RECLAMATION
Managing Water in the West

Draft Environmental Assessment

Award of WaterSMART Grant for Tracy Lake Groundwater Recharge Project
North San Joaquin Water Conservation District

January 2014

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitment to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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List of Acronyms and Abbreviations

AF	Acre-Feet
AFA	acre-feet per acre
APE	area of potential effect
BMPs	best management practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
cfs	cubic feet per second
CNDDB	California Natural Diversity Data Base
CO	carbon monoxide
CY	cubic yards
EBMUD	East Bay Municipal Utility District
EPA	Environmental Protection Agency
ESJGB	Eastern San Joaquin Groundwater Subbasin
GHG	greenhouse gases
HPU	Hydraulic Power Unit
MCC	Motor Control Center
MSL	mean sea-level
MW	megawatt
O_3	photochemical ozone
NAAQS	National Ambient Air Quality Standards
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NSJWCD/District	North San Joaquin Water Conservation District
Pb	lead
PM	particulate matter
Proposed Action	Bureau of Reclamation's Action
Proposed Project	NSJWCD's Action
Reclamation	Bureau of Reclamation
SHPO	California State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SWRCB	State Water Resources Control Board

Section 1 Introduction

1.1 Background

The WaterSMART Program focuses on improving water conservation and sustainability and helping water resource managers make sound decisions about water use. Through the WaterSMART Grants, the Bureau of Reclamation (Reclamation) provides 50/50 cost share funding to irrigation and water districts, Tribes, States and other entities with water or power delivery authority. Projects are selected through a competitive process and the focus is on projects that can be completed within 24 months that would help sustainable water supplies in the western United States.

North San Joaquin Water Conservation District's (NSJWCD) proposed project was selected out of 54 new projects in the western states to receive funding.

The "NSJWCD" or "District" was organized in 1948 under provisions of the Water Conservation District Act of 1931 and encompasses approximately 150,000 acres east and north of the City of Lodi in eastern San Joaquin County, California (Figure 1). The Mokelumne River passes through the NSJWCD service area, and the district lies within both the Cosumnes River and the Eastern San Joaquin sub-basins as defined in California Department of Water Resources (DWR) Bulletin 118. The major land uses in the area are agriculture and dry pasture areas.

Tracy Lake and the diversion facility are located approximately 7 miles northwest of the City of Lodi, California, in Section 8, Township 4 North, Range 6 East, Mount Diablo Range and Meridian. Access to the project is provided from West Brovelli Woods Lane which is accessed via Jahant Road and Highway 99. The Proposed Project would be located adjacent to the Mokelumne River downstream from the Woodbridge Irrigation District Diversion Dam and approximately 1,000 feet south of South Tracy Lake.

Currently, NSJWCD does not have any facilities in the vicinity of the Proposed Project. The District has three other diversion facilities on the Mokelumne River. These facilities are referred to as the North, South and CalFed facilities. All three have a cone fish screen that is rated for 30 cubic feet per second (cfs) and with the exception of CalFed have several pumps to address changes in demand. Of the three, the North facility is the only one that was not operated in 2009, 2010 and 2011 when water was last available.

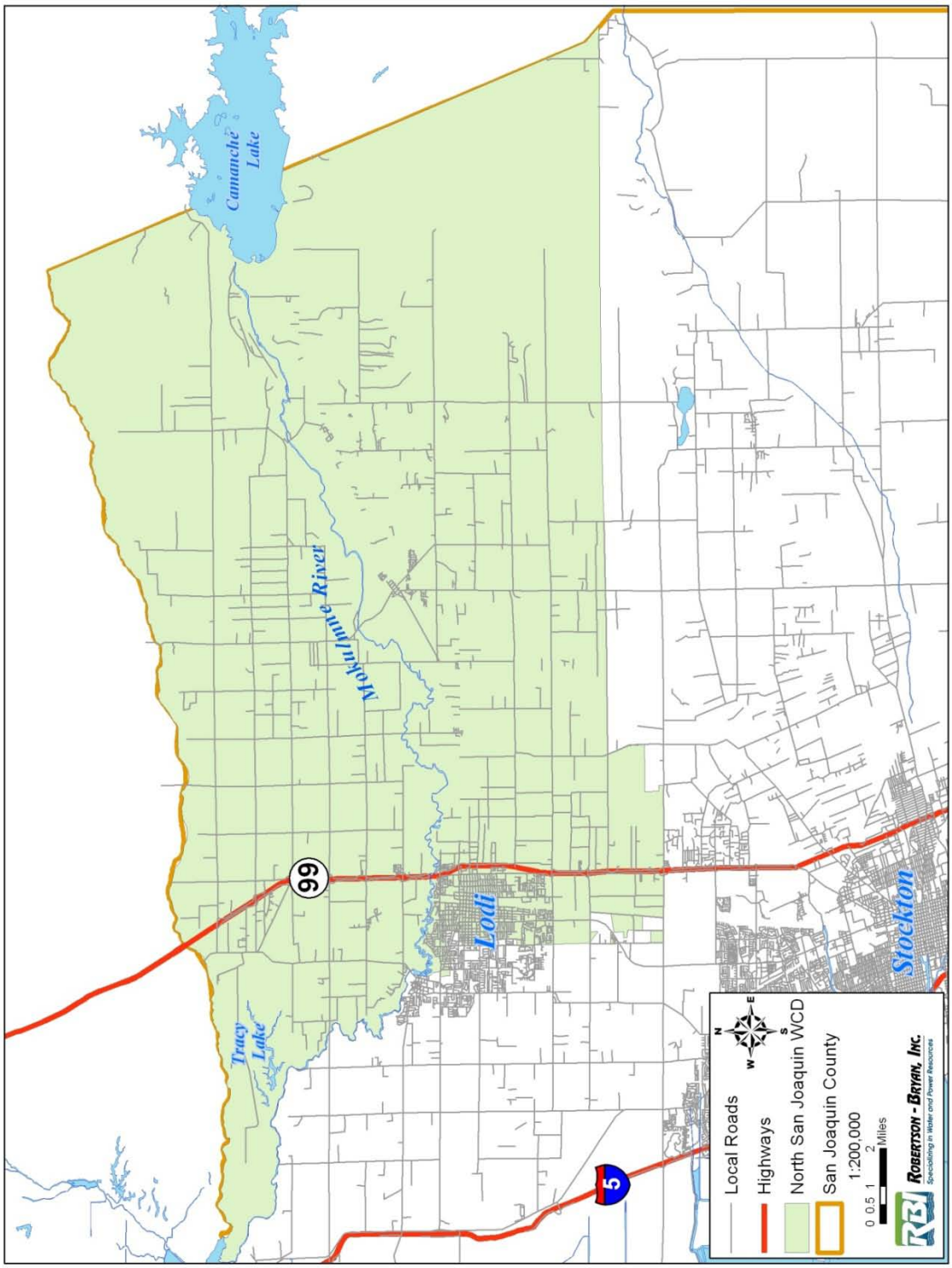
1.2 Purpose and Need

The purpose of the Proposed Action is to provide funding to NSJWCD to assist in its water efficiency efforts.

Implementing additional conjunctive use of the available Mokelumne River surface water supply and groundwater supply within NSJWCD boundaries, as a means to reduce groundwater overdraft, is the primary purpose of the Proposed Project. Accordingly, there are several objectives for the Proposed Project, as follows:

- Develop a groundwater recharge project in the Tracy Lake area to use available surface water from the Mokelumne River under NSJWCD's appropriative water right. Allow farmers in the area to replace groundwater pumping with surface water conveyed to Tracy Lake.

Figure 1 Regional map of Tracy Lake, lower Mokelumne River, and NSJWCD Boundaries



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Section 2 Alternatives Including Proposed Action

2.1 No Action Alternative

Reclamation would not provide funding. NSJWCD would continue with their proposed project utilizing NSJWCD funding, and may receive additional funding from other sources.

2.2 Proposed Action Alternative

Reclamation proposes to provide funding, under a WaterSMART grant, to NSJWCD for construction of a new water diversion intake structure with a fish screen in the Mokelumne River including a pump station and pipeline to convey the diverted water to Tracy Lake (Figure 1).

NSJWCD's proposed project is as described below.

Tracy Lake Recharge Project Components

Key components of the proposed project involve new construction and operation associated with a new water diversion intake structure with fish screen in the Mokelumne River for the Tracy Lake Groundwater Recharge Project. This proposed project would include a new pump station and pipeline to convey the diverted water to Tracy Lake. Appurtenances for these facilities would include installing a power line for the pump station, and an access road to the pump station and fish screen location.

Tracy Lake Diversion and Recharge Facilities

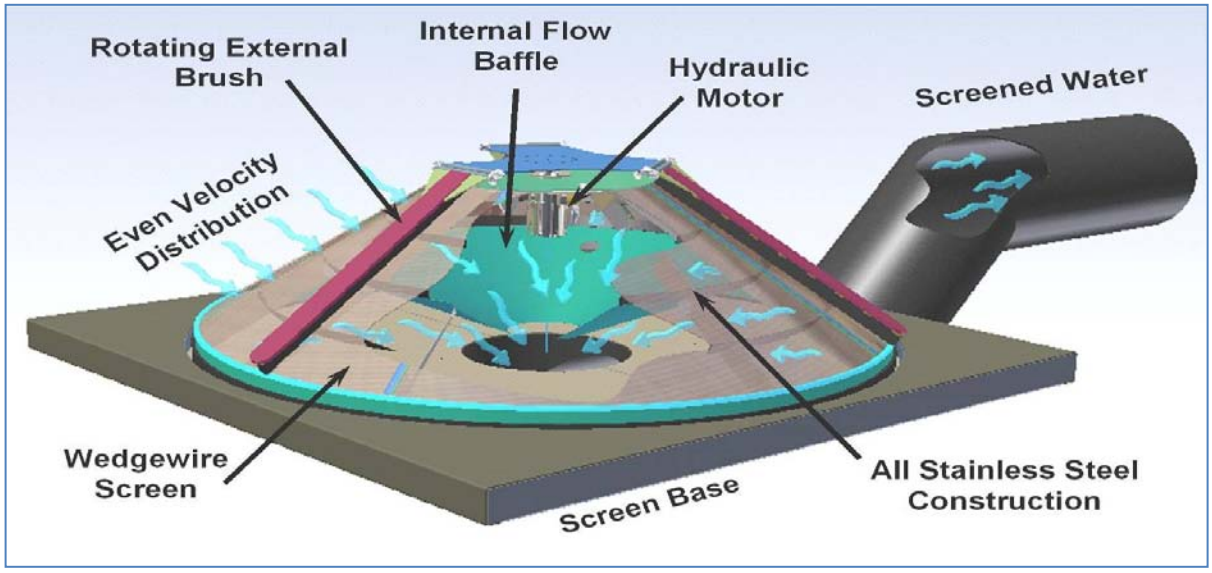
The Mokelumne River intake structure would consist of a 12-foot diameter cone shaped fish screen with self-cleaning system supported on a metal base and anchored to four new steel pipe piles in the river. The cone-shaped fish screen rests on top of a docking-inlet. The docking inlet supports the screen and also conveys water into the pump-station inlet pipe. Water flows through the fish screen surface and into the inlet pipe. The screen material must stay clean for the water to flow properly. To clean the fish screen periodically, three external brushes slowly rotate around the cone screen to brush away material that may have accumulated on the wedge wire screen. The brush arms are both double-hinged and weighted so that they maintain an even load distribution and do not need adjustment and can also rotate around screens in either a clockwise or counter-clockwise direction.

The fish screen system includes a Hydraulic Power Unit (HPU) consisting of a hydraulic motor located inside the screen, pump utilizing food-grade oil, directional control valves, oil reservoir, pressure gauge, and control switches all located inside the panel enclosure. The HPU uses a 3-Phase 480 Volt, 1-1/2 HP Motor with a Pump to operate the hydraulic motor-driven brushes on the screen. The enclosure can be easily accessed for inspection of oil levels and to perform routine maintenance as it is located on the pump station platform which is above the 100-year flood level. Hydraulic hoses are plumbed from this

HPU to the screen unit's hydraulic motor. Oil used in the hydraulic system is Chevron's Clarity Hydraulic oil which has been approved by NOAA Fisheries for use in similar fish screen systems. The unit would have an oil level switch in the hydraulic tank, so if there is a leak the power unit would shut off with minimal fluid loss. A control panel is used to control the operation of the hydraulic system and report the system status.

The fish screen would meet the fish screen criteria requirements set forth by the NOAA Fisheries and the California Department of Fish and Wildlife to protect the salmon run in the river. The cone screen has a surface area of approximately 131.9 square feet with wedgewire screens that provide for an open slot area of approximately 1.75 millimeter and an approach velocity of approximately 0.33 feet per second at a diversion rate of 40 cfs. This system is a replica of fish screens on NSJWCD's other three diversion structures on the Mokelumne River - North Diversion, South Diversion, and CalFed. The screens at all three of these sites were constructed by Intake Screens, Inc. Figure 2 shows a general system overview of the cone fish screen and the various physical components.

Figure 2 Standard ISI Cone Fish Screen System Diagram



NSJWCD would issue a contract for installation of the fish screen and construction of the pump station and conveyance pipeline to Tracy Lake. The new pump station would be located on the right bank of the Mokelumne River and be designed to withdraw up to 40 cfs of water through the fish screen into the wet well placed in the river bank area via a 48-inch inlet pipe. Construction within the streambed would involve the installation of the fish screen and a 48-inch inlet pipe. The wet well would be located outside the streambed in the river bank. Construction timing and techniques would be in accordance with the various permit requirements as delineated by the responsible local, state and federal agencies and is discussed in more detail below.

Figure 3 represents the general configuration of the pump station components as it is based on the 65% design drawings for the project. This site plan shows the estimated coordinates for the center of the wet well and the access platform. In addition, it shows the sizing and arrangement of the intake and discharge piping, together with calling out the type and location of the erosion protection material to be installed on the riverbank. The general location of the vehicular access area at the site is also shown. It should be noted, as called for on the drawings, that erosion protection at the edge of the Mokelumne River to protect the pipe and restore the bank after excavation would not be conventional rock rip rap. A geotextile based system would be used that would allow the native vegetation to re-establish itself and provide for better and more comprehensive erosion control system.

Figure 4 provides further details of the final alignment and elevations of the components of the diversion structure, discharge piping and access road and outlet structure in Tracy Lake. This drawing shows the discharge piping size, approximate depth of cover, location of access structures, and other pipeline appurtenances. As can be seen by comparing Figure 3 and Figure 4, the pump station wet well is well-outside the normal river channel.

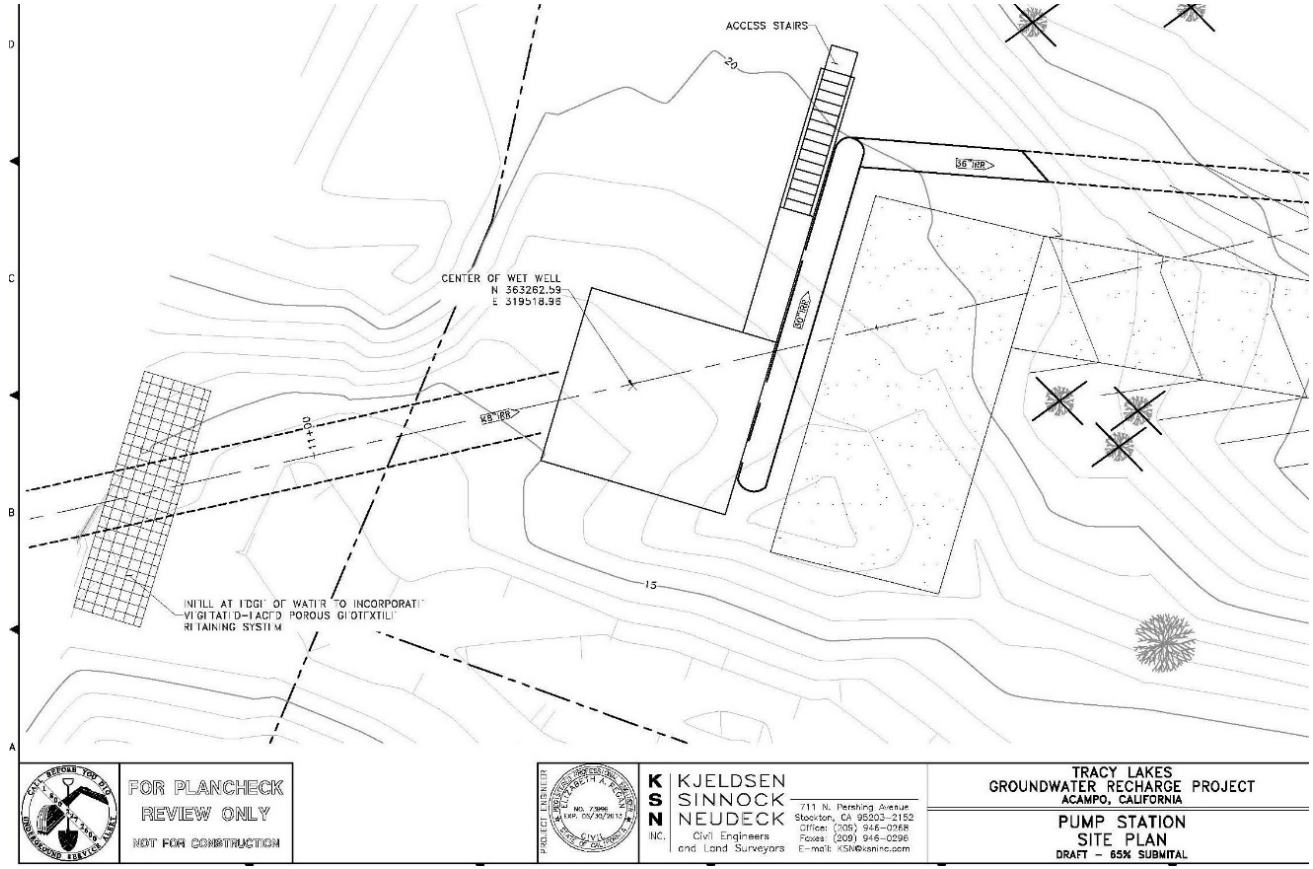


Figure 3 Pump Station Site Plan

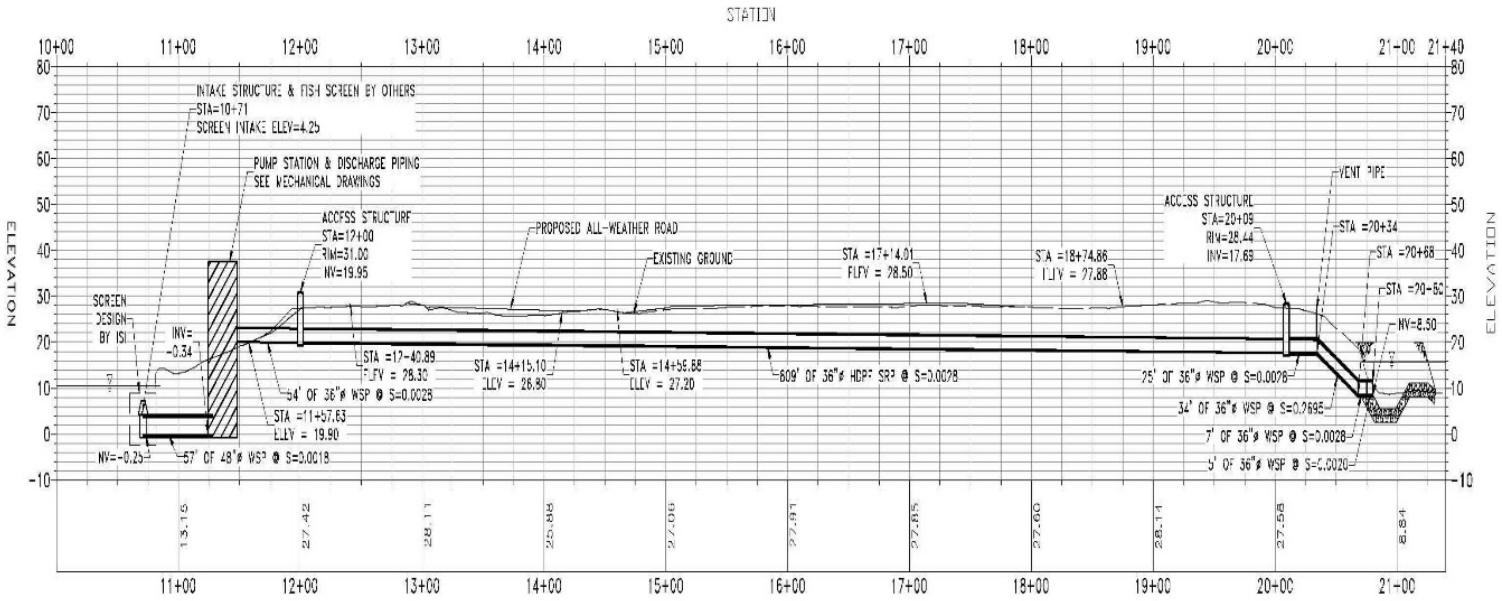


Figure 4 Cross Section of Pump Station and Pipeline

Figure 5, as discussed below, provides all the relevant information on the hydraulic profile of the pump station and river stages that were considered in the design. This figure provides the invert elevation of the wet well, - 0.34 feet which would dictate the extent of excavation in the river channel during construction and the technique used for construction as outlined in the Construction Activities and Schedule below. This elevation in turn is determined by the need to keep the fish screen fully submerged during low flow summer flow conditions when the diversion pumping would be occurring. For design it is assumed that during the normal irrigation season the water surface elevation in the river would be well above the fish screen as shown in Figure 5.

Diversion System would consist of the following elements:

Diversion Structure

a. A 12-foot diameter cone shaped fish screen with integral base, and four protection piles.
b. A 48-inch outlet pipe connecting the fish screen assembly with the Pump Station Wet Well.
c. Vegetated-faced porous geotextile retaining system at the River bank for erosion protection.

Wet Well

a. A 120-inch diameter galvanized corrugated steel pipe would form the caisson of the wet well.
b. The height of the wet well would be sufficient to clear the 100-year flood elevation of 28 feet by at least 1 foot – making the total wet well height of approximately 30 feet.
c. Openings to the wet well through the main floor of the station would be 1 foot above the 100-year flood elevation.
d. The wet well would be circular and constructed on a concrete base slab extending approximately 12 to 18 inches beyond the outside dimension of the caisson. Excavation for the pump station and appurtenances is estimated at approximately 3,500 cubic yards (CY) of material. Most of this material would be used as backfill around the existing structure or be spoiled on the access road for fill.

Pumps

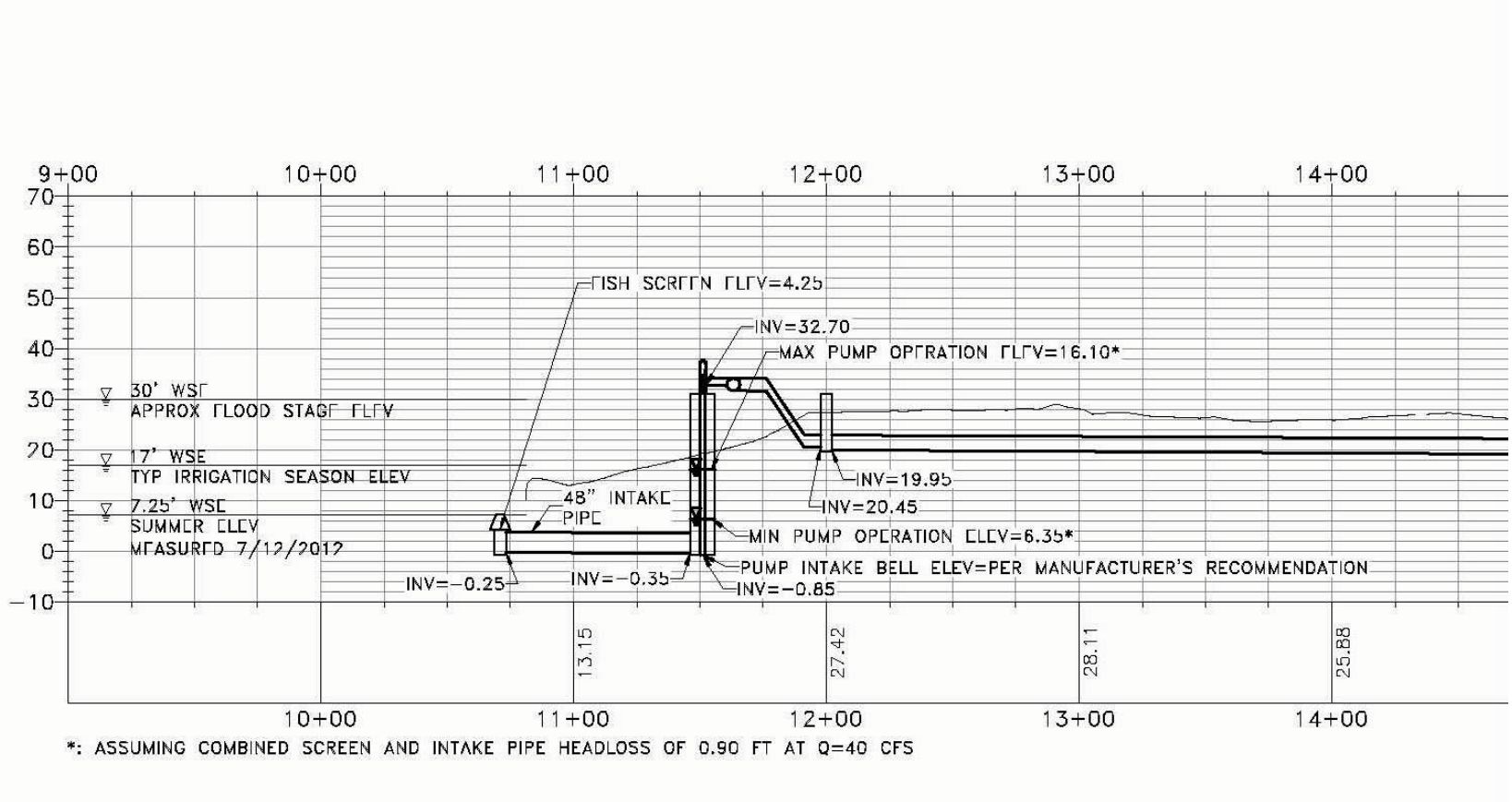
a. The pumping system plan is for the eventual installation of two pumping units respectively producing 25 and 15 cfs at minimum head for a maximum capacity of 40 cfs. The initial pumping unit would have a design capacity of 25 cfs to provide operational flexibility for the project due to unknowns regarding seepage, etc.
b. The pumps would be driven by electric motors approximately 100 and 60 horsepower in size, for an approximate load of 120 KW. The initial pump with a capacity of 25 cfs would have a variable speed drive to provide for operational flexibility. The second pump would have a soft start constant speed drive.
c. The pump and motor controls would be located on the platform above the wet well.

d. The pump and motor would accommodate the full range of delivery heads expected to be encountered (including wet well levels varying between minimum operating and "flood" levels). The larger pump would use the variable speed drive to maintain an operational level in Tracy Lake in response to changes in evaporation, percolation and diversions from the lake, and to facilitate a constant diversion rate from the Mokelumne River.

Platform

a. An expanded galvanized steel platform with rails would provide safe access to the Motor Control Center (MCC), HPU for the fish screen, and pump motors, all of which would be located above the 100-year flood elevation on the top of the wet well.
b. The manifold off the initial and planned future pump would initially consist of a valve and blind flange for interconnecting the second unit. The manifold design would accommodate future valving to prevent back flow when the second pump is added and operational.
c. A flow meter on the discharge piping to register flow from the pump station would have a manual read and would also transmit a signal to the MCC cabinet for storage in a data logger for storage and retrieval as required. This data logger would provide the record of flow diverted from the river on an hourly or more frequent time series if desired.

Figure 5 Hydraulic Profile of Pump Station



Discharge Pipeline

a. From the steel pipe manifold connected to the pump(s), a short segment of 30-inch diameter steel pipe would discharge to a 48-inch concrete standpipe about five feet in height before transitioning underground to a 36-inch diameter low-head pipe having approximately 30 inches of cover as shown on Figure 4. This alignment would continue approximately 1,000 feet underground northerly toward the lake and roughly parallel to the outlet channel, across the easterly portion of the homeowner's lawn and then turn east at about a 45 degree angle and dive down to the bottom of an arm of Tracy Lake as shown on Figure 6. The estimated amount of excavation for the pipeline is 1,300 CY with the majority of the material used as backfill for the pipeline and the excess being used for fill on the access road.
b. The 36-inch diameter pipe would transition from a low-head plastic pipe to welded steel pipe, at the junction structure which would empty into Tracy Lake over riprap slope protection to dissipate water energy and avoid erosion of the lake bottom. The amount of riprap is estimated to be 200 CY.

Access Road

Along the same alignment of the discharge pipeline, to the east and adjacent to the pipeline, the District would construct all-weather, class 2 aggregate base about 6 inches thick gravel access road with a top width of approximately 12 feet. The total width of the access road and pipeline trench/spoil would be approximately 20 feet. Excess spoil material from the construction activities would be used for road construction fill as appropriate.

Power Supply

Pacific Gas and Electricity would supply power to the pump station via a 12 KV 3-phase supply, presently available via overhead lines along Brovelli Woods Lane that terminate near the proposed location of the pipeline junction structure at Tracy Lake as shown on Figure 6. The power supply would generally follow the pipeline alignment to the pumping station and would terminate at a transformer with the low voltage feed from the transformer connecting to the pump station service panel for metering and switching.

Construction Activities and Schedule

Site Preparation and Restoration During the construction period, the work area would be accessed from the adjoining Brovelli Woods Lane. Construction personnel, equipment and material transport would access the project area via existing roads and rights-of-way. Staging of equipment and construction materials during the construction of the proposed project would occur on the vacant area south of Brovelli Woods Lane and adjacent to the access road to the pumping plant as shown below on Figure 6. This staging site is presently annual grass and weeds requiring rough grading for fire control and would temporarily occupy an area of about 1/2 acre.

Construction Methods Initial construction activities would involve site preparation including vegetation removal, grubbing, grading, excavation, placement of fill (as necessary), and compaction at the pump station and along the pipeline alignment. Approximately nine trees have been tentatively identified for removal, mitigation for tree removal and land disturbance would be in accordance with San Joaquin County Multi-Species Habitat Conservation Plan and Open Space Plan (SJMSCP).

Excavated surplus soil would remain on-site; select fill materials and aggregates would be brought to the site for foundations of structures, pipes, roadbeds, etc. Following completion of construction activities, the site contours of temporary disturbance areas would be restored and vegetated with appropriate non-invasive species native to the general area.

The construction access would require a 20-foot right-of way to accommodate spoil, trench equipment and material staging from Brovelli Woods Lane to the river for the pipeline and approximately 200 square foot area for the outfall structure and rip rap. Access for Construction - Access for construction would require two areas for equipment access: 1) pipeline construction to the site; and 2) access to construction for the outfall and riprap placement. The second access from Brovelli Woods Lane would be between the oaks in a 15-foot right-of-way from a staging area near the easterly bank of Tracy Lake to the outfall site.

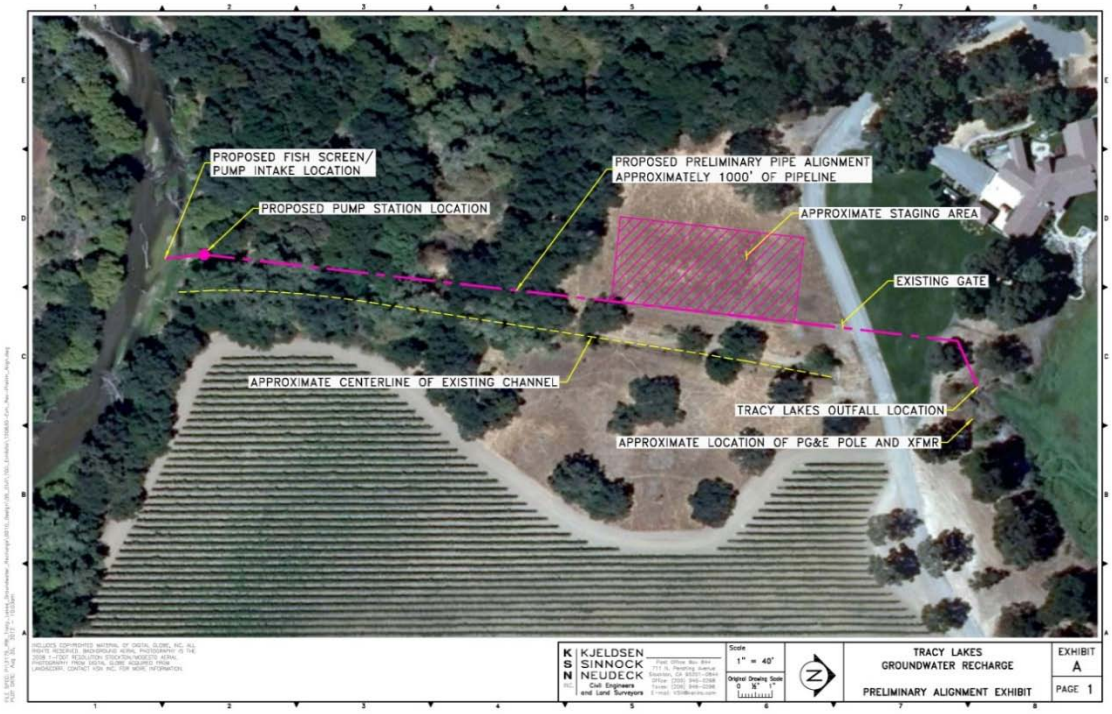


Figure 6 Conveyance Pipeline Alignment and Staging Area

In-river construction activities to prepare the site for the fish screen, intake pipe placement and wet well placement would involve open trench excavation and either sheet pile-driving or super sack (sand filter) placement for sediment control. The in-river work is anticipated to be completed using land-based equipment consisting of an excavator, small crane or backhoe, and possibly a pile driver.

For access and construction of the pump station and intake pipe, it is estimated that approximately four mature riparian trees would be removed to clear the site.

The trench for the intake pipe would be excavated first, followed by the placement of the fish screen base and initial segment of the intake pipe coupled to the fish screen base plate. Piles would then be driven through alignment holes in each corner of the fish screen base plate into the river bottom using a vibratory hammer, impact hammer or simply pushing them in with the backhoe or excavator bucket. The base and intake elevations are then set with attachment clamps to permanently affix the screen base to the piles. Additional intake pipe is then placed in the trench leading from the intake screen to the pump station wet well. This in-river portion of the pipeline would then be backfilled with clean rock fill and the pump station wet well would be constructed. Once the pump station wet well is constructed below grade, the pipeline would be backfilled as would the area around the wet well.

The area of the river bank excavated for the intake pipe trench would be stabilized with native material and a porous geotextile retaining system such as Tensar® Erosion Control Systems designed for this application, which would then be vegetated to provide long term bank stabilization. This reinforcement would be placed over an area approximately 30 feet in width and from below the water surface to an elevation approximately equal to the surrounding grade.

Before construction is initiated, in-river measures to control sediment discharge into the river and to keep fish out of the construction zone would be undertaken. Measures taken would depend on river water depth at the time of construction and may consist of several alternatives:

- If the depth is greater than three feet, it is anticipated that a coffer dam using interlocking sheet piles would be installed prior to beginning construction
- If the depth is less other methods of controlling sediment discharges such as silt fencing or sand filled super sacks would be used

Sheet piles are interlocking steel plates that are driven into the river bottom either by using a vibrator or impact hammer. If a vibrator or impact hammer is used, underwater noise thresholds for fish that may be present are not expected to exceed lethal levels based on site soil and water conditions. In fact, the contractor may be able to merely push the sheet piles into the soil. The construction contractor may elect to dewater or partially dewater the site during construction; however, in all likelihood the construction would be accomplished without dewatering due to past practices and site soil conditions and seepage rates. If any dewatering occurs or the sediments disturbed during

construction do not settle after construction is completed, the discharge would be routed either through portable settling tanks or applied onsite up gradient from the project site at rates suitable to prevent runoff. Other methods of disposal of the silt laden water include moisture for soil compaction, dust control, etc.

A fish rescue operation would be conducted prior to closing any coffer dam or other silt barrier to avoid harmful effects to fish that could potentially become trapped in the construction area. NSJWCD would retain qualified biologists and/or technicians to perform the fish rescue to move the fish out of the construction area. When the installation of the cofferdam/barrier is completed, the rescue would be conducted by sweeping the area within the cofferdam with seine nets. If the site is dewatered, a sump pump would be used to dewater the site after the initial fish rescue operation; when the water depth within the cofferdam is low (i.e., approximately 2 feet), the site would be swept again to remove any remaining fish within the cofferdam.

Excavation and construction activities for the discharge pipeline, electrical and control conduits, access road, access structures and stilling basin within Tracy Lake would be conducted using conventional equipment and methods, and would not involve any additional construction within the Mokelumne River channel.

Construction Schedule

Scheduling of construction activities would be in accordance with the appropriate permit conditions for activities in the river and along the alignment and is anticipated to occur in the spring and summer of 2014 and would take approximately 4 to 6 months of field construction time, with the in-river construction based on seasonal limitations occurring between June 1 and September 30.

Construction activities would be limited to normal daylight construction hours, and weekdays. When necessary, and approved in advance by NSJWCD with the landowner's concurrence, construction activities may take place outside the normal working hours and on weekends. Additionally, construction activities for in-river work in the lower Mokelumne River channel would be coordinated with agencies (e.g., San Joaquin County, USFWS, and CDFW), and is anticipated to occur in late summer/fall when the weather conditions are dry and lower Mokelumne River is at seasonally low stream flow conditions. All disturbed aquatic areas of the project site would be restored to a stabilized condition prior to September 30th to minimize impacts to sensitive aquatic species.

Construction time to include bidding, shop drawing review and approval, fabrication and delivery, and then construction would take approximately seven to eight months due to the long lead time for fabrication and delivery of the fish screens and pumps. Thus the contractor would be required to submit a schedule that reflects when the various components to be installed in-river would be on-site to minimize the actual construction time in-river, and to provide for construction coordination.

Construction Sequencing

The anticipated construction sequence would be:

1. Clearing and grubbing (staging, pipe line and access road, pumping plant and fish screen)
2. Fish screen and diversion works installation
3. Pump station sump and structure construction
4. Pipeline and power supply excavation
5. Pipeline and outfall placement
6. Electrical distribution and rough-in
7. Backfill Trench
8. Access road grading and gravel placement
9. Pump installation
10. Electrical service connection and motor controls
11. All work areas would be restored to its original condition

Construction Personnel and Equipment

NSJWCD would contract with a general contractor to perform the overall project implementation including oversight of ISI's installation of the diversion and fish screen intake system, pump station and conveyance pipeline, and other appurtenances, including site restoration activities for all work areas. At a peak level of construction, it is estimated that 8 to 10 construction workers would be involved in activities within the project area.

Table 1 below provides a list of all anticipated construction equipment for construction activity. A peak day of construction would involve the concurrent use of up to four pieces of heavy equipment for approximately 8 hours.

Table 1 Anticipated Construction Equipment for Construction Activities.

S.No.	Equipment
1	Track excavator
2	Rubber tired backhoe/loader
3	Long-reach crane
4	Concrete truck
5	Delivery dump truck
6	Water truck
7	Delivery truck and trailer
8	Small dozer
9	Pickup trucks
10	Fuel/oil service truck
11	Air compressor
12	Generator

Best Management Practices

NSJWCD, or the general contractor, would implement the following best management practices (BMPs) as part of the proposed project to minimize and avoid potential impacts to environmental resources. Where applicable, the BMPs would be clearly identified on

the construction drawings and in the specifications. The proposed project's construction permit would address NPDES criteria as set by the State Water Resources Control Board (SWRCB). The contractor also would be required to implement the BMPs in a timely manner.

- Construction activities would be limited to a designated work area (including the work corridor and staging area). The work area would be clearly identified on the construction drawings and would be staked and flagged where necessary prior to initiation of construction activities.
- All open trenches that pose risks to pedestrians, vehicles, or wildlife (via entrapment) would be filled or covered each night.
- Erosion control measures would be installed and maintained in place during the precipitation season (October-April). Soil disturbance activities would cease if adverse weather conditions substantially increase the likelihood of transporting soil off site.
- Construction would avoid where possible, damage and removal of mature trees. Construction would minimize activities required in the drip line of trees.
- Construction would be limited to the daylight hours. Construction activities would be coordinated prior to their start with the adjacent property owners.
- All construction equipment must have sound-control devices no less effective than those provided on the original equipment. No equipment would have an unmuffled exhaust system.
- To reduce potential contamination by spills, all refueling, storage, servicing, and maintenance of equipment would be performed at designated sites. Any fluids drained from the machinery during servicing would be collected in leak-proof containers and taken to an appropriate disposal or recycling facility. If such activities result in spillage or accumulation of a product on the soil, the contaminated soil would be disposed of properly. Under no circumstances would contaminated soils be added to a spoils pile or trench backfill.
- All maintenance materials (e.g., oils, grease, lubricants, and antifreeze) would be stored at staging areas.

Operations and Maintenance

The operations would occur during years when water is available to divert under the District's water right permit, historically during the wettest 60 percent of years. Tentative allocations would occur on or about March 1 and would be confirmed by April 1. Lake filling would commence on April 1 and would fill at the peak pumping capacity installed and within regulatory limits. Depending on weather and soil moisture, diversion from the lake would begin in April. The lake would fill to an approximate elevation of 16.0 feet mean sea-level (msl) generally by mid-April to the end of May depending on irrigation demand, percolation rates, evaporation and residual stored runoff. The district would pump water out of Mokelumne River to maintain the lake between minimum and maximum pool elevation of approximately 14 feet (250 AF) and 16.0 feet (450 AF) respectively during the permitted diversion season. This operating range for the lake would allow irrigation pumps to divert water from the lake for irrigation of adjacent agricultural lands.

NSJWCD, EBMUD andWoodbridge Irrigation District will have a coordinated operations agreement to control the release of NSJWCD's water from Camanche Reservoir, down river, through the WID dam and then to the Tracy Lake diversion point. The Tracy Lake Improvement District (TLID) would monitor release timing and water stage at the diversion location to maintain river stages either at or above normal flow levels that would occur absent the diversion. To accomplish this objective, flow from the diversion pumps in the Mokelumne River would be varied using a variable frequency drive to keep the pumping rate below the delivery rate and to maintain the water level in Tracy Lake within operational levels.

Initially, it is anticipated that diversion would occur at about 15 cfs of nominal constant rate to fill the lake to the minimum irrigation pumping level of about 14 feet msl. At this elevation, the water is deep enough to begin pumping out of the lake for irrigation. This re-diversion would serve 1,239 acres of irrigated land with an approximate water demand of 2,000 AF per year. Once Tracy Lake begins to fill and gets close to the maximum elevation of 16 feet, the diversion rate would be adjusted in an attempt to maintain a constant rate during the irrigation season. These activities would be coordinated with EBMUD and Woodbridge Irrigation District based on observations of lake losses due to evaporation, percolation and diversion. Recognizing that lake losses from evaporation and percolation are estimates, the first phase pump would have a maximum capacity of 25 cfs, but can be adjusted for a lower rate using the VFD in an effort to stabilize the lake level. Accounting for evaporation and percolation, total diversions for the initial phase of operations are estimated at 5,460 AFA, as depicted in Table 2.

Once fully built out, the diversions would alternate between 15, 25 and 40 cfs as needed to maintain lake level through the permissible diversion season. To reach the 40 cfs level, the 15 cfs and 25 cfs pumps would operate at the same time. A 40 cfs diversion would serve approximately 7,000 acres of irrigated land with a water demand of 10,700 AF per year. Accounting for evaporation and percolation, total diversions at full build-out are estimated at 13,600 AFA, as depicted in Table 3.

These Tables were developed to show the boundaries of the lake operation, minimum diversion and maximum diversion. Losses due to percolation and evaporation are estimates; therefore, some field adjustments would be necessary to balance the input to the lake to match the outputs. It should be noted that some reduction in diversion during May and October may be required to keep the lake level from exceeding 16 feet, which is associated with a storage volume of approximately 450 AF.

Table 2 Tracy Lake Reservoir Operation With 15 cfs Diversion

Month	Diversion from Mokelumne River to Tracy Lake (ac-ft)	Evaporation and Percolation (ac-ft)	Water Supplied for Irrigated Land (ac-ft)	End of Month Tracy Lake Storage (ac-ft)
Jan	0	19	0	0
Feb	0	0	0	0
Mar	0	0	0	0
Apr	900	329	133	439

May	900	527	240	572
Jun	510	460	280	342
Jul	930	503	372	397
Aug	930	488	360	479
Sep	480	457	200	299
Oct	810	417	120	572
Nov	0	366	33	173
Dec	0	155	0	18
Total	**5,460**	**3,722**	**1,738**	

Table 3 Tracy Lake Reservoir Operation With 40 cfs Diversion

Month	Diversion from Mokelumne River to Tracy Lake (ac-ft)	Evaporation and Percolation (ac-ft)	Water Supplied for Irrigated Land (ac-ft)	End of Month Tracy Lake Storage (ac-ft)
Jan	0	4	0	0
Feb	0	0	0	0
Mar	0	0	0	0
Apr	1,840	391	988	462
May	1,760	504	1,368	350
Jun	2,160	532	1,596	382
Jul	2,400	426	2,120	234
Aug	2,480	384	2,052	278
Sep	1,840	433	1,140	545
Oct	1,120	424	684	557
Nov	0	323	122	112
Dec	0	109	0	3
Total	**13,600**	**3,530**	**10,070**	

Mitigation Measures

- Conduct Pre-construction Surveys
    - Participation in SJMSCP
    - Section 5.2 - Measures to Minimize Impacts – Incidental Take Minimization Measures
    - Section 5.2.4.11 – A nest tree may be retained or potential Swainson's hawk nest trees may be removed.
    - If a nest tree becomes occupied during construction activities, then all construction activities shall remain a distance of two times the dripine of the tree, measured from the nest.
    - If a nest tree needs to be removed, then the nest tree may be removed between September 1 and February 15, when the nests are unoccupied.

- Section 5.3 – Measures to Mitigate Impacts – habitat-based approach which emphasizes the establishment, enhancement and management in-perpetuity of Preserves composed of covered species.
- NSJWCD has identified conservation measures and BMPs that would be implemented as part of the proposed project. These measures would be implemented to minimize soil and sediment disturbances, and habitat alteration, associated with excavation and construction activities. Additionally, NSJWCD will coordinate with resource agencies for authorization of the proposed project under the Section 1602 Streambed Alteration Agreement, Clean Water Act Section 404 Nationwide permit for effects to jurisdictional water bodies, and Section 401 Water Quality Certification permit programs prior to initiation of any construction activities associated with excavation and inundation of the proposed project site. These permits include terms and conditions that must be met, including BMPs, for minimizing disturbance of the streambed and riparian habitat.

Section 3 Affected Environment & Environmental Consequences

This section identifies the potentially affected environmental resources and the environmental consequences that could result from the Proposed Action and the No Action Alternative.

Indian Trust Assets **–** Indian Trust Assets (ITAs) are legal interests in property or rights held in trust by the United States for Indian Tribes on individual Indians. Indian reservations, Rancherias, and Public Domain Allotments are common ITAs in California. The Proposed Action does not have a potential to affect Indian Trust Assets.

Indian Sacred Sites – Sacred sites are defined in Executive Order 13007 (May 24, 1996) as "any specific, discrete narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be on appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site." The Proposed Action would not be located on or impact federal lands and therefore would not affect any Indian sacred sites on federal lands.

Environmental Justice – Executive Order 12898 requires each Federal agency to identify and address disproportionately high and adverse human health or environmental effects, including social and economic effects of its program, policies, and activities on minority populations and low-income populations. There would be no impact to any populations; therefore, there would be no adverse human health or environmental effects to minority or low-income populations.

3.1 Water Resources

3.1.1 Affected Environment

Water Rights

Multiple public entities hold appropriative water rights for Mokelumne River water including Woodbridge Irrigation District, Amador County, Calaveras County, EBMUD, and NSJWCD. On July 3, 1956, Decision 858 (D-858) was issued by the California State Engineer (predecessor to the SWRCB), which granted Permit 10478 to EBMUD for Mokelumne River water and Permit 10477 to NSJWCD. Permit 10477 is for the temporary appropriation of up to 20,000 AFA of water surplus to EBMUD's needs based with a diversion season of December 1 to July 1. Through an agreement between both parties, EBMUD stores up to 20,000 AF of water in the average to wettest years for delivery to NSJWCD during the irrigation season. Permit 10477 limits total diversions to 80 cfs and limits diversion from any one facility to 40 cfs.

NSJWCD has used up tp 9,500 AFA of water under Permit 10477 in the past, However, after the drought of the late 1980's and early 1990's, and due to the interim and unreliable nature of the Mokelumne River water supply, and the extensive use of more convenient private groundwater wells, the demand for Mokelumne River water within NSJWCD boundaries is currently only approximately 3,000 AFA. NSJWCD requested, and the SWRCB granted, extensions of time to develop facilities to fully use the available surface water under Permit 10477.

The prior extensions of time expired in 2012. The District timely filed new requests for extensions of time through 2025 to put the full amount of the permit to beneficial use. The District also filed petitions for change to facilitate use of water under the permit. The pending petitions for change include:

1. Request to add underground storage as a purpose of use under the permit;
2. Request to add existing Woodbridge Irrigation District dam at Lodi Lake, as an authorized point of diversion under the permit to enable the conveyance of up to 1,000 AF per year of Mokelumne River water to the City of Lodi for use in its water treatment plant and delivery to its municipal customers to reduce reliance on groundwater;
3. Request to add a new diversion facility for the Tracy Lake Groundwater Recharge Project.
4. Request to expand the authorized place of use under the permit to the current jurisdictional boundary of the District.

Mokelumne River

The Mokelumne River's watershed encompasses approximately 660 square miles, from the high Sierras to the Delta area. Snowmelt supplies a substantial portion of the river's flow, which is regulated by several reservoirs including the Salt Springs Reservoir on the North Fork Mokelumne River, and the Pardee and Camanche Reservoirs on the main channel. The Salt Springs Reservoir is a hydropower facility owned by Pacific Gas & Electric. Pardee and Camanche Reservoirs are both owned by EBMUD. Pardee Reservoir's approximately 210,000 AF capacity is operated for water supply; Camanche Reservoir's 430,000 AF capacity is used primarily for flood control and to meet instream flow requirements. Pardee Reservoir's 30 megawatt (MW) hydroelectric facility and Camanche's 10 MW facility generates electricity for the state's electrical grid system. Diversions from Pardee Reservoir supply EBMUD's Mokelumne River Aqueducts (Northeastern San Joaquin County Groundwater Banking Authority 2009).

Mokelumne River flows are governed by a joint settlement agreement between EBMUD, U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife. EBMUD is to make minimum releases from Camanche Reservoir, in order to support fisheries downstream of the Camanche Dam (Northeastern San Joaquin County Groundwater Banking Authority 2009).

Water Quality

The Lower Mokelumne River flows east to west from Camanche Reservoir to the Delta.

Controlled releases from Camanche Dam from 100 to 3,232 million gallons per day provide sustained flows throughout the year. Twenty-eight miles of the Lower Mokelumne River, from Camanche Reservoir toward the Delta have been identified as a Water Quality Limited Segment under Section 303(d) of the Clean Water Act (CWA). Pollutants identified on the California 303(d) List as impairing the Mokelumne River include copper and zinc. The EBMUD discharge from the Camanche Dam Power House separation/retention pond occurs within the copper and zinc impaired region of the Mokelumne River (CRWQCB 2003).

Groundwater

The NSJWCD overlies the Eastern San Joaquin County Groundwater Basin where almost all of the agricultural water demands are met from groundwater pumped from this basin. The groundwater pumping has exceeded the amount of aquifer recharge over the years leading to overdrafting of the groundwater basin. Overdrafting of the aquifer began in the early 1900s; however, the State did not formally recognize the problem until 1982 when it designated the basin as being "critically overdrafted." A number of studies have been completed over the years, which concluded that the estimated overdraft to be anywhere from 130,000 to 200,000 AFA. The NSJWCD engineer's report in 2009 estimated that the current overdraft within the district boundaries was about 50,000 AFA. Only 100,000 acres of the NSJWCD have been developed, and the annual groundwater use within the NSJWCD boundaries is about 173,000 AFA. About 50,000 acres are dry pasture areas, which may be developed into irrigated agricultural lands or urban land uses at some time in the future. This development has already started in the NSJWCD where in the past 2-3 years vineyards and houses are moving into the dry pasture area. Assuming a new groundwater annual demand of 1.75 AFA, development of the 50,000 acres will increase the NSJWCD overdraft to 137,500 AFA.

Groundwater levels in monitoring wells within the NSJWCD show various levels of decline in water levels since the 1960s, with an average drop of 17 feet, or about 0.3 feet per year. In general, the lowest groundwater levels were reached in the late 1970s, recovering 10 to 20 feet, but then declined again in the mid-1990s. The rate of decline during the last 5 years increased to 1 foot per year due to the drought conditions.

Existing Groundwater Overdraft and Water Supply Management Actions

Groundwater overdraft, as exacerbated by projected increased reliance on groundwater resources presents numerous problems for sustained economic and environmental conditions. These problems include increased energy costs, well replacements riparian and wetland habitat sustenance – all of which are substantial concerns of NSJWCD. In 1996, NSJWCD adopted a Groundwater Management Plan to address declining groundwater levels, degradation of groundwater quality, and securing reliable surface water supplies. Plan elements include the continued effort to seek a reliable supplemental surface water supply from the Mokelumne River and other sources, promotion of more efficient irrigation water application methods, participation in regional groundwater management efforts, and development of groundwater recharge facilities. In particular, NSJWCD continues to seek resolution to D-858 through requests to the SWRCB to

consider a reallocation of the unused portion of Mokelumne River Water under Permit 10478 from EBMUD to NSJWCD.

3.1.2 Environmental Consequences

No Action

Under the No Action Alternative, Reclamation would not provide funding for construction of a new water diversion intake structure and fish screen in the Mokelumne River to Tracy Lakes. NSJWCD could seek additional funding and continue with their proposed project. Impacts would be the same as the impacts as a result of the Proposed Action.

Proposed Action

Under the Proposed Action Reclamation would provide funding for NSJWCD's proposed project. The proposed project would help maintain or enhance groundwater elevations slightly because there would be a slight decrease in groundwater pumping; conserved water would allow farmers in the area to replace some groundwater pumping with water diverted from Tracy Lake. There would be no changes to water quality as a result of the Proposed Action as the Mokelumne River is the natural recharge source for this area.

The Proposed Action does not include additional groundwater pumping; it would help water-level impacts associated with existing groundwater pumping.

3.2 Land Resources

3.2.1 Affected Environment

NSJWCD was organized in 1948 under the Water Conservation District of 1931. NSJWCD includes approximately 155,070 acres east of the City of Lodi. Approximately 4,740 acres are within the Lodi city limits and 5,600 acres are within Lodi's sphere of influence (DWR 118).

3.2.2 Environmental Consequences

No Action

Under the No Action Alternative, Reclamation would not provide funding for construction of a new water diversion intake structure and fish screen in the Mokelumne River to Tracy Lakes. NSJWCD could seek additional funding and continue with their proposed project. Under the No Action Alternative, up to 7,000 acres of irrigated land would be served.

Proposed Action

Under the Proposed Action, Reclamation would fund the proposed project. Under the proposed project, up to 7,000 acres of irrigated land would be served. There would be no land use changes as a result of the Proposed Action.

3.3 Biological Resources

3.3.1 Affected Environment

Reconnaissance-level field surveys were conducted by Robertson-Bryan, Inc. only within the location of the proposed construction and staging zones for the water diversion, pump station, conveyance pipeline alignment, and outfall and stilling basin within the Tracy Lake lakebed.

A U.S. Fish and Wildlife Service Federal Endangered and Threatened species list was generated September 19, 2013 for the Lodi North quadrangle. The list included vernal pool fairy shrimp (*Branchinecta lynchi),* vernal pool tadpole shrimp (*Lepidurus packardi*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) spring-run and winter-run Chinook salmon (*Oncorhynchus tshawytscha*), delta smelt (*Hypomesus transpacificus*), Central Valley steelhead (*Oncorhynchus mykiss*), green sturgeon (*Acipenser medirostris*) California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii),* giant garter snake (*Thamnophis gigas*), riparian brush rabbit (Sylvilagus bachmani riparius), and succulent owl's-clover (*Castilleja campestris ssp. succulen*t).

A review of the California Natural Diversity Data Base (CNDDB) (California Department of Fish and Wildlife 2013) for the Lodi North quadrangle was utilized to compare to the U.S. Fish and Wildlife Service species list of September 19, 2013.

CNDDB lists occurrences in the Lodi North quadrangle for California tiger salamander, valley elderberry longhorn beetle, vernal pool tadpole shrimp, and the State listed threatened Swainson's hawk (*Buteo swainsoni*).

Tracy Lake does not represent habitat for vernal pool fairy shrimp or vernal pool tadpole shrimp because Tracy Lake has been drained and used for agricultural purposes that are incompatible with these invertebrates.

The elderberry longhorn beetle is not likely to occur in the proposed project area as no elderberry shrubs were discovered during a reconnaissance survey of the pipeline alignment work and staging areas.

The delta smelt and green sturgeon are not likely to occur in the proposed project area.

Below is information concerning species that have the potential to be in the proposed project area.

Central Valley Steelhead

Steelhead (*Oncorhynchus mykiss*) have the greatest diversity of life history patterns of any Pacific salmonid species, including varying degrees of anadromy, differences in reproductive biology, and plasticity of life history between generations. They prefer cold water between 55° F and 70° F. In the Mokelumne River, steelhead exhibit two forms, a

resident form that may remain in the river its entire life, and an anadromous form that migrates to the ocean and returns to the river to spawn.

Spawning occurs in the spring in the Mokelumne River, but the spawning migration of anadromous forms extends from summer until the following spring. Most anadromous adults migrate up the Mokelumne River between December and May. The eggs are buried in a redd excavated by the female. They hatch in three to four weeks and the fry emerge from the gravel two to three weeks later and begin feeding (USFWS 2009).

Small, apparently self-sustaining populations of steelhead exist in the Mokelumne River system. Steelhead smolts from the Mokelumne River system enter the Eastern Delta. Mokelumne River fish can either follow the north or south forks of the Mokelumne River through the Central Delta before entering the San Joaquin River at RM 22. Some fish may enter the San Joaquin River farther upstream if they diverge from the South Fork of the Mokelumne River into Little Potato Slough.

Central Valley steelhead – Approximately 7 percent of the steelhead from the Sacramento River basin emigrate prior to February in any given year and thus would be vulnerable to open DCC gates and diversion into the Delta interior. Steelhead begin showing up in the salvage at the CVP and SWP fish collection facilities in January and February and most likely represent the steelhead moving out of the Mokelumne system during December and January (NOAA Fisheries 2009).

Central Valley spring-run Chinook Salmon - Threatened

Central Valley spring-run Chinook salmon (*O. tshawytscha*) were extirpated from the San Joaquin River drainage by the late 1940's. The Mokelumne River lies outside of the Central Valley spring-run Chinook salmon distinct population segment (70 FR 37160) and the corresponding designated critical habitat (70 FR 52488).

Winter-run Chinook Salmon - Endangered

Winter-run Chinook salmon (*O. tshawytscha*) are unique to the Sacramento River. They typically migrate upstream as immature silvery fish during winter and spring (December – July) and then spawn several months later in early summer (late April – early August). No winter-run Chinook salmon have been observed in the lower Mokelumne River since EBMUD began monitoring salmon migration in 1990.

Fall-run Chinook Salmon – Species of Concern

Fall-run Chinook salmon typically emigrate to the ocean in the spring of their first year and return to their natal streams to spawn after a few years in the ocean. The annual fall-run Chinook salmon migration in the Mokelumne River begins in early October, peaks in November, and drops off in December and early January. Spawning generally occurs primarily in late October through January. The salmon eggs incubate and hatch in the gravel between late October and April, depending on time of spawning and water temperature. The fry remain there until the yolk sac is absorbed and they begin to emerge, usually January and continuing until April. Most juvenile Chinook salmon have left the spawning areas by late March and have left the river by July of their first year (USFWS 2009).

Fish habitat in the lower Mokelumne River adjacent to the proposed project site is dominated by low-gradient glides. Substrate within the river, near the proposed project site is a combination of fine sediments in the zones of slower current (e.g., loose sand, silt, and clay) and coarse sediment in zones with higher velocity. The river bank within the proposed project area is dominated by mature riparian forest habitat. The proposed construction site is located in a river reach that provides little or no direct habitat value for adult anadromous salmonids other than as a migration corridor, and only moderate habitat value for rearing juvenile salmonids. No spawning habitat for salmonids exists within the area affected by the proposed construction.

California Tiger Salamander – Threatened

The California tiger salamander (CTS) is listed as threatened under federal and state endangered species act.

CTS live in vacant or mammal-occupied burrows throughout most of the year, in grassland, savanna, or open woodland habitats. Adults remain in underground burrows or crevices for much of the year but emerge to breed during the rainy season (NatureServe 2013).

California Red-legged Frog - Threatened

California red-legged frog (*Rana aurora draytonii*) and riparian woodrat (*Neotoma fuscipes riparia*) have the potential to reside in the Proposed Action area. In 2008, Reclamation consulted with the U.S. Fish and Wildlife Service on the Proposed Coordinated Operations of the Central Valley and State Water Projects and requested consultation on the effects of operations on these species.

Succulent (fleshy) owl's-clover) - Threatened

The succulent owl's-clover (*Castilleja campestris ssp. succulent*) occurs in vernal pools, vernal swales, and other seasonal wetlands that pond water for three weeks or more (USFWS 2009). There are no records for this species in the direct vicinity of the proposed project area.

State Listed Species

Swainson's hawk – Threatened

Swainson's hawk (*Buteo swainsoni*) habitat varies from prairie and shrubsteppe to desert and intensive agricultural systems. They are highly migratory breeding in North American and wintering in South America. Nesting occurs in mid-April. In the Central Valley, they arrive in late February and early March. Swainson's construct nests in a wide variety of tree species. Nests in the Central Valley are typically built in a semi-exposed position in the upper canopy or lateral branches of tall trees (Woodbridge 1998). The Swainson's hawk is a potential summer forager and breeding resident within and surrounding the proposed project area.

3.3.2 Environmental Consequences

No Action

Under the No Action Alternative, Reclamation would not provide funding for construction of a new water diversion intake structure and fish screen in the Mokelumne River to Tracy Lakes. NSJWCD could seek additional funding and continue with their proposed project. Impacts would be the same as the impacts as a result of the Proposed Action.

Proposed Action

Under the Proposed Action, Reclamation would fund the proposed project. Evaluation of short-term construction-related potential impacts and impacts associated with altered habitat conditions during operation of the proposed project were evaluated. Construction-related impacts considered construction timing, physical habitat disturbance, potential for physical injury, salmonid life-stage, noise, turbidity, sedimentation and erosion as a result of in-river work, and hazardous spills (Appendix A).

The proposed project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species with implementation of mitigation.

The potential long-term operations-related effects of the proposed project would be minimized through the design features of facilities, and the water diversion scheduling and regulatory requirements under which Tracy Lake Improvement District would operate the facilities.

The fish screen intake and pump station facility would comply with current NOAA Fisheries and CDFW design specifications to minimize and avoid entrainment of anadromous salmonids. The potential for habitat loss, alteration, or increased predation associated with the in-river facilities is expected to be low due to the relatively small area of disturbance. Water diversion from the Mokelumne River to Tracy Lake would occur only in years when surplus water is available.

The proposed project would result in hydrologic changes in the form of incrementally reduced storage in Camanche Reservoir, and increased flows in the lower Mokelumne River between Camanche Dam and the proposed diversion location at Tracy Lake. However, the changes in seasonal reservoir storage and flows would be minor and would not be expected to adversely affect instream habitat or temperature conditions in the lower Mokelumne River, or restrict the migration or movement of anadromous fishes using the lower Mokelumne River.

Consequently, the potential for operations-related affects to cause direct lethality or injury, or otherwise adversely affect fishes or habitat, is low. For these reasons, the potential for operations-related activities to adversely affect ESA-listed anadromous salmonids or their habitat is very low.

Table 4 summarizes the potential impacts of the proposed project.

Table 4 Listed Species Impacts

Species	Common Name	Impact	Comment
Amphibians			
Ambystoma californiense	California tiger salamander	NE	**Present.** Could potentially be present in the project area and use Tracy Lake for aquatic breeding habitat. Impacts would be avoided or minimized through implementation of participation in the SJMSCP, pre-construction surveys, and BMPs implemented as part of the proposed project.
Rana draytonii	Red-legged frog	NE	**Absent.** Tracy Lakes does not represent appropriate habitat because it does not retain water long enough to allow for species' life cycle.
Fish			
Oncorhynchus mykiss	Central Valley steelhead	NLAA	**Present**. Pump would be screened to NOAA Fisheries standards to avoid impacting the threatened Central Valley steelhead
O. tshawytscha	Central Valley ESU fall-run Chinook salmon	NLAA	**Present**. Pump would be screened to NOAA Fisheries standards to avoid impacting the fall-run Chinook salmon
Hypomesus transpacificus	Delta Smelt	NE	**Unlikely to occur.** Not likely to be in the proposed project area.
Birds			
Buteo swainsoni	Swainson's hawk	May affect	**Present.** Potential summer forager and breeding resident within and surrounding the proposed project area. Impacts would be avoided or minimized through implementation of participation in the SJMSCP, pre-construction surveys, BMPs implemented as part of the proposed project. See details below.
Plant			
Castilleja campestris ssp. succulent	succulent owl's-clover	NE	**Unlikely to occur.** No vernal pools in the proposed project area.

Key: NE: No effect
NLAA: May affect, not likely to adversely affect

Potential impacts to Swainson's hawk would be avoided or minimized through implementation of participation in SJMSCP, pre-construction surveys, and BMPs implemented as part of the proposed project. If Swainson's hawks are identified in the construction or staging areas, NSJWCD would incorporate measures to minimize impacts pursuant to the SJMSCP. Any Swainson's hawks within the construction area during pre-construction surveys would be protected pursuant to the measures described in the SJMSCP. Disturbances to birds potentially nesting or foraging in the proposed project area would be minimized through implementation BMPs which require that construction activities are limited to the designated work area, which would be clearly identified on the construction drawings and would be staked and flagged, where necessary, prior to initiation of construction activities. Additionally, construction activities would be limited to the daylight hours and construction equipment must have sound-control devices no less effective than those provided on the original equipment. No equipment shall have an unmuffled exhaust system. Implementation of Mitigation Measures, BMPs would reduce the impact to special-status birds potentially present within the construction and staging areas.

Installation of the pipeline would require the removal of up to nine trees within the pipeline alignment area. Potential adverse effects of tree removal would be minimized through implementation of the BMPs, which require that construction activities avoid, where possible, damage and removal of mature trees and that activities within the drip-line of trees are minimized.

The operations-related activities including pump station operation and maintenance, and water diversions, would involve minimal noise or other disturbances in the project area, and thus would not directly affect special-status bird nesting or foraging activities.

3.4 Cultural Resources

3.4.1 Affected Environment

Cultural resources are defined as prehistoric and historic-era archaeological sites, Traditional Cultural Properties, Sites of Religious and Cultural Significance, and architectural properties (e.g., buildings, bridges, and structures). This definition includes historic properties as defined by the National Historic Preservation Act (NHPA).

Reclamation proposes to award a WaterSMART grant to NSJWCD to fund the proposed project. The expenditure of Federal funds constitutes an undertaking in accordance with Section 301(7) of the NHPA (16 U.S.C. 470). Reclamation consulted with the California State Historic Preservation Officer (SHPO) pursuant to the 36 CFR Part 8000 regulations which implement Section 106 of NHPA.

In an effort to identify historic properties in the area of potential effect (APE), the Consulting Archaeologist, completed a records search with the Central California Information Center of the California Historical Resources Information System, additional literature and archival search, a pedestrian survey, recordation of all identified cultural resources identified in the APE, and a evaluation of those cultural resources under the four criteria of eligibility of the California Register of Historical Resources.

One cultural resource was identified in the APE, a previously documented ditch/drain adjacent to the proposed pipeline route. It is an earthen-channel water conveyance structure apparently designed to direct overflow from Tracy Lake to the Mokelumne River. Reclamation found that it is not eligible under National Register of Historic Places Criterion A or Criterion B.

Pursuant to 36 CFR § 800.3(f)(2), 36 CFR Part 800.4(a)(4), and 36 CFR§ 800.4(a)(3), Reclamation sent letters to tribes, organizations, and individuals requesting their assistance in the identification of sites which may be eligible for list on the National Register. Reclamation will work with these Indian tribes, organizations, or individuals to address concerns, should any arise.

3.4.2 Environmental Consequences

No Action

Under the No Action Alternative, Reclamation would not provide funding for construction of a new water diversion intake structure and fish screen in the Mokelumne River to Tracy Lakes. NSJWCD could seek additional funding and continue with their proposed project. Impacts would be the same as the impacts as a result of the Proposed Action.

Proposed Action

Under the Proposed Action, Reclamation would fund the proposed project. The Proposed Action would result in no historic properties being affected pursuant to 36 CFR Part 800.4(d)(1).

3.5 Air Quality

3.5.1 Affected Environment

The Federal Clean Air Act (CAA) Amendments of 1970 established National Ambient Air Quality Standards (NAAQS) for six "criteria pollutants": photochemical ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), inhalable particulate matter (PM) up to 2.5 microns in diameter ($PM_{2.5}$) and from 2.5 to 10 microns in diameter (PM_{10}), and lead (Pb). The California CAA of 1977 created stricter California Ambient Air Quality Standards (CAAQS) for the six criteria pollutants pertaining to the state. The CAAQS also set standards for sulfates, hydrogen sulfide, and visibility. Table 6 below depicts the standards for both the NAAQS and CAAQS, and represents minimum acceptable concentrations of a particular pollutant to ensure that the air we breathe is considered healthy. When an area exceeds these standards, it is designated as "non-attainment" by the California Air Resources Board (CARB) for CAAQS and by the U.S. Environmental Protection Agency (EPA) for NAAQS.

Section 176 (C) of the Federal CAA (42 U.S.C. 7506 (C)) requires any entity of the Federal government that engages in, supports, or in any way provides financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan[1] (SIP) required under Section 110(a) of the Federal CAA (42 U.S.C. 7401 (a)) before the action is otherwise approved. In this context, conformity means that such Federal actions must be consistent with the SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of those standards. Each Federal agency must determine that any action that is proposed by the agency and that is subject to the regulations implementing the conformity requirements would, in fact conform to the applicable SIP before the action is taken. This process is often referred to as a general conformity analysis.

On November 30, 1993, the U.S. EPA promulgated final general conformity regulations (40 CFR 93 Subpart B) for all Federal activities except those covered under

[1] The SIP is the State's plan to attain the NAAQS for nonattainment pollutants.

transportation conformity. The general conformity regulations apply to proposed Federal actions in a non-attainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutants caused by the Proposed Action are equal to or exceed certain *de minimis* amounts thus requiring the Federal agency to make a determination of general conformity. If the Federal agency determines that the general conformity regulations do not apply to the Proposed Action (meaning the project emissions do not exceed the *de minimis* thresholds and are not regionally significant[2]), then no further analysis or documentation is required.

In 1994, the San Joaquin Valley Air Pollution Control District developed local thresholds for ozone[3], sulfur dioxide (SO_2), nitrous dioxide (NO_2), carbon monoxide (CO), lead (Pb), sulfur and PM_{10}, that if exceeded, would trigger the need for a general conformity analysis. The thresholds are a part of section 51.853, Applicability of District Rule 9110. In addition to the thresholds, guidance on land use impacts on air quality within the district can be found within the SJVAPCD's, *Guide for Assessing and Mitigating Air Quality Impacts* (2002).

Threshold levels that would trigger the need for a conformity analysis depend on the attainment status of the area where a project is sited. San Joaquin County is considered an extreme non-attainment zone for the 8-hour ozone standard, is in a non-attainment for the 8-hour $PM_{2.5}$ standard, and in a maintenance area for PM_{10}. There is no construction-related $PM_{2.5}$ threshold indicated in Rule 9110 despite the SJVAB being in a non-attainment area for $PM_{2.5}$.

Table 5 below shows the SJVAPCD's threshold levels. If a proposed project's emissions were to meet or exceed those levels, those emissions must be mitigated to the lowest reasonable level possible. In addition to the local thresholds set by SJVAPCD, a project must not exceed the allowed emission concentrations set by California and national standards (Table 6).

Table 5 SJVAPCD Rule 9110 General Conformity Thresholds Based on Federal NAAQS Attainment Status

Pollutant	**SJVAPCD Rule 9110 Threshold**	**Federal Attainment Status**
Ozone (O_3) and precursors including NO_x and VOCs	50 tons/year	Non-Attainment, Extreme (8-hour), Severe (1-hour)
Respirable Particulate Matter (PM_{10})	100 tons/year	Attainment, Maintenance Area
Fine Particulate Matter ($PM_{2.5}$)	None – No Threshold in Rule 9110	Non-attainment
Carbon Monoxide (CO)	None – Area in Attainment	Attainment
Nitrogen dioxide (NO_2)	None – Area in Attainment	Attainment
Sulfur Dioxide (SO_2)	None – Area in Attainment	Attainment

[2] Regardless of the Proposed Action's emissions relative to the *de minimis* amounts, if the action's total emissions
of a given pollutant represents 10 percent or more of the area's total emissions of that pollutant, the action is considered regionally significant and the federal agency must make a determination of general conformity.

[3] Nitrous oxides (NO_x) and volatile organic compounds (VOCs) (also referred to as reactive organic gases (ROGs) are ozone precursors.

Lead (Pb)	None – Area in Attainment	Attainment

Table 6 National and California State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1] Concentration	National Standards Concentration
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	-
	8 Hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	150 µg/m^3
	Annual Average	20 µg/m^3	-
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	-	35 µg/m^3
	Annual Average	12 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)	1 Hour	20 ppm (0.023 µg/m^3)	35 ppm (0.04 µg/m^3)
	8 Hour	9.0 ppm (0.01 µg/m^3)	9.0 ppm (0.01 µg/m^3)
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m^3)	0.10 ppm (188 µg/m^3)
	Annual Average	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (665 µg/m^3)	0.075 ppm (196 µg/m^3)
	3 Hour	-	0.5 ppm (1300 µg/m^3)
	24 Hour	0.04 ppm (105 µg/m^3)	0.14 ppm
	Annual Average	-	0.030 ppm
Lead (Pb)	30 Day Average	1.5 µg/m^3	-
	Calendar Quarter	-	1.5 µg/m^3
	Rolling 3-Month Average	-	0.15 µg/m^3

The proposed project is in San Joaquin County, California, which is within the boundaries of the San Joaquin Air Basin as defined by Air Resources Board. This area is within the jurisdiction of the San Joaquin Valley Air Pollution Control District. The lands surrounding the worksite are agriculture. The surrounding land is primarily agriculture. There is one house that would be in close proximity to the proposed project. However, it would not be anticipated that there would be an adverse affect as a result of the proposed project.

As shown in Table 5, the SJVAPCD has reached Federal and State attainment status for CO, NO_2, SO_2, and lead. The pollutants of greatest concern for the SJVAPCD are $PM_{2.5}$ and O_3 (including NO_x and VOC precursors) based on the attainment status of the area for these pollutants.

3.5.2 Environmental Consequences

No Action

Under the No Action Alternative, Reclamation would not provide funding for construction of a new water diversion intake structure and fish screen in the Mokelumne River to Tracy Lakes. NSJWCD could seek additional funding and continue with their proposed project. There would be no effect on conditions and trend in air quality within the SJVAPCD.

Proposed Action

Construction emissions would vary from day to day and by activity, depending on the timing and intensity of construction, and wind speed and direction – with each activity having its own potential to release emissions. Generally, air quality impacts from the Proposed Action would be localized in nature and decrease with distance. The Proposed Action would result in the temporary emissions of fugitive dust and vehicle combustion pollutants during the following construction and other activities:

- On-site earthwork (cut/fill, excavation, compacting)
- On-site construction equipment and haul truck engine emissions
- Off-site haul truck engine emission
- On-site and off-site haul truck fugitive dust emissions for paved and unpaved road travel

Work on the project is anticipated to last 6 months.

An electrical pump would be used to transfer water, thus there would be no operational emissions from this action.

Equipment that would be used to construct the Proposed Action that would generate combustion emissions include:

- Track excavator
- Rubber tired backhoe/loader
- Long-reach crane

- Concrete truck
- Delivery dump truck
- Water truck
- Delivery truck and trailer
- Rubber tired dozer
- Pickup trucks
- Fuel and oil service truck
- Air compressor
- Generator
- Welder

Calculated emissions from the Proposed Action include NO_x and VOC (as ozone precursors) and PM_{10}, and in general were estimated using various emissions models and spreadsheet calculations, depending on the source and data availability. Fugitive dust (PM_{10}) and ROG from construction, along with ozone, and particulate emissions from off-road equipment were calculated using the 2013 CalEEMod model.

Table 7 Unmitigated and Mitigated Estimated Project Emissions and SJVAPCD Rule 9110 General Conformity Thresholds

Pollutant	Unmitigated Emissions (tons/year)	Mitigated Emissions (tons/year)	Rule 9110 Threshold (tons/year)
NOx (as ozone precursor)	8.62	8.61	50
VOCs (as ozone precursors)	1.20	1.20	50
PM_{10}	1.12	0.87	100

The Proposed Action has been estimated to approximately produce no more than 9.81 tons/year of ozone precursors and no more than 0.87 tons/year of PM_{10} which is below the SJVAPCD *de minimis* levels that would trigger a need for a full conformity analysis (Table 7). Therefore, a general conformity analysis is not required.

3.6 Greenhouse Gas and Climate Change

Climate change implies a significant change having important economic, environmental, and social effects in a climatic condition such as temperature or precipitation. Climate change is generally attributed directly or indirectly to human activity that alters the composition of the global atmosphere, additive to natural climate variability observed over comparable time periods.

Greenhouse gases (GHG) in the atmosphere allow short wavelength solar radiation to pass through the atmosphere to reach the earth's surface, but absorb the longer wavelength heat that is radiated back into the atmosphere from the earth. The concentration of GHG in the atmosphere has an effect on the average temperature at the

surface of the earth. If the atmospheric concentration of greenhouse gases decreases over time, then more heat will escape through the atmosphere, and the average temperature at the earth's surface will go down. If the GHG concentration in the atmosphere increases, however, less heat will escape to outer space and the average temperature at the earth's surface will increase.

Burning of fossil fuels is considered a major contributor to perceived global climate change. CO_2, which is produced when fossil fuels are burned, is a GHG that effectively traps heat in the lower atmosphere. Some CO_2 is liberated naturally, but this may be augmented greatly through human activities. Increases in air temperature may lead to changes in precipitation patterns, runoff timing and volume, sea level rise, and changes in the amount of irrigation water needed due to modified evapotranspiration rates. These changes may lead to impacts to California's water resources and project operations. While there is general consensus in their trend, the magnitudes and onset-timing of impacts are uncertain and are scenario-dependent (Anderson et al. 2008).

3.6.1 Affected Environment

California adopted Assembly Bill 32 (AB 32), which refers to and incorporates specific versions of the U.S. EPA's Mandatory Reporting of Greenhouse Gas Rule (74 FR 56260). Both regulations require facilities that emit 25,000 metric tons or more per year of GHG to submit annual reports to the EPA and CARB, respectively.

CO_2 is the main GHG of concern since the Proposed Action would utilize on-road and off-road vehicles with combustible engines that produce CO_2 as emissions.

3.6.2 Environmental Consequences

No Action

Under the No Action Alternative, Reclamation would not provide funding for construction of a new water diversion intake structure and fish screen in the Mokelumne River to Tracy Lakes. NSJWCD could seek additional funding and continue with their proposed project. Impacts would be the same as the impacts as a result of the Proposed Action.

Proposed Action

Under the Proposed Action, Reclamation would fund the proposed project. While any increase in GHG emissions would add to the global inventory of gases that would contribute to global climate change, the proposed project would result in potentially minimal increases in GHG emissions. GHG generated by the proposed project has been estimated to be no greater than 790 tons/year. Since the amount of CO_2 emitted from the proposed project is under the 25,000 metric ton/year threshold, no report is required to be submitted to the EPA and CARB

3.7 Cumulative Effects

According to the Council on Environmental Quality regulations for implementing the procedural provisions of National Environmental Policy Act, a cumulative impact is

defined as *the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions*. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Reclamation's action is to award a grant for the construction of a pipeline and new diversion point from Mokelumne River to Tracy Lakes.

The proposed project would divert water only in years when there is a surplus of water supply subject to the NSJWCD, EBMUD, and WID water rights, and EBMUD's operations (including WID's obligations) are subject to compliance with the JSA requirements for temperature management and instream flows in the lower Mokelumne River for protection of fisheries resources. EBMUD must also comply with mitigation measures intended to ensure adequate flows that were established in its draft EIR for the Permit 10478 Time Extension Project. Therefore, implementation of the Proposed Action would not result in other cumulatively or indirectly adverse effects to fisheries resources related to instream flows and temperature conditions. Therefore, the proposed project's contribution to the future cumulative condition would not adversely affect ESA-listed anadromous salmonids or their habitat, including critical habitat and EFH.

The Proposed Action would not have a cumulative impact as a result of past, present, and reasonably foreseeable future actions.

Section 4 Consultation and Coordination

The EA will be available for review and comment from January 30, 2014 to February 28, 2014. .

The following is a list of agencies consulted during the preparation of this EA.

- North San Joaquin Water Conservation District
- NOAA Fisheries – Reclamation will consult with NOAA Fisheries; construction would not start until the consultation has concluded.
- U.S. Fish and Wildlife Service – NSJWCD has consulted with U.S. Fish and Wildlife Service and has developed a habitat conservation plan.
- State Historic Preservation Officer – Reclamation sent a letter to SHPO on December 11, 2013, inviting SHPO's comments and requesting concurrence with Reclamation's finding of no historic properties affected. SHPO failed to respond within the 30-day review period pursuant to 36 CRF Part 800.3(c)(4). In accordance with CFR Part 800.4(d)(1)(i), if SHPO does not object within 30 days of an adequately documented finding, the agency's responsibilities are fulfilled.

NSJWCD is applying for a Section 404 permit with Corps of Engineers, and will be applying for a Section 401 permit. Construction would not start until receipt of the subject permits.

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