

**SAN JOAQUIN VALLEY  
DRAINAGE AUTHORITY**

**Westside San Joaquin River Watershed Coalition  
Focused Watershed Management Plan III  
Poso Slough & Salt Slough**

**September 30, 2011**

# SAN JOAQUIN VALLEY DRAINAGE AUTHORITY

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September 27, 2011

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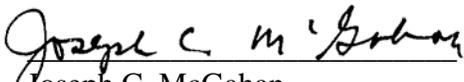
Subject: Westside San Joaquin River Watershed Coalition – Focused Watershed  
Management Plan II – Poso Slough and Salt Slough

Dear Pamela,

Attached is the Focused Watershed Management Plan III for Poso Slough and Salt Slough.

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 knowingly submitting false information, including the possibility of fine and imprisonment for violations.

If you should have any questions on the information submitted in this report, please give me a call directly at 559-582-9237.



Joseph C. McGahan

Watershed Coordinator  
Westside San Joaquin River Watershed Coalition

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## **Section 1: Background and Need**

In accordance with the Westside San Joaquin River Watershed Coalition (Westside Coalition or Coalition) Management Plan-General Approach dated October 23, 2008, a focused water quality improvement plan has been developed within specific subwatersheds. This focused effort will address Tier 1 Management Plan Priorities (aquatic toxicity, pesticides, sediment toxicity and sediment discharge) within the Salt Slough Subwatershed based on monitoring results from samples collected at Poso Slough at Indiana Avenue, Salt Slough at Sand Dam, and Salt Slough at Lander Avenue. The focused effort will address the specific details for eight requirements listed below for Management Plans identified in the Monitoring and Reporting Program (MRP) Order No. R5-2008-0831. These requirements are addressed generally, in the Management Plan – General Approach, and are being addressed in a more specific and complete way for the Focused Watershed Management Plan III (Focused Plan III) described here.

1. Identify irrigated agriculture source -- general practice or specific location that may be the cause of the water quality problem, or a study design to determine the source.
2. Identify management practices to be implemented to address the exceedances.
3. Develop a management practice implementation schedule. Implementation may occur through another Regional Water Board (Regional Board or Board) regulatory program designed to address the specific exceedances.
4. Develop management practice performance goals with a schedule.
5. Develop a waste-specific monitoring schedule.
6. Develop a process and schedule for evaluating management practice effectiveness.
7. Identify the participants and Coalition Group(s) that will implement the Management Plan.
8. Identify a routine schedule of reporting to the Regional Water Board.

The focused effort includes (1) a detailed watershed map of the subwatersheds, (2) determinations of pesticide use, (3) determination of management practice (MP) implementation, (4) intensified outreach to growers, (5) approach to implement additional MPs to address exceedances, and (6) monitoring to determine MP effectiveness.

**The Salt Slough Subwatershed:** The Salt Slough subwatershed is located within the Dos Palos subarea of the Westside Coalition and is monitored at three locations: Poso Slough at Indiana Avenue (PSAIA), Salt Slough at Sand Dam (SSASD) and Salt Slough at Lander Avenue (SSALA). **Figure 1** shows the estimated Salt Slough watershed boundary with the regions represented by the PSAIA and SSASD monitoring sites. The Salt Slough watershed covers a large area and includes irrigated agriculture (typically alfalfa and field crops such as cotton, melons, tomatoes, and corn), irrigated and native pasture, and managed wetlands. The Salt Slough watershed upstream of Lander Avenue covers approximately 108,000 acres and falls within San Luis Canal Company (SLCC), Central California Irrigation District (CCID), Grassland Water District and State and Federal refuges. The communities of Dos Palos and South Dos Palos also fall within the subwatershed.

The PSAIA monitoring site samples water from Poso Slough prior to discharge into Salt Slough. Lands within the PSAIA subwatershed are within CCID and are actively farmed with the exception of a handful of rural residences.

Water sampled by the SSASD site includes agricultural discharges from lands within CCID and San Luis Canal Company, including discharges from Poso Slough. Land use within the SSASD subwatershed is similar to that of the PSAIA subwatershed.

Land use downstream of the SSASD monitoring site shifts from irrigated agriculture to managed wetlands and refuges. These refuges contain wetland, riparian, and upland habitat. Although they are actively managed and irrigated, these lands typically do not see significant pesticide applications. Discharges from refuge lands often contain elevated levels of salts and boron. Typically, TDS and EC measurements from SSALA are higher than that of SSASD.

**Historic Data.** This focused watershed management plan is developed for the Salt Slough subwatershed upstream of Lander Avenue, which also includes the Poso Slough subwatershed, upstream of Indiana Avenue and the Salt Slough Subwatershed

upstream of Sand Dam. The 2008 Management Plan General Approach tabulated exceedances for the SSALA and SSASD monitoring results from July 2004 through August 2007. Monitoring at PSAIA began in March 2008 and was not evaluated in the Management Plan General Approach. Additionally, PSAIA was included in the MRP as a Core monitoring site and was not tested regularly for pesticides or toxicity. **Table 1** lists the exceedances within the Salt Slough Subwatershed from the Management Plan General Approach that require Management Plan action under the MRP Order.

**Table 1: Salt Slough Subwatershed 2004 through 2007  
Exceedances Requiring Management Plan Action**

Constituent	SSALA Count of Exceedances	SSASD Count of Exceedances
Water Flea Toxicity	4	2
Algae Toxicity	6	6
Chlorpyrifos	8	10
Total Suspended Solids	0	2
E. Coli	12	13
EC	39	20
TDS	39	21
D.O.	1*	3
pH	1*	5

\* Does not require Management Plan Action.

**Table 2** shows the count of exceedances at SSALA, SSASD, and PSAIA from January 2008 through December 2010. This data is more reflective of current conditions.

**Table 2: Salt Slough Subwatershed 2008 through 2010 Exceedance Count**

Constituent	SSALA Count of Exceedances	SSASD Count of Exceedances	PSAIA Count of Exceedances
Water Flea Toxicity	1	1	0
Algae Toxicity	0	0	2
Sediment Toxicity	0	0	1
Chlorpyrifos	7	6	3
Diuron	2	7	3
Malathion	1	2	0
DDT	1	0	0
Chlordane (gamma)	1	0	0
Ammonia (as N)	0	1	4
Boron	13	0	0
E. Coli	6	3	26
TDS	38	16	28
EC	39	26	31
D.O.	3	5	6
pH	2	4	5

## Section 2: Source Identification

Significant aquatic toxicity to water flea and algae has been observed infrequently at the three monitoring locations. However, when observed, the cause is usually linked to a pesticide (including chlorpyrifos and diuron) applied through agricultural practices. Pesticide exceedances have occurred for chlorpyrifos, diuron, malathion, and the legacy pesticides DDT and gamma-chlordane. Of these pesticides, chlorpyrifos, diuron and malathion have been detected with sufficient frequency to warrant management plan action.

The source for other constituent exceedances is less clear.

- Ammonia. Ammonia is added as a fertilizer by agriculture, naturally discharged by wildlife and cattle, and discharged through septic systems from rural residences.
- Boron. Boron is naturally occurring in the shallow groundwater and soil profile within the Salt Slough subwatershed and is typically present in the region at levels that are a nuisance to agricultural crop production. Boron is transported by

shallow groundwater migration and could be discharged through accretion into drains and sloughs or from subsurface drainage systems.

- E. coli. E. coli is a bacteria that is present in fecal discharges from warm blooded animals and is found throughout the Westside Coalition. The source for these detections could include wildlife, managed animals (including goats, sheep, cattle, and others), rural residence septic systems, and manure applications.
- Total Dissolved Solids (TDS) and electrical conductivity (EC). TDS and EC are measurements of the dissolved salts within the water. Most of the Salt Slough subwatershed is underlain with a highly-mineralized shallow aquifer. Groundwater from this aquifer can accrete into drains and sloughs or be discharged from subsurface drainage systems.
- Dissolved Oxygen (DO) and pH. Neither the source nor cause of DO and pH exceedances are known at this time.

The activities contained within this Focused Plan will target activities related to reducing pesticides exceedances and the related toxicity. Other constituents are lower tier priorities as identified in the Management Plan General Approach.

In the Fall of 2011, a management practice survey will be circulated throughout the subwatershed for the purpose of identifying existing grower management practices as they relate to crops, irrigation practices, and pest management practices.

### **Section 3: Identification of Management Practices to be Implemented**

- Pesticide Use: Pesticide use, including metal-based pesticides or fungicides (such as copper salts), within the watershed will be obtained from the Merced County Agriculture Commissioner and/or the Department of Pesticide Regulation. The primary and highest-priority pesticides for evaluation will be those which have exceeded water quality triggers in the watersheds (chlorpyrifos, diuron, and malathion). Generally this data is available approximately three to six months in arrears and may not be complete. Growers will also be asked about their pesticide use and application methods through management practice surveys.

This data will be used to develop a background inventory of applied materials and help determine which changes in pesticide use practices would be most appropriate and focus outreach efforts where most beneficial. Baseline pesticide use for these priority subwatersheds will be included in the Management Plan semi-annual reports to the Regional Board.

- **Baseline Management Practice Inventory:** A grower survey will be distributed to all agricultural growers in the priority subwatersheds (managed refuges and wildlife areas will not receive survey). If members are not in attendance at meetings, the surveys will be mailed to their residences, or delivered to them on site. The survey results will be used to develop a management practice (MP) inventory. This inventory will document current MPs implemented within the focused subwatersheds. Data will be collected from water districts, government agencies as well as individual growers. The goal will be to characterize as accurately as possible the current level of MP implementation within the subwatershed areas but not necessarily to document the specific locations of every MP implemented. A description of the completeness or overall response of the survey to date, with summary information, will be included in the semi-annual reports. Completion of the MP survey shall be considered a condition of membership with the Coalition. The Coalition sets the goal of 100% completeness for the survey returns, and failure to meet this completeness goal will be discussed with the Regional Board staff. A draft of the MP survey is included in **Figure 2**. This information will be used to determine what practices are currently in place, so that identification of additional MPs necessary to improve water quality can be clarified and later evaluated.

#### **Section 4: Management Practice Implementation**

Once a baseline of management practices is determined, and the recommended changes to management practices are identified, the Coalition will begin/continue the process of communicating, implementing and documenting the use of new or additional management practices. The semi-annual reports as required under the MRP will

include an ongoing and updated, detailed description or table documenting known or anticipated new management practices, historical practices, and changes to the previous update, including a summary of affected acres, and may include other pertinent information such as crop type, irrigation type or other details. The result of these activities will be updated, summarized and reported semi-annually to the Regional Board.

- Outreach to Growers: The Westside Coalition will work through the member districts to outreach to the growers. Member districts in these three watersheds include State and Federal Refuges, Grassland Water District, San Luis Canal Company, and Central California Irrigation District. Outreach will occur primarily as organized meetings through the districts, but also as individual field meetings and/or by utilizing mail-out information to resident growers in the subwatershed areas. The Coalition will maintain records of attendance through sign in sheets and meeting notes. This information will be included in the appropriate section of the SAMR. The Coalition will prioritize contact with individual growers that are likely or potential contributors to exceedances (such as growers that routinely discharge tail water) as the highest priority.

Outreach will take the form of group meetings (based on location or specific commodity groups, such as alfalfa growers) and “tailgate” meetings, which will be one-on-one meetings between the Coalition and individual growers. For both meeting types, the discussion will focus on the circumstances specific to each audience. For example, discussions with alfalfa growers will focus on chlorpyrifos exceedances, irrigation timing, and tailwater control. A tailgate discussion will focus on the water quality issues specific to that individual grower’s subwatershed and a review of management practices that may result in improvements. Appropriate outreach topics and the correct audience list for the information will be finalized subsequent to the initial baseline survey information collected. This is expected to be completed by June 30, 2012, and will be

communicated to the Regional Board staff and included in semi-annual monitoring reports.

- **Implementation Strategy:** Based on the findings from the surveys and other outreach, the Westside Coalition will determine which management practices will be appropriate for specific locations within the priority watersheds, and will develop an approach to ensure that the best MPs are implemented. Part of this approach will include the pursuit of funding sources to assist growers and districts with the capital resources that may be necessary for specific constructed management practices. These funding sources may be specific to sub-watersheds or generally applicable to the entire coalition. This approach will be described and communicated to the appropriate Coalition members and reported to the Regional Board in the semi-annual monitoring report.
- **Management Practices:** A management practice “toolbox” has been developed for growers within the subwatersheds. The tools included focus on tailwater management and specific pesticides (including chlorpyrifos). Information regarding pesticide application methods, equipment calibration and communications with aerial applicators will also be described to the appropriate growers and landowners. Since the primary constituents of concern are dissolved within the tailwater, management practices are expected to focus on tailwater management and reduction which could include improved irrigation systems, tailwater ponds, and tailwater return systems. The Coalition is in the processes of mapping the location of tailwater ponds and irrigation methods within the focused subwatershed and will update this information in the appropriate section of the SAMR.

### **Section 5: Management Practice Performance Goals and Schedule**

The performance goals for this management plan are both water quality based and MP implementation based. The MP implementation performance goal will hinge on the information that is derived regarding baseline MPs currently being implemented. This

determination and schedule will be provided to the Regional Board and included in the following semi-annual monitoring reports. Additional MPs to be implemented will be identified, and this information will be continuously updated, and periodically reported to the Regional Board in the ongoing semi-annual reports. Generally speaking these goals will be as follows.

- Reduce use of pesticides, or incorporate use of pesticides that are less likely to be transported to the waters of the State, or which breakdown quickly and are less likely to impact water quality.
- Calibrate spray rigs utilized on farmed acres to address possible overspray.
- Address potential aerial overspray by identifying the sensitive regions for all aerial applicators.
- Construct tailwater ponds to intercept and hold direct tailwater discharges.
- Install high-efficiency irrigation systems such as sprinkler or drip irrigation, tailwater recirculation, gated pipes, shorter runs, etc, where warranted by the crops that are grown.

It must be noted that these are long term goals, and the most appropriate measures will be finalized subsequent to the initial management practice survey findings. The Focused Plan will be a living document that will be re-evaluated in conjunction with the Regional Board staff, and re-prioritized as effectiveness of the activities are re-evaluated.

The water quality goals for Tier 1 of the Focused Plan in subwatersheds are as follows.

- Eliminate aquatic toxicity.
- Eliminate detection of pesticides.

Progress toward meeting performance goals will be evaluated by the Coalition and Regional Board staff at meetings held quarterly and reported in the SAMR. Any necessary changes to the strategy, activities or goals of the Focused Watershed Management Plan will be identified at these meetings. The notes of the meetings will be recorded and archived.

Performance goals for the Focused Plan will be based on implementation of management practices. More details will be developed for MP implementation following completion of the survey and survey assessment which will describe the baseline MP information. Focused Plan Interim Performance Goals are presented in **Table 3**.

**Table 3: Focused Plan Interim Performance Goals**

<b>Focused Plan Step</b>	<b>Outcome</b>	<b>Completion Date</b>
1. Development of survey document	Survey form that inquires about MPs relevant to Tier 1 parameters	September 30, 2011
2. Completion of grower survey	Submittal by 100% of growers	March 31, 2012
3. Finalize survey findings	Report on MP Baseline and summary of existing management activities.	June 30, 2012
4. Determine effective MPs and develop next steps (Performance Goals)	Detailed plan for next steps in Focused Plan	June 30, 2012
5. Collect and report monitoring data results.	Semi-annual Monitoring Reports	Twice Annually – June 15 <sup>th</sup> and November 30 <sup>th</sup> .
6. Collect and report pesticide use data.	Included in the Semi-annual Monitoring Reports.	Twice Annually – June 15 <sup>th</sup> and November 30 <sup>th</sup> .

## **Section 6: Constituent Specific Monitoring**

The Westside Coalition has implemented a Monitoring and Reporting Program for the purpose of complying with the Irrigated Lands Waiver program and to support the activities of the Management Plan, including the focused plan. This monitoring and reporting plan includes flexible provisions for Special Project Monitoring that will allow the Coalition to adapt to changing field conditions, by submitting revisions to the Management Plan (which must be approved by the Executive Officer) that can document changes in the frequency, locations, or constituents related to Special Project Monitoring. Additionally, more frequent, qualitative monitoring, such as field turbidity measurements at key locations, may be implemented. These results will provide input on the impact of specific management activities. The monitoring schedule for the Focused Plan will be addressed through the Westside Coalition MRP Order routine monitoring.

### **Section 7: Process for Evaluating Management Practice Effectiveness**

The effectiveness of management practices implementation will be conducted through the measures identified on **Table 3**, along with the interim performance goals. Subsequent to completion of Focused Plan Step # 4 (**Table 3**) additional performance goals related to MP implementation will be identified. The ultimate goal of this Focused Plan is to meet the water quality goals identified for the Irrigated Lands Regulatory Program, which will be reflected in the water quality results reported in the Semi-annual Monitoring Report.

### **Section 8: Identification of Implementing Participants**

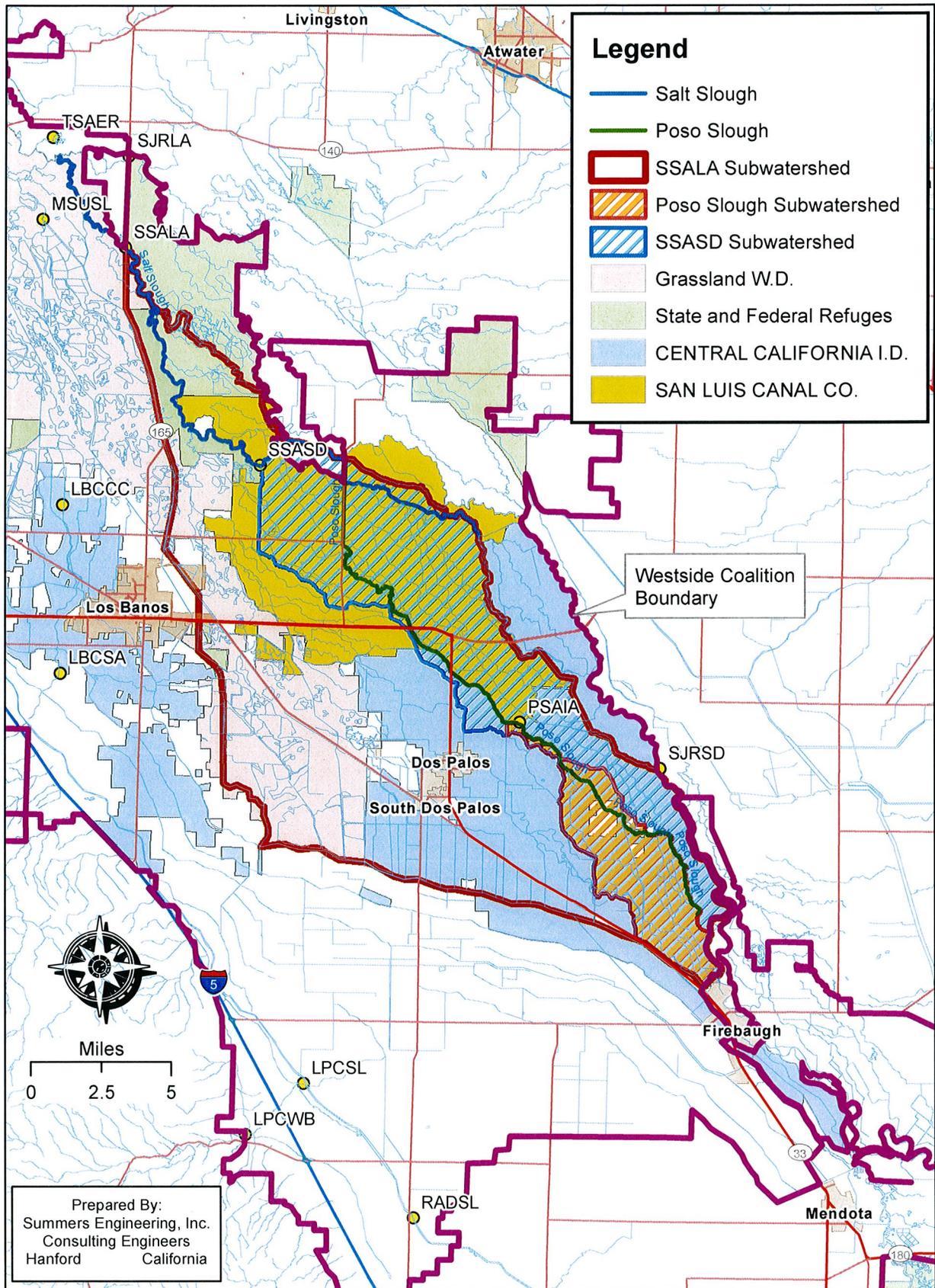
The Westside Coalition will work through the member districts for grower outreach. Member districts in these subwatersheds include State and Federal Refuges, Grassland Water District, San Luis Canal Company, and Central California Irrigation District. Individual growers will be expected to cooperate with the MP recommendations that will be provided to them. Cooperation by growers in the efforts to achieve water quality goals is a condition of Coalition membership.

### **Section 9: Schedule for Reporting**

All reports to the Management Plan and Focused Watershed Plan will be included within the Westside Coalition's semi-annual monitoring reports. Quarterly meetings will be held with Regional Board staff to discuss ongoing activities and to make decisions regarding necessary changes to the Management Plan approach. The Semi-annual Monitoring Reports will include a discussion of the Focused Watershed Plan activities, including:

- A summary of the Management Practice Survey Results
- Updated subwatershed maps
- Activities related to the CVSALTS, Dissolved Oxygen Study, the San Joaquin River Chlorpyrifos and Diazinon TMDL program, and other related Basin Plan programs.

Figure 1



**Westside San Joaquin River Watershed Coalition  
Salt Slough Watershed Upstream of Lander Avenue**

## Westside San Joaquin River Watershed Coalition

### Management Practice Survey

Please use 1 page per Parcel

**Parcel Number (APN):** \_\_\_\_\_ **Acreage:** \_\_\_\_\_

**Owner/Operator Information**

Company Name: \_\_\_\_\_ Contact Name: \_\_\_\_\_  
 Phone Number: \_\_\_\_\_ Fax: \_\_\_\_\_  
 Mailing Address: \_\_\_\_\_ Email: \_\_\_\_\_  
 \_\_\_\_\_  
 Watershed/ Receiving Waterbody: \_\_\_\_\_ District: \_\_\_\_\_

**Management Practices Information**

Irrigation Practices:

Crop: \_\_\_\_\_ Acreage: \_\_\_\_\_ Irrig Method: \_\_\_\_\_  
 Crop: \_\_\_\_\_ Acreage: \_\_\_\_\_ Irrig Method: \_\_\_\_\_  
 Crop: \_\_\_\_\_ Acreage: \_\_\_\_\_ Irrig Method: \_\_\_\_\_

**Please circle any of these materials that you expect to use in the next 12 months:**

Dimethoate (Cygon 400, Dimet) Diuron (Direx, Karmex) Diazinon Malathion  
 Cholorpyrifos (Lorsban, Lock-on, NuPhos, Govern, Scout, Empire, Dursban) Deltamethrin (Decis)  
 Bifenthrin (Brigade, Capture, Leverage) Cyfluthrin (Baythroid) Cypermethrin (Ammo, Cymbush)  
 Lambda-cyhalothrin (Karate, Warrior or Warrior II w/ zeon) Permethrin (Ambush, Pounce)  
 Esfenvalerate (Asana XL) Fenvalerate (Pydrin)  
 Resmethrin (Crossfire)  
 Other: \_\_\_\_\_

Do you have a Sedimentation Pond? Yes No  
 If Yes, How many acres does the pond drain: \_\_\_\_\_  
 Does the pond have a return system: Yes No  
 How frequently is the pond cleand out: \_\_\_\_\_

Does the property include a tile (subsurface) drainage system? Yes No  
 Does the property include a septic tank/system? Yes No  
 Do you use PAM: Yes No If Yes, How many acres: \_\_\_\_\_

Do you apply a dormant spray: Yes No If Yes, How many acres: \_\_\_\_\_  
 If Yes, do you apply a pesticide every year: \_\_\_\_\_  
 If Yes, do you apply a horticultural oil: \_\_\_\_\_

Do you apply a berm spray: Yes No If Yes, What material do you use: \_\_\_\_\_

Do you apply Manure? Yes No If Yes, How many acres: \_\_\_\_\_  
 If Yes, What kind: \_\_\_\_\_

What other practices do you implement to manage your tail water:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Does tailwater leave your porperty? Yes No  
 Does stormwater leave your property? Yes No

Completed by: \_\_\_\_\_

Questions: Contact Joe McGahan or Chris Linneman at 559-582-9237