# MokeWISE Program Scope of Work:
## *Project 4d: North San Joaquin Water Conservation District Infrastructure Improvements*

April 2015

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## Problem Statement and MokeWISE Stakeholder Interests

The North San Joaquin Water Conservation District (NSJWCD) Infrastructure Improvements Project involves rehabilitation of the NSJWCD South Pump and Distribution System, which deliveries water from the Mokelumne River to a portion of the NSJWCD service area. The existing pump and distribution system are out-dated and in a state of disrepair and most irrigated farmland along the system relies on groundwater, rather than utilizing surface water. Rehabilitation of the pump and distribution system will allow NSJWCD to more economically delivery surface water to irrigated farmland along the system, reducing reliance on groundwater pumping in the area. This use will result in in-lieu recharge to the groundwater basin underlying NSJWCD.

NSJWCD's existing surface water source is Permit 10477, which allows the district to extract water from the Mokelumne River in years when water surplus to the needs of EBMUD and other prior right holders is available. Rehabilitation of the South Pump and Distribution System will help enable NSJWCD to put the water available under Permit 10477 to beneficial use.

This Project could also allow NSJWCD to leverage its improved distribution system for groundwater banking. Groundwater banking projects would involve the delivery of additional surface water into the NSJWCD service area, from another source (such as EBMUD). NSJWCD would require that some of the banked water be left in the NSJWCD service area and not extracted, as a condition, in order to obtain local benefits from the banking and assist in correcting overdraft. Such an arrangement would bring additional surface water into the NSJWCD region to help reduce groundwater demand, and would allow NSJWCD to spread the costs of its distribution system and operations among additional users, thereby making the use of the system by local farmers more economical.

Environmental stakeholders in the MokeWISE process share the interest in stabilizing and if possible recovering the groundwater levels in northern San Joaquin County. However, these environmental stakeholders are concerned that additional water may be diverted from the Mokelumne River without improving the groundwater water balance in the NSJWCD service area, or with potential harm to aquatic resources, including anadromous fish. They are also concerned that without monitoring and reporting of groundwater pumping and water use there will be no accountability should groundwater levels in the project area trend down over time.

In 2014, California Sportfishing Protection Alliance (CSPA) and NSJWCD entered into a water rights protest dismissal agreement to address these concerns as they related to the use of water under NSJWCD's Permit 10477. The agreement requires NSJWCD to annually report certain groundwater levels in the project area to CSPA as well as to the State Water Resources Control Board. This reporting will provide a certain measure of accountability and will test the effectiveness of terms in a water right permit as a means to provide it. The

agreement also limits the delivery of surface water under Permit 10477 to lands already under cultivation to ensure that surface water deliveries are used to reduce groundwater pumping.

The CSPA and NSJWCD agreement only applies to the use of water under Permit 10477. If the improved NSJWCD system is used for a groundwater banking project, these same concerns will need to be addressed as part of that project.

Costs for the NSJWCD Infrastructure Improvements Project are estimated to be $20 million.

## Background Information

### North San Joaquin Water Conservation District

The North San Joaquin Water Conservation District (NSJWCD) is a California Water Conservation District. The District's jurisdictional area includes approximately 154,000 acres, of which 4,740 acres are within the Lodi city limits and 5,600 acres are within Lodi's sphere of influence. NSJWCD currently has three pump stations on the Mokelumne River and is in the process of building a fourth. The existing three pump stations include the South Pump station (40cfs), a North Pump Station (40 cfs) and a Woodbridge/Cal-Fed Pump station (15 cfs). The North pump is not currently operational. The Woodbridge pump station was used for a recharge project in 2009 and 2010. The South pump station is operational but in need of rehabilitation.

The new fourth pump station is for the Tracy Lake Groundwater Recharge Project, which was funded in part by a federal Water Smart grant in 2011. The balance of the cost of the project was funded by landowner assessments. The Tracy Lake Groundwater Recharge Project will include a new pump station located on the north side of the river, downstream of Woodbridge dam, and will provide water to irrigated vineyards north of the river.

In 1996, NSJWCD adopted a Groundwater Management Plan (GWMP) meeting requirements of Assembly Bill 3030 (AB3030) to address declining groundwater levels. Actions to address the groundwater quality and quantity issues included securing a surface water supply and implementing efficient water application methods. NSJWCD has a 20,000 AFY Mokelumne River water appropriative water right, Permit 10477. Permit 10477 is junior to the rights of Woodbridge Irrigation District and EBMUD, therefore there is generally only water available to NSJWCD under Permit 10477 in normal to wet years. The lack of annual reliability of this water supply has historically meant that farmers were reluctant to invest in the dual surface and groundwater irrigation system necessary to use it when it was available, and preferred to rely on groundwater only. However, currently there is a strong interest by farmers in NSJWCD in using surface water to supplement groundwater supplies and help correct overdraft.

Between 2007 and 2015, NSJWCD has had pending water right petitions related to Permit 10477 to allow it more time to put the full amount of water under the Permit to beneficial use and make various changes to points of diversion and place of use. CSPA, WID and EBMUD all protested the petitions. In 2014, all three protests were resolved by agreement. Also, in 2014, NSJWCD completed environmental review for the change petitions and the use of the full amount of water under Permit 10477 with the requested extension of time. Key aspects of the settlement agreements include:

- Recognition of WID's prior rights.
- Agreement not to interfere with Joint Settlement Agreement ("JSA") fishery flows or activities.
- Commitment to deliver water available under Permit 10477 to previously cultivated lands rather than to serve new demands.
- Commitment to groundwater monitoring and reporting.
- Financial assistance from EBMUD to NSJWCD for its South System.
- Additional wet and dry year water for NSJWCD from EBMUD if a groundwater banking program can be established.

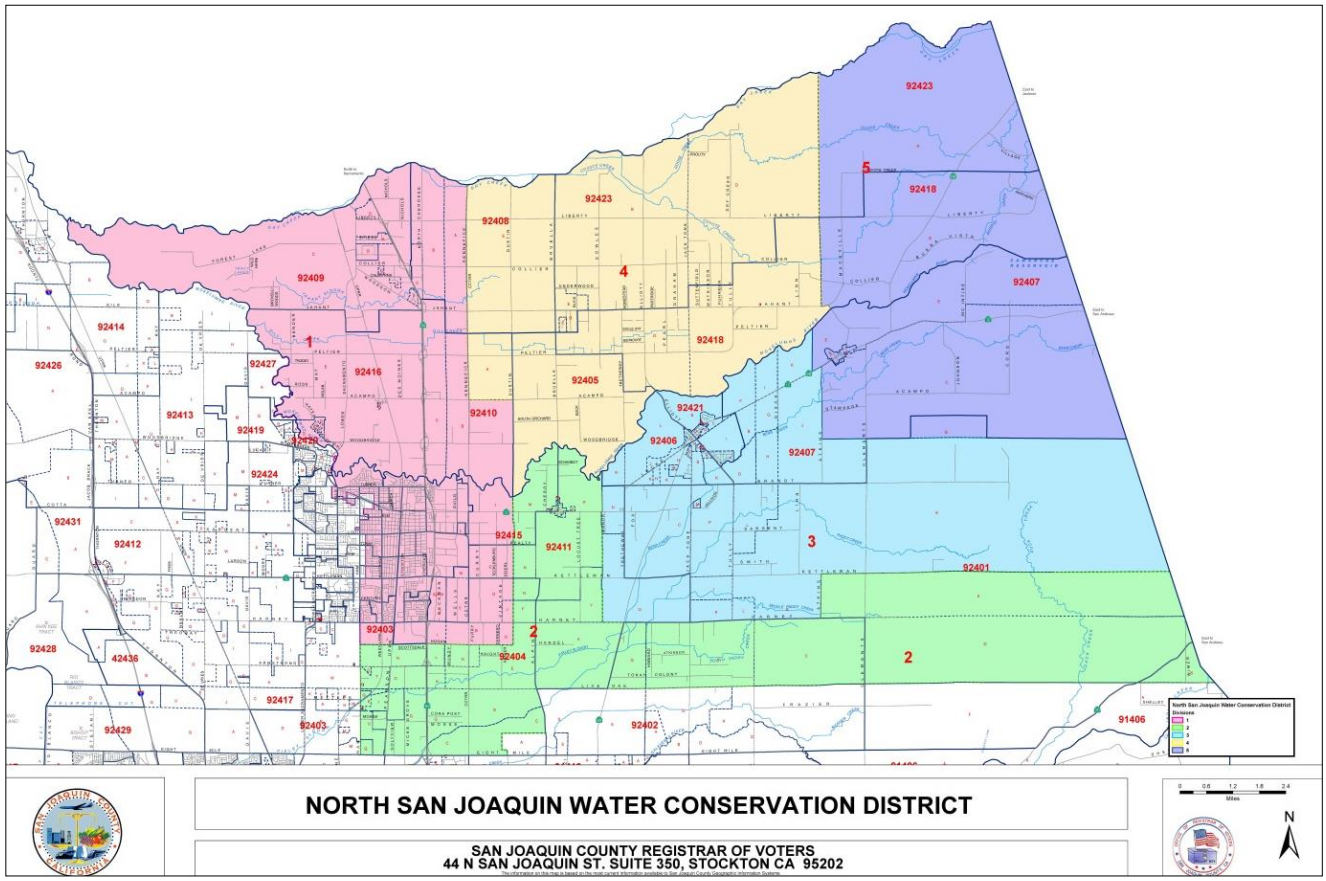
The State Water Resources Control Board approved the NSJWCD water right petitions on March 30, 2015.

# Project Information

## Project Location

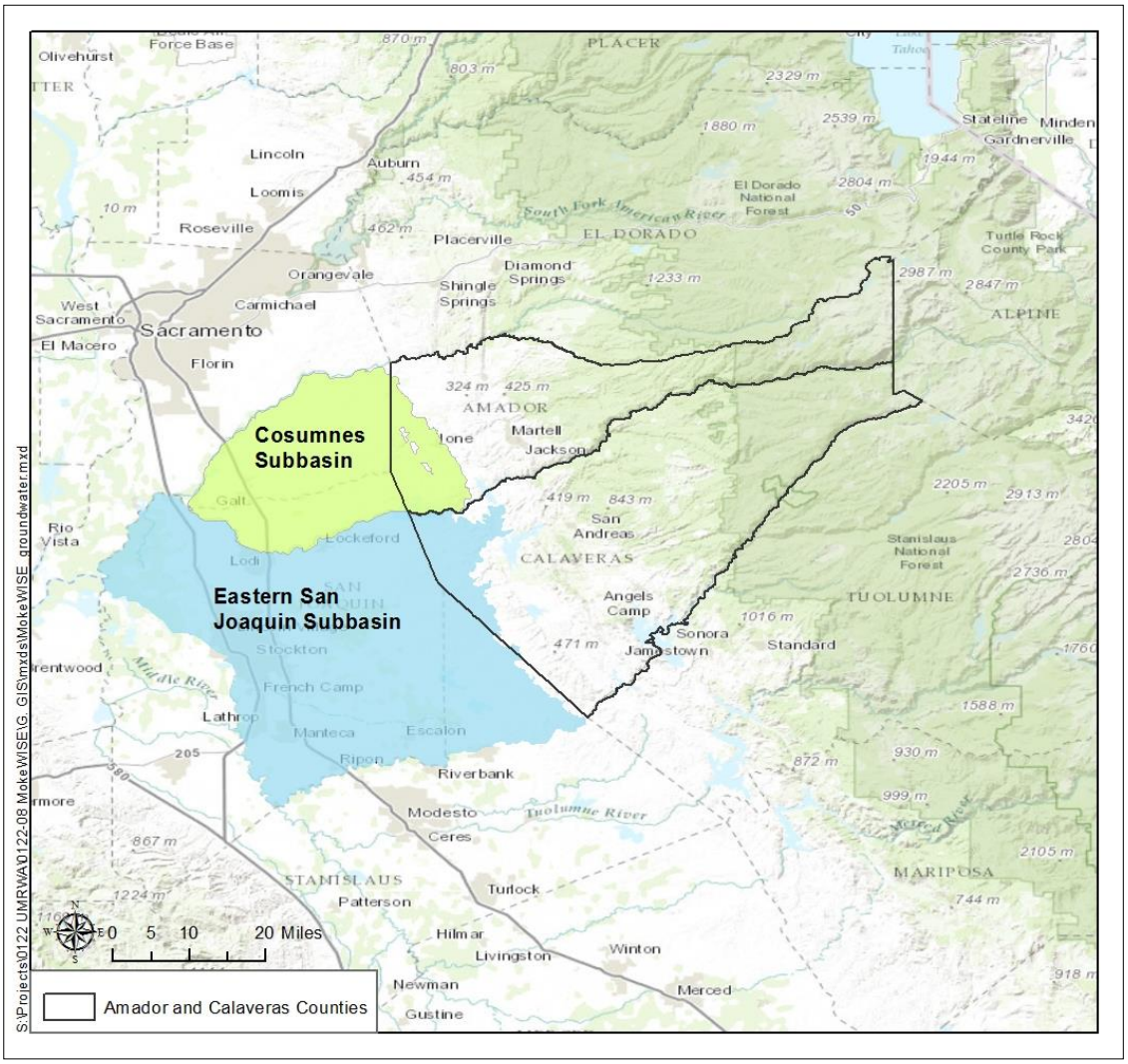
This Project is located within the NSJWCD service area in the lower Mokelumne River watershed. Error! Reference source not found. shows the NSJWCD service area. The lower Mokelumne River watershed is comprised of portions of the Eastern San Joaquin and Cosumnes Subbasins as shown in Error! Reference source not found..

**Figure 1: NSJWCD Service Area**




Source: NSJWCD Website

**Figure 2: Lower Mokelumne River Watershed and Subbasins**

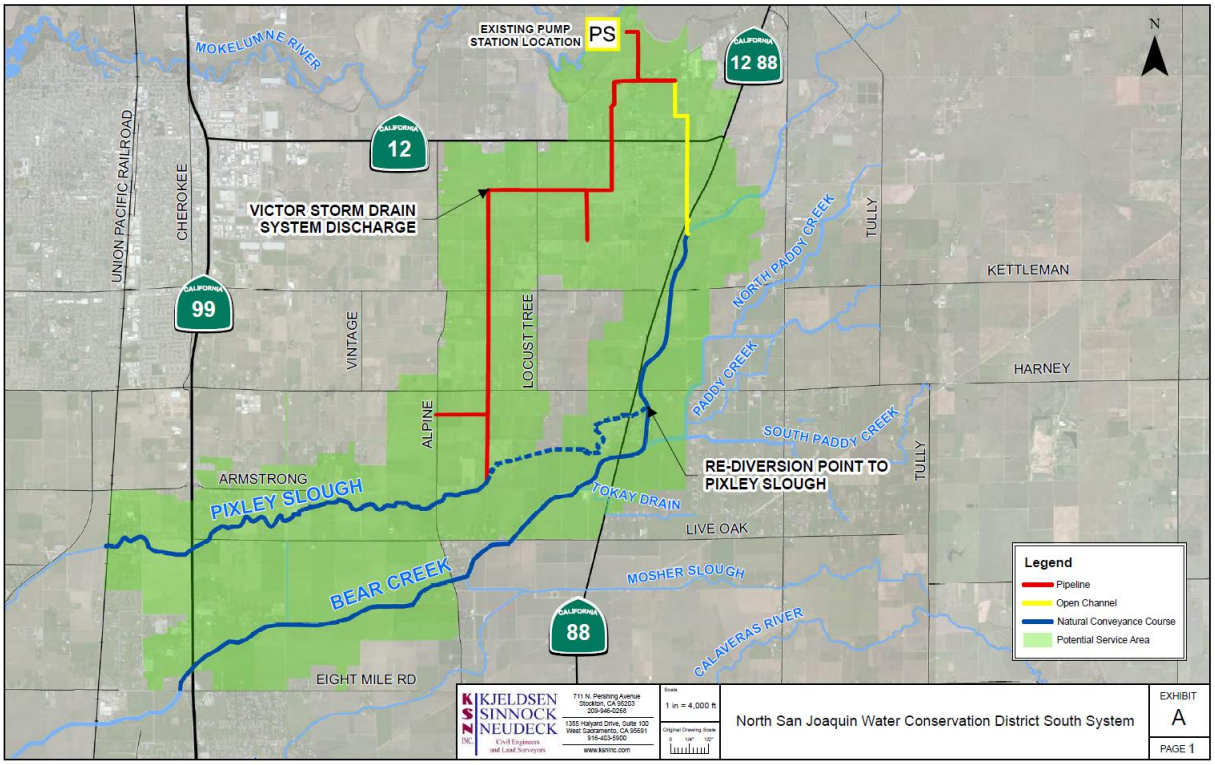



Source: RMC, 2015

## Project Description

The NSJWCD Infrastructure Improvements Project (Project) includes the repair and rehabilitation of the NSJWCD South Pump and Distribution System. The existing system consists of a series of older pumps and a network of cast in place concrete pipes and open ditch channels - all of which are located south of the Mokelumne River. See **Figure 3**, below.

**Figure 3: Existing NSJWCD South System**




There are 10,252 acres of irrigated farmland within 2000 feet of the existing south distribution system, with an estimated annual water demand of 24,400 afa. In most years, this demand is met entirely with groundwater. In recent years when surface water has been available under Permit 10477, 3,000 to 6,000 af was delivered along the south system.

With a current capacity of 30 cfs (at best), the south system can deliver 8,900 af of surface water during the irrigation season. With a rehabilitated capacity of 40 cfs (the permitted capacity per the water right), the south system could deliver 11,900 af during the irrigation season, which would satisfy approximately half of the total water demand along the system which is currently being met with groundwater pumping.

The existing pumps, electrical supply to the pumps, and the pipelines and channels are all outdated and in disrepair, which makes the system expensive to operate. In addition, the existing fish screen only allows for a diversion rate of 30 cfs, while the permitted diversion rate for this pump location is 40 cfs. Finally, the system is a low-head gravity flow system without pressurization. The water level in the existing system would normally only be about six inches above the adjacent irrigated land. The majority of on-farm irrigation systems observed in the South System potential service area are pressure systems such as: sprinklers, drip, and micro-spray. Therefore, to utilize surface water from the existing

system, these farmers must pressurize the water with their own facilities before it enters their irrigation systems.

For planning purposes, NSJWCD has evaluated South System infrastructure improvements in two components: (1) replacement or rehabilitation of the pump station, and (2) rehabilitation of the pipeline distribution system.

Construction of a new pump station is recommended due to the age and inefficient configuration of the existing facilities. The new pump station could be designed with a flow rate capacity of 40 cfs (maximum permitted diversion rate). The new pump station would include the installation of two pumps in parallel at a wet well located where the low-lift pump currently exists. A second new 30 cfs capacity fish screen would be installed closer to the center of the river channel to provide for flow rate capacity at 40 cfs (with both screens operating) and redundancy in the event one screen becomes inoperable. A new discharge pipeline would be installed to bypass the existing forebay and connect to the South System conveyance pipeline.

The new pump station would be designed to supply the existing gravity conveyance system, but should include design features (such as pipe material and pump selection) to accommodate the delivery of pressurized water if desired in the future. The pump station platform would be constructed such that all mechanical and electrical equipment would be above the 100 year flood elevation.

The above described modifications to the pump station and fish screen are considered the highest priority improvement for the South System. The next priority improvement is the rehabilitation of the distribution pipeline network. The existing cast-in-place concrete pipelines need to be repaired, slip-lined, or replaced with new PVC pipelines. In addition, some of the open ditch conveyance channels would be replaced with pipeline. If needed to pressurize parts of the system, additional pumps would be installed along the distribution system. The district will likely approach rehabilitation of the distribution system in phases, consistent with available funding.

## Project Sponsor

NSJWCD is the lead project sponsor.

# Scope of Work

## Task 1. Implementation of NSJWCD Infrastructure Improvements

### *Subtask 1.1 Design*

Preliminary design will consider the pump station and distribution system improvements. Distribution system improvements will have the potential to provide long-term energy savings through reduction in pumping costs. This design will be based on a full understanding of the history of NSJWCD infrastructure, especially the southern pump station, southern distribution system, and northern distribution system, as well as their current configuration and condition.

Design drawing elements will be prepared for the recommended infrastructure improvements for the southern pump station and distribution system and the northern distribution system. General drawings will include title sheet, list of drawings, vicinity and location map, symbols and abbreviations, design criteria and hydraulic profile. Plan views of the sites and enclosure mechanical layouts, enclosure elevations, profiles and cross sections depicting major modifications, equipment and piping will also be included. The design submittals will also include an updated preliminary construction schedule and updated construction cost estimates.

### *Subtask 1.2 Environmental Compliance*

NSJWCD has already completed CEQA compliance for the use of water under Permit 10477 at various points of diversion, including the South Pump and Distribution System. If the work proposed for the Infrastructure Improvements involves discretionary permitting or work not otherwise exempt from CEQA, the district will research and prepare the appropriate CEQA and NEPA compliance documents. It is assumed that the necessary documentation will consist of an Initial Study/Mitigated Negative Declaration (IS/MND) because all improvements will be within existing sites.

### *Subtask 1.3 Regulatory Coordination*

Local jurisdictional agencies will be contacted to determine permitting requirements for the proposed improvements. Temporary encroachment permits may be required for construction activities in adjacent public roadways. Permitting requirements will be identified and an approach for compliance will be recommended.

## Budget

The estimated budget for implementation of the infrastructure improvements is $2.2 million for the pump station rehabilitation (see below) and $10-18 million for the distribution system rehabilitation and possible pressurization.

**PUMP STATION REPLACEMENT PRELIMINARY OPINION OF PROBABLE PROJECT COST**

| Project Element | Preliminary Cost |
|---|---|
| Pump Station Construction | $ 1,400,000 |
| 30% Contingency | $ 420,000 |
| Pump Station Construction + Contingency | $ 1,820,000 |
| Design Engineering | $ 112,000 |
| Project / Construction Management | $ 140,000 |
| Environmental and Permitting | $ 125,000 |
| **Total Project Cost** | **$ 2,197,000** |

At an ENR CCI 20-cities Average of 9962, February 2015.

NSJWCD is currently working with an engineering firm to put together a more specific cost estimate for the distribution system rehabilitation. However, the rough cost estimate is $10-18 million. The specific costs will be determined based on whether or not the pipelines are repaired, replaced or slip-lined and whether or not parts of the system are pressurized.

## References

North San Joaquin Water Conservation District (NSJWCD). District Map. Available: http://www.nsjgroundwater.org/MAP-Posted_10-26-11.pdf

RMC, 2015. MokeWISE Program Final Memorandum Water Availability Analysis. January 2015.