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WaterSMART: Water and Energy Efficiency Grants for FY 2013

Funding Opportunity Announcement No. R13SF80003
Group 2 Project
CFDA No. 15.507

Patterson Irrigation District

Marshall Road and Spanish Drain Return System

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EXECUTIVE SUMMARY

Name: Patterson Irrigation District Application Date: January 17, 2012

City: Patterson County: Stanislaus State: California Congressional Dist.: 18th

Project Type: Agricultural Drainage Recovery Project

The proposed Two-Drains project will capture, impound, and recirculate agricultural surface drain flows from the Marshall Road Drain and Spanish Land Grant Drain. Drain water from these two drains is currently discharged into the San Joaquin River. The recovered drain water will be integrated with Patterson Irrigation District's (District) irrigation supplies and used for irrigation within the District's Boundary. The proposed project will:

- Construct three pump stations and approximately 3.7 miles of pipeline to recapture up to 5,000 acre feet per year of agricultural surface drain water.
- Prevent the discharge of up to 5,000 acre feet per year of drain water, and associated pollutants (including various pesticides and silt) to the San Joaquin River.
- Integrate the pump station controls with the District's SCADA system to allow remote system control and improve overall water delivery management affecting three laterals and approximately 12,400 acre feet per year.

The proposed project benefits include:

- Recover approximately 5,000 acre feet per year of drain water that will be used for irrigation.
- Make conserved/recaptured water available to other water agencies through water marketing. The District intends to market a volume of water equivalent to that recaptured by the proposed project, estimated at 5,000 acre feet per year.
- Improve water quality in the San Joaquin River by reducing the volume of agricultural drain water that is discharged.
    - Improve water management by expanding the District's SCADA system and using water level and flow control to automate delivery systems.

Table 1 summarizes the funding requirements of the proposed project by source. Note that this proposal is for Group II Funding.

Table 1: Funding Chart

Funding Source	Funding Amount
Patterson Irrigation District (non-federal)	$1,700,000
Requested Reclamation Funding	$1,500,000
Total Project Funding	$3,200,000

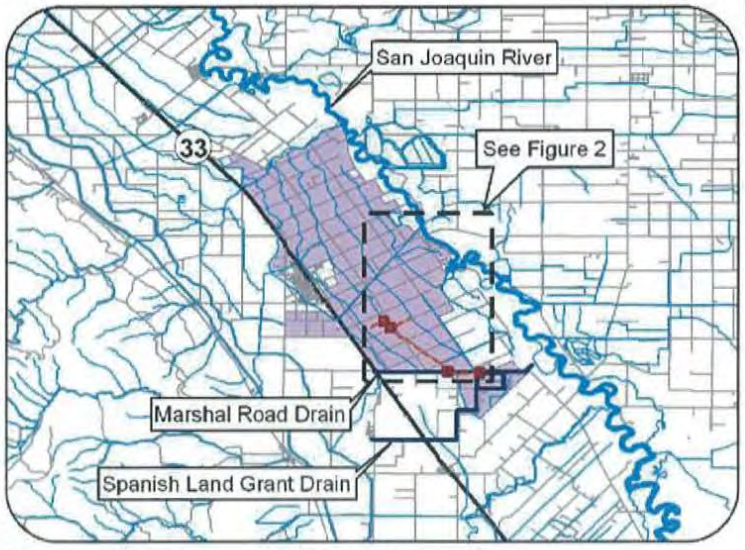
BACKGROUND DATA

Patterson Irrigation District is located south-western Stanislaus County, California. The Two-Drains Project (project) area is located approximately four miles southeast of the City of Patterson. The project service area is in the southerly part of the District beginning near the intersection of Alfalfa Road and Marshall Road and stretches northwest to approximately Pomelo Avenue. The project is within the CalFed Solution Area. A location map of the District and the proposed project is included in **Figure 1**. **Figure 2** shows the proposed project in more detail.

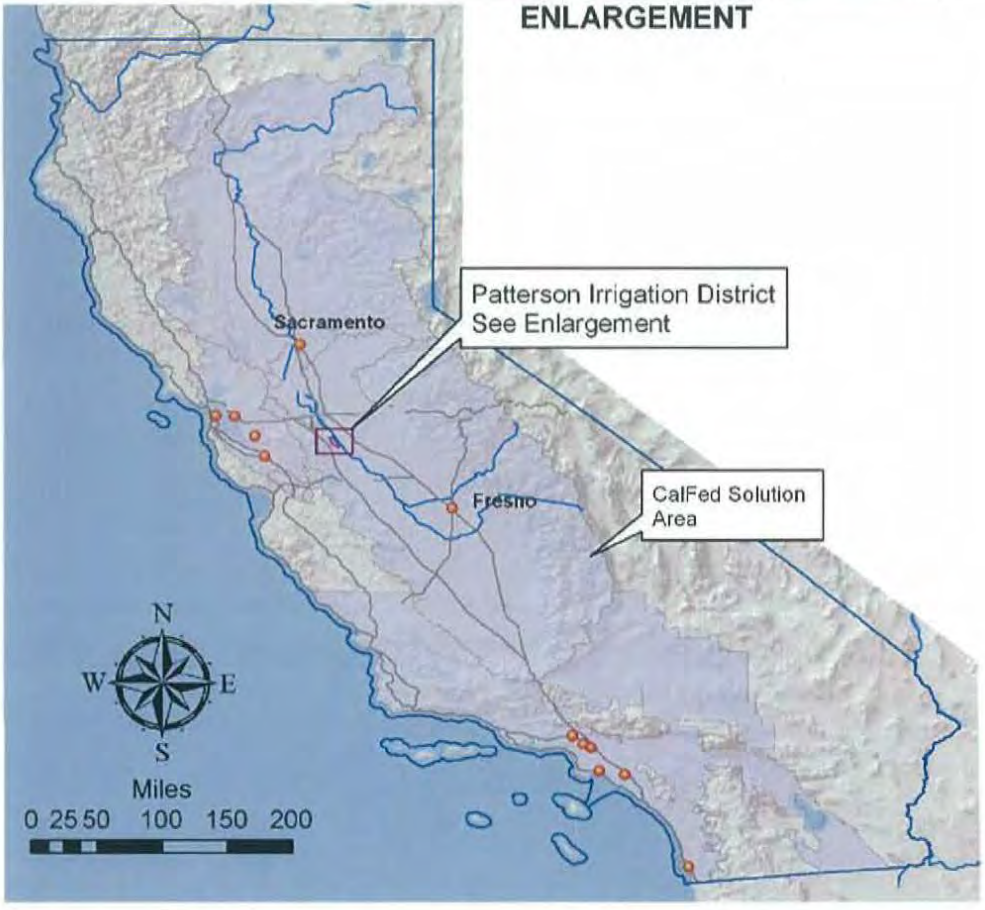
The District holds Pre-1914 water rights on the San Joaquin River and receives its water supply through a combination of San Joaquin River diversions, Central Valley Project (CVP) water through the Delta-Mendota Canal, and pumped groundwater. The average annual water supply diverted or pumped for agricultural irrigation purposes within the boundaries of the District is approximately 40,700 acre feet per year. The water use within the District boundaries is entirely for agricultural irrigation. The District serves approximately 12,700 acres and 230 water users. The major crops consist of alfalfa, corn, wheat, and beans.

The District's conveyance facilities include approximately four miles of main canal, 52 miles of lined laterals, 86 miles of pipeline, and eight pump stations. The District estimates system losses, including seepage and spills, to be in the range of 14 percent. In recent years, the District has spent more than $8 million on infrastructure projects designed to capture drainage water, increase its ability to market water to other agencies, and improve its distribution system management to better accommodate irrigation system improvements. Although no site-specific study has been performed, the District has estimated its on-farm efficiency at between 70-80% for surface irrigated fields (such as furrow) and 80-90% for high-efficiency systems. These estimates are based on typical values in other areas for similar irrigation methods.

Figure 1



ENLARGEMENT



Patterson Irrigation District
Location Map - Marshal & Spanish Drain Return System

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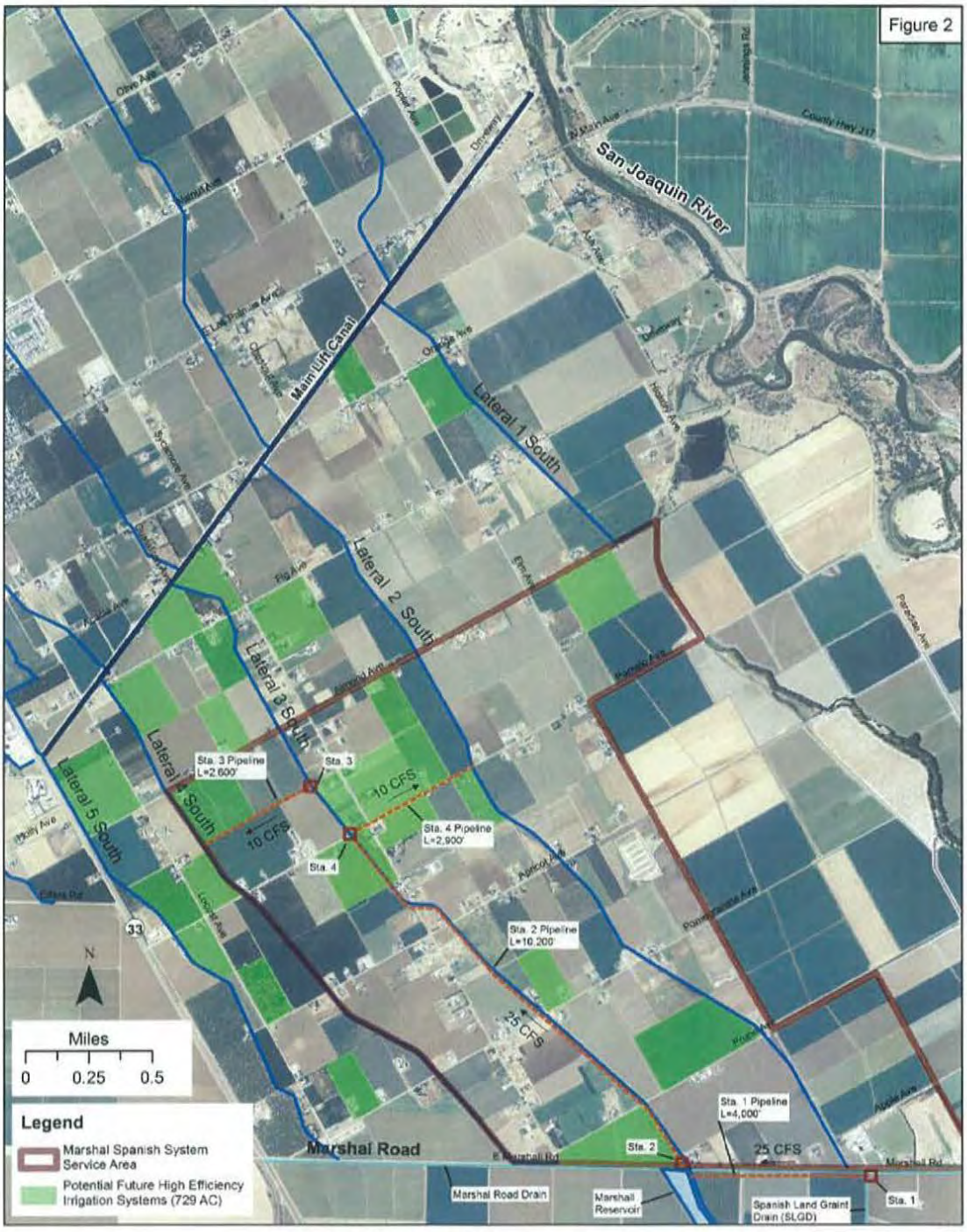

Marshal/Spanish Return System
Project Layout & Service Area

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The District is a founding agency of the Westside San Joaquin River Watershed Coalition (Westside Coalition), which helps its members comply with California's Irrigated Lands Regulatory Program (ILRP). The ILRP requires a comprehensive monitoring program which reports water quality exceedances caused by agricultural discharges. The Marshall Road Drain is one of the drainages monitored by the Westside Coalition, and has been the cause of numerous water quality exceedances. A primary goal of the Westside Coalition is to reduce the number of exceedances, and the proposed project will help to accomplish that by reducing the volume of drainage discharged from the site.

The District has a Long-Term Renewal Contract with the Bureau of Reclamation for 16,500 acre-feet of federal water supply from the Delta Division, and 6,000 acre-feet of Replacement Water (Contract No. 14-06-200-3598A-LTR1). This 25-year contract was executed on March 9, 2005. The District is also a member agency of the San Luis & Delta-Mendota Water Authority.

Recently, the District partnered with Reclamation through Cooperative Agreement on the construction of a new Fish Screen and Intake on the San Joaquin River, which replaced the district's antiquated diversion and screening facilities. The new intake includes screens that meet NOAA Fisheries and National Marine Fisheries Service screening requirements for Chinook salmon and steelhead. This project was completed in 2012.

TECHNICAL PROJECT DESCRIPTION

The proposed Two-Drains Project will capture and return agricultural surface flows and operational spills from the Marshall Road Drain and Spanish Land Grant Drain. The recovered drain water will be integrated with Patterson Irrigation District's (District) irrigation supplies and used for irrigation within the District's Boundary. The project will operate as a series of pump stations connecting to District water storage and conveyance facilities. Control of the project will be through the District's SCADA system, based on supply, demands, and water levels. Figure 2 shows the general locations of each of the proposed facilities.

- Station 1 – Station 1 would be a 25 cfs pump station located on the south side of Marshall Road, east of Alfalfa Avenue. The new pump station would connect to both the Marshall Road Drain and Spanish Land Grant Drain pipelines and pump the agricultural drainage and operational spill water into a new pipeline running approximately 4,000 feet west to the District's Marshall Reservoir, where the pumped water would be stored.
- Station 2 – Station 2 would be a 25 cfs pump station located at the District's South Side Reservoir and would pump water from the Reservoir into a new pipeline approximately 10,200 feet along Lateral 3 South, discharging into that Lateral 3 South upstream of Pomelo Avenue. A new long crested weir would be required at the Pomelo Avenue check structure in order to properly control water.

- Station 3 – Station 3 would be a 10 cfs pump station located at Lateral 3 South, upstream of Pomelo Avenue and would pump water from Lateral 3 South into a 2,600 foot long pipeline connecting to Lateral 4 South.
- Station 4 – Station 4 would be a SCADA controlled gate structure that would allow flow by gravity into a 2,900 foot long pipeline from Lateral 3 South to Lateral 2 South. No pump would be required at this station and flow rate would be controlled by the gate opening at the headworks of the Station 4 pipeline. The capacity of the pipeline would be up to 10 cfs.
- SCADA Integration – All four stations will be integrated into the District's SCADA system to control pump flow rates and gate operation according to system demands and capacities.

Note that lengths and capacities are approximate and final dimensions and flow rates will be determined during the design phase.

Project Tasks:

- **Environmental Compliance:** The proposed project is a new facility and an initial study and negative declaration will likely be required to comply with the California Environmental Quality Act (CEQA), however, given the developed nature of the project area, the District does not anticipate any significant environmental consequences and does not expect that any mitigation measures will be required. Data acquired during the development of CEQA documents will be shared with the U.S. Bureau of Reclamation for NEPA compliance.
- **Surveying and Design:** The proposed project alignments will be surveyed in Spring of 2013, with design following. The survey will also establish the District's existing right-of-way and regions where additional right-of-way or easements will be required. Design documents will include plan and profile drawings of the project, pump station details, electrical drawings, and specifications. Meters will be incorporated in the design to measure pumped volumes at each station (Station 4 will have a meter on the pipeline). The specifications will include provisions regarding prevailing wage requirements in compliance with the funding program's requirements.
- **Permitting:** The District will acquire encroachment permits from Stanislaus County for six road crossings. The District has a long-standing relationship with the County and does not expect this to be a lengthily or complicated process.
- **Acquisition of Right-of-Way:** The District expects to acquire right-of-way for Station 1 and Station 3 (Station 2 will be constructed on District owned property), and for portions of the pipeline alignments. The boundaries of acquired right-of-way will be determined during the design phase. Legal descriptions will be developed by a licensed surveyor.
- **New Pump Stations:** The three new pump stations will each consist of a reinforced concrete sump, pump and motor units, steel manifolds, and variable speed electrical controls. Flow meters will be installed in each

station to track the volume of water returned. Each station will be integrated into the District's SCADA system. Station 1 will likely include two pumping units with a combined maximum capacity of approximately 25 cfs. The Station 1 sump will be designed to capture incoming flow from the Spanish and Marshall drains according to the system demand, and spill any excess (un-captured) flows back into the drains. Station 2 will be located at the District's existing South Side Reservoir. This station will also likely include two pumping units and will pump approximately 25 cfs from the reservoir up to Lateral 3 South. Station 3 will likely be a single pump station with a capacity of approximately 10 cfs. This station will pump water from Lateral 3 South to Lateral 4 South.

- **Pipeline Installation:** The proposed project will install a total of 3.7 miles of pipeline along four different alignments. All pipe is expected to be PVC, ranging in diameter from 24" to 36". Pipeline alignments will be within existing District right of way or along county roads. Pipe will be trenched to a depth necessary to provide a minimum of 36" of cover and backfilled with native material at an appropriate level of compaction. The Station 1 pipeline is expected to be a 36" pipeline connecting the Station 1 pumps to the South Side Reservoir along Marshall Road (length ~ 4,000 feet). The Station 2 pipeline is expected to be a 36" pipeline connecting the South Side Reservoir to Lateral 3 South at Pomelo Avenue. The pipeline will run approximately 10,200 feet along the west bank of Lateral 3 South. The Station 3 pipeline is expected to be 24" diameter connecting Station 3 at Lateral 3 South to Lateral 4 south along an existing open-channel district sublateral(length ~2,600 feet). The Station 4 pipeline will connect Lateral 3 South (at Pomelo Ave.) to Lateral 2 South (length ~2,900 feet). This pipeline is expected to be a 24" diameter and would run east along Pomelo Avenue.
- **Water Level Control Structure:** New water level control structures will be required downstream of each of the pipeline outlets at Laterals 2 South, 3 South and 4 South. These structures will likely be cast-in-place reinforced concrete long crested weirs, although other structure types could be used. The exact size and layout of the water level control structures will be determined during the design phase.

EVALUATION CRITERIA

Criterion A: Water Conservation.

Subcriterion No. A.1(a) – Quantifiable Water Conservation. The proposed project will recover agricultural drain water from the Spanish and Marshall Drains, and return that water to the District's distribution system for reuse as irrigation supplies. The District's average water deliveries are approximately 40,700 afy. Discharge from both drains has been monitored continuously since 2005, and **Table 2** shows the average annual discharge for both drains. This drainage flows directly to the San Joaquin River.

Table 2: Annual Drainage Flows

Year	Marshall	Spanish	Combined Total
2005	1,202	4,152	5,354
2006	1,545	4,994	6,539
2007	2,003	5,110	7,113
2008	2,491	6,193	8,684
2009	1,147	6,328	7,475
2010	1,522	7,348	8,870
2011	2,731	3,366	6,097

The District expects to recover 5,000 afy on average, capturing approximately 70% of the discharge and reducing drainage flows to the San Joaquin River to less than 2,500 afy in most years. This water savings will occur on an annual basis through the life of the project (expected to be greater than 20 years). An equivalent volume of water from the District's other water sources will be marketed to other water agencies through existing and new water transfer agreements. Diverted water will be metered at the pump stations.

Subcriterion No. A.1(b) – Improved Water Management. The proposed project will improve the District's ability to manage water deliveries for portions of the Lateral 2 South, 3 South, and 4 South service areas (see **Figure 2**) by providing increased monitoring and SCADA controls. Currently, these three laterals are supplied only from the District's Main Lift Canal, at each lateral's headworks. The proposed project will provide mid-lateral water supplies, which will help the district match flows in each lateral according to real-time demand. SCADA integration and water level monitoring will adjust the project's pumping rates according to actual demand. The volume water with improved management will be equal to the deliveries by the affected laterals, which averages approximately 12,400 afy based on delivery records from 2006-2012.

Calculation of Water Better Managed Fraction:
(12,400 afy) ÷ (40,700 afy) = 30.5%

Subcriterion No. A.2 – Conserved Water Percentage of Total Water Supply
Total Water Supply: (5,000 afy) ÷ (40,700 afy) = 12.3%
Water Deliveries through Laterals 2 South – 4 South = (5,000 afy) ÷ (12,400) = 40.3%

Subcriterion No. A.3 – Reasonableness of Cost. The proposed project will recover an estimated 5,000 afy of agricultural drain water and improve water management of 12,400 acre feet per year (water managed in the affected laterals) through by automating the new and existing facilities with SCADA integration. The assumed lifespan for this project, based on the typical lifespan

of pump stations and piped facilities, is 20 years. The estimated total project cost is $3,200,000. The Reasonableness of Cost calculation is:

$3,200,000/((5,000 afy + 12,400 afy) x 20 years) = $9.20/af

A breakdown of the project costs is included in **Table 5** (in the Budget Proposal section). Since 2002, the District has implemented two sophisticated drainage capture and return systems and has been able to successfully recover an average of 4,600 afy. The project costs are based on costs from those projects as well as other similar projects in the region.

Criterion B – Energy-Water Nexus.
The proposed project will include components to improve energy efficiency related to the management and delivery for water.

Subcriterion No. B.1 – Implement Renewable Energy Projects Related to Water Management and Delivery.
The proposed project does not include any renewable energy components.

Subcriterion No. B.2 – Increasing Energy Efficiency in Water Management.
Reduced Field Operations: The proposed project will increase the District's SCADA control for Lateral's 2 South, 3 South, and 4 South, allowing the majority of operations to be performed from the District's office. This will eliminate the need to make field visits to the laterals for manual flow adjustments. The reduced daily vehicle miles is estimated at 15 miles per day (calculated as two, round trip visits per day), for a total of 5,100 miles of travel per year (15 miles per day x 340 days). Based on the U.S. EPA equations, this amounts to a reduction of approximately 2.5 tons of CO_2 per year.

Criterion C – Benefits to Endangered Species.
The proposed project will not result in a significant change in the surrounding environment and will not have a direct impact to any special status species. However, the project will reduce the volume of agricultural surface drain water which is currently discharged to the San Joaquin River and eventually to San Joaquin/Sacramento Delta. Both the San Joaquin River and the Delta are habitat to a variety of special status species, including the Delta Smelt and split tail and is a vital migration corridor for salmon and steelhead.

As referenced earlier, the District is a participating agency in the Westside San Joaquin River Watershed Coalition to help its growers comply with California's ILRP. As part of the Westside Coalition's monitoring program, water quality samples are collected from the Marshall Road Drain near its discharge point into the San Joaquin River. Collected

water quality data since the beginning of the monitoring program show chronic water quality exceedances from the Marshall Road Drain which negatively impact water quality in the San Joaquin River. **Table 3** shows the count of water quality exceedances from the Marshall Road Drain since the beginning of the project and from 2010 to present.

Table 3: Marshall Road Drain Water Quality Exceedances

Constituent	Count Since Start of Monitoring	Count from 2010 to 2012
Water Flea Toxicity	3	1
Algae Toxicity	5	
Ammonia	2	1
Arsenic	1	
Boron	8	
E. Coli	26	8
TDS	42	14
Chlorpyrifos*	18	6
DDE/DDT	19/7	8/3
Diazinon*	2	
Dimethoate	3	
Diuron	6	2
Gamma Chlordane	3	
Malathion	3	3
Methyl-Parathion	1	

* San Joaquin River TMDL constituent.

Water quality monitoring data for the Spanish Land Grant Drain is not available, however its service area is very similar to that of the Marshall Road Drain in terms of crops grown and cultural practices followed, and it is reasonable to assume that the number and types of water quality exceedances would also be similar. The proposed project is expected to divert 70% of the average annual discharge from these two drains and reduce the associated discharge of pollutants.

Since 2002, the District has operated the Marshall Reservoir, which recaptures drain water from the Marshall Road Drain upstream of the proposed Station 1. In addition to the volume of water captured by the reservoir, the District also tracks the load of silt that accumulates in the Marshall Reservoir from impounding the drain water. This silt load has consistently averaged about 1 cubic yard of silt for every acre foot of drain water recovered. The proposed project will recover water of similar quality and will reduce the silt load to the San Joaquin River at a similar rate (1 cubic yard per acre foot ~ 5,000 cubic yards per year). Suspended silt contributes to a number of water quality concerns including low dissolved oxygen levels, sediment-carried pesticides (such as pyrethroids and chlorpyrifos) and overall habitat degradation.

Criterion D – Water Marketing.
The District intends to market all the water recovered by this project as it is made available. The District has long standing agreements and relationships with Federal water districts and private water users within the Central Valley Project (CVP) area, and will market the conserved water through those markets.

- The estimated marketed water associated with this project is 5,000 afy. The actual volume will depend on the actual amount of drain water recovered by the project.
- All marketed water will go to other water agencies within the CVP service area. The District has existing or past water sale agreements with San Luis Water District, Panoche Water District, Westlands Water District, Del Puerto Water District, and Santa Clara Valley Water District. All of these water agencies acquire water through federal water contracts, which are subject to severe reductions in dry year types. This project will help alleviate some of that strain.
- The potential water market covers the entire CVP service area south of the San Joaquin/Sacramento Delta and includes several thousand water users. Conserved supplies would be put to reasonable and beneficial uses, including agricultural purposes within the CVP region.
- Given the demand for water in the western San Joaquin Valley, the potential water market duration is indefinite. The District expects demands for marketed water to continue for many years as many uncertainties in California regarding environmental and endangered species issues, hydrology, and conveyance continue to persist.

Criterion E – Other Contributions to Water Supply Sustainability.
The proposed project includes additional components that will contribute to water supply sustainability.

Subcriterion E.1: WaterSMART Basin Study Adaptation Strategy.
The proposed project is located within California's Central Valley (part of the CalFed Solution Area, see **Figure 1**), a region included in the Sacramento-San Joaquin Rivers Basin Study. At the time of the development of this proposal, this basin study was not published and specific adaptation strategies have not been identified. However, the project is consistent with several identified regional priorities, including reduction of drainage discharges that impair San Joaquin River water quality, recovery of drainwater for reuse as irrigation supplies, SCADA automation to provide more precise control of system operations, and increased water availability for marketing.

- The project will recover drain water from the two identified drains, which are known to carry a variety of pollutants of concern within the San Joaquin River, including silt, chlorpyrifos and diazinon. Reduction of drainage flows will result in a reduction of pollutants discharged.

- The proposed project will capture an estimated 5,000 afy of drainage flows and return them to the District's distribution system to meet irrigation demands within the District. This will free up an equivalent volume of the District's CVP or San Joaquin River supplies for transfer to other water users in need of additional supplies.
- The proposed project will expand the District's SCADA system and improve control of deliveries within the southerly portion of the District's distribution system, affecting approximately 3,000 acres within the District.

Subcriterion E.2: Expedite Future On-Farm Irrigation Improvements.
The proposed project will not directly improve any on-farm irrigation systems. However, by providing more precise control of deliveries, the project will allow the District to match canal flows with real-time demands and improve the systems overall reliability. This is a key issue for high-efficiency irrigation systems which rely on automatic timers, frequent changes in irrigation demands, and a greater overall flexibility in the distribution system. The improvements provided by the proposed project will make the installation of high efficiency irrigation systems more attractive to growers.

The majority of the proposed project service area is irrigated with conventional surface methods and the District has identified 23 fields (729 acres, total) that may upgrade to high-efficiency irrigation systems if funding assistance was available. The volume of water conserved though irrigation system upgrades is difficult to estimate as it is dependent on the pre-project cultural practices of each grower and the specific crop grown (which will change from year to year). Based on a comparison of furrow irrigated cotton and drip irrigated cotton, the potential water savings could be as high as 1.4 af/ac[1] – amounting to more than 1,000 acre feet per year in conserved water if the full 729 acres within the service area converts to drip.

All of the growers within the project service area would likely qualify for NRCS funding assistance through the EQUIP program (or other programs) and the District is prepared to and has provided technical assistance to those growers pursuing funding assistance. The District informs growers of funding opportunities as they are made available through mailer or newsletter.

Subcriterion E.3: Other Benefits - Improve Operations and Maintenance Efficiency.
The proposed project will provide additional benefits related to distribution system operations. By expanding the District's SCADA system, many of the daily operations of the affected laterals will be controlled directly from the office, reducing the number of vehicle miles related to field visits to the laterals by an estimated 5,100 miles per year. Based on EPA equations, this results in a

[1] This value was calculated from an average comparison of conventional irrigation water applications and buried drip water application on cotton fields near Firebaugh, California.

reduction of CO_2 emissions of 2.5 tons per year, plus an estimated cost savings of $2,800 per year in fuel and vehicle maintenance (assuming a cost rate of $0.55 per mile)

Criterion F: Implementation and Results

Subcriterion F.1: Project Planning.

The proposed project is consistent with the goals of Westside Coalition's Management Plan General Approach (portions included in **Appendix A**. The entire plan is available upon request). The goal of that plan is to reduce the number of water quality exceedances caused by agricultural discharges from lands within the Westside Coalition. Since 2004, the Westside Coalition has worked with its members (including Patterson Irrigation District) to reduce agricultural discharges and the associated exceedance. Since 2008, the District, the Westside Coalition, Central California Irrigation District, and Twin Oak's Irrigation District have worked together to address discharges from the Marshall Road Drain and the Spanish Land Grant Drain, and the proposed project is the result of that collaboration. Flow from both drains has been measured since 2005 to determine seasonal flow changes and the potential volume that could be recovered.

In 2005, the Central Valley Regional Water Quality Control Board (Regional Board) established a TMDL program for chlorpyrifos and diazinon pesticide discharges in the San Joaquin River (TMDL Program). The primary goal of this program is to limit and eventually eliminate the discharge of those two pesticides to the San Joaquin River. A link to the TMDL program is here: http://www.waterboards.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/san_joaquin_op_pesticide/index.shtml

The proposed project will significantly reduce discharges from the two drains into the San Joaquin River, reducing the amount of pesticides and silt associated with those discharges as well as the number of water quality exceedances, consistent with goals of both the TMDL Program and the Westside Coalition Management Plan.

Subcriterion F.2: Readiness to Proceed.

This project is being proposed as a three-year phased project under Group II Funding. The proposed project is ready to proceed, with survey work scheduled to begin with the notice of award and design work to follow. The proposed project is fairly sophisticated, with several pump stations and pipelines that will be integrated together with the District's distribution system and project design is expected to carry through 2013. Environmental review and documentation will be developed simultaneous with design. Construction will be phased after completion of design according to the following approximate schedule.

- July 2013 – Survey of project alignments. Survey data necessary for design and right-of-way will be acquired.
- September 2013 – Begin design including a hydraulic analysis based on the survey data and district operations. This phase of design will establish final pumping rates and a detailed hydraulic model. Environmental documentation will also be started.
- January 2014 – Finalize CEQA documentation and provide project environmental details to Reclamation for NEPA compliance.
- March 2014 – Finalize NEPA documentation and design drawings and prepare specifications.
- June 2014 – Begin construction of Station 1 pump station and pipeline and Station 2 pump station and pipeline.
- October 2014 – Construct water level control structures in Laterals 2 South, 3 South, and 4 South.
- June 2015 – Begin Construction of Station 3 pump station and pipeline and Station 4 pipeline.
- December 2015 – Installation of electrical equipment, pumps, and motors.
- February 2016 – SCADA integration and system testing.
- July 2016 – Submit Draft Final Report and As-Built Drawings.
- September 2016 – Submit Final Report.

Subcriterion F.3: Performance Measures.
The primary benefit of the proposed project is the recapture of drain water from the Marshall and Spanish drains. This will be a continuous and long term benefit measured directly by the flow meters installed as part of Station 1. Meter data will be recorded by the District and will be the basis by which the District markets water to other water agencies.

The Westside Coalition will continue to monitor water quality of Marshall Road Drain Discharges, when they occur. The number of water quality exceedances measured by the Westside Coalition will be reported semi-annually to the Regional Board, and a comparison between pre- and post-project exceedances will be made. To the extent that this data is available at the time of reporting, it will also be included in the project final report.

A secondary benefit of the project will be the conversion of up to 729 acres of furrow irrigated lands to high-efficiency drip irrigation systems (see **Figure 2**). Although the District will not directly implement this conversion, the proposed project and access to NRCS funding assistance will encourage growers to install drip systems. Three of the growers within the project service area have provided letters of intent to install drip irrigation systems to the District (see **Appendix B**). Based on historic average application rates, the water savings from these systems could be as high as 1.4 acre feet per acre, amounting to more than -1,000 feet per year should the entire 729 acre area convert to drip irrigation. The water savings from this benefit will be difficult to track; however, the District will

record the acreage within the service area that converts to high-efficiency systems. This data will be reported through the Westside Coalition's semi-annual reports.

Criterion G: Additional Non-Federal Funding.
The District has budgeted $1.7 million of reserve funds in its budget for this project. The total project cost is estimated at $3.2 million. The cost ratio of non-federal funds is:

($1.7M/$3.2M) = 53%

Any cost overruns will also be born by the District.

Criterion H: Connection to Reclamation Project Activities

(1) Patterson Irrigation District and the proposed project are both located in the Sacramento-San Joaquin Rivers Basin as well as in the CalFed Solution Area (see **Figure 1**). The proposed project will improve water quality in the San Joaquin River and the Sacramento/San Joaquin Delta, as well as reclaim drain water for irrigation use, improving water use efficiency. Both of these are Reclamation priorities.
(2) The District has a Reclamation water contract (via the CVP) that makes up approximately 10% of its water supply. This water is received from the Delta-Mendota Canal.
(3) The proposed project is not on Reclamation lands nor does it directly involve a Reclamation facility. However, water marketed by the District as a result of the proposed project would be marketed through the Delta-Mendota Canal, which is a Reclamation facility.
(4) The project is located in the Sacramento-San Joaquin Rivers Basin.
(5) Water marketed by the proposed project would used by water agencies within the Sacramento-San Joaquin Rivers Basin.

PERFORMANCE MEASURES

As indicated in **Subcriterion F.3**, the most significant performance measure of the proposed project will be the capture and return of drain water, which will be measured directly by the flow meters at Station 1. This data will be logged and reported by the District and will be the basis by which the District markets water to other water agencies.

The Westside Coalition will continue to monitor water quality of Marshall Road Drain Discharges, when they occur. The number of water quality exceedances measured by the Westside Coalition will be reported semi-annually to the Regional Board, and a comparison between pre- and post-project exceedances will be made. To the extent that this data is available at the time of reporting, it will also be included in the project final report.

ENVIRONMENTAL COMPLIANCE

The proposed project will construct new facilities for the distribution of water. Under the California Environmental Quality Act (CEQA), this project will require an initial study to review potential environmental impact. The District expects that the initial study will result in a negative declaration with minimal or no mitigation requirements, and will complete this work prior to any construction work. Gathered environmental data will be provided to Reclamation to assist with the necessary NEPA documentation.

1. *Will the project impact the surrounding environment?*
   The proposed project will involve trenching, placement of pipe and backfill of that trench; excavation and placement of concrete pump structures; and construction of small buildings to house electrical controls. During construction, trenching and excavation will generate a small amount of fugitive dust, however standard dust control measures will be implemented to minimize this impact and the construction period will be relatively short. After construction, the majority of the proposed facilities will be below ground and not visible. The pump stations and electrical buildings will be consistent with other district facilities. Lands surrounding the proposed project are either actively farmed or contain farm support facilities (such as shops and farm houses). The proposed project will not result in the loss of any farm land. Pipe alignments will be located within existing canal-bank or farm roads.

2. *What endangered or threatened species are in the project area?*
   There are a number of special status species that could potentially be in the project area, including the California tiger salamander, the California red-legged frog, Fresno kangaroo rat, and others. Because the proposed project alignment is actively traveled and maintained and the surrounding area actively farmed, there is limited habitat and it is unlikely that any special status will be in the project area during construction. A qualified biologist will survey the project area prior to construction to determine if there are any special status species in the project area prior to the start of construction, and will make recommendations for additional actions as required.

3. *Are there wetlands inside the project boundary?*
   There are no wetlands in the project boundary. The proposed project will be constructed within the existing farm roads or canal bank roads.

4. *When was the water delivery system constructed?*
   Laterals 2 South, 3 South, and 4 South were constructed in the first half of the 20th Century and have been maintained and updated a number of times as the district implemented more sophisticated delivery control systems. The South Side Reservoir was constructed in 2002.

5. *Will the project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)?*

The proposed project will modify the existing check structures downstream of the system inlets to Laterals 2 South, 3 South, and 4 South. Modifications will likely include construction of a cast in place concrete long crested weir. The existing check structures were constructed originally between 1910 and 1920.

6. *Are any building, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?*
   There are no buildings, structures, or features within the District listed in the National Register. The District is not aware of any features that are eligible for listing.

7. *Are there any known archeological sites in the proposed project area?*
   There are no known archeological sites in the proposed project area.

8. *Will the project have a disproportionately high and adverse effect on low income or minority populations?*
   The proposed project will have no impact on low income or minority populations.

9. *Will the project limit access or use of Indian sacred sites or impact tribal lands?*
   There are no tribal lands within the project or its service area. The proposed project will have no impact on tribal lands.

10. *Will the project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species in the area?*
    The project will have no impact on noxious weeds or non-native species compared to existing conditions.

OFFICIAL RESOLUTION

An official Resolution is included in **Appendix C** of this application.

REQUIRED PERMITS OR APPROVALS

The project will need to comply with the applicable provisions of NEPA and CEQA as outlined under **Project Tasks**. Encroachment permits will be required where the project pipeline crosses Stanislaus County Roads. These permits will be acquired once the design drawings are complete. The District intends to acquire other required right of way from landowners as necessary.

FUNDING PLAN AND LETTERS OF COMMITMENT

The total estimated cost of the proposed project is $3,200,000. This cost was calculated based on the District's recent experience in similar projects. This application is requesting $1,500,000 in federal funding assistance and will utilize $1,700,000 of District Funds.

- District funds. The District's contribution to the project will be through direct funding of administration, design, and construction of the project. The District has budgeted $1,700,000 to complete the project. This funding has been

allocated in the District's 2013 budget for the entire project and is available to complete the project.

The District expects to utilize the federal funding assistance for a portion of the engineering and construction costs and utilize District funding for all other costs, including surveying, design, remaining construction, administration, and inspection.

The District has not yet incurred any costs that would be used to meet its match obligation.

No other federal funding has been requested or received for this project.

If the funding requested by this application is denied, the proposed project would not be implemented at this time and other funding opportunities will be pursued. Should a lesser amount of funding be provided, the District may implement the first phase of the project (Station 1 pump station and pipeline), depending on the funding provided.

Table 4 summarizes the source and amount of project funding.

Table 4: Funding Chart

Funding Source	Funding Amount
Patterson Irrigation District (non-federal)	$1,700,000
Requested Reclamation Funding	$1,500,000
Other Federal Funding (non-Reclamation)	$0
Total Project Funding	$3,200,000

BUDGET PROPOSAL

Table 5 shows the project budget proposal. **Table 6** shows the anticipated funding schedule.

Table 5: Budget Proposal

ITEM	BUDGET ITEM DESCRIPTION	COMPUTATION Quantity	Unit	Unit Cost	DISTRICT FUNDING	RECLAMATION FUNDING	TOTAL COST
1	Salaries and Wages	0					$0
2	Fringe Benefits	0					$0
3	Travel	0					$0
4	Equipment	0					$0
5	Supplies/Materials	0					$0
6	Contractural/Construction						
6.1	Surveying (Design and line layout)	483	hours	$120	$58,000		$58,000
6.2	Engineering (Electrical and Civil Design)	1,200	hours	$150	$90,000	$90,000	$180,000
6.3	Construction						
6.3.1	Furnish & Install (F&I) Pipelines (24" and 36" and crossings)	19,700	each	$78	$786,000	$750,000	$1,536,000
6.3.1	F&I Pump Stations and Manifolds	3	each	$138,667	$372,000	$44,000	$416,000
6.3.2	F&I Pumps and Motors	3	each	$73,333	$170,000	$50,000	$220,000
6.3.3	F&I Electrical Equipment and SCADA Integration	3	each	$206,667	$94,000	$526,000	$620,000
6.3.4	F&I Long Crested Weirs in Lateral 2S, 3S, and 4S	3	each	$25,000	$50,000	$25,000	$75,000
6.3.5	F&I Outlet Structures for Pipelines	3	each	$5,000	$15,000		$15,000
6.3.6	F&I Right Of Way	6	acres	$2,500	$15,000		$15,000
7	Environmental and Regulatory Compliance						
7.1	Reclamation Costs (assumed)				$0	$15,000	$15,000
7.2	Engineering Consultant	100	hours	$150	$15,000		$15,000
8	Other Costs						
8.1	Construction Administration and Field Review	200	hours	$150	$30,000		$30,000
8.2	Review and Reporting	33	hours	$150	$5,000		$5,000
	TOTAL DIRECT COSTS:				$1,700,000	$1,500,000	$3,200,000
9	Indirect Costs (Not charged to the project)				$0	$0	$0
	TOTAL PROJECT COSTS:				$1,700,000	$1,500,000	$3,200,000
	Percent of Total Cost:				53%	46.875%	

Table 6: Funding Schedule

	Year 1	Year 2	Year 3
Federal Funding Requested	$130,000	$750,000	$620,000
District Funding	$178,000	$821,000	$701,000
Total Anticipated Funding Needs	$308,000	$1,571,000	$1,321,000

Budget Narrative.

a. Salaries and Wages. Although District staff will likely spend time administering and supervising the project, the District does not intend to separate that time from other daily duties of the staff. No District staff time will be charged to the project.
b. Fringe Benefits. The District will not charge fringe benefits associated with District staff to this project.
c. Travel. No travel is associated with this project.
d. Equipment. No equipment will be purchased as part of this project.
e. Materials and Supplies. No materials or supplies will be charged to this project.
f. Contractual. The proposed project will make use of a number of consultants and contractors for its completion.
    - Surveyor. A licensed professional surveyor will be used to survey the project alignment, develop topographic data for design, identify right of way limits, and set construction stakes. A surveyor in training (LSIT) and other staff technicians will convert the field data to CAD files for design. The hourly rate depends on the type of work (field work or office work) and the individual performing that work (licensed surveyor, LSIT, or technician). The proposed project has moderately complicated surveying requirements and a surveyor with experience in the area was consulted to develop an estimated cost for surveying services. The quote is attached in **Appendix D**.

    - Engineers. A licensed civil engineer will be for development of the environmental documents and civil design drawings and specifications, project administration, and field review of construction progress. An electrical engineer will develop the electrical design drawings and specifications. Billing rates for both engineers average $150 per hour. The engineering time was based on the following assumptions:
        a. Civil engineering design drawings and specifications: 660 hours
        b. Civil field review: 40 hours
        c. Environmental Documentation: 100 hours
        d. Electrical engineer design drawings and specifications: 400 hours
        e. Development of specifications and contract documents: 100 hours

    - Construction. A qualified contractor will be selected by the District, likely through a public bidding process. Estimated costs for the construction work are based on the unit costs for recent similar projects or from unit prices provided by contractors familiar with the project
        a. Furnish and Install Pipelines. The proposed project includes installation of 24" and 36" diameter pipe. Unit costs for PVC pipe in those diameters were provided by a contractor familiar with the area and were used for the budget. These costs include excavation of the pipe trench, placement of the pipe, backfill and compaction.
        b. Pump Stations and Manifolds. Pump stations consist of the construction of a concrete sump and steel manifold and valves. Engineering estimates

for the volume of reinforced concrete were made and a unit cost for reinforced concrete (by cubic yard) was provided by a contractor familiar with the project. The cost for steel manifolds was based on a similar project completed in 2006 and inflated to current value.

c. Pumps and Motors. Pump and motor units will be required at each pump station. The size and number of pumps for each station will be determined during the design phase. Costs for pumps and motors were based on a similar project completed in the District in 2006, adjusted for inflation.
d. Electrical Equipment and SCADA Integration. Electrical equipment will include typical electrical panels and variable speed drives necessary to operate the pumps. SCADA integration will include the computer components and antenna necessary to connect the pump stations with the District's existing SCADA system, as well as the time for a qualified SCADA integrator to program and test the system. These costs were estimated by the District's electrical engineer based on previous costs on similar projects.
e. Long Crested Weir. Long crested weirs will be required downstream of the pipe outlets into Laterals 2 South, 3 South, and 4 South. These were estimated as cast in place reinforced concrete structures. Cost for these were based on a similar structure installed by the District in 2009.
f. Outlet Structures for Pipeline. Outlet structures will be required at each of the discharge points into the laterals. These outlet structures are expected to be simple pre-cast concrete boxes installed in the side of the lateral. Estimated costs for these are based on similar concrete structures.
g. Right of way. Approximately 6 acres of right of way will be required for the new pump stations (Stations 1 and 3) and for portions of the pipe alignment where existing District right of way is not sufficient. Estimated value of the right of way was estimated based on prior District land acquisitions.
h. Control Gates. The new check structure will control the canal water

- Environmental and Regulatory Compliance Costs. The proposed project will construct new facilities and will require an Initial Environmental Study, likely resulting in a Negative Declaration. NEPA will require an Environmental Assessment (EA) that will likely result in a Finding of No Significant Impact (FONSI). The proposed project budget includes consultant costs to develop and Initial Study and Negative Declaration to comply with CEQA. All documents and backup information developed through that process would be provided to Reclamation for the EA. Costs incurred by Reclamation to develop the EA are not known and were assumed to be $15,000. The environmental compliance costs amount to 1% of the estimated project cost, which is consistent with the nature of the project and environmental costs of past projects. The District has sufficient reserves available to cover additional environmental costs should they be required.

g. Other Costs. Other costs include construction administration, field review and grant contract administration.
    - Construction Administration and field review. Construction administration activities include contract execution between the district and the contractor building the project, ensuring insurance requirements are met, invoice review and progress payments, and other associated tasks. Field review activities include trips to the construction sites to ensure project components are completed according to the design drawings and complying with permit requirements where appropriate. These two tasks are expected to include a total of 200 hours of engineering time at $150 per hour.
    - Review and Reporting includes the activities necessary to develop the grant program reports and reimbursement requests, including the final report. This is expected to require 33 hours of engineering time over the course of the three year project. Note that the District has limited staff and expects to use an engineering firm to complete this work.

h. Indirect Costs. Indirect costs incurred by the District will not be charged to the project.

i. Total Cost. The total estimated project cost is $3,200,000, including $1,500,000 (47%) in Reclamation funds, $1,700,000 (53%) in District funds. The District has sufficient reserves available in its budget to fund any cost overruns or unforeseen costs should they be required.

Budget Form.

SF 424C is included at the beginning of this application.

Appendix A

Portions of Westside San Joaquin River Watershed Coalition Management Plan General Approach

(Note: the full management plan is available upon request)

SAN JOAQUIN VALLEY DRAINAGE AUTHORITY

Westside San Joaquin River Watershed Coalition

Management Plan – General Approach

FINAL

October 23, 2008

California Regional Water Quality Control Board
Central Valley Region
Karl E. Longley, ScD,P.E., Chair

Linda S. Adams
Secretary for
Environmental
Protection

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Arnold
Schwarzenegger
Governor

18 November 2008

Mr. Joseph McGahan
Watershed Coordinator
Westside San Joaquin Watershed Coalition
P.O. Box 2157
Los Banos, CA 93635

APPROVAL FOR MANAGEMENT PLAN – GENERAL APPROACH, AND FOCUSED WATERSHED MANAGEMENT PLAN FOR INGRAM AND HOSPITAL CREEKS

On 23 October 2008, the Westside San Joaquin River Watershed Coalition (Westside Coalition) submitted a Management Plan – a General Approach to describe monitoring and management practice activities that will take place throughout the Westside Coalition area, and a Focused Watershed Management Plan (Focused Plan) to describe intensified efforts in the high-priority watersheds of Ingram and Hospital Creeks. The California Regional Water Quality Control Board, Central Valley Region (Regional Water Board) has reviewed both components of the Management Plan.

The Management Plan demonstrates the Westside Coalition's commitment to work with the Regional Water Board on the Central Valley's salinity problems through participation in the Central Valley Salinity Alternatives program. With this Management Plan, the Coalition is addressing their members' responsibilities to implement the Sacramento and San Joaquin River Basin Plan Total Maximum Daily Loads (TMDLs) for salt and boron, diazinon and chlorpyrifos, and dissolved oxygen.

In addition, your plan identifies actions to reduce pesticide discharges to tributaries to the San Joaquin River. When implemented, those actions should adequately address your members' diazinon and chlorpyrifos discharges to the San Joaquin River. Your plan and the associated actions meet the management plan requirements contained in the Basin Plan[1].

With one modification, the Westside Management Plan also addresses the specific requirements of the Irrigated Lands Regulatory Program. This necessary modification is described below.

Within the Focused Plan, interim goals of 90% completeness were set for two parameters: 1) completed surveys returned from growers that were asked to provide survey information, and 2) contact, by Coalition representatives, with growers that have been identified as likely or potential contributors of specific high-priority constituents in the focused watersheds. It is understood that information on the actual percent completeness of these goals (and other performance goals) will be reported to the Regional Water Board according to the schedule

[1] Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, IV-36.03, Item 8.

stated in the Focused Plan. The Focused Plan states that if the goals are not met, follow up actions will be determined in collaboration with Regional Water Board staff.

I want to make it clear that all growers in the Coalition are obligated to meet the conditions of the Coalition Group waiver. Since the Coalition will be focusing its initial efforts in two watersheds, all Coalition Group members in those watersheds must actively participate in addressing the identified water quality problems. Failure of individual participants to respond to requests by the Coalitions will put their status under the Coalition Group waiver in jeopardy. Given the obligations that growers assumed when joining the Coalition, the goals for completed surveys by growers in the focus watersheds should be set at 100%. Follow up actions described in the Focused Plan should occur if the 100% goal is not met.

In summary, the basic approach for source identification, outreach, and mitigation actions described in the Westside Coalition's Management Plan is appropriate. I am granting approval of the Management Plan with the understanding that the performance measures described above will be changed from 90% to 100% completeness for grower surveys and follow-up. With this approval, the Westside Coalition meets the Management Plan development requirements of the Coalition Group waiver[2] for those parameters and water bodies identified in Table 1 of the Westside Management Plan.

It is fully anticipated that the Westside Coalition will need to modify the Management Plan over time, as new monitoring data and performance measures inform us about the effectiveness of the actions, and as activities for Focused Plans in other water bodies need to be described. These modifications will need to be discussed and evaluated with Regional Water Board staff during the designated quarterly meetings and documented in Management Plan updates. Any updates will need to receive my approval as Executive Officer.

If there are any questions concerning these requirements, please contact John Swanson at 916-464-4849, or by email at jswanson@waterboards.ca.gov.

PAMELA C. CREEDON
Executive Officer

[2] B.6. of Amended Attachment B, Order No. R5-2006-0053.

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List of Tables

Section 1: Management Plan Overview

The Westside San Joaquin River Watershed Coalition (Westside Coalition or Coalition) received a letter from Pamela Creedon, Executive Officer of the Regional Water Quality Control Board (Regional Board or Board) dated November 30, 2006 that informed the Coalition of the requirement to develop and implement a management plan to address water quality exceedances at locations where there has been more than one exceedance within three years. The letter included a memorandum that identified the constituents and monitoring sites that had reported more than one exceedance and the required components of a management plan to address them. This request was partially in response to the Water Quality Strategy submitted to the Regional Board by the Westside Coalition on July 31, 2006 and subsequent discussions.

The Westside Coalition has developed this Management Plan (Plan) to address the requirements for a plan in the Regional Water Board Order R5-2008-0005 (Board Order), as listed below.

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 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 Board.

This Plan utilizes a two-pronged approach to address these Board Order requirements. First, a general approach is described which will be utilized throughout the Coalition Group subwatersheds. The general approach will identify the common strategies that will be used throughout the subwatersheds, but which will vary among constituent types. For example, the approach that will be used to address toxicity will be distinctly different

than the approach that will be used to address the exceedances for *E. coli*. These different approaches are described in this Plan document.

The second prong is the use of Focused Watershed Management Plans (Focused Plans), which identifies a much more specific strategy to achieve Management Plan implementation and improvements in water quality in specific watersheds. The Focused Plans will identify water quality improvement goals and appropriate management practices (MPs) for implementation, will set forth timelines for implementation, and will describe the tracking mechanism to measure progress toward the goals.

The Regional Board has recognized the achievement of water quality goals. The Board also understands that plan timelines are difficult and that the Coalition will need to acquire more information to know which will be appropriate and achievable. For this reason, the success of the Plan will be measured not only in improvements in water quality measurements, but also in achievement and quantification of MPs; particularly with the completion of the Focused Plans.

Therefore, as part of its second prong, the Plan identifies an adaptive strategy and a procedure for modifications to change components for flexibility or to address new issues by addendum, including but not limited to, ongoing modifications of the Management Plan monitoring program and implementation strategy to address identified water quality issues within the Coalition's area. Thus, the Plan is intended to be a living document, and activities identified within this Plan will be reviewed and evaluated on a continuous basis in consultation (at least quarterly) with Regional Board staff to realize the intended water quality improvements and to assure that resources are utilized in the most efficient manner. Consistent with the Westside Coalition's structure, membership, and authorities, the Plan may involve regional, district-based, or individual activities as appropriate. Ultimate enforcement responsibilities for discharges from individual parcels will remain with the Regional Board. This Plan categorizes the water quality issues into logical groups and subareas based on the apparent cause and

likely effective management activities that may be used to address the issue(s). Potential management activities are identified and an implementation schedule is included in this Plan.

The Westside Coalition is reporting and has compared water quality monitoring results to recommended water quality values (WQV) as requested by the Irrigated Lands Regulatory Program (ILRP) staff, even though some of the values have not been adopted in applicable regulations. Reporting of monitoring results that fall outside of the requested values should not be construed as acquiescence that these values are applicable water quality objectives under the Basin Plan. The Westside Coalition's efforts are focused on addressing known water quality issues.

Section 2: The Westside San Joaquin River Watershed Coalition

In April 2004, the San Joaquin Valley Drainage Authority (SJVDA) submitted a Watershed Evaluation Report for the Westside San Joaquin River Watershed Coalition. The Westside Coalition Watershed generally lies on the west side of the San Joaquin River from approximately the Stanislaus County Line to the north to 10 miles south of Mendota to the south and encompasses an area of approximately 496,000 acres. There are approximately 4,000 landowners and 1,500 operators within the watershed. The Westside Coalition includes water and irrigation districts, private water companies, individuals, and Federal, State, and private managed wetlands. A number of rural communities and the City of Los Banos are also situated within the Coalition's external boundaries, but are not part of the Coalition. See **Figure 1** of the Monitoring and Reporting Program (MRP) Plan (February 2008) for Monitoring Station Locations.

Organizational Structure: The San Joaquin Valley Drainage Authority, a California joint powers agency, is the umbrella organization for the Westside Coalition. Its members are water, irrigation and drainage districts generally on the west side of the San Joaquin Valley interested in a variety of drainage issues, from Tracy to Tulare Lake. The Westside Coalition is a special project under the SJVDA formed by some of the irrigation and water districts for the purposes of providing coverage as a watershed

coalition for landowners and operators under the ILRP. The Westside Coalition is comprised of the lands within Del Puerto Water District, Patterson Irrigation District, the San Joaquin River Exchange Contractors Water Authority (which includes Central California Irrigation District, San Luis Canal Company, Firebaugh Canal Water District, and Columbia Canal Company), Tranquillity Irrigation District/Fresno Slough Water District, Twin Oaks Irrigation District, West Stanislaus Irrigation District, Oak Flat Water District, El Solyo Water District, Stevinson Water District, White Lake Mutual Water Company, Lone Tree Mutual Water Company, Turner Island Water District and San Luis Water District. Grassland Water District/Grassland Resource Conservation District, State Refuges managed by the California Department of Fish and Game, and Federal Refuges managed by the U. S. Fish & Wildlife Service cover 128,000 acres. Each of the above agencies is acting on behalf of the lands located within its boundaries and engages its individual landowners and operators in the Westside Coalition's program for funding, monitoring and MP implementation. A number of additional individual landowners outside of organized districts have also joined the Westside Coalition.

The Coalition is governed by a Steering Committee that meets monthly in an open and public forum. The chairman may appoint ad hoc committees to develop recommendations on specific issues. The Coalition contracts with a Watershed Coordinator, and the Steering Committee provides direction to the Watershed Coordinator following discussion and appropriate action at these meetings. The Watershed Coordinator provides the primary communication link between the Coalition and the Regional Board. The Watershed Coordinator also serves as the primary communication link for water quality issues and ILRP information to the member districts, who then communicate with the landowners and operators. Follow up with individual members is directly through the Watershed Coordinator. The Watershed Coordinator assists the districts in grower outreach through presentations at meetings and grower workshops, providing results of water quality monitoring and providing results of MP evaluations. The structure of the Coalition takes advantage of the leadership of existing water and drainage entities upon whom landowners and water users are accustomed to rely for information and direction, and can provide direct

landowner assistance and information through the watershed coordinator. It is based upon the principle that proactive leadership is the most effective and appropriate tool to maximize individual landowner and operator cooperation in achieving watershed-based water quality improvement goals and is not structured as a regulatory enforcement body.

Summary of Monitoring Results: In July of 2004, the Westside Coalition began it's Phase I Monitoring, which included general physical and drinking water constituents, analyses for 30 different organophosphate pesticides, aquatic toxicity testing for algae, fathead minnow, and water flea, and sediment toxicity testing. In July of 2006, the Coalition implemented Phase II Monitoring with added constituents for nutrients, metals, and carbamate, herbicide, organochlorine, and pyrethroid pesticides. In the 36 month period from July 2004 through August 2007, the Westside Coalition has collected and reported more than 30,000 constituent results through its monitoring plan. **Table 1** shows the number of water quality results that fall outside of the recommended WQV at each monitoring site between July 2004 and August 2007.

Table 1: Count of Results Outside of Water Quality Values

July 2004 through August 2007

	DPCHW	DPCCR	HCARR	ICARR	LBCCC	LBCHW	MRDRR	MSUSL	NWHFR	OCAHW	OCARR	ROLFA	SCAOV	SSALA	SSASD	SJRLA	TSAER	WWNCR
Ceriodaphnia	2	1	3	0		2	1	1	0	6	3	1	1	4	3	1	0	0
Fathead	0	1	1	1	1	0	0	0	1	0	1	0	0	0		0	2	0
Algae	1	1	3	3	0	0	4	1	2	2	0	0	0	6	6	3	1	2
Total Pesticides	8	16	28	36	1	0	20	2	11	32	27	3	6	9	11	2	0	16
DDD	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
DDE	2	7	9	9	0	0	5	0	7	12	12	1	2	1	0	0	0	7
DDT	0	1	7	8	0	0	2	0	0	4	2	0	1	0	1	0	0	4
Chlorpyrifos	1	5	5	8	1	0	7	2	3	8	9	2	1	8	10	1	0	4
Diazinon	2	1	5	2	0	0	2	0	0	2	1	0	2	0	0	1	0	0
Dimethoate	0	0	0	5	0	0	2	0	0	3	1	0	0	0	0	0	0	1
Diuron	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lambda cyhalothrin	1	0	0	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0
Permethrin	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Es/fenvalerate	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Methyl parathion	2	1	1	1	0	0	0	0	0	1	2	0	0	0	0	0	0	0
Hyalella	5	4	5	6	2	1		1	3	5	1	0	0	1	0	1	1	5
TSS	0	0	16	17	2	1	0	0	0	3	2	0	0	0	2	0	0	4
E. Coli	18	20	24	18	10	23	17	12	25	26	33	16	7	12	13	12	16	15
EC	3	8	1	9	11	33	8	34	39	3	1	20	1	39	20	21	6	1
TDS	5	17	8	17	5	36	11	36	35	6	9	22	6	39	21	20	1	7
D.O.	1	0	0	2	6	10	4	0	9	2	1	5	0	1	3	0	8	0
pH	11	5	3	1	1		3	1	2	1	4	3	1	1	5	5	7	6

The site code abbreviations are defined below along with a brief description of each monitoring site. Map Designations are shown on Figure 1 of the MRP.

- Hospital (HCARR) and Ingram Creeks (ICARR) (Designation 1 & 2). The confluence of Hospital and Ingram Creeks is on the 303(d) list for pesticides. The sites are each located on the individual creeks, upstream of the confluence. Both of these creeks are significant drainages for the Patterson subarea.
- Westley Wasteway (WWNCR, Designation 3). Westley Wasteway is a significant drainage for the Patterson subarea for both tailwater and storm runoff. Land use upstream of this monitoring station is similar to that of Del Puerto Creek. The Westley Wasteway is also a dewatering channel for the Delta-Mendota Canal.
- Del Puerto Creek (DPCCR and DPCHW, Designation 4 & 5). Del Puerto Creek is on the 303(d) list for pesticides and is a major drainage for the Patterson subarea and major storm runoff collector. Two stations are identified on this waterbody; one near the discharge to the San Joaquin River, and one at Highway 33, near the middle of the Patterson subarea. Biological assessments are performed on Del Puerto Creek to assess its overall health, which will be useful in relating to collected water quality data.
- Salado Creek (SCOAV), Ramona Lake (ROLFA), and Marshall Road Drain (MRDRR) (Designations 6, 7 & 8). All three of these are significant drainages for the Patterson subarea. All three carry tailwater from similar land use areas, as well as operational spills. Salado Creek also collects storm water runoff from the City of Patterson. The outlet of Salado Creek is a pipe discharge into the San Joaquin River, and access for sampling is subject to the water level and flow conditions of the river, which frequently prevent sample collection. As of March 2008, the Westside Coalition discontinued monitoring at the Salado Creek location.
- Orestimba Creek (OCAHW and OCARR, Designation 9 and 10). There are two monitoring locations on Orestimba Creek; one near the discharge point to the San Joaquin River; and one upstream at Highway 33. The importance of Orestimba Creek is similar to that of Del Puerto as it is on the 303(d) list for

pesticides, is a major drainage for the Patterson subarea, and is included in the biological assessment portion of the monitoring program.

- Newman Wasteway (NWHFR, Designation 11). The Newman Wasteway is a significant drainage path for the Patterson subarea and is on the 303(d) list for salt and pesticides. This site measures drainage that originates from the southerly region of the Patterson subarea. Newman Wasteway is also a dewatering channel for the Delta-Mendota Canal and is sized to carry very high flows (>300 cfs).
- The San Joaquin River at Sack Dam (SJRSD) and Lander Avenue (SJRLA) (Designations 12 & 13). These are baseline sites to establish the water quality backdrop in the San Joaquin River. The Sack Dam site is a water supply site that delivers water to agricultural areas within the Dos Palos subarea as well as wetland water supplies. It can also receive agriculture return waters from the Tranquillity subarea. It is included to determine supply side water quality that may be affected by upstream discharge.
- Mud Slough (MSUSL) and Salt Slough (SSALA, and SSASD) (Designations 14, 15 & 16). These sites measure both drainage originating from the Los Banos and Dos Palos subareas that flow through the wetlands, as well as discharge from the wetlands themselves. Both Mud and Salt Sloughs are on the 303(d) list for a variety of constituents. In addition to the Westside Coalition's monitoring program, the Central Valley Regional Water Quality Control Board's Surface Water Ambient Monitoring Program (SWAMP) collects and analyzes samples from these sites throughout the year. These samples are analyzed for selenium, boron, and electric conductivity (EC), along with other constituents. The SWAMP data is available via the internet at: http://www.waterboards.ca.gov/centralvalley/programs/agunit/swamp/index.html.
- Los Banos Creek (LBCCC and LBCHW, Designations 17 & 18). Los Banos Creek carries storm water runoff from the Coastal Mountain Range, the City of Los Banos, and from the adjacent agricultural lands and wetlands. It also receives tail water from the Los Banos subarea. Two stations have been established on this waterbody: Los Banos Creek at China Camp Road, upstream

of the wetland area within the Los Banos subarea, and Los Banos Creek at Highway 140, within the wetlands.

- Turner Slough (TSAER) (Designation 19). This station is located on the east side of the San Joaquin River and measures drainage from a portion of the Patterson subarea.

Section 3: Plan Prong 1: Water Quality Improvement – General Approach

Water quality improvement goals, ongoing and planned MPs, implementation schedule, assessment and procedures are grouped within this plan according to the identifying metric (e.g., aquatic toxicity), and the potential cause or managed constituent (e.g., pesticides).

The Westside Coalition proposes to develop a Management Practice Inventory. This Management Practice Inventory will strive to document current MPs implemented within the watershed. Data will be collected from water districts, government agencies as well as individual growers. The goal will be to generally characterize the current level of MP implementation within the Coalition area but not to document the specifics of every MP implemented.

The Coalition will also inventory funding sources available to growers to help implement MP implementation. These funding sources may be specific to sub-watersheds or generally applicable to the entire Coalition. A list of potential funding sources will be generated and distributed to growers to facilitate MP implementation. Summarized and updated information on MP implementation and funding will be provided in each semi-annual monitoring report submitted to the Regional Board.

Aquatic Toxicity, Pesticides, and Metals:

- *Ceriodaphnia dubia* (water flea): There have been 29 measurements of significant toxicity to the water flea between July 2004 and August 2007. The Coalition has performed 11 Toxicity Identification Evaluations (TIEs) as follow-up. The TIEs generally indicated non-polar organic materials (both metabolically and non-

metabolically activated) as the likely cause, implying that pesticides were involved. Water chemistry data frequently measured detectable amounts of pesticides during events where toxicity was measured. Sites affected by water flea toxicity and detected insecticides are:

Del Puerto Creek (Cox Rd. & Hwy 33)
Orestimba Creek (Hwy 33 & River Rd.)
Salt Slough (Sand Dam & Lander Ave)
Marshall Rd Drain at River Rd.
Ingram Creek at River Road
Los Banos Creek at Hwy 140
Hospital Creek at River Rd.

- *Selenastrum capricornutum* (algae): There have been 37 measurements of significant toxicity to algae between July 2004 and August 2007, and three TIEs performed. One TIE was inconclusive due to insufficient toxicity. However, the others indicated herbicides and/or divalent cations (metals) as the potential cause. In some, but not all, events where algae toxicity was measured, herbicides were also detected in the water. Copper and zinc are also known to impact algae growth. The Westside Coalition has analyzed water for these metals since July of 2006,. Sites affected by algae toxicity are:

Hospital creek at River Rd.
Salt Slough (Sand Dam and Lander Ave.)
Ingram Creek at River Rd.
Westley Wasteway
Marshall Rd Drain at River Rd.
Orestimba Creek at Highway 33
Newman Wasteway
San Joaquin River at Lander Ave.

- *Pimephales promelas* (fathead minnow): There have been eight measurements of significant toxicity to fathead minnow between July 2004 and August 2007. Some follow-up samples were collected and none indicated persistent toxicity. A number of these measurements have been linked to pathogen interference (bacteria or virus infection) rather than site water effects. Turner Slough is the only monitoring site that has measured more than one result with significant toxicity, and of the two events at that site, one was associated with pathogen interference.
- *Pesticides:* Fifteen of the monitoring sites have exhibited more than one measurement of a pesticide that exceeded WQV's. Several pesticides have exhibited multiple exceedances at one or more locations. Pesticide concentrations and TIEs have indicated that pesticides (e.g. chlorpyrifos for water flea, and diuron for algae) are frequently the likely cause of observed toxicity. This Management Plan and the Focused Plans (see section 4) are intended to identify general

outreach and management that will occur and that are expected to reduce these occurrences, as well as to develop further monitoring and evaluation strategies to characterize the causes of the exceedances where necessary, so that efficient mitigation techniques can be developed.

An additional goal of this Management Plan is to establish monitoring and management activities on behalf of members of the Westside Coalition who are or who may be dischargers of chlorpyrifos and diazinon, as required in the Regional Board's Basin Plan for the Sacramento and San Joaquin River basins. The Basin Plan sets forth Total Maximum Daily Load (or TMDL) requirements for dischargers of chlorpyrifos and diazinon, and requires that dischargers of these two compounds comply with the monitoring and management criteria defined in the Basin Plan. The TMDL limits for chlorpyrifos and diazinon that apply to dischargers within the Westside Coalition are concentration-based numeric limits applied to specified segments of the San Joaquin River, as defined in the Basin Plan. To demonstrate compliance with the TMDL limits, several agriculturally-influenced tributaries to the San Joaquin River are routinely monitored, as described in the Westside Coalition's Monitoring and Reporting Program Order. In addition to the monitoring defined in the MRP Order (and to comply with the requirements of the TMDL), the Westside Coalition will also begin monitoring for chlorpyrifos and diazinon in the San Joaquin River at additional locations that may include the crossings at Las Palmas Avenue and at Maze Boulevard, at least quarterly, and beginning in 2010. The actual timing, frequency and exact locations for compliance monitoring in the San Joaquin River to be performed by the Westside Coalition will depend upon evaluation of ongoing monitoring results of tributaries, and monitoring to be performed by other organizations, including the East San Joaquin Coalition. Actual monitoring frequency and locations for San Joaquin River monitoring for chlorpyrifos and diazinon to be performed by the Westside Coalition in 2010 and beyond will be determined and documented in the form of an addendum to the Management Plan, or a revised Management Plan, prior to January 2010.

Appendix B

Letters of Intent

Marty Barbaste
Triangle J
431 Pomelo Avenue
Patterson, CA 95363

January 4, 2013

Mr. Peter Rietkerk
Patterson Irrigation District
PO Box 685
Patterson, CA 95363

SUBJECT: Patterson Irrigation District Spanish and Marshall Drain Return System

Dear Peter,

Thank you for informing me about the subject project and the potential benefits it will have on delivery reliability for the portion of Patterson Irrigation District's conveyance system that serves my property. Based on the information you have provided, I believe that this project will improve delivery reliability to my property and make irrigation improvements to our property more attractive in the future. We are currently evaluating the feasibility of converting our current irrigation system to a high-efficiency irrigation system such as drip/micro-sprayer or sprinkler irrigation to our property in this area, and will contact you for information regarding potential funding assistance and availability.

Sincerely,

Marty Barbaste
Triangle J

Frank Trinta
Trinta Bros.
524 Pomelo Avenue
Patterson, CA 95363

January 4, 2013

Mr. Peter Rietkerk
Patterson Irrigation District
PO Box 685
Patterson, CA 95363

SUBJECT: Patterson Irrigation District Spanish and Marshall Drain Return System

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Sincerely,

Frank Trinta
Trinta Bros.

Jeff Michelena
Michelena Farms
1600 Prune Avenue
Patterson, CA 95363

January 4, 2013

Mr. Peter Rietkerk
Patterson Irrigation District
PO Box 685
Patterson, CA 95363

SUBJECT: Patterson Irrigation District Spanish and Marshall Drain Return System

Dear Peter,

Thank you for informing me about the subject project and the potential benefits it will have on delivery reliability for the portion of Patterson Irrigation District's conveyance system that serves my property. Based on the information you have provided, I believe that this project will improve delivery reliability to my property and make irrigation improvements to our property more attractive in the future. We are currently evaluating the feasibility of converting our current irrigation system to a high-efficiency irrigation system such as drip/micro-sprayer or sprinkler irrigation to our property in this area, and will contact you for information regarding potential funding assistance and availability.

Sincerely,

Jeff Michelena
Michelena Farms

Appendix C

Official Resolution

THE PATTERSON IRRIGATION DISTRICT
RESOLUTION NO. 05-2012

RESOLUTION AUTHORIZING PREPARATION OF GRANT APPLICATION TO SEE FUNDING TO SUPPORT THE MARSHALL/SPANISH DRAINAGE RETURN PROJECT (TWO-DRAINS PROJECT)

WHEREAS, the Patterson Irrigation District (District) has completed various drainage recirculation projects within the local region in order to provide water conservation and improved flexibility of water supply within the District as well as also improve water quality in the San Joaquin River; and

WHEREAS, the District is currently proposing the Marshall/Spanish Drainage Return Project (Project), which includes installation of a small reservoir, as well as various pump and pipeline improvements to capture and recirculate an estimated 5,000 acre-feet of operational spill and agricultural drainage for recirculation; and

WHEREAS, the goals of the Project are to (1) reduce salt, silt, and nutrient loading to the San Joaquin River by diverting spill and drainage water into the proposed recovery reservoirs and recycling the water for delivery, (2) improve water management through the construction of an operational spill and tail-water recovery reservoir project, and (3) reduce organophosporus and pyrethroid pesticide concentrations in water discharged to the San Joaquin River; and

WHEREAS, the Project includes the construction of a small detention reservoir, three pump stations, long crested weirs, and approximately 19,700 feet of pipeline to store and irrigation drainage and operational spill and recirculate water from the reservoir(s) into agricultural water supply; and

WHEREAS, the District is seeking assistance for design and construction of this Project; and

WHEREAS, the District has appropriate funding available through capital reserves and/or in-kind contributions to provide a 50-percent cost share for the Project.

NOW, THEREFORE BE IT RESOLVED that the Board of Directors of Patterson Irrigation District:

1. Hereby finds the facts set forth in the recitals above and in the documents referenced therein are true and correct, and the Board of Directors so finds and determines.

2. Authorizes and directs the District's General Manager to submit the attached application on behalf of the District for the WaterSMART Water and Energy Efficiency Grants for 2013 offered by the Bureau of Reclamation (Reclamation).

3. Hereby certifies that the District is capable of providing the required cost share requirements through capital reserves and/or in-kind contributions.

4. If awarded, the Board hereby authorizes the General Manager to execute a cooperative agreement between the District and Reclamation, and pledges to work collaboratively with Reclamation to meet established deadlines for entering into a cooperative agreement.

PASSED AND ADOPTED the 14th day of December 2012 by the following vote:

AYES: Azevedo, Fantozzi, Reichmuth, Robinson, Scheuber

NOES:

ABSENT:

BY: _____
President

ATTEST: _____
Secretary

Appendix D

Cost Backup: Quote for Surveying Services

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Page Count: 49

P.O. Box 25783, Fresno, CA 93729
559.645.4849 fax: 559.645.4869
www@bedrockeng.com

December 13, 2012

BRE #12-2357

Chris Linneman
C/o Summers Engineering
887 N Irwin Street
Hanford, CA 93230

Re: Proposal for topographic and boundary survey:
Patterson Irrigation District – Marshall/Spanish Return System, Patterson, CA

Dear Chris:

Thank you for the opportunity to provide a budgetary proposal for surveying services on the above referenced project. I look forward to a favorable response to our proposal. If you have any questions or concerns, please do not hesitate to contact me.

Best regards,

Michael S. Hartley, PLS 7077
President, Bedrock Engineering

Email: mike@bedrockeng.com

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www@bedrockeng.com

PROPOSAL FOR SURVEY:
Patterson Irrigation District – Marshall/Spanish Return System, Patterson, CA

FIELD WORK:

Topographic Survey: Establish control; topographic survey along proposed pipeline alignment and roadways including 500 foot cross sections and all pertinent features; topographic survey for pump stations	$18000.00
Boundary Survey: Recover section corners and property corners along proposed pipeline corridor to locate existing easements and prepare legal descriptions	$8000.00
Construction Staking: Set alignment stakes for rough grading and demolition; set final grades stakes every 500 feet along proposed pipeline alignment; establish vertical control using digital level	$12000.00

OFFICE WORK:

Topographic Survey: Prepare topographic survey map showing spot elevations and cross sections	$6000.00
Boundary Survey: Research; boundary calculations; prepare legal descriptions for easements	$5000.00
Construction Staking: Project coordination; prepare vertical alignment profile; construction staking calculations; cut sheets	$3000.00

EXPENSES:

Mileage, Survey Supplies, postage, printing costs	$6000.00

TIME AND MATERIALS NOT TO EXCEED $58,000.00

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www@bedrockeng.com

FEE SCHEDULE FOR LAND SURVEYING AND CIVIL ENGINEERING SERVICES

EMPLOYEE CLASSIFICATION	HOURLY RATE
Principal Civil Engineer / Principal Land Surveyor	$125.00
Registered Civil Engineer / Professional Land Surveyor	$100.00
Engineering / Land Surveying Technician	$85.00
Administrative Assistant / Clerical	$50.00

FIELD CREW (normal rate & non-prevailing wage)	HOURLY RATE
One-person crew with robotic total station	$125.00
One-person crew with GPS total station	$150.00
Riegl Z390i laser one-person crew with scanner	$250.00
Each additional crew member	$50.00

FIELD CREW (prevailing wage in all counties)	HOURLY RATE
One-person crew with robotic total station	$175.00
One-person crew with GPS total station	$200.00
Riegl Z390i laser one-person crew with scanner	$300.00
Each additional crew member	$85.00

EXPENSES	RATE
Plotting and reproduction services	Direct cost + 15%
Transportation	$0.75 per mile
Lodging and meals	Direct cost + 15%
Postage	Direct cost + 15%
Subconsultants	Direct cost + 10%

Rates are effective October 1, 2012 and are subject to periodic revision.

Appendix E

Letter of Support for the Project from the Westside San Joaquin River Watershed Coalition

SAN JOAQUIN VALLEY DRAINAGE AUTHORITY

P O Box 2157 Los Banos, CA 93635
209 826 9696 Phone 209 826 9698 Fax

December 15, 2012

To Whom It May Concern:

The Westside San Joaquin River Watershed Coalition (Westside Coalition) supports the efforts of Patterson Irrigation District to recover drain water from the Marshall Road Drain and Spanish Land Grant Drain. These two drain systems discharge agricultural drainage flows into the San Joaquin River and contribute silt, pesticides and other pollutants that may cause exceedances of water quality objectives set by the Central Valley Regional Water Quality Control Board (Regional Board).

The project proposed by Patterson Irrigation District will reduce these discharges and help improve water quality in the San Joaquin River, which is a priority of the Westside Coalition and the Regional Board's Irrigated Lands Regulatory Program.

We are happy to have this project in our area, as it helps our growers attain water quality objectives.

Very truly yours,

Joseph C. McGahan
Watershed Coordinator
Westside San Joaquin River Watershed Coaltion

1335 West "I" Street
PO Box 1231
Los Banos, CA 93635

(209) 826-1421
Fax (209) 826-3184
Email: ccid@ccidwater.org

www.ccidwater.org

January 11, 2013

Peter M. Rietkerk, Manager
Patterson Irrigation District
948 Orange Avenue
Patterson, CA 95363

Re: Marshall Road & Spanish Drain Return Project

Dear Peter:

Central California Irrigation District (CCID), has reviewed Patterson Irrigation District's above-referenced water conservation proposal and write this letter in support of the project.

The Marshall Road & Spanish grant return project has multiple measurable water quality and water conservation benefits. This area is a priority for such projects due to the areas unique soil characteristics and land slope which leads to water quality and runoff sediment issues in tailwater.

CCID supports the implementation of this and similar types of projects which promote increased water management and conservation efforts which benefit the farms and ranches on the west side and the San Joaquin River.

Very truly yours,

Chris White
General Manager

CW:mm