RECLAMATION

Managing Water in the West

Environmental Assessment

Madera Irrigation District Water Conservation, Telemetry Upgrade & Improvement Project

WaterSMART: Water and Energy Efficiency Grant
Grant No. R13AP20050

13-21-MP

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Regional Office
Sacramento, CA

March 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 commitments to island communities.

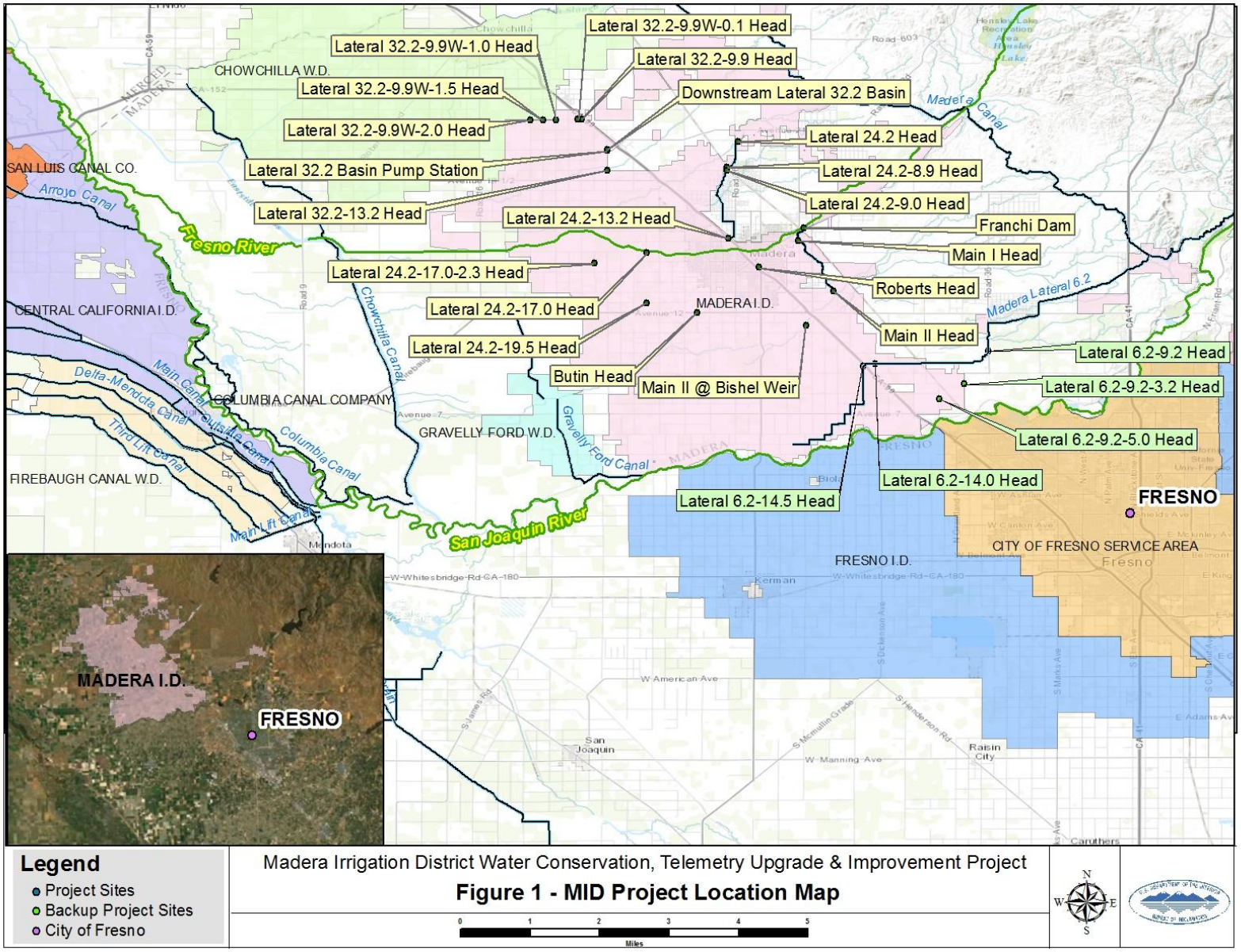
The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

List of Acronyms and Abbreviations

AF	acre-feet
APE	area of potential effect
CAAQS	California Ambient Air Quality Standards
DFW	California Department of Fish & Wildlife
EA	Environmental Assessment
MBTA	Migratory Bird Treaty Act
MID	Madera Irrigation District
NAAQS	National Ambient Air Quality Standards
NO_x	nitrogen oxides
O_3	ozone
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
Project	Water Conservation, Telemetry Upgrade & Improvement Project
ROG	reactive organic gases
SCADA	Supervisory Control and Data Acquisitions
FWS	U.S. Fish & Wildlife Service
SHPO	State Historic Preservation Officer
SJKF	San Joaquin kit fox
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
VOC	volatile organic compounds

Section 1 Introduction

This Environmental Assessment (EA) has been prepared to examine the potential direct, indirect, and cumulative impacts to the affected environment associated with providing federal grant funding to the Madera Irrigation District (MID) for its Water Conservation, Telemetry Upgrade & Improvement Project (Project). The Project area is located 18 miles northwest of the City of Fresno, in Madera County, California (see Figure 1).



1.1 Need for the Proposal

In a Total Channel Control Assessment Report performed by Rubicon Water in January 2011, it is estimated that MID's water losses are approximately 9,000 acre-feet (AF) in below average

rainfall below average rainfall seasons and approximately 61,000 acre-feet AF in above average rainfall seasons.

In situations where water is lost during the irrigation season, MID may require upstream releases from stored allocations behind federal dams to compensate for lost volumes, which reduces the availability of water from federal contracts. This, especially in a below average rainfall season and where federal allocations are reduced, causes the District to release limited resources earlier than intended. MID needs to improve its water management by reducing water lost through its distribution system and improving overall water-use efficiency.

Section 2 Proposed Action and Alternatives

2.1 No Action Alternative

Under the No Action Alternative, Reclamation would not award MID with a grant and the District would continue to operate and maintain its distribution system under existing conditions.

2.2 Proposed Action

Reclamation proposes to award MID with a WaterSMART Program: Water and Energy Efficiency grant to retrofit or replace 17 manual check structures and control gates within MID's extensive canal system with automated flume gates and flow meters. MID also proposes to integrate remote sensing capability with additional solar panel powered Supervisory Control and Data Acquisitions (SCADA) system connections to these and three additional sites. The grant funds would also go toward the SCADA master station setup at MID's main office.

The irrigation canals would be dewatered and each site would be cleaned of minimal silt and debris with shovels prior to construction activities. The Proposed Action can be divided into four components:

1. SCADA Master Station: MID would set up the SCADA system master station at MID's main office. The existing radio tower would be equipped with a new omnidirectional antenna to communicate to all of the radio devices within MID's boundaries. The contractor would set up, install, and integrate the SCADA master station in approximately six months.

2. Install Slip and Flume Meters: MID would replace the manually operated check gates with seven new automated slip meters. The majority of the new installations can be retrofitted within existing gates and concrete abutments without any significant modification. A few of the existing weir structures may require minor modification to accept the prefabricated gates and frames. MID would also install seven new automated flume meters on existing gates. The flume meter comprises the box portion of the slip meter and would be mounted in front of the existing canal gate with an aluminum shroud. The flume meter and shroud mount to the existing concrete. Once the meter is in

place, the contractor would install the telemetry device and integrate the automatic meter into the SCADA system.

A site specific solar panel power system with 85 watt solar panels and battery backup system would provide power to the SCADA communication system and motorized gates. The solar panel installation at each slip meter site would be modular and involve mounting either to the gate frames and adjacent concrete abutments or to the adjacent poles along access roads. MID would install a 16- by 16- by 6-inch deep concrete pad directly adjacent to the flume meters to mount a pedestal and solar panel. Each meter and solar panel installation would take approximately one to two days to complete, and require one maintenance truck with a boom and generator, and one concrete truck. The slip meters would be stored at the District's office and then delivered to each site on the day of their installment. All installations would be scheduled around the irrigation season, which is typically April through October, and in dry conditions. The following are the slip and flume meter sites with examples in Figures 2 and 3:

- **Slip Meters**:
  - Roberts Head
  - Butin Head
  - Lateral 24.2-8.9 Head
  - Lateral 24.2-9.0 Head
  - Lateral 24.2-17.0 Head
  - Lateral 24.2-19.5 Head
  - Lateral 32.2-9.9 Head

- **Flume Meters**:
  - Lateral 24.2-13.2 Head
  - Lateral 24.2-17.0-2.3 Head
  - Lateral 32.2-13.2 Head
  - Lateral 32.2-9.9W-0.1 Head
  - Lateral 32.2-9.9W-1.0 Head
  - Lateral 32.2-9.9W-1.5 Head
  - Lateral 32.2-9.9W-2.0 Head

- **Backup Sites**: There is the potential for MID to change slip meter installation sites to the following locations and are analyzed as part of the Project:
  - Lateral 6.2-14.5 Head
  - Lateral 6.2-9.2-5.0 Head
  - Lateral 6.2-9.2-3.2 Head
  - Lateral 6.2-14.0 Head
  - Lateral 6.2-9.2 Head

Figure 2 - Slip Meter

Figure 3 - Flume Meter

3. Install Flume Gates: MID would retrofit two manually operated check structures with new automated flume gates. The flume gates would be delivered directly to each site close to their installation dates. The contractor would cut into the existing concrete structures and pour new concrete headwalls to the appropriate size of the new flume gates. This activity may entail minor earthwork immediately adjacent to the gates within the canal road, and minor formwork on some gate locations to fit the new frames. The removed concrete would be placed downstream of the structure on the banks as rip rap. Once the gate is installed, the contractor would install the telemetry device and integrate the automatic gate into the SCADA system.

   A site specific solar panel power system with 85 watt solar panels and battery backup system would provide power to the SCADA communication system and motorized gates. The solar panel installation is a modular activity that mounts the solar panel to the gate frames and adjacent concrete abutments. Each gate and solar panel installation would take approximately three to four days to complete per site, and require one maintenance truck with a boom and generator, one concrete truck, and a concrete saw. All installations would be scheduled during the irrigation "off season" and in dry conditions. See Figure 4 for an example of the flume gate to be installed. The flume gate sites would involve the following:

   - Replace two existing manually-operated check structures with new automated flume gates at the following locations:
     - Main II Head
     - Downstream Lateral 32.2 Basin

   - The installation of an additional flume gate that was purchased with a previous Reclamation Field Services grant (R11AP20100) would be included in this Proposed Action. MID would remove the existing radial gate from the concrete structure, cut into the concrete headwalls to the desired dimensions for placement of new headwalls, wait two weeks for the concrete to cure, and install a flume gate at the Lateral 24.2 Head.

Figure 4 - Flume Gate

4. SCADA Interface Rubicon Units: MID's contractor would install the telemetry devices at each location to provide remote control capabilities and communication to the SCADA master station. There would be a radio and antenna installed at the three flume gate modernization sites, the 14 new flume and slip meters, as well as at three existing flume gates (Franchi Dam, Main I Head, and Main II at Bishel Weir) and the existing Lateral 32.2 Basin Pump Station. After the flow meters and gates are installed and the master station is set up at MID's main office, the contractor would install the telemetry devices at each site then integrate into the SCADA system. This is a modular activity and the contractor would use hand tools to complete it. Each installation would take approximately one to two days.

The ordering and installation of the meters and gates would commence as soon as possible in the first and second quarters of 2014 until the MID irrigation season starts, which is typically from March through September. The season start and end can vary up to two months annually depending upon rainfall, snowpack, and previous reservoir storage. If the gates or meters are not readily available in early 2014, then MID would order them, which could take up to 16 weeks to arrive. If the new devices arrive during the 2014 irrigation season, MID would wait until the irrigation season has ended to resume installations as early as October, and finish by March 2015. For the sites with potential Swainson's hawk nesting habitat, the meters or gates will be installed outside of both the irrigation season and the nesting period (March 1 through September 15).

2.2.1 Avoidance and Minimization Measures

As part of the Proposed Action, MID will implement the following measures in order to avoid and minimize potential effects to the affected environment:

- There will be no construction work during night time hours (30 minutes prior to sunset to 30 minutes after sunrise).

- Construction activities at the Project sites, with the exception of the Lateral 24.2 Head site, will not occur from March 1 to September 15 to avoid impacts to nesting Swainson's hawk (*Buteo swainsoni*) and other raptors protected by the Migratory Bird Treaty Act (MBTA). If construction must occur during the nesting season, a qualified biologist will conduct pre-construction surveys for active raptor nests on and adjacent to the action area within a ½ mile radius, within 10 days of ground disturbing activities (Swainson's Hawk Technical Advisory Committee 2000). If an active nest is located within 1/2 mile of the action area, then MID will coordinate with the U.S. Fish and Wildlife Service (FWS) and the California Department of Fish and Wildlife (DFW) to establish appropriate requirements for MID to follow to avoid take.

- Construction activities will be performed during the non-irrigation season (approximately October through February) between when the District stops delivering water and prior to the rain season when significant storm waters are diverted into the canal system. Sites that are known to receive the most pooling water at the onset of storm events will be worked on first in order to avoid halting the Project.

- Any dust generation from construction equipment will be mitigated by water sprayed on access roads prior to and during truck movement.

- The staging area and construction activities will be confined to the irrigation canals, existing concrete structures, and the canal roads.

Section 3 Affected Environment and Environmental Consequences

Potential impacts to the following resources were considered and found to be minor. Brief explanations for their impacts are provided below:

- Indian Trust Assets: The Proposed Action does not have the potential to affect Indian Trust Assets (see Appendix A).

- Indian Sacred Sites: The Proposed Action would not be located on or impact federal lands and therefore could not affect Indian sacred sites on federal lands.

- Environmental Justice: No significant changes in agricultural communities or practices would result from the Proposed Action, other than improvements made to individual canal structures. These changes are not likely to have effects to any individuals or populations within the action area. Accordingly, the Proposed Action would not have disproportionately negative impacts on low-income or minority individuals or populations within the Project area.

3.1 No Action Alternative

The No Action Alternative would consist of Reclamation not providing grant funding to facilitate water conservation measures at MID. Under the No Action Alternative, there would be no change to existing conditions and current trends of the affected environment. The irrigation system currently in place would continue to operate and MID would continue to provide irrigation service to its users.

3.2 Proposed Action

3.2.1 Water Resources

Surface Water

MID has three sources of water: the San Joaquin River, Fresno River, and pre-1914 water rights to Big Creek and Soquel Creek. This water is stored at either Millerton Lake behind Friant Dam or Hensley Lake behind Hidden Dam. MID's primary connection to Reclamation activities is through contracted water deliveries. In 1939, MID contracted with Reclamation for water deliveries, and in exchange for certain property and interests in water filings on the San Joaquin River the District was granted a water supply under conditions stipulated, of not to exceed 270,000 afy for a District area of 172,500 acres (Nolan 2013). This agreement was modified in 1950 and 1959. A permanent contract was entered into with the United States for 85,000 AF of Class 1 and 186,000 AF of Class 2 water. In 1975, MID contracted with Reclamation for the Hidden Dam project where Reclamation required the District to acquire 15,000 additional acres in exchange for water from this dam (Nolan 2013).

MID receives on average approximately 179,083 afy of federal and non-federal water supplies (see Table 1). MID water is distributed via Reclamation-owned facilities: Hidden Dam, Friant Dam, and Madera Canal. From the Hidden Dam of Hensley Lake, the water flows into the District along the Fresno River to deliver other federal and non-federal water rights. San Joaquin River water is imported to MID via the Madera Canal entering downstream of Hidden Dam.

Table 1: Annual Water Quantities Delivered to MID Under Each Right or Contract (Nolan 2013)

Year	Federal Ag. Water (AF)	Hidden Dam, Big Creek, other prior (AF)	Soquel Creek (Pre-1914) (AF)	Transfers into District (AF)	Wheeling (AF)	Total (AF)
2003	129,704	30,120	9,461	2,300	0	**171,585**
2004	99,880	22,066	7,963	10,531	0	**140,440**
2005	113,191	44,024	15,880	0	0	**173,095**
2006	158,432	40,421	15,865	0	0	**214,718**
2007	84,011	19,668	6,337	8,755	0	**118,771**
2008	94,569	35,255	5,937	5,525	0	**141,286**
2009	118,072	13,968	8,119	2,941	149	**143,249**
2010	157,201	72,939	12,588	7,646	268	**250,642**
2011	125,002	182,771	18,674	0	230	**326,677**
2012	65,055	32,837	6,266	5,000	1,211	**110,367**
Total	**1,145,117**	**494,067**	**107,090**	**42,698**	**1,858**	***1,790,830***
Average	**114,512**	**49,407**	**10,709**	**4,270**	**186**	***179,083***

MID loses approximately 9,000 AF in below average rainfall seasons and approximately 61,000 AF in above average rainfall seasons due to: i) imbalances in channel flows; ii) unanticipated high flows from storm waters that are channeled or piped into the system from the City of Madera; and iii) unforeseen dike breaching caused by ground squirrels burrowing into the embankments (Greci 2013). Since the District does not have the ability to pump and recirculate surplus waters back to the headworks or to the reservoir and keep these waters in-system, waters not consumed for irrigation purposes are lost to the following:

a) Seepage in either unlined canals or clay-lined canals whose clay barrier has been breached or through leakage;
b) Channeled through the canal system and: 1) flow through to the Madera Ranch Water Bank lands; 2) are diverted to natural channels; or 3) captured and sold to neighboring irrigation districts;
c) Unauthorized use or theft via bypassed or altered meters at turnouts;
d) System filling at the beginning of the irrigation season;
e) Evaporation;
f) Meter error; or
g) Spills.

These losses comprise approximately five percent of MID's water supply in a below average rainfall season or 34 percent in an above average rainfall season. Unused MID irrigation water is either disposed of through discharge into the Madera Branch Water Bank Lands, released into natural creeks and rivers, or sold to other districts either in direct or indirect transfer from waters allocated to MID in the San Luis Reservoir.

The Proposed Action would automate MID's extensive canal system with precise metered control gate operation along with remote sensing capability to allow for constant measurement. This improvement would allow MID to better manage each growers' needs and maintain a water balance throughout each canal segment without excess water flow resulting in spills. MID would have more advanced system-wide management of all check gates to ensure that accurate flows and delivery meet grower needs efficiently. During above average rainfall years, through implementation of the Project, it is estimated that approximately 22,350 AF (37 percent) of irrigation waters lost would be conserved. The estimated water savings during below average rainfall years is 2,160 AF (24 percent) of irrigation waters lost. Depending on the time of year and storm water runoff, water conserved from the Project would be: 1) better utilized within MID; 2) channeled to the Madera Ranch Water Bank lands as recharge; or 3) remain behind the Hidden or Friant Dams until needed. Water conserved would also reduce the amount of upstream releases from stored allocations behind federal dams that have historically been necessary to compensate for lost volumes during the irrigation season. This would increase the availability of water from federal contracts and MID would avoid having to release its limited resources earlier than intended.

Groundwater

MID is located in the Madera subbasin of the San Joaquin Valley Groundwater Basin, which includes the San Joaquin and Fresno Rivers. MID does not pump groundwater and the exact number and size of pumps on private property used by the growers within MID is not known at

this time. The Total Channel Control report estimates that after irrigation deliveries are terminated by MID, growers pump on average an additional 215,000 AF of well water. The estimated savings of conserved water from the Project could result in a reduction of up to 15 percent in annual pumping volume if the water conserved is used before irrigation deliveries are terminated.

3.2.2 Air Quality

The Project area is located within the San Joaquin Valley Air Basin (SJVAB), which is regulated by the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAB has reached National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for criteria pollutants of concern except for: ozone (O_3), inhalable particulate matter between 2.5 and 10 microns in diameter (PM_{10}), and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$). As a result, the emissions of most concern are O_3 (which includes precursors such as volatile organic compounds [VOC] and nitrogen oxides [NO_x]), PM_{10}, and $PM_{2.5}$. Table 2 below shows the attainment status and *de minimis* threshold for general conformity for the criteria pollutants of most concern.

Table 2. SJVAB Attainment Status and *De Minimis* Thresholds for Federal Conformity Determinations

Pollutant	Attainment Status[a]	(tons/year)
VOC (as ozone precursor)	Nonattainment[d]	10[b]
NO_x (as an ozone precursor)	Nonattainment[d]	10[b]
PM_{10}	Nonattainment (CAAQS) Attainment (NAAQS)	15[c]
$PM_{2.5}$	Nonattainment	100 15[c]

[a] Source: http://www.arb.ca.gov/desig/adm/adm.htm
[b] 40 CFR 93.153 [c] SJVAPCD Threshold
[d] The SJVAB is designated as Extreme for O_3 NAAQS:
http://www.epa.gov/airquality/ozonepollution/designations/2008standards/final/region9f.htm

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

- Minimized on-site earthwork (shoveling and stockpiling)
- On-site construction equipment and haul truck engine emissions

The telemetry consultant would arrive at each site in a work van that would run for two hours at a time. All construction work would occur within existing canals and structures, which are surrounded by irrigated agriculture. Calculated emissions from the Proposed Action were estimated using the 2013 California Emissions Estimator Model (version 2013.2.1) for reactive

organic gases (ROG)[1], NO_x, PM_{10}, and $PM_{2.5}$. Total project emissions are presented in Table 3 below.

Table 3. Estimated Project Emissions[a]		
Pollutant	**Unmitigated (tons/year)**	**Mitigated (tons/year)**
ROG/VOC	0.066	0.066
NO_x	0.58	0.58
PM_{10}	0.17	0.070
$PM_{2.5}$	0.047	0.037
Carbon dioxide equivalents	49.58	49.58

[a] Source: CalEEMod Version 2013.2.1

As shown in Table 3 above, the Proposed Action has been estimated to emit less than the *de minimis* threshold for NO_x and ROG/VOC as O_3 precursors, $PM_{2.5}$ and PM_{10}; therefore, a federal general conformity analysis report is not required. Notwithstanding this observation, the Proposed Action would comply with the SJVAPCD's Regulation VIII (SJVAPCD 2012) control measures for construction emissions of PM_{10}. One of these control measures includes the use of water with all "land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities" for fugitive dust suppression, as noted in Section 2.2.1. However, if dust suppression measures are not implemented, the estimated $PM_{2.5}$ and PM_{10} emissions from the Proposed Action would still be well below the respective SJVAPCD thresholds.

3.2.3 Special Status Biological Resources

The action area is the footprint of the installation and modification activities for the Proposed Action and a 200-foot buffer around those activities in which noise and dust could occur. The present land use around the action area consists of agricultural fields and orchards, farm roads and shoulders, and existing ditches and canal infrastructure. The action area has been heavily cultivated and managed for decades, and herbicides are routinely used to control unwanted vegetation.

The California Natural Diversity Database, a species list obtained from the FWS Sacramento Office website on September 20, 2013, and other information available to Reclamation were used to help determine if the Proposed Action would have the potential to affect federally-listed species within the action area.

The following Table 4 includes federally-listed species potentially occurring within the Berenda, Kismet, Bonita Ranch, Madera, Biola, Gregg, and Herndon quadrangles and their surrounding Gravelly Ford, Firebaugh NE, Mendota Dam, Raymond, Daulton, Raynor Creek, Le Grand, Plainsburg, and Chowchilla USGS 7.5-minute Quadrangles that encompass a 10-mile radius around the Proposed Action area. Included is a brief of each species' status, determination of effects from the Proposed Action, and summary of the rationale supporting the determinations.

[1] The term "volatile organic compounds" are synonymous with "reactive organic gases" for the purposes of this document since both terms refer to hydrocarbon compounds that contribute to ozone formation.

Table 4: Federally-Listed Species Identified as Potentially Occurring in the Madera and Immediate Surrounding USGS 7.5-minute Quadrangles

Scientific Name	Common Name	Federal Status	Effects	Potential habitat utilized by species in Proposed Action Area
INVERTEBRATES				
Lepidurus packardi	Vernal pool tadpole shrimp	E	NE	**Absent**. There are historic records of vernal pool habitat within 10 miles of the Proposed Action area, but none in the Proposed Action area itself. Vernal pool habitat and water quality of vernal pools would not be disturbed.
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	T	NE	**Absent**. There are two historic records of elderberry tree habitat five miles away from the Proposed Action area. However, there is no suitable habitat in the Proposed Action area itself, and no elderberry trees/shrubs would be disturbed.
Branchinecta lynchi	Vernal pool fairy shrimp	T	NE	**Absent.** There are historic records of vernal pool habitat within 10 miles of the Proposed Action area, but none in the Proposed Action area itself. Vernal pool habitat and water quality of vernal pools would not be disturbed.
Branchinecta conservatio	Conservancy fairy shrimp	E	NE	**Absent.** There are historic records of vernal pool habitat within 10 miles of the Proposed Action area, but none in the Proposed Action area itself. Vernal pool habitat and water quality of vernal pools would not be disturbed.
AMPHIBIANS				
Ambystoma californiense	California tiger salamander	T	NE	**Absent.** There are two historic records of vernal pool habitat within one mile of a Project site. However, one of the records declared the species in that location as extirpated. The other is 0.2 miles west of the Lateral 24.2 Head and is separated from the Project site by 200 yards of cultivated farmland, a farm equipment stock yard, and Road 26. The action area for that Project site itself does not have vernal pool habitat. Vernal pool habitat and water quality of vernal pools would not be disturbed.

Scientific Name	Common Name	Federal Status	Effects	Potential habitat utilized by species in Proposed Action Area
REPTILES				
Gambelia sila	Blunt-nosed leopard lizard	E	NE	**Absent**. There are several historic records of blunt-nosed leopard lizards within seven miles of the Proposed Action area. The closest occurrence is 1.5 miles east of the Lateral 24.2 Waste Way Spill site, but is dated back to 1916 and the land has since been converted to farmland. The rest of the records are from 1988 – 1990 and explain that a power plant was built in the late 1980s, which destroyed 200 acres of the lizard's habitat. There is no suitable habitat in the Proposed Action area itself, and no suitable habitat would be disturbed.
Thamnophis gigas	Giant garter snake	T	NE	**Absent.** There are no historic records of Giant garter snake within 10 miles of the Proposed Action area. No disturbance to aquatic habitat would occur. There is little to no suitable upland habitat for denning.
MAMMALS				
Dipodomys nitratoides exillis	Fresno kangaroo rat	E	NE	**Absent**. There are two historic records within 10 miles of the Proposed Action area. They are approximately three and nine miles away, but both are dated back to 1934, and there is no suitable habitat in the Proposed Action area itself. No suitable habitat would be disturbed.
Vulpes macrotis mutica	San Joaquin kit fox (SJKF)	E	NE	**Potential Migratory Corridor.** There are three historic records of SJKF six to seven miles away from the Proposed Action area. One of them was recorded as road kill, and the other two were last observed in 1990. Surrounding cultivated farmland presents unsuitable foraging and denning habitat, but the action area may be used as a migratory corridor.

Key:

(PE) Proposed Endangered – Proposed in the Federal Register as being in danger of extinction
(PT) Proposed Threatened – Proposed as likely to become endangered within the foreseeable future
(E) Endangered– Listed in the Federal Register as being in danger of extinction
(T) Threatened – Listed as likely to become endangered within the foreseeable future

(C) Candidate – Candidate which may become a proposed species
(NE) No Effect – Proposed Action will have no effect on the species
(NLAA) Not Likely to Adversely Affect – Proposed Action may affect the species, but is not likely to adversely affect.

Land use around the action areas consist primarily of cultivated farmlands and provide poor habitat for SJKF prey base. However, SJKF could use the action areas as migratory corridors. The closest SJKF occurrence to a Project site is a natal den that was observed in 1990, six miles southwest of the Lateral 24.2-19.5 Head. However, the majority of the Proposed Action is modular in nature with only a few sites requiring minor modification of existing structures to accept the prefabricated flume gates and frames, and the installation of a 16- x 16- x 6-inch deep concrete pad directly adjacent to a few flume meters for a pedestal and solar panel. Construction would only occur during the day (30 minutes after sunrise until 30 minutes prior to sunset) at one or two sites at a time, and be staged adjacent to each site on the canal roads. When taking into consideration that: 1. the nature of the proposed action is mostly modular with a few minor structural modifications and concrete placement; 2. SJKF are absent from the project area; and 3. if SJKF were to migrate through the project area, this would occur when no construction would be taking place, Reclamation has determined that the Proposed Action would have no effect to the federally-listed SJKF. If SJKF are encountered during construction, work will be halted and Reclamation will consult with the FWS.

Species Protected Under the Migratory Bird Treaty Act

The California Natural Diversity Database contains eight records of Swainson's hawks (*Buteo swainsoni)* occurrences within 10 miles of the action area, mostly within the riparian corridor along the Chowchilla River. The nearest occurrence is of a nest in a cottonwood tree in the Berenda Slough, three miles from a Project site. There are several large trees within 200 yards of the Lateral 24.2 Head, Lateral 24.2-17.0 Head, Franchi Dam, and Lateral 24.2-17.0-2.3 Head sites that could potentially be used for nesting. No trees would be removed as part of the Project; however, Project-related noise disturbance from construction and equipment could have indirect impacts to Swainson's hawks. Project-related noise disturbance from equipment engines could cause adults to abandon nests too early and leave any eggs or chicks vulnerable. As noted in Section 2.2.1, construction-related activities will occur outside of the nesting season to the extent possible. The Project construction timeframe is one week in March and one to two days in early April 2014 for the Lateral 24.2 flume gate site, and October 2014 through February 2015 for the following construction season.

Construction activities for the Lateral 24.2 Head site, which include concrete cutting and placement, would have to occur from March 14 up to March 28, 2014, excluding the weekend, due to the Reclamation Field Services grant time conditions for this gate. The concrete would be given two weeks to cure and then MID would install the flume gate in one to two days. Construction activities for this site would occur during the Swainson's hawk nesting season and MID will follow the avoidance and minimization measures as noted in Section 2.2.1. A pre-construction survey for Swainson's hawk was performed within a ½-mile radius from the Lateral 24.2 Head on March 5, 2014. Although nesting habitat is present in the action area, no active nesting species protected under the MBTA, including Swainson's hawk and cliff swallows, were observed in or adjacent to the project site using protocol survey methods.

MID will wait to install the ordered devices at the Lateral 24.2-17.0 Head, and Lateral 24.2-17.0-2.3 Head sites with potential Swainson's hawk nesting habitat nearby until after September 15, 2014, outside both the period Swainson's hawks are typically found in the Central Valley and the active nesting season. Although Franchi Dam has potential Swainson's hawk nesting habitat nearby as well, work activities at this site would only involve hand tools that would not cause noise disturbance, thus would not need to occur outside of the active nesting season. With construction activities at the sites of concern occurring outside of the nesting period and the absence of active nesting species protected under the MBTA at the Lateral 24.2 Head site, potential impacts to Swainson's hawk would be avoided and not reach the level of take.

3.2.4 Cultural Resources

The Proposed Action would allow the expenditure of federal funds by MID, and is the type of activity that has the potential to cause effects to historic properties pursuant to 36 CFR Part 800.3(a). MID's modern delivery system was constructed with Reclamation assistance in 1951 and 1955. Since the Project is in the process of transfer of ownership from Reclamation to MID, a field permit was granted to the Culturescape consultant to perform a non-collection survey on Reclamation lands. Culturescape identified and evaluated historic properties within the area of potential effect (APE). Historic properties were identified through a records search for recorded resources within half a mile of the proposed sites at the Southern San Joaquin Valley Information Center, California State University Bakersfield, contact with the Native American Heritage Commission and correspondence with representatives of affected tribes, a facilities survey, and review of literature pertinent to the Project area with regard to historic context of the location.

As a result of the survey no prehistoric materials were located. The historic features that were located were the sluicegates and facilities that displayed evidence of modifications and adaptations that diminished the integrity of several. Section 106 considers maintenance and modifications to include gates, valves, pumps, and other flow control devices as exempt from the evaluation process. The scope of work on these devices proposed by MID is limited and does not entail major ground disturbance and does not incorporate anything outside of the normal course of maintenance or modification to these units. As a result, Reclamation prepared a cultural resources report and consulted with the State Historic Preservation Officer (SHPO) on the assumed eligibility of the MID water delivery system and the finding of no adverse effect to historic properties pursuant to 36 CFR Part 800.5(b).

3.2.5 Cumulative Impacts

According to CEQ regulations for implementing the procedural provisions of NEPA, 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.

Air Quality

The Proposed Action has the potential to impact air quality through emissions of the criteria pollutants of most concern from ground disturbance and construction equipment. As described earlier, MID lies within the SJVAB which currently does not meet all State and Federal health-based air quality standards. As a federally funded Project, the Proposed Action must conform

with the SIP's purpose, part of which is to maintain emissions below the *de minimus* threshold for general conformity of the four remaining criteria pollutants that the SJVAB has not yet reached NAAQS and CAAQS attainment status for (refer to Table 2). Because the SJVAB encompasses seven counties in addition to Madera County, emissions from projects occurring in those counties at the same time as the Proposed Action could lead to a cumulative impact. Additional projects undergoing construction at the same time as the Proposed Action in the SJVAB include:

- Fresno County – Firebaugh Canal Water District (FCWD) 1st Lift Canal Lining Project – Phase II & Check 2 Modernization Project: FCWD is lining approximately two miles of its 1st Lift Canal with concrete from Shaw Avenue crossing to the Delta-Mendota Canal crossing. Check 2 on the 1st Lift Canal is also being relocated and replaced with an automated check structure and connected to the SCADA system at the same time, although it is a separate project. Construction is currently underway through January 2014. Emissions from this project were calculated with the 2013 CalEEMOD software and are presented in Table 5 below.

- Merced County – Henry Miller Reclamation District No. 2131 (HMRD) Island Canal System Modernization Project: HMRD plans to construct a pump bay control building, retrofit 15 existing check structures into four modern automatic flow control structures and 11 long crested weirs, and extend the height of the concrete liner by five inches on both sides of the Island "C" Canal from the head of the canal for a distance of approximately 1,100 feet to the head of Island "D" Canal. Construction is expected to begin January 2014 up until water deliveries resume in February, and continue from November 2014 through January 2015.

  After the Island Canal System Modernization Project is complete, HMRD plans to construct a regulating reservoir that would enhance the Island Canal system. A 19 acre regulating reservoir would be constructed with two sluice gates for gravity operation to serve as a buffer for the daily operational spill from the Island Canal system by collecting water from the drip systems shut off and saving approximately 1,900 AF that would otherwise be lost to Salt Slough and the San Joaquin River. The reservoir would also have two inlet and outlet pumps with respective discharge pipes and flow meters integrated to the SCADA system. HMRD is currently negotiating with landowners over the particular farmland that the reservoir would be located at. The design of the reservoir is site specific and has been proposed but not finalized, although work is anticipated to begin in 2015.

- Stanislaus, Merced, and Fresno Counties – Central California Irrigation District (CCID) East Ditch and Poso Canal Reservoirs Project: CCID plans to construct two separate regulating reservoirs complete with inlet and outlet pump stations with piped discharges and SCADA integrated controls. The East Ditch Reservoir is expected to occupy no more than 37.5 acres. The Poso Canal Reservoir is expected to occupy approximately 48 acres. Diversion facilities would be constructed at each reservoir as well. Construction is expected to start as soon as permitted and most likely occur during the winter when agricultural activities have ceased and irrigation canals are dry. Construction activities

would take approximately 12 months to complete. Emissions from this project were calculated with the 2013 CalEEMOD software and are presented in Table 5 below.

Table 5. Estimated Cumulative Project Emissions[a]					
Pollutant	**MID tons/year**	**FCWD tons/year**	**HMRD tons/year**	**CCID tons/year**	**Total tons/year**
ROG/VOC	0.066	0.07	0.10	0.80	1.04
NO_x	0.58	0.64	0.77	9.40	11.39
PM_{10}	0.070	2.06	2.62	4.80	9.55
$PM_{2.5}$	0.037	0.23	0.29	1.20	1.76
Carbon dioxide equivalents	44.98 metric tons/year	70.18 mt/year	93.80 mt/year	887.90 mt/year	1096.86 mt/year

[a] Source: CalEEMod Version 2013.2.1

As show in Table 5, the FCWD, HMRD, and CCID projects have been estimated to individually emit less than the *de minimus* thresholds for NO_x and ROG/VOC as O_3 precursors, $PM_{2.5}$, and PM_{10}. In combination with MID's Project emissions, the total for these criteria pollutants are still below the *de minimus* thresholds, with the exception of NO_x. Cumulatively, there would be an additional 11.39 tons/year of NO_x emissions added to the SJVAB. The baseline emissions trend for NO_x in the SJVAB is 144,832 tons/year; therefore, the additional NO_x emissions from the conservation projects are discountable (Ramalingam 2004).

Greenhouse gas impacts are considered to be cumulative impacts since any increase in greenhouse gas emissions would add to the existing inventory of gases that could contribute to climate change. The estimated greenhouse gas emission due to temporary Project construction activities is 49.58 tons of carbon dioxide equivalents. There are no on-going operational emissions from the Project.

Surface Water Resources

The Proposed Action has the potential to impact surface water availability in the Fresno and San Joaquin Rivers due to additional water conservation projects on connected waterways (see Figure 1).

MID water is distributed from Friant Dam via the Madera Canal (San Joaquin River and pre-1914 water) and Hidden Dam via the Fresno River. MID drain water either flows through to the Madera Ranch Water Bank lands, is diverted to natural channels that lead back to the Fresno River and San Joaquin River, or is captured and sold to neighboring irrigation districts. Returns to the Fresno River run through MID until its confluence with the San Joaquin River west of the District. Returns to the San Joaquin River flow along MID's southern boundary near the Fresno Irrigation District and towards Gravelly Ford Water District, then meanders northwest along the San Joaquin River Exchange Contractors (CCID, Columbia Canal Company, FCWD, and HMRD) service area.

The San Joaquin River Exchange Contractors historically diverted water from the San Joaquin River to 240,000 acres of irrigated land in the San Joaquin Valley. In 1939, they entered into contracts with Reclamation to exchange their river water for Central Valley Project water

delivered from the Delta-Mendota Canal and/or other works or sources of supply (called substitute water). Water for the Delta-Mendota Canal is diverted from the Delta at the federal C.W. "Bill" Jones Pumping Plant. The Exchange Contractors divert water from the Delta-Mendota Canal and the Mendota Pool, and from the San Joaquin River downstream of the Mendota Pool.

Water conservation projects either currently undergoing construction or proposed to occur in CCID, FCWD, and HMRD in combination with the Proposed Action could lead to cumulative impacts. Water delivered through FCWD's 1st Lift Canal is diverted from the Mendota Pool, to which the San Joaquin River feeds, through Fresno Slough and drains further north back into wetland channels that meander through agricultural operations, including HMRD, and wildlife areas north to the San Joaquin River. The canal lining and check modernization projects on this canal would conserve approximately 278 afy and reduce water diversions from Mendota Pool by that amount. The 278 afy conserved in the Mendota Pool could remain part of the San Joaquin River system and be used by a different Exchange Contractor or offset some of the water that would not return to the San Joaquin River due to the water conserved by HMRD or CCID's projects.

CCID diverts its water from the Delta-Mendota Canal through the Main Canal, Outside Canal, Helm Ditch and other facilities. CCID drain water flows through various channels in agricultural areas and wildlife areas back to the San Joaquin River. The East Ditch and Poso Canal Reservoirs Project is expected to conserve an estimated 12,000 afy of operational spill and drain water that would otherwise have been returned to channels that meander through agricultural operations and wildlife areas to the San Joaquin River.

HMRD receives its water from the Delta-Mendota Canal via the San Joaquin River where it is diverted to the Arroyo Canal and Delta Canal at Sack Dam. Water that is lost to use by HMRD also drains to Salt Slough and back to the San Joaquin River and wildlife refuges. The Island Canal System Modernization Project would conserve 1,700 afy, and the proposed regulating reservoir project is anticipated to conserve approximately 1,900 AF.

The Proposed Action would conserve 22,350 AF during above average rainfall years and 2,160 AF during below average rainfall years, which would further reduce returns to the Fresno and San Joaquin Rivers by those amounts. The total amount of water conserved by CCID, FCWD, HMRD, and MID's conservation projects would equal either approximately 38,200 AF or 18,000 AF depending on the rainfall season. The return flow from these water districts through various channels leading to the Fresno and San Joaquin Rivers, or to the Madera Ranch Water Bank lands could be reduced consequently. Although spill and drain water from the corresponding water districts would be reduced and could no longer return to relative water systems, water conserved from the associated projects would provide additional allocations stored behind federal dams for other users and remain part of the Fresno and San Joaquin River systems.

Groundwater Resources

The Proposed Action has the potential to impact groundwater supplies in the Madera subbasin within the San Joaquin Valley Groundwater Basin. Ninety percent of Reclamation and private agricultural wells within MID fall within the depth range of 100 to 225 feet depending on

geographic location. The historical trend of the groundwater table shows it is dropping three feet per year. The directions of groundwater flow vary on a local basis as a result of intense agricultural, municipal, and industrial groundwater pumping that also have caused overdraft in a variety of locations throughout the San Joaquin Valley Groundwater Basin.

Groundwater recharge in the Madera subbasin occurs from river and stream seepage, deep percolation of irrigation water, canal seepage, and intentional recharge (California Department of Water Resources 2004). In 2012, MID's distribution system lost approximately 36,400 AF due to seepage[2]. Improved water management by the Project would reduce MID's contribution to canal, river, and stream seepage from MID's distribution system, thus MID's contribution to groundwater recharge would be reduced.

Agricultural operations throughout the San Joaquin Valley Groundwater Basin with a history of over pumping for agricultural uses are drawing groundwater into the depression from the west, which has salinity content not conducive for irrigation waters. In addition, overuse of the aquifer has caused degradation of groundwater levels upstream of MID. MID is currently implementing a water storage program as a participant with a consortium of members in the Madera Ranch Water Bank lands project. The Madera Ranch Water Bank lands project is a current adaptation strategy to provide available surface waters in the Madera subbasin for use in recharging unconfined aquifers. The Proposed Action would create a surplus of water supply and an allocation for deposit by MID in the Madera Ranch Water Bank, which could reduce the risk of overdraft in the San Joaquin Valley Groundwater Basin.

Section 4 Consultation and Coordination

4.1 Agencies and Groups Consulted

Reclamation consulted and coordinated with the following agencies and groups in preparation of the EA:

- MID
- DFW
- FWS
- California State Parks, Office of Historic Preservation
- Culturescape
- Native American Heritage Commission

4.2 Endangered Species Act (16 USC § 1531 et seq.)

Section 7 of the Endangered Species Act requires Federal agencies, in consultation with the Secretary of the Interior, to ensure that their actions do not jeopardize the continued existence of

[2] Seepage is estimated at approximately 33% of flow.

endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species.

Reclamation determined that there would be no effect on the federally-listed SJKF, thus neither formal nor informal consultation with the FWS ensued. A no effect memorandum was filed at the Reclamation Mid-Pacific Office on January 13, 2014.

4.3 National Historic Preservation Act (16 USC § 470 et seq.)

The National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.) is the primary Federal legislation that outlines the Federal Government's responsibility to cultural resources. Section 106 of the National Historic Preservation Act requires the Federal Government to take into consideration the effects of an undertaking on cultural resources listed on or eligible for inclusion in the National Register of Historic Places, and to give the Advisory Council on Historic Preservation an opportunity to comment on the effects.

As noted in Section 3.2.4, Culturescape corresponded with the Native American Heritage Commission on October 10, 2013 on a list of tribal representatives of listed tribal locations of significance. No Native American traditional cultural places or properties were identified by the Sacred Lands File search.

Reclamation consulted with the SHPO on the finding of no adverse effect to historic properties on February 12, 2014. Pursuant to 36 CFR §800.3(c)(4), if SHPO fails to respond to a receipt of a request for review of a finding or determination within 30 days of receipt of the submission, the agency may move forward to their next step in consultations. A response from SHPO has yet to be received.

Section 5 References

California Emissions Estimator Model (CalEEMOD). 2013. Windows Version 2013.2.1. October 28, 2013.

California Department of Water Resources. 2004. California's Ground Water. Bulletin 118. Individual Basin Descriptions.

Giglio-Willoughby, Deborah. 2014. Email communication between D. Giglio-Willoughby, Special Assistant for Renewable Energy and Migratory Birds, FWS, and Alexandra Aviles, Natural Resources Specialist, Reclamation. February 18.

Greci, T. 2013. Irrigation Water Conservation, Telemetry and Delivery System Management Improvement Project. Madera Irrigation District Application for U.S. Bureau of Reclamation 2013 Water and Energy Efficiency Grant – Funding Group 1.

Nolan, Dina. 2013. Draft Water Management Plan (5-Year Update 2012). Madera Irrigation District.

SJVAPCD. 2012. Rules and Regulations. Regulation VIII. Rule 8021. Website: http://www.valleyair.org/rules/currntrules/r8021.pdf. Accessed: July 24, 2013.

Swainson's Hawk Technical Advisory Committee. 2000. Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley. Website: http://www.dfg.ca.gov/wildlife/nongame/docs/swain_proto.pdf. Accessed: February 14, 2014.

Appendix A: ITA Concurrence

Aviles, Alexandra <aaviles@usbr.gov>

ITA Request - Madera Irrigation District

RIVERA, PATRICIA <privera@usbr.gov> Fri, Oct 25, 2013 at 6:47 AM
To: "Aviles, Alexandra" <aaviles@usbr.gov>
Cc: Mary Williams <marywilliams@usbr.gov>, Kristi Seabrook <kseabrook@usbr.gov>

Alex,

I reviewed the proposed action to award the Madera Irrigation District (MID) with a WaterSMART Program: Water and Energy Efficiency grant to replace numerous manual control gates within MID's extensive canal system with automated flume gates and flow meters, and integrate remote sensing capability with additional Supervisory Control and Data Acquisitions (SCADA) system connection in order to provide system-wide management and monitoring for flow control. A SCADA system master station would be set up at the MID's main office to communicate to the District's radio devices. Telemetry devices would be installed at each remote location to communicate with the SCADA master station. Solar panels would be installed at each new telemetry site as well to power the radio boxes, requiring a 16" x 16" concrete pad to be poured immediately adjacent to the meter or gate.

The MID would replace seven current manually-operated check gates with automated slip meters. The majority of the new installations can be retrofitted within existing gates and concrete abutments without any significant modification. The MID also proposes to retrofit seven additional check gates with automated flume meters.

A total of five manually-operated check structures would be retrofitted with new automated flume gates, three of which were purchased by MID with a previous grant. Two of those sites (Main I Head and Main II at Bishel Weir) involve the removal of an existing radio gate from the concrete structure and placement of a flume gate.

The majority of all construction would be modular and remain within existing concrete structures, canal roads, and dewatered irrigation canals.

The proposed action does not have a potential to impact Indian Trust Assets.

Patricia Rivera
Native American Affairs Program Manager
US Bureau of Reclamation
Mid-Pacific Region
2800 Sacramento, California 95825
(916) 978-5194
[Quoted text hidden]