

Section J

Data Management

Section J – Data Management

J.1 Introduction

Data management is a regional effort amongst stakeholders to measure and report accurate information. Data Management plays a significant role in the implementation the IRWM Plan. Data management includes all activities that further the knowledge and ability to describe the Tule River Basin region (see Section C – Region Description), to capture changes in the region over time, and to monitor Plan performance. As an activity of the IRWM Plan implementation, the RWMG understands the importance of data management when used for assessing progress in water resources management and reporting progress of management activities to the region’s stakeholders.

This section of the IRWM Plan is developed to address the Data Management Standards of the California Department of Water Resources’ Guidelines for Integrated Regional Water Management Plans, dated July 2016. According to these standards an IRWM Plan must:

“describe the process of data collection, storage, and dissemination to IRWM participants, stakeholders, the public, and the State. Data in this standard may include, but is not limited to technical information such as designs, feasibility studies, reports, and information gathered for a specific project in any phase of development including the planning, design, construction, operation, and monitoring of a project.”

The guidelines also provide an overview of the minimum requirements for the Data Management Section of an IRWM Plan:

1. A brief overview of the data needs within the IRWM region
2. A description of typical data collection techniques
3. A description of how stakeholders contribute data to DMS
4. The entity responsible for maintaining data in the DMS
5. A description of the validation or quality assurance/quality control measures that will be implemented by the RWMG for data generated and submitted for inclusion into the DMS
6. An explanation of how data collected for IRWM project implementation will be transferred or shared between members of the RWMG and other interested parties throughout the IRWM region, including local, State, and federal agencies
7. An explanation of how the DMS supports the RWMG’s efforts to share collected data
8. An outline of how the data saved in the DMS will be distributed and remain compatible with State databases including CEDEN, Water Data Library (WDL), and CASGEM.

J.2 Data Needs within the IRWM Region

A variety of high quality data is needed to adequately manage and monitor water resources on a regional scale. This section will describe the data needed, the source of the data, how it is collected, and it's applicability for upload to a state or federal database system. The most significant statewide databases pertaining to water management planning include:

- California Environmental Data Exchange Network – CEDEN is a network designed to facilitate integration and sharing of environmental data collected by a variety of participants. Templates to submit data to CEDEN are available on the CEDEN website: <http://www.ceden.org>.
- Water Data Library (WDL) – The Department of Water Resources maintains the State's WDL which stores data from various monitoring stations. A variety of data is available in the WDL, including groundwater level wells, water quality stations, surface water stage and flow sites, rainfall/climate observers, and well logs. Information regarding the WDL can be found at: <http://wdl.water.ca.gov/>.
- California Statewide Groundwater Elevation Monitoring Program – Water Code §10920 et seq. establishes a groundwater monitoring program requiring the monitoring and reporting of groundwater elevations in all or part of a basin or sub-basin. Requirements of the CASGEM Program can be found at the following link: <http://www.water.ca.gov/groundwater/casgem/>.
- Surface Water Ambient Monitoring Program – The State Water Resources Control Board enforces and establishes standards for SWAMP. Under SWAMP, any group collecting or monitoring surface water quality data, using funds from Propositions 13, 40, 50, 84 and 1 must report such data to the SWAMP database. More information on SWAMP is available at the following link: http://www.swrcb.ca.gov/water_issues/programs/swamp.
- Groundwater Ambient Monitoring and Assessment program – The Groundwater Ambient Monitoring and Assessment (GAMA) Program is a groundwater quality monitoring program established by the State Water Resources Control Board. The stated mission of GAMA is to “provide data, information, and tools to enable the public and decision makers to better assess groundwater quality and quantity.

J.3 Current Data Programs and Data Collection Techniques

J.3.1 Groundwater Elevations

Data on groundwater levels are used to evaluate groundwater movement and storage conditions. Groundwater contour maps showing lines of equal elevation of the groundwater surface indicate the direction of groundwater movement and also can be used to develop estimates of groundwater flow entering or leaving the management area. Maps of depth to groundwater can provide insight into the distribution of pumping lifts and resultant energy cost for extraction. Maps showing changes in groundwater levels, when used in conjunction with data on specific yield, can also be used to estimate changes in groundwater storage.

The member districts of the DCTRA regularly measure groundwater levels in approximately 300 wells. These wells are shown on Appendix F: Well Location Map. Measurements are taken twice a year, once in the Spring (February) and again in the Fall (October). The current monitoring networks will be maintained or enhanced to assure the availability of sufficient data for the preparation of groundwater level and depth

contour maps. Measurement of groundwater levels will continue to be performed twice a year in order to show seasonal variations.

In addition to the wells measured by the DCTRA members, additional groundwater data is collected from readily available sources such as the Tulare County and the Department of Water Resources. Although this data does not have the consistency and standardization of the wells measured by the member districts, this data is used for analyzing overall trends in groundwater levels. The DCTRA Annual Report summarizes both the historical and current groundwater trends within the Basin, based upon data collected and made available each year.

J.3.2 Stream Flow

Stream flow data is used to evaluate surface water supplies and support flood protection activities. The two major streams in the region are Deer Creek and the Tule River. Both streams are monitored by USGS through the USGS National Streamflow Information Program (NSIP), which operates and maintains approximately 7,500 stream gauges. The data provided by these gauges is accurate and unbiased. USGS stream gauges are located at the outlets of both Deer Creek and the Tule River and measure streamflow from their respective accounting units in real time. Measurements are often made by depth and flow using a staff gauge and known relationship between water depth and channel flow.

J.3.3 Precipitation, Weather, and Climate Change

Precipitation and weather data is used to evaluate water supply, flood risk, evapotranspiration rate, and agricultural applied water demand. Precipitation and weather data is collected through the California Irrigation Management Information System (CIMIS), which is a program under the California Department of Water Resources. The CIMIS program consists of a network of over 145 automated weather stations in California. CIMIS weather stations collect and report precipitation and climate data on a minute-by-minute basis and are considered to be highly accurate. The IRWMP area contains one CIMIS station, which is located approximately one mile east of the City of Porterville.

Climate Change projections for the region were taken from Cal-Adapt, a web-based climate adaption planning tool under the California Energy Commission. This report utilized information on projected wildfire risk, annual high temperature, and inches of precipitation per decade. More detailed information regarding the use of this data is available in Section L – Technical Analysis. Although all climate projections have a degree of uncertainty, data presented in Cal-Adapt represents the best science available to predict local climate change impacts.

J.3.4 Reservoir Storage and Release Flows

Success Reservoir is the primary water reservoir related to the IRWMP region and provides flood control and surface water storage to the IRWMP region. Success Reservoir controls run-off from snow melt and precipitation during the flood season. After the flood season, the captured run-off can be released to satisfy the water demands of downstream districts.

The U.S. Army Corps of Engineers owns and operates Success Reservoir and is agency responsible for measuring storage capacity and monitoring surface water levels and release flows. Reservoir storage is usually calculated based on the depth at the dam or discharge point. Release flows are measured through flow depth or flow meters in discharge pipelines. Surface water levels and release flows are measured daily and the data is considered to be highly reliable.

J.3.5 Point and Non-Point Pollution Discharge

As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) requires all persons or agencies discharging pollutants from a point source into any waters of the United States to obtain a NPDES permit or a Waste Discharge Requirement from the Regional Water Quality Control Board (RWQCB). Permit holders must monitor and report on the following discharge parameters:

- Flow
- Pollutants listed in the terms of the permit conditions
- Pollutants that could have a significant impact on the quality of the receiving streams
- Pollutants specified as subject to monitoring by EPA regulations
- Other pollutants for which the EPA requests monitoring in writing

Each of these monitoring parameters must be measured at the frequency specified in the NPDES permit, WDR, or at intervals sufficiently frequent to yield data that would characterize the nature of the discharge. EPA conducts inspections of facilities subject to the regulations to determine compliance.

J.3.6 Groundwater Quality

Monitoring of groundwater quality provides the information required to determine the suitability of groundwater for various beneficial uses. Compiled groundwater quality data for the Plan area does not currently exist. The DCTRA participants will develop protocols to obtain groundwater quality data from readily available regulatory agencies that collect this data from domestic water providers, farmers, and dairies. Currently data from the community water systems within the basin is collected through the Consumer Confidence Reports. Other additional data that is readily available will be analyzed and reported within the Annual Report each year.

The sampling of the DCTRA participant wells will be expanded, if needed, to provide sufficient data to allow identification of areas where water quality is of concern. Supplemental sampling may also be performed to better define localized areas of impaired water quality. Testing will typically include standard agricultural type analysis, but may also include additional constituents as required. The current strategy is to continue to find other sources of readily available data to begin monitoring yearly trends in groundwater quality throughout the Basin.

J.3.7 Surface Water Quality

Water Quality measurements in surface waters assess environmental and human health risks over time. The IRWMP region has three main sources of surface water supply, the Tule River, Deer Creek, and the Central Valley Project. Imported surface water from the Central Valley Project generally originates in the San Joaquin River watershed (Friant-Kern Canal). The Friant-Kern Canal is monitored annually by Reclamation District 770, and by the Terra Bella Irrigation District at irregular intervals.

Tule River and Deer Creek are local surface water sources and their quality is monitored by several agencies. The Tule River is monitored annually by Reclamation District 770 and seasonally by the Tule River Association. The San Joaquin Valley Water Quality Coalition monitors both the Tule River and Deer Creek at irregular intervals through an ILRP Waiver Program.

J.3.8 Land Use and Population

Land use monitoring refers to the deliberate action of collecting data on land use over time as part of an overall effort to understand the region and what changes might be affecting managed water resources. Local jurisdiction Planning departments and the State Department of Finance harvest and create land use and population data for use in making land use policy decisions.

Population data comes from U.S. Census data. Historical data is used to identify trends in population distribution. Population data is used to estimate future water demand and calculate per capita water use.

J.3.9 Agricultural Water Demand

Agricultural water demand is a major component of water management in the IRWMP area. Agricultural water demand values were taken from the Agricultural Water Management Plans of each district within the region. Under the 2009 Water Conservation Act, agricultural water suppliers with more than 25,000 irrigated acres are required to develop a water management plan. In doing so, each district calculates water demand using crop type, crop acreage, and precipitation/weather data.

Because most wells within the region are privately owned, data on the actual quantity of water extracted is difficult to obtain. The values presented in Agricultural Water Management Plans represent approximate water demand based on all known factors.

J.3.10 Urban Water Demand

The primary source of data regarding urban water demand came from the Porterville Urban Water Management Plan, as the City of Porterville is the only urban water management planning area within the IRWMP boundary. This water management district is 100% metered, so the reported water use data is considered highly accurate. Water Meters are read monthly in normal water years and more frequently in drought years.

J.4 Regional Data Management System

The DCTRA currently maintains a database in which is contained information necessary to support operating the numeric groundwater model and in preparation of the various reports which it currently publishes including the Annual Groundwater Management Reports, the annual update to and five-year Water Management Plans required under Friant Division, CVP member units' contracts with the U.S. Bureau of Reclamation and publication of the various reports associated with the Tule River Association. The following data is contained and maintained in the regional data management system:

- Groundwater Levels
- Groundwater Quality
- Precipitation
- Subsidence
- Surface Water Quality
- Surface Water Quantity

In addition to this database, a complete water quality database related to surface water is maintained. Constituents monitored within that program are listed below. Both the contents of and the parameters contained within these databases are updated frequently. Water level information, for instance, is updated at least semiannually and water quality information is updated monthly, when flows are present at the monitoring locations.

- | | | |
|--------------------------|------------------|------------------------|
| • Flow | • Cyanazine | • Disulfoton |
| • EC | • Simazine | • Malathion |
| • pH | • Methamidophos | • Methidathion |
| • Temperature | • DDE | • Parathion, methyl |
| • Dissolved Oxygen | • DDT | • Phorate |
| • TDS | • DDD | • Phosmet |
| • Turbidity | • Dicofol | • Glyphosate |
| • Nitrate + Nitrate as N | • Dieldrin | • Paraquat |
| • Orthophosphate-P | • Endrin | • Trifluralin |
| • Ammonia-N | • Aldicarb | • TSS |
| • Unionized Ammonia | • Carbaryl | • E. coli |
| • TKN | • Carbofuran | • Fecal Coliform |
| • Phosphorus | • Diuron | • Toxicity, minnow |
| • Arsenic | • Linuron | • Toxicity, water flea |
| • Boron | • Methiocarb | • Toxicity, alga |
| • Cadmium | • Methomyl | • Hyalella Azteca |
| • Copper | • Oxymyl | • Grain Size |
| • Lead | • Azinphosmethyl | • Bifenthrin |
| • Nickel | • Methoxychlor | • Cyfluthrin |
| • Selenium | • Chlorpyrifos | • Cypermethrin |
| • Zinc | • Demeton-S | • Esfenvalerate |
| • Molybdenum | • Diazinon | • Fenprothrin |
| • Hardness | • Dichlorvos | • Lamba cyhalothrin |
| • Atrazine | • Dimethoate | • Permethrin |

J.4.1 Data Collection

Data is generated from a number of sources. Those sources include the DCTRA itself, the Tule River Association, the Friant Water Authority, the Tule Basin Water Quality Coalition and numerous state and federal agencies with whom the DCTRA and its member units have cooperative data sharing agreements. In addition, the DCTRA has an informational sharing arrangement with both the County of Kings and the County of Tulare with respect to information available in both of their ArcView databases and, to a certain extent, in their AutoCAD databases.

J.4.2 Database Maintenance

At the current time, with the governance of the IRWMP residing with DCTRA, DCTRA assumes the responsibility and lead role position of maintaining their database. Transition is occurring between the DCTRA with respect to the maintenance of the water quality database. As acceptance of the Tule Basin Water Quality Coalition by the Regional Water Quality Control Board has occurred, the water quality database maintenance is now by said Coalition. In addition, this database will be expanded from its current format of being the repository for surface water quality data and will expand to include groundwater quality data.

J.4.3 Data Sharing

In addition to responding to Public Records Act requests, the DCTRA routinely shares all of its information with parties, upon request. Numerous requests for water level information, water management information and project related performance measurements are satisfied, upon request.

J.4.4 Interface with State Database Systems

Data is currently automatically uploaded to State databases such as the California Environmental Resources Evaluation System (CERES), to CEDEN, the Water Data Library (WDL), CASGEM, of which the DCTRA is a signator participant and the California Environmental Information Catalog (CEIC). Water quality data is currently entered into the Groundwater Ambient Monitoring and Assessment Program (GAMA) of the State Water Resources Control Board and into the Surface Water Ambient Monitoring Program (SWAMP) of the same agency. DCTRA member units have long transmitted both spring and summer groundwater elevation readings to the State Department of Water Resources, with additional readings now being introduced on a separate basis into the California Statewide Groundwater Elevation Monitoring Program (CASGEM).

J.4.5 Quality Assurance/Quality Control Measures

Quality assurance and quality control measures involve the proper collection of data in the field, and proper transfer of data as it is uploaded to electronic files and stored for future use. The data contained in the database is historical data that has been completed by industry groups, commodity groups, municipalities, and public utility districts within the Tule River Basin. The data has been collected and submitted at the level of quality required by regulatory agencies; therefor the data is considered to be

accurate and reliable. Additionally, DCTRA has developed data collection and inventory protocols and standards to increase consistency amongst users. These protocols are described below:

Protocols to Ensure Accuracy of Groundwater Level Data

- Perform all groundwater level measurements of the Plan wells in as short a time period as possible.
- Perform semi-annual groundwater measurements at the same time of the year each year (February and October).
- Document the measurement reference point for each well.
- Document the date and time of each measurement.
- Measure each well twice, or more if needed, until consistent results are obtained.
- If there is reason to suspect groundwater contamination, water level measuring equipment should be decontaminated after the measurement.
- Landowners will be contacted for permission to access their property for field measurement of their well(s).

General Protocols for the Groundwater Quality Monitoring Program Include:

- Adequate well pumping time prior to sample collection with documentation of stabilized parameters.
- Proper sample containers, preservatives, and holding time.
- Secure chain-of-custody procedures.
- Testing shall be performed by an accredited, state-certified laboratory that uses proper quality control and quality assurance procedures.
- Samples shall be given a quality assurance code, which represents the relative confidence in the sample.
- Certain tests shall include spiked, duplicate and field-blank samples for comparison to genuine samples.
- Proper handling procedures.
- Documentation of all protocols and procedures that are used.
- Uniform time of year for sampling.
- Document the name, contact information, and qualifications of the individual taking the sample.
- Landowners will be contacted for permission to access their property and sample the groundwater pumped from their well.

Monitoring and reporting methods should be updated as better technology becomes available. This will ensure that the best available information is used when making water management decisions.