesticides to land that may be conveyed in storm water or irrigation runoff.

As shown in Table 1, this General Permit becomes effective on December 1, 2013. To obtain coverage under this General Permit on or after that date, Dischargers must submit their application for coverage as set forth in Section II.C below, at least 90 days prior to their first pesticide application.

B. Discharger

A Discharger under this General Permit includes any entity involved in the application of algaecides and aquatic herbicides that results in a discharge of algaecides and aquatic herbicides and their residues and degradation byproducts to waters of the United States, and meets either or both of the following two criteria:

The entity has control over the financing for or the decision to perform algaecide and aquatic herbicide applications that result in discharges, including the ability to modify those decisions;
or

The entity has day-to-day control of algaecide and aquatic herbicide applications or performs activities that are necessary to ensure compliance with this General Permit. For example, the entity is authorized to direct workers to carry out activities required by this General Permit or perform such activities themselves.

C. General Permit Application

To obtain authorization under this General Permit, Dischargers must submit to the State Water Board a complete application that consists of the following:

1. A Notice of Intent (NOI) shown as Attachment E, signed in accordance with the signatory requirements of the Standard Provisions in Attachment B;
2. An application fee. A fee is required only for new Dischargers. Dischargers enrolled under Order No. 2004-0009-DWQ and applying for coverage under this Permit will be billed during the regular billing cycle; and
3. An Aquatic Pesticide* Application Plan (APAP).

Within 90 days of receipt of an application, the State Water Board's Deputy Director of the Division of Water Quality (Deputy Director) will either issue a Notice of Applicability (NOA) or deny the application. The NOA will specify the permitted algaecide and aquatic herbicide active ingredients that may be used, and any region- specific conditions and requirements not stated in this General Permit. Any such region-specific conditions and requirements shall be enforceable. The Discharger is authorized to discharge starting on the date of the NOA.

Alternatively, the Deputy Director or a Regional Water Board Executive Officer may issue a Notice of Exclusion (NOE),¹ which either terminates the permit coverage or requires submittal of an application for an individual permit or alternative general permit.

D. Fees

The fee for enrollment under this General Permit shall be based on section 2200(b)(9) category 3 of title 23, California Code of Regulations, which is available at http://www.waterboards.ca.gov/resources/fees/docs/fy1112fee_schdl_npdes_prmt.pdf and is payable to the State Water Board.

E. Terminating Coverage

To terminate permit coverage, a Discharger must submit a complete and accurate Notice of Termination (NOT) provided in Attachment F. The Discharger's authorization to discharge under this General Permit terminates on the day of the coverage termination letter issued by the Deputy Director. Prior to the termination effective date, the Discharger is subject to the terms and conditions of this General Permit and is responsible for submitting the annual fee and all reports associated with this General Permit.

A Discharger must submit an NOT when one of the following conditions occurs:

1. A new operator has taken over responsibility of the Discharger's algae or aquatic weed control activities covered under an existing NOA;
2. The Discharger has ceased all discharges from the application of algaecides and aquatic herbicide for which it obtained General Permit coverage and does not expect to discharge during the remainder of this General Permit term; or
3. The Discharger has obtained coverage under an individual permit or an alternative general permit for all discharges required to be covered by an NPDES permit.

III. FINDINGS

The Fact Sheet (Attachment D), which contains the background information and rationale for the requirements in this General Permit, is hereby incorporated into this General Permit and constitutes its findings. All other attachments (A, B, C, and E through G) are also incorporated into this General Permit.

¹ An NOE is a one-page notice that indicates and justifies why the Discharger or proposed Discharger is not eligible for coverage under this General Permit and states the reason why. This justification can include, but is not limited to, necessity to comply with a total maximum daily load or to protect sensitive water bodies. The NOE can also indicate that the coverage is denied if feasible alternatives to the selected pesticide application project are not analyzed.

THEREFORE, IT IS HEREBY ORDERED that this General Permit supersedes Order No. 2004-0009-DWQ except for enforcement purposes, and in order to meet the provisions contained in division 7 of the Water Code (commencing with §13000) and regulations adopted thereunder, and the provisions of the CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

IV. DISCHARGE PROHIBITIONS

- A. The discharge of residual algaecides and aquatic herbicides in a manner different from that described in this General Permit is prohibited.
- B. The discharge of residual algaecides and aquatic herbicides shall not create a nuisance as defined in section 13050 of the California Water Code.
- C. The discharge shall not cause, have a reasonable potential to cause, or contribute to an in-stream excursion above any applicable standard or criterion promulgated by U.S. EPA pursuant to section 303 of the CWA, or water quality objective adopted by the State or Regional Water Boards.
- D. All pesticides are prohibited from the waters of the Lahontan Region (Region 6). The use of this permit is invalid in the Lahontan Region unless the discharger has requested a prohibition exemption from the Lahontan Water Board and the Lahontan Water Board has granted an exemption for the use of algaecides or aquatic herbicides.

V. EFFLUENT LIMITATIONS

- A. The discharge of residual algaecides and aquatic herbicides must meet applicable water quality standards; and
- B. Dischargers shall implement Best Management Practices (BMPs) when applying aquatic algaecides and aquatic herbicides. The BMPs must be provided in the APAP which is described in Section VIII.C below.

VI. RECEIVING WATER LIMITATIONS

The discharge shall not result in any of the following:

- A. The discharge of residual algaecides and aquatic herbicides shall not cause or contribute to an exceedance of the following limitations in the receiving water:*

Table 3. Receiving Water Limitations

Constituent/ Parameter	BENEFICIAL USE ¹			All Designations	Basis
	MUN, µg/L	WARM or COLD, µg/L	Other than MUN, WARM, or COLD, µg/L		
2,4-D	70				U.S. EPA
MCL U.S. EPA Water Acrolein ²	320	21	780		Quality Criteria, 1986.
Copper ²				Dissolved Freshwater ³ Copper Chronic = $0.960 \exp\{0.8545 [\ln(\text{hardness}^4)] - 1.702\}$ ^{5,6} Dissolved saltwater ³ Copper Chronic = $0.83 \exp\{0.8545 [\ln(\text{hardness}^4)] - 1.702\}$ ^{5,6}	California Toxics Rule
Diquat	20				U.S. EPA MCL
Endothall	100				U.S. EPA MCL
Fluridone	560				U.S. EPA Integrated Risk Information System
Glyphosate	700				U.S. EPA MCL
Nonylphenol				Freshwater Chronic Criterion = 6.6 µg/L Saltwater Chronic Criterion = 1.7 µg/L	U.S. EPA National Recommended Ambient Water Quality Criteria
Toxicity toxicity in receiving water(s).	Algaecide and aquatic herbicide applications shall not cause or contribute to				Regional Water Boards' Basin Plans

Notes:

1. See Regional Water Boards' Water Quality Control Plans (Basin Plans) for beneficial use definitions.
2. Public entities and mutual water companies* listed in Attachment G are not required to meet these limitations in receiving waters during the exception period described in the APAP and Section VIII.C.10 below.
3. For waters in which the salinity is equal to or less than 1 part per thousand 95% or more of the time, the freshwater criteria apply. For waters in which the salinity is equal to or greater than 10 parts per thousand 95% or more of the time, saltwater criteria apply. For waters in which the salinity is between 1 and 10 parts per thousand, the applicable criteria are the more stringent of the freshwater or saltwater criteria.
4. For freshwater aquatic life criteria, waters with a hardness 400 mg/L or less as calcium carbonate, the actual ambient hardness of surface water shall be used. For waters with a hardness of over 400 mg/L as calcium carbonate, a hardness of 400 mg/L as calcium carbonate shall be used with a default Water-Effect Ratio of 1.
5. Values should be rounded to two significant figures.
6. This limitation does not apply to the Sacramento River and its tributaries above the State Highway 32 Bridge at Hamilton City. See Table III-1 of the Basin Plan for the Sacramento and San Joaquin River Basins for copper limitation.

B. Dissolved Oxygen. Dissolved oxygen to be below the Regional Water Board Basin Plans' dissolved oxygen objectives for the receiving water.

C. Floating Material. Floating material to be present in the amounts that cause nuisance or adversely affect beneficial uses.

- D. **Settleable Substances.** Settleable substances to be present in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
- E. **Suspended Material.** Suspended material to be present in concentrations that cause nuisance or adversely affect beneficial uses.
- F. **Taste and Odors.** Taste- or odor-producing substances to be present in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses or domestic or municipal water supplies.
- G. **Toxic Pollutants.** Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.
- H. **Color.** Esthetically undesirable discoloration.
- I. **Aquatic Communities.** Aquatic communities and populations, including vertebrates, invertebrates, and non-target plant species to be degraded.

VII. RECEIVING WATER MONITORING TRIGGERS

In the absence of Receiving Water Limitations, the Receiving Water Monitoring Triggers shown in Table 4 below will be used to assess compliance with the narrative receiving water toxicity limitation. However, exceeding the monitoring trigger does not constitute a violation of this General Permit as long as the Discharger performs the following actions: (1) initiates additional investigations for the cause of the exceedance; (2) implements additional BMPs to reduce the algaecide and aquatic herbicide residue concentration to be below the monitoring triggers in future applications; and (3) evaluates the appropriateness of using alternative products.

Table 4. Receiving Water Monitoring Triggers

Ingredient	Unit	Instantaneous Maximum Monitoring Trigger	Basis
Imazapyr	mg/L	11.2	U.S. EPA Office of Pesticides <i>Ecotoxicity Database</i>
Triclopyr Triethylamine	mg/L	13.0	U.S. EPA Office of Pesticides <i>Ecotoxicity Database</i>

VIII. AQUATIC PESTICIDE USE REQUIREMENTS

A. Application Schedule

The Discharger shall provide a phone number or other specific contact information to all persons who request the Discharger’s application schedule. The Discharger shall provide the requester with the most current application schedule and inform the requester if the schedule is subject to change. Information may be made available by electronic means, including posting prominently on a well-known website.

B. Public Notice Requirements

Every calendar year, at least 15 days prior to the first application of algaecide or aquatic herbicide, the Discharger shall notify potentially affected public agencies. The Discharger shall post the notification on its website if available. The notification shall include the following information:

1. A statement of the discharger's intent to apply algaecide or aquatic herbicide(s);
2. Name of algaecide and aquatic herbicide(s);
3. Purpose of use;
4. General time period and locations of expected use;
5. Any water use restrictions or precautions during treatment; and
6. A phone number that interested persons may call to obtain additional information from the Discharger.

C. Aquatic Pesticides Application Plan (APAP)

Dischargers shall submit an APAP at least 90 days before the expected day of permit coverage. The APAP shall contain, but not be limited to, the following elements sufficient to address each proposed treatment area:*

1. Description of the water system to which algaecides and aquatic herbicides are being applied;
2. Description of the treatment area in the water system;
3. Description of types of weed(s) and algae that are being controlled and why;
4. Algaecide and aquatic herbicide products or types of algaecides and aquatic herbicides expected to be used and if known their degradation byproducts, the method in which they are applied, and if applicable, the adjuvants and surfactants used;
5. Discussion of the factors influencing the decision to select algaecide and aquatic herbicide applications for algae and weed control;
6. If applicable, list the gates or control structures to be used to control the extent of receiving waters potentially affected by algaecide and aquatic herbicide application and provide an inspection schedule of those gates or control structures to ensure they are not leaking;
7. If the Discharger has been granted a short-term or seasonal exception under *State Water Board Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays,* and Estuaries of California* (Policy) section 5.3 from meeting acrolein and copper receiving water limitations, provide the beginning and ending dates of the exception period, and justification for the needed time for the exception. If algaecide and aquatic herbicide applications occur outside of the exception period, describe plans to ensure that receiving water criteria are not exceeded because the Dischargers must comply with the

acrolein and copper receiving water limitations for all applications that occur outside of the exception period;

8. Description of monitoring program;
9. Description of procedures used to prevent sample contamination from persons, equipment, and vehicles associated with algaecide and aquatic herbicide application;
10. Description of the BMPs to be implemented. The BMPs shall include, at the minimum:
 - a. Measures to prevent algaecide and aquatic herbicide spill and for spill containment during the event of a spill;
 - b. Measures to ensure that only an appropriate rate of application consistent with product label requirements is applied for the targeted weeds or algae;
 - c. The Discharger's plan in educating its staff and algaecide and aquatic herbicide applicators on how to avoid any potential adverse effects* from the algaecide and aquatic herbicide applications;
 - d. Discussion on planning and coordination with nearby farmers and agencies with water rights diversion so that beneficial uses of the water (irrigation, drinking water supply, domestic stock water, etc.) are not impacted during the treatment period; and
 - e. A description of measures that will be used for preventing fish kill when algaecides and aquatic herbicides will be used for algae and aquatic weed controls.
11. Examination of Possible Alternatives. Dischargers should examine the alternatives to algaecide and aquatic herbicide use to reduce the need for applying algaecides and herbicides. Such methods include:
 - a. Evaluating the following management options, in which the impact to water quality, impact to non-target organisms including plants, algaecide and aquatic herbicide resistance, feasibility, and cost effectiveness should be considered:
 - i. No action;
 - ii. Prevention;
 - iii. Mechanical or physical methods;
 - iv. Cultural methods;
 - v. Biological control agents; and
 - vi. Algaecides and aquatic herbicides;

If there are no alternatives to algaecides and aquatic herbicides, Dischargers shall use the minimum amount of algaecides and aquatic herbicides that is necessary to have an effective control program and is consistent with the algaecide and aquatic herbicide product label requirements.

- b. Using the least intrusive method of algaecide and aquatic herbicide application; and
- c. Applying a decision matrix concept to the choice of the most appropriate formulation.

D. APAP Processing, Approval, and Modifications

Upon receipt of an APAP, staff will post it on the State Water Board's website for a 30-day public comment period² and will distribute a notice via the State Water Board's Lyris list that an APAP has been posted. Staff will coordinate with Regional Water Board staff in reviewing the application package for completeness and applicability to this General Permit. If no comments are received and State and Regional Water Board staff deem the APAP complete, the Deputy Director will issue an NOA within five (5) working days of closure of the comment period. If comments are received, staff will work with Regional Water Board staff and the Discharger to address the comments to allow the Deputy Director to issue an NOA as expeditiously as possible. Permit coverage will begin when the Discharger receives the NOA.

Major changes to the APAP shall be submitted to the Deputy Director for approval. Examples of major changes include using a different product other than what is specified in the APAP, changing an application method that may result in different amounts of pesticides being applied, or adding or deleting BMPs.

E. Algaecide and Aquatic Herbicide Application Log

The Discharger shall maintain a log for each algaecide and aquatic herbicide application. The application log shall contain, at a minimum, the following information:

1. Date of application;
2. Location of application;
3. Name of applicator;
4. Type and amount of algaecide and aquatic herbicide used;
5. Application details, such as flow and level of water body, time application started and stopped, algaecide and aquatic herbicide application rate and concentration;
6. Visual monitoring assessment; and
7. Certification that applicator(s) followed the APAP.

² See *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486 (2nd Cir. 2005).

IX. PROVISIONS

A. Standard Provisions

1. All Dischargers authorized to discharge under this General Permit shall comply with the Federal Standard Provisions included in Attachment B of this General Permit.
2. This General Permit does not authorize the discharge of residual algaecides and aquatic herbicides or their degradation byproducts to waters of the United States that are impaired by the active ingredient of the algaecides and herbicides used. Impaired waters are those waters not meeting water quality standards pursuant to section 303(d) of the CWA. California impaired waters are listed on:
http://www.waterboards.ca.gov/water_issues/programs/tmdl/2010state_ir_reports/2010_combo303d.xls.
3. This General Permit does not authorize any take of endangered species. The discharge is prohibited from adversely impacting biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or state endangered species laws. To ensure that endangered species issues are raised to the responsible agencies, the State Water Board has notified the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the California Department of Fish and Wildlife of this General Permit.
4. The State Water Board may use this General Permit to regulate the discharge of algaecides and aquatic herbicides and their residues to a surface water classified as Outstanding National Resource Waters or as a water body impaired by unknown toxicity only after the following conditions are satisfied: (1) the proposed project will comply with the limitations and discharge requirements specified in the General Permit; and (2) if required, the proposed algaecide and aquatic herbicide application qualifies for and has been granted a Basin Plan prohibition exception prior to discharge. The two bodies of water that are classified as Outstanding National Resource Waters in California are Lake Tahoe and Mono Lake.
5. The Discharger must follow all FIFRA pesticide label instructions and any Restricted Material Use Permits issued by a County Agricultural Commissioner.
6. All adjuvants used with the algaecides and aquatic herbicides must be labeled for aquatic use.
7. The Discharger must comply with effluent and receiving water limitations and must develop and implement an APAP.
8. To reduce the potential impacts to water quality, Dischargers shall implement the feasible alternatives to algaecide and aquatic herbicide use that are identified in the APAP.
9. All Dischargers authorized to discharge under this General Permit shall comply with discharge prohibitions and other requirements contained in Basin Plans, as implemented by the State and the nine Regional Water Boards.

10. All Dischargers authorized to discharge under this General Permit shall comply with the following provisions:

- a. After notice and opportunity for a hearing, this General Permit may be terminated or modified for cause, including, but not limited to:
 - i. Violation of any term or condition contained in this General Permit;
 - ii. Obtaining this General Permit by misrepresentation or by failing to disclose fully all relevant facts;
 - iii. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; and
 - iv. A material change in the character, location, or volume of discharge (if applicable).
- b. The provisions of this General Permit are severable. If any provision of this General Permit is found invalid, the remainder of this General Permit shall not be affected.
- c. The Discharger shall maintain a copy of this General Permit and make it available at all times to operating personnel. Key operating personnel shall be familiar with its content.
- d. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the State and Regional Water Boards.
- e. All monitoring and analysis instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated based on manufacturer's recommendations to ensure their continued accuracy.
- f. Each Discharger shall file with the State Water Board and the appropriate Regional Water Board technical reports on self monitoring* performed according to the detailed specifications contained in the Monitoring and Reporting Program attached to this General Permit.
- g. The State and Regional Water Board are authorized to enforce the terms of this General Permit under provisions of the California Water Code, including, but not limited to, sections 13385, 13386, and 13387.

B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the Monitoring and Reporting Program, and future revisions thereto, in Attachment C of this General Permit.

C. Special Provisions

1. Reopener Provisions

This General Permit may be reopened for modification and reissuance in accordance with the provisions contained in title 40 Code Federal Regulation (40 C.F.R.) section 122.62, and for the following reasons:

a. **Addition to the Public Entity List.** This General Permit may be reopened to modify Attachment G if any additional entity becomes qualified for a Policy section 5.3 exception.

b. **Addition of Aquatic Pesticide Active Ingredients.** This General Permit may be reopened to add additional algaecide and aquatic herbicide active ingredients if new active ingredients are registered by U.S. EPA and DPR.

c. **Acute and Chronic Toxicity.** If the State Water Board revises the Policy toxicity control provisions that would require new implementation procedures including the establishment of numeric chronic toxicity limitations, this General Permit may be reopened to include numeric acute and/or chronic toxicity receiving water limitations based on the new provisions.

d. **Receiving Water Limitations.** This General Permit may be reopened to add numeric Receiving Water Limitations for the residual algaecide and aquatic herbicides* exceeding the triggers if the additional investigation results show necessary.

e. **Endangered Species Act.** If U.S. EPA develops biological opinions regarding algaecides and aquatic herbicides included in this General Permit, this General Permit may be re-opened to add or modify Receiving Water Limitations/Monitoring Triggers for aquatic herbicides and algaecides and their residues of concern, if necessary.

2. **Change of Discharger**

In the event of any change in the Discharger that has obtained coverage under this General Permit, the previous Discharger shall notify the new Discharger of the existence of this General Permit by letter. A copy of the letter shall be immediately forwarded to the Deputy Director. After receipt of the letter, the Deputy Director will terminate the permit coverage to the previous Discharger. The new Discharger shall complete and submit to the Deputy Director a revised NOI form (Attachment E), and any revisions to the APAP prepared by the previous control entity or a new APAP.

3. **Application Package**

Dischargers who seek coverage under this General Permit shall file a complete application package at least 90 days before the expected date of algaecide and aquatic herbicide application. The application package shall include an NOI, APAP, and application fee. Enrolled Dischargers will be billed annually thereafter.

4. **Special Studies, Technical Reports, and Additional Monitoring Requirements**

a. **Additional Investigation**

Each Discharger must conduct additional investigations when the chemical monitoring shows exceedance of any receiving water limitation or monitoring trigger. The additional investigations shall identify corrective actions to

eliminate exceedance of receiving water limitations or monitoring triggers caused by the algaecide and aquatic herbicide application. The investigation shall include, but not be limited to evaluating the need to implement one or more of the following actions: revising and improving the existing BMPs, revising the mode of application, using less toxic algaecide and aquatic herbicide products, or selecting alternative methods for algae and aquatic weed control.

b. **Qualified Biologist Certification Following Project Completion**

Upon completion of an algaecide and aquatic herbicide project, public entities and mutual water companies listed in Attachment G of this General Permit shall provide certification by a qualified biologist* that beneficial uses of receiving waters have been restored.

5. **Corrective Action**

a. **Exceedance of Receiving Water Limitations or Monitoring Triggers.**

If a Receiving Water Limitation in Table 3 or a Monitoring Trigger in Table 4 is exceeded in the Event or Post-Event sample, the Discharger shall perform the following actions: (1) initiate additional investigations for the cause of the exceedance, (2) implement appropriate BMPs to reduce the algaecide and aquatic herbicide concentration to be below the applicable receiving water limitation or monitoring triggers in future applications, and (3) evaluate the appropriateness of using alternative products.

b. **Revision of Control Measures.**

If any of the following situations occur, the Discharger must review and, as necessary, revise the evaluation and selection of the control measures to ensure that the situation is eliminated and will not be repeated in the future:

- i. An unauthorized release or discharge associated with the application of algaecides and aquatic herbicides (e.g., spill, leak, or discharge not authorized by this or another NPDES permit) occurs;
- ii. The Discharger becomes aware, or the State Water Board concludes, that the control measures are not adequate/sufficient for the discharge to meet applicable water quality standards;
- iii. Any monitoring activities indicate that the Discharger failed to:
 - a) Follow the label instructions for the product used;
 - b) Use the minimum amount of algaecide and aquatic herbicide product per application and optimum frequency of algaecide and aquatic herbicide applications that are necessary for an effective control program consistent with reducing the potential for development of resistance and the algaecide and aquatic herbicide product label requirements;
 - c) Perform regular maintenance activities to reduce leaks, spills, or other unintended discharges of algaecides and aquatic herbicides

associated with the application of algaecides and aquatic herbicides covered under this General Permit; or

d) Maintain algaecide and aquatic herbicide application equipment in proper operating condition by adhering to any manufacturer's conditions and industry practices, and by calibrating, cleaning, and repairing such equipment on a regular basis to ensure effective algaecide and aquatic herbicide application and algae and aquatic weed control. The Discharger must ensure that the equipment's rate of algaecide and aquatic herbicide application is calibrated to deliver the minimum quantity of algaecides and aquatic herbicides

that is needed to have an effective control program and is consistent with the algaecide and aquatic herbicide product label requirements.

c. **Corrective Action Deadlines**

If the Discharger determines that changes to the control measures are necessary to eliminate any situation identified above, the Discharger shall make such changes within 60 days. The Discharger shall take the corrective action before any further discharge of the algaecides and aquatic herbicides and their residues will be allowed.

d. **Effect of Corrective Action**

The occurrence of a situation identified in Section C.5.b above may constitute a violation of this General Permit. Correcting the situation according to Corrective Action Section C.5.c above does not absolve the Discharger of liability for any original violation. However, failure to comply with any Corrective Action as required by Section C.5.c above constitutes an additional permit violation. The State and Regional Water Boards will consider the appropriateness and promptness of corrective action in determining enforcement responses to permit violations.

The State Water Board and the appropriate Regional Water Boards may impose additional requirements and schedules of compliance, including requirements to submit additional information concerning the condition(s) triggering corrective action or schedules and requirements more stringent than specified in this General Permit. Those requirements and schedules will supersede those in the Corrective Action Section above if such requirements conflict.

6. **Adverse Incident to Threatened or Endangered Species or Critical Habitat**

If the Discharger becomes aware of an adverse incident^{*} to a federally-listed threatened or endangered species or its federally-designated critical habitat, that may have resulted from the Discharger's algaecides and aquatic herbicides application, the Discharger must immediately notify the National Marine Fisheries Service (NMFS) Santa Rosa office by phone at (707) 575-6050 in the case of an anadromous or marine species, or the U.S. Fish and Wildlife Service (FWS) at (916) 414-6600 in the case of a terrestrial or freshwater species. This notification must be made by telephone immediately when the Discharger becomes aware of the adverse incident and must include at least the following information:

- a. The caller's name, telephone number, and e-mail address;
- b. Applicator name and mailing address;
- c. The name of the affected species;
- d. How and when the Discharger became aware of the adverse incident;
- e. Description of the location of the adverse incident;
- f. Description of the adverse incident, including the U.S. EPA pesticide registration number for each product applied in the area of the adverse incident; and
- g. Description of any steps that have been taken or will be taken to alleviate the adverse impact to the species.

Additional information on federally-listed threatened or endangered species and federally-designated critical habitat is available from NMFS (www.nmfs.noaa.gov) for anadromous or marine species or FWS (www.fws.gov) for terrestrial or freshwater species.

X. COMPLIANCE DETERMINATION

Compliance with receiving water limitations and monitoring triggers shall be determined through event and post-event monitoring results.

Attachment A – Definitions

Active Ingredient

Active ingredients are ingredients disclosed by manufacturers that yield toxic effects* on target organisms.

Adjuvants

Adjuvants are ingredients that are mixed with herbicides prior to an application event and are often trade secrets. These ingredients are chosen by the Discharger, based on site characteristics, and typically increase the effectiveness of pesticides on target organisms.

Adverse Incident

Adverse Incident means a situation where the Discharger observes upon inspection or becomes aware of in which:

- A person or non-target organism may have been exposed to an algaecide or aquatic herbicide residue; and
- The person or non-target organism suffered an adverse or toxic effect.

Adverse or Toxic Effect

An “adverse or toxic effect” includes any impact that occurs within waters of the United States on non-target organisms as a result of algaecide or aquatic herbicide residue discharge.

Examples of these effects may include:

- Distressed or dead juvenile and small fishes
- Washed up or floating fish
- Fish swimming abnormally or erratically
- Fish lying lethargically at water surface or in shallow water
- Fish that are listless or nonresponsive to disturbance
- Stunting, wilting, or desiccation of non-target submerged or emergent aquatic plants
- Other dead or visibly distressed non-target aquatic organisms (amphibians, turtles, invertebrates, etc.)

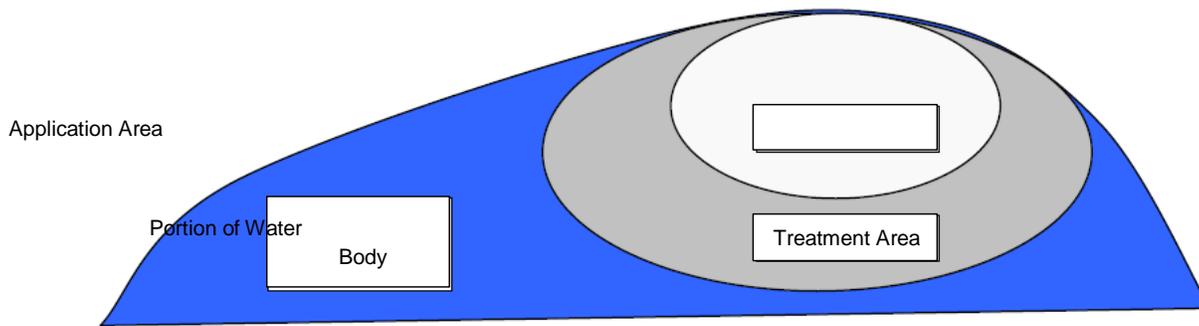
An “adverse or toxic effect” also includes any adverse effects to humans (e.g., skin rashes) or domesticated animals that occur either directly or indirectly from a discharge to waters of the United States that are temporally and spatially related to exposure to an algaecide and aquatic herbicide residue (e.g., vomiting, lethargy).

Algae Control

Algae control means the treatment of filamentous algae, cyanobacteria (blue-green algae), or algal species that have the potential to affect human or environmental health.

Application Area

The application area is the area to which aquatic pesticides are directly applied.



Application Event

The application event is the time that introduction of the algaecide or aquatic herbicide to the treatment area takes place, not the length of time that the environment is exposed to the algaecide or aquatic herbicide.

Aquatic Pesticides

Aquatic pesticides in this General Permit are limited to algaecides and aquatic herbicides labeled for aquatic use to control aquatic weeds or algae.

Beneficial Uses

Beneficial uses of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

Coalition

Specifically refers to a monitoring coalition which is a collaborative monitoring partnership of dischargers to develop a monitoring plan that addresses the monitoring requirements of this General Permit. The Coalition's monitoring plan will be submitted for Coalition members in lieu of individual monitoring plans from each member.

Enclosed Bays

Enclosed Bays means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

Estuaries

Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of freshwater and seawater. Estuaries do not include inland surface waters or ocean waters.

Half-Life

Half-life is the time required for half of the compound introduced into an ecosystem to be eliminated or disintegrated by natural processes.

Inert Ingredients

Inert ingredients are additional ingredients and are often trade secrets; therefore, they are not always disclosed by the manufacturer.

Mutual Water Company

A mutual water company is defined in the Public Utilities Code, section 2725 as “[a]ny private corporation or association organized for the purpose of delivering water to its stockholders and members at cost, including use of works for conserving, treating, and reclaiming water.”

Point Source

Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, or vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

Priority Pollutants

Priority pollutants are listed within the California Toxics Rule in 40 Code of Federal Regulations, section 131.38(b)(1). Criteria to protect aquatic life and human health are set for priority pollutants in the California Toxics Rule.

Public Entity

Public entity includes the federal government or a state, county, city and county, city, district, public authority, or public agency.

Qualified Biologist

A qualified biologist is a biologist who has the knowledge and experience in the ecosystem where the algaecide or aquatic herbicide is applied so that he or she can adequately evaluate whether the beneficial uses of the receiving waters have been protected and/or restored upon completion of the algaecide and aquatic herbicide application project.

Receiving Waters

Receiving waters are waters of the United States anywhere outside of the treatment area at anytime and anywhere inside the treatment area after completion of the treatment event.

Representative Monitoring Location

To be considered “representative,” at a minimum, a location must be similar in hydrology, algaecide or aquatic herbicide use, and other factors that affect the residual discharge to the areas being represented in that environmental setting.

Residual Algaecide and Aquatic Herbicide

Residual algaecide and aquatic herbicide are those portions of the pesticides that remain in

the water after the application and its intended purpose (injury or elimination of targeted pests) have been completed.

Self Monitoring

Sampling and analysis performed by the Discharger or Coalition to determine compliance with the Permit. All laboratory analyses must be conducted by a laboratory certified by the California Department of Public Health.

Treatment Area

The treatment area is the area being treated by the algaecide or aquatic herbicide for algae and aquatic weed control and, therefore, the area being targeted to receive an appropriate rate of application consistent with product label requirements of algaecide or aquatic herbicide. It is the responsibility of the Discharger to define the treatment area for each specific algaecide and aquatic herbicide application.

Waters of the United States

1. All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters, including interstate "wetlands;"
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sand flats, "wetlands," sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:
 - a. Which are or could be used by interstate or foreign travelers for recreational or other purposes;
 - b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - c. Which are used or could be used for industrial purposes by industries in interstate commerce.
4. All impoundments of waters otherwise defined as waters of the United States under this definition;
5. Tributaries of waters identified in items 1 through 4 of this definition;
6. The territorial sea; and
7. "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (1) through (6) of this definition. Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 C.F.R. section 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States [See Note 1 of this Section.] Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with U.S. EPA.

Attachment B – Standard Provisions

I. STANDARD PROVISIONS – PERMIT COMPLIANCE (IF APPLICABLE)

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this General Permit. Any noncompliance constitutes a violation of the CWA and the California Water Code and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. §122.41(a).)

2. The Discharger shall comply with effluent standards or prohibitions established under section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement. (40 C.F.R. §122.41(a)(1).)

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit. (40 C.F.R. §122.41(c).)

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge in violation of this General Permit that has a reasonable likelihood of adversely affecting human health or the environment. (40 C.F.R. §122.41(d).)

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. (40 C.F.R. §122.41(e).)

E. Property Rights

1. This General Permit does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. §122.41(g).)

2. The issuance of this General Permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 C.F.R. §122.5(c).)

F. Inspection and Entry

The Discharger shall allow the Regional Water Board, State Water Board, United States Environmental Protection Agency (U.S. EPA), and/or their authorized

representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, (40 C.F.R. §122.41(i); Water Code, §13383) to:

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this General Permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this General Permit;
3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this General Permit; and
4. Sample or monitor, at reasonable times, for the purposes of assuring General Permit compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location.

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any General Permit condition. (40 C.F.R. §122.41(f).)

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this General Permit after the expiration date of this General Permit, the Discharger must apply for and obtain authorization as required by the new permit. (40 C.F.R. §122.41(b).)

C. Transfers

This General Permit is not transferable to any person except after notice to the State Water Board. The State Water Board may require modification or revocation and reissuance of the General Permit to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 C.F.R. §122.41(l)(3); §122.61.)

D. Continuation of this Permit

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued in accordance with 40 C.F.R. section 122.6 and remain in full force and effect.

III. STANDARD PROVISIONS – MONITORING

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. §122.41(j)(1).)

Monitoring results must be conducted according to test procedures under 40 C.F.R. part 136 unless other test procedures have been specified in this General Permit. (40 C.F.R. §122.41(j)(4); §122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

A. Records Retention

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this General Permit, and records of all data used to complete the application for this General Permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the the State Water Board's Deputy Director of the Division of Water Quality (Deputy Director) at any time. (40 C.F.R. §122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 C.F.R. §122.41(j)(3)(i).);
2. The individual(s) who performed the sampling or measurements (40 C.F.R. §122.41(j)(3)(ii).);
3. The date(s) analyses were performed (40 C.F.R. §122.41(j)(3)(iii).);
4. The individual(s) who performed the analyses (40 C.F.R. §122.41(j)(3)(iv).);
5. The analytical techniques or methods used (40 C.F.R. §122.41(j)(3)(v).); and
6. The results of such analyses. (40 C.F.R. §122.41(j)(3)(vi).)

C. Claims of confidentiality for the following information will be denied (40 C.F.R. §122.7(b).):

1. The name and address of any permit applicant or Discharger (40 C.F.R. §122.7(b)(1).); and
2. Permit applications and attachments, permits and effluent data. (40 C.F.R. §122.7(b)(2).)

V. STANDARD PROVISIONS –

REPORTING A. Duty to Provide

Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or U.S. EPA within a reasonable time, any information which the Regional Water Board, State Water Board, or U.S. EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this General Permit or to determine compliance with this General Permit. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or U.S. EPA copies of records required to be kept by this General Permit. (40 C.F.R. §122.41(h); Wat. Code, §13267.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or U.S. EPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, V.B.5, and V.B.6 below. (40 C.F.R. §122.41(k).)
2. **For a corporation.** By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
3. **For a partnership or sole proprietorship.** By a general partner or the proprietor, respectively;
4. **For a municipality, state, federal, or other public agency:** All permit applications shall be signed by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA). (40 C.F.R. §122.22(a)(3).)
5. All reports required by this General Permit and other information requested by the Regional Water Board, State Water Board, or U.S. EPA shall be signed by a person described in Standard Provisions – Reporting V.B.1 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.1 above (40 C.F.R. §122.22(b)(1).);
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity or an individual or a position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 C.F.R. §122.22(b)(2).); and
 - c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 C.F.R. §122.22(b)(3).)

6. If an authorization under Standard Provisions – Reporting V.B.1 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.1 above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative.
(40 C.F.R. §122.22(c).)

Any person signing a document under Standard Provisions – Reporting V.B.1 or V.B.3 above shall make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.” (40 C.F.R. §122.22(d).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment C) in this General Permit. (40 C.F.R. §122.22(l)(4).)
2. Monitoring results must be reported on a Self Monitoring* Report (SMR) form as agreed to by the Deputy Director and the Discharger.
3. If the Discharger monitors any pollutant more frequently than required by this General Permit using test procedures approved under 40 C.F.R part 136 or as specified in this General Permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the SMR or a reporting form specified by the State Water Board. (40 C.F.R. §122.41(l)(4)(ii).)
4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this General Permit. (40 C.F.R. §122.41(l)(4)(iii).)

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this General Permit, shall be submitted no later than 14 days following each schedule date. (40 C.F.R. §122.41(l)(5).)

E. Planned Changes

The Discharger shall give notice to the State and the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted activity or discharge. Notice is required under this provision (40 C.F.R. §122.41(l)(1)) only when

the alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in this General Permit nor to notification requirements under 40 C.F.R. section 122.42(a)(1).

F. Anticipated Noncompliance

The Discharger shall give advance notice to the State and Regional Water Boards of any planned changes in the permitted discharge or activity that may result in noncompliance with General Permit requirements. (40 C.F.R. §122.41(l)(2).)

G. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.F above. (40 C.F.R. §122.41(l)(7).)

H. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the State Water Board, Regional Water Board, or U.S. EPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. §122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

The State and the Regional Water Boards are authorized to enforce the terms of this General Permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

Attachment C – Monitoring and Reporting Program

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ATTACHMENT C – MONITORING AND REPORTING PROGRAM

Section 122.48 of title 40 of the Code of Federal Regulations (40 C.F.R. §122.48) requires that all NPDES permits specify monitoring and reporting requirements. California Water Code sections 13267 and 13383 also authorize the State Water Resources Control Board (the State Water Board) and the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This Monitoring and Reporting Program (MRP) establishes monitoring and reporting requirements which implement federal and California State laws and regulations.

This MRP is designed to address the two key questions shown below. It also encourages Dischargers to form monitoring coalitions with others doing similar applications within a given watershed or doing applications of similar environmental settings (flowing water and non-flowing water). The Coalition or Discharger may select sites representing worst case scenarios or high-use areas for each active ingredient in each environmental setting. If the Discharger elects in its Aquatic Pesticide Application Plan (APAP) to undertake monitoring and reporting through a Coalition, then the Coalition will prepare and implement an MRP (pursuant to this Attachment C) and act on behalf of the Discharger with respect to monitoring and reporting. Otherwise, the Discharger will prepare and implement an individual MRP.

Question No. 1: Does the residual algaecides and aquatic herbicides discharge cause an exceedance of receiving water limitations?

Question No. 2: Does the discharge of residual algaecides and aquatic herbicides, including active ingredients, inert ingredients, and degradation byproducts, in any combination cause or contribute to an exceedance of the “no toxics in toxic amount” narrative toxicity objective?

If the Discharger elects in its APAP to undertake monitoring and reporting through a Coalition, the APAP should reference and attach the Coalition’s monitoring plan.

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the nature of the monitored discharge. All samples shall be taken at the anticipated monitoring locations specified in the Discharger’s or Coalition’s APAP.

B. All laboratory analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health in accordance with California Water Code section 13176. Laboratories that perform sample analyses shall be identified in all monitoring reports. The Discharger shall institute a Quality Assurance-Quality Control Program for any onsite field measurements such as electric conductivity, pH, turbidity, and temperature. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by the State Water Board and the appropriate Regional Water Board staff. The Quality Assurance- Quality Control Program must conform to United States Environmental Protection Agency (U.S. EPA) guidelines or to procedures approved by the State Water Board and the appropriate Regional Water Board.

C. All analyses shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants," promulgated by the U.S. EPA in title 40 Code Federal Regulation (40 C.F.R.) 136 or equivalent methods that are commercially and reasonably available and that provide quantification of sampling parameters and constituents sufficient to evaluate compliance with applicable effluent limits and to perform reasonable potential analysis. Equivalent methods must be more sensitive than those specified in 40 C.F.R. 136 if the method is available in the 40 C.F.R. 136, and must be approved for use by the Regional Water Board Executive Officer.

Any procedures to prevent the contamination of samples as described in the monitoring program in the APAP shall be implemented.

D. Records of monitoring information shall include the following:

1. The date, exact place, and time of sampling or measurements;
2. The individuals who performed the sampling or measurements;
3. The dates analysis were performed;
4. The individuals who performed the analyses;
5. The analytical techniques or methods used; and
6. Results of analyses.

E. All monitoring instruments and devices used to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their accuracy.

F. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this MRP.

II. MONITORING LOCATIONS AND SAMPLE TYPES

A. Monitoring Locations

Each Discharger or Coalition shall establish monitoring locations specified in the APAP to demonstrate compliance with the receiving water limitations, discharge specifications, and other requirements in this General Permit. The number and location of samples shall be selected to answer the two key questions. A Discharger or Coalition may use representative monitoring locations* to characterize water quality for all waters of the United States within the Discharger's or Coalition's boundaries for each environmental setting (flowing water and non-flowing water). However, the Discharger or Coalition must provide justification for the selection of the representative monitoring locations. To be considered "representative," at a minimum, a location must be similar in hydrology, algaecides and aquatic herbicides use, and other factors that affect the discharge of algaecides and aquatic herbicides and their residues to surface waters as a result of applications to the areas being represented in that environmental setting. Each Discharger or Coalition must provide technical justification and identify which areas are to be considered representative. Monitoring location information shall include a description of the treatment area, GPS

coordinates if feasible, and algaecides and aquatic herbicides being applied. The specific monitoring locations initially identified as representative monitoring locations may be changed based on surveillance of the Discharger or Coalition.

B. Sample Types

The following monitoring is required for each sampling:

1. **Background Monitoring.** Background monitoring samples shall be collected upstream at the time of the application event* or in the application area* just prior to (up to 24 hours in advance of) the application event.
2. **Event Monitoring.** Event monitoring samples shall be collected immediately downstream of the treatment area in flowing waters or immediately outside of the treatment area in non-flowing waters, immediately after the application event, but after sufficient time has elapsed such that treated water would have exited the treatment area.
3. **Post-Event Monitoring.** Post-event monitoring samples shall be collected within the treatment area within one week after application.

III. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

A. General Monitoring Requirements

The monitoring program described in the APAP shall be designed to answer the two key questions stated above. The monitoring program in the APAP shall describe the tasks and time schedules in which these two key questions will be addressed. Monitoring shall take place at locations that are being planned to be applied or may be applied as described in the Discharger's APAP.

The monitoring program described in the APAP must consider watershed specific attributes and waste constituents, based on the characteristics of applications within the Coalition's or Discharger's area, as well as the receiving water quality conditions. Developing the details of a monitoring design requires clearly defining several inputs to the design and then organizing these in a logical framework that supports effective decision making about indicators, monitoring locations, and monitoring frequency. The logical framework should describe:

1. The basic geographic and hydrographic features of the area, particularly application points and the pathways(s) of residue flows;
2. Algaecides and aquatic herbicides application practices and how they are distributed in space and time;
3. Relevant knowledge about the transport, fates, and effects of algaecides and aquatic herbicides, including best- and worst-case scenarios;
4. Description of the designated beneficial uses in each water body;
5. Relevant knowledge about the action of cumulative and indirect effects;

6. Mechanisms through which algaecides and aquatic herbicides applications could lead to designated use impacts, given the basic features of the area;
7. Known and potential impacts of algaecides and aquatic herbicides applications on water quality, ranked in terms of relative risk, based on factors such as magnitude, frequency and duration;
8. Sufficient number of sampling areas to assess the entire Discharger's or Coalition's area of influence; and
9. A description of sampling methods and a sampling schedule.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by the treatment area. Attention shall be given to the presence or absence of:

1. Floating or suspended matter;
2. Discoloration;
3. Bottom deposits;
4. Aquatic life;
5. Visible films, sheens, or coatings;
6. Fungi, slimes, or objectionable growths; and
7. Potential nuisance conditions.

Notes on receiving water conditions shall be summarized in the monitoring report.

B. Visual, Physical, and Chemical Monitoring Requirements

Monitoring shall take place at locations that are described and scheduled in the Coalition's or Discharger's APAP. Monitoring for all active ingredients must include frequent and routine monitoring on a pre-determined schedule, as summarized in the Table C-1 below:

Table C-1. Monitoring Requirements

Sample Type	Constituent/Parameter	Units	Sample Method	Minimum Sampling Frequency	Sample Type Requirement	Required Analytical Test Method
Visual	1. Monitoring area description (pond, lake, open waterway, channel, etc.) 2. Appearance of waterway (sheen, color, clarity, etc.) 3. Weather conditions (fog, rain, wind, etc.)	Not applicable	Visual Observation	1	Background, Event and Post-event Monitoring	Not applicable
Physical	1. Temperature ²	°F	Grab	5	Background, Event and Post-event Monitoring	6
	2. pH	Number				
	3. Turbidity	NTU				
	4. Electric Conductivity ³ @ 25°C	µmhos/cm				
Chemical	1. Active Ingredient ⁷	µg/L	Grab ⁴	5	Background, Event and Post-event Monitoring	6
	2. Nonylphenol ⁸	µg/L				
	3. Hardness (if copper is monitored)	mg/L				
	4. Dissolved Oxygen ²	mg/L				
¹ All applications at all sites. ² Field testing. ³ Field or laboratory testing. ⁴ Samples shall be collected at three feet below the surface of the water body or at mid water column depth if the depth is less than three feet. ⁵ Collect samples from a minimum of six application events for each active ingredient in each environmental setting (flowing water and non-flowing water) per year, except for glyphosate. If there are less than six application events in a year, collect samples during each application event for each active ingredient in each environmental setting (flowing water and non-flowing water). If the results from six consecutive sampling events show concentrations that are less than the receiving water limitation/trigger for an active ingredient in an environmental setting, sampling shall be reduced to one application event per year for that active ingredient in that environmental setting. If the yearly sampling event shows exceedance of the receiving water limitation/trigger for an active ingredient in an environmental setting, then sampling shall return to six application events for that active ingredient in each environmental setting. For glyphosate, collect samples from one application event from each environmental setting (flowing water and non-flowing water) per year. ⁶ Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. part 136. ⁷ 2,4-D, acrolein, dissolved copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, and triclopyr. ⁸ It is required only when a surfactant is used.						

IV. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Coalition or Discharger shall comply with all Standard Provisions (Attachment B) related to monitoring, reporting, and recordkeeping.

2. Upon written direction of the State Water Board or the Regional Water Board, the Coalition or Discharger shall submit information as specified.

3. The Coalition or Discharger shall report to the State Water Board and appropriate Regional Water Board any toxic chemical release data that are reported to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act" of 1986 (42 U.S.C. §11001 et. seq.).

B. Annual Information Collection

The Coalition or Discharger shall complete and retain all information on the previous reporting year beginning January 1 and ending December 31. When requested by the Deputy Director or Executive Officer of the applicable Regional Water Board, the Coalition or Discharger shall submit the annual information which must include the following:

1. An executive summary discussing compliance or violation of this General Permit and the effectiveness of the APAP to reduce or prevent the discharge of pollutants associated with algaecide and aquatic herbicide applications;

2. A summary of monitoring data, including the identification of water quality improvements or degradation as a result of the algaecide or aquatic pesticide application, if appropriate, and recommendations for improvements to the APAP [including proposed best management practices (BMPs)] and monitoring program based on the monitoring results. All receiving water monitoring data shall be compared to receiving water limitations and receiving water monitoring triggers;

3. Identification of BMPs currently in use and a discussion of their effectiveness in meeting the requirements in this General Permit;

4. A discussion of BMP modifications addressing violations of this General Permit;

5. A map showing the location of each treatment area;

6. Types and amounts of algaecides and aquatic herbicides used at each application event;*

7. Information on surface area and/or volume of treatment areas and any other information used to calculate dosage, concentration, and quantity of each algaecide and aquatic herbicide used;

8. Sampling results shall indicate the name of the sampling agency or organization, detailed sampling location information (including latitude and longitude or township/range/section if available), detailed map or description of each sampling area (address, cross roads, etc.), collection date, name of constituent/parameter and its concentration detected, minimum levels, method detection limits for each constituent analysis, name or description of water body sampled, and a comparison with applicable water quality standards, description of analytical QA/quality control plan. Sampling results shall be tabulated so that they are readily discernible; and

9. Summary of algaecide and aquatic herbicide application log.

C. Annual Report

The Coalition or Discharger shall submit to the Deputy Director and the appropriate Regional Water Board Executive Officer an annual report consisting of a summary of the past year's activities, and certify compliance with all requirements of this General Permit. If there is no discharge of algaecides and aquatic herbicides, their residues, or their degradation byproducts, the Coalition or Discharger shall provide the Deputy Director and the appropriate Regional Water Board Executive Officer a certification that algaecide and aquatic herbicide application activities did not result in a discharge to any water body. The annual report shall contain the following information:

1. An executive summary discussing compliance or violation of this General Permit and the effectiveness of the APAP; and
2. A summary of monitoring data, including the identification of water quality improvements or degradation as a result of the algaecide or aquatic pesticide application,
3. Dischargers shall submit the annual report according to the following schedule:

Table C-2. Reporting Schedule

Reporting Frequency	Reporting Period	Annual Report Due
Annual	January 1 through December 31	March 1

D. Electronic Reporting

At any time during the term of this General Permit, the State Water Board or the appropriate Regional Water Board may notify the Coalition or Discharger of the requirement to submit electronically Self Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program (<http://www.waterboards.ca.gov/ciwqs/index.html>). Until such notification is given, the Coalition or Discharger shall submit hardcopy SMRs. The CIWQS website will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

The Coalition or Discharger shall report the results for all monitoring specified in this MRP in the SMR. The Coalition or Discharger shall submit annual SMRs including the results of all required monitoring using U.S. EPA-approved test methods or other test methods specified in this General Permit. If the Coalition or Discharger monitors any pollutant more frequently than required by this General Permit, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

E. Reporting Protocols

The Coalition or Discharger shall report with each sample result the applicable reported Minimum Level (ML) and the current Minimum Detection Limit, as determined by the procedure in 40 C.F.R. part 136.

The Coalition or Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

1. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).
2. Sample results less than the Report Limit, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (plus a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

3. Sample results less than the laboratory's MDL shall be reported as "<" followed by the MDL.
4. The Coalition or Discharger shall instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Coalition or Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.
5. Multiple Sample Data: If two or more sample results are available, the Coalition or Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or "Not Detected" (ND). In those cases, the Coalition or Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:
 - a. The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.
 - b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.
6. The annual report shall comply with the following requirements:
 - a. The Coalition or Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the algacide and aquatic herbicide applications are conducted in compliance

with effluent and receiving water limitations. The Coalition or Discharger is not required to duplicate the submittal of data that are entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Coalition or Discharger shall submit electronically the data in a tabular format as an attachment.

b. The Coalition or Discharger shall attach a cover letter to the annual report that clearly identifies violations of the permit; discusses corrective actions taken or planned; and provides a time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

c. The annual report must be submitted to the State Water Board and the appropriate Regional Water Board, signed and certified as required by the Standard Provisions (Attachment B).

F. Other Reporting Requirements

1. Twenty-Four Hour Report

The Coalition or Discharger shall report to the State Water Board and appropriate Regional Water Board any noncompliance, including any unexpected or unintended effect of an algaecide or aquatic herbicide use that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Coalition or Discharger becomes aware of the circumstances and must include the following information:

- a. The caller's name and telephone number;
- b. Applicator name and mailing address;
- c. Waste Discharge Identification (WDID) number;
- d. The name and telephone number of a contact person;
- e. How and when the Coalition or Discharger become aware of the noncompliance;
- f. Description of the location of the noncompliance;
- g. Description of the noncompliance identified and the U.S. EPA pesticide registration number for each product the Discharger applied in the area of the noncompliance; and
- h. Description of any steps that the Coalition or Discharger has taken or will take to correct, repair, remedy, cleanup, or otherwise address any adverse effects.

If the Coalition or Discharger is unable to notify the State and the appropriate Regional Water Board within 24 hours, the Coalition or Discharger must do so as soon as possible and also provide the rationale for why the Discharger was unable to provide such notification within 24 hours.

2. **Five-Day Written Report**

The Coalition or Discharger shall also provide a written submission within five (5) days of the time the Discharger becomes aware of the noncompliance. The written submission shall contain the following information:

- a. Date and time the Coalition or Discharger contacted the State Water Board and the appropriate Regional Water Board notifying of the noncompliance and any instructions received from the State and/or Regional Water Board; information required to be provided in Section D.1 (24-Hour Reporting);
- b. A description of the noncompliance and its cause, including exact date and time and species affected, estimated number of individual and approximate size of dead or distressed organisms (other than the pests to be eliminated);
- c. Location of incident, including the names of any waters affected and appearance of those waters (sheen, color, clarity, etc);
- d. Magnitude and scope of the affected area (e.g. aquatic square area or total stream distance affected);
- e. Algaecide and aquatic herbicide application rate, intended use site (e.g., banks, above, or direct to water), method of application, and name of algaecide and herbicide product, description of algaecide and herbicide ingredients, and U.S. EPA registration number;
- f. Description of the habitat and the circumstances under which the noncompliance activity occurred (including any available ambient water data for aquatic algaecides and aquatic herbicides applied);
- g. Laboratory tests performed, if any, and timing of tests. Provide a summary of the test results within five days after they become available;
- h. If applicable, explain why the Coalition or Discharger believes the noncompliance could not have been caused by exposure to the algaecides or aquatic herbicides from the Coalition's or Discharger's application; and
- i. Actions to be taken to prevent recurrence of adverse incidents.

The State Water Board staff or Regional Water Board staff may waive the above- required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours.

Attachment D – Fact Sheet

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Attachment D – Fact Sheet

As described in Section III, Findings, of this General Permit, the State Water Resources Control Board (State Water Board) incorporates this Fact Sheet as findings of the State Water Board that support the issuance of this General Permit. This Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this General Permit.

This General Permit has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California.

I. PERMIT INFORMATION

A. Background

1. The Regulatory Background

In 1972, the Federal Water Pollution Control Act (also referred to as the Clean Water Act or CWA) was amended to provide that the discharge of pollutants to waters of the United States from any point source is effectively prohibited unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit.

On September 22, 1989, the U.S. Environmental Protection Agency (U.S. EPA) granted the State of California, through the State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Boards (Regional Water Boards), the authority to issue general NPDES permits pursuant to title 40 Code of Federal Regulations (40 C.F.R.) 122 and 123.

Section 122.28 of 40 C.F.R. provides for issuance of general permits to regulate a category of point sources if the sources involve the same or substantially similar types of operations; discharge the same type of waste; require the same type of effluent limitations or operating conditions; require similar monitoring; and are more appropriately regulated under a general permit rather than individual permits.

On March 12, 2001, the Ninth Circuit Court of Appeals held that discharges of pollutants from the use of aquatic pesticides in waters of the United States require coverage under an NPDES permit. (*Headwaters, Inc. v. Talent Irrigation District*).³ The *Talent* decision was issued just prior to the major season for applying aquatic pesticides.

Because of the serious public health, safety, and economic implications of delaying pesticide applications, in 2001 the State Water Board adopted Water Quality Order (Order) No. 2001-12-DWQ, Statewide General NPDES Permit for

³ 243 F.3d 526 (9th Cir., 2001).

Discharges of Aquatic Pesticides to Waters of the United States on an emergency basis to provide immediate NPDES permit coverage for broad categories of aquatic pesticide use in California.

Order No. 2001-12-DWQ imposed requirements on any discharge of aquatic pesticides by public entities to waters of the United States in accordance with the Policy which establishes procedures for implementing water quality standards for priority pollutants* in NPDES permits.

Section 5.3 of the State Water Board Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (Policy) allows for short-term or seasonal exceptions from its requirements for resource or pest management conducted by public entities or mutual water companies. In order to qualify for an exception from meeting priority pollutant standards, a public entity must fulfill the requirements listed in section 5.3 and the State Water Board must decide to grant the exception. Among other requirements, entities seeking an exception to complying with water quality standards for priority pollutants must submit documents in compliance with California Environmental Quality Act (CEQA).⁴ Because of the emergency adoption of Order No. 2001-12-DWQ, the State Water Board invoked an exemption to the requirements of section 5.3 of the Policy and issued the permit incorporating a categorical exception to water quality standards for priority pollutants.

Order No. 2001-12-DWQ required that Dischargers develop a best management practices (BMPs) plan that minimizes adverse impacts to receiving waters and a monitoring and reporting plan that is representative of each type of aquatic pesticide application.

In August 2001, Waterkeepers Northern California (Waterkeepers) filed a lawsuit against the State Water Board challenging several aspects of Order No. 2001-12- DWQ. Major aspects of the challenge included the emergency adoption of the Order without compliance with CEQA and other exception requirements of the Policy; failure to address cumulative impacts; and failure to comply with the California Toxics Rule (CTR).⁵

In a settlement of the Waterkeepers' lawsuit, the State Water Board agreed to fund a comprehensive aquatic pesticide monitoring program that would assess receiving water toxicity caused by aquatic pesticides and alternatives for pesticide use. The State Water Board contracted with the San Francisco Estuary Institute (SFEI) to conduct the program. SFEI published the final report on February 5, 2004.

In November 2002, the Ninth Circuit issued another opinion concerning the need for an NPDES permit for pesticide application. (*League of Wilderness Defenders*

⁴ Cal. Pub. Resources Code § 21000 et. seq.

⁵ 40 C.F.R. Section 131.38.

v. Forsgren.⁶) In this case, the court held that the USDA Forest Service must obtain an NPDES permit before it sprays insecticides* from an aircraft directly into or over rivers as part of silviculture activities. The court found that the insecticides are pollutants under the CWA. The court also defined the exemption for silvicultural pest control from the definition of “point source” in U.S. EPA’s regulations to be limited to pest control activities from which there is natural runoff.

Also in 2002, the Second Circuit issued an unpublished decision regarding the need for an NPDES permit for application of pesticides for mosquito control in federal wetland areas. (*Altman v. Town of Amherst*.) The lower court had dismissed a citizens’ suit, holding that pesticides, when used for their intended purpose, do not constitute a “pollutant” for purposes of the CWA, and are more appropriately regulated under Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The appeals court vacated the trial court’s decision and remanded the matter. In its unpublished decision, the Second Circuit expressed concern that: “[u]ntil the EPA articulates a clear interpretation of current law - among other things, whether properly used pesticides released into or over waters of the United States can trigger the requirements for NPDES permits - the question of whether properly used pesticides can become pollutants that violate the [Clean Water Act] will remain open.”

Order No. 2001-12-DWQ expired on January 31, 2004. In 2004, it was replaced by two general permits: a vector control permit for larvicides (Order No. 2004-0008-DWQ) and a weed control permit (Order No. 2004-0009-DWQ). The State Water Board determined that adoption of these two permits was consistent with the Ninth Circuit decisions.

In 2005, the Ninth Circuit held that a pesticide that is applied consistent with FIFRA is not a “chemical waste” (*Fairhurst v. Hager*),⁷ but also stated that it would not change its decision in *Headwaters*. The court stated that whether an NPDES permit was required depends on whether there was any “residue or unintended effect” from application of the pesticide. In *Fairhurst*, the court found neither residue nor unintended effect was present. Therefore, the pesticide application at issue did not require an NPDES permit.

U.S. EPA’s Final Rule: On November 20, 2006, U.S. EPA adopted a final regulation providing that NPDES permits are not required for pesticide applications as long as the Discharger follows FIFRA label instructions. According to the regulation, pesticides applied under the following two circumstances are not pollutants and, therefore, are not subject to NPDES permitting requirements:

- a. The application of pesticides directly to waters of the United States in order to control pests. Examples of such applications include applications to control

⁶ 309 F.3d 1181 (9th Cir., 2002).

⁷ 422 F.3d 1146 (9th Cir., 2005).

mosquito larvae, aquatic weeds, or other pests that are present in waters of the United States;
and

b. The application of pesticides to control pests that are present over waters of the United States, including near such waters, where a portion of the pesticides will unavoidably be deposited to waters of the United States in order to target the pests effectively; for example, when insecticides are aerially applied to a forest canopy where waters of the United States may be present below the canopy or when pesticides are applied over or near water for control of adult mosquitoes or other pests.

Lawsuits Against U.S. EPA's Final Rule: After U.S. EPA's new regulation was adopted in 2006, lawsuits were filed by both the pesticide industry and environmental groups in 11 of the 13 Circuits, including the Ninth Circuit Court, challenging U.S. EPA's Final Rule.

The National Cotton Council of America v. U.S. EPA:⁸ The petitions for review were consolidated in the Sixth Circuit Court by an order of the Judicial Panel on Multidistrict Litigation.

On January 11, 2009, the Sixth Circuit Court of Appeals determined that U.S. EPA's Final Rule is not a reasonable interpretation of the CWA and vacated the Final Rule. U.S. EPA did not request reconsideration of the decision, but did file a motion for a two-year stay of the effect of the decision in order to provide agencies time to develop, propose, and issue NPDES general permits for pesticide applications covered by the ruling. On June 8, 2009, the Sixth Circuit granted the motion, such that the U.S. EPA exemption was to remain in place until April 9, 2011. Subsequently, U.S. EPA was granted an extension of the stay, which allowed the exemption to continue until October 31, 2011.

2. Related Pesticide Regulation Information

Pesticide formulations may include "active ingredients" and "inert ingredients." Adjuvants or surfactants may be added to the ingredients in the application equipment that is used in the delivery of the aquatic pesticide.

As part of the registration process of pesticides for use in California, U.S. EPA and the California Department of Pesticide Regulation (DPR) evaluate data submitted by registrants to ensure that a product used according to label instructions will cause no harm or adverse impact on non-target organisms that cannot be reduced or mitigated with protective measures or use restrictions. Registrants are required to submit data on the effects of pesticides on target pests (efficacy) as well as non-target effects. Data on non-target effects include plant effects (phytotoxicity), fish and wildlife hazards (ecotoxicity), impacts on endangered species, effects on the environment, environmental fate, degradation byproducts, leachability, and persistence. Requirements that are specific to use in California are included in many pesticide labels that are approved by U.S. EPA.

⁸ 553 F.3d 927 (6th Cir., 2009).

Use must be reported to the County Agricultural Commissioner where required by law or by agreement with DPR.

The CWA, at section 301(a), broadly prohibits the discharge of any pollutant to waters of the United States, except in compliance with an NPDES permit. Since FIFRA is not necessarily as protective of water quality as the CWA, pesticides discharged into surface waters may constitute pollutants within the meaning of the CWA even if the discharge is in compliance with the registration requirements of FIFRA, thus, requiring coverage under a valid NPDES permit.

DPR and the County Agricultural Commissioners regulate the sale and use of pesticides in California. Pesticide applications subject to this General Permit must be consistent with permits issued by County Agricultural Commissioners and the pesticide label instructions approved by U.S. EPA under FIFRA. According to federal law, pesticide label language is under the sole jurisdiction of U.S. EPA. Label language and any changes thereto must be approved by

U.S. EPA before the product can be sold in this country. DPR cannot require manufacturers to make changes on labels; however, DPR can refuse to register products unless manufacturers address unmitigated hazards by amending the pesticide label.

State regulations require that the County Agricultural Commissioners determine if a substantial adverse environmental impact will result from the proposed use of a restricted material. If the County Agricultural Commissioner determines that this is likely, the commissioner may deny the restricted pesticide use permit or may issue it under the condition that site-specific use practices be followed (beyond the label and applicable regulations) to mitigate potentially adverse effects. DPR conducts scientific evaluations of potential health and environmental impacts and provides commissioners with information in the form of suggested permit conditions. DPR's suggested permit conditions reflect minimum measures necessary to protect people and the environment. County Agricultural Commissioners use this information and its evaluation of local conditions to set site-specific limits in permits.

B. General Criteria

1. This General Permit serves as a general NPDES Permit for the discharge of residual algaecides and aquatic herbicides to surface waters as a result of algaecides and aquatic herbicides applications for algae and aquatic weed controls.

2. Dischargers who submit a complete application under this General Permit are not required to submit an individual permit application. The State Water Board's Deputy Director of the Division of Water Quality (Deputy Director) may request additional information or determine that a Discharger is not eligible for coverage under this General Permit and would be better regulated under an individual permit or other general NPDES permit adopted by the appropriate Regional

Water Board. If the discharge becomes covered by an individual or another general permit, the applicability of this General Permit to the specified discharge

will be immediately terminated on the effective date of the individual permit or coverage under the other general permit.

II. NOTIFICATION REQUIREMENTS

A. General Permit Application

To obtain authorization under this General Permit, Dischargers must submit to the State Water Board a complete application at least 90 days prior to their first application of the season. This is to allow posting of the Aquatic Pesticide Application Plan (APAP) for a 30-day comment period, staff to review APAP and respond to comments, and the Deputy Director to issue the Notice of Applicability (NOA). Following are the application information requirements:

1. A Notice of Intent (NOI shown as Attachment E) signed in accordance with the signatory requirements of the Standard Provisions in Attachment B;
2. An application fee. A fee is required only for new Dischargers. Dischargers that are enrolled under Order No. 2004-0009-DWQ and are applying for coverage under this Permit will be billed during the regular billing cycle; and
3. An APAP.

State Water Board staff will post the APAP on the State Water Board's website for 30 days for public review. In the meantime, the State and Regional Water Board staff will review the application package for completeness and applicability to this General Permit. After the application has been deemed complete, the Deputy Director will issue an NOA. The NOA will specify the permitted active ingredients of algaecides and aquatic herbicides that may be used, and any Regional Water Board specific conditions and requirements not stated in this General Permit. Any such region- specific conditions and requirements shall be enforceable. The Discharger is authorized to discharge starting on the date of the NOA. If comments are received, staff will immediately work to resolve them in order to issue an NOA within 90 days of receipt of the application.

This General Permit specifies an effective date of December 1, 2013. The effective date is delayed because, with the impending start of the 2013 application season, Dischargers may be unable to comply with the requirement to submit their applications 90 days prior to their first pesticide application. The delay will allow enrollees under Water Quality Order No. 2004-0009-DWQ to have continued permit coverage throughout the 2013 application season while preparing their new application for coverage under this General Permit; new enrollees to prepare and submit their applications as well; and Water Boards' staff to process the applications and issue NOAs.

Alternatively, the Deputy Director may issue a Notice of Exclusion, which either terminates permit coverage or requires submittal of an application for an individual permit or alternative general permit.

B. Fee

The annual fee for enrollment under this General Permit, shall be based on Category 3 in section 2200(b)(9) of title 23, California Code of Regulations (Cal. Code Regs.). This category is appropriate because algaecide and aquatic herbicide applications incorporate BMPs to control potential impacts to beneficial uses, and this General Permit prohibits pollutant discharge associated with algaecide and aquatic herbicide applications from causing exceedance of CTR criteria or water quality objectives. Information concerning the applicable fees can be found at

http://www.waterboards.ca.gov/resources/fees/docs/fy1112fee_schdl_npdes_prmt.pdf

C. Public Notification

The State Water Board has notified interested agencies and persons of its intent to prescribe waste discharge requirements in this General Permit and provided them with an opportunity to submit their written comments and recommendations.

III. DISCHARGE DESCRIPTION

This General Permit covers the point source discharge to waters of the United States of pesticide residues resulting from applications using products containing 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, and triclopyr-based algaecides and aquatic herbicides, and adjuvants containing ingredients represented by the surrogate nonylphenol. This General Permit covers only discharges of algaecides, aquatic herbicides, and adjuvants that are currently registered for use in California, or that become registered for use and contain the above-listed active ingredients and ingredients represented by the surrogate of nonylphenol.

A. Existing Discharge Description

As of January 11, 2013, there were 153 active enrollees under Water Quality Order No. 2004-0009-DWQ, Statewide General National Pollutant Discharge Elimination System Permit for the Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States, General Permit No. CAG990005 (Order No. 2004-0009- DWQ). Most of the enrollees are local public agencies such as cities and irrigation, flood control, or reclamation districts. The other enrollees include six state of California agencies: the Departments of Boating and Waterways, Fish and Wildlife, Food and Agriculture, Parks and Recreation, Transportation, and Water Resources; a federal agency, U.S. Department of Fish and Wildlife Service; and a few private entities such as home owner associations and mobile home park owners.

The State Water Board granted exceptions to public agencies and mutual water companies that met the criteria stated in section 5.3 of the Policy for short-term or seasonal exceptions from meeting the receiving water limitations for priority pollutants of acrolein and copper.

Order No. 2004-0009-DWQ permits the discharge of aquatic pesticides with the following active ingredients: 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, and triclopyr. The State Water Board reopened Order No. 2004-0009- DWQ after its adoption to add two more active ingredients: (1) imazapyr, a non- selective herbicide, for control of cordgrass and broadleaf weeds and other emergent aquatic species; and (2) sodium carbonate peroxyhydrate as an alternative to copper for algae control.*

B. Annual Report Review

State Water Board staff reviewed annual reports from 2004 through 2008⁹ submitted under Order No. 2004-0009-DWQ. The data are summarized in Table D-1 below. As shown in Table D-1, all constituent concentrations from post-event application samples were below receiving water limitations except for the following: three exceedances each for acrolein and glyphosate and 82 exceedances for copper out of 288 monitoring events. For glyphosate, it is likely that the three exceedances were not the result of aquatic pesticide applications because the pre-application samples also showed exceedances and the remaining 151 sampling events showed no exceedance. For copper, 43 of the 82 exceedances were from public agencies or mutual water companies that were excepted from meeting priority pollutant limitations during the exception period. Thus, staff did not consider these exceedances as violations of the receiving water limitations. However, 39 of the exceedances were from entities that did not have a Policy exception. Therefore, staff considered these exceedances as true violations of the receiving water limitations.

Table D-1. Monitoring Data Summary, 2004-2008, Order No. 2004-0009-DWQ

Pollutant	Number of Samples	Number of Exceedance
2,4-D	3	0
Acrolein	213	3
Copper	288	85
Diquat	17	0
Endothall	6	0
Fluridone	12	0
Glyphosate	154	3
Nonylphenol	53	0

Under Order No. 2004-0009-DWQ, the most commonly used aquatic pesticide products contained copper, acrolein, and glyphosate in descending order.

⁹ The data are submitted to the Regional Water Boards per Order No. 2004-0009-DWQ. When State Water Board staff started collecting data from the Regional Water Boards, the data available covered only this period.

C. Receiving Water Description

The annual reports showed that most algae and aquatic weed control applications were performed in fresh inland surface waters such as lakes, ponds, flood control and drainage channels, or canals. Some applications were performed in coastal waters, marina lagoons, and slough with brackish water.

IV. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this General Permit are based on the applicable plans, policies, and regulations identified below.

A. Legal Authorities

This General Permit is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (U.S. EPA) and chapter 5.5, division 7 of the California Water Code, commencing with section 13370. It shall serve as an NPDES permit for point source discharges of residual algaecides and aquatic herbicides to surface waters. This General Permit also serves as WDRs pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with §13260).

This General Permit shall serve as a General NPDES permit for point source discharges of residues from algaecides and aquatic herbicide applications for algae and aquatic weed control. This General Permit also serves as general Waste Discharge Requirements pursuant to article 4, chapter 4, and division 7 of the California Water Code (commencing with §13260).

B. California Environmental Quality Act (CEQA)

Pursuant to California Water Code section 13389, State and Regional Water Boards are exempt from the requirement to comply with Chapter 3, Division 13 of the Public Resources Code when adopting NPDES permits.

C. State and Federal Regulations, Policies, and Plans

1. Water Quality Control Plans (Basin Plans)

The Regional Water Boards have adopted Basin Plans that designate beneficial uses, establish water quality objectives, and contain implementation programs and policies to achieve those objectives for all waters addressed through the plans. In addition, the Basin Plans implement State Water Board Resolution No.

88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. The Basin Plans identify typical beneficial uses as follows: municipal and domestic supply, agricultural irrigation, stock watering, process supply, service supply, hydropower supply, water contact recreation, canoeing and rafting recreation, other non-contact water recreation,* warm freshwater aquatic habitat, cold freshwater habitat,* warm fish migration habitat, cold fish migration habitat,

warm and cold spawning habitat, wildlife habitat, navigation, rare, threatened, or endangered species habitat, groundwater recharge,* and freshwater replenishment.

Requirements of this General Permit implement provisions contained in the applicable Basin Plans.

2. **National Toxics Rule (NTR) and California Toxics Rule (CTR)**

U.S. EPA adopted the NTR on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About 40 criteria in the NTR applied in California. On May 18, 2000, U.S. EPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality criteria for priority pollutants.

3. **State Implementation Policy (Policy)**

On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (Policy). The Policy became effective on April 28, 2000 with respect to the priority pollutant criteria promulgated for California by U.S. EPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plans. The Policy became effective on May 18, 2000 with respect to the priority pollutant criteria promulgated by U.S. EPA through the CTR. The State Water Board adopted amendments to the Policy on February 24, 2005 that became effective on July 13, 2005. The Policy establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this General Permit implement the Policy.

Policy Exception

The Policy provides categorical exceptions allowing short-term or seasonal exceptions from meeting the priority pollutant criteria/objectives if it is determined to be necessary to implement control measures for resource or pest management conducted by public entities or mutual water companies to fulfill statutory requirements. The Policy specifically refers to vector or weed control, pest eradication, or fishery management as the basis for categorical exceptions. The exceptions are only granted to public entities or mutual water companies that have adequately provided the following information as required by the Policy:

- a. A detailed description of the proposed action which includes the proposed method of completing the action;
- c. A time schedule;
- d. A discharge and receiving water monitoring plan that specifies monitoring prior to application events,* during application events, and after completion with the appropriate quality control procedures;

- e. CEQA documentation including notifying potentially affected public and government agencies; and
- f. Any necessary contingency plans.

The public entities and mutual water companies listed in Attachment G have met the above requirements before the issuance or during the term of the Order No. 2004-0009-DWQ.

The final Negative Declaration or Mitigated Negative Declarations (ND/MND) prepared by the public entities or mutual water companies have determined that the water quality impacts identified in the environmental assessments of the ND/MND from algaecide and aquatic herbicide applications are less than significant, and would not have a significant effect on the environment. The boards of each public entity and mutual water company*, as the lead agencies under CEQA, approved the final ND/MND. Therefore, each public entity or mutual water company is not required to meet priority pollutant criteria during the exception period.

During the issuance of the Order No. 2004-0009-DWQ, as required in section 15096 of the CEQA Guidelines, the State Water Board, as a Responsible Agency under CEQA, considered the ND/MND approved by the board of each public entity or mutual water company. The State Water Board found that the projects will have less than significant water quality impact if the Dischargers meet the requirements in this General Permit. Accordingly, the Policy 5.3 exception granted previously will continue to be valid under this Order.

Any Discharger not listed in Attachment G is required to meet all applicable priority pollutant criteria for receiving waters.

4. **Antidegradation Policy**

Section 131.12 of 40 C.F.R. requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Basin Plans implement, and incorporate by reference, both the state and federal antidegradation policies.

The permitted discharge must be consistent with the antidegradation provision of 40 C.F.R. section 131.12 and Resolution No. 68-16. The conditions of this General Permit require residual algaecide and aquatic herbicide discharges to meet applicable water quality objectives. Specifically, the General Permit sets receiving water limitations for 2,4-D, acrolein, copper, diquat, endothall, fluridone glyphosate, and nonylphenol. It also sets receiving water monitoring triggers for imazapyr and triclopyr triethylamine (TEA).

The BMPs and other controls required pursuant to the General Permit constitute Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT).

The General Permit requirements are protective of the broad range of beneficial uses set forth in basin plans throughout the state, constituting best control available consistent with the purposes of the algaecide and aquatic herbicide application in order to ensure that pollution or nuisance will not occur. The nature of pesticides is to be toxic in order to protect beneficial uses such as human health or long-term viability of aquatic life. For example, blue-green algae are bacteria that live in both fresh and marine waters. In California, certain forms of blue-green algae have been a particular problem in the Klamath River watershed and on the Central Coast. Blooms of these bacteria can poison livestock, wildlife, and humans; they can also damage drinking water sources. The use of an algaecide is one of the effective ways to control the harmful blooms of blue-green algae. Although algaecide application will temporarily degrade the water quality and result in short-term toxicity in the receiving water, it prevents the toxicities in the entire water body for a long period of time. While surface waters may be temporarily degraded; water quality standards and objectives will not be exceeded after project completion.

Another example of benefits of pesticide application is the control of aquatic weeds in flood control channels. Aquatic herbicides used to control emerging aquatic weeds in a flood control channel will effectively prevent full growth and bloom of aquatic weeds that may block the channel and cause flooding in the surrounding communities. Although the water quality is temporarily degraded while the herbicide is taking its effect in eliminating the weeds, the water quality will not be exceeded after the project is completed. In addition, the receiving water limitations and other requirements of this General Permit will ensure maintenance of the highest water quality consistent with maximum benefit to the people of the state.

Given the nature of a General Permit and the broad range of beneficial uses to be protected across the state, data analysis of specific water bodies is infeasible. While surface waters may be temporarily degraded, water quality standards and objectives will not be exceeded. The nature of pesticides is to be toxic in order to protect human health and water resources. However, compliance with receiving water limitations is required. Therefore, this General Permit is consistent with state and federal antidegradation policies.

5. Endangered Species Act

This General Permit does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code §2050 et. seq) or the Federal Endangered Species Act (16 U.S.C.A. §1531 et. seq). This General Permit requires compliance with effluent limitations, receiving water limitations, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

6. Impaired Water Bodies on CWA 303(d) List

This General Permit does not authorize the discharge of residual algaecides and aquatic herbicides and their degradation byproducts to waters of the United States that are impaired by the same active ingredients and their degradation byproducts. The links to California's impaired waters bodies are provided at http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtm.

7. Other Plans, Policies, and Regulations

The State Water Board adopted the *Water Quality Control Policy for the Enclosed Bays and Estuaries of California*. The requirements within this General Permit are consistent with the policy.

V. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

Effluent limitations and toxic and pretreatment effluent standards established pursuant to sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the CWA and amendments thereto are applicable to the discharge.

The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations: (1) 40 C.F.R. section 122.44(a) requires that permits include applicable technology-based limitations and standards; and (2) 40 C.F.R. section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established.

The CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law (33 U.S.C., §1311(b)(1)(C); 40 C.F.R. §122.44(d)(1)). NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to numeric criteria specifying maximum amounts of particular pollutants. Pursuant to 40 C.F.R. section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "*are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.*" Section 122.44(d)(1)(vi) of 40 C.F.R. further provides that "[w]here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits."

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations: 40 C.F.R. section 122.44(a) requires that permits include applicable technology-based

limitations and standards; and section 122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established.

With respect to narrative objectives, the State Water Board must establish effluent limitations using one or more of three specified sources: (1) U.S. EPA's published water quality criteria; (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria; or (3) an indicator parameter (i.e., 40 C.F.R.

§122.44(d)(1)(vi)(A), (B) or (C)). Basin Plans contain a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" Basin Plans require the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. Basin Plans state that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. Basin Plans also limit chemical constituents in concentrations that adversely affect surface water beneficial uses. Basin Plans further state that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

A. Discharge Prohibitions

1. The discharge of residual algaecides, residual aquatic herbicides, and their degradation byproducts in a manner different from that described in this General Permit is prohibited.

This prohibition is based on 40 C.F.R. 122.21(a), "Duty to Apply," and California Water Code section 13260, which requires filing a Report of Waste Discharge before discharges can occur. Discharges not described in the NOI, and subsequently not discharged in the manner permitted by this General Permit, are prohibited.

2. The discharge of residual algaecides, residual aquatic herbicides, and their degradation byproducts shall not create a nuisance as defined in section 13050 of the California Water Code.

This prohibition is based on California Water Code section 13050 for water quality control for achieving water quality objectives.

3. The discharge shall not cause, have a reasonable potential to cause, or contribute to an in-stream excursion above any applicable standard or criterion promulgated by U.S. EPA pursuant to section 303 of the CWA, or water quality objective adopted by the State or Regional Water Boards.

This prohibition is based on CWA section 301 and California Water Code.

4. All pesticides are prohibited from the waters of the Lahontan Region (Region 6). The use of this permit is invalid in the Lahontan Region unless the discharger has

requested a prohibition exemption from the Lahontan Water Board and the Lahontan Water Board has granted an exemption for the use of algaecides or aquatic herbicides.

This prohibition is based on the Lahontan Water Board's region-wide waste discharge prohibition for pesticides in water with exemption criteria to allow certain uses of aquatic pesticides.

B. Effluent Limitations

1. Technology-Based Effluent Limitations

The intent of technology-based effluent limitations in NPDES permits is to require a minimum level of treatment of pollutants based on available treatment technologies while allowing the Discharger to use any available control technique to meet the limitations. For industrial and other non-municipal facilities, technology-based effluent limitations are derived by using: (1) national effluent limitations guidelines and standards established by U.S. EPA; or best professional judgment on a case-by-case basis in the absence of national effluent limitations guidelines and standards. In the case of pesticide applications, U.S. EPA has not developed guidelines and standards other than the requirement to follow the labels when applying pesticides. At this point, it is not appropriate to establish technology-based effluent limitations other than following the label when applying algaecides and aquatic herbicides.

Therefore, the effluent limitations contained in this General Permit are narrative and include requirements to develop and implement an APAP that describes appropriate BMPs, including compliance with all algaecide and aquatic herbicide label instructions, and to comply with numeric receiving water limitations and actions required if monitoring triggers are exceeded.

The BMPs required herein constitute BAT and BCT and will be implemented to minimize the area and duration of impacts caused by the discharge of algaecides and aquatic herbicides in the treatment area and to allow for restoration of water quality and protection of beneficial uses of the receiving waters to pre-application quality following completion of an application event.* In addition, for those enrollees that have been granted an exception to meeting receiving water limitations for acrolein and copper, in accordance with the Policy, this General Permit requires that upon completion of a pesticide application project, the Discharger shall provide certification by a qualified biologist that the receiving water beneficial uses have been restored.

The development of BMPs provides the flexibility necessary to establish controls to minimize the area extent and duration of impacts caused by the discharge of algaecides and aquatic herbicides. This flexibility allows Dischargers to implement appropriate BMPs for different types of applications and different types of waters.

Much of the BMP development has been incorporated into the algaecide and aquatic herbicide regulation process by U.S. EPA, DPR, and County Agricultural

Commissioners. The Dischargers must be licensed by DPR if such licensing is required for the algaecide and aquatic herbicide application project. The algaecide and aquatic herbicide use must be consistent with the algaecide and aquatic herbicide label instructions and any Restricted Material Use Permits issued by County Agricultural Commissioners.

U.S. EPA and DPR scientists review algaecide and aquatic herbicide labels to ensure that a product used according to label instructions will cause no harm (or “adverse impact”) on non-target organisms that cannot be reduced (or “mitigated”) with protective measures or use restrictions. Many of the label directions constitute BMPs to protect water quality and beneficial uses. Label directions may include: precautionary statements regarding toxicity and environmental hazards; directions for proper handling, dosage, application, and disposal practices; prohibited activities; spill prevention and response measures; and restrictions on type of water body and flow conditions.

A Restricted Material Use Permit issued by the County Agricultural Commissioner incorporates applicable suggested permit conditions from DPR and local site- specific conditions necessary to protect the environment. State regulations require that specific types of information be provided in an application to the County Agricultural Commissioners for a Restricted Material Use Permit. The County Agricultural Commissioners review the application to ensure that appropriate alternatives were considered and that any potential adverse effects are mitigated. The County Agricultural Commissioners also conduct pre-project inspections on at least five percent of projects.

This General Permit requires that Dischargers use BMPs when implementing control programs in order to mitigate effects to water quality resulting from algaecide and aquatic herbicide applications. Dischargers are required to consider alternative control measures to determine if there are feasible alternatives to the selected algaecide and aquatic herbicide application project that could reduce potential water quality impacts. If the Discharger identifies alternative control measures to the selected algaecide and aquatic herbicide application project that could reduce potential water quality impacts and that are also feasible, practicable, and cost-effective, the Discharger shall implement the identified alternative measures. The selection of control measures that use non- toxic and less toxic alternatives is an example of an effective BMP.

2. **Water Quality-Based Effluent Limitations (WQBELs)**

a. **Scope and Authority**

Section 122.44(d)(1)(i) of 40 C.F.R. mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established using: (1) U.S. EPA criteria under CWA section 304(a), supplemented where necessary by other relevant information; (2) an

indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in 40 C.F.R. section 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plans, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

Section 122.44(k)(3) of 40 C.F.R. allows the use of other requirements such as BMPs in lieu of numeric effluent limits if the latter are infeasible. It is infeasible for the State Water Board to establish numeric effluent limitations in this General Permit because:

- i. The application of algaecides and aquatic herbicides is not necessarily considered a discharge of pollutants according to the *National Cotton Council of America v. U.S. EPA*¹⁰ and other applicable case law. The Sixth Circuit Court of Appeals ruled that residual pesticides associated with the application of pesticides at, over, or near water constitute pollutants within the meaning of the CWA and that the discharge must be regulated under an NPDES permit;
- ii. This General Permit regulates the discharge of residual algaecides and aquatic herbicides used for algae and aquatic weed control to waters of the United States. These are algaecides and herbicides with registration labels that explicitly allow direct application to water bodies. In algaecides and aquatic herbicides applications to control pests, any algaecides and aquatic herbicides residue or degradation byproduct that is deposited in waters of the United States is a pollutant. However, at what point the algaecides and aquatic herbicides become a residue is not precisely known and varies depending on the type of algaecides and aquatic herbicides, application method and quantity, water chemistry, etc. Therefore, in the application of algaecides and aquatic herbicides, the exact effluent is unknown;
- iii. It would be impractical to provide effective treatment of the algaecides and aquatic herbicides residue to protect water quality, given typically, algaecides and aquatic herbicides applications consist of numerous short duration intermittent algaecides and aquatic herbicides residue releases to surface waters from many different locations; and
- iv. Treatment may render the algaecides and aquatic herbicides useless for algae and aquatic weed control.

¹⁰ 553 F.3d 927 (6th Cir., 2009)

Therefore, as stated in Technology-Based Effluent Limitations, Section V.B.1 above, the effluent limitations contained in this General Permit are narrative and include requirements to develop and implement an APAP that describes appropriate BMPs, including compliance with all algaecides and aquatic herbicides label instructions, and to comply with narrative receiving water limitations and triggers.

b. Receiving Water Beneficial Uses

Algaecide and aquatic herbicide applications for algae and aquatic weed control may potentially deposit residual algaecides and aquatic herbicides to surface waters. Beneficial uses of receiving waters are as follows: municipal and domestic supply, agricultural irrigation, agricultural stock watering, process water supply, service water supply, and hydropower supply, water contact recreation, canoeing and rafting recreation, other non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm and cold spawning habitat, wildlife habitat, navigation, groundwater recharge, and freshwater replenishment. Requirements of this General Permit implement the applicable Basin Plans.

c. Determining the Need for WQBELs

Water quality standards include Regional Water Board Basin Plan beneficial uses and narrative and numeric water quality objectives, State Water Board- adopted standards, and federal standards, including the CTR and NTR, as well as antidegradation policies. The Basin Plans include numeric site- specific water quality objectives and narrative objectives for toxicity, chemical constituents, and tastes and odors. The narrative toxicity objective states:

“All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.” With regard to the narrative chemical constituent objective, the

Basin Plans state that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, *“...water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)”* in title 22 of CCR.

The narrative tastes and odors objective states: *“Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.”*

Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard.

d. **Antidegradation Policy**

The permitted discharge is consistent with the antidegradation provisions of 40 C.F.R. section 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. Due to the low volume of discharge expected from discharges regulated under this General Permit, the impact on existing water quality will be insignificant. Dischargers seeking authorization to discharge under this General Permit are required to demonstrate compliance with receiving water limitations during the application. If, however, the appropriate Regional Water Board, subsequent to review of any application, finds that the impact of a discharge will be significant, then authorization for coverage under this General Permit will be denied and coverage under an individual permit will be required (including preparation of an antidegradation analysis).

VI. RATIONALE FOR RECEIVING WATER LIMITATIONS AND MONITORING TRIGGERS

A. Groundwater

[Not Applicable]

B. Surface Water

CWA section 303(a-c), requires states to adopt water quality standards, including criteria necessary to protect beneficial uses. Regional Water Boards adopted water quality criteria as water quality objectives in the Basin Plans. The Basin Plans state that “[t]he numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect the beneficial uses.” The Basin Plans include numeric and narrative water quality objectives for various beneficial uses and water bodies. This General Permit contains receiving water limitations based on the Basin Plans’ numerical and narrative water quality objectives for bio-stimulatory substances, chemical constituents, color, temperature, floating material, settleable substances, suspended material, tastes and odors, and toxicity. This General Permit also requires compliance with any amendment or revision to the water quality objectives contained in the Basin Plans adopted by Regional Water Boards subsequent to adoption of this General Permit.

Once algaecides and aquatic herbicides have been applied to a treatment area, the algaecide and aquatic herbicide product can actively control pests within the treatment area. The discharge of algaecides and aquatic herbicides, their residues, and their degradation byproducts from the applications to surface water must meet applicable water quality criteria and objectives. The receiving water limitations ensure that an application event* does not result in an exceedance of a water quality standard in the receiving water.

To protect all designated beneficial uses of the receiving water, the most protective (lowest) and appropriate (to implement the CTR criteria and WQOs in the Basin

Plans) criteria should be selected as the permit limitation for a particular water body and constituent. In many cases, water quality standards include narrative, rather than numerical, water quality objectives. In such cases, numeric water quality limits from the literature or publicly available information may be used to ascertain compliance with water quality criteria.

Algaecide and aquatic herbicide formulations contain disclosed “active” ingredients that yield toxic effects* on target organisms and may also have toxic effects on non- target organisms. Algaecide and aquatic herbicide active ingredients that do not contain pollutants for which there are applicable numeric CTR criteria may still have toxic effects on receiving water bodies. In addition, the inactive or “inert” ingredients of algaecides and aquatic herbicides, which are trade secrets and have not been publicly disclosed, may also contain toxic pollutants or pollutants that could affect water quality.

DPR is responsible for reviewing toxic effects of product formulations and determining whether an algaecide or aquatic herbicide is suitable for use in California’s waters. In this General Permit, inert ingredients are also considered on a constituent-by- constituent basis. U.S. EPA regulates pesticide use through strict labeling requirements in order to mitigate negative impacts to human health and the environment, and DPR environmental and medical toxicologists review toxicity data on formulations and can deny registration or work with registrants or County Agricultural Commissioners to impose additional requirements in order to protect human health or the environment.

U.S. EPA and DPR require that pesticides undergo toxicity testing and meet specific toxicity requirements before registering the pesticide for application to surface waters. U.S. EPA has found that the application of properly registered pesticides pose a minimal threat to people and the environment. In addition, the effects of these pesticides on water quality will be mitigated through compliance with FIFRA label requirements, application of BMPs, and monitoring.

Basin Plan water quality objectives to protect the beneficial uses of surface water and groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity, and tastes and odors. The toxicity objective requires that surface water and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the MCLs set forth in title 22, Cal. Code Regs. The tastes and odors objective states that surface water and groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plans require the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

1. Receiving Water Limitations

The instantaneous maximum receiving water limitations are based on promulgated water quality criteria such as those provided in the CTR, water quality objectives adopted by the State and Regional Water Boards in their Basin Plans, water quality criteria adopted by the California Department of Fish and Wildlife, water quality standards such as drinking water standards adopted by U.S. EPA or the California Department of Public Health (CDPH), or U.S. EPA National Recommended Ambient Water Quality Criteria.

This General Permit provides receiving water limitations based on the lowest water quality criteria/objectives to protect all designated beneficial uses of the receiving water. The receiving water limitations in this General Permit are the same as those in Order No. 2004-0009-DWQ. The rationale for each limitation is summarized below.

Table D-2. Summary of Receiving Water Limitations

Constituent/ Parameter	BENEFICIAL USE ¹			All Designations	Basis
	MUN, µg/L	WARM or COLD, µg/L	Other than MUN, WARM, or COLD, µg/L		
2,4,-D	70				U.S. EPA
MCL U.S. EPA Water Acrolein ²	320	21	780		Quality Criteria, 1986.
Copper ²				Dissolved Freshwater ³ Copper Chronic = $0.960 \exp\{0.8545 [\ln(\text{hardness}^4)] - 1.702\}$ ^{5,6} Dissolved saltwater ³ Copper Chronic = $0.83 \exp\{0.8545 [\ln(\text{hardness}^4)] - 1.702\}$ ^{5,6}	California Toxics Rule
Diquat	20				U.S. EPA MCL
Endothall	100				U.S. EPA MCL
Fluridone	560				U.S. EPA Integrated Risk Information System
Glyphosate	700				U.S. EPA
MCL Freshwater Nonylphenol	Chronic Criterion =			6.6 µg/L Saltwater Chronic Criterion = 1.7 µg/L	U.S. EPA National Recommended Ambient Water Quality Criteria
Toxicity toxicity in receiving	Algaecide and aquatic herbicide applications shall not cause or contribute to				Regional Water Boards' Basin Plans

Notes

1. See Regional Water Boards' Water Quality Control Plans (Basin Plans) for beneficial use definitions.
2. Public entities and mutual water companies listed in Attachment G are not required to meet this receiving water limitation during the exception period described in Section VIII.C.10, Limitations and Discharge Requirements, Aquatic Pesticides Application Plan (APAP).

3. For waters in which the salinity is equal to or less than 1 part per thousand 95% or more of the time, the freshwater criteria apply. For waters in which the salinity is equal to or greater than 10 parts per thousand 95% or more of the time, saltwater criteria apply. For waters in which the salinity is between 1 and 10 parts per thousand, the applicable criteria are the more stringent of the freshwater or saltwater criteria.
4. For freshwater aquatic life criteria, waters with a hardness 400 mg/L or less as calcium carbonate, the actual ambient hardness of surface water shall be used. For waters with a hardness of over 400 mg/L as calcium carbonate, a hardness of 400 mg/L as calcium carbonate shall be used with a default Water- Effect Ratio of 1.
5. Values should be rounded to two significant figures.
6. This limitation does not apply to the Sacramento River and its tributaries above the State Highway 32 Bridge at Hamilton City. See Table III-1 of the Basin Plan for the Sacramento and San Joaquin River Basins for copper limitation.

The copper limitation in Order No. 2004-0009-DWQ was based on the CTR's Criteria Continuous Concentration (CCC) expressed in total recoverable concentration. This General Permit also uses CCC from the CTR as the basis of the copper limitations; however, the copper limitation is now expressed in dissolved concentration. Since the copper criterion in the CTR is expressed in dissolved concentration, the receiving water limitation must also be expressed in dissolved rather than total concentration since it is the dissolved portion of copper that is bioavailable to aquatic life.

Based on Policy section 5.3, this General Permit grants public entities and mutual water companies listed in Attachment G a short-term or seasonal exception from meeting receiving water limitations for acrolein and copper during treatment. As a condition of the exception, this General Permit requires Dischargers to provide the length and justification of required exception periods in their APAPs. There is no discrete definition for short-term; but the intent is to allow the exception to apply during the treatment period. It is up to the Discharger to make this demonstration.

The receiving water dissolved oxygen limitation is based on the Regional Water Board Basin Plans' dissolved oxygen objectives.

2. Receiving Water Monitoring Triggers

In algaecide or aquatic herbicide applications, it is reasonable to conclude that some residual algaecides or aquatic herbicides will remain in the receiving waters. These residual algaecides or aquatic herbicides may cause toxicity to aquatic life. However, information regarding the specific amount of algaecide or aquatic herbicide residues (described below) in the receiving water as a result of direct applications for weed control is not adequate to develop receiving water limitations for these algaecides and aquatic herbicides. Therefore, this General Permit only contains Receiving Water Monitoring Triggers and/or monitoring requirements for these algaecides or aquatic herbicides. The monitoring triggers and monitoring data will be used to assess whether the discharges of these algaecide or aquatic herbicide residues have the reasonable potential to cause or contribute to an excursion of a water quality standard, including numeric and narrative objectives within a standard.

In the absence of adopted criteria, objectives, or standards, the State Water Board used U.S. EPA's Ambient Criteria for the Protection of Freshwater Aquatic

Life (Ambient Water Quality Criteria) which are directly applicable as a regulatory level to implement narrative toxicity limitations included in all Regional Water Board Basin Plans. Where adopted criteria, objectives, standards, or Ambient Water Quality Criteria are unavailable, the State Water Board used data from U.S. EPA's *Ecotoxicity Database* to develop the Receiving Water Monitoring Triggers to protect all beneficial uses of the receiving water.

For constituents that do not have Ambient Water Quality Criteria, the Instantaneous Maximum Receiving Water Monitoring Trigger is based on one-tenth of the lowest 50 Percent Lethal Concentration (LC50) from U.S. EPA's *Ecotoxicity Database*. Using one-tenth of the lowest LC50 as the receiving water monitoring trigger is consistent with the Central Valley Regional Water Board's Basin Plan approach when developing the Daily Maximum Limitation for algaecides or aquatic herbicides that do not have water quality criteria.

This General Permit may be re-opened to add receiving water limitations to the algaecides or aquatic herbicides listed below if the monitoring triggers are exceeded or the monitoring data indicate re-opening of the permit is appropriate. The following is a detailed discussion of toxicity data, applicable water quality criteria, and Receiving Water Monitoring Triggers, if applicable, for these algaecide or aquatic herbicide:

a. Imazamox

Imazamox is a derivative of the active ingredient, ammonium salt of imazamox for the aquatic herbicide Clearcast, which DPR registered for use in California in October 2012. It is labeled for application to water for the control of submerged aquatic plants species and some emergent and floating species.

Imazamox is an herbicide that inhibits an enzyme in aquatic plants that is essential for the synthesis of three-branched chain amino acids.

Staff obtained toxicity data for imazamox from U.S. EPA's *Ecotoxicity Database* to assess its toxicity to freshwater aquatic life. However, U.S. EPA's *Ecotoxicity Database* contains toxicity data only for imazamox, but not for its salt. Table D-3 summarizes the toxicity data for imazamox below.

Table D-3. Toxicity Data Summary for Imazamox (CAS# 114311-32-9)

Type of Organism	Study Length	Study Date	LC50 (mg/L)
Mysid	96 h	1998	> 100
		1998	> 94.3
Bluegill sunfish	96 h	1994	> 119
Rainbow trout	96 h	1994	> 122
Sheephead mino	96 h	1998	> 94.2
		1998	> 94.2
Lowest LC50/10 > 9.4 mg/L			

Ambient Water Quality Criteria are unavailable for imazamox and imazamox salt. Table D-3 shows that one-tenth of the lowest LC50 to protect the most sensitive freshwater aquatic life for imazamox is greater than 9.4 mg/l.

Due to the absence of water quality criteria for imazamox and its low toxicity to aquatic life as indicated in U.S. EPA's *Ecotoxicity Database*, this General Permit does not have a receiving water monitoring trigger for imazamox. However, this General Permit requires receiving water monitoring for imazamox to collect data, which will provide information on whether the use of imazamox has water quality impacts.

b. Imazapyr

The active ingredient imazapyr is marketed by the trade names Arsenal, Chopper, and Assault. Upon contact, imazapyr can interfere with DNA synthesis and cell growth of the plants. The target weed species are grasses, broad-leaves, vines, brambles, shrubs and trees, and riparian and emerged aquatics. The result of exposure is death of new leaves. It was first registered in the United States in 1984.

Imazapyr is a slow-acting amino acid synthesis inhibitor. It has an average water half-life* of four days with photodegradation as the primary form of degradation in water. Imazapyr acts more quickly and is less toxic than other low-volume herbicides. According to the San Francisco Estuary* Invasive *Spartina* Project's May 4, 2005 report titled *Use of Imazapyr Herbicide to Control Invasive Cordgrass (Spartina spp.) in the San Francisco Estuary*, imazapyr in water rapidly degrades via photolysis. The report further states that a number of field studies demonstrated that imazapyr rapidly dissipated from water within several days, and no detectable residues of imazapyr were found in either water or sediment within two months; in estuarine systems, dilution of imazapyr with the incoming tides contributes to its rapid dissipation, suggesting that imazapyr is not environmentally persistent in the estuarine environment and does not result in significant impacts to water quality. The report concludes that imazapyr herbicides can be a safe, highly effective treatment for control and eradication of non-native *Spartina* species in the San Francisco Estuary and offers an improved risk scenario over the existing treatment regime with glyphosate herbicides. On August 30, 2005, DPR registered imazapyr for aquatic application as an aquatic herbicide.

Toxicity data for imazapyr were obtained from U.S. EPA's *Ecotoxicity Database* to assess the toxicity of imazapyr to freshwater aquatic life. Tables D-4 and D-5 summarize the toxicity data for imazapyr and imazapyr salt.

Table D-4. Toxicity Data Summary for Imazapyr (CAS#81334-34-1)

Type of Organism	Study Length	Study Date	LC50 (mg/L)
Pink shrimp	96 h	1988	> 189
Atlantic silverside	96 h	1988	> 184
Bluegill sunfish	96 h	1983	> 100
		1983	> 100

Type of Organism	Study Length	Study Date	LC50 (mg/L)
Channel catfish	96 h	1983	> 100
Rainbow trout	96 h	1983	> 100
		1995	> 110
Lowest LC50/10 > 10			

Table D-5. Toxicity Data Summary for Imazapyr Isopropylamine Salt (CAS#81510-83-0)

Type of Organism	Study Length	Study Date	LC50 (mg/L)
Water flea	48 h	1984	350
Rainbow trout	96 h	1984	112
Bluegill sunfish	96 h	1984	> 1000
Lowest LC50/10 = 11.2			

Ambient Water Quality Criteria are unavailable for imazapyr and imazapyr salt. Tables D-4 and D-5 show that the lowest one-tenth of LC50 to protect the most sensitive freshwater aquatic life for imazapyr is 11.2 mg/l.

Due to its safe use in the environment and low toxicity to aquatic life as indicated in U.S. EPA's *Ecotoxicity Database*, this General Permit does not have a receiving water limitation for imazapyr. However, this General Permit contains a monitoring trigger of 11.2 mg/l based on one-tenth of the lowest LC50 from U.S. EPA's *Ecotoxicity Database* and requires receiving water monitoring to collect data, which will provide information on whether imazapyr has water quality impacts.

c. Penoxsulam

Penoxsulam is the active ingredient for Galleon SC, a selective systemic aquatic herbicide for management of freshwater aquatic vegetation in ponds, lakes, reservoirs, marshes, wetlands, non-irrigation canals, slow-moving water bodies, etc. Penoxsulam is a post-emergence acetolactate synthase (ALS) inhibitor developed by Dow AgroSciences to be used as a foliar spray on dry-seeded rice crops. The mode of action is to inhibit the acetolactate synthase enzyme in the target weed.

The U.S. EPA Pesticide Fact Sheet states that penoxsulam is expected to be very mobile, but not very persistent, in either aqueous or terrestrial environments. Penoxsulam exists almost exclusively in a disassociated state at pH values normally found in rice paddy water (averaging about eight), but not in terrestrial environments where lower pH values may be found. Penoxsulam degrades by two different transformation mechanisms, producing 13 different identified transformation products, 11 of which meet

the criteria to be classified as major degradation byproducts,¹¹ six of which reached peak concentrations at study termination, indicating a greater degree of persistence than penoxsulam and a potential to reach concentrations even greater than those reported at study termination. The results of the screening-level risk assessment suggest that penoxsulam will not pose a threat to aquatic or terrestrial animals, however, this conclusion must be tempered by the fact that testing has not been conducted on several major degradation byproducts.

Toxicity data for penoxsulam were obtained from U.S. EPA's *Ecotoxicity Database* to assess the toxicity of penoxsulam to freshwater aquatic life. Table D-6 summarizes the toxicity data for penoxsulam.

Table D-6. Toxicity Data Summary for Penoxsulam (CAS#219714-96-2)

Type of Organism	Study Length	Study Date	LC50 (mg/L)
Bluegill sunfish	96 h	2000	> 103
Common carp fish	96 h	2001	> 101
Mysid	96 h	2000	> 114
Rainbow trout	96 h	2002	> 147
		2000	> 102
Scud	96 h	2000	> 126
Lowest LC50/10 > 10.1			

Ambient Water Quality Criteria are unavailable for penoxsulam. Table D-6 shows that the lowest one-tenth of LC50 to protect the most sensitive freshwater aquatic life for penoxsulam is greater than 10.1 mg/l.

Due to its safe use in the environment, low toxicity to aquatic life as indicated in U.S. EPA's *Ecotoxicity Database*, and lack of accurate toxicity value, this General Permit does not have a receiving water monitoring trigger.

However, this General Permit requires receiving water monitoring to collect data, which will provide information on whether penoxsulam has water quality impacts.

d. Sodium Carbonate Peroxyhydrate

Sodium carbonate hydroxyhydrate has been registered as an algaecide since early 2006. The most common brand names are PAK 27, Phycomycin, and Green Clean. It is an alternative to traditional copper based algaecides.

It acts as an oxidizing agent and thus kills the target algae. When it is

¹¹ U.S. EPA defines major degradation byproducts to be BSA, 2-amino-TP, TPSA, BSTCA methyl, BSTCA, 2-amino-TCA, 5-OH-penoxsulam, SFA, sulfonamide, 5,8-di-OH and 5-OH, 2 aminoTP.

applied into water, the compound quickly breaks down into hydrogen peroxide (H₂O₂) and sodium carbonate. The hydrogen peroxide oxidizes and thus kills the target pests. After contact, the hydrogen peroxide breaks down into water and oxygen.

U.S. EPA has waived toxicity testing for freshwater fish and invertebrate during the registration process. According to the U.S. EPA fact sheet, when the pesticide is applied in accordance with directions on the label, no harm is expected to freshwater fish or freshwater invertebrates.

There are no toxicity data for sodium carbonate peroxyhydrate in U.S. EPA's *Ecotoxicity Database*. Therefore, this General Permit does not have a monitoring trigger or a monitoring requirement for sodium carbonate peroxyhydrate.

e. Triclopyr Triethylamine (TEA) Salt

Triclopyr TEA is a systemic herbicide used to control broad-leaf weeds and woody plants.

U.S. EPA concluded in its re-registration document that triclopyr TEA is practically non-toxic to freshwater fish and aquatic invertebrates on an acute basis and triclopyr TEA is slightly toxic to practically non-toxic to estuarine/marine fish and invertebrates on an acute basis.

Triclopyr produces the metabolite or degradate 3,5,6-trichloro-2-pyridinol (TCP). Based on its analysis, U.S. EPA concludes that the existing uses of triclopyr are unlikely to result in acute or chronic dietary risks from TCP. Based on limited available data and modeling estimates, with less certainty, the U.S. EPA concluded that existing uses of triclopyr are unlikely to result in acute or chronic drinking water risks from TCP.

Toxicity data for triclopyr TEA were obtained from U.S. EPA's *Ecotoxicity Database* to assess the toxicity of triclopyr TEA to freshwater aquatic life. Table D-7 summarizes the toxicity data for Triclopyr TEA.

**Table D-7. Toxicity Data Summary for Triclopyr TEA Salt
 (CAS#57213-69-1)**

Type of Organism	Study Length	Study Date	LC50 (mg/L)
Bluegill sunfish	96 h	1978	891
	96 h	1973	471
Fathead minnow	96 h	1978	947
	96 h	1983	546
	96 h	1983	279
Grass shrimp	96 h	1992	326
Inland Silverside fish	96 h	1989	130
Pink shrimp	96 h	1975	895
Rainbow trout	96 h	1973	240
	96 h	1978	552

Type of Organism	Study Length	Study Date	LC50 (mg/L)
Lowest LC50/10 = 13.0			

Ambient Water Quality Criteria are unavailable for triclopyr TEA. Table D-7 shows that the lowest one-tenth of LC50 to protect the most sensitive freshwater aquatic life for triclopyr TEA is 13 mg/l.

Due to its safe use in the environment and low toxicity to aquatic life as indicated in U.S. EPA's *Ecotoxicity Database*, this General Permit does not have a receiving water limitation for triclopyr TEA. However, this General Permit contains a monitoring trigger of 13.0 mg/l based on one-tenth of the lowest LC50 from U.S. EPA's *Ecotoxicity Database* and requires receiving water monitoring to collect data, which will provide information on whether triclopyr TEA has water quality impacts.

VII. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

A. MRP Goals

Section 122.48 of 40 C.F.R. requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the State and Regional Water Boards to require technical and monitoring reports. The Monitoring and Reporting Program (MRP) in Attachment C of this General Permit establishes monitoring and reporting requirements to implement federal and state requirements.

The goals of the MRP are to:

1. Identify and characterize algaecide or aquatic herbicide application projects conducted by the Discharger;
2. Determine compliance with the receiving water limitations and other requirements specified in this General Permit;
3. Measure and improve the effectiveness of the APAP;
4. Support the development, implementation, and effectiveness of BMPs;
5. Assess the chemical, physical, and biological impacts on receiving waters resulting from algaecide or aquatic herbicide applications;
6. Assess the overall health and evaluate long-term trends in receiving water quality;
7. Demonstrate that water quality of the receiving waters following completion of resource or weed management projects are equivalent to pre-application conditions; and
8. Ensure that projects that are monitored are representative of all algaecide or aquatic herbicide and application methods used by the Discharger.

The MRP in the Attachment C of this General Permit is considered as baseline monitoring requirements. Monitoring plans proposed by Dischargers in their APAP must meet the minimum requirements prescribed in the MRP. Public entities and mutual water companies that have a Policy section 5.3 exception should comply with the MRP in this General Permit as well as monitoring plan proposed in their CEQA document where the two plans differ.

B. Effluent Monitoring

Pursuant to the requirements of 40 C.F.R. section 122.44(i), effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess compliance with effluent limitations, assess the effectiveness of the treatment process, and assess the impacts of the discharge on the receiving water and groundwater.

The application of pesticides for pest control is not necessarily considered a discharge of pollutants according to the *National Cotton Council of America v. U.S. EPA* decision and other applicable case law. The regulated discharge is the discharge of residual pesticides. At what point the pesticide becomes a residue is not precisely known. Therefore, in the application of pesticides, the exact effluent is unknown. Thus, the effluent monitoring requirement is not applicable for algaecide or aquatic herbicide applications.

C. Toxicity Testing Requirements

The State Water Board, pursuant to the Porter-Cologne Act and the federal CWA, customarily requires the Discharger to conduct toxicity monitoring. In fact, both Acts anticipate Discharger self monitoring. However, this General Permit does not require toxicity testing based on the 2004 toxicity study funded by the State Water Board and data collected from 2004 to 2008. The toxicity study found the following: (1) There was no toxicity with the use of 2,4-D, glyphosate, and triclopyr; (2) Toxicity testing was difficult for acrolein due to its volatility; (3) Results were inconclusive for diquat and fluridone; and (4) Peak copper concentrations did not exceed toxicity values. The monitoring data collected under Order No. 2004-0009-DWQ from 2004 to 2008 showed that all constituent concentrations from post-event application samples were below receiving water limitations except for the following: three exceedances each for acrolein and glyphosate and 82 exceedances for copper out of 288 monitoring events. For glyphosate, it is likely that the three exceedances were not the result of aquatic herbicide applications because the pre-application samples also showed exceedances and the remaining 151 samples showed no exceedance. For copper, 43 of the 82 exceedances were from public agencies or mutual water companies that were excepted from meeting priority pollutant limitations during the exception period. The Policy allows the exception. Thus, staff did not consider these exceedances as violations of the receiving water limitations. However, 39 of the exceedances were from entities that did not have a Policy exception. Although staff considered these exceedances as true violations of the receiving water limitations, staff is not aware of any long-term impacts from these exceedances. Long-term impacts from

exceedances are likely not going to occur for the following reasons: (1) water quality criteria, which are used directly as receiving water limitations in this General Permit, have built-in factors of safety; (2) as shown in the 2004 toxicity study, the actual peak concentrations after applications of copper did not exceed toxicity values; and (3) the applications are short-term in duration. All of the foregoing information indicates that widespread acute ecosystem impacts will not occur from algaecide or aquatic herbicides applied according to their label instructions and requirements of this General Permit. Therefore, toxicity monitoring requirements are not necessary.

D. Receiving Water Monitoring

Receiving water monitoring is necessary to determine the impacts of the discharge on the receiving stream.

All forms of testing have some degree of uncertainty associated with them. The more limited the amount of test data available, the larger the uncertainty. The intent of this General Permit's sampling program is to select a number that will detect most events of noncompliance without requiring needless or burdensome monitoring.

Staff also used EPA's Technical Support Document for Water Quality-Based Toxics Control (TSD) to determine the appropriate number of samples that would be needed to characterize the impacts of the residual pesticide discharge from pesticide applications. Page 53 of the TSD recommends using a coefficient of variation (CV) 0.6 when the data set contains less than 10 samples. Table 3-1 of the TSD shows that with a CV of 0.6, the multiplying factors used to determine whether a discharge causes, has the reasonable potential to cause, or contributes to an excursion above a state water quality standard begin to stabilize when the sample number is six. Thus, this General Permit requires six samples per year for each active ingredient in each environmental setting (flowing water and non-flowing water) to characterize the effects of residual pesticide discharge from pesticide applications. However, after a Discharger or Coalition has provided results from six consecutive sampling events showing concentrations that are less than the receiving water limitation/trigger for an active ingredient in a specific environmental setting, sampling shall be reduced to one application event per year for that active ingredient in that environmental setting.

Similarly, this General Permit contains a reduced monitoring frequency of once per year (instead of six) at each environmental setting for glyphosate. The reduced monitoring frequency is based on staff's review of available data from 2004 to 2008 that showed no exceedance of the permit limitation for glyphosate under Order No. 2004-0009-DWQ.

VIII. RATIONALE FOR AQUATIC PESTICIDE USE REQUIREMENTS

A. Application Schedule

The Discharger shall provide a phone number or other specific contact information for all persons who request the Discharger's application schedule.

B. Application Notification Requirements

The Policy section 5.3, Categorical Exception, requires public agencies and mutual water companies that have been granted the short-term or seasonal exception for compliance with priority pollutant limitations to notify potentially affected public and government agencies of algaecide or aquatic herbicide application.

C. APAP

This General Permit contains narrative effluent limitations, which include implementing BMPs described in the APAP, which is a requirement of this General Permit. See Section VI, Rationale for Effluent Limitations and Discharge Specifications, for more detailed explanation of the need for an APAP.

D. APAP Processing, Approval, and Modifications

Upon receipt of a new or an amended APAP, staff will post it on the State Water Board's website. Major changes to the APAP shall be submitted to the Deputy Director for approval. Examples of major changes include using a different product other than what is specified in the APAP, changing an application method that may result in different amounts of algaecide or aquatic herbicides being applied, or adding or deleting BMPs. Since the APAP shall include ALL (1) the water bodies or water body systems in which algaecide or aquatic herbicides are being planned to be applied or may be applied to control algae and aquatic weeds and (2) the application areas and the target areas in the system that are being planned to be applied or may be applied, changes in monitoring locations are not considered major changes. However, these changes need to be reported in the annual report.

In preparing for the reissuance of the General Permit, staff will evaluate review periods and comments received during the life of this permit and look for efficiencies. Based on this information, staff will propose revisions to the public comment process for APAPs.

E. Aquatic Pesticide Application Log

An application log to record all algaecide or aquatic herbicide applications is necessary. This application log will help Dischargers and the Water Boards' staff to investigate any exceedance of receiving water limitations or receiving water monitoring triggers.

IX. RATIONALE FOR PROVISIONS

A. Standard Provisions

1. Standard Provisions in Attachment B

Standard Provisions, which apply to all NPDES permits in accordance with 40 C.F.R. section 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 C.F.R. section 122.42, are provided

in Attachment B. The Discharger must comply with applicable standard provisions and with those additional conditions that are applicable under 40 C.F.R. section 122.42.

Sections 122.41(a)(1) and (b) through (n) of 40 C.F.R. establish conditions that apply to all state-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the General Permit.

Section 123.25(a)(12) of 40 C.F.R. allows the state to omit or modify conditions to impose more stringent requirements. In accordance with 40 C.F.R.

Section 123.25, this General Permit omits federal conditions that address enforcement authority specified in 40 C.F.R. section 122.41(j)(5) and (k)(2) because the enforcement authority under the California Water Code is more stringent. In lieu of these conditions, this General Permit incorporates by reference California Water Code section 13387(e).

2. **Discharge to Impaired Water Bodies**

Impaired water bodies are water quality limited segments listed under CWA 303(d) listings. The water bodies on these lists do not meet water quality standards, even if the discharge itself meets water quality standards. The Basin Plans state that *“Additional treatment beyond minimum federal standards will be imposed on dischargers to Water Quality Limit Segments. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.”* The allocated loads are Discharger and receiving water specific. It is infeasible to assign a uniform load in a statewide general permit. Therefore, this General Permit does not authorize the discharge of active ingredients of algaecides or aquatic herbicides, their residues, and their degradation byproducts to water bodies that are already impaired due to the same product active ingredients, their residues, and their degradation byproducts.

B. **Special Provisions**

1. **Reopener Provisions**

The reopener provisions allow future modification to this General Permit in accordance with 40 C.F.R. section 122.62.

a. **Addition to Policy Exception List in Attachment G**

This General Permit may be reopened to add a public entity or a mutual water company which may not otherwise meet the receiving water limitations for acrolein and copper and meets the requirements for an exception from meeting those limitations, consistent with section 5.3 of the Policy.

b. **Addition of Aquatic Pesticide Active Ingredients**

This General Permit may be reopened to add newly registered algaecide or aquatic herbicide active ingredients so that Dischargers can be covered by this General Permit when they apply the algaecide or aquatic herbicide products with the new active ingredients.

c. Acute and Chronic Toxicity

When the State Water Board revises the Policy's toxicity control provisions that would require the establishment of numeric chronic toxicity limitations or other actions, this General Permit may be reopened to comply with those requirements.

d. Receiving Water Limitations

If monitoring data for residual pesticides show exceedance of monitoring triggers, the Discharger or Coalition shall conduct additional investigations to determine the cause of exceedance. At a minimum, the Discharger or Coalition shall evaluate its application methods, BMPs, and the appropriateness of using alternative products. As a result of the evaluation, this General Permit may be re-opened to add numeric Receiving Water Limitations for the residual pesticides exceeding the triggers.

e. Endangered Species Act

If U.S. EPA develops biological opinions regarding pesticides included in this General Permit, this General Permit may be re-opened to add or modify Receiving Water Limitations/Monitoring Triggers for residual pesticides of concern, if necessary.

2. Special Studies, Technical Reports, and Additional Monitoring Requirements

a. Additional Investigation

This General Permit requires Dischargers to conduct additional investigations if the monitoring results exceed the receiving water monitoring limitations. These investigations are necessary in order to address the exceedance caused by the algacide or aquatic herbicide application and meet the General Permit's limitations and requirements including Basin Plans' narrative water quality objective of no toxics in toxic amount. b. Qualified

Biologist Certification Following Project Completion

The requirement is retained from Order No. 2004-0009-DWQ and is based on Policy section 5.3 exception.

3. Corrective Action

When receiving water limitations or triggers are exceeded, Dischargers are expected to assess the cause of exceedance and take appropriate actions as necessary to prevent recurrence of the problem.

X. COMPLIANCE DETERMINATION

This General Permit specifies that compliance be based on event and post-event sampling results. The event sample results will determine if exceedance occurred outside the Treatment Area* during treatment. Post-event samples will determine if exceedance occurred in the Application or Treatment Area after treatment. Since the minimum effective concentration and time needed to effectively kill or control target weeds or algae vary due

to site specific conditions, such as flow, target species, water chemistry, and type of algaecides or aquatic herbicides, this General Permit allows Dischargers to determine when treatment is completed.

XI. PUBLIC PARTICIPATION

The State Water Board is considering the issuance of WDRs that will serve as a general NPDES permit for algaecide or aquatic herbicide applications. As a step in the WDR adoption process, the State Water Board staff has developed tentative WDRs. The State Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The State Water Board has notified interested agencies, parties, and persons of its intent to prescribe general WDRs for algaecide or aquatic herbicide applications and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided to interested parties through specific mailings and publication in major newspapers throughout California. The State Water Board, in a public meeting, heard and considered all comments pertaining to discharges to be regulated by this General Permit. Details of the Public Hearing are provided in the Fact Sheet of this General Permit.

B. Written Comments

Interested persons were invited to submit written comments concerning this tentative WDR. Comments were due at the State Water Board offices by 12:00 noon on **August 21, 2012**. Seven comment letters were received.

C. Public Hearing and Meeting

The State Water Board held a public hearing on the tentative WDRs during its regular Board meeting on **August 7, 2012**. The State Water Board will consider adoption of the WDRs at a public meeting on the following date, time, and location:

Date: **February 19, 2013**
Time: 9:00 a.m.
Location: State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Interested persons are invited to attend. At the public meeting, the State Water Board will hear comments, if any, limited to changes on the draft General Permit.

Please be aware that dates and venues may change. The State Water Board's website address is www.waterboards.ca.gov where you can access the current agenda for changes in dates and locations.

D. Information and Copying

The tentative effluent limitations, receiving water limitations, and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the State Water Board by calling (916) 379-9152.

E. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding this general WDR and NPDES permit should contact the State Water Board, reference the general WDR and NPDES permit, and provide a name, address, and phone number.

F. Additional Information

Requests for additional information or questions regarding this General Permit should be directed to NPDES_Wastewater@waterboards.ca.gov.

Attachment E – Notice of Intent

**WATER QUALITY ORDER NO. 2013-0002-DWQ GENERAL PERMIT
 NO. CAG990005**

**STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
 (NPDES) PERMIT FOR RESIDUAL AQUATIC PESTICIDE DISCHARGES TO WATERS OF
 THE UNITED STATES FROM ALGAE AND AQUATIC WEED CONTROL APPLICATIONS**

I. NOTICE OF INTENT STATUS (see Instructions)

Mark only one item	A. New Applicator	B. Change of Information: WDID# _____
	C. <input type="checkbox"/> Change of ownership or responsibility: WDID# _____	

II. DISCHARGER INFORMATION

A. Name			
B. Mailing Address			
C. City	D. County	E. State	F. Zip
G. Contact Person	H. E-mail address	I. Title	J. Phone

III. BILLING ADDRESS (Enter Information only if different from Section II above)

A. Name			
B. Mailing Address			
C. City	D. County	E. State	F. Zip
G. E-mail address	H. Title	I. Phone	

IX. CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I certify that the provisions of the General Permit, including developing and implementing a monitoring program, will be complied with."

A. Printed Name: _____

B. Signature: _____ Date: _____

C. Title: _____

XI. FOR STATE WATER BOARD STAFF USE ONLY

WDID:	Date NOI Received:	Date NOI Processed:
Case Handler's Initial:	Fee Amount Received: \$	Check #:
Lyris List Notification of Posting of APAP	Date _____	Confirmation Sent _____

INSTRUCTIONS FOR COMPLETING NOI

WATER QUALITY ORDER NO. 2013-0002-DWQ GENERAL PERMIT NO. CAG990005

STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR RESIDUAL AQUATIC PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM ALGAE AND AQUATIC WEED CONTROL APPLICATIONS

These instructions are intended to help you, the Discharger, to complete the Notice of Intent (NOI) form for the Statewide General NPDES permit. **Please type or print clearly when completing the NOI form.** For any field, if more space is needed, submit a supplemental letter with the NOI.

Send the completed and signed form along with the filing fee and supporting documentation to the Division of Water Quality, State Water Resources Control Board. Please also send a copy of the form and supporting documentation to the appropriate Regional Water Quality Control Board (Regional Water Board).

Section I – Notice of Intent Status

Indicate whether this request is for the first time coverage under this General Permit or a change of information for the discharge already covered under this General Permit. Dischargers that are covered under Order No. 2004-0009-DWQ before effective date of this General Permit should check the box for change of information. For a change of information or ownership, please supply the eleven-digit Waste Discharge Identification (WDID) number for the discharge.

Section II – Discharger Information

Enter the name of the Discharger.

Enter the street number and street name where correspondence should be sent (P.O. Box is acceptable).

Enter the city that applies to the mailing address given. Enter the county that applies to the mailing address given. Enter the state that applies to the mailing address given. Enter the zip code that applies to the mailing address given. Enter the name (first and last) of the contact person.

Enter the e-mail address of the contact person.

Enter the contact person's title.

Enter the daytime telephone number of the contact person

Section III – Billing Address

Enter the information **only** if it is different from Section II above.

A. Enter the name (first and last) of the person who will be responsible for the billing.

- B.** Enter the street number and street name where the billing should be sent (P.O. Box is acceptable).
- C.** Enter the city that applies to the billing address.
- D.** Enter the county that applies to the billing address.
- E.** Enter the state that applies to the billing address.
- F.** Enter the zip code that applies to the billing address.
- G.** Enter the e-mail address of the person responsible for billing.
- H.** Enter the title of the person responsible for billing.
- I.** Enter the daytime telephone number of the person responsible for billing.

Section IV – Receiving Water Information

Please be reminded that this General Permit does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code §2050 et. seq) or the Federal Endangered Species Act (16 U.S.C.A. §1531 et. seq). This General Permit requires compliance with effluent limitations, receiving water limitations, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

Additional information on federally-listed threatened or endangered species and federally-designated critical habitat is available from NMFS (www.nmfs.noaa.gov) for anadromous or marine species or FWS (www.fws.gov) for terrestrial or freshwater species.

- A.** Check all boxes that apply. At least one box must be checked.
 1. Check this box if the treatment area is a canal, ditch, or other constructed conveyance system owned and controlled by Discharger. Print the name of the conveyance system.
 2. Check this box if the treatment area is a canal, ditch, or other constructed conveyance system owned and controlled by an entity other than the Discharger. Print the owner’s name and names of the conveyance system.
 3. Check this box if the treatment area is not a constructed conveyance system (including application to river, lake, creek, stream, bay, or ocean) and enter the name(s) of the water body(s).
- B.** List all Regional Water Board numbers where algaecide and aquatic herbicide application is proposed. Regional Water Board boundaries are defined in section 13200 of the California Water Code. The boundaries can also be found on our website at http://www.waterboards.ca.gov/waterboards_map.shtml

Regional Water Board Numbers	Regional Water Board Names
1	North Coast
2	San Francisco Bay
3	Central Coast

Regional Water Board Numbers	Regional Water Board Names
4	Los Angeles
5	Central Valley (Includes Sacramento, Fresno, Redding Offices)
6	Lahontan (South Lake Tahoe, Victorville offices)
7	Colorado River Basin
8	Santa Ana
9	San Diego

Section V – Algaecide and Aquatic Herbicide Application Information

- A.** List the appropriate target organism(s).
- B.** List the name and active ingredients of each algaecide and aquatic herbicide to be used.
- C.** List the start and end date of proposed aquatic algaecide and aquatic herbicide application event.
- D.** List the name(s) and type(s) of adjuvants that will be used.

The Discharger must submit a new NOI if any information stated in this section will be changed. If the Discharger plans to use an algaecide and aquatic herbicide product not currently covered under its Notice of Applicability (NOA), and the algaecide and aquatic herbicide product may be discharged to a water of the United States as a result of algaecide and aquatic herbicide application, the Discharger must receive a revised NOA from the State Water Board’s Deputy Director of the Division of Water Quality before using that product.

Section VI – Aquatic Pesticide Application Plan

The Coalition or Discharger must prepare and complete an Aquatic Pesticide Application Plan (APAP). The minimum contents of APAP are specified in the permit under Section VIII.C, Limitations and Discharge Requirements, of the General Permit. The Discharger must ensure that its applicator is familiar with the APAP contents before algaecide and aquatic herbicide application.

If an APAP is not complete at the time of application, enter the date by which it will be completed.

Section VII – Notification

Indicate if you have notified potentially affected public and governmental agencies, as required under item VIII.B of the General Permit.

Section VIII – Fee

The amount of Annual fee shall be based on Category 3 discharge specified in section 2200(b)(9) of title 23, California Code of Regulations. Fee information can be found at http://www.waterboards.ca.gov/resources/fees/docs/fy1112fee_schdl_npdes_prmt.pdf.

Check the YES box if you have included payment of the annual fee. Check the NO box if you have not included this payment. **NOTE:** You will be billed annually and payment is required to continue coverage.

Section IX– Certification

- A.** Print the name of the appropriate official. The person who signs the NOI must meet the signatory and certification requirements stated in Attachment B Standard Provisions item V.B.
- B.** The person whose name is printed above must sign and date the NOI.
- C.** Enter the title of the person signing the NOI.

IV. CERTIFICATION

"I certify under penalty of law that 1) I am not required to be permitted under this General Permit No.CAG990005, and 2) this document and all attachments were prepared under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I understand that the submittal of this Notice of Termination does not release an algacide or aquatic herbicide applicator from liability for any violations of the Clean Water Act."

A. Printed Name: _____

B. Signature: _____ Date: _____

C. Title: _____

V. FOR STATE WATER BOARD USE ONLY

Approved for Termination Denied and Returned to the Discharger

A. Printed Name: _____

B. Signature: _____

C. Date: _____

NOT Effective Date: / /

Attachment G – Exception List

LIST OF PUBLIC AGENCIES AND MUTAL WATER COMPANIES GRANTED AN EXCEPTION PURSUANT TO STATE WATER RESOURCES CONTROL BOARD POLICY FOR IMPLEMENTATION OF TOXICS STANDARDS FOR INLAND SURFACE WATERS, ENCLOSED BAYS, AND ESTUARIES OF CALIFORNIA

The public entities and mutual water companies listed herein have prepared Initial Studies, Negative Declarations (ND), Mitigated Negative Declarations (MND), and Notices of Determination for the discharge of algaecides and aquatic herbicides in accordance with the California Environmental Quality Act (CEQA (Public Resources Code § 21000 et seq.)) to comply with the exception requirements of section 5.3 of the Policy. The boards of each public entity, as the lead agencies under CEQA, approved the Final ND/MND and determined that the discharge of algaecides and aquatic herbicides in their respective projects would not have a significant effect on the environment. These public entities and mutual water companies have determined that the water quality or related water quality impacts identified in the environmental assessments of the ND/MND are less than significant.

In addition to submitting the CEQA documentation, these public entities and mutual water companies have also complied with the other exception requirements of section 5.3 of the Policy.

As required in section 15096 of the CEQA Guidelines, the State Water Resources Control Board (State Water Board), as a Responsible Agency under CEQA, considered the ND/MND approved by the board of each public entity and finds that the projects will have less than significant water quality impact if the waste discharge requirements in this General Permit are followed. Accordingly, the public entities and mutual water companies listed herein are hereby granted an exception pursuant to section 5.3 of the Policy.

1. Byron-Bethany Irrigation District
2. City of Antioch Department of Public Works
3. Contra Costa Water District
4. Contra Costa County Flood Control and Water Conservation District
5. Department of Food and Agriculture
6. Department of Water Resources
7. Friant Water Users Authority
8. Glenn-Colusa Irrigation District
9. Maine Prairie Water District
10. Marin Municipal Water District
11. Metropolitan Water District of Southern California
12. Modesto Irrigation District
13. Nevada Irrigation District

14. North Marin Water District
15. Oakdale Irrigation District
16. Placer County Water Agency
17. Potter Valley Irrigation District
18. Princeton-Cordora-Glenn Irrigation District
19. Provident Irrigation District
20. Reclamation District 1004
21. Santa Cruz Water Department
22. Solano Irrigation District
23. South Feather Water and Power Agency
24. South Sutter Water District
25. Tehama Colusa Canal Authority
26. Turlock Irrigation District
27. Woodbridge Irrigation District
28. Yolo County Flood Control and Water Conservation District

APPENDIX D

City of Sacramento Aquatic Pesticide Application Plan (APAP)

**City of Sacramento
Department of Utilities**

AQUATIC PESTICIDE APPLICATION PLAN (APAP)

**Water Quality Order (# 2004-0009-DWQ) Statewide
General National Pollutant Discharge Elimination
System (NPDES) Permit for the Discharge of Aquatic
Pesticides for Aquatic Weed Control in Waters of the
United States
General Permit # CAG990005**

September 19, 2012

Prepared for:

**City of Sacramento
Department of Utilities
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Submitted to:

**Central Valley Regional Water Quality Control Board
11020 Sun Center Drive #200
Rancho Cordova, CA 95670
Contact: Michael Negrete
(916) 464-4662**

CERTIFICATION

“I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to insure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment”.

Signed and Agreed:

William Roberts

Field Services Superintendent, Department of Utilities

City of Sacramento

Stephen Burkholder

Project Biologist

Michael S. Blankinship

Licensed Professional Engineer (Civil) #C64112

Pest Control Advisor # 75890

City of Sacramento
Department of Utilities
AQUATIC PESTICIDE APPLICATION PLAN
FOR THE STATEWIDE NPDES PERMIT FOR
DISCHARGES OF AQUATIC PESTICIDES

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Introduction

In March 2001, the State Water Resources Control Board (SWRCB) prepared Water Quality Order # 2001-12-DWQ which created Statewide General National Pollutant Discharge Elimination System (NPDES) Permit # CAG990003 for the discharges of aquatic herbicides to waters of the United States. The purpose of Order # 2001-12-DWQ was to minimize the areal extent and duration of adverse impacts to beneficial uses of water bodies treated with aquatic herbicides. The purpose of the general permit was to substantially reduce the potential discharger liability incurred for releasing water treated with aquatic herbicides into waters of the United States. The general permit expired January 31, 2004.

On May 20, 2004 the SWRCB adopted the statewide general NPDES Permit for Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States #CAG 990005 (herein referred to as the “general permit”). Dischargers must have the general permit to perform aquatic herbicide applications. In May 2009, the general permit expired, but according to SWRCB staff, it is still active. It is anticipated that a new general permit will be available for use in 2012. Changes to the general permit, if any, are not known at this time.

Coverage under the general permit is available to single dischargers and potentially to regional dischargers for releases of potential and/or actual pollutants to waters of the United States. Dischargers eligible for coverage under the general permit are public entities that conduct resource or pest management control measures, including local, state, and federal agencies responsible for control of algae, aquatic weeds, and other organisms that adversely impact operation and use of drinking water reservoirs, water conveyance facilities, irrigation canals, flood control channels, detention basins and/or natural water bodies.

The general permit does not cover indirect or non-point source discharges, whether from agricultural or other applications of pesticides to land, that may be conveyed in storm water or irrigation runoff, and only covers pesticides that are applied according to label directions and that are registered for use on aquatic sites by the California Department of Pesticide Regulation (DPR).

The City of Sacramento (City) covers approximately 100 square miles, with a population of about 472,000 people in 2011. The City of Sacramento, Department of Utilities (“Department”) is the entity responsible for water, storm drainage, and sewer services. The Department maintains and operates the drainage system for the City to allow surface water to flow to collection points, prevent flooding, and is able to pump water from its collection points, detention basins and canals. The Sacramento drainage system facilities are designed to provide urban flood protection in a series of drainage zones throughout the city. The drainage system includes a large network of storm drains, detention basins, creeks, ditches, canals, pumping stations and underground pipes to convey urban runoff and stormwater. Refer to **Figure 1**.

The Department’s drainage system receives urban runoff and drainage throughout the year, and stormwater runoff during wet months. Efficient conveyance of urban runoff and stormwater is critical to the Department’s mission of flood control. The Department maintains the canals, creeks, ditches, detention basins and pump stations to ensure efficient conveyance of water. Generally, urban runoff flows into underground pipes that discharge directly into pumping

stations, into drainage channels terminating at pumping stations and/or into detention basins that are also controlled by pumping stations. In some locations, urban runoff discharges from underground pipes directly into creeks.

The Department experiences issues resulting in reduced capacity and flow in its drainage system due to the presence of aquatic and riparian vegetation. Additionally, detention basins and channels in residential areas are prone to infestation by nuisance vegetation and algae that can create mosquito breeding habitat, citizen complaints of odor, and impede efficient water flow.

Using Integrated Pest Management (IPM) techniques, the Department intends to apply aquatic herbicides identified in the Notices of Intent to Comply (NOI) submitted to the Central Valley Regional Water Quality Control Board (RWQCB). For the purposes of applying to, and complying with, the 2004 general permit, the Department has created this Aquatic Pesticide Application Plan (APAP).

The general permit Fact Sheet describes the APAP as follows:

An APAP is a comprehensive plan developed by the discharger that describes the project, the need for the project, what will be done to reduce water quality impacts, and how those impacts will be monitored. Specifically, the APAP must contain the following thirteen (13) elements.

- A. Description of the water body(ies) or water body systems being controlled.
- B. Description of what weed(s) are being controlled and why.
- C. Discussion of control tolerances (i.e. how much growth can occur before action is necessary).
- D. Discussion of the factors influencing the decision to use aquatic herbicides in regard to those tolerances (pros and cons).
- E. Type(s) of aquatic herbicides used², the method in which they are applied, and the adjuvants used.
- F. Description of the application area and the treatment area in the system.
- G. Other control methods used (alternatives) and what their limitations are.
- H. How much product is needed and how this is determined.
- I. Monitoring Plan, including the location of representative site(s).
- J. If applicable, list the gates or control structures and inspection schedule of those gates or control structures to ensure that they are not leaking.
- K. If the Control Agency has been granted a Section 5.3 exception, describe the exception period. If weeds are also controlled outside of this period, describe how is it ensured that receiving water criteria are not exceeded.
- L. Description of the BMPs to be implemented.
- M. Evaluation of other available BMPs to determine feasible alternatives to the selected aquatic herbicide application project that could reduce potential water quality impacts.

¹ List the types and the names of aquatic pesticides used or anticipated to be used. If additional or alternative pesticides are used during the year, amend the APAP and note this in the annual report.

This APAP is organized to address the aforementioned A-M elements.

Insert Figure 1 – Project Location Map.

Element A: Description of Water Bodies and Systems Controlled

The drainage system maintained by the Department includes a large network of storm drains, detention basins, creeks, canals, pumps and underground pipes to convey urban runoff and stormwater. The Department maintains the system to ensure efficient conveyance of water. The Department's drainage system receives urban runoff and drainage throughout the year, and stormwater runoff during wet months.

In areas where the Department manages aquatic weeds, urban runoff flows into underground pipes that discharge into drainage channels and/or detention basins. In some locations, urban runoff discharges from underground pipes directly into creeks. The Department maintains hydrologic control of the system by operating pumps on an "as-needed" basis, or when water reaches the elevation where a pump is activated.

Element B: Description of Weeds

Weeds found in the drainage system include emergent, floating, and submerged aquatic vegetation and algae. Vegetation species recently noted in the system include Eurasian watermilfoil (*Myriophyllum spicatum*), pondweeds (*Potamogeton* spp.), waterprimrose (*Ludwigia* spp.), coontail (*Ceratophyllum demersum*), cattails (*Typha* spp.), bulrush (*Scirpus* spp.), red sesbania (*Sesbania punicea*), duckweed (*Lemna* spp.), mosquitofern (*Azolla* spp.), and filamentous algae. The presence of these weeds and others can adversely impact water flow and capacity in waterways controlled by the Department.

Element C: Discussion of Control Tolerances

Treatment of aquatic vegetation by the Department is determined by the application of Integrated Pest Management (IPM). One of the primary operational goals of the City's IPM program is to establish a general and reasonable set of control measures that not only aid in managing aquatic vegetation populations, but also address public health & safety, economic, legal and aesthetic requirements. An action threshold level is the point at which action should be taken to control aquatic vegetation before the drainage feature is significantly impacted; moreover, established action threshold levels may change based on public expectations. A central feature of IPM is to determine when control action is absolutely necessary and when it is not, for the presence of some aquatic vegetation species may be a sign of a well-balanced, flourishing ecosystem. Examples of when or how thresholds are met are when vegetation impedes flow, decreases capacity, or creates a nuisance. Typical problems associated with aquatic vegetation or algae blooms are adversely impact water quality or a reduction in the Department's flood control capabilities. If vegetation or algae equals or exceeds a threshold, a control method is implemented. Control methods may include mechanical, cultural controls, biological, and/or chemical, consistent with the Department's IPM techniques. Chemical control may or may not be used as a last resort control method, and is considered a very important part of the IPM program. For some aquatic weed varieties, herbicides offer the most effective (i.e. long-lasting or least labor intensive) control; sometimes, they may be the only control available.

Aquatic herbicide applications may also be made prior to threshold exceedance. For example, based on predicted growth rate and density, historical weed trends, weather, water availability, and experience, weeds or algae may reasonably be predicted to cause future problems. Accordingly, they may be treated soon after emergence or when appropriate based on the herbicide to be used. Even though weeds may not be an immediate problem at this phase, treating them before they mature reduces the amount of aquatic herbicide needed because the younger weeds are more susceptible and there is less plant mass to target. Furthermore, treating aquatic weeds and algae within the ideal time frame of its growth cycle ensures that the selected control measures will be most effective. Managing aquatic weed populations before they produce seeds, tubers or other reproductive organs is an important step in a comprehensive weed control program. Generally, treating weeds earlier in the growth cycle results in less mechanical controls needed and less total herbicide used. Selection of appropriate aquatic herbicide(s) and rate of application is done based on the identification of the weed, its growth state and the appearance of that weed on the product label as a plant it controls.

Element D: Discussion of Factors Influencing Aquatic Pesticide Use

The selection of and decision to use an aquatic herbicide is based on the recommendation of a California Department of Pesticide Regulation (CDPR)-licensed Pest Control Advisor (PCA). The PCA considers a variety of control options that may include mechanical and/or cultural techniques that alone or in combination with chemical controls are the most efficacious and protective of the environment.

Evaluating alternative control techniques is part of the Department's IPM approach; therefore an alternative treatment may be selected as part of a test program. Alternative control techniques include mechanical removal (i.e. manually, or with an excavator), grazing and/or controlled burns. A more detailed description of each of these is presented in **Element G** of this document.

In general, alternative control techniques are more expensive, labor intensive, not as effective, may cause temporary water quality degradation, and/or further spread aquatic weeds. The equipment and labor required to perform these techniques is not always readily available. This may cause delays in removal leading to increased plant material to remove and increased cost.

Element E: Types of Aquatic Pesticides Used

Table 1 summarizes the products used by the Department.

Table 1: Aquatic Herbicides Available for Use

Herbicide ⁽¹⁾	Method
2,4-D	Backpack sprayer, handgun, or boom sprayer
Diquat Dibromide	Submersed boom, handgun, or boom sprayer
Endothall	Submersed boom, spreader (granules), handgun or boom sprayer
Fluridone	Submersed boom, or spreader
Glyphosate	Backpack sprayer, handgun, or boom sprayer
Imazapyr	Backpack sprayer, handgun, or boom sprayer
Sodium Carbonate Peroxyhydrate	Handgun, boom sprayer (liquid), or spreader (granules)
Triclopyr	Backpack sprayer, handgun, or boom sprayer

⁽¹⁾ Adjuvants are not included in this list and will be selected as appropriate based on herbicide choice.

All applications are made in strict accordance with the product label. For example, an application of fluridone granules to a detention basin will be made with a spreader calibrated to deliver the correct amount of material per acre treated to deliver the desired target concentration.

Using a backpack sprayer, handgun or boom sprayer, applications of glyphosate are made to emergent vegetation working upstream (in flowing water) Spray applications are not made if wind speed exceeds 10 miles per hour (mph) or consistent with label requirements. Applications will also not be made if there is a potential for drift onto desirable vegetation, or if any other adverse conditions exist.

Element F: Description of Application and Treatment Area

Application areas may include any of the detention basins, creeks, canals, pump areas and conveyance systems maintained by the Department. See **Figure 1**.

Element G: Other Control Methods Used

The Department has evaluated the effectiveness of the following techniques as alternatives or supplements to the control of aquatic vegetation:

G.1 Mechanical Removal

Mechanical removal in the drainage system includes hand cutting from shore or while wading, hand-pulling weeds, or use of motor-driven aquatic weed harvesters to pull up and remove vegetation.

Generally, these techniques are very labor intensive per unit acre or length of water treated. Mechanical removal places personnel at risk of general water, boating, slip, trip and fall hazards, drowning, risks the spilling of motor oil and fuel, and can increase air pollution. Blankinship & Associates, Inc. estimates that the cost per area of mechanical removal is significantly higher than the cost of labor, product and equipment of the application of aquatic herbicides. The increased cost of mechanical aquatic weed abatement does not include the cost of the aforementioned risks (pollution abatement, workman's compensation claims, etc.).

In some instances, the use of mechanical techniques may be necessary when the use of aquatic pesticides is not practical, or vegetation is not at an appropriate growth stage. The Department estimates that mechanical removal is 10 to 25 times more expensive than using chemical controls. This additional expense does not include the cost for disposal or for obtaining permits.

Environmental impacts due to the use of mechanical techniques include the creation of water-borne sediment and turbidity due to people and equipment working in the water. This suspended sediment can adversely affect aquatic species by lowering dissolved oxygen and preventing light penetration. Disturbing sediment may cause additional problems including, but not limited to, new areas for weed establishment, division and re-establishment of aquatic weeds, and siltation in the system. Many aquatic plant species the Department hopes to control can be spread through fragmentation, and mechanical control has the potential to increase the distribution of the problem vegetation. The costs for trucking and waste disposal are not included. Waste must be taken to traditional landfills and cannot be taken to green waste disposal due to the concern that redistribution of the material may occur and subsequently result in re-establishment.

Mechanical removal has been, and will continue to be used by the Department, as feasible, to remove vegetation from detention basins and channels. While effective in the short-term, regrowth or reemergence of vegetation is common. Additionally, work crews who had done grubbing and harvesting are no longer allowed near the water due to safety concerns.

G.2 Native Species Establishment

No appropriate submersed aquatic, native plants have been found to establish within waterways, detention basins or channels to out compete weed species and not create similar or other operational problems. As such, aquatic vegetation must be removed or controlled to maintain the weed density tolerances established by the Department.

After the removal of non-native invasive species, the introduction and re-establishment of native species has been successful in some circumstances along the banks or margins of a water body. This technique provides competition for non-desirable species and may reduce the need for weed abatement. Limitations to this approach include availability of suitable native species, availability of labor to plant native species, and irrigate and cultivate until the native plant stand is established, and safe access to banks for work crews. Plant characteristics such as growth patterns and the potential to invade crops must be considered as well as the timing for introduction of native plants. This technique is expensive, takes many years, may be subject to expensive and time-consuming regulatory agency (i.e., California Department of Fish and Game, Corps of Engineers, etc.) approval, and may not be feasible in all areas.

In the north drainage area detention basins, select native species were planted when the basins were constructed. In some cases, they are still present in and around the margins of the basin, but in others, non-native weed species have out-competed them.

G.3 Controlled Burns

This option is most suitable for some types of emergent and terrestrial weeds, and is not appropriate for submerged aquatic vegetation. This option is not a suitable alternative control method for vegetation in the drainage system maintained by the Department due to the potential adverse impact of fires in residential areas. Additionally, no controlled burns allowable within city limits due to air quality concerns.

G.4 Grazing

This option is most suitable for emergent and terrestrial weeds, and is not suitable for submerged aquatic weeds or algae present in the drainage system. Impacts to water quality from animal feces, increases in turbidity, nutrients, and bank erosion, and impacts to desirable species make this option unfeasible in some cases. The cost of hiring grazing animals is also generally more costly than chemical control alternatives. This option is not a suitable alternative control in the detention basins. The urban nature of the drainage system, presence of traffic, and lack of fencing limits where grazing could be implemented within the drainage system. Grazing is not currently a control technique used by the Department, but will be considered as feasible.

G.5 Tilling or Discing

This option is not suitable for the control of aquatic or riparian vegetation because tilling or discing exposes erodible soils. The Department avoids tilling and discing so as not to encourage erosion of banks and sedimentation within its drainage system.

G.6 Habitat Modification

After the removal of non-native terrestrial and emergent invasive species, the introduction and re-establishment of native species has been successful at the waters' edge in some cases. See Section G.2. This technique is intended to provide competition for non-desirable species and reduce the need for weed abatement only around the perimeter of the water bodies (i.e.,

detention basins or channels), but is not possible within the basin. Limitations to this approach include availability of suitable native species, availability of labor to plant native species, and safe access to banks for work crews.

The Department will also consider other habitat modifying techniques appropriate for the individual target areas; for example, dredging, oxygenation or aeration, shading, and bio-manipulation. In areas where sedimentation has significantly impacted the capacity of the water body, dredging can increase the water volume, reduce organic matter generated in the water body, and remove nutrient-containing sediment. Aeration, oxygenation and mixing are methods that can mechanically add oxygen directly to the water, and can result in the reduction of nuisance algae growth.

Shading can reduce unwanted submerged plants and algae which uses inert dyes that are non-toxic to the habitat. Use of inert dyes works on algae and submerged vegetation by limiting their ability to photosynthesize when the dye is present, but is not a long-term solution.

Bio-manipulation utilizes various natural mechanisms that can reduce suspended algae, and involves increasing biological controls in the habitat. The biological controls are typically done by top-down or bottom-up changes to the food-web structure aimed at increasing populations of algae-consuming zooplankton. Bio-manipulation may be more efficient when used in conjunction of other habitat modification methods.

A potential method for the control of submersed aquatic vegetation is the use of weed mats. These mats can be secured to the bottom of the standing water body with soil nails or like devices and provide a physical and sunlight penetration barrier to weeds growing in soil in the bottom of detention basins.

The use of the product called Phoslock[®], active ingredients are lanthanum and bentonite clay, is another tool to be considered to reduce the amount of nutrients available to algae. Adding this product to water will alter the water chemistry by minimizing the available nutrients necessary for algal growth. Once in the water column, this product binds with free reactive phosphorous to form an insoluble mineral that is not bio-available to nuisance aquatic vegetation.

G.7 No Controls

As feasible, this technique is used. For example, consistent with the IPM program used by the Department, a threshold is typically reached prior to treatment. Prior to reaching a threshold, no control is considered.

Element H: Quantity of Product Required

The quantity of aquatic herbicide product required is determined by a PCA that has followed the label directions in making a recommendation. The amount of material used is highly variable and depends on the type, location, and density of weeds, weed area to be treated, temperature and amount of water present in treatment area. All these factors are considered by the PCA prior to making a recommendation for an application.

Element I: Monitoring and Reporting Program (MRP)

The general permit Fact Sheet describes the goals of the MRP as:

- i. Determine compliance with the receiving water limitations and other requirements specified in the General Permit.
- ii. Measure and improve the effectiveness of the APAP.
- iii. Support the development, implementation, and effectiveness of BMPs.
- iv. Assess the chemical, physical, and biological impacts on receiving waters resulting from aquatic herbicide applications.
- v. Assess the overall health and evaluate long-term trends in receiving water quality.
- vi. Demonstrate that water quality of the receiving waters following completion of resource or weed management projects are equivalent to pre-application conditions.
- vii. Identify and characterize aquatic herbicide application projects conducted by the discharger.
- viii. Ensure that projects that are monitored are representative of all herbicides and application methods used by the discharger.

Attachment C of the General Permit provides MRP guidelines that the Department will use to meet the aforementioned goals. The MRP for this APAP is consistent with the above goals.

I.1 Monitoring Procedures

I.1.1 Monitoring Frequency and Site Locations

Visual monitoring will be performed for all applications at all sites and be recorded by the applicator or other present qualified personnel. Records from this monitoring will be kept with the application records of the Department. **Figure 2** is the form used to document this monitoring.

Water quality sampling will be conducted for all applications at 10% of all sites. The number of application sites required can be determined based on the following table:

Number of Application Site(s)	Number of Samples Site(s)
1	1
2-24	2
25-34	3
35-44	4
45-54	5

Sites will be chosen to represent the variations in treatment that occur, including product, target species, conveyance or reservoir type, seasonal, and regional variations. The exact location(s) of sample site(s) will be determined after site scouting and a decision to make an aquatic herbicide application are made per the Department's IPM approach. **Figure 3** is the form used to document sampling.

I.1.2 Determining Sample Locations

Sampling will be performed as described in Attachment C of the general permit and will include background monitoring, event monitoring, and post-event monitoring. Once the Department determines that an herbicide application is needed, the exact locations of sample collection will be determined using guidance presented in **Figure 4**.

Figure 2: Aquatic Herbicide Application Log

Aquatic Herbicide Application Log rev 4.11 Pg. 1/1

****IMPORTANT** To Be Completed EVERY TIME an Aquatic Herbicide Application is Made**

I. GENERAL

Date _____	Location _____	Start Time _____	Stop Time _____
Agency _____		Personnel _____	
Weather _____			
Total Area Treated (Ac or linear ft) _____		Target Weed(s) _____	

If NO applications made this month, check here and list month: _____

II. PESTICIDE & ADJUVANT INFORMATION

Herbicide #1 Used: _____	Rate or Target Concentration: _____	Total Amt Applied _____
Herbicide #2 Used: _____	Rate or Target Concentration: _____	Total Amt Applied _____
Adjuvant #1 Used: _____	Rate or Target Concentration: _____	Total Amt Applied _____
Adjuvant #2 Used: _____	Rate or Target Concentration: _____	Total Amt Applied _____
Method of Application: _____ Application Made With or Against water flow (Circle One)		

III. TREATED WATERBODY INFORMATION

Waterbody type (Circle One: lined canal, unlined canal, creek, drain, ditch, reservoir, lake, pond) Other: _____	
Water flow (ft/sec, cfs) _____	Water Depth (ft): _____ Water temperature (F): _____
Percent weed cover _____	Sheen: (circle one) yes no
Color: (circle one) none brown green other: _____	Clarity (circle one) poor fair good
Other Information: _____	

IV. POST TREATMENT EFFICACY & IMPACT

Describe post treatment efficacy (circle one) poor fair good Describe any impacts to water quality (circle one) none some significant If other than "none", describe: _____
--

V. GATES, WEIRS, CHECKS OR OTHER CONTROL STRUCTURES (ONLY FILL OUT IF APPLICABLE)

A. Are there any gates or control structures in the treatment area that may discharge to streams, rivers, lakes, or other natural waterways?	Yes	No	N/A
(If the answer to question A is Yes then answer questions B-F the Table below, otherwise leave blank)			
<u>Before Application</u>			
B. Have flow control structures been closed & sealed to prevent aquatic pesticide from discharging to natural waterways?	Yes	No	
C. Have necessary flow control structures been inspected for leaks?	Yes	No	
D. If leaks were found, were they sealed or otherwise prevented from allowing water to discharge to natural waterways prior to application?	Yes	No	
<u>During Application</u>			
E. Were necessary flow control structures inspected for leaks?	Yes	No	
F. If leaks developed, was the application stopped until the leak could be sealed or prevented from allowing water to discharge to natural waterways?	Yes	No	
If the answer of any of the above questions is No, explain: _____			
Gate	Time Closed	Time Opened	How was time opened determined:

VI. CERTIFICATION

I _____ (print name) certify that the APAP has been followed (sign here): X _____

**Figure 3a – Aquatic Herbicide Field Monitoring & Sampling Form
(Moving Water) Page 1 of 2**

Aquatic Herbicide Field Monitoring & Sampling Form – Moving Water

rev 4.11 Pg 1/2

****IMPORTANT** Attach Relevant Aquatic Herbicide Application Log (AHAL) Form**

Client Name: _____

<p>SAMPLE #1: Background (BG) Collect upstream of, or in, treatment area before treatment</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Draw Sample Location and include identifiable points of reference</p> <p style="text-align: center;">N ↑ Scale: 1"~ _____</p> </div>	<p>Sampler Name: _____</p> <p>Date/Time: _____</p> <p>Herbicide Applied (Surfactants?): _____</p> <p>Approximate Water Speed (ft/sec): _____</p> <p>Sample Waypoint #: _____</p> <p>Application Start Waypoint#: _____</p> <p>Target Weeds: _____</p> <p>Site Description: _____</p> <p>_____</p> <p>DO (mg/L): _____ EC (mmho/cm) _____</p> <p>pH: _____ Turbidity (NTU): _____</p> <p>Temp (*C): _____</p>
--	--

<p>SAMPLE # 2: Downstream INITIAL (DS-Int) Collect downstream of treatment area while treated water is present</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Draw Sample Location and include identifiable points of reference</p> <p style="text-align: center;">N ↑ Scale: 1"~ _____</p> </div>	<p>Sampler Name: _____</p> <p>Date: _____ Time: _____</p> <p>Sample Way Pt#: _____</p> <p>Application End WP#: _____</p> <p>Distance from Treatment Area Boundary (ft): _____</p> <p>Approximate Water Speed (ft/sec): _____</p> <p>Length of Treated Area (ft): _____</p> <p>Application Start/End Time: _____</p> <p>Application made with or against water flow? (Circle One)</p> <p>DO (mg/L): _____ EC (mmho/cm) _____</p> <p>pH: _____ Turbidity (NTU): _____</p> <p>Temp (*C): _____</p>
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**Figure 3a – Aquatic Herbicide Field Monitoring & Sampling Form
(Moving Water) Page 2 of 2**

I.1.2.2 Moving Water

BG: In moving water, the background sample (BG) is collected at near the upstream end of the area where treatment begins. This will provide a background sample useful in assessing pretreatment conditions.

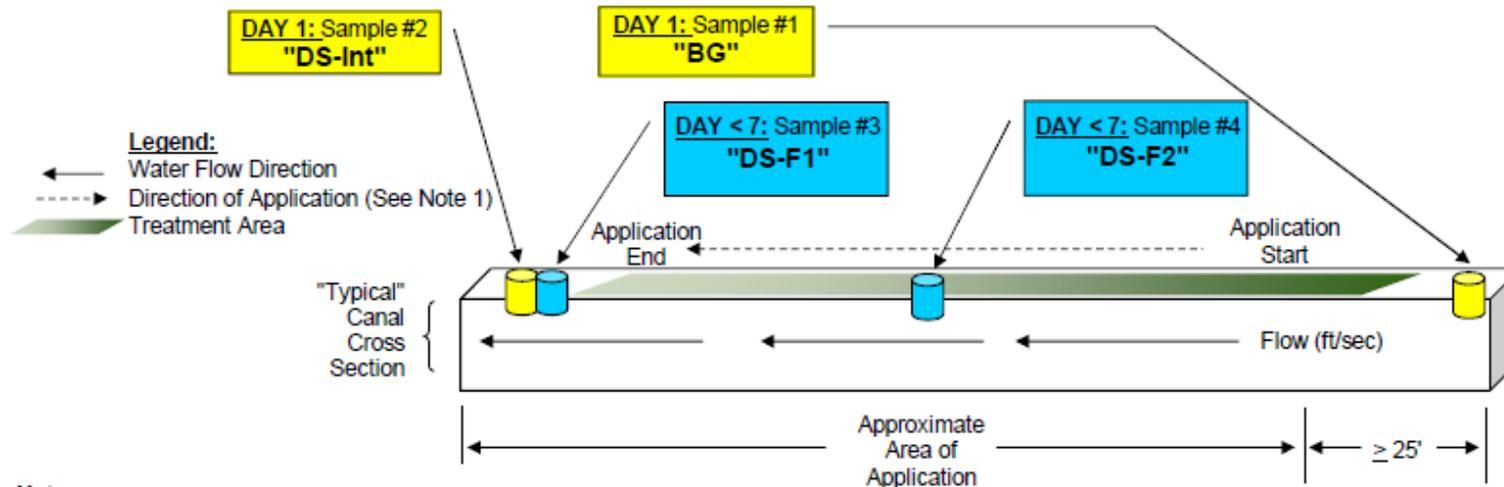
DS-Int: The downstream initial sample (DS-Int) is collected at or near the end of the treatment area immediately after an aquatic pesticide application when treated water is predicted to reach the sample site. The rationale for this location is that it assesses the downstream pesticide concentration after some degree of uptake, dilution, and degradation occurs. The timing for the collection of this sample will be a site-specific estimation based on flow rates and length of the application area. Refer to **Figure 3b** for detail. Field Duplicate and Field Blank samples will be collected at this site.

DS-F1: The first post application event sample collected is downstream final sample (DS-F1). The DS-F1 sample is collected at the same location as DS-Int within one (1) week after treatment. The sample timing generally allows assessment of additional uptake, dilution, and degradation of the pesticide outside of the treatment area.

DS-F2: The second post application event sample is downstream final sample (DS-F2). This sample is collected anywhere within the treatment area. As with DS-F1, this sample is collected within one (1) week after aquatic pesticide application. This will allow assessment of additional uptake, dilution, and degradation of the pesticide in the treatment area. This sample is collected at the same time as the DS-F1 sample.

One full set of four samples (i.e., BG, DS-Int, DS-F1, and DS-F2) will be collected during each treatment from the site(s) representing 10 % of all sites treated within the District. Additionally, one Field Duplicate (FD) and one Field Blank (FB) will be collected and submitted for analysis for each analyte, once per year. The FD and FB samples will be collected at the DS-Int site immediately after application. See **Figure 3a** for the field sampling forms to be used.

Figure 3b – Moving Water Sampling Schematic



Notes:

1.) Application start and end locations may vary depending on application technique and/or aquatic herbicide used.

Stream Sample Instructions Steps 1-5:

1.) Estimate stream flow estimated by averaging flow meter measurement (ft/sec) at center and edge of stream. Alternatively, estimate the time a floating object travels a known distance.

Day 1 Sampling

2.) Sample #1. Collect Background surfacewater sample (BG) at least 25 feet upstream of point of last application. Sample area consistent with area treated (i.e., if bank treated, sample close to bank)

3.) Sample #2. Collect Initial Downstream Sample (DS-Int) at or near the end of the conveyance approximately "X" minutes after the time that the end point of application is reached where:

$$X \text{ (min)} = \frac{\text{Distance Between Application Start and End of Conveyance (ft)}}{\text{Flow Rate (ft/sec)} \times 60}$$

Day < 7 Sampling

4.) Sample #3. Collect Final Downstream Sample (DS-F1) at same location as DS-Int Sample within 7 days of treatment completion.

5.) Sample #4. Collect Post-Event Downstream Treatment Sample (DS-F2) at a location in the treatment area within 7 days of treatment completion.

**Figure 4a – Aquatic Herbicide Field Monitoring & Sampling Form
(Static Water) Page 1 of 2**

Aquatic Herbicide Field Monitoring & Sampling Form – Static Water rev 4.11
Pg 1/2

****IMPORTANT** Attach Relevant Aquatic Herbicide Application Log (AHAL) Form**

Client Name: _____

<p>SAMPLE #1: Background (BG) Collect inside the treatment area < 24 hours before treatment</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Draw Sample Location and include identifiable points of reference</p> <p align="center">↑ N Scale: 1"~_____</p> </div>	<p>Sampler Name: _____</p> <p>Date: _____ Time: _____</p> <p>Herbicide Applied (Surfactants?): _____ _____</p> <p>Sample Waypoint # or ID: _____</p> <p>Target Weeds: _____</p> <p>Site Description: _____ _____</p> <p>DO (mg/L): _____ EC (mmho/cm): _____</p> <p>pH: _____ Turbidity (NTU): _____</p> <p>Temp (°C): _____</p>
--	--

<p>SAMPLE # 2: Adjacent to Treatment Area (ATA1) Collect adjacent to the treatment area following herbicide application only when sufficient time has elapsed for the herbicide to disperse and move out of treatment area.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Draw Sample Location and include identifiable points of reference</p> <p align="center">↑ N Scale: 1"~_____</p> </div>	<p>Date: _____ Time: _____</p> <p>Application Start/End Time: _____ // _____</p> <p>Sample Waypoint # or ID: _____</p> <p>Distance from Treatment Area Boundary (ft): _____</p> <p>Site Description: _____ _____</p> <p>Approximate Water Speed (ft/sec): _____</p> <p>Size of Treated Area (ft² or Ac): _____</p> <p>DO (mg/L): _____ EC (mmho/cm): _____</p> <p>pH: _____ Turbidity (NTU): _____</p> <p>Temp (°C): _____</p>
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Figure 4a – Aquatic Herbicide Field Monitoring & Sampling Form

(Static Water) Page 2 of 2

Aquatic Herbicide Field Monitoring & Sampling Form – Static Water

rev 5.11
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SAMPLE # 3: Adjacent to Treatment Area (ATA2)
 Collect at the same location as ATA1 within 1 week of application.

Sampler Name: _____

Date: _____ Time: _____

Approximate Water Speed (ft/sec): _____

DO (mg/L): _____ EC (mmho/cm): _____

pH: _____ Turbidity (NTU): _____

Temp (°C): _____

SAMPLE # 4: Treatment Area (TA)
 Collect at the same location as the BG within 1 week of application.

Date: _____ Time: _____

Approximate Water Speed (ft/sec): _____

DO (mg/L): _____ EC (mmho/cm): _____

pH: _____ Turbidity (NTU): _____

Temp (°C): _____

Date Field Blank Collected: _____

Date Field Duplicate Collected: _____

	Date and Time Samples, COC and Cooler shipped to lab	Method of Shipment
BG		
ATA 1		
ATA 2		
TA		
	NOTE: Attach Chain of Custody	

I.1.2.1 Static Water (Lake, Basin or Pond) Sampling

Background (BG): The Background sample (BG) is collected inside the treatment area within 24 hours prior to the start of treatment.

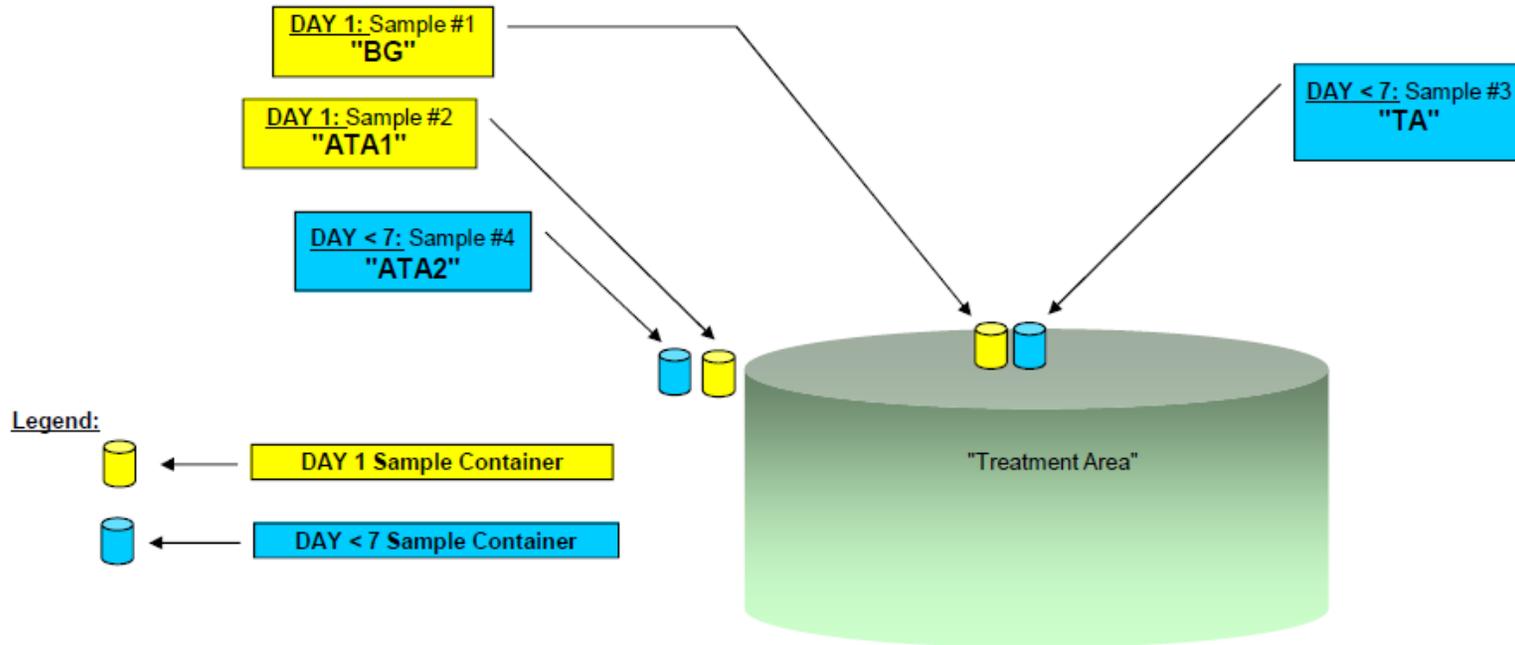
Adjacent Treatment Area-1 (ATA1): The Adjacent Treatment Area sample (ATA1) is collected adjacent to the treatment area immediately following the application. The treatment area is the area that is treated by the aquatic herbicide to control weeds. Refer to **Figure 4b** for detail. Field Duplicate and Field Blank samples will be collected at this site.

Adjacent Treatment Area-2 (ATA2): The first post-event sample is collected at the same location as the ATA1 sample within one (1) week after the herbicide application. The Adjacent Treatment Area 2 sample (ATA2) will be collected at the same time as the TA sample. This will allow assessment of additional uptake, dilution, and degradation of the herbicide in the treatment area.

Treatment Area (TA): The second post-event sample is the treatment area sample (TA). It will be collected at the same location as the BG sample, within one (1) week after the application was made.

One full set of four samples (i.e., BG, ATA1, TA, and ATA2) will be collected during each treatment from the predetermined sites. Additionally, one Field Duplicate (FD) and one Field Blank (FB) will be collected and submitted for analysis for each analyte, once per year. The FD and FB samples will be collected at the ATA1 site immediately after application. See **Figure 4a** for the field sampling form to be used.

Figure 4b – Static Water Sampling Schematic



Notes:

Day 1 Sampling

Sample #1. Collect Background sample (BG) before treatment inside the area to be treated.

Sample #2. Collect Adjacent to the Treatment Area (ATA1) sample adjacent and outside of the treatment area immediately after application.

Day < 7 Sampling

Sample #3. Collect Adjacent to the Treatment Area (ATA2) sample at the same location as ATA1 within 7 days of application completion.

Sample #4. Collect Treatment Area (TA) sample at the same location as the BG within 7 days of application completion.

I.1.3 Sample Collection

If the water depth is 6 feet or greater the sample will be collected at a depth of 3 feet. If the water depth is less than 6 feet the sample will be collected at the approximate mid-depth. As necessary, an intermediary sampling device (e.g., Van-Dorn style sampler or long-handled sampling pole) will be used for locations that are difficult to access. Long-handled sampling poles with attached sampling container will be inverted before being lowered into the water to the desired sample depth, where it will be turned upright to collect the sample. Appropriate cleaning technique is discussed in section I.3.3.3.

I.1.4 Field Measurements

In conjunction with sample collection, temperature will be measured in the field. Turbidity, electrical conductivity/ salinity, pH, and dissolved oxygen may be measured in the field using field meters as available, or analyzed in the laboratory. Turbidity meters are calibrated according to manufacturer's specifications to a standard curve at the beginning of the year, and checked with a standard prior to each use. Conductivity meters are calibrated by the manufacturer and will be checked according to manufacturer's specifications with standards throughout the year (typically once per month) to evaluate instrument performance. If the calibration drifts outside the manufacturer's specifications, the conductivity probe will be recalibrated. Calibration logs are maintained for all instruments to document calibration.

I.1.5 Sample Preservation and Transportation

If preservation is required for the monitored constituent, the preservative will be placed in the sample container by the container vendor prior to sample collection. Once a sample is collected and labeled it will immediately be placed in a dark, cold (~4° C) environment, typically a cooler with ice. Delivery to the laboratory should occur on the same day or the next day as the sample collection.

I.1.6 Sample Analysis

Table 2 shows the constituents that each sample must be analyzed for.

Table 2: Required Sample Analysis

Analyte	EPA Method	Reporting Limit	Hold Time (Days)	Container	Chemical Preservative
Temperature ¹	N/A	N/A	N/A	N/A	N/A
Turbidity ²	180.1	0.00 NTU	2	100 mL HDPE	None
Electrical Conductivity ²	120.1	0 µS/cm	28	100 mL HDPE	None
*2,4-D ²	8151, 8150A, 615	0.5 µg/L	7	1L Amber Glass	None
*Copper (total)	200.7, 200.8	0.5 µg/L	180	250 mL HDPE	pH<2 w/ HNO ₃
*Diquat	549	40 µg/L	7	500 mL Amber HDPE	H ₂ SO ₄
*Endothall	548.1	40 µg/L	7	2x40 mL VOA	HCl
*Fluridone	SePro FasTest	1 µg/L	7	30 ml Amber HDPE	None
*Glyphosate ²	547	0.5 µg/L	14	2 x 40 mL VOA	None
*Triclopyr	8151-modified	1.0 µg/L	7	1L Amber Glass	None
Nonylphenol ³	EPA 550.1m	0.5 µg/L	7	2 x 40 mL VOA	None
pH ²	150.1 or 150.2	1-14	Immediately	100 mL HDPE	None
Dissolved Oxygen ²	360.1 or 360.2	0.0 mg/L	1	1L Amber Glass	None
Hardness ⁴	200.7	1.0 mg/L	1	250 mL HDPE	None

* Signifies active ingredient (herbicide). Chemical analysis is only required for the active ingredient(s) used in treatment.

EPA Methods are taken from NEMI 2004.

¹Must be field measured.

²May be field or laboratory measured.

³Required only when a non-ionic surfactant is used.

⁴Required for copper applications only.

I.2 Reporting Procedures

An annual report for each reporting period, from January 1 to December 31 will be prepared and submitted by March 1 of the following year. The annual report will be submitted to the Central Valley RWQCB. In years when no aquatic herbicides are used, a letter stating no applications will be sent to the RWQCB in lieu of an annual report.

The annual report will contain the following information as described in Attachment C of the general permit:

- a. An Executive Summary discussing General Permit compliance or violation and the effectiveness of the APAP to reduce or prevent the discharge of pollutants associated with aquatic herbicide applications.
- b. A summary of monitoring data, including the identification of water quality improvements or degradation, and recommendations for improvement to the APAP (including proposed BMPs) based on the monitoring results. All receiving water monitoring data shall be compared to applicable water quality standards.
- c. Identification of BMPs and a discussion of their effectiveness in meeting the 2004 General Permit requirements.
- d. A discussion of BMP modifications addressing violations of the 2004 General Permit.
- e. A map showing the location of each application and treatment area.
- f. Types and amounts of aquatic herbicides used at each application event during each application.
- g. Information on surface area and/or volume of treatment area and any other information used to calculate dosage and quantity of each herbicide used.
- h. List of gates in the treatment area that may discharge to surface waters; time of gate closure and reopening, include any calculations used to determine closure and reopening times, if applicable.
- i. Sampling results for all required monitoring under section B of the 2004 General Permit MRP and any additional sampling conducted in compliance with section A.2 of the 2004 General Permit MRP. Sampling results shall indicate the name of the sampling agency or organization, detailed sampling location information (including latitude and longitude or township/range/section if available), detailed map or description of each sampling site (i.e. address, cross roads, etc.), collection date, name of constituent/parameter and its

concentration detected, minimum levels, method detection limits for each constituent analysis, name or description of water body sampled, and a comparison with applicable water quality standards, description of analytical QA/QC plan. Sampling results shall be tabulated so that they are readily discernable.

- j. Recommendations to improve the monitoring program, BMPs, and APAP to ascertain compliance with this General Permit.
- k. Proposed changes to the APAP and monitoring program as appropriate.

I.3 MRP Quality Assurance Plan (QAP)

I.3.1 Purpose

The purpose of this section is to present guidelines for the collection and analysis of samples necessary to meet the APAP objective of assessing adverse impacts, if any, to beneficial uses of water bodies treated with aquatic herbicides.

This section describes the techniques, equipment, analytical methods, and quality assurance and quality control procedures for sample collection and analysis. Guidance for the preparation of this chapter included: NPDES Storm Water Sampling Guidance Document (USEPA 1992); Guidelines and Specifications for Preparing Quality Assurance Project Plans (USEPA 1980); and U.S. Geological Survey, National Field Manual for the Collection of Water Quality Data (USGS 1995).

I.3.2 APAP Contact

William Roberts of the City of Sacramento, Department of Utilities is the contact for this project. Mr. Roberts can be reached at (916) 808-6955, and will be responsible for receiving, reviewing, and providing feedback on project reports to the RWQCB. Michael Blankinship and Stephen Burkholder of Blankinship & Associates, Inc. are the environmental consultants responsible for permit compliance documentation. They can be reached at (530) 757-0941.

I.3.3 Surfacewater Sampling Techniques

If the water depth is 6 feet or greater the sample will be collected at a depth of 3 feet, if the water depth is less than 6 feet the sample will be collected at the approximate mid-depth. As necessary, an intermediary sampling device (e.g., Van-Dorn style sampler or long-handled sampling pole) will be used for locations that are difficult to access. Long-handled sampling poles with attached sampling container will be inverted before being lowered into the water to the desired sample depth, where it will be turned upright to collect the sample. Appropriate cleaning technique is discussed in section I.3.3.3.

During collection, the samples will be collected in a manner that minimizes the amount of suspended sediment and debris in the sample. Surface water grab samples will be collected directly by the sample container, or by an intermediary container in the event that the sample container cannot be adequately or safely used. Intermediary samplers will be either poly (plastic/HDPE), stainless steel or glass. Stainless steel and glass containers will be washed thoroughly and triple rinsed before collection of the next sample. Alternatively, disposable poly or glass intermediary sample containers can be used.

I.3.3.1 Sample Containers

Clean, empty sample containers with caps will be supplied in protective cardboard cartons or ice chests by the primary laboratory. The containers will be certified clean by either the laboratory or the container supplier. To ensure data quality control, the sampler will utilize the appropriate sample container as specified by the laboratory for each sample type. Sample container type, holding time, and appropriate preservatives are listed in **Table 2**. Each container will be affixed with a label indicating a discrete sample number for each sample location. The label will also indicate the date and time of sampling and the sampler's name.

I.3.3.2 Sample Preservation

Samples will be collected with bottles containing the correct preservative(s), refrigerated at four (4) degrees Celsius (C), stored in a dark place, and transported to the analytical laboratory. Preservatives shall be added to sampling bottles before sampling occurs by the laboratory supplying the containers and performing the analysis. Refer to **Table 2**.

1.3.3.3 Sampling Equipment Cleaning

In the event that sampling equipment will be used in more than one location, the equipment will be thoroughly cleaned with a non-phosphate cleaner, triple-rinsed with distilled water, and then rinsed once with the water being sampled prior to its first use at a new sample collection location.

1.3.3.4 Sample Packing and Shipping

All samples are to be packed and transported the day the samples are collected to provide ample time for samples to be analyzed within the required holding time.

Ice will be included in coolers containing samples that require temperature control. Samples will be packaged in the following manner:

1. Sample container stickers will be checked for secure attachment to each sample container.
2. The sample containers will be placed in the lined cooler. Bubble-wrap, suitable foam padding, or newspaper will be placed between sample containers to protect the sample containers from breakage during shipment and handling.
3. The Chain of Custody (COC) will be placed inside a plastic bag and placed inside the cooler. The COC will indicate each unique sample identification name, time and place of sample collection, the sample collector, the required analysis, turn-around-time, and location to which data will be reported.
4. The cooler will then be readied for pick-up by a courier or delivered directly to the laboratory.

I.3.4 Field Sampling Operations

I.3.4.1 Field Logbook

A bound logbook will be maintained by members of the sampling team to provide a record of sample location, significant events, observations, and measurements taken during sampling. Entries will be signed and dated. Field data will be recorded with permanent ink. Field logbooks are intended to provide sufficient data and observations to enable project team members to reconstruct events that occurred during the sampling. The field logbook entries will be legible, factual, detailed, and objective. See **Figure 3** for the forms to be used to record relevant field data.

I.3.4.2 Alteration of Sampling Techniques

It is possible that actual field conditions may require a modification of the procedures outlined herein. Specifically, water levels, weather, other environmental parameters and hazards including stream flow, rainfall, and irrigation water use may pose access and/or sampling problems. In such instances, variations from standard procedures and planned sampling locations and frequencies will be documented by means of appropriate entry into the field logbook.

I.3.4.3 Flow Estimation

A flow meter calibrated according to the manufacturer's directions will be placed as close to the center of the stream or creek as possible and a reading taken in feet per second (ft/sec). Alternatively, the time a common floating object (branch, leaf, etc.) travels a known distance will be estimated and represented in ft/sec. A minimum distance of approximately 25 feet will be used. Flow estimation measurements will be made for all moving water sampling locations.

I.3.4.4 Chain-of-Custody (COC)

The COC record will be employed as physical evidence of sample custody. The sampler will complete a COC record to accompany each sample shipment from the field to the laboratory. The COC will specify: time, date, location of sample collection, specific and unique sample number, requested analysis, sampler name, required turn-around-time, time and date of sample transaction between field and laboratory staff, preservative, if any, and name of receiving party at the laboratory.

Corrections to the COC will be made by drawing a line through, initialing, and dating the error, and entering the correct information. Erasures are not permitted.

Upon receipt of the samples, laboratory personnel will check to insure that the contents of the ice chest(s) are accurately described by the COC. Upon verification of the number and type of samples and the requested analysis, a laboratory representative will sign the COC, indicating receipt of the samples.

The COC record form will be completed in duplicate. Upon sample delivery, the original copy will be left with the laboratory and a copy will be kept by the sampler, three-hole punched, and placed in the field logbook.

1.3.4.5 Sample Label

The sample label should resemble the example provided below. The label will contain information on the specific project (i.e. City of Sacramento, Department of Utilities APAP), the unique individual sample ID (i.e. Basin 1 – BG), the date and time the sample was collected, and the name of the sampler (i.e. S. Burkholder).

Prior to sampling, a water resistant label will be completed with waterproof ink and will be affixed to the appropriate container.

1.3.4.6 Corrections to Documentation

Documents will not be destroyed or thrown away, even if they are illegible or contain inaccuracies that require a replacement or correction. If an error is made on a document used by an individual, that individual will make corrections by making a line through the error and entering the correct information. The erroneous information will not be obliterated. Corrections will be initialed and dated.

I.3.4.7 Document Control

A central file location will be established and used to store documentation such as the filed logbook and laboratory data. A binder kept in a known location in the Department office is an ideal place.

I.3.4.8 Sample Kit

Prior to departing to the field to collect samples, the following equipment will be prepared for use:

- Laboratory-supplied sampling bottles (one set for each sample to be collected plus spares, plus QA/QC samples)
- Sample labels (one for each sample to be collected plus spares)
- Sharpie® Pen or other permanent, water-proof ink marker
- Chain of Custody forms
- Field data logbook
- Flow meter (optional – for moving water applications)
- Zip lock style bags for paperwork
- Non-phosphate cleaner (i.e. Liqui-Nox®)
- Deionized or distilled water
- Ice or blue ice packs
- Clear Mailing Tape
- Plastic ice chest(s)
- Grab pole
- Gloves
- Rubber boots
- Stop or wrist watch
- Camera

I.3.5 Quality Assurance and Quality Control (QA/QC)

The purpose of quality assurance and quality control (QA/QC) is to assure and control the quality of data generated during sample collection and analysis as described earlier in this document. Quality assurance and quality control are measured in a variety of ways, as described below.

1.3.5.1 Precision

Precision is a measure of the reproducibility of measurements under a given set of conditions. It is a quantitative measure of the variability of a group of measurements compared to the average value of the group and is expressed as the relative percent difference (RPD). Sources of error in precision (imprecision) can be related to both laboratory and field techniques. Specifically, lack of precision is caused by inconsistencies in instrument setting, measurement and sampling techniques, and record keeping.

Laboratory precision is estimated by generating analytical laboratory matrix spike (MS) and matrix spike duplicate (MSD) sample results and calculating RPD. In general, laboratory RPD values of less than 25% will be considered acceptable.

Field precision is estimated by collecting field duplicates (FDs) in the field and calculating RPD. In general, field RPD values of less than 25% will be considered acceptable. Refer to the discussion of FDs in section 1.3.6.1.

1.3.5.2 Accuracy

Accuracy is a measure of how close data are to their true values and is expressed as percent recovery (%R), which is the difference between the mean and the true value expressed as a percentage of the true value. Sources of error (inaccuracy) are the sampling process, field contamination, preservation, handling, sample matrix effects, sample preparation, analytical techniques, and instrument error.

Laboratory accuracy is estimated using reference standards, matrix spike (MS) and matrix spike duplicates (MSD) samples. Acceptable accuracy is generally between 75 and 125%. Refer to the earlier discussion of MS and MSD.

I.3.5.3 Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid measurements. The completeness objective is that the sufficiently valid data is generated to allow for submittal to the RWQCB. Completeness will be assessed by comparing the number of valid sample results to the number of samples collected. The objective for completeness is $\geq 80\%$.

I.3.5.4 Representativeness

Representativeness refers to a sample or group of samples that reflects the predominant characteristics of the media at the sampling point. The objective in addressing representativeness is to assess whether the information obtained during the sampling and analysis represents the actual site conditions. Permit requirements of sampling each application at 10 % of all sites treated is assumed to meet the representativeness criteria

I.3.6 Field Quality Assurance and Quality Control

I.3.6.1 Field Duplicate

The purpose of a field duplicate (FD) is to quantify the precision, or reproducibility, of the field sampling technique. It involves the duplication of the technique used for a particular field sample collection method and the subsequent comparison of the initial and duplicate values. This comparison is measured as the relative percent difference (RPD). RPD is calculated as follows:

$$\text{RPD} = [(\text{Sample1} - \text{Sample2}) / (\text{Average of Samples 1 and 2})] \times 100$$

An acceptable field RPD value is $\leq 35\%$.

The FD is collected at the same time as the actual field sample and one FD per year will be collected.

1.3.6.2 Field Blank

The purpose of the field blank (FB) is to assure that the field sampling technique, equipment, or equipment cleaning technique or materials do not impart a false positive or negative result during the collection of the sample. A FB will be prepared with distilled water and allowed to come into contact with the sampling device in a manner identical to the actual sample. The only acceptable values for analytes in the FB is less than the detection limit for the compounds of interest, or an expected, previously determined, background value.

The FB will be collected at the same time as the actual field sample and one FB per year will be collected.

A summary of the field and laboratory QA/QC samples being analyzed is presented in **Table 3**.

Table 3: Summary of QA/QC Sample Analysis, Actions, and Validation Criteria

<u>QA/QC Sample</u>	<u>Action Required</u>	QA/QC Parameter	Value Required
		<u>Estimated</u>	<u>For Valid Data</u>
Field			
Field Blank (FB)	Collect in Field	False Negative/Positive	0 or no more than 20% of known Background
Field Duplicate (FD)	" " "	Precision	RPD ≤ 35 %

Laboratory			
Matrix Spike (MS)	Prepared By Lab	Accuracy	75 < % R < 125 %
Matrix Spike Duplicate (MSD)	" " "	Precision	RPD < 25 %
Method Blank (MB)	" " "	False Negative/Positive	0 or no more than 20% of known Background

I.3.7 Laboratory Quality Assurance and Quality Control

Laboratory precision and accuracy will be monitored by a series of laboratory-generated quality control samples. As long as sufficient sample volume is collected and submitted to the laboratory, no additional effort is required by field activities to generate laboratory quality control samples.

Each set of field samples will have associated with it one each from the following set of laboratory quality control samples.

1.3.7.1 Method Blank

The purpose of the method blank (MB) is to assure that the analytical technique does not impart a false positive result during the preparation or analysis of the sample. A method blank will be prepared by the laboratory from high purity distilled or deionized water. The only acceptable values for analytes in the MB are zero or an expected, previously determined, background values.

1.3.7.2 Matrix Spike

The purpose of a matrix spike (MS) is to quantify accuracy and to assure that the analytical technique does not impart a false negative or positive result during the preparation or analysis of the sample. It involves the introduction of the analyte (or an analyte surrogate) of interest into the actual sample matrix and then quantitating it.

The amount detected divided by the amount added to the matrix is expressed as a percent recovery (%R). Acceptable values of %R range from 75% to 125%. Percent recovery is calculated as follows:

$$\%R = [(Spike\ Amount\ Detected - Sample\ Value) / Amount\ Spiked] \times 100$$

10.3.7.3 Matrix Spike Duplicate

The purpose of a matrix spike duplicate (MSD) is to quantify laboratory precision. An acceptable RPD is less than or equal to 25%. The MSD involves duplication of the MS resulting in two data points from which relative percent difference (RPD) is calculated as follows:

$$RPD = [(MS - MSD) / (Average\ of\ MS\ and\ MSD)] \times 100$$

I.3.8 Data Validation

Data validation will use data generated from the analytical laboratory and the field. The criteria for evaluating data are summarized in **Table 3**. References that can be used to assist in data validation include USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA 1994) and USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA 1999).

The purpose of data validation is to ensure that data collected are of sufficient quality for inclusion in reports to the RWQCB. In order to serve this purpose, the following information must be available in order to evaluate data validity:

1. Date of sample collection – required to uniquely identify sample and holding time.
2. Location of samples – required to identify sample.
3. Laboratory QA/QC procedures – required to assess analytical accuracy, precision, and sample integrity. A laboratory QA/QC sample set consists of a MS, a MSD, and a MB. A laboratory QA/QC sample set will be analyzed by the laboratory for each field sample batch. Sufficient sample volume and number will be supplied to the laboratory in order to prepare and evaluate the laboratory QA/QC sample set.
4. Analytical methods – required to assess appropriateness and acceptability of analytical method used.
5. Detection limits – required to assess lower limit of parameter identification.
6. Holding times, preservation, and dates of extraction and analysis – required to assess if a sample was extracted and analyzed within the specified time limits and if a sample was stored at the appropriate temperature.
7. Field QA/QC procedures – required to assess field precision and sample integrity. A field QA/QC sample set consists of FB and FD samples. A field QA/QC sample set will be analyzed by the laboratory for one sampling event per year. Sufficient sample volume and number will be collected in the field and supplied to each laboratory in order to prepare and evaluate the field QA/QC sample set.

I.3.9 Data Qualification

Data collected for compliance with the Permit will be qualified through the Analytical Lab Validation process described in 1.3.8. This process will ensure all data has been thoroughly reviewed and qualified as valid. During the data validation process, data qualifiers will be used to classify sample data. The following qualifiers will be used:

A - Acceptable. The data have satisfied each of the requirements and are quantitatively acceptable (i.e., valid) and will be used in reports.

R - Reject. Data not valid. This qualifier will be used for samples that cannot be uniquely identified by date of collection or sample location or that fail holding time, detection limit requirements, or criteria established in **Table 3**. Invalid data will not be presented in reports submitted to the RWQCB.

I.3.10 Corrective Action

1.3.10.1 Field or Laboratory QA/QC Exceedance

If previously described criteria for valid data are not met, then corrective action as follows will be taken:

1. The laboratory will be asked to check their quality assurance/quality control data and calculations associated with the sample in question. If the error is not found and resolved, then:
 - a. The extracts or the actual samples, which will be saved until the data are validated, will be reanalyzed by the laboratory if they are within holding time limitations. These new results will be compared with the previous results. If the error is not found and resolved, then:

b. If field analytical equipment is used, then calibration records will be reviewed. If the error is not found, then:

c. The sampling procedure and sample preparation will be re-checked and verified. If the procedures appear to be in order and the error is not resolved, then:

d. The data will be deemed invalid and not used.

2. Upon discovery of the source of an error, every attempt will be made to address the cause of the error and remedy the problem.

I.3.11 Data Reporting

The results of sampling and analysis will be summarized to the RWQCB in an Annual Report. The data will be tabulated so that they are readily discernible.

Element J: Leaks and Inspection Schedule

To evaluate the presence of leaks, gates within the treatment area will be inspected prior to and during the application. The Aquatic Herbicide Application Log (AHAL, **Figure 2**) is the form used to document this inspection. If leaks do develop, they will be stopped immediately.

Element K: Section 5.3 Exception Period

The Department may apply for a SIP Section 5.3 Exception for the use of copper in its drainage system. If an exception is granted this section will be amended to include the period as outlined in the required CEQA documentation. The Department will not apply any copper until/unless a SIP Exception is granted. This amendment will be noted in the annual report.

Element L: Description of Implemented BMPs

The Department regularly implements the following Best Management Practices (BMPs) to eliminate or reduce the discharge of pollutants and minimize the areal extent and duration of impacts to water quality. During implementation, the effectiveness of the BMPs are continually evaluated and refined as needed to enhance protection of surface water.

L.1 Site Scouting

Prior to treatment, the Department's PCA and/or qualified staff scout sites to evaluate the extent to which acceptable aquatic weed thresholds have been exceeded. Thresholds are based on maintenance of recreational and aesthetic beneficial uses, complaints from the community, water quality issues and the prevention of odors.

If a location is deemed to have exceeded a threshold, or given weed population is anticipated to exceed a threshold based on site and weather conditions, historic weed growth, or other information, an aquatic herbicide application is considered. If the application can be made without negatively impacting the water quality, then an application is made.

L.2 Consideration of Alternatives to Aquatic Pesticides

If aquatic weed thresholds can be maintained at acceptable levels with efficient use of alternative control techniques, then these techniques will be considered and implemented as feasible. Several alternative aquatic vegetation and algae control techniques were discussed earlier.

L.3 Written Recommendations Prepared by PCA

Prior to application, a PCA licensed by California Department of Pesticide Regulation (DPR) scouts the area to be treated, makes a positive identification of pest(s) present, checks applicable product label(s) for control efficacy, and prepares a written recommendation, including rates of application, and any warnings or conditions that limit the application so that non-target flora and fauna are not adversely impacted. Licensed PCAs must complete continuing education to stay licensed, and therefore are up-to-date on the latest techniques for pest control.

L.4 Applications Made According to Label

All aquatic herbicide applications are made according to the product label in accordance with regulations of the U.S. EPA, CalEPA, DPR, and the local Agricultural Commissioner. The Department regularly monitors updates and amendments to the label so that applications are always in accordance with label directions.

L.5 Applications Made by Qualified Applicator Certificate Holders

Qualified Applicator Certificate/License holders (QAC/QALs) licensed by DPR make applications or supervise applications recommended by the PCA. Licensed applicators have knowledge of proper equipment loading, nozzle selection, calibration, and operation so that spills are minimized, precise application rates are made according to the label, and only target plants are treated. Licensed QAC/QALs must complete continuing education to stay licensed, and therefore are up-to-date on the latest techniques for pest control.

L.6 Use of Adjuvants

As appropriate, the PCA will consider and use adjuvants (surfactants, emulsifiers, pH control agents, drift retardants, etc.) to increase the efficacy of the aquatic herbicide so that the least possible material is used in the most efficient manner possible to control the pest. Adjuvants may also reduce the unintentional movement of aquatic herbicide applications to off-site locations that may have sensitive receptors.

The Department and its PCA is in regular contact with the manufacturer's representatives to gain knowledge and assess new or modified adjuvants that will improve efficacy or further decrease off-target movement.

L.7 Application Restrictions Based on Site Conditions

As needed, the PCA will modify treatment techniques accordingly. For example, wind speed and air temperature have significant impacts on the transport of herbicides. As needed, restrictions or prohibitions are placed on aquatic herbicide applications to prevent impact to non-target sensitive species that may be downwind or downstream of the application area. Other factors considered by the PCA include, but are not limited to day length, existing or anticipated precipitation, current and anticipated water exchange, and water depth and movement.

L.8 Evaluation of Effectiveness

The effectiveness of BMPs will be continuously evaluated during the year, as well as in-depth evaluation at the end of the year. The following data will be used to evaluate BMP effectiveness:

- Results of sampling and analysis as described herein, and
- Feedback from field staff, including efficacy, staff safety and efficiency

After data from surfacewater quality monitoring has been reviewed, if results indicate that a herbicide was present at a time and location that are not protective of water quality, BMPs used in that area will be reevaluated and modified as needed to address potential cause(s) for the presence of the herbicide detection.

Note that the presence of an herbicide does not in and of itself suggest that a beneficial use has been impaired or that water quality has been adversely affected. Criteria used to evaluate protectiveness include, but are not limited to: review of published beneficial uses; actual beneficial uses based on site-specific conditions; location; and numeric criteria, if any, described in the appropriate RWQCB Basin Plan, the 2004 General Permit, or as described in "A Compilation of Water Quality Goals" (CVRWQCB 2004).

Element M: Evaluation of Other Available BMPs

As appropriate, BMPs are identified and demonstrated by reliable sources, and the Department will evaluate them and consider them for implementation. Reliable sources include, for example, the University of California Cooperative Extension (UCCE).

References

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APPENDIX E

Geosyntec Technical Memorandums

Prepared for

City of Sacramento
Engineering Services Division, Department of Utilities
1395 35th Avenue
Sacramento, California 95822

**NORTH NATOMAS STORMWATER
QUALITY EVALUATION REPORT,
TECHNICAL MEMORANDUM NO. 1**

**MONITORING RECOMMENDATIONS FOR
MEASURING SEDIMENT ACCUMULATION
AND QUALITY**

Prepared by

Geosyntec 
consultants

engineers | scientists | innovators

475 14th Street, Suite 400
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Project Number: WW8012

5 September 2006

**North Natomas Stormwater Quality
Evaluation Report
Monitoring Recommendations for Measuring
Sediment Accumulation and Quality
Sacramento, California**

Prepared by

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475 14th Street, Suite 400
Oakland, California 94612

Project Number: WW8012
5 September 2006

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Study Questions

The Scope of Work (May, 2005) contains the following two tasks and associated questions to be addressed.

Task 1 Detention Basin Monitoring Evaluation

Question 1A: What modifications or enhancements of current monitoring conducted in flood control/water quality basins are recommended to determine the treatment performance achieved in these basins, characterize the discharges from the basins, and provide data for lake maintenance, including requirements regarding the frequency of dredging and disposal of sediments?

Question 1B: What are causes of algal blooms in these facilities (e.g., what is role of groundwater pumping, or nutrient loading in urban drainage?), what are potential methods for control of algae and other aquatic plants (e.g., with respect to operation and maintenance), and what monitoring might be conducted to better understand problems and evaluate effectiveness of recommended control methods. Under normal maintenance operations, how can the health of aquatic species be protected?

Question 1C: How do the existing North Natomas Basin Adaptive Management Plans need to be modified to incorporate answers to Questions 1A and 1B, and develop a holistic lake management plan?

Question 1D: What monitoring is recommended to better evaluate the interaction between detention/water quality basins and groundwater; and effects of that interaction on water quality in flood control/water quality basins, and on groundwater quality? (from Task 2)

Task 2 Evaluation of Introduction of Constituents of Concern to Groundwater from Detention Basin

Question 2A: What is the nature of surface/groundwater interactions below the flood control/water quality basins (e.g., effects of groundwater pumping to maintain water levels in basins), and the anticipated effects of those interactions on water quality in the detention/water quality basins and on groundwater quality?

Question 2B: To what extent do regional groundwater issues affect the groundwater conditions in the Natomas Area; for example legacy problems from past land use practices, contribution from upland sources including agriculture and AirPark?

Question 2C: What additional sampling should be conducted to better understand the groundwater surface water interaction and the effects of that interaction on water quality (incorporate into Task 1)?

This memorandum addresses Question 1A and presents our recommendations for monitoring sediment accumulation in the North Natomas Basins, and performing the chemical characterization of sediment to evaluate appropriate disposal options.

The memorandum is one of four memoranda that GeoSyntec will provide on the North Natomas Basins. Technical Memorandum #2 addresses groundwater-surface water interaction in the basins, and recommends additional monitoring to further understand this interaction (Task 2). Technical Memorandum #3 summarizes monitoring results and provides recommendations for modifications to the monitoring program based on our review of existing data. Technical Memorandum #4 addresses basin limnology and makes recommendations regarding lake management.

This memorandum is organized as follows. Section 2 discusses how basins are generally designed for sediment accumulation and provides specific information on the North Natomas basins. Section 3 summarizes guidance on the recommended frequency of sediment removal. Section 4 discusses methods to characterize sediment quality to evaluate appropriate disposal options. Section 5 provides our recommendations for sediment accumulation monitoring and sediment characterization. The references are provided in Section 6.

Designing Basins for Sediment Accumulation

Water quality basins are typically designed with forebays that function as the primary settling area for coarse sediment, trash and debris. Properly designed forebays eliminate or decrease the required maintenance in the main pools, and are designed to facilitate easier and more economic sediment removal than sediment removal from the main pool. The City of Sacramento Department of Utilities Procedures Manual, Section 11.6, Regional Water Quality Control, states “systems providing stormwater quality control measures per Section 6.2 and 6.3 shall incorporate sediment collection areas near the inlet area, where heavy sediment settles out”.

Guidance on water quality basins recommends incorporating a forebay into the basin design, which should be about 10%-25% of the total surface area of the basin (CASQA, 2003; Center for Watershed Protection, 2004; Metropolitan Council, 2001). Another general guide is for the forebay to be designed to accommodate 0.1 inch of runoff from the catchment area (Center for Watershed Protection, 2004). The length-to-width ratio of the forebay should be at least 2:1 to minimize short-circuiting. (Metropolitan Council, 2001).

If a forebay is not incorporated into the design, some design guidance calls for providing additional storage volume (typically designed for 25 years of storage) to collect sediments. For the North Natomas area, where soils, terrain, topography, and development result in relatively low erosion rates, a reasonable assumption is to add 10% to 20% to the water quality design volume for sediment accumulation (ASCE and WEF, 1998; USEPA, 2004). Another common method is to add 1 foot of depth above the design depth for water quality treatment (Minton, 2004).

Table 1 summarizes information on catchment and design aspects of the North Natomas Basins that could affect sediment accumulation and quality. We used the aerial photographs (from USGS) of the basins, which are provided in Attachment 1 and the basin schematics to evaluate the presence of forebays and other primary settling areas. The information in the Adaptive Management Plans (for Basins 1, 2, 3, 4, 7A, and 7B) regarding primary settling areas is generally consistent with the schematics and aerial photos.

A review of the “as-builts” along with the aerial photos, and site visits indicate the following with respect to the incorporation and design of forebays. Basin 7B contains what appears to be an adequately sized forebay that serves the northwest inlet that drains a portion of San Juan Road. Three forebays also have been incorporated into Basin 7A. Basin 4 has a small forebay which is part of an “erosion control pipe discharge structure” that serves the inlet (two 54 inch RCPs) from the upstream flood control structure. The nearby 24 inch storm drain inlet (which is currently instrumented to collect water quality samples) has no forebay. Basin 3 also has a forebay. No other basins appear to have forebays. No analysis of the sizes of the forebays was conducted as part of this work, but in general the forebays appear to be less than the minimum design standard of 10% of the basin area.

TABLE 1: NORTH NATOMAS BASIN DESIGN FOR SEDIMENT ACCUMULATION

BASIN NO.	TYPE OF BASIN	CATCHMENT AREA (ACRES) AND LAND USE	NUMBER OF INLETS	PRIMARY SETTLING AREA(S)	INFORMATION ON SETTLING AREAS FROM THE ADAPTIVE MANAGEMENT PLAN	RECOMMENDED LOCATION FOR MONITORING SEDIMENT ACCUMULATION
1	Combination water quality and flood control basin	1,789 Residential and commercial	>5 Inlets that enter upstream channel 3 inlets to basin	Upstream low flow channel with micropools	The micropools and concrete low flow channel provide the primary structural settling areas in the channel (p. 10). Low flow channel has adequate capacity to hold anticipated sediment load until next maintenance period. Sediment level shall be at least 1 foot (0.3 m) below top of low flow channel (p. 16).	Micropools in low flow channel upstream of basin
2	Combination water quality and flood control	340 Residential, open space	4	Settling area by the outlet pump station	The primary settling area is located at the east end of the basin near the inlet to the pump station (p. 10). Monitor quarterly and remove sediment as needed. Settling areas have adequate capacity to hold anticipated sediment load until next maintenance period. Sediment level shall be at least 1 foot (0.3 m) below outlet elevation (p. 14).	Pool near pump station

BASIN NO.	TYPE OF BASIN	CATCHMENT AREA (ACRES) AND LAND USE	NUMBER OF INLETS	PRIMARY SETTLING AREA(S)	INFORMATION ON SETTLING AREAS FROM THE ADAPTIVE MANAGEMENT PLAN	RECOMMENDED LOCATION FOR MONITORING SEDIMENT ACCUMULATION
3	Wet Pond - Water quality basin with permanent wet pond. Wet Pond is located downstream of separate flood control basin.	473 Residential	1	Forebay by inlet connecting to upstream flood control basin.	The forebay at the base of the inlet is the primary settling area although sediment may settle throughout the pond, and even in the upland areas of the basin in high water events (p. 10) Monitor quarterly and remove sediment as needed. Settling areas have adequate capacity to hold anticipated sediment load until next maintenance period. Sediment level shall be at least 1 foot (0.3 m) below outlet elevation (p. 14).	Forebay
4	Wet Pond – Water quality basin with permanent wet pond. Upstream flood control basin	470 Single-family residential	1	Small forebay by inlet connected (via 2-54 RCPs) to upstream flood control basin.	The forebay at the base of the inlet is the primary settling area although sediment may settle throughout the pond, and even in the upland areas of the basin in high water events. The pond will need to be emptied periodically to allow the removal of accumulated sediment in order to preserve capacity, and to keep the settling function of the forebays operating properly (p. 10). Monitor quarterly and remove sediment as needed. Settling areas have adequate capacity to hold anticipated sediment load until next maintenance period. Sediment level shall be at least 1 foot (0.3 m) below outlet elevation (p. 14).	Micropool in the east portion of basin, in vicinity of inlets to basin.
5	Combination water quality and flood control	488 Residential, commercial,	3	None	No Adaptive Management Plan	In basin proper near inlets

BASIN NO.	TYPE OF BASIN	CATCHMENT AREA (ACRES) AND LAND USE	NUMBER OF INLETS	PRIMARY SETTLING AREA(S)	INFORMATION ON SETTLING AREAS FROM THE ADAPTIVE MANAGEMENT PLAN	RECOMMENDED LOCATION FOR MONITORING SEDIMENT ACCUMULATION
		office				
6A	Combination water quality and flood control	695 Residential	2 inlets to upstream channel, 2 inlets to basin (1 outfall and Deep Channel)	None	No Adaptive Management Plan	In basin proper near inlets
6B	Dry Extended Detention	Not known	2	None	No Adaptive Management Plan	In basin proper near inlets
7A	Combination – permanent pool is contained in low-flow sinuous channel in larger floodplain	492 Residential, commercial, industrial	3	Forebays by each inlet	The forebays at the bases of the inlets are the primary settling areas, although sediment may settle throughout the channels and pools and even in the upland areas of the basin in high water events. The channel and pools need to be emptied periodically to allow the removal of accumulated sediment to preserve capacity and to keep the forebays operating properly (p. 10). Monitor quarterly and remove sediment as needed. Sediment level shall be a least 1 foot (0.3m) below outlet elevation (p. 14).	Forebays

BASIN NO.	TYPE OF BASIN	CATCHMENT AREA (ACRES) AND LAND USE	NUMBER OF INLETS	PRIMARY SETTLING AREA(S)	INFORMATION ON SETTLING AREAS FROM THE ADAPTIVE MANAGEMENT PLAN	RECOMMENDED LOCATION FOR MONITORING SEDIMENT ACCUMULATION
7B	Combination – permanent pool is contained in low-flow sinuous channel in larger floodplain	178 Mixed residential, commercial, agriculture, industrial	4	Forebay by west inlet (for drainage from San Juan Rd) Forebay serves only one inlet	The primary settling area is located just downstream of the western inlet to the basin (p. 10). Monitor quarterly and remove sediment as needed. Settling areas have adequate capacity to hold anticipated sediment load until next maintenance period. Sediment level shall be at least 1 foot (0.3 m) below outlet elevation (p. 14).	Forebay by west inlet
8A	Combination water quality and flood control in residential development (Urban lake)	331 Residential, open space, limited commercial and industrial	8	None	No Adaptive Management Plan	In basin proper near inlets
8C	Combination water quality and flood control in residential development (Urban lake)	416	4	None	No Adaptive Management Plan	In basin proper near inlets
20	Not known	Not known	Not known	None	No Adaptive Management Plan	Inlets
20B	Dry Extended Detention	Not known	Not known	None	No Adaptive Management Plan	Inlets

Summary of Guidance on Frequency of Sediment Removal from Basins

In general, the frequency of sediment removal depends on the sediment deposition rates, and the volumes of either the forebay (if a forebay is provided) or portion of the volume of the main pool (in addition to the water quality treatment volume) set aside for sediment deposition. Accumulation rates of 6 to 13 mm/yr (0.15 to 0.25 in/yr) in ponds have been reported for built out drainages. However, accumulation can be 10 to 100 times greater when construction activities occur in the catchment, especially when effective erosion control practices are not applied (WEF and ASCE, 1998; USEPA, 2004).

The annual volume of sediment that can accumulate in the various basins was estimated using Equation 1 that takes into account the rainfall, catchment area and land use, runoff TSS, trap efficiency, and assumed bulk density of deposited sediments (see Attachment 2 for summary of results). The method neglects the bed load contribution and assumes that there are no other sources of sediment, such as construction activities, being delivered to the ponds.

$$V_{sed} = 1.43 \cdot 10^{-3} \cdot \frac{P_A \cdot R_V \cdot A_C \cdot C_{TSS} \cdot TE}{\rho_{sed}} \quad (1)$$

where:

V_{sed} = average annual volume of bottom sediment deposit [ft³]

P_A = annual runoff producing-precipitation [cm]

R_V = volumetric runoff coefficient

A_C = area of catchment

C_{TSS} = mean annual concentration of total suspended sediments in runoff [mg/L]

TE = trapping efficiency (fraction of TSS retained in pond)

ρ_{sed} = bulk density of sediment [g/cm³]

1.43×10^{-3} = unit conversion from (ac mg cm cm³ g⁻¹ L⁻¹) to ft³.

Application of Equation 1 to the North Natomas Basins (using wet weather TSS influent and effluent data for Basin 7A) indicates that the estimated annual volume of sediment is very small (less than 0.1 %) relative to the volume of the Wet Weather Treatment Pool (Table 5, Attachment 2). This reflects the relatively low rainfall, modest levels of development (in terms of imperviousness), and the relatively large volumes of the basins. These results assume that there is no ongoing development in the drainage areas.

Various references indicate the frequency of sediment removal from the permanent pool of a wet basin ranges from 5 to 25 years (but usually more frequently than once every 25 years) (Metropolitan Council, 2001; Schueler, 2000; USEPA, 2004). Dry extended detention basins typically do not have as much sediment storage capacity as wet basins, and therefore require more frequent maintenance (Metropolitan Council, 2001). The deposition estimates for the North Natomas basins in Attachment 2 suggest that sediment accumulation is much lower than found in the studies above, and that the frequency of sediment removal, based on a criterion of 20% of the water quality volume, is more than 100 years.

For those basins with forebays, guidance indicates that sediment will generally need to be removed from the forebay every 5-7 years, or when the accumulated sediment volume exceeds 10 percent of the basin volume (CASQA, 2003). For those North Natomas Basins that have appropriately designed forebays (e.g., Basins 7A and 7B) the accumulation rates would be much higher than estimated in Attachment 2, and a survey of accumulation in the forebays should be conducted, at least initially.

Evaluation and Disposal of Sediment Removed from Basins

Data from various municipalities that handle dredged sediment from stormwater basins indicate that pond sediments are likely to meet toxicity limits (i.e., are classified as non-hazardous) and can be safely landfilled, used as landfill daily cover, or used as undesignated construction fill material (USEPA, 1999a, 1999b). Onsite disposal is also an option if space is available. Concerns regarding toxicants are more relevant if the catchment area includes commercial and/or industrial land uses, or known hot spots. There may also be visual or olfactory indications of pollution.

Waste is considered hazardous in California if it exhibits one or more of the following four characteristics:

1. Ignitable (Flashpoint < 140°F)
2. Corrosive (aqueous pH < 2 or > 12.5)
3. Reactive (normally unstable, undergoes violent changes without detonating, water reactive)
4. Toxic (see below)

There are both federal and state regulations governing hazardous waste determination in California. In 1990, USEPA promulgated a rule to revise the existing toxicity characteristics used to identify wastes that are hazardous, and therefore subject to regulation under Subtitle "C" of the Resource Conservation and Recovery Act (RCRA). This rule replaced the Extraction Procedure (EP) Toxicity Characteristic with a more comprehensive testing procedure known as the Toxicity Characteristic Leaching Procedure (TCLP) or USEPA Method 1311. The TCLP is designed to determine the mobility of both organic and inorganic chemicals present in liquid, solid, and multiphase wastes.

While California enforces the federal (TCLP) regulations concerning toxicity, it applies an additional set of leaching procedures, and a bioassay, as outlined in Titles 22 and 26 of the California Code of Regulations. The procedures known as the Total Threshold Limit Concentration (TTLC) and Soluble Threshold Limit Concentration (STLC) are intended to simulate conditions that may be present in a landfill where water may pass through the landfilled waste and infiltrate into the groundwater, carrying the soluble constituents with it. The TTLC analysis determines the total concentration of each target analyte in a sample, and is generally performed first. When any target analyte exceeds the TTLC limits, the waste is classified as hazardous, and further testing is not required. If the TTLC limits are not exceeded, the results are used to determine whether the STLC (or Waste Extraction Test, WET) or TCLP procedure is necessary. A TCLP should be run if the TTLC concentration is greater than 1/20 of the TCLP limit; and an STLC should be run if the TTLC concentration is greater than 1/10 of the STLC limit.

The TCLP and STLC analyses both simulate landfill leachate, but the primary differences between the two methods are summarized in Table 2. The STLC analysis is generally considered the more aggressive analysis of the two.

TABLE 2: PRIMARY DIFFERENCES BETWEEN TCLP AND STLC (WET) ANALYSES

TCLP	STLC (WET)
Extraction (leaching) solution is a buffered solution containing sodium hydroxide and acetic acid. Two solutions are used. Solution 1 is for volatile constituents. For non-volatile constituents, the pH of the soil slurry (prior to extraction) determines whether Solution 1 or 2 is used. Solution 1 has a pH of 4.93±0.05. Solution 2 has a pH of 2.88±0.05.	Extraction (leaching) solution is a buffered 0.2M sodium citrate (prepared with sodium hydroxide and citric acid) with a pH of 5.0±0.1.
18-hour extraction	48-hour extraction
8 inorganic constituents; 23 organic constituents	19 inorganic constituents; 18 organic constituents

Table 3 provides the TTLC, STLC and TCLP concentrations for the various inorganic and organic constituents. STLC and TCLP concentrations are generally comparable. The exceptions are trichloroethene (TCE), heptachlor and pentachlorophenol. The STLCs for TCE and heptachlor are much higher than the TCLPs; and the STLC for pentachlorophenol is much lower than the TCLP. This is because state and federal methodologies for determining risk are not always equivalent.

TABLE 3: SUMMARY OF FEDERAL AND CALIFORNIA HAZARDOUS WASTE CRITERIA

CONSTITUENT	TTLIC [MG/KG] [WET WEIGHT]	STLC [MG/L]	TCLP [MG/L]
Metals			
Antimony	500	15	--
Arsenic	500	5.0	5.0
Barium	10,000 (except barium sulfate)	100	100
Beryllium	75	0.75	--
Cadmium	100	1.0	1.0
Chromium	2,500	5	5
Cobalt	8,000	80	--
Copper	2,500	25	--
Lead	1,000	5.0	5.0
Mercury	20	0.2	0.2
Molybdenum	3,500	350	--
Nickel	2,000	20	--
Selenium	100	1.0	1.0
Silver	500	5	5
Thallium	700	7.0	--
Vanadium	2,400	24	--
Zinc	5,000	250	--
Chromium (VI)	500	5	--
Fluoride Salts	18,000	180	--
Volatile Organic Compounds			
Benzene	--	--	0.5
Carbon tetrachloride	--	--	0.5
Chlorobenzene	--	--	100.0
Chloroform	--	--	6.0
1,4-Dichlorobenzene	--	--	7.5
1,2-Dichloroethane	--	--	0.5
1,1-Dichloroethylene	--	--	0.7
Methyl ethyl ketone (MEK)	--	--	200.0
Tetrachloroethylene (PCE)	--	--	0.7
Trichloroethylene (TCE)	2,040	204	0.5
Vinyl chloride			0.2
Chlorinated Herbicides			
2,4-Dichlorophenoxyacetic acid	100	10	10.0
2,4,5-TP (Silvex)	10	1.0	1.0
Organochlorine Pesticides and PCBs			

CONSTITUENT	TTLIC [MG/KG] [WET WEIGHT]	STLC [MG/L]	TCLP [MG/L]
Aldrin	1.4	0.14	--
Chlordane	2.5	0.25	0.03
DDT/DDE/DDD	1.0	0.1	--
Dieldrin	8.0	0.8	--
Endrin	0.2	0.02	0.02
Heptachlor (& its Epoxide)	4.7	0.47	0.008
Kepone	21	2.1	--
Lindane	4.0	0.4	0.4
Methoxychlor	100	10	10
Mirex	21	2.1	--
Toxaphene	5.0	0.5	0.5
Semi-Volatile Organic Compounds			
o-Cresol	--	--	200.0
m-Cresol	--	--	200.0
p-Cresol	--	--	200.0
Cresols (Total)	--	--	200.0
2,4-Dinitrotoluene	--	--	0.13
Hexachlorobenzene	--	--	0.13
Hexachlorobutadiene	--	--	0.5
Hexachloroethane	--	--	3.0
Nitrobenzene	--	--	2.0
Pentachlorophenol	17	1.7	100.0
Pyridine	--	--	5.0
2,4,5-Trichlorophenol	--	--	400.0
2,4,6-Trichlorophenol	--	--	2.0
Miscellaneous Compounds			
Dioxin (2,3,7,8-TCDD)	0.01	0.001	--
Organic Lead Compounds	13	--	--
Asbestos	1%	--	--
Fish Bioassay (Title 22, CCR 66261.24): acute 96-hr LC50 of ≤500 mg/L			

Methods outlined in EPA SW-846 Chapter 9 (USEPA, 1986) should be used to calculate the number of samples required to adequately characterize dredged sediment for disposal. The SW-846 method requires an estimate of the mean concentration and standard deviation of the data for target constituents, which would be difficult to obtain if sediment data are not currently available. Equation 2 is used to determine a representative number of samples:

$$n = \frac{t_{20} s^2}{(RT - \bar{x})^2} \quad (2)$$

where:

- n = number of samples
- \bar{x} = preliminary estimate of the mean concentration
- s = preliminary estimate of the standard deviation of the data
- t_{20} = students t-value obtained from tables (SW-846, Table 9-2)
- RT = regulatory threshold

The San Francisco Bay RWQCB developed guidance on the re-use of soil impacted by petroleum hydrocarbons (SFRWQCB, 2002). The guidance requires a statistical basis to determine the number of samples, but provides alternate guidance as follows:

- Stockpiles < 500 CY: 1 sample per 25 CY (which would be the case for North Natomas basins)
- Stockpiles 500-1,000 CY: 20 samples plus 1 sample per 100 CY over 500 CY
- Stockpiles 1,000-10,000 CY: 25 samples plus 1 sample per 500 CY over 1,000 CY

Sediment stockpile sample locations should be determined using a statistical random sampling approach. Sample locations can be equidistant along a randomly selected transect of the stockpile (through the longest length of the stockpile); the first and last sample locations should be 1 foot or more from the edge of the stockpile. Alternatively, the stockpile can be divided into grid cells with approximately equal areas (the number of grid cells should be equal to the estimated number of samples required); one sample location should be randomly selected within each grid cell.

SW-846 requires determination of the 80% confidence interval of the mean concentration (which assumes that data are normally distributed) for each constituent of concern as follows:

$$CI = \bar{x} \pm t_{20} \frac{s}{\sqrt{n}} \quad (3)$$

- where CI = the confidence interval of the mean
- \bar{x} = calculated mean of the monitoring data
- s = standard deviation of the monitoring data
- n = number of samples
- t_{20} = students t-value obtained from tables (SW-846, Table 9-2).

If the upper limit of the confidence interval is less than the applicable regulatory threshold, the constituent is not considered to be present at a hazardous concentration; otherwise, the opposite conclusion is tentatively reached. If a tentative conclusion of hazard is reached, the total number of samples (n_2) to collect using the new mean and standard deviation should be calculated using Equation 2. If n_2 is smaller than the number of samples used for the original assessment, the stockpiled sediment is characterized as hazardous waste. If n_2 is larger than the number used for the initial assessment, conduct laboratory chemical analysis of an additional ($n_2 - n$) soil samples and recalculate the confidence interval. If an additional ($n_2 - n$) cannot be reasonably collected, a definitive conclusion of hazard is also reached.

Sediments should be dewatered onsite if feasible, as this will reduce the volume of material (and costs) required for transport and disposal. Depending on the evaluation of the analytical results as described above, dredged sediment will need to be disposed at a RCRA-approved facility (if any TCLP criteria are exceeded), at a Class I landfill (if TCLP or STLC criteria are not met), at a Class II or Class III (non-hazardous), or as unclassified fill material. Stormwater sediments from municipal basins are typically classified as non-hazardous. The California Integrated Waste Management Board maintains a Solid Waste Information System (SWIS) database of landfills in the state, which includes landfill acceptance criteria. The SWIS database can be accessed at <http://www.ciwmb.ca.gov/swis/>.

Recommendations for Monitoring Basin Sediment Deposition and Pollutant Accumulation

Sediment Deposition Rates, Monitoring, and Maintenance

Predicted sediment deposition rates for basins without forebays are extremely low, such that the annual volume of deposition is less than 0.1% of the wet weather design treatment volume (Table 5, Attachment 2). These estimates assume that the drainage area is already developed and there is no ongoing construction. (Where basins were subject to runoff from drainage areas under construction, accumulation rates could be much larger.) Predicted deposition rates appear to be so low that, if accurate, the magnitude of deposition might be difficult to measure without actually draining the pond and conducting a level survey to establish a baseline and then conduct an additional survey 10 years or so later.

Several basins have forebays. Sediment deposition in the better designed forebays will be much larger than that for basins without forebays. Basins with what appear to be better designed, albeit somewhat small, forebays include Basins 7A, 7B, and 3. Basin 7A has what appears to be one of the better designed forebays (for the inlet that drains San Juan Road). An inspection of the forebays and measurements of depth with a staff gage, combined with information from the as-builts, should allow one to estimate

deposition in the forebays. Sediment should be removed if the volume of sediment exceeds about 20% of the volume of the forebay, or if the depth of sediments in the forebay is such that sediments might be subject to scour and resuspension.

Pollutant Accumulation Rates, Monitoring, and Maintenance

Because the predicted accumulation of sediments appears to be quite low, the City may wish to consider sampling sediments from the basins to determine if removal should be conducted based on sediment quality (i.e., accumulation of pollutants relative to hazardous concentrations). Such accumulation is caused in part by sediment deposition, but also can be caused by adsorption and uptake in plants and sediments.

The literature indicates that sediments removed from basins where drainages are principally residential and commercial are not classified as hazardous, and we expect the same to be true for the Natomas Basins. The primary characteristic of concern is toxicity due to the potential presence of certain chemical constituents like trace metals and pesticides. (The selection of organics such as pesticides could be informed by the sampling data, depending on the detection levels.)

Due to liability concerns associated with landfill disposal, sediment should be screened according to California hazardous waste criteria. TTLC analyses are recommended initially. Because STLC and TLCP have a 10-fold and 20-fold dilution, respectively, whether these analyses need to be performed can be determined based on the TTLC results, as discussed in Section 4.

Screening level grab or occasional core samples (if there is a sufficient amount of sediment) collected from the forebay or other primary settling area (i.e., near inlets for basins without forebays or the low flow channel) will indicate if sediment concentrations are approaching hazardous levels. The City may wish to consider candidate basins based on age of the basin, drainage land use, and complementary sampling (e.g., Basin 4 is planned for performance monitoring). If initial screening indicates concentrations are significantly below hazardous waste criteria, subsequent analyses could probably be significantly reduced or eliminated.

Grab samples for initial screening should be collected from within 10 feet of basin inlets or from the forebay. Obtaining a representative sample in the basins near the inlets will be more challenging as the depth of the contaminated layer may be quite small, whereas sampling the forebays should allow the use of traditional sediment sampling methods. Sediment collection methods are described by USEPA (2001). From each location, collect 3 to 5 grab samples of surface (up to 6 inches below surface, depending on the anticipated depth of contamination) sediments. The volumes of sediment collected should be sufficient to run all TTLC analyses (and potential STLC and TCLP analyses) and associated QA/QC (e.g., matrix spikes, duplicate samples). The analytical laboratory will provide information on the mass of sediment needed for the analyses. The grab samples from each location

could be composited at the lab for the screening analysis. However, the accurate evaluation of hazardous waste concentrations (per USEPA SW-846), requires comparison of the upper confidence limit of the sample mean to the regulatory target. Consequently, discrete analyses (no compositing) would allow calculation of a sample mean (if there is only one sample location for the basin) and use of the SW-846 evaluation method.

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**NORTH NATOMAS STORMWATER
QUALITY EVALUATION REPORT,
TECHNICAL MEMORANDUM NO. 4**

**LONG-TERM MANAGEMENT OPTIONS FOR THE
NORTH NATOMAS BASINS, SACRAMENTO**

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1. INTRODUCTION

1.1 Algae Problems and Potential Solutions

The City of Sacramento's North Natomas stormwater basins are subject to nuisance algal blooms and excess aquatic plants (e.g., duckweed), and the City wished to better understand the causes of the algae blooms and how to control them in an environmentally holistic manner. A review by Alex Horne Associates of the data analyzed by Geosyntec Consultants in 2006³ indicates that there is an imbalance between the growth of nuisance algae and the two main factors that reduce algae growth; namely zooplankton grazing and competition for nutrients from other photosynthetic organisms. The immediate cause of high algae growth is that nutrient concentrations in the inflows are sometimes too high.

Zooplankton grazing is low due to lack of suitable habitat, predation by small fish, and possible toxicity from the inflows. Competition for nutrients by micro-organisms associated with the periphyton biofilm on submerged aquatic plants is not adequate to reduce even the smaller amounts of nutrients present in some basins due to current management practices and lack of suitable habitat.

Lake managers have developed a list of 17 methods for the management of nuisance algae in lakes and ponds⁴. To meet the long-term goal of utilizing holistic methods, the following five in-lake management methods can be considered. They are listed in descending order of importance.

- Biomanipulation (possibly including limited nutrient harvesting via fish control).
- Lake wetland filtration.
- Oxygenation/aeration/mixing.
- Shading (pond dyes).
- Weed harvesting.

Note that the current use of copper sulfate in Westlake (Basin 8A) and Sundance Lake (Basin 8C), which is a non-holistic method, and perhaps the herbicide Sonar, can be continued until other more sustainable holistic methods are established.

1.2 Recommendations

Different aquatic ecosystems in the North Natomas basins will require different management approaches. For this reason we suggest that the following three approaches be selected for experimental development of the most sustainable, holistic management options.

³ Geosyntec, 2006, Technical Memorandum #3 – Monitoring Data Summary and Monitoring Recommendations

⁴ EPA/NALMS, 1988; Goldman & Horne, 1994; Cooke et al., 2005; McComas, 2003, Horne, 2006

- Classic biomanipulation and/or wetlands filtration in the larger, open water home-lined urban lakes (i.e., Westlake and Sundance Lake).
- Aeration and wetlands filtration for smaller shallow tree-lined ponds (e.g., the central pond in Basin 4).
- Revising the low flow patterns in linear facilities (e.g., the channels and small ponds and wetlands in Basins 7A and 7B).

Wetlands filtration (new wetlands) and aeration require a source of power. Use of wind and/or solar power is more holistic than use of electricity from the grid, although such electricity is readily available at the pump stations. More detail on these recommendations is given at the end of the report.

2. KEY Questions Regarding the North Natomas Detention Ponds

This technical memorandum addresses the following questions:

Question 1B

1. What are the causes of the algal blooms in these facilities (e.g., what is the role of groundwater pumping or nutrient loading in urban drainage)?
2. What are the potential methods for controlling algae and other aquatic plants (e.g., with respect to operation and maintenance)?
3. What monitoring might be conducted to better understand problems and evaluate effectiveness of recommended control methods?
4. Under normal maintenance operations, how can the health of aquatic species be protected?

Question 1C

1. How do the existing North Natomas Basin Adaptive Plans need to be modified to incorporate answers to the above questions, and develop a holistic lake management plan?

2.1 Overview of Water Quality Data

A review of water quality data provided the following general observations:

- Bio-stimulatory nutrients (nitrogen and phosphorus) were present in ample concentrations to grow algae, especially in the open ponds, impacting water quality.⁵ Dissolved oxygen is often too low (<5.0 mg/L) to sustain aquatic life in summer, especially since high water temperatures (as high as 25°C) reduces the saturation concentration of dissolved oxygen.⁶
- Occasional high spikes of nutrients from stormwater and dry weather inflows boost algal growth, unless washed out of the smaller ponds by cleaner water later in the storm.⁷
- In a few samples, ammonia is present at potentially toxic concentrations (e.g., >1 mg/L).⁸

⁵ Geosyntec, 2006, Technical Memo Number 3, Table B-2.

⁶ See Geosyntec, 2006, Technical Memo Number 3, Table B-2 and Appendix C Figures showing profiles for dissolved oxygen.

⁷ See Geosyntec, 2006, Technical Memo Number 3, Tables B-2 and B-3, and Appendix C Figures showing trend analyses for nitrogen and phosphorus species.

- Total dissolved solids (TDS) show an overall general decline between 2000 and 2005.⁹

⁸ See Geosyntec, 2006, Technical Memo Number 3, Table B-2.

⁹ See Geosyntec, 2006, Technical Memo Number 3, Appendix D.

3. Answer to Question 1B (1): What Are the Causes of Algal Blooms?

3.1 Role of Urban Drainage

Urban runoff supplies considerable amounts of nutrients, which cause nuisance algae blooms in several of the basins. Although the data indicate only occasional high-concentration spikes of nutrients, the mass of inflowing nutrients will be retained in the detention basins following smaller storms and dry weather inflows. In larger storms, soluble nutrients could be flushed through the basins, although some uptake may occur during the flushing period. Most of the data collected by the City of Sacramento were collected in dry weather, either during the summer or during the wet season when it was not raining. Therefore, the data generally reflect conditions that occur in the ponds much of the year.

Not all algae blooms are a problem. To simplify the discussion, algae blooms can be divided into undesirable or nuisance blooms, and beneficial blooms. The factors that stimulate and support nuisance algal blooms in the North Natomas basins are more dominant than those natural mechanisms that are likely to reduce or control algal biomass. Frequently, the concentrations of all the potential nutrients (nitrate, ammonia, total phosphorus) in the urban stormwater inflows are so high that algae likely grow at their maximum rate in the sunny conditions between February and November. In contrast, the two natural mechanisms that control algae – zooplankton grazing and competing non-nuisance algae and plants – are not favored by the current physical and biological conditions in the North Natomas basins.

Basin #4 is a shallow open water basin with riparian vegetation. The 470 acre catchment contains single family residences and Northpointe Park. Dry weather nitrate and ammonia concentrations in the basin near the inlet are as high as 20 and 10 mg/L, respectively (Table 1). Most natural levels of these nutrients would be 10 to 100 times lower than these concentrations (<1 mg/L) in winter and even lower in summer. Lower concentrations also were observed in the basin; for example, median concentrations for nitrate and ammonia were 0.1 mg/L, but this likely reflects the uptake of the nutrients by excessive algae growth. Later in the season, these nutrients will be recycled after the algae die and thus contribute to more algae growth in the next year. Also, ammonia at concentrations much above 1 mg/L and less on warm summer days would be toxic to many fish and invertebrates.

TABLE 1: CONCENTRATIONS OF ALGAL STIMULATING NUTRIENTS IN INFLOW AND POND FOR BASIN #4 SHOWING HIGH MAXIMUM AND MODERATELY HIGH MEAN VALUES

CONSTITUENT	CONCENTRATION (mg/L)	
	MAXIMUM	MEAN
Inlet Samples (NN4IN) June 04 – Mar 05		
Nitrate-N	20	0.5
Ammonia-N	10 (one sample only)	0.4
Total Phosphorus (TP)	2.4	0.2
North Side of Basin (NN4A) Sept 99 – Aug 02		
Nitrate-N	0.5	
Ammonia-N	0.1	
Total Phosphorus (TP)	0.1	
	FREQUENT LEVELS	
Dissolved Oxygen	<5 mg/L	
Temperature	20 – 25 °C	

Observations by Alex Horne Associates of Basin 4 in September 2005 indicated large blooms of floating green algae, probably Cladophora (common name is blanket weed). This algae was also common in several other lakes and ponds. These dense algae form when nitrate is high and zooplankton grazing is low, which is consistent with the nutrient data collected by the City of Sacramento. As indicated in Table 1, total phosphorus (TP) concentrations are also occasionally high (2.4 mg/L) relative to a desirable value of 0.01 mg/L. Algae cannot use TP directly and rely on soluble inorganic phosphate. However, most TP can be easily broken down to bioavailable soluble phosphate by algae using the enzyme alkaline phosphatase. Thus, high values of TP translate within hours into bioavailable phosphate.

Similar data were found for other basins (Table 2) although concentrations were generally lower than in Basin 4. However, the concentrations were still often high enough to provide the algae with adequate nutrients and produce blooms.

TABLE 2: SELECTED CONCENTRATIONS OF ALGAL STIMULATING NUTRIENTS IN INFLOW AND POND SAMPLE FOR OTHER BASINS WITH ALGAE PROBLEMS

CONSTITUENT	CONCENTRATION (mg/L)
Basin 5	
Nitrate-N	2
Ammonia-N	9
Basin 6A	

Nitrate-N	6.5
Ammonia-N	0.2 – 0.7
Basin 7A	
Nitrate-N	0.5 – 4.3
Ammonia-N	0.1 – 1.3
Total Phosphorus (TP)	0.1 – 0.6

3.2 Role of Groundwater Pumping

Groundwater is not a major source of high concentrations of nutrients since the larger lakes, which are sustained in the summer by groundwater pumping, are much lower in nutrients. For example, nitrate-N in Westlake (Basin 8A) and Sundance Lake (Basin 8C) is usually around 0.1-0.2 mg/L (Table 3). These urban lakes seem to have less large floating green algae scum than the pond-wetlands-like waters, but do have some nuisance algae problems from suspended algae, as indicated by the elevated concentrations of chlorophyll *a* in Table 3. Chlorophyll *a* is a green algal pigment and is a good measure of the biomass of algae. Since these lakes are treated with copper, floating blooms may be suppressed. However, low water clarity and the associated high chlorophyll *a* concentrations indicate that some source of nutrients is present.

TABLE 3: SELECTED CONCENTRATIONS OF ALGAL STIMULATING NUTRIENTS FOR OTHER BASINS WITH FEWER ALGAE PROBLEMS*

CONSTITUENT	CONCENTRATION (mg/L)	DESIRABLE LEVEL (mg/L)
Basin 8A		
Nitrate-N	0.1 – 0.2	<0.110
Total Phosphorus (TP)	0.05 – 0.25	<0.032
Secchi Depth	1.7 m	>2.0 m
Chlorophyll a	64 µg/L	<10 µg/L
Basin 8C		
Nitrate-N	~0.1	<0.110
Ammonia-N	~0.1	<0.05
Total Phosphate TP	~0.1	<0.032
Secchi Depth	1.2 m	>2.0 m
Chlorophyll a	23 µg/L	<10 µg/L

Note:

*Desirable levels are those generally accepted by the lake management community. See for example Welch & Lindell, 1992; Horne, 1992.

The data were reported as total phosphate. However, it was assumed that since the values were so high, the reported data are for total phosphorus (i.e., following acid digestion) rather than soluble phosphate measured prior to any digestion.

3.3 Role of Grazers (Zooplankton and Benthos)

Lack of high rates of grazing by zooplankton is one of the three main reasons why algae nuisance blooms occur. In terms of achieving the goals of lake management and good water clarity and appearance, grazing is beneficial and zooplankton in particular is to be encouraged. If lakes contained only nutrients and algae, most of them would have nuisance levels of algae by summertime. Factors that regulate the fluctuations of algal biomass in lakes can be expressed as:

$$dC/dt = (dP/dt C) - (G + D + Pa + S) \quad (1)$$

where:

C = algal population, (e.g., as measured by chlorophyll a concentration)

dC/dt = rate of increase or decrease of algal population

dP/dt = rate of algal growth (essentially photosynthesis, P)

G = grazing rate loss of algae by zooplankton, or benthic grazers in shallow lakes

D = natural death loss

Pa = loss by parasitism (usually fungi or phages [viruses that infect bacteria])

S = loss by sinking to the sediments.

Essentially, the dP/dt C term is the source term with photosynthesis directly related to the nutrient concentration. The loss terms (G + D + Pa + S) are factors that may or may not be successfully controlled by the lake manager.

In most lakes and ponds, the dominant losses of algae are via zooplankton grazing (G) and sinking (S). Sinking becomes most important in deep lakes or those shallow lakes with very active benthos. None of the North Natomas ponds are deep, so the control of algae is primarily grazing by large zooplankton and benthic organisms.

Almost all grazers are more sensitive to pollution than plants and algae. The occasional high spikes of ammonia-N (1.0 to 10 mg/L in some North Natomas ponds) will kill or damage grazers. Most of the spikes in ammonia concentrations were observed in inlets during winter dry-weather flows in cool weather. A healthy over-wintering population of some zooplankton (copepods) is vital to preserve stock to reproduce and graze on algae the following summer. The most common and desirable summer grazing zooplankton is large Daphnia that reside in an over-winter resting cyst that is resistant to most pollutants and low oxygen. Ammonia is less toxic in winter since its action is amplified by high temperatures, low dissolved oxygen, and high pH. During summer conditions, the observed ammonia concentrations are much lower than in the winter spikes. So the overall effects of the odd high ammonia spike may be relatively small in the North Natomas ponds. Therefore, high ammonia is not likely to be the main direct cause of the low grazing rates.

Other pollutants such as heavy metals or pesticides can reduce aquatic invertebrates and thus reduce grazing on algae. Pesticides washed out from old or current farmland or from household use, such as termite control, may affect grazing zooplankton. Of the pesticides monitored in Basin 7A during wet and dry weather, diazinon was detected most frequently (Table 4), and concentrations (particularly the wet weather concentrations 0.24-2.20 $\mu\text{g/L}$) occasionally could be potentially harmful to grazers when concentrations exceed USEPA acute and chronic Ambient Water Quality Criteria (0.17 $\mu\text{g/L}$) (Federal Register, February 23, 2006). A proposed amendment to the Sacramento River Basin Plan suggests a water quality objective of 0.16 $\mu\text{g/L}$ (acute

toxicity) and 0.1 µg/L (chronic toxicity, Table 4). Measured chlorpyrifos concentrations would also be about twice as high as a similar proposed Basin Plan amendment (Table 4). These and other pesticides could have an effect on the zooplankton grazers. In turn, properly designed wetlands can reduce these pesticides.

**TABLE 4: PESTICIDES REPORTED IN DETECTABLE AMOUNTS
IN THE NORTH NATOMAS BASINS**

PESTICIDE	BASIN	CONCENTRATION RANGE (µg/L)	WATER QUALITY OBJECTIVES (µg/L)
Chlorpyrifos	Basin 7 Dry Weather	0.05 - 0.07	Proposed Amendment to the Basin Plan for the Sacramento and San Joaquin Rivers: WQO = 0.025 (acute); 0.015 (chronic)
	Basin 7 Wet Weather	0.05 - 0.06	
Diazinon	Basin 4	0.04 - 0.56	Proposed Amendment to the Basin Plan for the Sacramento and San Joaquin Rivers: WQO = 0.16 (acute); 0.10 (chronic) USEPA National Recommended WQC for freshwater = 0.17 (acute and chronic)
	Basin 5	0.03 - 0.05	
	Basin 6	0.05 - 0.21	
	Basin 7 Dry Weather	0.05 - 3.25	
	Basin 7 Wet Weather	0.24 - 2.2	
Malathion	Basin 4	0.1 - 0.5	CADFG = 0.43 (acute); EPA Red Book = 0.1 (instantaneous maximum)
	Basin 7 Dry Weather	0.1 - 1.0	
	Basin 7 Wet Weather	0.1 - 0.165	
Prowl (Pendimethalin)	Basin 4	0.06 - 0.1	No water quality standards.
	Basin 7 Wet Weather	0.1 - 0.3	The USEPA ECOTOX database includes EC50 (for intoxication) results of 2 studies for Daphnia magna. EC50s for the 2 studies

			were 280 µg/L and 5,100 µg/L. There were no LC50 data.
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Note: All data are dry weather, except where noted (Basin 7 wet weather data). Simazine and Atrazine were not analyzed.

Heavy metal pollution seems unlikely in this region since the usual sources, such as copper from automobile brake pads, zinc from automobile tires, and zinc plating on home gutters, is partially balanced by decomposing vegetation, such as leaves, which are natural chelating agents.

During the hot summer, some pollutants may recycle to affect grazers at the worst time of year in terms of algae control. However, despite the theoretical possibilities, most heavy metals and organics do not exit the sediments to harm the aquatic animals. It is likely that the wetlands around some ponds and the anoxic sediments in others contain potentially toxic heavy metals as insoluble sulfides. As with ammonia, it is not likely that these metals will account for the majority of lower grazing rates on nuisance algae.

3.4 Role of the Lack of Competitors for Nutrients

The lack of competitors for nutrients is a major reason why algae nuisance blooms occur in the ponds. In the growth Equation 1 shown above, the major positive term includes photosynthesis and thus nutrients. Nutrient loads into the lakes cannot be fully reduced; therefore, in-lake competition for nutrients can be a method of nuisance algae reduction. This concept is key to the bio-manipulation method described later; but, in brief, nutrients that support non-nuisance or desirable aquatic species are not available for nuisance algal blooms. Desirable species include attached algae that grow as part of the biofilm on submerged water plants and debris. Others include higher plants, such as lilies, which absorb nutrients via their roots, not leaves. Although the total biomass of desirable species may be high, they are not considered a nuisance since the water around them is usually clear and free from suspended algae.

Too much submerged or emergent vegetation is a problem as well, since it can impede free movement of boats and can adversely affect the aesthetics of a pond. This is less of a problem for some of the North Natomas ponds where there is no boating. Although the dissolved oxygen at the base of thick stands of submerged vegetation is usually

low, this is not a major drawback since conversion of nitrate to nitrogen gas under low oxygen conditions (denitrification) is enhanced.

4. Answer to Question 1B (2): What Are the Potential Methods for Control of Algae and Other Aquatic Plants (e.g., With Respect to Operation and Maintenance)?

There are a number of methods to control algae and aquatic plants with respect to operation and maintenance. There are five general classes of watershed pollution controls¹⁰ including wetlands^{11,12} and 17 generally accepted techniques of in-lake restoration¹³. Most methods are a variation of the 17 methods¹⁴. The two management methods and their applicability for the North Natomas basins are summarized in Tables 5 and 6.

TABLE 5: APPLICABILITY OF WATERSHED MANAGEMENT METHODS FOR CONTROLLING ALGAE AND AQUATIC PLANTS FOR THE LARGER OPEN NORTH NATOMAS BASINS

METHOD	APPLICABILITY FOR N. NATOMAS BASINS	USE
Treat domestic or industrial sewage	Not applicable, new sub-divisions with adequate collection, treatment & disposal outside the basin.	NA
Treat non-point sources (TMDLs)	Likely to be applicable only in a few sites with old historical or abandoned septic tanks. Most of area formerly agricultural land.	NA
Decrease farm or landscape nutrient sources	Source control possible with public education, use of slow-release fertilizers.	Yes
Construct sediment detention basins	Already in place as the Natomas ponds.	NA

¹⁰ Horne, 2006.

¹¹ Kadlec & Knight, 2000.

¹² Mitsch Gosselink, 2000.

¹³ Horne, 2006

¹⁴ EPA/NALMS, 1988; Golman & Horne, 1994; Cooke et al., 2005; McComas 2003; Horne, 2006.

METHOD	APPLICABILITY FOR N. NATOMAS BASINS	USE
Construct wetlands for pollution removal	Some in existence but more can be created as part of the management plan.	Yes

Of the five watershed methods, only two are applicable for the North Natomas Basin ponds. These are source control of fertilizers and improvement to the existing wetlands and ponds. Source control of fertilizers on golf courses, irrigated landscapes, and other public spaces can be achieved through education – perhaps by a simple flier notification. Most commercial and private land is over-fertilized since the cost of the chemical is much less than the labor to apply it. Many users should respond by using less fertilizer, once they know of the damage that the runoff of excess nutrients can do in the surrounding lakes and streams. Photographs of the dense surface algae blooms could help show the damage done by excess nutrients.

Recommendations include the use of slow-release fertilizers, performance of soil checks to assess the need to add more fertilizers, and implementation of soil erosion controls. Note that phosphorus and pesticides tend to attach to soils. For private plots, source control is much more difficult, but public education can help increase awareness of recommended solutions. The Lake Management Plans for Sundance and Westlake state that public education is critical for effective Best Management Practices and recommend a public education program. The Lake Management Plans also list the landscape maintenance guidelines that will be incorporated into covenants for the developments.

If source controls and other watershed controls are not fully successful, some in-lake or in-pond management strategies can be employed (Table 6).

TABLE 6: APPLICABILITY OF THE 17 IN-LAKE MANAGEMENT METHODS FOR THE LARGER OPEN NORTH NATOMAS BASINS

METHOD	APPLICABILITY FOR N. NATOMAS BASINS	USE
Dredging	Will eventually be needed to remove settled debris, silt and organic matter generated in the lake.	Eventually (see TM#1)
Water level drawdown & water level fluctuation	Can control small fish breeding and unwanted submerged or emergent plants. In general static summer water level is best.	Rarely

METHOD	APPLICABILITY FOR N. NATOMAS BASINS	USE
De-stratification & lake mixing	Possible method using aeration-mixing or propellers where DO is now < 5 mg/L. Will move oxygenated surface water to anoxic sediments.	Possible
Macrophyte (water weed) harvesting	No weed nuisance at present, method may be needed along with herbicides in enhanced lake for (unsanctioned) inshore swimming/boating areas (e.g., Basins 8A, 8C).	Maybe
Wetland algae filters	Good method for direct removal of most algae and smaller floating scums. Modifications to existing sites may be possible for some basins.	Yes
Algae (phytoplankton) harvesting	Cost is high unless a few kinds of algae are sold for high priced health food or food dye.	No
Selective withdrawal of hypolimnion water	Lakes too shallow to have a hypolimnion.	No
Dilution/flushing	Not applicable. No spare or clean water available in large amounts.	No
Sediment sealing (fabric liners, barriers)	Not needed. Ponds either sealed or groundwater fed. Only use could be for weed control alongside docks.	Limited
Herbicides (for algae or macrophytes)	Copper algaecides are currently being used in some urban ponds (Basins 8A, 8C). Use of Sonar herbicide could be used to manage the submerged vegetation. Long-term plan is to minimize herbicide use	Yes
Oxygenation or aeration	Main method for preventing fish kills, odors, internal nutrient loading. Direct cure for current low DO.	Yes
Shading (dyes)	Possible for algae control on more open ponds such as Basins 8A, 8C. Dye is photo-degraded and lasts only few months.	Yes
Sediment settling (alum, phosloc)	Would give only temporary control. Alum very rarely used in California since it is impossible to control natural and un-natural inflows of TP	Possible
Pathogens of algae or	Ineffective for blue-green algae due to resistance buildup. None known for	No

METHOD	APPLICABILITY FOR N. NATOMAS BASINS	USE
macrophytes	macrophytes	
Grazers on algae or macrophytes	Not applicable, lake may need more submerged macrophytes not less for biomanipulation	No
Nutrient harvesting from fish or other biota	Many small fish and large carp may be harvested as part of the biomanipulation process. N and P removal expected to be small relative to inflows.	Yes
Biomanipulation	Will be the main sustainable method to remove nuisance algae and tie up nutrients.	Yes

To meet the long-term goal utilizing holistic methods, as requested by the City of Sacramento, the following five in-lake management methods are recommended. They are listed in descending order of importance, as follows:

1. Biomanipulation (possibly including limited nutrient harvesting via fish control).
2. Lake wetland filtration.
3. Oxygenation/aeration/mixing.
4. Shading (pond dyes).
5. Weed harvesting.

Note that the current use of copper sulfate in Westlake (Basin 8A) and Sundance Lake (Basin 8C), which is a non-holistic method, and perhaps the herbicide Sonar, can be continued until other more sustainable holistic methods are established. These methods will be discussed in detail below.

4.1 Bio-manipulation – The Proposed Holistic Solution

4.1.1 Concept

Bio-manipulation utilizes various natural mechanisms to reduce suspended algae. It can be thought of as Ecological Engineering that modifies the ecosystem so the net result favors clear water over phytoplankton and suspended sediments. Bio-manipulation has had success in Europe in large and small shallow lakes, but the principle applies to all lakes. There are two main components to bio-manipulation – increasing the lake’s natural filtering ability and increasing benefits provided by submerged plants.

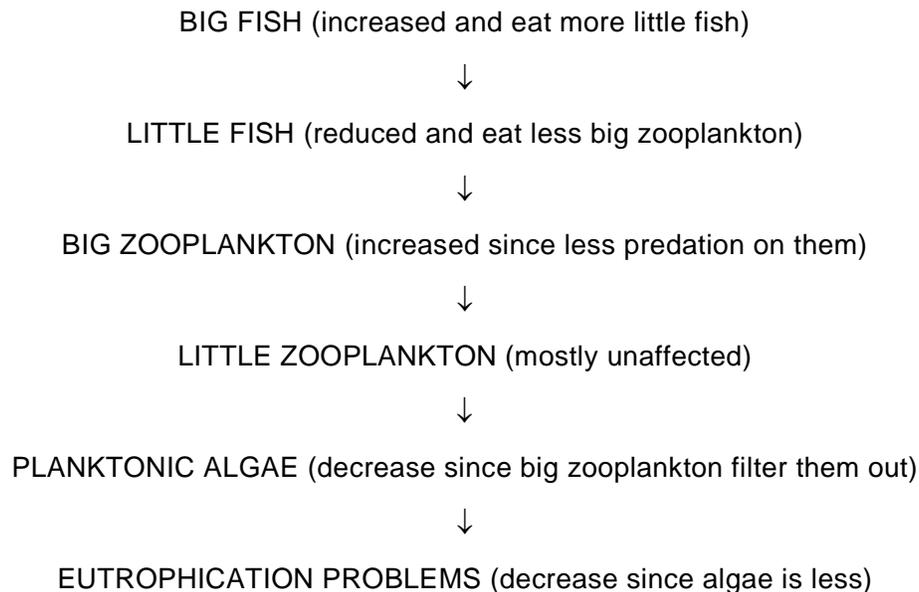
The first goal of bio-manipulation is to maximize the natural filtering ability of herbivorous zooplankton to remove nuisance and other algae. This goal can be met successfully by increasing the algae-filtering component in the lake food web, in particular to increase the amount of the large species of Daphnia. At abundances found in some lakes, zooplankton can filter the entire lake volume in a week. Since algal populations, under favorable growth conditions, can double in 3 to 7 days, filtering by Daphnia can significantly reduce the algae. The desirable “clear water” phase in summer lakes results from zooplankton grazing once the highest spring bloom algae growth rates decline as nutrients are used up. Daphnia is a small zooplankton and the larger species are just visible to the naked eye. Daphnia is often mistakenly called a “water flea” since it can move quickly if it senses a predator.

Daphnia needs to be in the surface water in order to feed on algae. Most fish are sight predators, so most zooplankton feed only at night. Reduction of predation can be achieved by providing Daphnia a safe daylight refuge. Such refuges are (i) among submerged vegetation and (ii) in the darkness of deep water. The edges of submerged plants, such as the pond weed Potamogeton, are refuges for Daphnia from fish predation. Shoreline reed beds can also serve as refuges. In shallow lakes like the Natomas Basins, there is no deep dark water. However, Daphnia may hide in the fluffy sediments near the basin bottom so long as there is sufficient dissolved oxygen.

Bio-manipulation also requires engineering the ecosystem’s trophic levels to reduce small fish, which are involved in zooplankton grazing and are predators on Daphnia. The size-efficiency hypothesis first shown by Brooks & Dodson in 1965 demonstrated that small fish prefer to eat the largest zooplankton. Because one large zooplankton filters many more times the water (and algae) of a small zooplankton, excessive fish grazing on zooplankton encourages nuisance algae blooms. The trophic cascade provides a solution to this problem. Typically, lake managers with algae problems think “bottom up,” that is:

NUTRIENTS → NUISANCE ALGAE → LOW SECCHI DISC → PROBLEMS

Thus, the focus in the past has been on nutrient reductions in the lake or watershed. However, in many situations where the drainage basin area is large relative to the lake area, it may be impossible to reduce nutrients to the desired level. Thus bio-manipulation restores or enhances the natural trophic cascade to reduce algae even when nutrients are higher than ideal. The concept is called “top down” and is the opposite of the bottom up concept. Essentially, the top down method adds larger fish to eat the smaller fish that would otherwise eat the larger Daphnia.



Addition of larger fish predators, such as bass, is quite feasible in the larger North Natomas lakes, such as those in Basins 1, 5A, 8A and 8C. The addition of larger fish predators is not always practical in small shallow ponds, although these fish can survive in remarkably restricted water.

It is the nature of fish reproduction, which involves lots of eggs, that in some years, the hatch is very successful. When this happens, predation by the larger fish cannot keep up with the population explosion of small fish and the associated increased predation on Daphnia. Algae blooms may result. Successful fish spawning may be due to unusually warm spring temperatures or unknown causes, so lake managers have no control.

The direct netting and removal of small fish may be used to supplement traditional top-down fish predation as a maintenance task. Small fish can be removed quite cheaply by netting, returning the few larger or more desirable fish, and discarding the small fish until the numbers are sufficiently decreased. This form of bio-manipulation using nets has been very successful even in large shallow European lakes and has resulted in the best water clarity reported since the 1920s and a reduction in nuisance blue-green algae, which is a problem in Basins 8A and 8C. The method can also be combined with

the removal of nuisance carp, which increase lake algae through their bottom grubbing for food.

Small fish can also be reduced by lowering the lake level in spring to strand the nests of fish, such as bluegill. The method of drawdown often used to reduce excess shoreline vegetation can also be used in bio-manipulation. This may require pumping out excess water, and this can be facilitated since almost all basins have pumped outlets.

Bio-manipulation in the context of the North Natomas Ponds may involve harvesting of small fish to increase Daphnia, removal of carp to reduce bottom grubbing and associated nutrient releases, and weed harvesting, if overgrowths occur. If disposed of outside the watershed, weed harvesting will reduce N and P in the ponds that would otherwise recycle and stimulate nuisance algae growth. Alex Horne Associates understands that nutrient harvesting has never been used successfully alone, since the vast amounts of N and P are held in the algae and sediments, not in fish or water weeds. However, if used as part of other management options, the removal of some N and P may assist in the overall plan.

The second goal of bio-manipulation is to encourage the beneficial effects of submerged vegetation. Submerged aquatic vegetation (SAV), especially leafy plants, indirectly reduce nutrients, trap nuisance phytoplankton, reduce sediment re-suspension, and promote denitrification. These effects are most pronounced with leafy plants, such as the pond weed Potamogeton, but even water lilies can have a beneficial effect as well as aesthetic value. SAV assists in the reduction of suspended nuisance algae in several ways. The underwater stems provide a solid surface habitat for attached algae (periphyton) that are superior competitors for nutrients compared with suspended algae. Nutrients passing among the submerged plants are stripped out by the periphyton and are not available for nuisance algae growth. Second, any nuisance algae that drift in among dense SAV are trapped. They either sink to the bottom in the quiescent conditions or are eaten by the microscopic animals, such as rotifers, that live attached to the plant stems. Third, the roots of submerged plants stabilize the sediments that are otherwise easily mixed into the water by the wind or shoreline animals. Fourth, the rhizome and root areas of SAV provide a good site for denitrification, which converts nitrate to nitrogen gas. Nitrate is one of the nutrients excessively present in the influents of the North Natomas basins.

4.1.2 Advantages

- Bio-manipulation is sustainable over long periods with minimal maintenance.

- Because of the hysteresis¹⁵ effect of nutrient loading in shallow lakes, bio-manipulation may be the only successful method short of dredging.
- Bio-manipulation restores the alternate stable state for shallow lakes; that is, it produces clear water with submerged macrophytes versus muddy lakes with excess nuisance algae.

4.1.3 Disadvantages

- Bio-manipulation may need some maintenance due to the tendency of small fish to dominate eutrophic lakes where large predators, such as big fish, are not present, are over-fished, or are few in numbers due to pollution (especially low DO and ammonia).
- Bio-manipulation so far has worked better in shallow ponds, not deep ones. However, since Natomas has only shallow lakes and ponds, bio-manipulation is a good sustainable option.
- Bio-manipulation may need 30 to 50% of existing shallow water devoted to submerged macrophytes. The basins should not require re-grading to develop shallow areas suitable for submerged vegetation. A method of preventing the weeds from extending over the rest of the water may be needed if the entire lake is very shallow. Herbicides or weed cutters are options.

4.1.4 Summary of Biomanipulation Recommendations

Bio-manipulation is the preferred method for almost all lakes and ponds and is ideal for the holistic management of the North Natomas facilities. Bio-manipulation is a sustainable, low-cost method providing clear water. Any or all of the components of

¹⁵ **Hysteresis.** Most people and regulations on nutrient control in terms of external loading assume that the decreases in loading provided by TMDLs will restore lakes to their former conditions. However, recent research on the ecology of shallow lakes shows that for these systems, restoration is unlikely unless the nutrient loads are reduced below the historical levels, at least until the new ecosystem is established (Scheffer, 1998). The effect is called lake hysteresis and is similar in concept to normal hysteresis as for example in a stretched rubber band. Once stretched the band does not return to its original shape but a somewhat larger one, at least for some time. A shallow lake that has been changed by nutrient pollution will not return to its original trophic state when nutrients are restored to historical levels. Thus even greater reductions are needed. In these cases some in-lake management is needed.

bio-manipulation can be used. Experimental tests of bio-manipulation components could be performed at Basin 4, which features shallow, tree-lined ponds with obvious floating large nuisance algae and low DO, and at Basins 8A or 8C, which are house-lined small lakes with occasional planktonic blooms, and where low DO is uncommon and is currently treated with copper. See Section **Error! Reference source not found.** for specific recommendations on experimental approaches and monitoring.

Achieving the two goals of biomanipulation, which are (1) to maximize the natural filtering ability of herbivorous zooplankton to remove nuisance and other algae and (2) to encourage the beneficial effects of submerged vegetation, can be more efficient when used in conjunction with other methods. The recommended methods include: wetlands filtration and enhanced water flow; oxygenation/aeration/mixing; shading (pond dyes), and weed harvesting. These concepts are detailed in Sections 4.2 through 4.5. Use of herbicides/algaecides is discussed in Section 4.6.

4.2 Wetlands for Filtering Algae Directly

4.2.1 Concept

Wetlands are excellent for filtering small particles from water, provided residence times are at least 1 to 2 days, and for reducing soluble materials by bacterial action or sorption on peat, provided residence times are between 1 to 2 weeks. This option requires that water containing algae flows by gravity or is pumped from the lake or pond surface and passed through a constructed wetland. The wetland can be designed to appear natural and can offer value as a wildlife habitat.

Since algae filtration wetlands work over a period of weeks, pumping water from lake to wetland does not have to be continuous. Thus, solar or wind power, or inexpensive off-peak power, can be used. One suitable application for the algae-filtering wetlands is for the larger house-lined Basins 8A and 8C, where planktonic algae are most dense and copper is currently used for algae control. Some of these lakes have rather plain and unimaginative grassy areas along the lake shore that could easily be adapted for wetlands. For areas with no such convenient sites, the wetland can be set back from the water a little distance or set up as floating wetland islands. Other suitable sites for wetlands could include adjacent parkland, such as the terrace adjoining Basin 4, or shallow benches constructed across the channels in Basins 2, 7A, and 7B. See Section 5 for specific recommendations on experimental design and monitoring.

There are a variety of wetlands in Basins 2, 7A and 7B, and the channel upstream of Basin 1. These can be more effectively used to clean up the water. While the current wetlands provide habitat for wildlife, are aesthetically pleasing in appearance, and perform some pollution treatment, they are less efficient than a wetland designed specifically for pollution control.

The key to efficient pollution control, and especially nutrient removal by wetlands, is creating the correct hydraulic flow. Polluted water needs to flow slowly and evenly between the plant stems and let the microbial biofilm process the nutrients and other undesirable chemicals. Under the current natural conditions where wetland plants form a fringe along the shoreline, most water flows in a channel and bypass the wetland plants and little is treated.

There are several ways to increase the natural filtering and treatment capacity of the North Natomas facilities. These include re-shaping the existing wetlands, extending the original wetlands, creating some new wetlands and moving the water through them with solar/wind power.

4.2.2 Advantages

- Removes up to 90% of particles.
- Is well suited for nuisance blue-green algae that float and are concentrated downwind at the surface of the water.
- Low cost since natural processes do the work.

4.2.3 Disadvantages

- If water must be pumped into or out of the wetlands, pumping costs can be high if lakes are large or if much hydraulic head is needed; however, we can use wind and solar power.
- Wetland must be created; however, this is inexpensive, and can provide wildlife and aesthetic benefits.
- Large surface clumps of green algae, such as blanket weed, as are found in Basin 4 are not easily removed by small wetlands. However, if partially broken up by pumping, the algae would probably be eaten or decomposed in the wetland.

4.3 Aeration, Oxygenation, and Mixing

4.3.1 Concept

Oxygen depletion is common in many lakes and ponds. Bad smells and fish kills often result. Oxygen depletion is generally caused when the oxygen demand from decaying algae exceeds the oxygen replenishment from the atmosphere and from photosynthesis. Oxygen can be mechanically added directly to a pond by purchasing and pumping pure oxygen into the pond, or by mixing oxygen-rich surface water down with propellers or compressed air-lift pumps.

The most widely used method of lake management is simple aeration with bubbles, which is similar to air provided by aquarium aerators, but it is not always successful. In lakes less than 50 feet deep, only a small amount of oxygen is transferred directly from air bubbles to the water. Aeration in shallow lakes is more effective using air lift pump mixing. In shallow lakes, the air bubbles form a mixing cell to swirl surface water to the bottom. Often the desired mixing can be more economically supplied using large but slow-revolving submerged propellers. Use of pure oxygen is superior to aeration since it is five times more efficient (air is only 20% oxygen). Current methods use various kinds of mechanical devices from enclosed air lift pump towers, to miles of perforated hose, or to sophisticated underwater pure oxygen, no-bubble mixing systems. Oxygenation/aeration/mixing can reduce algae and reverse eutrophication where watershed control of nutrients is not fully possible.

The US EPA dissolved oxygen standard for all freshwaters is a minimum of 5 mg/L. Several of the ponds (e.g., Basin 4) show oxygen concentrations lower than this standard, and some occasionally show much lower concentrations. Other methods may improve the situation, but propeller mixing and perhaps aeration may have a role to play in some of the Natomas basins. See Section 5 for specific recommendations on experimental design and monitoring.

4.3.2 Advantages

- Eliminates fish kills. Even if fishing is not allowed in the lake, fish arrive in almost all new lakes. Dead fish are not appealing to residents living in the homes that border the shoreline.
- Non-toxic and directly solves problem of low or no oxygen.
- Prevents anoxic recycling of nutrients and release of bad odors.
- May reduce nuisance algae.

- Compressed air and propellers are inexpensive and accepted by the public.
- Only small amounts of pure oxygen are needed in small lakes and ponds.

4.3.3 Disadvantages

- For compressed air mixing, a large amount of piping may be necessary and cost may be expensive for larger lakes with aeration. However, this is not the case with some oxygenation methods.
- Some communities resist shipping of liquid oxygen on local streets; however, oxygen can be generated on site.
- Mixing the lake with compressed air or propellers warms the lake sediments and increases decomposition rates of organic matter, at least initially.
- Algae may increase.

4.4 Shading

4.4.1 Concept

Algae and unwanted submerged plants depend on sunlight. Thus, they can be reduced by shading. Shading can be enhanced with various pond dyes that are on the market. They are often used to make golf course water hazards appear blue. However, use of pond dyes is possible but is not the long-term solution.

4.4.2 Advantages

- Non toxic material, decays in a few weeks to months.
- Inexpensive, simple to apply, and no permit is needed.
- Works for algae and submerged macrophytes. Note that this method is partially contradictory to the bio-manipulation methods proposed for North Natomas. Pond dyes could be used temporarily in the initial improvement stages, but are not recommended for most ponds.

4.4.3 Disadvantages

- Heavy applications produce strange colors if algae are still present.
- Will not work for some emergent macrophytes or in very shallow water.

4.5 Harvesting Aquatic Weeds

4.5.1 Concept

A certain amount of submerged macrophytes is essential for the long-term goal of bio-manipulation in the North Natomas ponds and lakes. However, in some situations where the water is clear and shallow, there may be an overabundance of macrophytes. In such situations, the plants can be cut below the water line and removed. Harvesting is a common method for removing excessive macrophytes. Depending on the amount to be harvested, hand collection or a rotating screen collects the cut weeds and pulls them to a floating platform for later disposal on land. Submerged plants are not presently a nuisance in most of the North Natomas ponds. Harvesting should be avoided when possible, but may be needed in conjunction with bio-manipulation.

4.5.2 Advantages

- Solves main visual, aesthetic, hydraulic problems directly.
- Removes some nutrients, although does not provide significant reduction.
- Avoids use of toxic chemicals.
- Techniques are well developed.
- Can be used in parallel with some herbicide use.
- Some macrophyte stands can easily be left for fish habitat.

4.5.3 Disadvantages

- Only about half of the weeds that are cut are harvested; the rest float away or sink and release nutrients back into the pond upon death.
- Weeds often grow back quickly, and harvesting must be continued at some level (like cutting a lawn).
- Costs are incurred for labor or equipment used during continual harvesting.

4.6 Herbicides and Algaecides

4.6.1 Concept

With any management program for small or shallow lakes, holistic or not, natural variations arise in the ecosystem. If these result in large nuisance algae or macrophyte growths, then suppression using chemical poisons has been a traditional practice. In California, the copper-based algaecides including copper sulfate and organic-Cu

compounds such as Cutrine, Sonar, (a fluoride based poison for submerged plants) and glyphosate (Rodeo for emergent plants) are the normal choices allowed by the EPA.

Eutrophication is advanced in some of the North Natomas ponds and control of all sources of nutrients, including internal recycling, will take some time or may be impossible. Currently, copper based algaecides are used in some of the larger home-lined lakes, such as Basins 8A and 8C, to control nuisance phytoplankton. This practice should be reconsidered since the blooms are not large. The holistic goal is to use copper strictly as an emergency measure. The policy governing the application of copper or herbicides in other ponds is not clear to us, but again the goal is to use copper as an emergency measure only.

Toxic blooms of blue-green algae, even if small, can be toxic or at least produce chronic effects. Toxicity varies in a bloom from place to place (such as the toxic “mosaic” of Carmichael) or can become concentrated if a light bloom is wind blown to the leeward shoreline. In most cases, such blooms do not result in harm to animals, but further testing may be needed. Recently, costs for testing have dropped to approximately \$50/sample for the hepatotoxin microcystin, which is one of the two main toxins.

4.6.2 Advantages

- Proven method and long history of little or no effects on other biota with proper use of copper; only small amounts of Sonar are needed.
- Almost all copper added to lakes and ponds accumulates in an inert harmless form in the sediments; little passes downstream under normal circumstances.
- Toxicant can be placed where needed. For example, pellets can be used for benthic algae, or soluble forms for phytoplankton.

4.6.3 Disadvantages

- Use of toxicants requires equipment and crew safety training .
- Price of copper has increased three fold in the last few years; Sonar is costly for large systems.
- Longer lasting heavy metal toxicants (copper) are perceived by regulatory agencies to be a problem.
- Overdoses of copper may kill wildlife such as fish in lakes and receiving waters.
- Resistance can develop in target species if toxicant used extensively and frequently.

- Is not a holistic treatment, although if used sparingly as part of bio-manipulation, some algaecide/herbicide use may be appropriate.

5. HOW TO IMPLEMENT RECOMMENDED Holistic Lake Management Practices

Holistic lake management emphasizes the importance of the whole and the interdependence of the parts. Holistic lake management avoids the use of toxic chemicals, such as copper algaecides or herbicides. Bio-manipulation is a holistic management practice which uses the entire lake ecosystem to manage the nutrient and energy flows to control nuisance algae blooms. However, not all bio-manipulation methods are practicable, and the range of site conditions will require testing and tailoring different bio-manipulation elements and lake management strategies.

The North Natomas basins include several ponds that are beautiful and support wildlife, even though they are quite young. However, most have various kinds of nuisance algae blooms. Fortunately, most of the sites have ample room around the ponds to locate any new facilities as needed.

From the point of view of ecological management, the North Natomas basins may be characterized into three main types:

1. Open water small lakes with many homes around the shore and with some water based activity including small boats, such as Basins 8A and 8C.
2. Smaller open water ponds or small lakes lined with trees or grass with homes situated further back from the water. Water based activities include nearby pedestrians and wildlife observation. Examples are Basins 1, 3, 4, and 5.
3. Small closed waters with narrow channels, wetlands riparian fringes, a few small ponds, and homes presently located far away, such as Basins 7A and 7B.

Since there is time to develop creative holistic management, some experiments are suggested. We recommend selection of three basins, each containing one of the above types. The tests suggested are:

1. Classic bio-manipulation and/or wetlands filtration in a larger, open water home-lined lake, such as Westlake in Basin 8A.
2. Aeration and wetlands filtration for smaller shallow tree-lined ponds, such as the central ponds in Basin 4.
3. Revise the wetlands flow patterns in linear facilities, for example, the low flow channels and small ponds in Basins 2, 7A and 7B.
4. Test a few blue-green algae scums for microcystin toxicity.

The recommended experimental design and monitoring for Tests 1, 2, and 3 are discussed below.

5.1 Classic Bio-manipulation and/or Wetlands Filtration in a Larger, Open Water Home-Lined Lake (Westlake, Basin 8A)

5.1.1 Why Choose Westlake, Basin 8A?

Although of reasonable quality in June 2003, in September the lake did not meet water quality objectives. The lake had low water clarity, high chlorophyll *a* concentrations, and a large bloom of the nuisance and potentially toxic blue-green algae *Anabaena*. Westlake has a 17:1 ratio of watershed to lake area and this puts it in the mesotrophic class; sustainable good water quality should be attainable. At approximately 19 acres, the lake is big enough to be a real lake, but even at this size, predator introduction would not be too expensive. It is shallow (~ 12 feet) and has a concrete wall around its edges so there is no natural riparian zone, which makes it a good choice for bio-manipulation. The lake is currently managed as a vegetated wet-pond system so the changes proposed for bio-manipulation are not too large. There are at least two sets of basic limnology data from 2003 for this lake. Thus, we already have information about zooplankton, water clarity, and algae as well as the nutrient data from the routine monitoring that occurs at all the basins.

Classic bio-manipulation is totally sustainable when it works fully. If the large piscivorous fish cannot breed in Westlake, they will need to be replaced every few years. The submerged vegetation is self-sustaining. Large *Daphnia* can breed anywhere and are already present in most water. Annual netting of small fish to keep their numbers low requires energy, but is low-cost maintenance that works if the large fish cannot keep the small fish population adequately controlled.

5.1.2 The Knowledge Gap at Westlake: Small Fish Biomass

We do not know the amount of small fish or young-of-the-year (YOY) larger fish in Westlake. The presence of larger predatory fish or benthic grubbing fish, such as carp, is not documented. For success with bio-manipulation in a shallow eutrophic lake, the biomass of small fish present during the eutrophic conditions (fall at Westlake) must be reduced by over 75%. The total number of small fish must be known prior to bio-manipulation so that the driver of success can be measured. The introduction of large fish, such as bass, is the simplest method to reduce small fish, but other methods are also possible, such as applying rotenone, restocking, and netting.

5.1.3 How to Perform a Classic Bio-manipulation Experiment at Westlake

The following steps are required:

1. Monitor variables in Table 7 before conducting bio-manipulation. Use old data or collect new; some needed data was not collected in past monitoring.
2. Reduce small fish and YOY larger fish by 75% using one or more of the following methods: add large predatory fish, such as largemouth or smallmouth bass; net out small fish; apply rotenone to kill all fish and restock desired ratios of piscivorous to planktivorous fish. Small fish that feed on large Daphnia must be eliminated.
3. Increase correct kind and area of submerged aquatic macrophytes. About 40% of the lake's shallow area should be covered with a meadow of leafy native submerged aquatic macrophytes, such as pond weeds. Four benefits are expected from the right kind and location of submerged plants:
 - Shelter from predation by the remaining small fish will be provided for the increased population of Daphnia around the edge areas of the plant stands.
 - Competition will increase for nutrients, such as nitrate and phosphate, by non- nuisance algae growing on the plant leaves.
 - Sedimentation sites will develop for phytoplankton in the quiescent zones between the plant stems; i.e., the suspended algae will float in but not out.
 - Denitrification sites will increase in the anoxic plant root sites where mixing is low, reducing nitrate in the lake.
 - Other possible benefits are not yet well documented, such as allelopathy; i.e., chemicals secreted by the macrophytes inhibit growth of the nuisance algae.
4. Remove or suppress bottom grubbing fish, such as carp.
5. Monitor variables in Table 7 after bio-manipulation. Specifically, match collections made prior to bio-manipulation and add any new data collected during the tests.

The necessary measurements of parameters are shown in Table 7. Most of these measurements are similar to those made in earlier surveys in Basin 8A by Stuart Perry & Mark Sytsma in 2003. Additional measurements include estimates of small fish and some way to determine if carp and large predatory fish are now in Westlake.

TABLE 7: MEASUREMENTS FOR CLASSIC BIOMANIPULATION IN WESTLAKE (BASIN 8A) FOR A BEFORE AND AFTER COMPARISON OF BIOMANIPULATION

PARAMETER	MEASUREMENT	RESULTS
Water clarity	Secchi depth	Meters of clear water
Algae (phytoplankton)	Chlorophyll <i>a</i>	Biomass of algae
Zooplankton	~ 150 um mesh net tows over fixed depth/distance	Net volume of 3 major size classes
Large Daphnia	~ 150 um mesh net tows over fixed depth/distance	Numbers & size of large Daphnia
Submerged macrophytes	Survey using rakes & transects	Approx % cover & dominant species
Small fish		pounds /acre small fish
Predatory fish	From stocking numbers & local questionnaire	Pounds/acre predators
Nutrients	Nitrate, ammonia & TN, TP	Concentration in surface samples in open water

Note that zooplankton grazing volumes per individual are much greater for the larger individuals, such as large Daphnia (2 to 3 mm long) and trivial for smaller small Daphnia (< 0.5 mm) and other small zooplankton, such as rotifers.

Largemouth bass are a suitable predatory fish and native pond weed is a suitable submerged aquatic plant. The stocking density of the bass depends on the size of the bass and the amount of prey fish in the lake. The stocking density is usually determined as so many fish per acre and that number is best obtained from the fish supplier.

However, research shows that Daphnia is not the only vital component of sustained bio-manipulation. The co-equal need is for extensive underwater meadows of the right kind of submerged aquatic plants such as pondweeds, which are macrophytes. Ideally about 40% of the lake should be covered with (or planted, if bare) with submerged aquatic plants.

If the experiment does not turn into a long-term success and if the pond weeds become a nuisance, they can easily be eliminated using the herbicide Sonar, which is licensed for weed control in California. In 2003, Westlake was infested with introduced exotic plants that were treated with herbicides and these may need to be further treated before the introduction of native plants. The herbicides break down after a few months,

so no long term effects should occur. Westlake is used for non-power boat use with no swimming allowed, so some submerged plants should be acceptable to the homeowners, especially if the plants do not reach the surface.

5.1.4 Example of the Level of Detail Needed for Zooplankton Analysis for Basin 8A (Westlake) to Determine the Effects of Bio-manipulation

This discussion is based on data that was collected from a small reservoir near Pebble Beach almost the same size and depth as Westlake and the identifications and size measurements were made by Dr. James Roth. The identification and sizing can be expected to take 2-3 hours per sample initially and less once the identification has been made.

Plankton was collected by vertical tows from the outlet pier using a 12-inch diameter conical net of 150 micron mesh nylon. Tow length was 18 ft, 2 inches. The water was clear, and no net clogging occurred. Volume sampled was 404 liters. The settled volume of the sample after preservation was 6.0 ml. Identifications were made under a Bausch & Lomb StereoZoom 7 microscope with the keys in Pennak's "Freshwater Invertebrates of the United States" (3rd Ed.). The sample, made up to 100 ml and a 5-ml sub-sample taken with an automatic pipette, was counted. The results are shown Table 8.

TABLE 8: PLANKTON COLLECTED IN FOREST LAKE RESERVOIR, 11 MAY 2006

SPECIES	SIZE CLASS	LENGTH, MM	NUMBER PER LITER	PERCENT COMPOSITION
<i>Daphnia pulex</i>	Large	2.5 - 3.0	5.7	8.4
<i>Daphnia pulex</i>	Medium	1.0 -1.5	5.2	7.7
<i>Daphnia pulex</i>	Small	0.5 - 0.7	55.8	82.4
<i>Ceriodaphnia reticulata</i>	Large	1.0 - 1.1	0.4	0.7
<i>Ceriodaphnia reticulata</i>	Small	0.4 - 0.5	0.3	0.5
Red chironomid larvae		5.0 - 10.0	0.2	0.3

A single cladoceran species, *Daphnia pulex*, accounted for the majority of the numbers and biomass of the plankton collected. This is a common and widespread species. Another common cladoceran species, *Ceriodaphnia reticulata*, accounted for only 1% of the total numbers. Red chironomid larvae were also found in the water column. These are ordinarily benthic, where they construct mud tubes. They will probably remain on the bottom once enough sediment accumulates for tube construction.

5.2 Aeration and Wetlands Filtration for Smaller Shallow Tree-Lined Ponds (e.g., the Central Pond in Basin 4)

5.2.1 Why Choose a Pond in Basin 4?

The overall appearance of the ponds in Basin 4 is beautiful and there is a view of the water from the surrounding pedestrian paths. Presently not many fringing trees have grown up to obscure the water. Unfortunately, the ponds are often covered with ugly floating filamentous algae, primarily the blanket weed *Cladophora* or similar large filamentous green algae. The main concerns with blanket weed cover are loss of dissolved oxygen underneath the mat and wind-blown weeds piling up on the shore. Additionally, flies congregate on the rotting smelly piles of decaying blanket weed.

Cladophora is usually found in abundance when nutrients are high, especially when nitrate-N exceeds 1 mg/L. Very high nutrients concentrations are reported occasionally from this basin. Ammonia and nitrate peaks are noted at 10-20 mg/L, 0.5 mg/L TP. The high nutrient concentration ensures that blanket weed is well nourished and abundant in Basin 4. The high nitrate concentrations are unlikely to be sufficiently lowered to prevent blanket weed growth for at least the next decade. Excess nitrogen added to land builds up a long-term source in the soil. The soil nitrogen source is then slowly released to the groundwater and streams. The excess of nitrogen over phosphorus suggests that the upstream golf course fertilizers may be escaping the greens and fairways. Dissolved oxygen (DO) is often virtually zero in all basins. The warm water (20-25°C) exacerbates the low DO in summer, since warm water contains less DO than cool water.

5.2.2 Poor Likelihood of Success with Classic Bio-manipulation in Basin 4

It might be possible to restore Basin 4 ponds using classic bio-manipulation as suggested for Basin 8A (Westlake). However, the low DO means that the natural zooplankton and benthic insect predators of the algae cannot survive. The essential large piscivorous fish needed for bio-manipulation would probably also suffocate, since large fish usually need more DO than small ones. Under these conditions of low DO, unassisted bio-manipulation would be impossible. In addition, the ponds are small and

shallow and may easily be overwhelmed by submerged vegetation, resulting in a marsh rather than the desirable open water. Finally, *Daphnia* and other large zooplankton are too small to eat the large blanket weed.

Since nutrient levels are so high, their reduction will take several years even with cooperation from the upstream sources. Two alternative options can be tried – aeration and wetlands filtration. These options require some power and can be almost fully sustained through the use of renewable energy such as small windmills or solar panels.

5.2.3 Use of Aeration at Basin 4

Some form of aeration is the most common method of lake management. Basin 4 ponds are often anoxic during summer days and may be anoxic for a much longer period at night. The goal of aeration is to bring oxygen down to the lake bed and sometimes to the surface on calm nights. No chemicals are needed, but some form of energy is needed to power small electric motors. The available methods of getting oxygen into lakes are:

- Stir oxygen downward from the surface using compressed air as an air-lift pump. But the ponds are too shallow for oxygen in the air bubbles to dissolve directly in sufficient amounts.
- Mix the lake water downward from the surface with propellers set at a 20 to 40 degree angle. This method is by far the most efficient, but will not work if there is no oxygen in the surface water.
- Some larger systems need pure oxygen additions, but the North Natomas Basins are too shallow for the gas bubbles to dissolve, and such systems are probably not warranted for such small basins. A mixing unit to stir gas and water together is more appropriate.

A choice of a small aeration system is recommended for the Basin 4 ponds. Complete sustainability can be achieved by using wind or possibly solar power.

5.2.4 Filtering Wetlands

Unlike aeration, filtering wetlands are a new and so far little used component for lake management. However, those wetlands in service have been very effective in removing over 95% of particulates. Wetlands are fully sustainable and no chemicals are needed, but some form of energy would be needed to pump water from the ponds to the wetlands. In most cases, gravity flow takes cleaner water back to the ponds. Wetlands directly remove soluble and particulate nutrients, including algae. The wetlands can be situated anywhere, but the slightly sloping sides of the flood control

basin are ideal. It is also important to design the filtering wetland to attract bird life since this enhances the environment for the local people, some of whom will be keen birders.

5.2.5 How to Carry Out Aeration and Wetlands Filtration in the Basin 4 Ponds

The following steps are required:

1. Monitor variables in Table 9 before aeration or wetlands construction. Almost all of these variables are taken as part of current routing monitoring, but monitoring frequencies may need to be increased from quarterly to monthly for three years.
2. Install a small aeration/mixing system using solar or wind power. A small aerator can easily be installed using simple diffuser blocks on the lake bed to pipe air from a small shore-based compressor powered with electric (120 v) power. An alternative is to use small propellers, but some of the ponds may be too shallow. Mixing to stir oxygen to the lake bed using slowly rotating propeller blades is the most efficient method to accomplish aeration-mixing. For these ponds, either system would be inexpensive, small, and quiet. To make the power source sustainable, the main source can be replaced by small windmills or solar panels.

An apparently obvious choice is the commercially available Solar Bee system, since these float on water and use a small solar panel to power a tiny propeller to move water. Unfortunately, Solar Bees do not supply the needed compressed air for mixing and are currently so underpowered that they provide very little vertical mixing force. These devices merely stir a little water from top to bottom and spread it horizontally. Solar Bees would have no effect at all on large blooms of blanket weed that can block turnouts in the very large Central Valley Project canals. A Solar Bee system is more costly for the same power as a conventional system so Alex Horne Associates recommends a conventional setup. If a Solar Bee system seems appealing, it might be worth working with the company to get them to produce a larger test system, possibly with its solar power array located on shore. Alex Horne Associates calls this approach a "Solar Hive," and it can easily be set up using conventional solar panels located to power a conventional setup. Since solar power does not work at night when aeration is often critical, a conventional system using large solar panels on shore during the day and conventional electricity at night would be a better choice overall.

3. Install a filtering treatment wetland. Treatment wetlands are simple to construct. The wetlands consist of an approximate rectangle of ideally 3:1 length to width,

but the shape can vary widely; they are two feet deep, and have a hydraulic residence time of 2 to 7 days. The size of the wetlands is determined by the amount of incoming pumped pond water that is necessary to accommodate. Five to ten percent of the Basin 4 pond volume will need to be pumped daily. However, pumping as little as 1% of the volume of the Basin 4 ponds may be effective in reducing the nuisance algae. The ponds are filled with plants, and are not open ponds with a reedy fringe. Cattails (*Typha* spp.) or bulrush (*Scirpus* spp.) are the best plants to use and are easily obtained from local agencies that are clearing out drainage channels. Sustainability is achieved if the pump is wind-powered. Wind power presents an advantage since it does not matter when water is pumped from the ponds through the wetlands, so the timing of the wind is not critical. The windmill does not have to be large or tall since the power needed is not great.

The measurements to be made are shown in Table 9. Additional measurements are the estimation of the percent cover and major species of floating algae.

TABLE 9: MEASUREMENTS FOR AERATION AND WETLANDS FILTRATION IN BASIN 4 PONDS FOR A BEFORE AND AFTER COMPARISON OF BIO-MANIPULATION

PARAMETER	MEASUREMENT	RESULTS
Floating algae	Percent surface cover, species	Blanket weed cover
Water clarity	Secchi depth	Meters of clear water
Algae (phytoplankton)	Chlorophyll a	Biomass of algae
Nutrients	Nitrate, ammonia & TN, TP	Concentration in surface samples in open water

5.3 Revising the Wetlands Flow Patterns and Bio-manipulation in Linear Facilities (the Channels and Small Ponds in Basins 7A and 7B)

5.3.1 Why Choose the Linear Channels in Basins 7A and 7B?

The linear channels in Basins 7A and 7B are lined in places by wetland vegetation, but water can flow around the vegetation and receive very little treatment. One solution is to spread the flows through dense marsh vegetation instead of allowing water to flow between the two vegetated banks. For example, small shallow berms can be constructed across the channel to contain the flow. The water in these areas needs to be less than two feet deep. In these areas, cattails and bulrush can be planted, or vegetation at the sides may be allowed to grow into the newly shallow water. The

areas with vegetation may alternate with open pond-like sections. During low flow situations, water will flow across the berms containing the wetland plants, and be filtered and treated in the microbial biofilm that grows on the dead leaves and the erect stems of the water plants. In wet weather flows, the water will flow over the vegetation, and treatment will be minimal.

In these basins, the masses of floating filamentous green algae (blanket weed), cloudy brown-green water, and wind-blown trash makes these waters unattractive. Generally, this basin consists of long channels with a few wider and deeper ponds with little permanent riparian cover. Also, unlike the ponds in some other basins, there are presently few homes close by. Given the shape of the larger detention basin around these permanent waters, there is little likelihood of houses overlooking most of the channels. Nutrient concentrations are moderate most of the time, but spikes of ammonia (1.3 mg/L), nitrate-N (4.3 mg/L), and TP (0.6 mg/L) show why blanket weed is abundant. Dissolved oxygen (DO) is sometimes too low relative to a desirable minimum of 5 mg/L, such as 1-4 mg/L in summer, but DO levels are not as low as levels at some of the other basins. However, the water is warm and nocturnal DO values will probably be much lower in some of the deeper, more sheltered spots. Also in Basin 7, dry and wet weather flows contain higher concentrations of pesticides than in other basins in the region. Pesticides detected at these levels include chlorpyrifos, diazinon, malathion and prowl.

The linear arrangement of the detention ponds in Basin 7 requires adaptation for sustainable management. Currently there are several sites where wetlands plants have taken over some of the shallow water. The plants are a mixture of submerged and emergent vegetation, such as cattails. The vegetation is potentially a part of bio-manipulation. However, the water flows around the plants, not through them, so the vegetation cannot remove nutrients and pesticides, nor filter out floating algae. Hydraulic modifications are required to force the lower summer water or small winter storm flows to pass through the plants, but not block winter storm flows. The marginally sufficient levels of oxygen and should increase after the modifications are made, so aeration is not recommended at this time

5.3.2 How to Carry Out a Flow Pattern Modification Experiment in Basin 7

The best site for the flow pattern modification experiment may be Basin 7A. The following steps are required:

1. Monitor variables in Table 10 before and after action. Most variables are part of the current monitoring program.

2. Map the approximate cover of plants before and after the wetlands are reconfigured. Estimating a rough percentage of the coverage of the main types of vegetation at each stage is needed.
3. Plant emergent or submergent vegetation across the full width of the low flow channels. To ensure plug flow may require making the center of the channel shallower, since emergent plants like cattails and bulrush cannot grow in water that is permanently more than two feet deep. Alternatively, submerged plants can be set in the deeper areas if they are dense enough to carry a good biofilm on their stems and leaves.
4. Add cross weirs to spread and slow the flow, if needed. The gradient in the Basin 7 channels is low, but without cross weirs, internal channels are created that can lead to short-circuiting. The idea is to create a series of cells featuring dense vegetation with low summer and winter flows passing through them.

The measurements needed are shown in Table 10. Most of these measurements are similar to those recorded in earlier monitoring, except for the vegetation cover.

TABLE 10: MEASUREMENTS FOR FLOW PATTERN MODIFICATIONS IN BASIN 7A FOR A BEFORE AND AFTER COMPARISON OF BIOMANIPULATION

PARAMETER	MEASUREMENT	RESULTS
Water clarity	Secchi depth	Meters of clear water
Algae (phytoplankton)	Chlorophyll a	Biomass of algae
Nutrients	Nitrate, ammonia & TN, TP	Concentration in surface samples in open water
Anthropogenic pollution	Pesticides	Concentration in surface samples in open water
Vegetation (emergent, submergent if present or planted)	Visual estimate of area, ID of main species	Percent cover and main species

Note that Basin 7A oxygen may support piscivorous fish, but the likely nocturnal low DO concentrations could kill them; therefore, bio-manipulation may become an option later in this experiment. When the new vegetation is established, it should be sufficient for the purposes of bio-manipulation, as explained in the Basin 8A experiment. Thus, adding the piscivorous fish at a later stage is the only remaining step.

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APPENDIX F

City of Sacramento Draft Maintenance Prescriptions

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General (all areas)

Activity	Frequency	Criteria
Note presence of any <u>nuisance</u> wildlife species during site inspections.	Ongoing	Monitoring logs containing records of observations.
Follow measures to minimize impacts to special status species such as giant garter snake and tri-colored blackbird.	Necessary precautions for all maintenance/monitoring activities.	No adverse impact to special status species.
Monitor for evidence of water quality problems when on site for any maintenance activities.	Twice a week	Water free from: plant die off, dead animals, the presence of murky water, noxious odor, sudden increase in algae, or evidence of chemical spill.
Monitor maintenance access points and keep clear of obstructing vegetation.	Monitor quarterly and remove vegetation as needed.	Access points are clear of obstructions.

Permanent Pond

Target condition:

Maintain target basin capacity, and manage water quality to prevent nuisances such as odors, insects, and excessive algae blooms.

Activity	Frequency	Criteria
Monitor for evidence of water quality problems when on site for any maintenance activities.	Twice a week	Water free from the presence of murky water, noxious odor, sudden increase in algae, or evidence of chemical spill.
Monitor and treat for algae blooms using appropriate biological and mechanical methods. Use chemical methods when appropriate.	Monitor twice a week and treat as needed based on monitoring observation.	Reduce presence of algae to 15% or less of pond surface.
Monitor and remove decomposed organic matter from basins, channel and micro pools	Monitor semi-annually and remove organic matter as needed.	Organic debris is not supporting algae blooms or creating other nuisances. <ul style="list-style-type: none"> Basins, low flow channel and micro pools are able to hold 100% of target capacity.
Monitor and remove sediment from settling areas in basins, and from the low flow channel of Basin 1 (including in-channel sediment traps in the secondary channel and micro pools). Further information on sediment removal from the 2006 GeoSyntec is included below.	Monitor quarterly and remove sediment as needed.	Settling areas, low flow channel and micro pools have adequate capacity to hold anticipated sediment load until next maintenance period. See table below for recommended criteria and recommended management strategies. <ul style="list-style-type: none"> Sediment level shall be at least 1 foot (0.3 m) below outlet elevation in basins, and at least 1 foot (0.3 m) below top of low flow channel Sediment will generally need to be removed from the forebay every 5-7 years, when the accumulated sediment volume exceeds 10% of the basin volume (CASQA, 2003), or when the sediment exceeds about 20% of the

		<ul style="list-style-type: none"> • volume of the forebay Sediment should be removed if the depth of the sediment in the forebay is such that sediments might be subject to scour and resuspension.
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Below is a table for the North Natomas basins identifying the primary settling areas, recommended sediment monitoring locations, and some recommended management strategies. In general, the frequency of sediment removal depends on the sediment deposition rates, and the volumes of either the forebay (if a forebay is provided) or portion of the volume of the main pool (in addition to the water quality treatment volume) set aside for sediment deposition. Predicted deposition rates identified a 2006 GeoSyntec report appear to be so low that, if accurate, the magnitude of deposition might be difficult to measure without actually draining the pond and conducting a level survey to establish a baseline and then conduct an additional survey 10 years or so later. Basins with what appear to be better designed forebays include Basins 7A, 7B, and 3, and sediment deposition will be much larger. A survey of these better designed forebays would include an inspection of the forebays, measurements of depth with a staff gage, utilization of information from the as-builts, and an estimation of deposition.

Because the predicted accumulation of sediments appears to be quite low, sampling sediments from the basins to determine if removal should be conducted based on sediment quality (i.e., accumulation of pollutants relative to hazardous concentrations, or if nutrient accumulation may impact elevated nutrients in the water) should be considered. Literature indicates that sediments removed from basins where drainages are principally residential and commercial are not classified as hazardous, and it is expected the same to be true for the Natomas Basins.

BASIN NO.	PRIMARY SETTLING AREA(S)	RECOMMENDED LOCATION FOR MONITORING SEDIMENT ACCUMULATION	RECOMMENDED MANAGEMENT STRATEGIES
1	Upstream low flow channel with micropools.	Micropools in low flow channel upstream of basin	Sediment level shall be at least 1 foot below top of low flow channel
2	Settling area near the inlet of Sump 12.	Pool near pump station	
3	Forebay at the base of the inlet connecting to upstream flood control basin, and sediment may settle throughout the pond.	Forebay	<ul style="list-style-type: none"> • Sediment level shall be at least 1 foot (0.3 m) below outlet elevation in basins • sediment will generally need to be removed from the forebay every 5-7 years, or when the accumulated sediment volume exceeds 10% of the basin volume (CASQA, 2003)
4	Small forebay at the base of the inlet connected (via 2-54 RCPs) to upstream flood control basin, and sediment may settle throughout the pond.	Micropool in the east portion of basin, in vicinity of inlets to basin.	<ul style="list-style-type: none"> • The pond will need to be emptied periodically to allow the removal of accumulated sediment in order to preserve capacity, and to keep the settling function of the forebays operating properly • sediment will generally need to be removed from the forebay every 5-7 years, or when

BASIN NO.	PRIMARY SETTLING AREA(S)	RECOMMENDED LOCATION FOR MONITORING SEDIMENT ACCUMULATION	RECOMMENDED MANAGEMENT STRATEGIES
			the accumulated sediment volume exceeds 10% of the basin volume (CASQA, 2003)
5	None	In basin proper near inlets	
6A	None	In basin proper near inlets	
7A	Forebays at the bases of each inlet, and sediment may settle throughout the channels and pools.	Forebays	<ul style="list-style-type: none"> The channel and pools need to be emptied periodically to allow the removal of accumulated sediment to preserve capacity and to keep the forebays operating properly A survey of accumulation in the forebays should be conducted to determine frequency of sediment removal. GeoSyntec report indicates that accumulation rates in these forebays are much higher than the other basins (i.e., more frequent than the 5-7 year removal rate).
7B	Forebay by west inlet (for drainage from San Juan Rd) serves only one inlet	Forebay by west inlet	<ul style="list-style-type: none"> A survey of accumulation in the forebays should be conducted to determine frequency of sediment removal. GeoSyntec report indicates that accumulation rates in these forebays are much higher than the other basins (i.e., more frequent than the 5-7 year removal rate).

Inlets

Target condition:

All inlets shall be kept free of obstructions to flow and adequately armored as needed to prevent erosion.

Activity	Frequency	Criteria
Remove obstructions such as vegetation and debris from inlets.	Monitor monthly during dry season and following major events during rainy season. Treat as needed based on monitoring observation.	Water flow shall not be impeded for an area of at least 20 feet from headwall.
Monitor condition of inlet structures such as rock aprons, spillways and pipes for structural failure, undercutting and erosion and repair.	Monthly with repairs as needed.	No evidence of structural failure, erosion or undercutting.

Maintenance Access Roads

Target condition: Access roads are to be clear of physical and visual obstructions.

Activity	Frequency	Criteria
Inspect and repair road as necessary to maintain accessibility for service vehicles	Once per year.	Travel surface is maintained in a way that all types of service vehicles may successfully access maintenance areas.
Keep access roads clean and free of debris, including trash and vegetation	Weekly.	Travel ways are not obstructed
Inspect signs and replace or repair damaged or missing signs where necessary.	Twice per week.	Signs are legible and attractive.

Pond Edge and Islands

Target condition for pond edge:

Maintain diverse mix of native sedges and rushes in limited area of pond and around perimeter of pond to support habitat for water fowl and other wildlife, enhance water quality treatment, and protect pond from encroachment that could create excess organic debris or impact pond capacity and conveyance.

Target condition for islands:

All islands will have well-established vegetation with structural diversity providing habitat refuge and nesting opportunities, and stable shoreline. Species will include emergents, native grasses, forbs (non-woody plants such as annuals and perennials), and trees.

Activity	Frequency	Criteria
Monitor extent of emergent vegetation on ponds edge, and remove plants encroaching into pond or basin floor.	Monthly with removal as needed.	Emergents shall not become established more than 2' into pond or more than 3' outside of pond.
Monitor health and distribution of emergent species. Limit spread of cattails (<i>Typha sp.</i>) to allow other species to become established.	Monthly	Plants should provide a minimum of 80% cover in this area above water's edge, with no fewer than six native wetland plants established per square meter (6/m ²). Cattails should not represent more than 35% of the emergent cover.
Monitor health of trees and herbaceous species on island. Address mortality or disease with replanting, or replacement with other species as appropriate.	Monthly with replanting to occur between September and February for trees or forbs, and year round for emergents.	100% of island surface is vegetated. Emergent species not more than 2' into pond or 3' above pond edge. Tree canopy over 75% of island surface.
Monitor island perimeter for erosion. Identify cause of erosion and stabilize with bioengineered measures such as fiber blankets, additional planting, and regrading.	Monthly with repairs as needed.	Island perimeter stabilized with no evidence of erosion.

Basin Slopes and Floor

General target conditions:

Maintain diverse mix of predominantly native grasses, forbs, shrubs and tree species to provide habitat opportunities, enhance recreation and environmental education experience, and create scenic views without adversely impacting the storage or conveyance capacity of the basin. Landscape should generally emulate the ecology of the local native landscapes, and the species should be adapted to seasonal variations in weather including dry summers and frequent but short periods of inundation in the winter.

Target condition for basin Floor and Basins 3, 4 and 7A slopes:

The basin slope and floor landscape should have a predominance of grasses, forbs and low growing shrubs interspersed with scattered grouping of trees. Shrub and tree species may be more dominant than on basin floor to limit the need for mowing on the slopes

Target condition for Basins 2 and 7B Slopes:

The basin slope landscape should have a predominance of grasses interspersed with scattered grouping of trees

Target condition for Basin 1 channel slope:

Maintain 100% cover on channel slopes of predominantly native grasses, with periodic drifts of native forbs and shrubs. The channel slope landscape should have all surfaces vegetated to prevent erosion. The plant species for this zone may need to be revisited if the channel's water surface elevation is routinely maintained at levels beyond the top of the low flow channel.

Activity	Frequency	Criteria
Monitor for and remove all <u>invasive plants</u> as needed using manual and mechanical methods and selective application of herbicides.	Monitoring twice a year with removal conducted as needed	Less than 1% cover by invasive weeds.
Monitor and manage vegetation to maintain target cover. Thin as needed and identifying supplemental or replacement planting	Every 1 to 3 years	Diverse mix of native species adapted to conditions. For basin floor , maintain 30% tree cover, 30% shrub cover, and the remaining 40% area to be covered by forbs and grasses at density of at least 20 plants per square meter (20/m ²). For basin slopes , maintain 40% tree cover, 40% shrub cover, and remaining 20% area to be covered by grasses and forbs at density of at least 20 plants per square meter (20/m ²). For channel slopes , 30% shrubs and forbs coverage with shrubs arranged in drifts that run generally

		parallel to channel flow, and the remaining 70% are to be covered by grasses at a density of 20 plants per square meter (20/m ²)
Mow native grass areas	Biannually	Set mowing level to 4" or greater. During the time period of August 15 th – March 1 st , you can set the mowing level as low as 3". Remove clippings if in excess of 4" of material
Monitor slopes for visible rills, gullies, or other signs of erosion.	Monthly with repairs as needed.	Channel slopes stabilized with no evidence of erosion.

Attachment A

Terms

Bio-manipulation: Deliberate alteration of an ecosystem by adding or removing species.

Emergent Vegetation: Vegetation that grows in water and pierces the surface so that it is exposed to the air.

Forebay: A small pool located at a basin inlet meant to settle the water and prevent excessive sediment from reaching the basin.

Forbs: Non-woody plants such as annuals and perennials.

Gullies: A large ditch cut into the soil by running water. Gullies are formed after a rill has developed and gone untreated.

Herbaceous Plant: A plant that has leaves and stems that die down at the end of the growing season to the soil level.

Invasive Plant Species: Non-native plant species that infest natural ecosystems.

Native Plant Species: Plants indigenous to an ecosystem.

Nuisance Wildlife Species: Certain wildlife species have the potential to become a nuisance due either to their unchecked capacity for predation of other desirable species, or because their presence is incompatible with the operation and anticipated human uses of the basin. Domestic species may also prey on other desirable wildlife species and their presence should be discouraged. Regular monitoring should be conducted to observe the presence of such species and to control or eradicate their presence as needed. Examples include: skunk, raccoons, beaver, starlings, Canada geese, voles, rats and other rodents, cats, dogs, and mosquitoes.

Rills: Cuts into the soil caused by running water. If erosion is significant, may develop into a gully. Rills can be removed by simple tilling of the disrupted land.

Special Status Species: Any species which is listed as threatened or endangered by the California Department of Fish and Wildlife.

Attachment B

Low Flow Channel and Micro Pools (Basin 1)

General Target conditions:

Maintain capacity by removing accumulated sediment, and manage water quality to prevent nuisances such as odors, insects, and excessive algae blooms.

Target condition for micro pools:

Maintain well-established emergent vegetation in micro pool areas and upstream areas with species diversity providing habitat refuge and nesting opportunities. Maintain adequate year round water surface elevation to support emergent community.

Target condition for low flow channel:

Keep the low flow channel's minimum year round water surface elevation at the top of the concrete channel. Maintain diverse mix of moisture tolerant, low growing (<18") grasses and emergent species such that no unvegetated soil is exposed. Limit spread of cattails (Typha sp.) to allow other species to become established. Plants should provide 100% cover at density of at least 12 plants per square meter (12/m²).

Activity	Frequency	Criteria
Monitor for and remove all invasive species as needed using manual and mechanical methods and selective application of herbicides	Monthly	Less than 1% cover by invasive species.
Monitor health of emergent plants within the channel bed and micro pools.	Monthly	Upstream area of micro pools contains established emergent vegetation. At least two emergent species present, with cattails accounting for no more than 50% of the vegetation at any one pool. Cattails should not represent more than 20% of cover within the channel bed
Monitor and remove sediment from the low flow channel (including in-channel sediment traps in the secondary channel and micro pools	Monitor quarterly and remove sediment as needed.	Low flow channel and micro pools have adequate capacity to hold anticipated sediment load until next maintenance period.

<p>Monitor stability of placed boulders on channel slopes and reposition as necessary to secure any that are likely to become dislodged and enter low flow channel or micro pools. Check bank around groupings for signs of erosion or undercutting.</p>	<p>Monthly</p>	<p>Placed boulders are secure and situated on slopes; none are in low flow channel or micro pools.</p>
<p>Monitor channel bed, micro pool perimeter, and retaining walls for erosion. Identify cause of erosion and stabilize with bioengineered measures such as fiber blankets, additional planting, and re-grading.</p>	<p>Monthly with repairs as needed.</p>	<p>Entire channel bed and micro pool perimeter stabilized with no evidence of erosion.</p>
<p>Monitor and treat for algae blooms using appropriate biological, mechanical or chemical methods.</p>	<p>Monitor monthly and treat as needed based on monitoring observation.</p>	<p>Reduce presence of algae to:</p> <ul style="list-style-type: none"> • 15% or less of low flow channel surface. • 10% or less of micro pool surface.

Passive Upland Park (Basin 7A)

Target condition: Maintain tree, native shrubs, and native grasses species to provide ample shade for basin visitors, enhance passive recreation uses, and create scenic views without adversely impacting the storage or conveyance capacity of the basin.

Activity	Frequency	Criteria
Monitor health of trees and shrubs, and maintain adequate cover and species diversity. Thin shrubs as needed and dead head or prune minimally to prevent fire danger, allowing seed to set as food for birds and wildlife.	Once a year	All trees and shrubs are healthy, properly pruned to prevent hazards and maintain visibility.
Monitor for and remove all invasive species as needed from native shrub beds, using manual or mechanical methods and selective application of herbicides.	Monthly	Manage invasive species prior to seeding stage. Less than 1% cover by invasive plants.
Mow native grass areas	Biannually	Set mowing level to 4" or greater. During the time period of August 15 th – March 1 st , you can set the mowing level as low as 3". Remove clippings if in excess of 4" of material

Attachment C

Special Status Animal Species and Preservation Methods

1.0 Burrowing Owl (*Athene cunicularia*)

- Burrowing owls are small, long-legged, ground-dwelling owls with a yellow bill and bright yellow eyes. They are about 9" tall with a 22" wingspan. They typically use the burrows of squirrels or other animals for nesting, but may also use manmade structures or dig their own burrows if the soil is soft.
- Maintenance activities will avoid impacts to burrowing owls consistent with the Burrowing Owl Mitigation Guidelines adopted by CDFG. Specifically, do not disturb occupied burrows during the nesting season (February 1 through August 31) unless a qualified biologist approved by CDFG verifies through non-invasive measures that either: 1) the birds have not begun egg-laying and incubation; or 2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival



Burrowing Owl and Burrow

Giant Garter Snake (*Thamnophis gigas*)

- The giant garter snake can reach a length of 5' and weigh 1 – 1.5 lbs. Females tend to be slightly larger than males. The snake is brownish to olive with a checkered pattern of black spots, which are separated by yellow stripes. The underside of the snake is cream to olive or brown. Snakes often appear a solid dark color when emerging from winter dormancy.
- Restrict desilting and/or resloping of channels to after May 1 and before October 1 in any calendar year.
- Limit re-sloping of any channels to one side in any calendar year.

- If mowing vegetative cover on the top or inside of channel banks to the water line, or within 200 feet of open water, mow to not less than 6 inches in height measured from the ground.
- Limit activity involving habitat disturbance to the period between May 1 and September 30. This is the active period for giant garter snake and direct mortality is lessened, because snakes are expected to actively move and avoid danger.
- If aquatic habitat must be filled in or excavated between April 15 and September 30, the habitat should first be completely dewatered for at least 15 consecutive days prior to excavation or filling. Make sure dewatered habitat does not continue to support giant garter snake prey – if site cannot be completely dewatered, netting and salvaging of prey items may be necessary. This dewatering measure is also adequate to avoid direct harm of northwestern pond turtle.
- If giant garter snake is found in an area where it would be directly harmed by maintenance activities, cease such activity and allow snake to leave on its own. Notify FWS and biological monitor if snake remains in harm's way and activity must continue. Qualified biological monitor shall remain in the area to make sure snake is not harmed. Escape routes for giant garter snake should be determined in advance of undertaking the maintenance activity to allow the snake to leave on its own. If the snake does not leave on its own within 1 working day, consult further with FWS.



Giant Garter Snake

Swainson's Hawk (*Buteo swainsoni*)

- Swainson's Hawks are medium sized birds that have a 52" wingspan and weighs about 2 lbs. These hawks can have different feather colorations, or morphs, but all have dark upper parts and slender, pointed wings.
- Preserve valley oaks and other large trees wherever possible.
- Do not remove any trees containing raptor nests without first consulting with qualified biological monitor. If tree must be removed, biological monitor should determine whether nest is used by Swainson's hawk. Do not remove nest trees during Swainson's hawk breeding season (March 15 to September 15) unless absolutely necessary. If a Swainson's hawk nest tree is to be removed during the Swainson's hawk breeding season, the tree may not be removed until the biological monitor has determined that breeding is completed and no young are present, or, if young are present, until CDFG has determined that the young have fledged and are no longer dependent upon the nest tree.

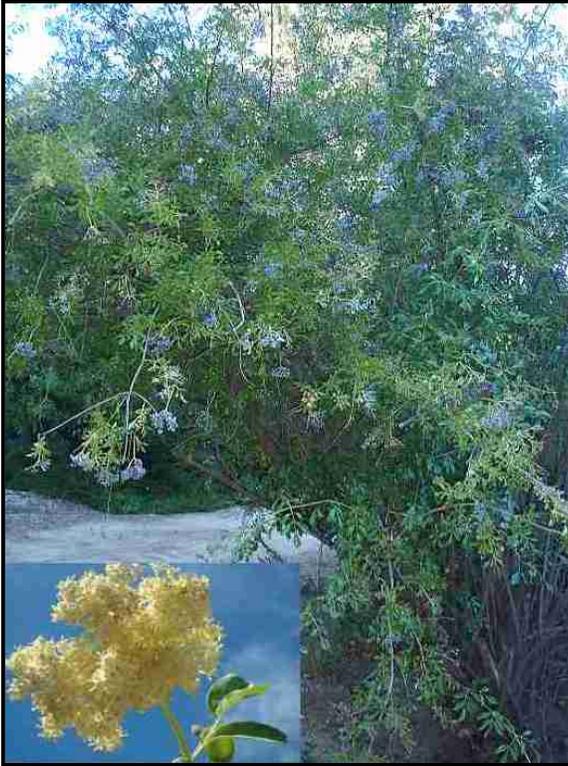


Swainson's Hawk

Valley Elderberry Longhorn Beetle (*Democeros californicus dimorphus*)

- Adult beetles are about $\frac{3}{4}$ inch long with prominent antennae. Females are larger than males, and both have bright red wings.

- Avoiding planting elderberry shrubs (*Sambucus spp.*) in detention basins.
- Remove all shrubs with stems less than one inch in diameter at ground level.
- Avoid pruning or removing shrubs with stems at least one inch in diameter at ground level.
- Do not apply insecticides, herbicides, fertilizers, or other chemicals that might harm VELB or elderberry shrubs within 100 feet of any elderberry shrubs with stems at least one inch in diameter at ground level.
- Mowing within 100 feet of elderberry shrubs may occur during July through April. No mowing should occur within five (5) feet of elderberry stems. Mowing should be done in a way that avoids damaging plants (e.g., stripping away bark through careless use of equipment).



Elderberry Shrub w/Flowers and Fruit and Elderberry Longhorn Beetle

Tricolored Blackbird (*Agelaius tricolor*) and Migratory Bird Species

- The male Tricolored Blackbird can be identified by its distinctive white stripes on the bottom of their red shoulder patches.
- Avoid removal or disturbance of emergent wetland vegetation or blackberry shrubs during tricolored blackbird breeding season (April through July).

- Avoid removal of any vegetation or structures with bird nests during avian breeding season (March 15 through July 31).



Tricolored Blackbird

Nuisance Wildlife Species and Control Methods

1.0 Skunks

- Removal by City Animal Control
- Presence incompatible with recreation and adjacent residential land use

2.0 Raccoons

- Removal by City Animal Control if nuisance develops
- May become dependent on residential food sources such as garbage cans, animal food, etc.
- Animals may become aggressive towards recreational users walking through basin trails and maintenance workers during breeding season

3.0 Beavers

- Removal by City Animal Control if nuisance develops and demolition of dens/dams if basin operation impaired
- May kill trees and shrubs in basin to get materials to build dams
- Structures may impede basin operation

4.0 Starlings

- Remove nests occupied by starlings
- Will occupy nests of native species and prevent native species from reproducing

5.0 Canada Geese

- Maintain emergent vegetation to prevent unimpeded access to water. Encourage diverse forbs interspersed with turf areas to reduce food supply.
- May defoliate turf areas from excessive feeding
- Droppings are incompatible with recreation uses
- May become aggressive towards residents and maintenance workers

6.0 Voles, Rats, and Other Rodents

- Destroy burrows and removal by City Animal Control if nuisance develops. Provide protective cages on young seedlings.
- May destroy irrigation components by gnawing
- May feed on roots and stems of young seedlings

7.0 Cats

- Removal by City Animal Control
- May harass wildlife

8.0 Dogs

- Removal by City Animal Control
- May harass wildlife, recreational users or maintenance staff.

9.0 Mosquitos

- Control by Sacramento/Yolo Mosquito & Vector Control District if nuisance develops
- Vector for disease
- Incompatible with recreation uses

Plant Species

Invasive Plant Species: Issues and Control Methods

1.0 Mosquito Fern (*Azola Sp.*)



- Displaces native vegetation
- Seeds, leaves, and bark toxic to humans

Control Methods: Appropriate herbicide

2.0 Bermuda Grass (*Cynodon Dactylon*)



- Displaces native vegetation

Control Methods: Herbicide, manual removal and shading by other species

3.0 Black Locust (*Robinia Psuedoacacia*)



- Displaces native vegetation
- Seeds, leaves and bark toxic to humans

Control Methods: Mechanical removal, cutting root shoots repeatedly, herbicides

4.0 Dallis Grass (*Paspalum Dilatum*)



- Displaces native species

Control Methods: Manual removal and mowing before seed sets

5.0 Water Hyacinth (*Eichhornia Crassipes*)



- Dominates waterways
- Degrades open water habitat
- Can clog pumps
- Breeding habitat for mosquitos
- Displaces native species

Control Methods: Mechanical removal and approved foliar spray

6.0 Giant Reed (*Arundo Donax*)



- Displaces native plants and associated wildlife
- Reduces habitat
- Fuel load fire hazard
- Reduces basin capacity

Control Methods: Manual removal and approved herbicide

7.0 Himalayan Blackberry (*Rubus Discolor*)



- Competes with native species
- Can limit access to water for wildlife
- Limits access for maintenance
- Limits recreation uses

Control Methods: Manual removal of canes and roots and appropriate herbicide

8.0 Water Primrose (*Ludwigia Peploides*)



- Displaces native species
- Clogs waterways and pumps

Control Methods: Mechanical removal and appropriate herbicide

9.0 Medusa Head Grass (*Taeniatherum Caput-Medusae*)



- Competes with native species
- Inhibits germination of native species
- Fuel load fire danger

Control Methods: Mowing before annual seed is set to prevent dispersal

10.0 Parrot's Feather (*Myriophyllum Aquatica*)



- Competes with native aquatic plants
- Forms dense mats that can entirely cover open water
- Can block pumps and water intakes
- Provides optimal habitat for mosquitos

Control Methods: Mechanical removal preferred

11.0 Bristly Ox-Tounge (*Picris Echinoids*)



- Displaces native species

Control Methods: Manual removal and repeated mowing before seed sets

12.0 Water Lettuce (*Pistia Stratiotes*)



- Displaces native species
- Damages habitat value of open water

Control Methods: Manual removal or appropriate herbicide

13.0 Scotch Broom (*Cystus Scoparius*)



- Displaces native vegetation
- Fuel load fire hazard

Control Methods: Manual removal and appropriate foliar spray

14.0 Red Sesbania (*Sesbania Punicea*)



- Rapidly displaces native species

Control Methods: Manual removal at any time, but especially before seed sets

15.0 Cattails (*Typha Latifolia*)



- Competes with other natives
- Decomposition of plants can reduce pond capacity

Control Methods: Manual removal to limit spread and allow other natives to become established

16.0 Yellow Star Thistle (*Centaurea Solstitialis*)



- Displaces native plants and animals
- Limits recreation use

Control Methods: Mechanical removal with post-emergent herbicide. Important control times are late winter / early spring and mid-summer before seed sets.

PROJECT #: 14053-Natomas CFD-3
PROJECT NAME: Water Quality Detention Basin Regulatory Support
DEPARTMENT: Utilities
DIVISION: Operations & Maintenance

CITY OF SACRAMENTO

**PROFESSIONAL SERVICES AGREEMENT
FOR ARCHITECTS, LANDSCAPE ARCHITECTS, PROFESSIONAL ENGINEERS,
AND PROFESSIONAL LAND SURVEYORS**

THIS AGREEMENT is made at Sacramento, California, as of _____, by and between the **CITY OF SACRAMENTO**, a municipal corporation ("CITY"), and

Blankinship & Associates, Inc.
1590 Drew Avenue, Davis, CA 95618
Phone: (530) 757-0941 Fax: (530) 757-0940

("CONTRACTOR"), who agree as follows:

- Services.** Subject to the terms and conditions set forth in this Agreement, CONTRACTOR shall provide to CITY the services described in Exhibit A. CONTRACTOR shall provide said services at the time, place, and in the manner specified in Exhibit A. CONTRACTOR shall not be compensated for services outside the scope of Exhibit A unless prior to the commencement of such services: (a) CONTRACTOR notifies CITY and CITY agrees that such services are outside the scope of Exhibit A; (b) CONTRACTOR estimates the additional compensation required for these additional services; and (c) CITY, after notice, approves in writing a Supplemental Agreement specifying the additional services and amount of compensation therefor. CITY shall have no obligations whatsoever under this Agreement and/or any Supplemental Agreement, unless and until this Agreement or any Supplemental Agreement is approved by the Sacramento City Manager or the City Manager's authorized designee, or by the Sacramento City Council, as required by the Sacramento City Code.
- Payment.** CITY shall pay CONTRACTOR for services rendered pursuant to this Agreement at the times and in the manner set forth in Exhibit B. The payments specified in Exhibit B shall be the only payments to be made to CONTRACTOR for the services rendered pursuant to this Agreement unless pursuant to Section 1, above, CITY approves additional compensation for additional services. CONTRACTOR shall submit all billings for said services to CITY in the manner specified in Exhibit B, or, if not specified in Exhibit B, according to the usual and customary procedures and practices that CONTRACTOR uses for billing clients similar to CITY.
- Facilities and Equipment.** Except as set forth in Exhibit C, CONTRACTOR shall, at its sole cost and expense, furnish all facilities and equipment that may be required for furnishing services pursuant to this Agreement. CITY shall furnish to CONTRACTOR only the facilities and equipment listed in Exhibit C according to any terms and conditions set forth in Exhibit C.
- General Provisions.** The General Provisions set forth in Exhibit D, that include indemnity and insurance requirements, are part of this Agreement. In the event of any conflict between the General Provisions and any terms or conditions of any document prepared or provided by CONTRACTOR and made a part of

this Agreement, including without limitation any document relating to the scope of services or payment therefor, the General Provisions shall control over said terms or conditions.

- 5. **Non-Discrimination in Employee Benefits.** This Agreement is subject to the provisions of Sacramento City Code Chapter 3.54, Non-Discrimination in Employee Benefits by City Contractors. The requirements of Sacramento City Code Chapter 3.54 are summarized in Exhibit E. CONTRACTOR is required to sign the attached Declaration of Compliance (Equal Benefits Ordinance), to assure compliance with these requirements.
- 6. **Authority.** The person signing this Agreement for CONTRACTOR hereby represents and warrants that he/she is fully authorized to sign this Agreement on behalf of CONTRACTOR and to bind CONTRACTOR to the performance of its obligations hereunder.
- 7. **Exhibits.** All exhibits referred to herein are attached hereto and are by this reference incorporated as if set forth fully herein.

Executed as of the day and year first above stated.

CITY OF SACRAMENTO
A Municipal Corporation

By: _____

Print name: _____

Title: _____

For: John F. Shirey, City Manager

APPROVED TO AS FORM:

City Attorney

ATTEST:

City Clerk

Attachments

- Exhibit A - Scope of Service
- Exhibit B - Fee Schedule/Manner of Payment
- Exhibit C - Facilities/Equipment Provided
- Exhibit D - General Provisions
- Exhibit E - Non-Discrimination in Employee Benefits

CONTRACTOR:

NAME OF FIRM

Federal I.D. No.

State I.D. No.

City of Sacramento Business Op. Tax Cert. No.

TYPE OF BUSINESS ENTITY (*check one*):

- Individual/Sole Proprietor
- Partnership
- Corporation (*may require 2 signatures*)
- Limited Liability Company
- Other (*please specify: _____*)

Signature of Authorized Person

Print Name and Title

Additional Signature (*if required*)

Print Name and Title

**DECLARATION OF COMPLIANCE
Equal Benefits Ordinance**

Name of Contractor: _____

Address: _____

The above named Contractor ("Contractor") hereby declares and agrees as follows:

1. Contractor has read and understands the Requirements of the Non-Discrimination In Employee Benefits Code (the "Requirements") attached hereto as Exhibit E.
2. As a condition of receiving this Agreement, Contractor agrees to fully comply with the Requirements, as well as any additional requirements that may be specified in the City of Sacramento's Non-Discrimination In Employee Benefits Code codified at Chapter 3.54 of the Sacramento City Code (the "Ordinance").
3. Contractor understands, to the extent that such benefits are not preempted or prohibited by federal or state law, employee benefits covered by the Ordinance are any of the following:
 - a. Bereavement Leave
 - b. Disability, life, and other types of insurance
 - c. Family medical leave
 - d. Health benefits
 - e. Membership or membership discounts
 - f. Moving expenses
 - g. Pension and retirement benefits
 - h. Vacation
 - i. Travel benefits
 - j. Any other benefit offered to employees

Contractor agrees that if Contractor offers any of the above-listed employee benefits, Contractor will offer those benefits, without discrimination between employees with spouses and employees with domestic partners, and without discrimination between the spouses and domestic partners of such employees.

4. Contractor understands that Contractor will not be considered to be discriminating in the provision or application of employee benefits under the following conditions or circumstances:
 - a. If the actual cost of providing a benefit to a domestic partner or spouse exceeds the cost of providing the same benefit to a spouse or domestic partner of an employee, Contractor will not be required to provide the benefit, nor shall it be deemed discriminatory, if Contractor requires the employee to pay the monetary difference in order to provide the benefit to the domestic partner or to the spouse.

- b. If Contractor is unable to provide a certain benefit, despite taking reasonable measures to do so, if Contractor provides the employee with a cash equivalent Contractor will not be deemed to be discriminating in the application of that benefit.
 - c. If Contractor provides employee benefits neither to employee's spouses nor to employee's domestic partners.
 - d. If Contractor provides employee benefits to employees on a basis unrelated to marital or domestic partner status.
 - e. If Contractor submits written evidence of making reasonable efforts to end discrimination in employee benefits by implementing policies that will be enacted before the first effective date after the first open enrollment process following the date this Agreement is executed by the City of Sacramento ("City"). Contractor understands that any delay in the implementation of such policies may not exceed one (1) year from the date this Agreement is executed by the City, and applies only to those employee benefits for which an open enrollment process is applicable.
 - f. Until administrative steps can be taken to incorporate nondiscrimination in employee benefits. The time allotted for these administrative steps will apply only to those employee benefits for which administrative steps are necessary and may not exceed three (3) months from the date this Agreement is executed by the City.
 - g. Until the expiration of a current collective bargaining agreement(s) if employee benefits are governed by such collective bargaining agreement(s).
 - h. Contractor takes all reasonable measures to end discrimination in employee benefits by either requesting that the union(s) involved agree to reopen the agreement(s) in order for Contractor to take whatever steps are necessary to end discrimination in employee benefits or by ending discrimination in employee benefits without reopening the collective bargaining agreement(s).
 - i. In the event Contractor cannot end discrimination in employee benefits despite taking all reasonable measures to do so, Contractor provides a cash equivalent to eligible employees for whom employee benefits are not available. Unless otherwise authorized in writing by the City Manager, Contractor understands this cash equivalent must begin at the time the union(s) refuse to allow the collective bargaining agreement(s) to be reopened or not longer than three (3) months after the date this Agreement is executed by the City.
5. Contractor understands that failure to comply with the provisions of Section 4(a) through 4(i), above, will subject Contractor to possible suspension and/or termination of this Agreement for cause; repayment of any or all of the Agreement amount disbursed by the City; debarment for future agreements until all penalties and restitution have been paid in full and/or for up to two (2) years; and/or the imposition of a penalty, payable to the City, in the sum of \$50.00 for each employee, for each calendar day during which the employee was discriminated against in violation of the provisions of the Ordinance.

6. Contractor understands and agrees to provide notice to each current employee and, within ten (10) days of hire, to each new employee, of their rights under the Ordinance. Contractor further agrees to maintain a copy of each such letter provided, in an appropriate file for inspection by authorized representatives of the City. Contractor also agrees to prominently display a poster informing each employee of these rights.

7. Contractor understands that Contractor has the right to request a waiver of, or exemption from, the provisions of the Ordinance by submitting a written request to the City's Procurement Services Division prior to Agreement award, which request shall identify the provision(s) of the Ordinance authorizing such waiver or exemption and the factual basis for such waiver or exemption. The City shall determine in its sole discretion whether to approve any such request.

8. Contractor agrees to defend, indemnify and hold harmless, the City, its officers and employees, against any claims, actions, damages, costs (including reasonable attorney fees), or other liabilities of any kind arising from any violation of the Requirements or of the Ordinance by Contractor.

The undersigned declares under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that he or she is authorized to bind the Contractor to the provisions of this Declaration.

Signature of Authorized Representative

Date

Print Name

Title

EXHIBIT A

PROFESSIONAL SERVICES AGREEMENT FOR DESIGN PROFESSIONALS

SCOPE OF SERVICES

1. Representatives.

The CITY Representative for this Agreement is:

Mick Smith, Drainage Collection Supervisor
5730 24th Street, Bldg #19, Sacramento, CA 95822
Phone (916) 808-2269 Fax (916) 391-3128 E-mail: msmith2@cityofsacramento.org

All CONTRACTOR questions pertaining to this Agreement shall be referred to the CITY Representative or the Representative's designee.

The CONTRACTOR Representative for this Agreement is:

Michael S. Blankinship, P.E.
Blankinship & Associates, Inc.
1590 Drew Avenue, Davis, CA 95618
Phone: (530) 757-0941 Fax: (530) 757-0940

All CITY questions pertaining to this Agreement shall be referred to the CONTRACTOR Representative. All correspondence to CONTRACTOR shall be addressed to the address set forth on page one of this Agreement. Unless otherwise provided in this Agreement, all correspondence to the CITY shall be addressed to the CITY Representative.

2. Professional Liability Insurance. Professional Liability (Errors and Omissions) insurance is required for this Agreement. If required, such coverage must be continued for at least 3 years following the completion of all Services and Additional Services under this Agreement. (See Exhibit D, Section 11, for complete insurance requirements.)

3. Conflict of Interest Requirements.

A. **Generally.** Under the California Political Reform Act, Government Code §§ 81000 et seq., designated employees of the CITY are required to comply with the CITY's Conflict of Interest Code. The term "designated employees" is a term of art and includes individuals who are working for contractors who are providing services or performing work for the CITY and who are considered to be "consultants" under the Political Reform Act. The term "consultant" generally includes individuals who make, or participate in making, governmental decisions or who serve in a staff capacity. Individuals who perform work that is solely clerical, ministerial, manual or secretarial are not "consultants."

The CITY's Conflict of Interest Code requires designated employees, including individuals who qualify as "consultants", to file the following statements of economic interests:

- (1) An “assuming office” statement of economic interests to be filed within 30 days after execution of the agreement between the City and the contractor;
- (2) Annual statements of economic interests while the agreement remains in effect, to be filed not later than April 30 of each year; and
- (3) A “leaving office” statement of economic interests to be filed within 30 days of completion of the contract.

The above statements of economic interests are public records subject to public disclosure under the California Public Records Act.

The CITY’s Conflict of Interest Code also requires individuals who qualify as “consultants” under the Political Reform Act to comply with the conflict of interest provisions of the Political Reform Act, which generally prohibit individuals from making or participating in the making of decisions that will have a material financial effect on their economic interests.

- B. **Conflict of Interest Statements.** The individual(s) who will provide services or perform work pursuant to this Agreement are “consultants” within the meaning of the Political Reform Act and the CITY’s Conflict of Interest Code: yes no *[check one]*

If “yes” is checked above, CONTRACTOR shall cause the following to occur within 30 days after execution of this Agreement:

- (1) Identify the individuals who will provide services or perform work under this Agreement as “consultants”;
- (2) Cause these individuals to file with the CITY Representative the “assuming office” statements of economic interests required by the CITY’s Conflict of Interest Code.

Thereafter, throughout the term of the Agreement, CONTRACTOR shall cause these individuals to file with the CITY Representative annual statements of economic interests, and “leaving office” statements of economic interests, as required by the CITY’s Conflict of Interest Code. The CITY may withhold all or a portion of any payment due under this Agreement until all required statements are filed.

4. **Scope of Services.**

The services provided shall be as set forth in Attachment 1 to Exhibit A, attached hereto and incorporated herein.

5. **Time of Performance.**

The services described in Attachment 1 to Exhibit A, attached hereto and incorporated herein, shall be provided for an initial one year term beginning at contract award and ending on June 30, 2014, with the option to extend for up to two additional one-year terms, not to exceed a maximum of three years. Extensions of the contract in succeeding fiscal years shall be subject to funding availability in the adopted budgets for each fiscal year.

ATTACHMENT 1 TO EXHIBIT A

City of Sacramento Water Quality Detention Basin Regulatory Support

2013-2014 Blankinship & Associates Scope of Work

This Scope of Work describes the consulting services to be provided by Blankinship & Associates, Inc. (Blankinship) and its subcontractors collectively ("CONTRACTOR") to the City of Sacramento Department of Utilities (DOU) for regulatory support needed to comply with the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit #CAG990005 for the discharge of aquatic pesticides used for aquatic weed control, and with the Streambed Alteration Agreement between the Department of Fish and Wildlife (DFW) and City of Sacramento Department of Utilities for Routine Maintenance of Stream Channels within the City. Services will include the following tasks:

TASK 1: REGULATORY SUPPORT FOR DOU'S AQUATIC WEED CONTROL NPDES PERMIT

The objective of this task is to support DOU in managing DOU's aquatic weed control NPDES permit. In 2004, the State Water Resources Control Board (SWRCB) created Statewide General NPDES Permit for the Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States ("permit"). In order to make applications of aquatic pesticides to Waters of the United States, the permit is needed. The Permit was revised on March 5, 2013 and will become available on December 1, 2013. The NPDES permit requires compliance with the following:

- The Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries in California (aka the State Implementation Policy, or SIP)
- The California Toxics Rule (CTR)
- Applicable Regional Water Quality Control Board (RWQCB) Basin Plan Water Quality Objectives (WQOs)

In 2012, Blankinship prepared the City's Notice of Intent (NOI) and an Aquatic Pesticide Application Plan (APAP). In 2013, Blankinship performed sampling and analysis for aquatic pesticide applications made by the City. In order to have new permit coverage, the following sub-tasks are proposed:

Sub-Task 1.1: Project Meetings

As needed, Blankinship will meet City staff to refine our understanding of City operations related to aquatic weed management and permit compliance. This will include, but not be limited to discussions on weed types, thresholds and locations, herbicide efficacy, etc.

Sub-Task 1.2: Revise and Prepare an Aquatic Pesticide Application Plan (APAP)

Based on the new permit, Blankinship will revise the existing APAP and prepare a draft and final Aquatic Pesticide Application Plan (APAP) suitable for submittal to the RWQCB that documents compliance with the Notice of Intent (NOI) and permit requirements.

If the City obtains a SIP exception for the use of copper and acrolein, Blankinship will amend the NOI and APAP.

Sub-Task 1.3: APAP Training

During one of the sampling events described in Sub-Task 1.4 below, Blankinship will instruct and demonstrate to City staff proper sample site location selection and criteria and appropriate technique for sample collection, labeling and packaging, field analysis and recordkeeping. Training will cover sampling site selection and the procurement of and proper use, maintenance and calibration of field testing

equipment for pH, turbidity and conductivity. This task does not include the purchase of field instruments.

Sub-Task 1.4: Sample Collection and Analysis

Based on the revised APAP, Blankinship will collect and submit for analysis surface water samples according to permit requirements.

Specifically, Blankinship will collect and submit for laboratory analysis at up to six (6) aquatic pesticide application events using one of following active ingredients: glyphosate, imazapyr, triclopyr, 2,4-D, penoxulum, imazamox, fluridone, endothal, diquat, sodium carbonate peroxyhydrate, for copper and acrolein. Note that copper and acrolein can only be used if the City obtains a SIP exception.

If additional sites are sampled or additional trips are required, additional costs may be incurred.

Reduced and no analytical laboratory costs are associated with sampling for glyphosate and sodium carbonate peroxyhydrate, respectively. If these herbicides are used, sampling and analysis at site(s) and/or application(s) beyond that stated above may be possible depending on remaining budget. All aquatic herbicide applications are assumed not to use a nonylphenol-like adjuvant; additional costs will be incurred if this is not the case.

After sample collection, Blankinship will arrange for sample transportation under chain-of-custody procedures to an analytical laboratory certified for the required analyses. Upon receipt of the analytical laboratory data, Blankinship will perform quality assurance/quality control (QA/QC) and validation of the data consistent with requirements of the APAP.

Sub-Task 1.5: Annual Report Preparation for 2013 and 2014

Based on the activity from the above tasks and from data collected during 2013, Blankinship will tabulate analytical laboratory and field data, and prepare tables of results for inclusion in the annual 2013 and 2014 annual reports to the RWQCB. After City staff review of the draft reports, Blankinship will submit final reports to the RWQCB on the City's behalf.

TASK 2: REGULATORY SUPPORT ON DOU'S DFW ROUTINE MAINTENANCE AGREEMENT (RMA)

CONTRACTOR will provide as-needed professional and technical support to DOU with DOU's Routine Maintenance Agreement (RMA) with the California Department of Fish and Wildlife (DFW). DOU maintains various water quality detention basins and associated channels that eventually discharge into local waterways. In addition to stormwater quality treatment and flood control, aesthetic and recreational value, provides wildlife habitat, and are viewed as a public amenity due to their integration into a park or open space. Because some detention basins provide wildlife habitat and aquatic features, CONTRACTOR will coordinate with DOU to perform the following services:

Sub-Task 2.1 Develop Quick Reference Cards

CONTRACTOR will develop quick-reference cards or alike for identification of select special status species. CONTRACTOR will provide approximately 25 sets of cards.

Sub-Task 2.2 Annual Training

CONTRACTOR will provide annual training to City field staff on special status species. This training will be done in City facilities and will include appropriate presentations by a combination of CONTRACTOR'S biologists. Focus will be on existing maintenance facilities and activities, the content of the existing CDFW RMA and previously observed or anticipated species.

Sub-Task 2.3 Biological Surveys

CONTRACTOR will conduct biological surveys of work areas as requested by DOU and according to the requirements of the existing DFW RMA. When requested by DOU, a qualified biologist will conduct surveys in areas where special status species are likely to occur, and will determine whether such species are present. Results of our surveys will be presented in technical memorandum. The number of surveys will be limited by the budget allocated.

Sub-Task 2.4 Renewal Negotiations

CONTRACTOR expects that the utility of the current DFW RMA will be demonstrated through DOU adherence while working on maintenance projects identified in or authorized by the RMA. Based on the CONTRACTOR'S observations and feedback from City maintenance staff, CONTRACTOR will meet with City staff and prepare key elements of the draft revised RMA. CONTRACTOR will then meet with both City and DFW staff assist with the negotiation of a revised City RMA.

NOTES TO SCOPE OF WORK

1. Assumptions and limitations are as stated in the tasks above.
2. Work will commence 2 weeks upon execution of this agreement. Work on Task 1 will commence first.
3. The period during which Blankinship & Associates services described herein will extend from approximately October 2013 through approximately June 2014. However, upon mutual consent of the City and Blankinship and Associates, some activities may extend beyond this time.
4. Remaining budget from FY2013/2014 may be utilized for assignments continuing in FY2014/2015.

OPTIONAL TASK : STATE IMPLEMENTATION POLICY (SIP) EXCEPTION

Nuisance aquatic vegetation in and along the City's water quality detention basins and associated channels includes but is not limited to: emergent weeds (cattail, bulrush, tules), floating weeds (azolla and duckweed), submersed weeds (milfoil, sago and curly leaf pond weed) and algae. The City has historically used Reward[®] (diquat) and various glyphosate-containing herbicides to control one or more of these aquatic plants. The City does not currently use copper.

The concentration of copper needed to effectively control aquatic weeds typically exceeds SIP water quality criteria in treatment area after treatment is complete and/or in receiving water during or after treatment.

Although the SIP prohibits discharge of copper in excess of applicable water quality criteria into receiving waters, Section 5.3 of the SIP allows for short term or seasonal exceptions from meeting water quality criteria if determined to be necessary to implement control measures either for resource or pest management conducted by public entities. Such exceptions may also be granted for draining water supply reservoirs, canals, and pipelines for maintenance, for draining municipal storm water conveyances for cleaning or maintenance, or for draining water treatment facilities for cleaning or maintenance. The City has concluded that it meets one or more of the criteria for gaining a Section 5.3 SIP exception.

Permittees who elect to use a SIP exception to gain permit coverage must satisfactorily complete several steps, including preparation and submission of a California Environmental Quality Act (CEQA) document which when completed and submitted to the SWRCB, will be referenced in a revised permit. Once listed in the revised Permit, the City may discharge copper to receiving waters in excess of water criteria on a short term or seasonal basis.

The SWRCB staff has indicated once all application documents are submitted, they will post the City's SIP exception request for a 30 day public notice and draft a resolution that adds the City to the permit's exception list. Once these steps are completed, SWRCB staff will schedule a request for permit reopening on a SWRCB meeting agenda. During the meeting, the SWRCB will be asked to adopt the resolution and the revised exception list which is attached to the permit.

In order for the City to gain a SIP exception for use in 2014, the following optional tasks shall be performed if, and as directed by, City:

Agency Pre-Consultation and Consultation

Blankinship will meet with SWRCB and/or Central Valley RWQCB staff as responsible and trustee agencies to discuss and present details of the proposed CEQA document prior to submittal.

City Pre-Consultation and Consultation

Blankinship will meet with City staff to gather further details of the aquatic weed management program. At a minimum, the following data and documentation is required:

1. Data on the type and location of known or suspected endangered, threatened, or listed species;
2. Information on the status of any endangered, threatened or listed species or habitat within the District;
3. Habitat or water quality related interactions with regulatory agencies such as Department of Pesticide Regulation (CDPR), County Agricultural Commissioner (CAC), National Marine Fisheries Service (NMFS), US Fish and Wildlife Service (USFWS), US Army Corps of Engineers (COE), California Department of Fish & Wildlife (CDFW), or other local, state, and federal agencies;
4. Information on the status and activity of any group(s) that may oppose the use of copper and/or acrolein or have been adverse to the District on related issues.

CEQA Document Preparation and Notice of Preparation

Based on the results of Sub-Tasks 2.1 and 2.2, Blankinship will prepare a CEQA Initial Study that includes significant focus on water quality and biological resources with the intention of identifying the water quality and/or biological environmental impacts of the project and determine whether the identified impacts are "significant". The project is defined as the City's use of copper to control aquatic weeds in detention basins and water conveyances.

Based on findings of "significance", Blankinship will prepare one of the following documents:

- Negative Declaration if there are no "significant" impacts; or
- Mitigated Negative Declaration if there are potentially "significant" impacts that can be avoided or mitigated

If one or more potentially significant impacts are identified, Blankinship intends to establish a course of mitigation based on one or more of the following:

1. The EPA registration process resulting in the product label;
2. The CDPR registration process resulting in a California label;
3. The PCA written recommendation;
4. The application done or supervised by a QAL/QAC;
5. The existence of the NPDES Permit:
 - a. Monitoring and reporting as required;
 - b. Cumulative impacts assessed by SWRCB through permit;
6. The existence of the SIP exception to the CTR Priority Pollutant values for copper and/or acrolein;

7. Current mitigation employed by the District, including, but not limited to implementation of Integrated Pest Management (IPM); and
8. Available water quality data that demonstrates no apparent adverse impacts from the use of copper and/or acrolein.

Publication, Notification and Filing

Working with City staff, Blankinship will assist in the preparation and circulation of a public Notice of Intent (NOI) to adopt a Negative Declaration or Mitigated Negative Declaration. This will include the following sub-tasks:

- Post an NOI with the Sacramento County Clerk, individuals and locations identified by the City;
- Provide an NOI and a Notice of Completion (NOC) to the State Clearing House, responsible, trustee, and other agencies identified by the City;
- Consult with up to three (3) responsible and trustee agencies identified by the City;
- If there are proposed changes to mitigation measures, attend a public hearing;
- File a Notice of Determination (NOD) with the County Clerk and the State Office of Planning and Research.

Preparation of SIP Exception and Submission to the SWRCB

Blankinship will prepare required SIP Exception documents according to the “Procedures for Case-by-Case Exceptions from SIP Provisions” published by the SWRCB. Once completed, Blankinship will deliver the SIP exception request documentation package to SWRCB staff.

Attend SWRCB Workshop and Meeting

On the behalf of the City, Blankinship will attend one (1) SWRCB meeting to answer any questions pertaining to the City’s SIP exception request and CEQA documentation.

Assumptions and Limitations

In addition to the conditions stated in the tasks above, the scope of work for TASK 2 assumes the following:

- 1.) The City is the certifying lead agency for the Negative Declaration or Mitigated Negative Declaration
- 2.) Biological resource data, historical copper use data if available, maps, and other required project background information is made readily available to us by the City when available.
- 3.) Blankinship’s proposal was prepared consistent with the “Statewide General NPDES permit for Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States” adopted by the SWRCB on March 5, 2013 and effective December 1, 2013.
- 4.) The timeline for the re-opening of the Permit by the SWRCB to add the City as a SIP exception holder is unknown. As such, Blankinship will work with SWRCB staff to identify the earliest possible date.
- 5.) Because TASK 2’s scope is based on requirements of the Permit, uncertainty exists as to the level of effort needed to prepare a scientifically and legally defensible CEQA document. This scope of work proposes that an initial study/negative declaration be used initially. Depending on factors including, but not limited to, state agency policy, public comment, revisions to the Permit and the results of the initial study, and other factors not yet known, an EIR may be required. No warranty, expressed or implied is made that suggests that an initial study/negative declaration will be adequate.

- 6.) Blankinship's scope for TASK 2 is of a technical nature and Blankinship does not offer legal advice. Accordingly, we strongly suggest that the CEQA documentation be reviewed by the City's legal counsel.
- 7.) Delays caused by the City or the City's legal counsel are not the responsibility of Blankinship & Associates, Inc.
- 8.) Blankinship's response to public comments is limited to a total of 5 staff hours.

Blankinship's attendance at City meetings, public hearings, and consultation with responsible and trustee agencies identified by the City is limited to 15 hours.

EXHIBIT B

PROFESSIONAL SERVICES AGREEMENT FOR DESIGN PROFESSIONALS

FEE SCHEDULE/MANNER OF PAYMENT

1. **CONTRACTOR's Compensation.** The total of all fees paid to the CONTRACTOR for the performance of all services set forth in Exhibit A, including normal revisions (hereafter the "Services"), and for all authorized Reimbursable Expenses, shall not exceed the total sum of \$ 225,000.
2. **Billable Rates.** CONTRACTOR shall be paid for the performance of Services on an hourly rate, daily rate, flat fee, lump sum or other basis, as set forth in Attachment 1 to Exhibit B, attached hereto and incorporated herein.
3. **CONTRACTOR's Reimbursable Expenses.** Reimbursable Expenses shall be limited to actual expenditures of CONTRACTOR for expenses that are necessary for the proper completion of the Services and shall only be payable if specifically authorized in advance by CITY.
4. **Payments to CONTRACTOR.**
 - A. Payments to CONTRACTOR shall be made within a reasonable time after receipt of CONTRACTOR's invoice, said payments to be made in proportion to services performed or as otherwise specified in Attachment 1 to Exhibit B. CONTRACTOR may request payment on a monthly basis. CONTRACTOR shall be responsible for the cost of supplying all documentation necessary to verify the monthly billings to the satisfaction of CITY.
 - B. All invoices submitted by CONTRACTOR shall contain the following information:
 - (1) Job Name
 - (2) Description of services billed under this invoice, and overall status of project
 - (3) Date of Invoice Issuance
 - (4) Sequential Invoice Number
 - (5) CITY's Purchase Order Number
 - (6) Total Contract Amount
 - (7) Amount of this Invoice (Itemize all Reimbursable Expenses)
 - (8) Total Billed to Date
 - (9) Total Remaining on Contract
 - (10) Updated project schedule. This shall identify those steps that shall be taken to bring the project back on schedule if it is behind schedule.
 - C. Items shall be separated into Services and Reimbursable Expenses. Billings that do not conform to the format outlined above shall be returned to CONTRACTOR for correction. CITY shall not be responsible for delays in payment to CONTRACTOR resulting from CONTRACTOR's failure to comply with the invoice format described below.

D. Requests for payment shall be sent to:

*Department of Utilities, Operations & Maintenance
5730 24th Street, Sacramento, CA 95822
Phone: (916) 808-6275 Fax: (916) 421-4596*

Attn: Jaime Lynne Brown

5. **Additional Services.** Additional Services are those services related to the scope of services of CONTRACTOR set forth in Exhibit A but not anticipated at the time of execution of this Agreement. Additional Services shall be provided only when a Supplemental Agreement authorizing such Additional Services is approved by CITY in accordance with CITY's Supplemental Agreement procedures. CITY reserves the right to perform any Additional Services with its own staff or to retain other consultants to perform said Additional Services.
6. **Accounting Records of CONTRACTOR.** During performance of this Agreement and for a period of three (3) years after completing all Services and Additional Services hereunder, CONTRACTOR shall maintain all accounting and financial records related to this Agreement, including, but not limited to, records of CONTRACTOR's costs for all Services and Additional Services performed under this Agreement and records of CONTRACTOR's Reimbursable Expenses, in accordance with generally accepted accounting practices, and shall keep and make such records available for inspection and audit by representatives of the CITY upon reasonable written notice.
7. **Taxes.** CONTRACTOR shall pay, when and as due, any and all taxes incurred as a result of CONTRACTOR's compensation hereunder, including estimated taxes, and shall provide CITY with proof of such payment upon request. CONTRACTOR hereby agrees to indemnify CITY for any claims, losses, costs, fees, liabilities, damages or injuries suffered by CITY arising out of CONTRACTOR's breach of this Section 7.

Attachment 1 to Exhibit B

FEE SCHEDULE/MANNER OF PAYMENT

Budget for Blankinship and Associates, Inc.

CONTRACTOR’S Compensation: The total of all fees paid to the CONTRACTOR for the performance of all services set forth in Exhibit A, including normal revisions (hereafter the “Services”), and for all authorized Reimbursable Expenses, shall not exceed the total sum of **\$ 79,000.00** for the Initial one-year term. Pricing for subsequent one-year extensions shall be subject to negotiation between the CITY and the CONTRACTOR based on estimated scope of services at that time.

The Water Quality Detention Basin Regulatory Support has been divided into two tasks, plus one optional task, each of which is divided into additional sub-tasks. Invoices will be paid on a time and materials basis against the tasked outlined in the Payment Schedule below. Each month the CONTRACTOR will prepare an itemized invoice outlining charge’s specific to each task.

Payment Schedule

<u>Task</u>	<u>Description</u>	<u>Total*</u>
1	AQUATIC WEED CONTROL NPDES PERMIT REGULATORY SUPPORT	
	1.1 Project Meetings	\$2,000
	1.2 Revise and Prepare APAP	\$3,000
	1.3 APAP Training	\$2,000
	1.4 Sample Collection and Analysis	\$20,000
	1.5 Annual Report Preparation for 2013 and 2014	\$3,000
2	DFW ROUTINE MAINTENANCE AGREEMENT REGULATORY SUPPORT	
	2.1 Develop Quick Reference Cards	\$4,000
	2.2 Annual Training	\$4,000
	2.3 Biological Surveys	\$6,000
	2.4 Renewal Negotiations	\$6,000
	Items 1 & 2 SUBTOTAL	\$50,000

Optional	STATE IMPLEMENTATION POLICY (SIP) EXCEPTION	
	Agency Pre-Consultation and Consultation	\$2,000
	City Pre-Consultation and Consultation	\$2,000
	CEQA Document Preparation and Notice of Preparation	\$20,000
	Publication, Notification and filing	\$2,000
	Preparation of SIP Exception and Submission to the SWRCB	\$2,000
	Attend SWRCB Workshop and Meeting	\$1,000
	Optional SUBTOTAL	\$ 29,000
	<u>TOTAL</u>	\$79,000

***The City Representative can approve reallocations of the above budget amounts from one task to another, provided that the not-to-exceed amount specified in Exhibit B of this Agreement is not exceeded.**

Expenses:

Expenses such as travel (tolls, per diem, etc.) and outside services (copying, binding, etc.) are charged at cost plus 15%. Mileage charges are at Internal Revenue Service (IRS) rates. Costs for field equipment and vehicle use will be charged according to Blankinship & Associates current fee schedule.

Blankinship & Associates, Inc.
Statement of Qualifications
Water Quality Detention Basin Maintenance and Regulatory Support
Q13141431008

Fee Schedule

<u>Person</u>	<u>Firm</u>	<u>Hourly Rate</u>
Blankinship	Blankinship	185
Sullivan	Blankinship	145
Burkholder	Blankinship	135
Beil	Blankinship	125
Bonnar	Blankinship	125
Acersion	Blankinship	125
Tanaka	Blankinship	125
Reynolds	HT Harvey	185
Boursier	HT Harvey	225
White	HT Harvey	135

EXHIBIT C

PROFESSIONAL SERVICES AGREEMENT FOR DESIGN PROFESSIONALS

FACILITIES AND EQUIPMENT TO BE PROVIDED BY CITY

CITY shall [*check one*] Not furnish any facilities or equipment for this Agreement; or

furnish the following facilities or equipment for the Agreement [*list, if applicable*]:

EXHIBIT D

PROFESSIONAL SERVICES AGREEMENT FOR DESIGN PROFESSIONALS

GENERAL PROVISIONS

1. Independent Contractor.

- A. It is understood and agreed that CONTRACTOR (including CONTRACTOR's employees) is an independent contractor and that no relationship of employer-employee exists between the parties hereto for any purpose whatsoever. Neither CONTRACTOR nor CONTRACTOR's assigned personnel shall be entitled to any benefits payable to employees of CITY. CITY is not required to make any deductions or withholdings from the compensation payable to CONTRACTOR under the provisions of this Agreement, and CONTRACTOR shall be issued a Form 1099 for its services hereunder. As an independent contractor, CONTRACTOR hereby agrees to indemnify and hold CITY harmless from any and all claims that may be made against CITY based upon any contention by any of CONTRACTOR's employees or by any third party, including but not limited to any state or federal agency, that an employer-employee relationship or a substitute therefor exists for any purpose whatsoever by reason of this Agreement or by reason of the nature and/or performance of any Services under this Agreement. (As used in this Exhibit D, the term "Services" shall include both Services and Additional Services as such terms are defined elsewhere in this Agreement.)
- B. It is further understood and agreed by the parties hereto that CONTRACTOR, in the performance of its obligations hereunder, is subject to the control and direction of CITY as to the designation of tasks to be performed and the results to be accomplished under this Agreement, but not as to the means, methods, or sequence used by CONTRACTOR for accomplishing such results. To the extent that CONTRACTOR obtains permission to, and does, use CITY facilities, space, equipment or support services in the performance of this Agreement, this use shall be at the CONTRACTOR's sole discretion based on the CONTRACTOR's determination that such use will promote CONTRACTOR's efficiency and effectiveness. Except as may be specifically provided elsewhere in this Agreement, the CITY does not require that CONTRACTOR use CITY facilities, equipment or support services or work in CITY locations in the performance of this Agreement.
- C. If, in the performance of this Agreement, any third persons are employed by CONTRACTOR, such persons shall be entirely and exclusively under the direction, supervision, and control of CONTRACTOR. Except as may be specifically provided elsewhere in this Agreement, all terms of employment, including hours, wages, working conditions, discipline, hiring, and discharging, or any other terms of employment or requirements of law, shall be determined by CONTRACTOR. It is further understood and agreed that CONTRACTOR shall issue W-2 or 1099 Forms for income and employment tax purposes, for all of CONTRACTOR's assigned personnel and subcontractors.
- D. The provisions of this Section 1 shall survive any expiration or termination of this Agreement. Nothing in this Agreement shall be construed to create an exclusive relationship between CITY and CONTRACTOR. CONTRACTOR may represent, perform services for, or be employed by such additional persons or companies as CONTRACTOR sees fit provided that CONTRACTOR does not violate the provisions of Section 5, below.

2. **Licenses; Permits, Etc.** CONTRACTOR represents and warrants that CONTRACTOR has all licenses, permits, City Business Operations Tax Certificate, qualifications, and approvals of whatsoever nature that are legally required for CONTRACTOR to practice its profession or provide any services under the Agreement. CONTRACTOR represents and warrants that CONTRACTOR shall, at its sole cost and expense, keep in effect or obtain at all times during the term of this Agreement any licenses, permits, and approvals that are legally required for CONTRACTOR to practice its profession or provide such Services. Without limiting the generality of the foregoing, if CONTRACTOR is an out-of-state corporation, CONTRACTOR warrants and represents that it possesses a valid certificate of qualification to transact business in the State of California issued by the California Secretary of State pursuant to Section 2105 of the California Corporations Code.
3. **Time.** CONTRACTOR shall devote such time and effort to the performance of Services pursuant to this Agreement as is necessary for the satisfactory and timely performance of CONTRACTOR's obligations under this Agreement. Neither party shall be considered in default of this Agreement, to the extent that party's performance is prevented or delayed by any cause, present or future, that is beyond the reasonable control of that party.
4. **CONTRACTOR Not Agent.** Except as CITY may specify in writing, CONTRACTOR and CONTRACTOR's personnel shall have no authority, express or implied, to act on behalf of CITY in any capacity whatsoever as an agent. CONTRACTOR and CONTRACTOR's personnel shall have no authority, express or implied, to bind CITY to any obligations whatsoever.
5. **Conflicts of Interest.** CONTRACTOR covenants that neither it, nor any officer or principal of its firm, has or shall acquire any interest, directly or indirectly, that would conflict in any manner with the interests of CITY or that would in any way hinder CONTRACTOR's performance of Services under this Agreement. CONTRACTOR further covenants that in the performance of this Agreement, no person having any such interest shall be employed by it as an officer, employee, agent or subcontractor, without the written consent of CITY. CONTRACTOR agrees to avoid conflicts of interest or the appearance of any conflicts of interest with the interests of CITY at all times during the performance of this Agreement. If CONTRACTOR is or employs a former officer or employee of the CITY, CONTRACTOR and any such employee(s) shall comply with the provisions of Sacramento City Code Section 2.16.090 pertaining to appearances before the City Council or any CITY department, board, commission or committee.
6. **Confidentiality of CITY Information.** During performance of this Agreement, CONTRACTOR may gain access to and use CITY information regarding inventions, machinery, products, prices, apparatus, costs, discounts, future plans, business affairs, governmental affairs, processes, trade secrets, technical matters, systems, facilities, customer lists, product design, copyright, data, and other vital information (hereafter collectively referred to as "City Information") that are valuable, special and unique assets of the CITY. CONTRACTOR agrees to protect all City Information and treat it as strictly confidential, and further agrees that CONTRACTOR shall not at any time, either directly or indirectly, divulge, disclose or communicate in any manner any City Information to any third party without the prior written consent of CITY. In addition, CONTRACTOR shall comply with all CITY policies governing the use of the CITY network and technology systems, as set forth in applicable provisions of the City of Sacramento Administrative Policy Instructions # 30. A violation by CONTRACTOR of this Section 6 shall be a material violation of this Agreement and shall justify legal and/or equitable relief.

7. CONTRACTOR Information.

- A. CITY shall have full ownership and control, including ownership of any copyrights, of all information prepared, produced, or provided by CONTRACTOR pursuant to this Agreement. In this Agreement, the term “information” shall be construed to mean and include: any and all work product, submittals, reports, plans, specifications, and other deliverables consisting of documents, writings, handwritings, typewriting, printing, photostatting, photographing, computer models, and any other computerized data and every other means of recording any form of information, communications, or representation, including letters, works, pictures, drawings, sounds, or symbols, or any combination thereof. CONTRACTOR shall not be responsible for any unauthorized modification or use of such information for other than its intended purpose by CITY.
- B. CONTRACTOR shall fully defend, indemnify and hold harmless CITY, its officers and employees, and each and every one of them, from and against any and all claims, actions, lawsuits or other proceedings alleging that all or any part of the information prepared, produced, or provided by CONTRACTOR pursuant to this Agreement infringes upon any third party’s trademark, trade name, copyright, patent or other intellectual property rights. CITY shall make reasonable efforts to notify CONTRACTOR not later than ten (10) days after CITY is served with any such claim, action, lawsuit or other proceeding, provided that CITY’s failure to provide such notice within such time period shall not relieve CONTRACTOR of its obligations hereunder, which shall survive any termination or expiration of this Agreement.
- C. All proprietary and other information received from CONTRACTOR by CITY, whether received in connection with CONTRACTOR’s proposal to CITY or in connection with any Services performed by CONTRACTOR, will be disclosed upon receipt of a request for disclosure, pursuant to the California Public Records Act; provided, however, that, if any information is set apart and clearly marked “trade secret” when it is provided to CITY, CITY shall give notice to CONTRACTOR of any request for the disclosure of such information. The CONTRACTOR shall then have five (5) days from the date it receives such notice to enter into an agreement with the CITY, satisfactory to the City Attorney, providing for the defense of, and complete indemnification and reimbursement for all costs (including plaintiff’s attorney fees) incurred by CITY in any legal action to compel the disclosure of such information under the California Public Records Act. The CONTRACTOR shall have sole responsibility for defense of the actual “trade secret” designation of such information.
- D. The parties understand and agree that any failure by CONTRACTOR to respond to the notice provided by CITY and/or to enter into an agreement with CITY, in accordance with the provisions of subsection C, above, shall constitute a complete waiver by CONTRACTOR of any rights regarding the information designated “trade secret” by CONTRACTOR, and such information shall be disclosed by CITY pursuant to applicable procedures required by the Public Records Act.

8. Standard of Performance. CONTRACTOR shall perform all Services required pursuant to this Agreement in the manner and according to the standards currently observed by a competent practitioner of CONTRACTOR's profession in California. All products of whatsoever nature that CONTRACTOR delivers to CITY pursuant to this Agreement shall be prepared in a professional manner and conform to the standards of quality normally observed by a person currently practicing in CONTRACTOR's profession, and shall be provided in accordance with any schedule of performance specified in Exhibit A. CONTRACTOR shall assign only competent personnel to perform Services pursuant to this Agreement. CONTRACTOR shall notify CITY in writing of any changes in CONTRACTOR's staff assigned to perform the Services required under this Agreement, prior to any such performance. In the event that CITY, at any time during the term of this Agreement, desires the removal of any person assigned by CONTRACTOR to perform Services pursuant to this Agreement, because CITY, in its sole discretion, determines that such person is not performing in accordance with the standards required herein, CONTRACTOR shall remove such person immediately upon receiving notice from CITY of the desire of CITY for the removal of such person.

9. Term; Suspension; Termination.

- A. This Agreement shall become effective on the date that it is approved by both parties, set forth on the first page of the Agreement, and shall continue in effect until both parties have fully performed their respective obligations under this Agreement, unless sooner terminated as provided herein.
- B. CITY shall have the right at any time to temporarily suspend CONTRACTOR's performance hereunder, in whole or in part, by giving a written notice of suspension to CONTRACTOR. If CITY gives such notice of suspension, CONTRACTOR shall immediately suspend its activities under this Agreement, as specified in such notice.
- C. CITY shall have the right to terminate this Agreement at any time by giving a written notice of termination to CONTRACTOR. If CITY gives such notice of termination, CONTRACTOR shall immediately cease rendering Services pursuant to this Agreement. If CITY terminates this Agreement:
 - (1) CONTRACTOR shall, not later than five days after such notice of termination, deliver to CITY copies of all information prepared pursuant to this Agreement.
 - (2) CITY shall pay CONTRACTOR the reasonable value of Services rendered by CONTRACTOR prior to termination; provided, however, CITY shall not in any manner be liable for lost profits that might have been made by CONTRACTOR had the Agreement not been terminated or had CONTRACTOR completed the Services required by this Agreement. In this regard, CONTRACTOR shall furnish to CITY such financial information as in the judgment of the CITY is necessary for CITY to determine the reasonable value of the Services rendered by CONTRACTOR. The foregoing is cumulative and does not affect any right or remedy that CITY may have in law or equity.

10. Indemnity.

- A. Indemnity: CONTRACTOR shall defend, hold harmless and indemnify CITY, its officers and employees, and each and every one of them, from and against any and all claims, actions, damages, costs, liabilities, demands, losses, judgments, penalties and expenses of every type and description, including, but not limited to, any fees and/or costs reasonably incurred by CITY's staff attorneys or outside attorneys and any fees and expenses incurred in enforcing this provision (hereafter collectively referred to as "Liabilities"), including but not limited to Claims arising from personal injury or death, damage to personal, real, or intellectual property, or the environment, contractual or other economic damages, or regulatory penalties, that arise out of, pertain to, or relate to any negligent act or omission, recklessness, or willful misconduct of CONTRACTOR, its sub-consultants, subcontractors, or agents, and their respective officers and employees, in connection with performance of or failure to perform this Agreement, whether or not such Claims are litigated, settled, or reduced to judgment; provided that the foregoing indemnity does not apply to liability for damages for death or bodily injury to persons, injury to property, or other loss, damage, or expense to the extent arising from (i) the sole negligence or willful misconduct of, or defects in design furnished by, CITY, its agents, servants, or independent contractors who are directly responsible to CITY, or (ii) the active negligence of CITY. CONTRACTOR's obligations under this subsection do not apply to any Liabilities arising from the actual application of pesticides by the CITY, its officers, employees or agents, except to the extent resulting from any error or omission by CONTRACTOR, its sub-consultants, subcontractors or agents, and their respective officers and employees.
- B. Insurance Policies; Intellectual Property Claims: The existence or acceptance by CITY of any of the insurance policies or coverages described in this Agreement shall not affect or limit any of CITY's rights under this Section 10, nor shall the limits of such insurance limit the liability of CONTRACTOR hereunder. This Section 10 shall not apply to any intellectual property claims, actions, lawsuits, or other proceedings subject to the provisions of Section 7.B., above. The provisions of this Section 10 shall survive any expiration or termination of this Agreement.

11. Insurance Requirements. During the entire term of this Agreement, CONTRACTOR shall maintain the insurance coverage described in this Section 11.

Full compensation for all premiums that CONTRACTOR is required to pay for the insurance coverage described herein shall be included in the compensation specified for the Services provided by CONTRACTOR under this Agreement. No additional compensation will be provided for CONTRACTOR's insurance premiums.

It is understood and agreed by the CONTRACTOR that its liability to the CITY shall not in any way be limited to or affected by the amount of insurance coverage required or carried by the CONTRACTOR in connection with this Agreement.

A. Minimum Scope & Limits of Insurance Coverage

- (1) Commercial General Liability Insurance, providing coverage at least as broad as ISO CGL Form 00 01 on an occurrence basis for bodily injury, including death, of one or more persons, property damage and personal injury, with limits of not less than one million

dollars (\$1,000,000) per occurrence. The policy shall provide contractual liability and products and completed operations coverage for the term of the policy.

- (2) Automobile Liability Insurance providing coverage at least as broad as ISO Form CA 00 01 on an occurrence basis for bodily injury, including death, of one or more persons, property damage and personal injury, with limits of not less than one million dollars (\$1,000,000) per occurrence. The policy shall provide coverage for owned, non-owned and/or hired autos as appropriate to the operations of the CONTRACTOR. No automobile liability insurance shall be required if CONTRACTOR completes the following certification:

“I certify that a motor vehicle will not be used in the performance of any work or services under this agreement.” _____(CONTRACTOR initials)

- (3) Workers’ Compensation Insurance with statutory limits, and Employers’ Liability Insurance with limits of not less than one million dollars (\$1,000,000). The Worker’s Compensation policy shall include a waiver of subrogation for contracts involving construction or maintenance, or if required by the CITY by selecting the option below:

X Workers’ Compensation waiver of subrogation in favor of the City is required for all work performed by the CONTRACTOR.

No Workers’ Compensation insurance shall be required if CONTRACTOR completes the following certification:

“I certify that my business has no employees, and that I do not employ anyone. I am exempt from the legal requirements to provide Workers' Compensation insurance.” _____ (CONTRACTOR initials)

- (4) Professional Liability Insurance providing coverage on a claims made basis for errors, omissions or malpractice with limits of not less than one million (\$1,000,000) dollars if required by the CITY under Exhibit A, Section 2.

B. Additional Insured Coverage

- (1) Commercial General Liability Insurance: The CITY, its officials, employees and volunteers shall be covered by policy terms or endorsement as additional insureds as respects general liability arising out of activities performed by or on behalf of CONTRACTOR, products and completed operations of CONTRACTOR, and premises owned, leased or used by CONTRACTOR. The general liability additional insured endorsement must be signed by an authorized representative of the insurance carrier for contracts involving construction or maintenance, or if required by the CITY by selecting the option below:

X Additional insured endorsement must be signed by an authorized representative of the insurance carrier.

If the policy includes a blanket additional insured endorsement or contractual additional insured coverage, the above signature requirement may be fulfilled by submitting that

document with a signed declaration page referencing the blanket endorsement or policy form.

- (2) Automobile Liability Insurance: The CITY, its officials, employees and volunteers shall be covered by policy terms or endorsement as additional insureds as respects auto liability.

C. Other Insurance Provisions

The policies are to contain, or be endorsed to contain, the following provisions:

- (1) Except for professional liability, CONTRACTOR's insurance coverage shall be primary insurance as respects CITY, its officials, employees and volunteers. Any insurance or self-insurance maintained by CITY, its officials, employees or volunteers shall be in excess of CONTRACTOR's insurance and shall not contribute with it.
- (2) Any failure to comply with reporting provisions of the policies shall not affect coverage provided to CITY, its officials, employees or volunteers.
- (3) Coverage shall state that CONTRACTOR's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
- (4) CITY will be provided with thirty (30) days written notice of cancellation or material change in the policy language or terms.

D. Acceptability of Insurance

Insurance shall be placed with insurers with a Bests' rating of not less than A:V. Self-insured retentions, policy terms or other variations that do not comply with the requirements of this Section 11 must be declared to and approved by the CITY Risk Management Division in writing prior to execution of this Agreement.

E. Verification of Coverage

- (1) CONTRACTOR shall furnish CITY with certificates and required endorsements evidencing the insurance required. The certificates and endorsements shall be forwarded to the CITY representative named in Exhibit A. Copies of policies shall be delivered to the CITY on demand. Certificates of insurance shall be signed by an authorized representative of the insurance carrier.
- (2) The CITY may withdraw its offer of contract or cancel this Agreement if the certificates of insurance and endorsements required have not been provided prior to execution of this Agreement. The CITY may withhold payments to CONTRACTOR and/or cancel the Agreement if the insurance is canceled or CONTRACTOR otherwise ceases to be insured as required herein.

F. Subcontractors

CONTRACTOR shall require and verify that all sub-consultants and subcontractors maintain insurance coverage that meets the minimum scope and limits of insurance coverage specified in subsection A, above.

- 12. Equal Employment Opportunity.** During the performance of this Agreement, CONTRACTOR, for itself, its assignees and successors in interest, agrees as follows:
- A. Compliance With Regulations: CONTRACTOR shall comply with the Executive Order 11246 entitled “Equal Opportunity in Federal Employment”, as amended by Executive Order 11375 and 12086, and as supplemented in Department of Labor regulations (41 CFR Chapter 60), hereinafter collectively referred to as the “Regulations”.
 - B. Nondiscrimination: CONTRACTOR, with regards to the work performed by it after award and prior to completion of the work pursuant to this Agreement, shall not discriminate on the ground of race, color, religion, sex, national origin, age, marital status, physical handicap or sexual orientation in selection and retention of subcontractors, including procurement of materials and leases of equipment. CONTRACTOR shall not participate either directly or indirectly in discrimination prohibited by the Regulations.
 - C. Solicitations for Subcontractors, Including Procurement of Materials and Equipment: In all solicitations either by competitive bidding or negotiations made by CONTRACTOR for work to be performed under any subcontract, including all procurement of materials or equipment, each potential subcontractor or supplier shall be notified by CONTRACTOR of CONTRACTOR’s obligation under this Agreement and the Regulations relative to nondiscrimination on the ground of race, color, religion, sex, national origin, age, marital status, physical handicap or sexual orientation.
 - D. Information and Reports: CONTRACTOR shall provide all information and reports required by the Regulations, or by any orders or instructions issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information and its facilities as may be determined by the CITY to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of CONTRACTOR is in the exclusive possession of another who fails or refuses to furnish this information, CONTRACTOR shall so certify to the CITY, and shall set forth what efforts it has made to obtain the information.
 - E. Sanctions for Noncompliance: In the event of noncompliance by CONTRACTOR with the nondiscrimination provisions of this Agreement, the CITY shall impose such sanctions as it may determine to be appropriate including, but not limited to:
 - (1) Withholding of payments to CONTRACTOR under this Agreement until CONTRACTOR complies;
 - (2) Cancellation, termination, or suspension of the Agreement, in whole or in part.
 - F. Incorporation of Provisions: CONTRACTOR shall include the provisions of subsections A through E, above, in every subcontract, including procurement of materials and leases of equipment, unless exempted by the Regulations, or by any order or instructions issued pursuant thereto. CONTRACTOR shall take such action with respect to any subcontract or procurement as the CITY

may direct as a means of enforcing such provisions including sanctions for noncompliance; provided, however, that in the event CONTRACTOR becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, CONTRACTOR may request CITY to enter such litigation to protect the interests of CITY.

13. **Entire Agreement.** This document, including all Exhibits, contains the entire agreement between the parties and supersedes whatever oral or written understanding they may have had prior to the execution of this Agreement. No alteration to the terms of this Agreement shall be valid unless approved in writing by CONTRACTOR, and by CITY, in accordance with applicable provisions of the Sacramento City Code.
14. **Severability.** If any portion of this Agreement or the application thereof to any person or circumstance shall be held invalid or unenforceable, the remainder of this Agreement shall not be affected thereby and shall be enforced to the greatest extent permitted by law.
15. **Waiver.** Neither CITY acceptance of, or payment for, any Service or Additional Service performed by CONTRACTOR, nor any waiver by either party of any default, breach or condition precedent, shall be construed as a waiver of any provision of this Agreement, nor as a waiver of any other default, breach or condition precedent or any other right hereunder.
16. **Enforcement of Agreement.** This Agreement shall be governed, construed and enforced in accordance with the laws of the State of California. Venue of any litigation arising out of or connected with this Agreement shall lie exclusively in the state trial court or Federal District Court located in Sacramento County in the State of California, and the parties consent to jurisdiction over their persons and over the subject matter of any such litigation in such courts, and consent to service of process issued by such courts.
17. **Assignment Prohibited.** The expertise and experience of CONTRACTOR are material considerations for this Agreement. CITY has a strong interest in the qualifications and capability of the persons and entities that will fulfill the obligations imposed on CONTRACTOR under this Agreement. In recognition of this interest, CONTRACTOR shall not assign any right or obligation pursuant to this Agreement without the written consent of the CITY. Any attempted or purported assignment without CITY's written consent shall be void and of no effect.
18. **Binding Effect.** This Agreement shall be binding on the heirs, executors, administrators, successors and assigns of the parties, subject to the provisions of Section 17, above.
19. **Use Tax Requirements.** During the performance of this Agreement, CONTRACTOR, for itself, its assignees and successors in interest, agrees as follows:
 - A. Use Tax Direct Payment Permit: For all leases and purchases of materials, equipment, supplies, or other tangible personal property used to perform the Agreement and shipped from outside California, the Contractor and any subcontractors leasing or purchasing such materials, equipment, supplies or other tangible personal property shall obtain a Use Tax Direct Payment Permit from the California State Board of Equalization ("SBE") in accordance with the applicable SBE criteria and requirements.
 - B. Sellers Permit: For any construction contract and any construction subcontract in the amount of

\$5,000,000 or more, Contractor and the subcontractor(s) shall obtain sellers permits from the SBE and shall register the jobsite as the place of business for the purpose of allocating local sales and use tax to the City. Contractor and its subcontractors shall remit the self-accrued use tax to the SBE, and shall provide a copy of each remittance to the City.

- C. The above provisions shall apply in all instances unless prohibited by the funding source for the Agreement.

EXHIBIT E

REQUIREMENTS OF THE NON-DISCRIMINATION IN EMPLOYEE BENEFITS CODE

INTRODUCTION

The Sacramento Non-Discrimination In Employee Benefits Code (the "Ordinance"), codified as Sacramento City Code Chapter 3.54, prohibits City contractors from discriminating in the provision of employee benefits between employees with spouses and employees with domestic partners, and between the spouses and domestic partners of employees.

APPLICATION

The provisions of the Ordinance apply to any contract or agreement (as defined below), between a Contractor and the City of Sacramento, in an amount exceeding \$100,000.00. The Ordinance applies to that portion of a contractor's operations that occur: (i) within the City of Sacramento; (ii) on real property outside the City of Sacramento if the property is owned by the City or if the City has a right to occupy the property; or (iii) at any location where a significant amount of work related to a City contract is being performed.

The Ordinance does not apply: to subcontractors or subcontracts of any Contractor or contractors; to transactions entered into pursuant to cooperative purchasing agreements approved by the Sacramento City Council; to legal contracts of other governmental jurisdictions or public agencies without separate competitive bidding by the City; where the requirements of the ordinance will violate or are inconsistent with the terms or conditions of a grant, subvention or agreement with a public agency or the instructions of an authorized representative of any such agency with respect to any such grant, subvention or agreement; to permits for excavation or street construction; or to agreements for the use of City right-of-way where a contracting utility has the power of eminent domain.

DEFINITIONS

As set forth in the Ordinance, the following definitions apply:

"Contract" means an agreement for public works or improvements to be performed, or for goods or services to be purchased or grants to be provided, at the expense of the City or to be paid out of moneys deposited in the treasury or out of the trust money under the control or collected by the City. "Contract" also means a written agreement for the exclusive use ("exclusive use" means the right to use or occupy real property to the exclusion of others, other than the right reserved by the fee owner) or occupancy of real property for a term exceeding 29 days in any calendar year, whether by singular or cumulative instrument, (i) for the operation or use by others of real property owned or controlled by the City for the operation of a business, social, or other establishment or organization, including leases, concessions, franchises and easements, or (ii) for the City's use or occupancy of real property owned by others, including leases, concessions, franchises and easements.

"Contract" shall not include: a revocable at-will use or encroachment permit for the use of or encroachment on City property regardless of the ultimate duration of such permit; excavation, street construction or street use permits; agreements for the use of City right-of-way where a contracting utility has the power of eminent domain; or agreements governing the use of City property that constitute a public forum for activities that are primarily for the purpose of espousing or advocating causes or ideas and that are generally protected by the First Amendment to the United States Constitution or that are primarily recreational in nature.

“Contractor” means any person or persons, firm, partnership, corporation, company, or combination thereof, that enters into a Contract with the City. “Contractor” does not include a public entity.

“Domestic Partner” means any person who has a currently registered domestic partnership with a governmental entity pursuant to state or local law authorizing the registration.

“Employee Benefits” means bereavement leave; disability, life, and other types of insurance; family medical leave; health benefits; membership or membership discounts; moving expenses; pension and retirement benefits; vacation; travel benefits; and any other benefit given to employees. “Employee benefits” shall not include benefits to the extent that the application of the requirements of this chapter to such benefits may be preempted by federal or state.

CONTRACTOR’S OBLIGATION TO PROVIDE THE CITY WITH DOCUMENTATION AND INFORMATION

Contractor shall provide the City with documentation and information verifying its compliance with the requirements of the Ordinance within ten (10) days of receipt of a request from the City. Contractors shall keep accurate payroll records, showing, for each City Contract, the employee’s name, address, Social Security number, work classification, straight time pay rate, overtime pay rate, overtime hours worked, status and exemptions, and benefits for each day and pay period that the employee works on the City Contract. Each request for payroll records shall be accompanied by an affidavit to be completed and returned by the Contractor, as stated, attesting that the information contained in the payroll records is true and correct, and that the Contractor has complied with the requirements of the Ordinance. A violation of the Ordinance or noncompliance with the requirements of the Ordinance shall constitute a breach of contract.

EMPLOYER COMPLIANCE CERTIFICATE AND NOTICE REQUIREMENTS

(a) All contractors seeking a Contract subject to the Ordinance shall submit a completed Declaration of Compliance Form, signed by an authorized representative, with each proposal, bid or application. The Declaration of Compliance shall be made a part of the executed contract, and will be made available for public inspection and copying during regular business hours.

(b) The Contractor shall give each existing employee working directly on a City contract, and (at the time of hire), each new employee, a copy of the notification provided as Attachment “A.”

(c) Contractor shall post, in a place visible to all employees, a copy of the notice provided as Attachment “B.”

Attachment A



YOUR RIGHTS UNDER THE CITY OF SACRAMENTO'S NON-DISCRIMINATION IN EMPLOYEE BENEFITS CODE

On (date), your employer (the "Employer") entered into a contract with the City of Sacramento (the "City") for (contract details), and as a condition of that contract, agreed to abide by the requirements of the City's Non-Discrimination In Employee Benefits Code (Sacramento City Code Section 3.54).

The Ordinance does not require the Employer to provide employee benefits. The Ordinance does require that if certain employee benefits are provided by the Employer, that those benefits be provided without discrimination between employees with spouses and employees with domestic partners, and without discrimination between the spouse or domestic partner of employees.

The Ordinance covers any employee working on the specific contract referenced above, but only for the period of time while those employees are actually working on this specific contract.

The included employee benefits are:

- Bereavement leave
- Disability, life and other types of insurance
- Family medical leave
- Health benefits
- Membership or membership discounts
- Moving expenses
- Pension and retirement benefits
- Vacation
- Travel benefits
- Any other benefits given to employees

(Employee Benefits does not include benefits that may be preempted by federal or state law.)

If you feel you have been discriminated or retaliated against by your employer in the terms and conditions of your application for employment, or in your employment, or in the application of these employee benefits, because of your status as an applicant or as an employee protected by the Ordinance, or because you reported a violation of the Ordinance, and after having exhausted all remedies with your employer,

You May . . .

- Submit a written complaint to the City of Sacramento, Contract Services Unit, containing the details of the alleged violation. The address is:

City of Sacramento
Procurement Services Division
5730 24th Street, Bldg. 1
Sacramento, CA 95822

- Bring an action in the appropriate division of the Superior Court of the State of California against the Employer and obtain the following remedies:
 - Reinstatement, injunctive relief, compensatory damages and punitive damages
 - Reasonable attorney's fees and costs

Attachment B



YOUR RIGHTS UNDER THE CITY OF SACRAMENTO'S NON-DISCRIMINATION IN EMPLOYEE BENEFITS CODE

If your employer provides employee benefits, they must be provided to those employees working on a City of Sacramento contract without discriminating between employees with spouses and employees with domestic partners.

The included employee benefits are:

- Bereavement leave
- Disability, life and other types of insurance
- Family medical leave
- Health benefits
- Membership or membership discounts
- Moving expenses
- Pension and retirement benefits
- Vacation
- Travel benefits
- Any other benefits given to employees

If you feel you have been discriminated against by your employer . . .

You May . . .

- Submit a written complaint to the City of Sacramento, Contract Services Unit, containing the details of the alleged violation. The address is:

City of Sacramento
Procurement Services Division
5730 24th Street, Bldg. 1
Sacramento, CA 95822
- Bring an action in the appropriate division of the Superior Court of the State of California against the employer and obtain reinstatement, injunctive relief, compensatory damages, punitive damages and reasonable attorney's fees and costs.

Discrimination and Retaliation Prohibited.

If you feel you have been discriminated or retaliated against by your employer in the terms and conditions of your application for employment, or in your employment, because of your status as an applicant or as an employee protected by the Ordinance, or because you reported a violation of this Ordinance . . .

You May Also . . .

Submit a written complaint to the City of Sacramento, Contract Services Unit, at the same address, containing the details of the alleged violation.