

APPENDIX A

MENDOTA POOL GROUP MEMBERSHIP

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Mendota Pool Group Membership

The Mendota Pool group is an unincorporated association of farmers, consisting of the following members:

Baker Farming Co.

Blackburn Farming Co., Inc.

Britz Mendota, TIC.

Coelho West Farms

Conejo Farms

Fordel, Inc.

Hansen Farms

H.G.H. Farms

Meyers Farming I

Terra Linda Farms I

JC&S Land Co.

APPENDIX B
MONITORING PROGRAM

Table of Contents

	Page
B.1 INTRODUCTION	B-1
B.2 PUMPAGE	B-3
B.3 GROUNDWATER LEVELS	B-4
B.4 GROUNDWATER QUALITY	B-4
B.4.1 MONITORING OF MPG PRODUCTION WELLS	B-5
B.4.2 MONITORING OF NON-MPG WELLS	B-5
B.5 SURFACE WATER FLOW DIRECTION	B-6
B.6 SURFACE WATER QUALITY	B-7
B.7 SEDIMENT QUALITY	B-7
B.8 COMPACTION	B-8
B.9 REPORTING	B-8

Tables:

Table B-1 Summary of Monitoring Program

Table B-2 Construction Data For Wells Used for Groundwater Level and Quality Monitoring

Table B-3 Groundwater Level Monitoring Network

Table B-4 Groundwater Quality Monitoring Network

Table B-5 Analytical Methods and Detection Limits for Water Quality Analyses

Table B-6 Surface Water Quality Monitoring Network

Table B-7 Sediment Quality Monitoring Network

Table B-8 Analytical Methods and Detection Limits for Sediment Quality Analyses

Figures:

Figure B-1. Groundwater Level Monitoring Network

Figure B-2. Groundwater Quality Monitoring Network

Figure B-3. Surface Water Sampling Locations

Figure B-4. Sediment Sampling Locations

Attachment 1. Sample Collection and Quality Control Procedures for Water and Sediment Samples

B.1 INTRODUCTION

The monitoring program for the 10-year proposed project will be an expanded version of the Mendota Pool Group (MPG) monitoring program developed in 1999 by Luhdorff and Scalmanini, Consulting Engineers (LSCE), consultants to the MPG, and Kenneth D. Schmidt and Associates (KDSA), consultants to the San Joaquin River Exchange Contractors Water Authority (SJREC) and Newhall Land and Farming Co. (NLF). This program was designed to monitor the potential long-term effects of MPG transfer pumping on groundwater levels, groundwater quality, flow direction, and surface water quality in the Mendota Pool, and land subsidence in the Mendota area. Details of the 1999 monitoring program were provided in the Phase I report (KDSA and LSCE 2000a).

Since 1999, the monitoring program has been expanded each year. Details of the 2000 monitoring program were provided in the Phase II report (KDSA and LSCE 2000b) and the 2000 Annual Report (LSCE and KDSA 2001). Details of the 2001 monitoring program were provided in the EA for the 2001 pumping program (Reclamation 2001) and the 2001 Annual Report (LSCE and KDSA 2002). The 2002 monitoring program is summarized in the EA for the 2002 pumping program (Reclamation 2002). The program for the 10-year proposed project (Table B-1) will generally be similar to the 2002 monitoring program.

Changes to the monitoring program since 1999 include an increased number of wells used for groundwater level and quality monitoring. Additional groundwater quality sampling events were added in some years to investigate seasonal fluctuations of groundwater quality and variations among analytical laboratories. Analyses were performed for additional trace metals such as arsenic and molybdenum, and lower detection limits were used for selenium analyses. The surface water sampling program has also been expanded with additional sample locations, sampling events, and the installation of a continuous electrical conductivity (EC) recorder in the Mendota Wildlife Area (MWA) at the request of the California Department of Fish and Game (CDFG). Also at the request of CDFG, the MPG added sediment quality sampling to the program in 2001. Finally, in response to comments received on environmental documents prepared to obtain exchange agreements between Reclamation and the MPG, the study area was enlarged in 2001 to encompass at least a 6-mile radius from the approximate center of the MPG wells in Farmers Water District (FWD). For the portion of the expanded study area east of the Chowchilla Bypass, only water level monitoring is being conducted at this time. The MWA is included only for evaluation of potential surface water quality impacts.

The monitoring program requires the participation of many entities, in addition to the MPG. Thus, although the MPG collects and compiles a large amount of the necessary data, it must rely on the cooperation of all participants in order to fully accomplish the program objectives. Recognizing that there are different participants in the program, four levels of participation have been defined to characterize the roles and responsibilities of the various entities:

Level I – This level is comprised of the MPG members and encompasses the monitoring activities where the MPG has control over (1) the environmental components monitored, (2) the data quality objectives, and (3) the monitoring

frequency. This includes groundwater level and quality monitoring in wells owned by the MPG and the collection of surface water and sediment samples. The monitoring of the USGS monitoring wells west of the Mendota Airport and the Fordel extensometer are also considered Level I activities because these are located on property owned by one of the MPG members. Level I activities do not include monitoring conducted by the Meyers Farm Water Bank or pumpage data collected by the San Luis and Delta-Mendota Water Authority (SLDMWA). Monitoring efforts of the Level I participants are coordinated through the MPG agent and consultants to the MPG.

Level II – This level consists of the SJREC and NLF, which are the signatories of the Settlement Agreement along with the MPG. These entities participate in the monitoring program under the terms of the Agreement. The SJREC consists of four entities: Central California Irrigation District (CCID), Columbia Canal Company (CCC), Firebaugh Canal Water District (FCWD), and San Luis Canal Company (SLCC). These entities are responsible for collection and analysis of groundwater quality samples from wells in their respective service areas and surface water quality samples from their canal intakes. The SJREC maintains continuous recorders to monitor EC at its canal intakes, and CCID monitors compaction and water levels at the Yearout Ranch extensometer. The SJREC and NLF also provide monthly pumpage data for their wells. These entities also grant the MPG access to specific wells, primarily for water level monitoring purposes. The data quality objectives and monitoring frequency can be coordinated between the MPG and these entities. However, the MPG does not have any control over the implementation of this monitoring effort. SJREC and NLF participate in the preparation of the annual monitoring reports.

Level III – This level of participation applies to the various public agencies, including the SLDMWA, Reclamation, the City of Mendota, the U.S. Geological Survey (USGS), and the Department of Water Resources (DWR), that conduct monitoring programs as part of their regular duties. Fresno County provides data for monitoring wells at the Mendota disposal site, and the Regional Water Quality Control Board (RWQCB) provides water quality data for the Spreckels Sugar Co. wells. These agencies generally provide data to the MPG upon request. The data collected, data quality objectives, and monitoring frequencies are set by the respective agencies relative to their requirements. The MPG has no control over monitoring conducted by these agencies.

Level IV – This level includes all other entities in the area not included in the preceding three levels. This includes water districts such as Westlands Water District (WWD), James Irrigation District, Tranquillity Irrigation District, and Aliso Water District, and corporations such as Spreckels Sugar Co., AES Mendota (formerly Mendota Biomass), and Locke Ranch. Participation by these entities in the MPG monitoring program is strictly voluntary. The MPG regularly requests data from these entities with varying success. In certain cases, the MPG has been granted access to non-MPG properties to monitor water levels or to collect water quality samples from specific wells. When samples are collected by the MPG, the MPG

would specify the data to be collected and the data quality objectives. The monitoring frequency at these properties depends in part on when access is granted. Otherwise, the MPG has no control over the data collected, data quality objectives, or monitoring frequencies.

The elements of the monitoring program for the proposed project are summarized on Table B-1 and described in the following sections. The monitoring program will be reevaluated annually and modified if conditions change or transfer pumping impacts are different than expected.

Construction data for all wells in the groundwater level or quality monitoring networks are provided on Table B-2. Also indicated on this table is the type of data collected from each well, i.e., water levels and/or water quality, and the participation level of the well owner. This table does not include wells for which only pumpage data are obtained.

B.2 PUMPAGE

Pumpage from the MPG wells along the Fresno Slough branch of the Mendota Pool is metered at the introduction points where water from the wells enters the Pool. The majority of these wells are metered individually, but a number of shallow wells are manifolded together and metered in clusters. The SLDMWA reads the meters on a weekly basis during the irrigation season. Wells in FWD are metered individually, and pumpage is monitored on a monthly frequency by FWD. The MPG maintains records to determine whether the water is pumped for transfer or adjacent use.

Level II participants (the SJREC and NLF) provide monthly data for wells within their service areas. Only CCID and CCC provide metered pumpage data; FCWD and SLCC do not operate wells within the study area. The NLF wells south of Avenue 4 are metered, and pumpage for other wells is estimated based on monthly power records in conjunction with pump efficiency estimates from pump tests.

The City of Mendota is the only Level III entity that operates water supply wells within the study area. It has provided meter readings for its wells since 1999.

Since the beginning of the monitoring program in 1999, participation by Level IV entities in the study area has been sporadic. Spreckels Sugar Co. provided the combined monthly pumpage for its production wells in 1999 and 2000 but did not provide 2001 pumpage data. Spreckels has indicated that it will provide 2002 pumpage data. Locke Ranch provided an estimate of its annual pumpage in 1999 and 2000 but has not provided data for 2001 or 2002. Pumpage data for the Mendota Biomass well was not provided for 1999-2001, but Mendota Biomass (now AES Mendota) provided 2002 power use records for its production well. The MPG will continue to encourage participation in the monitoring program by these entities, including requesting pumpage data in future years. If the pumpage data are not provided, it will be estimated based on data from previous years.

A large portion of Aliso Water District in Madera County was added to the study area in 2001, but only one grower provided 2001 power use records for his wells. Pumpage for wells for which no data were provided was estimated based on typical crop water demands

and the crop acreage shown on the 2001 Madera County land use map produced by DWR. The MPG will continue to request pumpage data from Aliso WD but will have to rely on estimates if the data are not provided. The area south of Aliso WD in Fresno County is undistricted, and pumpage data have not been requested in this area. This pumpage has been estimated based on typical crop water demands and the crop acreage shown on the 2000 Fresno County land use map produced by DWR. Pumpage estimates for the eastern portion of the study area are discussed in the 2001 Annual Report (LSCE & KDSA 2002). Pumpage from private domestic wells is disregarded because it is considered negligible relative to the magnitude of irrigation pumpage in the area.

B.3 GROUNDWATER LEVELS

Water level measurements will be made in a network of wells in the Mendota area in order to estimate the water level impacts caused by MPG transfer pumping. The wells in the monitoring network include both "shallow" (completed to a depth of 130 feet or less) and "deep" (completed below the A-clay but above the Corcoran Clay, i.e., between 200 to 450 foot depth) water supply wells, and shallow and deep monitoring wells. Some wells monitored by Reclamation in the eastern portion of the study area are composite wells (completed both above and below the Corcoran Clay). USGS monitoring well 31J6 is completed in the lower aquifer below the Corcoran Clay, west of the Fresno Slough. The wells in the water level monitoring network are listed on Table B-3, along with the entity responsible for monitoring each well and the planned monitoring frequency. The well locations are shown on Figure B-1.

Most of the wells included in the water level monitoring network are owned, operated, and/or monitored by entities that are signatories of the Settlement Agreement. The 2003 water level monitoring network includes 116 wells. Seventy-three wells are measured on a bimonthly frequency by the MPG, including seven wells east of the Chowchilla Bypass (Figure B-1).

WWD monitors four USGS monitoring wells in the southwestern corner of the study area and has informed the MPG that the monitoring frequency will be reduced from monthly measurements in 2002 to semi-annual measurements in 2003. It is anticipated that the Meyers Farm Water Bank will continue to provide monthly water level data from its nine shallow monitoring wells located east of Fresno Slough. An additional 29 wells east of the Chowchilla Bypass are measured semi-annually by Reclamation (typically January and September), but many of these wells are either composite wells or wells of unknown depth.

In addition to the collection of manual measurements, three continuous water level recorders are in operation and will be maintained throughout the 10-year program. The MPG operates continuous recorders in USGS monitoring well 31J3 (near the Fordel extensometer) and FWD well R-5 (an unused production well near the San Joaquin River). The third continuous recorder is installed in the Yearout Ranch extensometer and is operated by CCID.

B.4 GROUNDWATER QUALITY

The purpose of this component of the monitoring program is to evaluate changes in groundwater quality and to forecast potential surface water quality impacts. The

groundwater quality data are used in models for prediction of total dissolved solids (TDS) and boron concentrations in the Mendota Pool, as discussed in Appendix D. There are 170 wells in the current groundwater quality monitoring network; these are listed on Table B-4 and plotted on Figure B-2. The groundwater quality monitoring program may be modified annually based on the data gathered from the previous sampling year, review of the historical record, and water quality trend analyses.

B.4.1 MONITORING OF MPG PRODUCTION WELLS

The MPG will collect water quality samples on an annual basis from all MPG production wells that are in operation during the proposed 10-year project. Currently, 66 wells are scheduled to be pumped; and if possible, samples will also be collected from five wells that are not scheduled to be pumped (Fordel M-1, SC-6, CGH-6A and 6B, and FWD R-11) for a total of 71 MPG wells (Table B-4). Every year, a complete analysis will be conducted on samples from 21 of these wells. Samples from the remaining 50 wells will be analyzed for EC and TDS on an annual basis and a complete analysis will be conducted every other year, as indicated on Table B-4. The complete analysis will include EC and TDS, general minerals (calcium, magnesium, sodium, potassium, boron, copper, iron, manganese, zinc, sulfate, chloride, bicarbonate, alkalinity, nitrate, and fluoride), pH, sodium adsorption ration (SAR), and additional trace elements (arsenic, molybdenum, and selenium).

The 21 MPG wells for which a complete sample analysis will be conducted annually are wells where additional data are required to evaluate water quality changes. This includes eight shallow wells which are considered to be impacted by wastewater (Fordel M-2, M-3, and M-4; Terra Linda TL-4C and TL-17; and Coelho West CW-3, CW-4, and CW-5) and three deep wells where the potential for future wastewater impacts is high (FWD wells R-1, R-3, and R-11). The Coelho West and FWD wells near the Spreckels Sugar Co. property will also be analyzed for barium, which is a common constituent in certain types of wastewater from the Spreckels' factory. Other MPG wells for which complete water quality analyses will be performed on an annual basis are Fordel M-1 and M-6, TL-10A and TL-14, CGH-6A and CGH-6B, FS-5 and FS-10, and CW-1 and CW-2.

The annual and biennial sampling schedules will provide sufficient data to regularly compare predicted and measured values and will ensure that data-supported modifications to the pumping program can be made throughout the project. The sampling will be conducted during the summer and fall when the wells are pumping. The analytical methods and required detection limits are listed in Table B-5. The selenium and molybdenum analyses will be conducted using methods able to achieve detection limits of at least 0.4 µg/l for selenium and 1 µg/l for molybdenum. Sample collection and quality control procedures are summarized in Attachment 1.

B.4.2 MONITORING OF NON-MPG WELLS

The groundwater quality monitoring network consists of 99 non-MPG wells, including 37 wells in the SJREC and NLF service areas. CCID samples its wells annually for general minerals and boron. CCC samples wells in its service area annually for EC and TDS and biennially for irrigation suitability (general minerals plus SAR). NLF samples nine of its

production wells annually for irrigation suitability and selenium. Other NLF production wells are not sampled on a regular schedule. Data from these wells will be obtained and evaluated as available. Five NLF monitoring wells will be sampled annually for irrigation suitability and selenium.

The City of Mendota monitors water quality in three of its water supply wells west of the Fresno Slough and in its three new wells on the B&B Ranch. Complete analyses (excluding molybdenum) have been conducted at least once a year, and more frequent sampling has been conducted in the active water supply wells. Only annual general mineral and inorganic data from the City's wells will be used in the MPG monitoring program.

Spreckels Sugar Co. samples its 32 monitoring wells and eight of its production wells semi-annually. The samples are analyzed for general minerals and trace elements (including boron and barium). Only a portion of the Spreckels Sugar Co. water quality data have been provided to the MPG, but the MPG has obtained other data from the RWQCB Central Valley Region. The MPG expects that future data will be available either from Spreckels Sugar Co. or the RWQCB.

The MPG will collect annual samples for complete analysis from seven monitoring wells located on MPG properties west of the Fresno Slough. These are USGS wells 31J4 and 31J5 and Meyers Farming wells S-1, S-2, S-3, P-1, and P-4. The Meyers Farm Water Bank has installed nine monitoring wells (MF-1 through MF-9) east of the Slough, which are scheduled to be sampled semi-annually. Although the Meyers Farm monitoring program is separate from the MPG program, it is expected that annual data will be provided to the MPG upon request.

B.5 SURFACE WATER FLOW DIRECTION

The purpose of the determination of surface water flow direction is to ensure compliance with the terms of the Settlement Agreement that MPG pumping will not occur when flow in the Fresno Slough branch of the Pool is to the north. The SLDMWA monitors flow in the Pool on a daily basis, including stage measurements at Mendota Dam, and has agreed to notify the MPG if a north flow event is expected to occur. As in previous years, the MPG will use daily records of inflows to and outflows from the Pool provided by the SLDMWA to calculate a detailed water budget for the portion of the Fresno Slough south of the Firebaugh Intake Canal. This analysis will be conducted at the end of each year. Included in the records obtained from SLDMWA are MPG pumping into the slough, Kings River (James Bypass) inflows, and inflows from and diversions to the MWA, James and Tranquillity Irrigation Districts, Fresno Slough Water District, and WWD via Laterals 6 and 7 south of the MWA. Evaporation, seepage, and change in storage will be estimated as for previous years. The water budget calculations, including the amount of inflow to the MWA from the Delta-Mendota Canal (DMC), are used in the surface water mixing models to forecast water quality in the Mendota Pool.

B.6 SURFACE WATER QUALITY

The purpose of the surface water quality monitoring is to allow the MPG to detect any potential exceedances of water quality objectives and adjust the pumping program accordingly, and to ensure compliance with the water quality objectives at key locations in the Pool. The MPG currently conducts surface water sampling at 13 stations in the Mendota Pool, the DMC, or in canals that divert water from the Pool (Figure B-3). During periods when transfer pumping is occurring, a monthly sampling schedule is maintained by the MPG at the DMC terminus in the northern portion of the Fresno Slough and at three locations in the southern portion of the Slough: the MWA, the James ID Booster Plant, and the Lateral 6 & 7 intake (Table B-6). At the remaining nine sampling stations, the MPG will collect two samples per year, typically in June and October. The MPG also operates a continuous EC recorder at the MWA bridge located one mile south of Whites Bridge.

The surface water grab samples collected by the MPG will be analyzed for irrigation suitability. The semi-annual surface water samples are also analyzed for arsenic, molybdenum, and selenium. The laboratories, analytical methods, and required detection limits used to analyze these samples are listed in Table B-5. The sample collection and quality control procedures for the surface water quality monitoring program are summarized in Attachment 1.

Reclamation has been monitoring EC in the DMC at Bass Avenue (Check 21) since 1993 using a continuous recorder. As part of the DMC Water Quality Monitoring Program, Reclamation has also analyzed daily composite samples from the DMC and the CCID Main Canal at Bass Avenue for boron and selenium since July 2002. Monthly grab samples are also collected from these locations by Reclamation and analyzed for EC, pH, turbidity, and selenium but only the selenium data have been provided to the MPG. The SJREC operates continuous EC recorders at its five canal intakes (Columbia Canal, CCID Main Canal, CCID Outside Canal, Firebaugh Intake Canal, and SLCC Arroyo Canal); the data from the Arroyo Canal are not utilized in this monitoring program. The SJREC has indicated that monthly grab samples will continue to be collected at the canal intakes. These samples will be analyzed for EC, boron, and selenium. In the southern portion of the Fresno Slough, continuous EC monitoring has been conducted by James ID at its booster plant on the James Bypass since June 2001.

B.7 SEDIMENT QUALITY

A sediment quality monitoring program was initiated in 2001 at the request of CDFG. Its objectives are to provide baseline characterization of metal concentrations in Pool sediments and to allow identification of temporal and spatial trends in sediment quality. Sediment samples were collected in August and October 2001 and in October 2002. The sampling program will continue on an annual schedule during the proposed 10-year project (Table B-7).

Sediment samples are collected in triplicate from eight stations in or near the Pool: the Columbia Canal intake, Mendota Dam, the DMC terminus, the Firebaugh Intake Canal intake, the Etchegoinberry introduction point, the MWA approximately one-quarter mile

south of Whites Bridge, the James ID Booster Plant, and Lateral 6 (Figure B-4). The samples are analyzed for arsenic, boron, molybdenum, and selenium, along with grain size (percent sand, silt, and clay), cation exchange capacity (CEC), EC, total organic carbon (TOC), and pH. The latter four parameters are used to evaluate the ability of sediment to bind metals. The analytical methods and required detection limits for the sediment quality analyses are listed in Table B-8. The sample collection and quality control procedures for the sediment sampling program are summarized in Attachment 1.

B.8 COMPACTION

Continuous compaction data are collected from two extensometers in the Mendota area to evaluate compliance with the subsidence criterion specified in the Settlement Agreement. The MPG installed the Fordel extensometer west of the Fresno Slough in 1999 and will continue to monitor it throughout the proposed project. The Yearout Ranch extensometer, located east of the Slough, was installed by DWR in 1965 and has been operated by CCID since 1999. Both extensometers monitor compaction above the Corcoran Clay, which was encountered at depths of 418 and 428 feet at Fordel and Yearout Ranch, respectively. The extensometers measure total compaction, which is the sum of the elastic and inelastic compaction. Inelastic compaction is generally irreversible and results in land surface subsidence. The inelastic compaction is calculated at the end of each year by subtracting the total compaction measured during the winter after groundwater levels have recovered from that measured during the previous winter.

B.9 REPORTING

The data collected for this monitoring program will be evaluated as received so that the MPG pumping program can be modified if unexpected impacts occur. The data will be fully analyzed at the end of each irrigation season to estimate the impacts caused by MPG transfer pumping. The data and analyses will be summarized in an annual report prepared by LSCE and KDSA at the end of each year. Future reports will be similar to the 2000 and 2001 annual reports (LSCE and KDSA 2001 and 2002). Major items to be included in the annual reports are listed below:

- The current monitoring program will be summarized, including tables and maps similar to those prepared for this appendix.
- Monthly MPG and non-MPG pumpage within the study area will be tabulated and compared with previous years.
- Depth-to-water measurements for each well in the bimonthly groundwater level monitoring program will be plotted on hydrographs. Contour maps of groundwater elevations in the shallow and deep zones will be prepared for both pumping and non-pumping periods. Drawdown during the irrigation season and recovery at the end of the season will be calculated. The groundwater flow model will be used to estimate how much of the drawdown at each well was caused by MPG transfer pumping.

- Groundwater quality data for all wells will be tabulated. Groundwater quality contour maps prepared for previous reports will be updated if significant changes have occurred. The data will be evaluated to estimate any impacts caused by MPG transfer pumping.
- A daily water budget will be prepared to determine the flow direction and rate in the Fresno Slough branch of the Pool. Surface water grab sample results will be tabulated. Daily data from continuous EC recorders will be summarized on tables and plots.
- Compaction measured at the Fordel and Yearout Ranch extensometers will be plotted along with the continuous water level data. Elastic and inelastic compaction will be calculated for both locations. The groundwater flow model will be used to estimate how much of the inelastic compaction may have been caused by MPG transfer pumping.

The annual reports will be provided to the signatories to the Settlement Agreement and to Reclamation for their review.

Table B-1. Summary of Monitoring Program

Item	Description	Number	Frequency
Pumpage	MPG meter readings (Fresno Slough wells) ¹	All	Weekly
	MPG meter readings (FWD wells) ¹	All	Monthly
	SJREC (CCID and CCC) and NLF	All	Monthly
	Pumpage by others (measured or estimated)	As available	
Groundwater Levels	Wells monitored by MPG	71	Bi-monthly ²
	Wells monitored by others	43	Varies ³
Groundwater Quality	Wells monitored by MPG	78	Annual
	Wells monitored by others	92	Annual
Surface Water Flow	Inflow and outflow measurements ¹	All	Daily
	Stage measurements ¹	1	Daily
Surface Water Quality	MPG grab sample locations	13	Varies ⁴
	MPG EC logger (at MWA)	1	Continuous
	SJREC grab sample locations	4	Monthly
	SJREC EC loggers at canal intakes	4	Continuous
	Reclamation's grab sample locations	3	Monthly
	Reclamation's automated sampling locations	3	Continuous
Sediment Quality	MPG sample locations	8	Annual
Compaction	Compaction recorder monitored by MPG	1	Continuous
	Compaction recorder monitored by SJREC	1	Continuous

1. Monitored by the San Luis and Delta-Mendota Water Authority.

2. Includes two wells monitored continuously.

3. Includes one well monitored continuously by CCID.

4. Semi-annual sampling will be conducted at 9 locations. Monthly sampling will be conducted at 4 locations.

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
MPG Wells													
Fordel, Inc.	M-1	PW	D	T13S/R15E-20N1	300	200-300	180	18	159.61	Y	MPG	MPG	I
	M-2	PW	S	T13S/R15E-20N2	100	50-100	20	12	159.06	Y		MPG	I
	M-3	PW	S	T13S/R15E-20N3	100	50-100	20	12	NA	Y	MPG	I	
	M-4	PW	S	T13S/R15E-20N4	99	60-95	35	12	NA	Y	MPG	I	
	M-5	PW	S	T13S/R15E-20N5	100	60-100	30	12	NA	Y	MPG	I	
	M-6	PW	S	T13S/R15E-20N6	100	60-100	30	12	NA	Y	MPG	I	
Terra Linda Farms	TL-1	PW	D	T13S/R15E-29C2	275	150-275	140	16	151.65	Y	MPG	MPG	I
	TL-2	PW	D	T13S/15E-29D	275	125-275	140	16	NA	Y		MPG	I
	TL-3	PW	D	T13S/R15E-20P	275	150-275	140	16	NA	Y		MPG	I
	TL-4A	PW	S	T13S/R15E-29	120	60-120	55	16	NA	Y		MPG	I
	TL-4C	PW	S	T13S/R15E-29	120	60-120	50	16	NA	Y		MPG	I
	TL-5	PW	D	T13S/R15E-32	400	200-400	170	16	NA	Y		MPG	I
	TL-7	PW	D	T13S/R15E-32	NA	NA	NA	NA	156.89	NA		MPG	I
	TL-8	PW	D	T13S/R15E-29	NA	NA	NA	NA	NA	NA		MPG	I
	TL-10A	PW	S	T13S/R15E29C	90	50-80	20	12	156.1	Y		MPG	I
	TL-10B	PW	S	T12S/R15E-29F5	80	50-80	20	12	NA	Y		MPG	I
	TL-10C	PW	S	T13S/R15E-29F6	80	50-80	12	12	NA	Y		MPG	I
	TL-11	PW	S	T13S/R15E-29F7	NA	NA	NA	NA	NA	NA		MPG	I
	TL-12	PW	S	T13S/15E-29	130	40-130	25	16	NA	Y		MPG	I
	TL-13	PW	S	T13S/R15E-32	130	40-130	30	16	NA	Y		MPG	I
	TL-14	PW	S	T13S/R15E-32	130	40-130	30	16	NA	Y		MPG	I
TL-15	PW	S	T13S/R15E-32	130	40-130	25	16	NA	Y	MPG	I		

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
Terra Linda Farms	TL-16	PW	S	T13S/R15E-19	120	60-120	50	16	NA	Y		MPG	I
	TL-17	PW	S	T13S/R15E-29	120	60-120	50	16	NA	Y		MPG	I
	HS-3	UW	D	13S/15E-29F2	410	120-410	None	16	154.03	Y	MPG		I
Terra Linda Farms	D&H	UW	D	T13S/R15E-29K	360	160-360	None	16	NA	Y	MPG		I
Etchegoinberry	No. 2	UW	S	T13S/R15E-29R3	120	50-100	20	16	151.26	Y	MPG		I
Coelho/Coelho/Fordel	CCF-2	PW	D	T13S/R15E-32	400	200-400	125	18	NA	Y	MPG		I
Silver Creek Packing Co.	SC-3B	PW	S	T13S/R15E-32	130	40-130	30	16	NA	Y		MPG	I
	SC-4B	PW	S	T13S/R15E-32	130	40-130	30	16	NA	Y		MPG	I
Coelho/Gardner/Hansen	CGH-1A	PW	S	T14S/R15E-4D	146	90-130	20	12	NA	Y		MPG	I
	CGH-1B	PW	S	T14S/R15E-4D	147	90-131	20	12	NA	Y		MPG	I
	CGH-1C	PW	S	T14S/R15E-4D	148	90-132	20	12	NA	Y		MPG	I
	CGH-2	PW	S	T14S/R15E-5	146	75-115	20	12	NA	Y		MPG	I
	CGH-6A	PW	S	T14S/R15E-5A	NA	NA	NA	NA	NA	NA		MPG	I
	CGH-6B	PW	S	T14S/R15E-5A	NA	NA	NA	NA	NA	NA		MPG	I
	CGH-6C	PW	S	T14S/R15E-5A	NA	NA	NA	NA	NA	NA		MPG	I
	CGH-6D	PW	S	T14S/R15E-5A	NA	NA	NA	NA	NA	NA		MPG	I
	CGH-9	PW	S	T14S/R15E-5	130	40-130	25	16	NA	Y		MPG	I
	CGH-10	PW	S	T14S/R15E-5	130	40-130	25	16	NA	Y		MPG	I
Meyers Farming	MS-4	UW	S	T14S/R15E-5	130	60-130	50	16	156	Y	MPG		I
	MS-5	UW	D	T14S/R15E-5	220	100-220	80	16	NA	Y	MPG		I
	MS-7	PW	S	T14S/R15E-5	125	65-125	50	16	NA	Y		MPG	I

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
Five Star	FS-1	PW	S	T14S/R15E-9C2	110	50-110	20	12	NA	Y	MPG	MPG	I
	FS-2	PW	S	T14S/R15E-9C3	110	60-110	20	12	NA	Y		MPG	I
	FS-3	PW	S	T14S/R15E-9C4	100	50-100	20	12	NA	Y		MPG	I
	FS-4	PW	S	T14S/R15E-9C5	100	50-100	20	12	NA	Y		MPG	I
	FS-5	PW	S	T14S/R15E-9C6	110	60-110	20	12	155.81	Y		MPG	I
Five Star	FS-6	PW	S	T14S/R15E-9C7	110	60-110	20	12	NA	Y	MPG	MPG	I
	FS-7	PW	S	T14S/R15E-9C8	110	60-110	20	12	NA	Y		MPG	I
	FS-8	PW	S	T14S/R15E-9C9	105	60-105	20	12	NA	Y		MPG	I
	FS-9	PW	S	T14S/R15E-9C10	110	60-110	20	12	NA	Y		MPG	I
	FS-10	PW	S	T14S/R15E-4P	100	20-100	20	12	154.38	Y		MPG	I
Coelho West	CW-1	PW	S	T14S/R15E-9B1	100	50-100	20	12	NA	Y	MPG	MPG	I
	CW-2	PW	S	T14S/R15E-9B2	100	50-100	20	12	NA	Y		MPG	I
	CW-3	PW	S	T14S/R15E-9C15	100	50-100	20	12	157.42	Y		MPG	I
	CW-4	PW	S	T14S/R15E-9C16	100	50-100	20	12	NA	Y		MPG	I
	CW-5	PW	S	T14S/R15E-9C17	110	60-110	20	12	NA	Y		MPG	I
Farmers Water District	R-1	PW	D	T13S/R15E-35C	277	100-276	None	16	NA	Y	MPG	MPG	I
	R-2	PW	D	T13S/R15E-27G1	301	136-300	None	16	NA	Y		MPG	I
	R-3	PW	D	T13S/R15E-34	304	107-303	None	16	NA	Y		MPG	I
	R-4	PW	D	T13S/R15E-25	296	112-296	None	16	NA	Y		MPG	I
	R-5	UW	D	T13S/R15E-26B1	322	180-322	72	16	NA	Y		MPG	I
	R-6	PW	D	T13S/R15E-27C1	400	100-400	20	20	NA	Y	MPG	MPG	I
	R-7	PW	D	T13S/R15E-23P1	400	100-400	20	20	166.18	Y		MPG	I
	R-8	PW	D	T13S/R15E-27H1	490	120-480	20	20	NA	Y		MPG	I
	R-9	PW	D	T13S/R15E-25N	480	240-480	None	20	NA	Y		MPG	I
	R-10	PW	D	T13S/R15E-27	480	240-480	20	16	NA	Y		MPG	I
	R-11	PW	D	T13S/R15E-34A	510	230-510	20	16	NA	Y		MPG	I

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
Farmers Water District	WL-2	UW	D	T13S/R15E-26K1	242	101-242	16	20	170.23	Y	MPG		I
	EL-1	UW	D	T13S/R15E-25	268	98-268	16	20	NA	Y	MPG		I
Baker Farming Co.	BF-1	PW	D	T13S/R15E-27	400	160-400	115	16	NA	Y		MPG	I
	BF-2	PW	D	T13S/R15E-22	420	140-420	100	16	NA	Y	MPG	MPG	I
Baker Farming Co.	BF-3	PW	D	T13S/R15E-22	420	140-410	100	16	NA	Y		MPG	I
	BF-4	PW	D	T13S/R15E-22	410	140-410	115	16	NA	Y		MPG	I
	BF-5	PW	D	T13S/R15E-22	NA	NA	NA	NA	NA	NA		MPG	I
Panoche Creek Farms	PCF-1	PW	D	T13S/R15E-27	NA	NA	NA	NA	NA	NA	MPG	MPG	I
Non-MPG Wells (West of Chowchilla Bypass)													
Central California ID	5A	PW	D	T13S/R15E-19G1	260	100-260	20	16	153.14	Y	MPG	CCID	II
	12C	PW	D	T13S/R14E-2P	180	80-180	NA	16	148.81	NA		CCID	II
	15B	PW	D	T13S/R14E-12E1	180	100-180	20	16	150.06	Y	MPG	CCID	II
	16B	PW	D	T13S/R14E-11H	185	95-180	NA	16	149.09	NA		CCID	II
	23B	PW	D	T13S/R14E-2	180	90-180	NA	16	148.51	NA		CCID	II
	28C	PW	D	T13S/R14E-13	360	200-360	50	17.4	NA	Y	MPG	CCID	II
	32B	PW	D	T13S/R15E-19	225	100-225	None	16	152.81	WDS/Y	MPG	CCID	II
	35A	PW	D	T13S/R14E-12L1	190	80-190	20	16	151.11	Y	MPG	CCID	II
	38A	PW	D	T13S/R14E-12B3	290	126-290	88	16	153.08	Y	MPG		II
	Yearout	MW	D	T13S/R15E-35D5	433	373-433	NA	4	166.79	Y	CCID		II
Firebaugh Canal WD	24R1	UW	D	T13S/R14E-24R1	326	216-316	30	16	NA	Y	MPG		II
	25D2	UW	D	T13S/R14E-25D2	NA	NA	NA	NA	NA	NA	MPG		II

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
Columbia Canal Co.	CC-1	PW	D	T13S/R15E-25	NA	NA	NA	NA	NA	NA	MPG	CCC	II
	CC-2	PW	D	T13S/R15E-23	455	180-455	None	16	NA	Y		CCC	II
	Cardella-1	PW	D	T13S/R15E-20	NA	NA	NA	NA	NA	NA		CCC	II
	Cardella-2	PW	D	T13S/R15E-16D	NA	NA	NA	NA	NA	NA	MPG	CCC	II
	Lopes-Obs.	MW	S	T13S/R15E-17	100	80-100	20	2	NA	Y	MPG		II
	USBR-4	MW	S	T13S/R15E-22	100	60-100	20	2	165.55	Y	MPG		II
	Elrod-1	PW	D	T12S/R14E-36	NA	NA	NA	NA	NA	NA		CCC	II
Columbia Canal Co.	Elrod-2	PW	D	T12S/R14E-27	NA	NA	NA	NA	NA	NA		CCC	II
	Burkhart-Heirs	PW	D	T12S/R14E-28	NA	NA	NA	NA	NA	NA		CCC	II
	DMA	PW	D	T12S/R14E-26	NA	NA	NA	NA	NA	NA		CCC	II
	Davis	PW	D	T12S/R14E-34	NA	NA	NA	NA	NA	NA		CCC	II
	Garcia-1	PW	D	T12S/R14E-35	NA	NA	NA	NA	NA	NA		CCC	II
	Garcia-2	PW	D	T12S/R14E-35	NA	NA	NA	NA	NA	NA		CCC	II
	Garcia-3	PW	D	T12S/R14E-35	NA	NA	NA	NA	NA	NA		CCC	II
	Garcia-4	PW	D	T12S/R14E-34	NA	NA	NA	NA	NA	NA		CCC	II
	Garcia-5	PW	D	T12S/R14E-35	NA	NA	NA	NA	NA	NA		CCC	II
	Snyder	PW	D	T13S/R15E-7	NA	NA	NA	NA	NA	NA		CCC	II
B&B Ranch	Mowry Diesel	UW	D	T13S/R15E-21K1	NA	NA	NA	NA	164.5	NA	MPG	CCC	II
Newhall Land & Farming	W-7	PW	D	T12S/R15E-34R1	288	170-276	NA	14	165	Y	USBR		III
	W-8	PW	D	T13S/R15E-11B1	318	198-312	NA	14	166	WDS/Y	MPG		II
	W-11	PW	D	T12S/R15E-34K1	296	180-280	NA	14	164	WDS/Y	MPG		II
	W-12	PW	D	T13S/R15E-2G1	188	188-262	NA	16	165.5	Y	USBR		III
	W-15	PW	D	T13S/R15E-14M1	304	180-300	NA	14	165	WDS/Y	MPG		II
	W-32	PW	D	T12S/R15E-33P	310	170-300	NA	14	157.55	Y	MPG	NLF	II
	W-42	PW	D	T13S/R15E-4	390	150-390	20	16	158.39	Y	MPG	NLF	II

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
Newhall Land & Farming	W-53	PW	D	T13S/R15E-21	308	130-308	20	16	161.97	Y	MPG	NLF	II
	W-74	PW	D	T13S/R15E-7	380	200-380	NA	16	160.41	Y	MPG	NLF	II
	W-77	PW	D	T13S/R15E-15	400	200-380	NA	16	163.17	Y	MPG		II
	W-78	PW	D	T13S/R15E-16	405	150-405	None	16	161.15	Y	MPG	NLF	II
	W-89	PW	D	T13S/R15E-2	500	234-498	None	16	NA	Y	MPG	NLF	II
	W-91	PW	D	T12S/R15E-33	500	228-498	None	16	158.24	Y	MPG	NLF	II
	W-94	PW	D	T13S/R15E-22	500	225-498	None	16	165.33	Y	MPG	NLF	II
	W-95	PW	D	T13S/R15E-25	500	234-498	NA	16	169.25	Y	MPG	NLF	II
	MW-1	MW	D	T13S/R15A-22	160	110-150	90	6	NA	Y		NLF	II
	MW-2	MW	S	T13S/R15A-25	80	40-80	30	4	166.82	Y	MPG	NLF	II
	MW-3	MW	S	T13S/R15E-16	80	40-80	20	4	160.40	Y	MPG	NLF	II
	MW-4	MW	S	T13S/R15E-3	80	40-80	20	4	159.03	Y	MPG	NLF	II
	MW-5	MW	S	T12S/R15E-33	95	35-95	20	4	156.19	Y	MPG	NLF	II
Mitigation Land Trust	MLT-W	UW	D	T13S/R15E-20G2	NA	NA	NA	NA	157.19	NA	MPG		IV
U.S. Bureau of Reclamation	19R1	UW	D	T13S/R15E-19R1	247	NA	NA	NA	164.5	WDS	MPG		III
Spreckels Sugar Co.	MW-1	MW	S	T14S/R15E-4Q	82	38-78	20	6	166.79	Y	MPG	SSC	IV
	MW-2	MW	S	T14S/R15E-3	80	36-76	20	6	163.25	Y		SSC	IV
	MW-3	MW	S	T14S/R15E-4H	82	39-79	20	6	170.64	Y	MPG	SSC	IV
	MW-4	MW	S	T13S/R15E-34	72	30-70	20	6	166.07	Y		SSC	IV
	MW-5	MW	S	T13S/R15E-34	70	26-66	20	6	166.17	Y		SSC	IV
	MW-6	MW	S	T13S/R15E-34	82	38-78	20	6	166.70	Y	MPG	SSC	IV
	MW-7	MW	D	T13S/R15E-34	150	110-150	105	6	166.69	Y		SSC	IV
	MW-8	MW	D	T13S/R15E-34	150	120-150	110	6	163.21	Y		SSC	IV
	MW-9	MW	S	T13S/R15E-34	70	30-60	20	6	163.06	Y		SSC	IV

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
Spreckels Sugar Co.	MW-10	MW	D	T13S/R15E-34	150	120-150	110	6	164.77	Y	MPG	SSC	IV
	MW-11	MW	D	T13S/R15E-34N	150	120-150	110	6	163.60	Y	MPG	SSC	IV
	MW-12	MW	D	T13S/R15E-34	130	100-130	95	6	163.77	Y		SSC	IV
	MW-13	MW	S	T13S/R15E-34	70	30-60	20	6	163.79	Y		SSC	IV
	MW-14	MW	D	T13S/R15E-33F	190	120-190	110	6	164.00	Y	MPG	SSC	IV
	MW-15	MW	S	T14S/R15E-3	50	18-48	12	6	167.33	Y		SSC	IV
	MW-16	MW	D	T14S/R15E-3	150	110-150	100	6	166.36	Y		SSC	IV
	MW-17	MW	S	T14S/R15E-3	50	20-50	15	6	165.01	Y		SSC	IV
	MW-18	MW	S	T14S/R15E-3	50	20-50	15	6	166.29	Y		SSC	IV
	MW-19	MW	S	T14S/R15E-3	70	30-70	24	6	170.68	Y		SSC	IV
	MW-20	MW	S	T14S/R15E-3	66	35-65	NA	NA	167.17	Y		SSC	IV
	MW-21	EW	S	T14S/R15E-3	75	35-65	NA	NA	168.91	Y		SSC	IV
	MW-22	MW	D	T14S/R15E-3	160	118-158	NA	NA	167.61	Y		SSC	IV
	MW-23	EW	S	T14S/R15E-3	66	34-64	NA	NA	166.99	Y		SSC	IV
	MW-24	MW	S	T13S/R15E-34	62	30-50	NA	NA	166.57	Y		SSC	IV
	MW-25	MW	S	T14S/R15E-3	75	38-68	NA	NA	164.99	Y		SSC	IV
	MW-26	EW	S	T14S/R15E-3	65	33-63	NA	NA	167.94	Y		SSC	IV
	MW-27	MW	S	T14S/R15E-3	60	28-58	NA	NA	166.40	Y		SSC	IV
	MW-28	MW	S	T14S/R15E-2	76	38-68	NA	NA	168.58	Y		SSC	IV
	MW-29	MW	S	T13S/R15E-35	74	40-70	NA	NA	165.62	Y		SSC	IV
	MW-30	MW	S	T13S/R15E-35	75	38-68	NA	NA	169.08	Y		SSC	IV
	MW-31	MW	S	T13S/R15E-35	71	37-67	NA	NA	167.48	Y		SSC	IV
	MW-32	MW	S	T13S/R15E-35	70	37-67	20	6	170.10	Y	MPG	SSC	IV
	PW-1	PW	D	T13S/R15E-34	NA	200-440	180	16	NA	Y		SSC	IV
	PW-4	PW	D	T14S/R15E-3	NA	NA	NA	16	NA	NA		SSC	IV
	PW-6	PW	D	T13S/R15E-34	218	133-213	123	12	164.5	Y		SSC	IV
	PW-7	PW	D	T13S/R15E-34	224	139-219	129	12	164.4	Y		SSC	IV
	PW-8	PW	D	T13S/R15E-34	224	140-220	124	12	NA	Y		SSC	IV

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
Spreckels Sugar Co.	PW-9	PW	D	T13S/R15E-34	NA	NA	NA	NA	NA	NA		SSC	IV
	PW-10	PW	D	T13S/R15E-34	220	110-220	117	NA	NA	Y		SSC	IV
	PW-11	PW	D	T13S/R15-35	300	160-300	140	14	NA	Y		SSC	IV
City of Mendota	No. 3	PW	D	T13S/R15E-30	308	168-288	150	14.5	NA	Y		City	IV
	No. 5	PW	D	T13S/R15E-19	258	174-246	160	16	NA	Y		City	IV
	No. 7	PW	D	T13S/R15E-21	405	260-395	235	14	NA	Y		City	IV
	No. 8	PW	D	T13S/R15E-21	405	240-375	230	14	NA	Y		City	IV
	No. 9	PW	D	T13S/R15E-21	405	260-395	240	14	NA	Y		City	IV
	18Q	MW	D	T13S/R15E-19	252	132-252	122	10	NA	Y	MPG		IV
U.S. Geological Survey	31J3	MW	D	T13S/R15E-31J3	415	400-410	NA	6	160.2	Y	MPG		I
	31J4	MW	S	T13S/R15E-31J4	70	55-65	NA	6	160.5	Y	MPG	MPG	I
	31J5	MW	D	T13S/R15E-31J5	260	240-250	NA	6	160.2	Y	MPG	MPG	I
	31J6	MW	L	T13S/R15E-31J6	500	480-490	NA	6	161.5	Y	MPG		I
	10A1	MW	S	T14S/R14E-10A1	18	13-18	2	2	202.2	Y	WWD		IV
	10A2	MW	S	T14S/R14E-10A2	88	81-86	75	2	201.0	Y	WWD		IV
	10A3	MW	D	T14S/R14E-10A3	347	332-342	323	6	202.5	Y	WWD		IV
	10A4	MW	D	T14S/R14E-10A4	194	178-188	171	5	201.8	Y	WWD		IV
Hansen Farms	7C1	PW	D	T14S/R15E-7C1	200	140-200	50	8	NA	Y	MPG		IV
Meyers Farming	S-1	MW	S	T14S/R15E-5	80	20-75	13	2	NA	Y		MPG	I
	S-2	MW	S	T14S/R15E-5	78	23-78	16	2	162.34	Y	MPG	MPG	I
	S-3	MW	S	T14S/R15E-5	79	24-79	17	2	159.05	Y		MPG	I
	P-1	MW	S	T14S/R15E-8	80	25-80	19	2	157.66	Y		MPG	I
	P-4	MW	S	T14S/R15E-8	80	24-79	21	2	NA	Y		MPG	I
	P-6	MW	S	T14S/R15E-8Q	79	24-79	18	2	161.08	Y	MPG		I
	MF-1	MW	S	T13S/R15E-33Q	80	38-68	28	2	159.42	Y	MF	MF	IV

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
Meyers Farming	MF-2	MW	S	T13S/R15E-33L	80	38-68	30	2	158.35	Y	MF	MF	IV
	MF-3	MW	S	T14S/R15E-4C	70	40-60	30	2	158.42	Y	MF	MF	IV
	MF-4	MW	S	T14S/R15E-4A	70	40-60	30	2	159.89	Y	MF	MF	IV
	MF-5	MW	S	T14S/R15E-4F	60	40-50	25	2	158.44	Y	MF	MF	IV
	MF-6	MW	S	T14S/R15E-4G	75	55-70	20	2	164.99	Y	MF	MF	IV
	MF-7	MW	S	T14S/R15E-4K	55	35-50	20	2	160.01	Y	MF	MF	IV
	MF-8	MW	S	T14S/R15E-3L	55	35-50	20	2	161.41	Y	MF	MF	IV
	MF-9	MW	S	T14S/R15E-4H	55	35-50	20	2	160.67	Y	MF	MF	IV
Non-MPG Wells (East of Chowchilla Bypass)													
North of study area El Paco Ranch	#54	PW	D	T12S/R16E-16R1	296	170-286	16	191.0	NA	Y	USBR		III
Aliso Water District Woolf Entrprises	WE-75	PW	D	T13S/R16E-18H1	333	NA	NA	NA	NA	WDS	MPG		IV
Woolf Entrprises	WE-51	PW	D	T13S/R16E-19K1	380	NA	NA	NA	174	WDS	MPG		IV
Woolf Enterprises	WE-53	PW	D	T13S/R16E-30A1	392	190-390	NA	16	>175	WDS	USBR		III
Prosperi	DP-2	PW	D	T12S/R16E-31G1	NA	NA	NA	18	179	WDS	MPG		IV
Prosperi	DP-4	PW	D	T12S/R16E-31A	340	160-324	NA	16	NA	WDS/Y	MPG		IV
Lyon Packing	LP-11	PW	D	T13S/R16E-5C1	316	NA	NA	14	182	WDS	USBR		III
Giffen Ranch	GIF-23	PW	D	T13S/R16E-8H1	264	NA	NA	14	179.1	WDS	USBR		III
Groefsema Ranches	GR-28	PW	D	T13S/R16E-14H2	304	NA	NA	12	197.8	WDS	USBR		III
Golden State Vinters	GSV-H	PW	D	T13S/R16E-16D2	258	NA	NA	12	179.0	WDS	USBR		III
Golden State Vinters	GSV-646	PW	D	T13S/R16E-20J1	404	185-360	NA	16	>180	WDS	USBR		III
Gravelly Ford WD Simpson	26H1	PW	D	T12S/R16E-26H1	330	130-298	NA	12	201	WDS	MPG		IV

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
Undistricted (Madera County) Simpson	25A2	PW	D	T12S/R16E-25A1	150	135-150	NA	NA	209	WDS	MPG		IV
Undistricted (Fresno County) Horner	34C1	PW	D	T13S/R16E-34C1	240	104-236	NA	16	183	WDS	MPG		IV
Unknown	4L1	PW	D	T14S/R16E-4L1	340	128-328	NA	16	>170	WDS	USBR		III
Schaad	NA	PW	D	T13S/R16E-22J1	264	150-260	NA	14	191.0	WDS	USBR		III
Schaad	NA	PW	D	T13S/R16E-22J2	320	116-236	NA	14	191.0	WDS	USBR		III
Schaad	NA	PW	D	T13S/R16E-27A2	372	150-365	NA	16	190.0	WDS	USBR		III
Schaad	#3	PW	D	T13S/R16E-27F1	300	108-248	NA	16	185.5	WDS	USBR		III
Schaad	NA	PW	D	T13S/R16E-29F1	360	NA	NA	16	176.0	WDS	USBR		III
Larry Shehadey	NA	PW	D	T13S/R16E-30L3	400	135-400	NA	16	>175	WDS	USBR		III
Larry Shehadey	NA	PW	D	T13S/R16E-30Q1	340	130-340	NA	16	>175	WDS	USBR		III
Larry Shehadey	NA	PW	D	T13S/R16E-32F1	378	116-368	NA	16	>175	WDS	USBR		III
Larry Shehadey	NA	PW	D	T13S/R16E-33B2	352	NA	NA	16	177.0	WDS	USBR		III
Larry Shehadey	NA	PW	D	T13S/R16E-33F1	370	120-360	NA	16	175.5	WDS	USBR		III
Larry Shehadey	NA	PW	D	T13S/R16E-33L1	400	192-400	NA	16	>175	WDS	USBR		III
Agape Farms	NA	PW	C	T13S/R16E-34C2	405	150-395	NA	16	183.0	WDS	USBR		III
Agape Farms	NA	PW	D	T13S/R16E-34D1	346	150-346	NA	16	>180	WDS	USBR		III
Agape Farms	NA	PW	C	T13S/R16E-34P2	418	220-418	NA	NA	181.0	WDS	USBR		III

Table B-2. Construction Data for Wells Used for Groundwater Level and Quality Monitoring

Owner	Well ID	Type of Well ¹	Depth Zone ²	State Well No.	Total Depth (ft)	Perf. Interval (ft)	Seal Depth (ft)	Casing Dia. (in)	Wellhead Elevation (ft msl)	Drillers Log or WDS ³	Measured Parameter ⁴		Participation Level
											WL	WQ	
Connolly	NA	PW	D	T14S/R16E-3F1	330	120-320	NA	16	182.0	WDS	USBR		III
Duran	NA	PW	D	T14S/R16E-3P1	380	NA	NA	16	>175	WDS	USBR		III
Bar 20 Partners Ltd.	NA	PW	D	T14S/R16E-5J1	376	175-320	NA	16	169.5	WDS	USBR		III
Bar 20 Partners Ltd.	NA	PW	D	T14S/R16E-5L2	400	220-?	NA	16	168.0	WDS	USBR		III
Bar 20 Partners Ltd.	NA	PW	D	T14S/R16E-6B1	420	180-420	NA	16	171.5	WDS	USBR		III

1. PW = Production Well; MW = Monitoring Well; UW= Unused Production Well, EW = Extraction Well

2. S = Shallow (<130 ft deep); D = Deep (>130 ft deep); L = Lower Aquifer (below Corcoran Clay); C = Composite Well (likely to be completed above and below Corcoran Clay)

3. WDS = DWR Well Data Sheet available; Y = Drillers log available

4. WL = Water Level; WQ = Water Quality

Responsible Entities: MPG = Mendota Pool Group, CCID = Central California Irrigation District, CCC = Columbia Canal Company, NLF = Newhall Land and Farming, USBR = U.S. Bureau of Reclamation, SSC = Spreckels Sugar Co., City = City of Mendota, WWD = Westlands Water District, MF = Meyers Farming
NA = Information not available

Table B-3. Groundwater Level Monitoring Network

Owner	Well ID	State Well Number	Frequency	Entity ¹
MPG Wells				
Fordel, Inc.	M-1	T13S/R15E-20N1	Bimonthly	MPG
	M-2	T13S/R15E-20N2	Bimonthly	MPG
Terra Linda Farms	TL-10A	T13S/R15E-29C	Bimonthly	MPG
	HS-3	13S/15E-29F2	Bimonthly	MPG
	D&H	T13S/R15E-29K	Bimonthly	MPG
Etchegoinberry	No. 2	T13S/R15E-29R3	Bimonthly	MPG
Coelho/Coelho/Fordel	CCF-2	T13S/R15E-32	Bimonthly	MPG
Meyers Farming	MS-4	T14S/R15E-5	Bimonthly	MPG
	MS-5	T14S/R15E-5	Bimonthly	MPG
Five Star	FS-5	14S/15E-9C6	Bimonthly	MPG
Farmers Water District	R-5	T13S/R15E-26B1	Continuous	MPG
	R-7	T13S/R15E-23P1	Bimonthly	MPG
	R-8	T13S/R15E-27H1	Bimonthly	MPG
	WL-2	T13S/R15E-26K1	Bimonthly	MPG
	EL-1	T13S/R15E-25	Bimonthly	MPG
Baker Farming Co.	BF-2	T13S/R15E-22	Bimonthly	MPG
Panoche Creek Farms	PCF-1	T13S/R15E-27	Bimonthly	MPG
Non-MPG Wells (West of Chowchilla Bypass)				
Central California ID	5A	T13S/R15E-19G1	Bimonthly	MPG
	15B	T13S/R14E-12E1	Bimonthly	MPG
	28C	T13S/R15E-13	Bimonthly	MPG
	32B	T13S/R15E-19	Bimonthly	MPG
	35A	T13S/R14E-12L1	Bimonthly	MPG
	38A	T13S/R14E-12B3	Bimonthly	MPG
	Yearout Ranch	T13S/R15E-35D5	Continuous	CCID
Firebaugh Canal WD	24R1	T13S/R14E-24R1	Bimonthly	MPG
	25D2	T13S/R14E-25D2	Bimonthly	MPG
Columbia Canal Co.	CC-1	T13S/R15E-25F1	Bimonthly	MPG
	Cardella-2 (Lopes-1)	T13S/R15E-16	Bimonthly	MPG
	Lopes-Obs.	T13S/R15E-17	Bimonthly	MPG
	USBR-4	T13S/R15E-22	Bimonthly	MPG
B & B Ranch	Mowry Diesel	T13S/R15E-21K1	Bimonthly	MPG
Mitigation Land Trust	MLT-W	T13S/R15E-20G2	Bimonthly	MPG

Table B-3. Groundwater Level Monitoring Network

Owner	Well ID	State Well Number	Frequency	Entity ¹
USBR	19R1	T13S/R15E-19R1	Bimonthly	MPG
Newhall Land & Farming	W-7	T12S/R15E-34R1	Semi-annual	USBR
	W-8	T13S/R15E-11B1	Bimonthly	MPG
	W-11	T12S/R15E-34K1	Bimonthly	MPG
	W-12	T13S/R15E-02G1	Semi-annual	USBR
	W-15	T13S/R15E-14M1	Bimonthly	MPG
	W-32	T12S/R15E-33P	Bimonthly	MPG
	W-42	T13S/R15E-4	Bimonthly	MPG
	W-53	T13S/R15E-21	Bimonthly	MPG
	W-74	T13S/R15E-7	Bimonthly	MPG
	W-77	T13S/R15E-15	Bimonthly	MPG
	W-78	T13S/R15E-16	Bimonthly	MPG
	W-89	T13S/R15E-2	Bimonthly	MPG
	W-91	T12S/R15E-33	Bimonthly	MPG
	W-94	T13S/R15E-22	Bimonthly	MPG
	W-95	T13S/R15E-25	Bimonthly	MPG
	MW-2	T13S/R15A-25	Bimonthly	MPG
	MW-3	T13S/R15E-16	Bimonthly	MPG
	MW-4	T13S/R15E-3	Bimonthly	MPG
	MW-5	T12S/R15E-33	Bimonthly	MPG
Spreckels Sugar Co.	MW-1	T14S/R15E-4Q	Bimonthly	MPG
	MW-3	T14S/R15E-4H	Bimonthly	MPG
	MW-6	T13S/R15E-34N	Bimonthly	MPG
	MW-10	T13S/R15E-34	Bimonthly	MPG
	MW-11	T13S/R15E-34N	Bimonthly	MPG
	MW-14	T13S/R15E-33F	Bimonthly	MPG
	MW-32	T13S/R15E-35	Bimonthly	MPG
City of Mendota	18Q	T13S/R15E-18	Bimonthly	MPG
USGS	31J3	T13S/R15E-31J3	Continuous	MPG
	31J4	T13S/R15E-31J4	Bimonthly	MPG
	31J5	T13S/R15E-31J5	Bimonthly	MPG
	31J6	T13S/R15E-31J6	Bimonthly	MPG
	10A1	T14S/R14E-10A1	Semi-annual	WWD
	10A2	T14S/R14E-10A2	Semi-annual	WWD
	10A3	T14S/R14E-10A3	Semi-annual	WWD
	10A4	T14S/R14E-10A4	Semi-annual	WWD
Hansen Farms	7C1	T14S/R15E-7C1	Bimonthly	MPG

Table B-3. Groundwater Level Monitoring Network

Owner	Well ID	State Well Number	Frequency	Entity ¹
Meyers Farming	S-2	T14S/R15E-5	Bimonthly	MPG
	P-6	T14S/R15E-8Q	Bimonthly	MPG
	MF-1	T13S/R15E-33Q	Monthly	MF
	MF-2	T13S/R15E-33L	Monthly	MF
	MF-3	T14S/R15E-4C	Monthly	MF
	MF-4	T14S/R15E-4A	Monthly	MF
	MF-5	T14S/R15E-4F	Monthly	MF
	MF-6	T14S/R15E-4G	Monthly	MF
	MF-7	T14S/R15E-4K	Monthly	MF
	MF-8	T14S/R15E-3L	Monthly	MF
	MF-9	T14S/R15E-4H	Monthly	MF
Non-MPG Wells (East of Chowchilla Bypass)				
North of study area				
El Paco Ranch	No.54	T12S/R16E-16R1	Semi-annual	USBR
Aliso Water District				
Woolf Enterprises	WE-51	T13S/R16E-19K1	Bimonthly	MPG
Woolf Enterprises	WE-75	T13S/R16E-18H1	Bimonthly	MPG
Denis Prosperi	DP-2	T12S/R16E-31G1	Bimonthly	MPG
Denis Prosperi	DP-4	T12S/R16E-31A	Bimonthly	MPG
Lyon Packing	LP-11	T13S/R16E-5C1	Semi-annual	USBR
Giffen Ranch	GIF-23	T13S/R16E-8H1	Semi-annual	USBR
Groefsema Ranches	GR-28	T13S/R16E-14H2	Semi-annual	USBR
Golden State Vinters	GSV-H	T13S/R16E-16D2	Semi-annual	USBR
Woolf Enterprises	WE-53	T13S/R16E-30A1	Semi-annual	USBR
Golden State Vinters	GSV-646	T13S/R16E-20J1	Semi-annual	USBR
Gravelly Ford WD				
John Simpson	NA	T12S/R16E-25A1	Bimonthly	MPG
John Simpson	NA	T12S/R16E-26H1	Bimonthly	MPG
Undistricted (Fresno County)				
Schaad	NA	T13S/R16E-22J1	Semi-annual	USBR
Schaad	NA	T13S/R16E-22J2	Semi-annual	USBR
Schaad	NA	T13S/R16E-27A2	Semi-annual	USBR
Schaad	No.3	T13S/R16E-27F1	Semi-annual	USBR
NA	NA	T13S/R16E-29F1	Semi-annual	USBR
Larry Shehadey Farms	NA	T13S/R16E-30L3	Semi-annual	USBR
Larry Shehadey Farms	NA	T13S/R16E-30Q1	Semi-annual	USBR
Larry Shehadey Farms	NA	T13S/R16E-32F1	Semi-annual	USBR
Larry Shehadey Farms	NA	T13S/R16E-33B2	Semi-annual	USBR
Larry Shehadey Farms	NA	T13S/R16E-33F1	Semi-annual	USBR
Larry Shehadey Farms	NA	T13S/R16E-33L1	Semi-annual	USBR

Table B-3. Groundwater Level Monitoring Network

Owner	Well ID	State Well Number	Frequency	Entity ¹
Undistricted (Fresno County)				
Donald Horner	NA	T13S/R16E-34C1	Bimonthly	MPG
Agape Farms	NA	T13S/R16E-34C2	Semi-annual	USBR
Agape Farms	NA	T13S/R16E-34D1	Semi-annual	USBR
Agape Farms	NA	T13S/R16E-34P2	Semi-annual	USBR
Connolly	NA	T14S/R16E-3F1	Semi-annual	USBR
Duran	NA	T14S/R16E-3P1	Semi-annual	USBR
Larry Shehadey Farms	NA	T14S/R16E-4L1	Semi-annual	USBR
Bar 20 Partners Ltd.	NA	T14S/R16E-5J1	Semi-annual	USBR
Bar 20 Partners Ltd.	NA	T14S/R16E-5L2	Semi-annual	USBR
Bar 20 Partners Ltd.	NA	T14S/R16E-6B1	Semi-annual	USBR

1. MPG = Mendota Pool Group, CCID = Central California Irrigation District, NLF = Newhall Land & Farming,
 USBR = U.S. Bureau of Reclamation, WWD = Westlands Water District, MF = Meyers Farming

Table B-4. Groundwater Quality Monitoring Network

Owner	Well ID	Depth Zone	Sampling Schedule ¹		Responsible Entity ²
			Annual	Biennial	
MPG Wells					
Fordel, Inc.	M-1	D	Complete	-	MPG
	M-2	S	Complete	-	MPG
	M-3	S	Complete	-	MPG
	M-4	S	Complete	-	MPG
	M-5	S	EC/TDS	Complete	MPG
	M-6	S	Complete	-	MPG
Terra Linda Farms	TL-1	D	EC/TDS	Complete	MPG
	TL-2	D	EC/TDS	Complete	MPG
	TL-3	D	EC/TDS	Complete	MPG
	TL-4A	S	EC/TDS	Complete	MPG
	TL-4C	S	Complete	-	MPG
	TL-5	D	EC/TDS	Complete	MPG
	TL-7	D	EC/TDS	Complete	MPG
	TL-8	D	EC/TDS	Complete	MPG
	TL-10A	S	Complete	-	MPG
	TL-10B	S	EC/TDS	Complete	MPG
	TL-10C	S	EC/TDS	Complete	MPG
	TL-11	S	EC/TDS	Complete	MPG
	TL-12	S	EC/TDS	Complete	MPG
	TL-13	S	EC/TDS	Complete	MPG
	TL-14	S	Complete	-	MPG
	TL-15	S	EC/TDS	Complete	MPG
	TL-16	S	EC/TDS	Complete	MPG
TL-17	S	Complete	-	MPG	
Silver Creek Packing	SC-3B	S	EC/TDS	Complete	MPG
	SC-4B	S	EC/TDS	Complete	MPG
Coelho/Gardner/Hanson	CGH-1A	S	EC/TDS	Complete	MPG
	CGH-1B	S	EC/TDS	Complete	MPG
	CGH-1C	S	EC/TDS	Complete	MPG
	CGH-2	S	EC/TDS	Complete	MPG
	CGH-6A	S	Complete	-	MPG
	CGH-6B	S	Complete	-	MPG
	CGH-6C	S	EC/TDS	Complete	MPG
	CGH-6D	S	EC/TDS	Complete	MPG
	CGH-9	S	EC/TDS	Complete	MPG
CGH-10	S	EC/TDS	Complete	MPG	
Meyers Farming	MS-7	S	EC/TDS	Complete	MPG
Five Star/Conejo Farms	FS-1	S	EC/TDS	Complete	MPG
	FS-2	S	EC/TDS	Complete	MPG
	FS-3	S	EC/TDS	Complete	MPG
	FS-4	S	EC/TDS	Complete	MPG
	FS-5	S	Complete	-	MPG

Table B-4. Groundwater Quality Monitoring Network

Owner	Well ID	Depth Zone	Sampling Schedule ¹		Responsible Entity ²
			Annual	Biennial	
Five Star/Conejo Farms	FS-6	S	EC/TDS	Complete	MPG
	FS-7	S	EC/TDS	Complete	MPG
	FS-8	S	EC/TDS	Complete	MPG
	FS-9	S	EC/TDS	Complete	MPG
	FS-10	S	Complete	-	MPG
Coelho West	CW-1	S	Complete	-	MPG
	CW-2	S	Complete	-	MPG
	CW-3	S	Complete	-	MPG
	CW-4	S	Complete	-	MPG
	CW-5	S	Complete	-	MPG
Farmers Water District	R-1	D	Complete	-	MPG
	R-2	D	EC/TDS	Complete	MPG
	R-3	D	Complete	-	MPG
	R-4	D	EC/TDS	Complete	MPG
	R-6	D	EC/TDS	Complete	MPG
	R-7	D	EC/TDS	Complete	MPG
	R-8	D	EC/TDS	Complete	MPG
	R-9	D	EC/TDS	Complete	MPG
	R-10	D	EC/TDS	Complete	MPG
	R-11	D	Complete	-	MPG
Baker Farming Co.	BF-1	D	EC/TDS	Complete	MPG
	BF-2	D	EC/TDS	Complete	MPG
	BF-3	D	EC/TDS	Complete	MPG
	BF-4	D	EC/TDS	Complete	MPG
	BF-5	D	EC/TDS	Complete	MPG
Panoche Creek Farms	PCF-1	D	EC/TDS	Complete	MPG
Non MPG Wells					
Central California ID	5A	D	Gen. Min.	-	CCID
	12C	D	Gen. Min.	-	CCID
	15B	D	Gen. Min.	-	CCID
	23B	D	Gen. Min.	-	CCID
	28C	D	Gen. Min.	-	CCID
	32B	D	Gen. Min.	-	CCID
	35A	D	Gen. Min.	-	CCID
	38A	D	Gen. Min.	-	CCID
Columbia Canal Company	CC-1	D	EC/TDS	Irr. Suitability	CCC
	CC-2	D	EC/TDS	Irr. Suitability	CCC
	Cardella-1	D	EC/TDS	Irr. Suitability	CCC
	Cardella-2 (Lopes-1)	D	EC/TDS	Irr. Suitability	CCC
	Elrod-1	D	EC/TDS	Irr. Suitability	CCC
	Elrod-2	D	EC/TDS	Irr. Suitability	CCC
	Burkhart-Heirs	D	EC/TDS	Irr. Suitability	CCC
	DMA	D	EC/TDS	Irr. Suitability	CCC
	Davis	D	EC/TDS	Irr. Suitability	CCC
	Garcia-1	D	EC/TDS	Irr. Suitability	CCC
	Garcia-2	D	EC/TDS	Irr. Suitability	CCC

Table B-4. Groundwater Quality Monitoring Network

Owner	Well ID	Depth Zone	Sampling Schedule ¹		Responsible Entity ²
			Annual	Biennial	
Columbia Canal Company	Garcia-3	D	EC/TDS	Irr. Suitability	CCC
	Garcia-4	D	EC/TDS	Irr. Suitability	CCC
	Garcia-5	D	EC/TDS	Irr. Suitability	CCC
	Snyder	D	EC/TDS	Irr. Suitability	CCC
B&B Ranch	Mowry Diesel	D	EC/TDS	Irr. Suitability	CCC
Newhall Land & Farming	W-32	D	Irr. Suitability/Se	-	NLF
	W-42	D	Irr. Suitability/Se	-	NLF
	W-53	D	Irr. Suitability/Se	-	NLF
	W-74	D	Irr. Suitability/Se	-	NLF
	W-78	D	Irr. Suitability/Se	-	NLF
	W-89	D	Irr. Suitability/Se	-	NLF
	W-91	D	Irr. Suitability/Se	-	NLF
	W-94	D	Irr. Suitability/Se	-	NLF
	W-95	D	Irr. Suitability/Se	-	NLF
	MW-1	D	Irr. Suitability/Se	-	NLF
	MW-2	S	Irr. Suitability/Se	-	NLF
	MW-3	S	Irr. Suitability/Se	-	NLF
	MW-4	S	Irr. Suitability/Se	-	NLF
	MW-5	S	Irr. Suitability/Se	-	NLF
Spreckels Sugar Co.	MW-1	S	Gen. Min./TE/Ba	-	SSC
	MW-2	S	Gen. Min./TE/Ba	-	SSC
	MW-3	S	Gen. Min./TE/Ba	-	SSC
	MW-4	S	Gen. Min./TE/Ba	-	SSC
	MW-5	S	Gen. Min./TE/Ba	-	SSC
	MW-6	S	Gen. Min./TE/Ba	-	SSC
	MW-7	D	Gen. Min./TE/Ba	-	SSC
	MW-8	D	Gen. Min./TE/Ba	-	SSC
	MW-9	S	Gen. Min./TE/Ba	-	SSC
	MW-10	D	Gen. Min./TE/Ba	-	SSC
	MW-11	D	Gen. Min./TE/Ba	-	SSC
	MW-12	D	Gen. Min./TE/Ba	-	SSC
	MW-13	S	Gen. Min./TE/Ba	-	SSC
	MW-14	D	Gen. Min./TE/Ba	-	SSC
	MW-15	S	Gen. Min./TE/Ba	-	SSC
	MW-16	D	Gen. Min./TE/Ba	-	SSC
	MW-17	S	Gen. Min./TE/Ba	-	SSC
	MW-18	S	Gen. Min./TE/Ba	-	SSC
	MW-19	S	Gen. Min./TE/Ba	-	SSC
	MW-20	S	Gen. Min./TE/Ba	-	SSC
	MW-21	S	Gen. Min./TE/Ba	-	SSC
	MW-22	D	Gen. Min./TE/Ba	-	SSC
	MW-23	S	Gen. Min./TE/Ba	-	SSC
	MW-24	S	Gen. Min./TE/Ba	-	SSC
	MW-25	S	Gen. Min./TE/Ba	-	SSC
	MW-26	S	Gen. Min./TE/Ba	-	SSC
	MW-27	S	Gen. Min./TE/Ba	-	SSC

Table B-4. Groundwater Quality Monitoring Network

Owner	Well ID	Depth Zone	Sampling Schedule ¹		Responsible Entity ²
			Annual	Biennial	
Spreckels Sugar Co.	MW-28	S	Gen. Min./TE/Ba	-	SSC
	MW-29	S	Gen. Min./TE/Ba	-	SSC
	MW-30	S	Gen. Min./TE/Ba	-	SSC
	MW-31	S	Gen. Min./TE/Ba	-	SSC
	MW-32	S	Gen. Min./TE/Ba	-	SSC
	PW-1	D	Gen. Min./TE/Ba	-	SSC
	PW-4	D	Gen. Min./TE/Ba	-	SSC
	PW-6	D	Gen. Min./TE/Ba	-	SSC
	PW-7	D	Gen. Min./TE/Ba	-	SSC
	PW-8	D	Gen. Min./TE/Ba	-	SSC
	PW-9	D	Gen. Min./TE/Ba	-	SSC
	PW-10	D	Gen. Min./TE/Ba	-	SSC
	PW-11	D	Gen. Min./TE/Ba	-	SSC
City of Mendota	No. 3	D	Gen. Min./TE	-	City
	No. 5	D	Gen. Min./TE	-	City
	No. 7	D	Gen. Min./TE	-	City
	No. 8	D	Gen. Min./TE	-	City
	No. 9	D	Gen. Min./TE	-	City
USGS	31J4	S	Complete	-	MPG
	31J5	D	Complete	-	MPG
Meyers Farming	S-1	S	Complete	-	MPG
	S-2	S	Complete	-	MPG
	S-3	S	Complete	-	MPG
	P-1	S	Complete	-	MPG
	P-4	S	Complete	-	MPG
	MF-1	S	Gen. Min./TE	-	MF
	MF-2	S	Gen. Min./TE	-	MF
	MF-3	S	Gen. Min./TE	-	MF
	MF-4	S	Gen. Min./TE	-	MF
	MF-5	S	Gen. Min./TE	-	MF
	MF-6	S	Gen. Min./TE	-	MF
	MF-7	S	Gen. Min./TE	-	MF
	MF-8	S	Gen. Min./TE	-	MF
	MF-9	S	Gen. Min./TE	-	MF

1. Gen. Min. = general minerals; typically consists of anions (sulfate, chloride, bicarbonate, alkalinity, nitrate, and fluoride) and cations (calcium, magnesium, sodium, potassium, boron, copper, iron, manganese, and zinc), EC/TDS, and pH.

EC/TDS = electrical conductivity, total dissolved solids

Irr. Suitability = Irrigation Suitability; typically includes general minerals and sodium adsorption ratio.

TE = trace elements; typically includes arsenic, molybdenum, and selenium. Barium is also included for certain samples.

Complete = includes general minerals and trace elements.

2. MPG = Mendota Pool Group, CCID = Central California Irrigation District, NLF = Newhall Land & Farming,
CCC = Columbia Canal Company, SSC = Spreckels Sugar Co., City = City of Mendota,
MF = Meyers Farming

Table B-5. Analytical Methods and Detection Limits for Water Quality Analyses

Analyte	Lab ¹	Type ²	Value	Units	Method
Arsenic	FGL	PQL	2	mg/L	200.8
Bicarbonate	FGL	PQL	10	mg/L	2320B
Boron	FGL	PQL	0.05	mg/L	200.7
Calcium	FGL	PQL	1	mg/L	200.7
Carbonate	FGL	PQL	10	mg/L	2320B
Chloride	FGL	PQL	1	mg/L	300.1
Copper	FGL	PQL	10	mg/L	200.7
Fluoride	FGL	PQL	0.1	mg/L	300.1
Hydroxide	FGL	PQL	10	mg/L	2320B
Iron	FGL	PQL	50	mg/L	200.7
Magnesium	FGL	PQL	1	mg/L	200.7
Manganese	FGL	PQL	10	mg/L	200.7
Molybdenum	OBL	DL	1	µg/L	ICP OES
Nitrate	FGL	PQL	0.1	mg/L	4500NO3F
Nitrite as N	FGL	PQL	0.1	mg/L	300.0
Potassium	FGL	PQL	1	mg/L	200.7
Selenium	OBL	DL	0.4	µg/L	AFS
Sodium	FGL	PQL	1	mg/L	200.7
Electrical Conductivity	FGL	PQL	1	µmhos/cm	2510B
Sulfate	FGL	PQL	1	mg/L	300.0
Total Alkalinity (as CaCO ₃)	FGL	PQL	10	mg/L	2320B
Total Dissolved Solids	FGL	PQL	40	mg/L	2540
Total Hardness	FGL	PQL	2.5	mg/L	200.7
Zinc	FGL	PQL	20	mg/L	200.7

1. Laboratories planned to be used in 2003. The MPG may elect to use other laboratories that meet or exceed the data quality objectives.

FGL = Fruit Growers Laboratory, Santa Paula, CA; OBL = Olson Biochemistry Laboratories, Brookings, SD

2. DL = Detection Limit, PQL = Practical Quantitation Limit

Table B-6. Surface Water Quality Monitoring Network

Sample Location	Grab Sampling ¹				Continuous Logging Analysis and Entity ³
	Semi-Annual	Entity ²	Monthly	Entity ²	
Columbia Canal	Irr. Suit., As, Mo, Se	MPG	EC, B, Se	SJREC	EC (SJREC)
Mendota Dam	Irr. Suit., As, Mo, Se	MPG	-	-	-
CCID Main Canal	Irr. Suit., As, Mo, Se	MPG	EC, B, Se EC, Se	SJREC USBR	EC (SJREC) & B, Se (USBR)
Mowry Bridge	Irr. Suit., As, Mo, Se	MPG	-	-	-
Delta-Mendota Canal (at Bass Avenue, Check 21)	Irr. Suit., As, Mo, Se	MPG	Irr. Suit. EC, Se	MPG USBR	EC, B, Se (USBR)
CCID Outside Canal	Irr. Suit., As, Mo, Se	MPG	EC, B, Se EC, Se	SJREC USBR	EC (SJREC)
Firebaugh Intake Canal	Irr. Suit., As, Mo, Se	MPG	EC, B, Se	SJREC	EC (SJREC)
West of Fordel	Irr. Suit., As, Mo, Se	MPG	-	-	-
Etchegoinberry	Irr. Suit., As, Mo, Se	MPG	-	-	-
Mendota Wildlife Area ⁴	Irr. Suit., As, Mo, Se	MPG	Irr. Suit.	MPG	EC (MPG)
James ID Booster Plant	Irr. Suit., As, Mo, Se	MPG	Irr. Suit.	MPG	EC (JID)
Tranquillity ID Intake	Irr. Suit., As, Mo, Se	MPG	-	-	-
Lateral 6&7	Irr. Suit., As, Mo, Se	MPG	Irr. Suit.	MPG	-

1. Irr. Suit. = Irrigation Suitability; typically includes general minerals and sodium adsorption ratio.

EC = electrical conductivity, As = arsenic, B = boron, Mo = molybdenum, Se = selenium

2. MPG = Mendota Pool Group, USBR = U.S. Bureau of Reclamation, SJREC = San Joaquin River Exchange Contractors

3. USBR collects daily composite samples with automated equipment. Samples are picked up once a week.

JID = James Irrigation District

4. Approximately one mile south of Whites Bridge.

Table B-7. Sediment Quality Monitoring Network

Sample Location	Sediment Sampling Frequency	Analyses¹	Monitoring Entity
Columbia Canal	Annual	As, B, Mo, Se, EC, TOC, CEC, GSD, pH	MPG
Mendota Dam	Annual	As, B, Mo, Se, EC, TOC, CEC, GSD, pH	MPG
Delta-Mendota Canal	Annual	As, B, Mo, Se, EC, TOC, CEC, GSD, pH	MPG
Firebaugh Intake Canal	Annual	As, B, Mo, Se, EC, TOC, CEC, GSD, pH	MPG
Etchegoinberry	Annual	As, B, Mo, Se, EC, TOC, CEC, GSD, pH	MPG
Mendota Wildlife Area ²	Annual	As, B, Mo, Se, EC, TOC, CEC, GSD, pH	MPG
James ID Booster Plant	Annual	As, B, Mo, Se, EC, TOC, CEC, GSD, pH	MPG
Lateral 6&7	Annual	As, B, Mo, Se, EC, TOC, CEC, GSD, pH	MPG

1. As = arsenic, B = boron, Mo = molybdenum, Se = selenium, EC = electrical conductivity,

CEC = cation exchange capacity, GSD = grain size distribution

(fraction of sands, silts and clays in the sediment sample)

2. Approximately one quarter mile south of Whites Bridge.

Table B-8. Analytical Methods and Detection Limits for Sediment Quality Analyses

Analyte	Lab ¹	Limit ²	Value	Units	Method
Arsenic	CAS	lowest MRL	0.9	mg/kg	7060A
Boron	CAS	lowest MRL	9	mg/kg	6010B
Cation Exchange Capacity	CAS	MRL	0.2-0.4	meq/100g	7770
Molybdenum	CAS	MRL	1.8	mg/kg	6010B
Selenium	CAS	lowest MRL	1.8	mg/kg	7740
Electrical Conductivity	CAS	MRL	2	umhos/cm	OSU
Total Organic Carbon	CAS	MRL	0.05	%	ASTM D4129-82M
Grain Size Distribution	CAS		0.01	%	ASTM D422

1. Laboratory planned to be used in 2003. The MPG may elect to use other laboratories that meet or exceed the data quality objectives.

CAS = Columbia Analytical Services, Kelso, WA.

2. MRL = Method Reporting Limit; MDL = Method Detection Limit

ATTACHMENT 1.

SAMPLE COLLECTION AND QUALITY CONTROL PROCEDURES FOR WATER AND SEDIMENT SAMPLES

The following sections present recommended sample collection and field and laboratory quality control (QC) procedures for collection and analysis of water (including surface and groundwater) and sediment samples for the Mendota Pool monitoring program. Following these procedures will ensure data quality and data usability.

SAMPLE COLLECTION PROCEDURES

Surface water, groundwater, and sediment samples will be collected and analyzed for various constituents as described in this Appendix and summarized in Tables B-4, B-6, and B-7. Analytical methods and required detection limits are summarized in Tables B-5 and B-8.

SURFACE WATER AND SEDIMENT SAMPLING

Sampling equipment for surface water sample collection includes a non-disposable bailer or bucket for purposes of collecting grab samples. The surface water sampling equipment is rinsed between locations with laboratory-quality water (i.e., potable water that is chemically characterized to ensure the rinse water does not effect the results of trace level analyses for such constituents as selenium; this water is not chlorinated).

Sediment samples are collected from a boat using an Ekman dredge. Sediment for analysis is collected from the top 2 cm of the sediment collected by the dredge. Multiple deployments of the dredge may be necessary to obtain sufficient samples for each replicate. Sampling equipment is washed and rinsed with laboratory-quality water between each replicate.

GROUNDWATER PURGING AND SAMPLING

Groundwater samples are most often collected from water supply wells that are equipped with permanent pumping equipment. Some wells in the water quality monitoring program have been constructed specifically for monitoring purposes and are small-diameter wells completed to varying depths, ranging from near or at the water table to below the Corcoran Clay. These wells are sampled with portable submersible pumping equipment, except for the Spreckels Sugar Co. monitoring wells, which are equipped with permanent submersible pumps.

Prior to sampling a well, the well is purged to remove groundwater that has been in the casing. While there is a gradient that moves groundwater through the well structure where the well is perforated, the quality of the water in the casing is subject to changes in composition due to atmospheric exposure and other factors. Purging typically includes the removal of three casing volumes of water prior to sample collection, but there are many additional factors that can be considered when determining whether sufficient purging has occurred. The best approach to making this determination is by monitoring the stabilization

of a few simple water quality parameters during purging operations. Typically, at least three indicator parameters are measured including electrical conductivity (EC), pH, and temperature. Discharge water is collected in a beaker (with a volume of about 0.5 liter) to allow measurement with a portable field meter. Depending upon the field instrumentation, all three parameters (EC, pH and temperature) can be measured simultaneously. The field instrument is calibrated daily in accordance with the procedures specified in the instrument's manual.

When wells are sampled on behalf of the MPG, the indicator readings and field observations are recorded on a field data sheet. In addition to indicator parameter measurements, other measurements are periodically recorded, including measurement time and pumping rate (primarily to track the volume of water removed during purging operations); pumping water level measurements are sometimes recorded, but are not necessary for the purposes of this project. The field observations include turbidity (particulate matter) measurements, which are particularly useful when evaluating trends in total metals concentrations because samples collected from supply wells or monitoring wells that have variable turbidity depending upon well construction, use, or other factors may influence the observed total metals/trace elements concentrations. In the absence of a field meter to quantify turbidity, visual observation and field notations are helpful for identifying atypical groundwater conditions. The sampler will note whether the water is clear or cloudy (turbid) at the outset of purging operations and whether the water clears during purging operations (the degree of clarity when purging operations are complete should be noted).

As indicated above, portable submersible pumps are used to sample many of the monitoring wells. Because the focus of the sampling program is primarily on salinity and associated constituents and selected trace elements, purging operations are sufficient to remove residual water from the pump and tubing that remained from the previously sampled well. No other special cleaning operations are required.

Samples collected from water supply wells in the network that have been idle prior to a sampling event have similar purging requirements to those described above. Sampling events for water supply wells are preferably coordinated with the pumping period, so purging becomes less necessary and sampling can be expedited. It is important that the well identification be noted (well clusters have in the past resulted in questionable data sources). It is also important that the samples be collected at the wellhead to the extent possible. If the sampling point is located away from the wellhead, care should be taken to ensure that the sampling point (spigot, tubing, pipe, etc.) has been flushed with the water to be sampled and that field parameters are measured and turbidity measured and/or noted.

Purging is conducted until field parameters stabilize. Stabilization is defined as three consecutive readings at 5-minute intervals where parameters do not vary by more than 5 percent. If parameters have not sufficiently stabilized, purging should continue. The sampling and purging data collected as part of the project provide a useful indication of purging requirements for future sampling events. Unless extraordinary circumstances are encountered, not more than ten casing volumes will be purged. Monitoring well samples will be collected while pumping at a slow rate (less than 0.1 gpm).

CONTAINERS AND PRESERVATION

Sample containers and preservation for metals analyses (including selenium and molybdenum) are summarized in Table 1. Due to the potential of contaminating the samples with boron from borosilicate glass, at no time should water or sediment samples contact glass, glass wool, or filter materials containing glass.

Table 1. Required Sample Containers, Preservation, and Holding Times for Water and Sediment Samples

<u>ANALYTE</u>	<u>SAMPLE MATRIX</u>	<u>CONTAINER</u>	<u>PRESERVATIVE</u>	<u>HOLDING TIME^a</u>
Metals, Total	Water	P/G	Add HNO ₃ to pH<2	6 months
Cations	Water	P/G(B)	Refrigerate	24 hours (regulatory: 14 days)
Anions	Water	P	None or refrigerate at 4°C	28 days
Electrical Conductivity	Water	P/G	Refrigerate	28 days
Total Dissolved Solids (TDS)	Water	P/G	Refrigerate	7 days (regulatory: 2 days)
pH	Water	P/G	Analyze immediately	24 hours
Hydroxide	Water			
Nitrite as N	Water	P/G	Analyze as soon as possible or	None (regulatory: 48 hours)
Total hardness	Water	P/G	Add HNO ₃ to pH<2	6 months
Metals, Total	Sediment	P/G	Cool, 4°C	6 months
Grain Size	Sediment	P/G	Cool, 4°C	6 months
Electrical Conductivity	Sediment	P/G	Refrigerate	28 days
Cation Exchange Capacity	Sediment			
Total Organic Carbon (TOC)	Sediment	P/G	Cool, 4°C	28 days

Notes:

1. P = Polyethylene
2. G = Glass
3. G(B) = Glass/borosilicate

QUALITY CONTROL PROCEDURES

The following sections present recommended field and laboratory QC checks for the sampling and analysis activities. A discussion of field QC samples, frequency of collection, and acceptance criteria is included. A discussion of laboratory QC samples and analyses follows.

FIELD QC SAMPLES

The recommended type and frequency of field QC samples to be collected are summarized in Table 2 and described below.

FIELD (SOURCE WATER) BLANKS

Field blanks are samples of the water source (laboratory-quality water) used for decontamination. This blank is used to monitor for potential contaminants introduced from the water source used to rinse equipment during field sampling activities. Due to the low level target values established as Refuge Water Quality Objectives by CDFG, these blanks are considered important for evaluation of the surface water quality results in order to ensure that the rinse water does not contain levels of the target compounds that would result in nonrepresentative grab samples and apparent exceedance of established target concentrations. Field blanks will not be collected for groundwater quality samples.

Typically, at least one sample for each source of water or one field blank per lot number of laboratory-quality water for a specified event will be collected and analyzed for the same parameters as the corresponding field environmental samples.

DUPLICATE (BLIND) FIELD SAMPLES

Blind duplicate field samples are collected to monitor the precision of the field sampling process. Duplicates will be collected for surface water and groundwater samples; they will not be collected for sediment samples because the inherent variability of those samples precludes obtaining a true duplicate. The true identity of the duplicate sample is not noted on the chain of custody form, rather a unique identifier is provided. It is recommended that blind duplicates be collected from at least 5 percent of the total number of sample locations (i.e., a duplicate sample would be collected from one of the thirteen surface water sampling stations during each event and approximately four samples would be collected in duplicate from the wells sampled by the MPG during any one sampling year). It is best to choose locations that are known or suspected to contain moderate levels of the analytes of interest so that detected levels can be compared for precision.

The identities of the duplicate samples are recorded in the field-sampling logbook, and this information is forwarded to the data quality evaluation team to aid in reviewing the data quality. The sources (locations) of the blind field duplicates will not be revealed to the laboratory. Each blind field duplicate sample will have a unique sample identification number on the chain of custody form sent to the laboratory such that the laboratory cannot determine its source.

Table 2. Field QC Samples For Precision and Accuracy

Type of QC Sample	Frequency
Equipment rinsate blank – Total metals	1 per surface water sampling event
Field (rinse water source) blank	1 per rinse water source
Field “blind” duplicate	5 percent of samples collected per event (i.e., 1 for each sw sampling event and about 4% for the groundwater sampling conducted during the year by the MPG)

Note: Duplicates to be collected from surface water and groundwater samples only. The inherent variability of sediment samples precludes obtaining a true duplicate sample for assessment of precision.

LABORATORY QUALITY CONTROL REQUIREMENTS

Laboratory Responsibilities

The laboratory should report quality control data with each analytical batch or sample delivery group, which is not to exceed 20 samples. At a minimum, the laboratory should analyze and report results for a method or procedural blank, a laboratory duplicate, a laboratory control spike for selected analytes (particularly for trace elements with low-level detection limits), and each sample delivery group. These results should be reported with the sample results, and the QC data sheets or the report narrative should include the acceptance criteria for these analyses. Before the laboratory releases each data package, the laboratory must carefully review the sample and laboratory performance QC data to verify sample identity and also the completeness and accuracy of the sample and QC data. An explanation of any QC data that do not meet acceptance criteria and any corrective actions taken by the laboratory should be included in the data report.

Review of Laboratory Data Reports

Data validation should include a data completeness check of each data package and a thorough review of all laboratory reporting forms. Specifically, this review should include:

- Review of data package completeness;
- Review of the required reporting summary forms to determine if the QC requirements were met and to determine the effect of exceeded QC requirements on the precision, accuracy, and sensitivity of the data;
- Review of the overall data package to determine if contractual requirements were met;

- Review of additional quality assurance (QA) and QC parameters, such as field blank contamination, to determine technical usability of the data; and
- Application of standard data quality qualifiers to the data.

In addition, each data validation should include a comprehensive review of the following QA/QC parameters as indicated in the National Functional Guidelines:

- Holding times (to assess potential for degradation that would affect accuracy);
- Blanks (to assess contamination for all compounds);
- Internal Standards (to assess method accuracy and sensitivity);
- Target Compound Identification;
- Compound Reporting Limits and Method Detection Limits (to assess sensitivity as compared to project-specific requirements).

Data validation is partially based on best professional judgment. In order to achieve consistent data validation, data worksheets should be completed for each data validation effort. A data review worksheet is a summary form on which the data reviewer records data validation notes and conclusions specific to each analytical method. The worksheets will help the reviewer to track and summarize the overall quality of the data. Sample results will then be qualified as appropriate, following EPA protocols. Samples that do not meet the acceptance limit criteria will be indicated with a qualifying flag, which is a one or two-letter abbreviation that indicates a problem with the data (Table 3).

Table 3. Data Validation Qualifiers

Qualifier	Explanation of Qualifier
U	The compound was analyzed for, but was not detected above, the reported method detection limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
UJ	The analyte was not detected above the reported method detection limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
B	The analyte was positively identified; the reported concentration is greater than the instrument detection limit but less than the QA Project Plan specified Reporting Limit.