7.0 BASIN MANAGEMENT PLAN ELEMENTS

This section describes the groundwater management goals developed cooperatively by basin stakeholders and the proposed monitoring features to characterize annual basin hydrology and track on-going salt and nutrient loadings and other constituents of concern in the East Subbasin. The proposed annual monitoring efforts and data analysis described in this section will provide the data needed to evaluate the effectiveness of the strategies to manage salt and nutrient loads and CECs as described in Section 10 of this SNMP report.

7.1 Groundwater Management Goals

Groundwater management goals set forth in the "Ground Water Management Plan, Santa Clara River Valley Ground Water Basin, East Subbasin, Los Angeles County" (2003) included the development of a groundwater monitoring plan. The 2003 Ground Water Management Plan (GWMP) lays out four water supply management goals for the East Subbasin. The four groundwater management goals are reproduced below:

1. Development of an integrated surface water, groundwater, and recycled water supply to meet existing and projected demands for municipal, agricultural, and other water supply since pumpage for other uses is from the same aquifer system. This objective includes agricultural small community, non-agricultural irrigation, and individual domestic uses.

2. Assessment of groundwater basin conditions to determine a range of operational yield values that will make use of local groundwater conjunctively with SWP and recycled water to avoid groundwater overdraft and the undesirable effects associated with it. A corresponding basin objective is to manage groundwater levels associated with groundwater discharge to the Santa Clara River at the west end of the basin, and thus not adversely impact surface and groundwater discharges to the downstream basins(s).

3. Preservation of groundwater quality for beneficial use in the basin, and for beneficial use of surface water and groundwater discharges from the basin. Included in this management goal will be the active characterization and solution of any groundwater contamination problems, through cooperation with responsible parties or through independent action if timely action by responsible parties is not forthcoming and the preceding management objectives are thereby impacted or constrained.

4. Preservation of interrelated surface water resources. Included in this management goal will be the maintenance of appropriate surface water flows and non-degradation of surface water quality as a result of managing groundwater conditions to meet the other management goals for the Basin.

The 2003 GWMP provides ten (10) primary elements of water management to be accomplished through implementation of the GWMP. Primary Element 1 - monitoring of groundwater levels, quality, production, and subsidence provides a framework from which to establish a groundwater monitoring program.

The elements in the 2003 GWMP which are related to a proposed groundwater monitoring plan for Salt and Nutrient Management planning include the following:

- Monitoring of groundwater levels, quality, production and subsidence,
- Monitoring and management of surface water flows and quality,
- Continuation of conjunctive use operations,
- Long-term salinity management,
- Integration of recycled water,
- Identification and management of recharge areas and wellhead protection areas, and
- Identification of well construction, abandonment and destruction policies.

With reference to the 2003 GWMP, Section 3.2.1 of the 2010 UWMP provides the following narrative:

"As part of legislation authorizing CLWA to provide retail water service to individual municipal customers, Assembly Bill (AB) 134 (2001) included a requirement that CLWA prepare a GWMP in accordance with the provisions of Water Code Section 10753, which was originally enacted by AB 3030. The general contents of CLWA's GWMP were outlined in 2002, and a detailed plan was adopted in 2003 to satisfy the requirements of AB 134. The plan both complements and formalizes a number of existing water supply and water resource planning and management activities in CLWA's service area, which effectively encompasses the East Subbasin of the Santa Clara River Valley Ground Water Basin. Notably, CLWA's GWMP also includes a basin-wide monitoring program (provided CD format as Appendix G)." The 2010 UWMP further states that the existing groundwater monitoring program will be reflected in the upcoming groundwater reporting to DWR as part of SBX7-6 implementation (CASGEM).

The intent of this Salt and Nutrient Management Plan is to provide a tool to aid in managing the water quality of the East Subbasin so as to follow the SNMP guidelines and to accomplish the overall goals of the GWMP. Specifically, characterization of salt and nutrient load sources will provide additional insight in the development of conjunctive use scenarios and potential impacts.

7.2 Recycled Water, Storm Water - Recharge Use and Objectives

7.2.1 Recycled Water Use and Objectives

Regarding recycled water use and objectives, the following information is reported in the 2010 UWMP:

1) Draft Recycled Water System Master Plans for the CLWA service area were completed in 1993 and 2002. The Program EIR for the Recycled Water Plan was certified by the CLWA Board in March 2007. Table 4-1 of the 2010 UWMP reproduced below provides a listing of the eight agencies that will participate in the implementation of the Recycled Water Master Plan.

Participating Agencies in the Recycled Water Master Plan

Participating Agencies	Role in Plan Development
Castaic Lake Water Agency	Wholesale water provider
Newhall County Water District	Retail water purveyor
Santa Clarita Water Division	Retail water purveyor
Valencia Water Company	Retail water purveyor
Los Angeles County Waterworks District No. 36	Retail water purveyor
Los Angeles County Sanitation District No. 26[20]	Recycled water supplier
Los Angeles County Sanitation District No. 32[21]	Recycled water supplier
Berry Petroleum	Potential recycled water supplier

Source: Table 4-1 of the 2010 UWMP

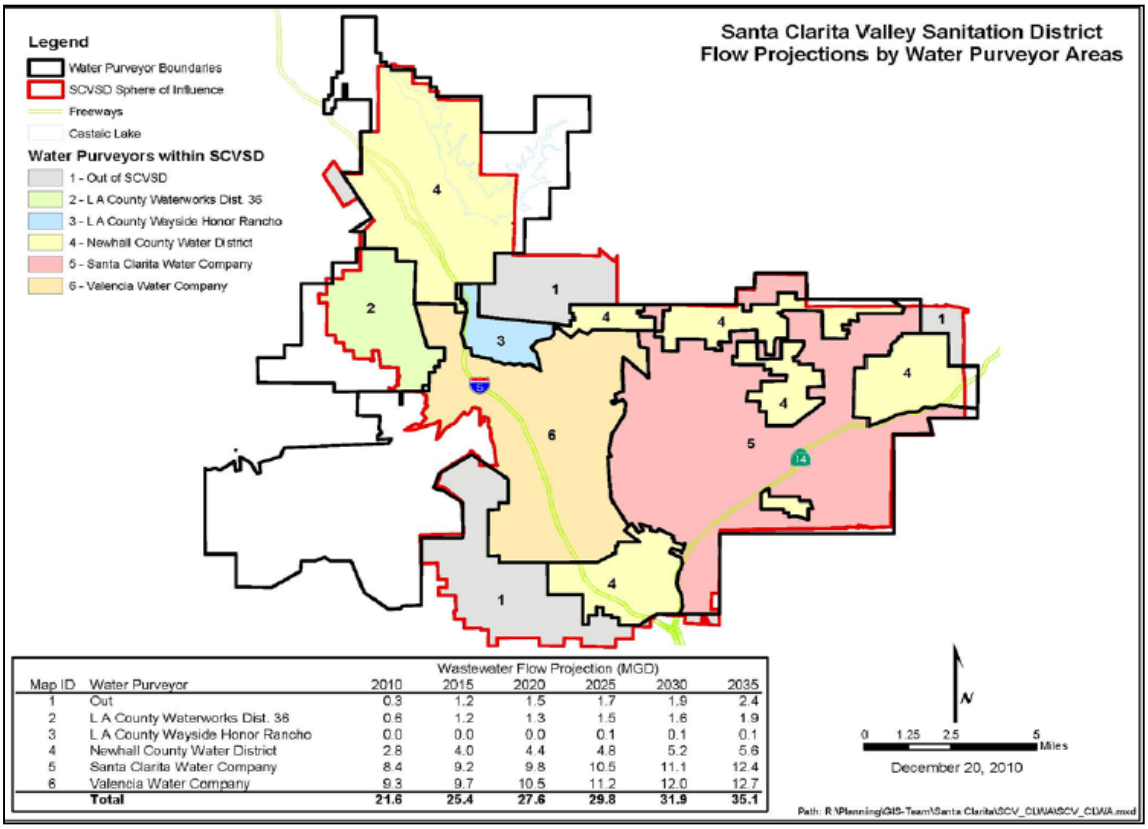
2) CLWA has constructed Phase I of the Recycled Water Master Plan, which can deliver 1,700 AFY of water to the VWC service area. However, although deliveries of recycled water began in 2003 for irrigation water supply at a golf course and in roadway median strips, by 2009, recycled water deliveries were 328 AF for that year. The current location of recycled water application along with proposed phases of distribution infrastructure for Phases 2A and 2C is shown on Figure 10.

3) According to the 2010 UWMP, the Recycled Water Master Plan along with the Newhall Ranch development is expected to ultimately recycle up to 22,800 acre-ft/year of treated (tertiary) wastewater suitable for reuse on golf courses, landscaping and other non-potable uses. CLWA completed a preliminary design report in 2009 on the second phase of the Recycled Water Master Plan (Phase 2A) that will take water from the Saugus Water Reclamation Plant (WRP) and distribute it to identified users to the north, across the Santa Clara River and then to the west and east. Customers included in the Phase 2A expansion will be Santa Clarita Central Park and the Bridgeport and River Village developments. Large irrigation customers will be served with this expansion with a collective design that will increase recycled water deliveries by approximately 500 AFY.

4) Recycled water will be further expanded with the South End Recycled Water Project (Phase 2C). VWC has initiated project design expanding the existing recycled water transmission and distribution system southerly to supply recycled water to additional customers as well as to potentially supply a source of recycled water to customers of adjacent water agencies. Phase 2C of the Recycled Plan will result in the use of approximately 910 AFY of recycled water. The project also has a proposed west branch that will extend the existing recycled water system to serve customers along the western portions of Valencia Boulevard.

As population continues to grow in the Valley, wastewater projections provided in the 2010 UWMP show an overall increase of approximately 38% from 2010 to 2035. The inset below shows the projection of wastewater flows by Purveyor in the project area for the 2010 UWMP projections period of 2010 through 2035. The current and increased treated (tertiary) wastewater is a valuable supply suitable for reuse on golf courses, landscaping and other non-potable uses, which will decrease the demand of potable water, allowing it to be used for potable water purposes.

Santa Clarita Valley Sanitation District Flow Projections by Water Purveyor Service Area



Map ID	Water Purveyor	Wastewater Flow Projection (MGD) 2010	2015	2020	2025	2030	2035
1	Out	0.3	1.2	1.5	1.7	1.9	2.4
2	L A County Waterworks Dist. 36	0.6	1.2	1.3	1.5	1.6	1.9
3	L A County Wayside Honor Rancho	0.0	0.0	0.0	0.1	0.1	0.1
4	Newhall County Water District	2.8	4.0	4.4	4.8	5.2	5.6
5	Santa Clarita Water Company	8.4	9.2	9.8	10.5	11.1	12.4
6	Valencia Water Company	9.3	9.7	10.5	11.2	12.0	12.7
	Total	**21.6**	**25.4**	**27.6**	**29.8**	**31.9**	**35.1**

Source: Figure 4-1 of the 2010 UWMP

7.2.2 Stormwater Use and Objectives

The 2010 UWMP does not address the potential for capture and recharge of stormwater within the watershed. The 2012 IRWMP Update includes the objectives of meeting state permits and policies related to stormwater management and promoting low impact development, green streets, and other stormwater recharge projects.

For purposes of this planning document, we assume that approximately 1,000 acre-ft/yr on average will come from urban storm water run-off while an average 4000 acre-ft/yr will come from storm flows in the Santa Clara River and tributary drainages, for a total of 5,000[1] acre-ft/yr combined urban run-off and stormwater capture. The water balance for projected future conditions will assume that projects to capture and recharge urban run-off and storm flows will be in place by 2050.

7.3 Basin Monitoring Program

The proposed Salt and Nutrient Ground Water Monitoring Program must take into consideration the existing and planned land uses and facilities that can potentially impact long-term groundwater quality in the East Subbasin. Basin monitoring will consider point discharges such as stormwater outfalls, NPDES discharge points (both WRP and single point outfalls), areas of un-sewered waste discharges, and land areas with planned long-term application of recycled water, and the contributions of groundwater from adjacent subbasins.

Basin wide baseline groundwater quality will be established to use as a point of reference for the single SNMP monitoring program dataset. The current availability of groundwater quality data indicates that several gaps exist primarily in the western end of the basins which results in an incomplete characterization of the groundwater quality of the East Subbasin. As an example, the South Fork groundwater subunit has very little groundwater quality data available for the alluvial deposits. In addition, a significant data gap for quality in the alluvial aquifer is present in the area west of the Valencia Wastewater Reclamation Plant and west of the confluence of Castaic Valley groundwater subunit and the Santa Clara-Bouquet-San Francisquito Canyons groundwater subunit. Further investigation may show that wells for groundwater sampling may exist in the area.

7.3.1 Identify Stakeholders Implementing the Monitoring

Figures 11, 12, and 13 show the locations of groundwater monitoring points used by the various agencies for both the alluvial aquifer and Saugus Formation. Specifically, groundwater level monitoring and groundwater sampling analysis is conducted by the LACFCD, NCWD, NLF, SCWD, VWC, and WHR. The Los Angeles County Sanitation District maintains a surface water sampling program related to wastewater discharge permits. The United States Geological Survey (USGS) periodically monitors wells in the East Subbasin as part of their on-going GAMA program. The locations of wells sampled as part of the USGS Groundwater Ambient Monitoring and Assessment (GAMA) program are shown on Figure 14.

[1] Represents the lower assumed value to increase water supply by capture and recharge of 5,000 to 10,000 AFY of urban and storm water runoff from the 2008 Integrated Regional Water Management Plan, TABLE ES-1 and Table 3.1 1; “Upper Santa Clara River IRWMP Objectives, Definitions, and Measurements”

The CDPH maintains a database of groundwater quality information derived from the various sources listed above.

7.3.2 Ground Water Monitoring Plans

Historically there has been no unified monitoring system for groundwater levels and groundwater quality in the East Subbasin. Groundwater levels and groundwater quality sampling and analysis have been conducted by various agencies in pursuit of meeting their individual needs and requirement. There is a need and requirement for a unified on-going groundwater monitoring system for the East Subbasin, to not only address current water quality regulations such as the groundwater basin objectives and drinking water standards but also to have the facility to evaluate potentially new constituents in groundwater such as chemicals of emerging concern (CECs).

As stated previously, the 2003 GWMP presented a proposed monitoring program as part of the effort to provide on-going data for groundwater management planning. Further discussion of the 2003 GWMP is provided below. As stated previously, the USGS GAMA Program collects and reports data from the East Subbasin. A discussion of the program is also provided below.

7.3.2.1 2003 Ground Water Management Plan

According to the GWMP, long term development and use of groundwater in the area has resulted in a fairly substantial amount of historical groundwater level data, and a useful amount of groundwater quality data and groundwater pumping data that has been collected in the basin. During preparation of this Salt and Nutrient Management Plan we have confirmed the extent of the available data and have also identified data gaps which will be discussed. The 2003 GWMP reports that "all the available historical groundwater level, quality, and pumping data have been organized into a computerized data base for the Upper Santa Clara River Area." The database was updated and augmented with additional data to use for this study.

The network of wells reported in the 2003 GWMP are a combination of active production wells, inactive production wells, and dedicated monitoring wells located throughout the East Subbasin. According to the GWMP, the historical data collection efforts cannot be classified as an organized area-wide program of groundwater data collection. However, there is generally sufficient data available on which to interpret basin conditions (page 2 of GWMP Appendix I). The GWMP noted that monitoring of existing wells, and expansion of the network of both production and monitoring wells, will be key to accomplishing all the goals for the basin in this management plan. A regular and unified system of monitoring groundwater levels, quality, and pumping will provide the basis for ongoing assessment of basin conditions for salt and nutrient management as well as accomplish the GWMP goal of "developing operational protocols that allow conjunctive use to support ongoing ground water supply while avoiding

undesirable conditions such as chronically depressed ground water levels or degraded ground water quality."

Appendix A of the GWMP reports dates of water level measurements for 140 alluvial wells and 14 wells in the Saugus Formation and water quality measurement dates for 53 alluvial wells and 12 Saugus wells. The GWMP notes that the monitoring network can consist of the current network of wells, but possibly expanded to include some dedicated monitoring wells, as well as some potential new production wells. The frequencies and types of groundwater data collection have varied by agency as a function of specific monitoring objectives in various parts of the basin. The 2003 GWMP notes that the lack of historical subsidence and the low potential for it to occur has resulted in no formal subsidence monitoring, i.e. no extensometers, fixed -point ground surveys, or remote sensing. The 2003 GWMP further notes "if the analysis of planned additional dry-year pumping indicates the potential for subsidence attributable to lower ground water levels, monitoring or other appropriate action (e.g., redistributed or reduced pumping) will be undertaken." It is the intent of this SNMP to use this assessment and approach and to build on it.

7.3.2.2 USGS - GAMA Program

The USGS - GAMA Program website provides a description of the development of the GAMA monitoring program:

"In October 2001, The California Assembly passed a bill, AB 599, establishing the Ground-Water- Quality Monitoring Act of 2001." The goal of AB 599 is to improve statewide comprehensive ground-water monitoring and increase availability of information about ground-water quality to the public. AB 599 requires the State Water Resources Control Board (SWRCB), in collaboration with an interagency task force (ITF) and a public advisory committee (PAC), to develop a plan for a comprehensive ground-water monitoring program. AB 599 specifies that the comprehensive program should be capable of assessing each ground-water basin in the State through direct and other statistically reliable sampling approaches, and that the program should integrate existing monitoring programs and design new program elements, as necessary. AB 599 also stresses the importance of prioritizing ground-water basins that provide drinking water.

The USGS, in cooperation with the SWRCB, and in coordination with the ITF and PAC, has developed a framework for a comprehensive ground-water-quality monitoring and assessment program for California. The proposed framework relies extensively on previous work conducted by the USGS through its National Water-Quality Assessment (NAWQA) program. In particular, the NAWQA program defines three types of ground-water assessment: (1) status, the assessment of the current quality of the ground-water resource; (2) trends, the detection of changes in water quality, and (3) understanding, assessing the human and natural factors that affect ground-water quality.

The GAMA program includes participants which include representatives from California Water Boards (SWRCB/RWQCB), Department of Water Resources (DWR), Department of Public Health (DPH), USGS, Lawrence Livermore National Laboratory (LLNL), regional water management entities, and county and local water agencies. A key aspect of the GAMA program is interagency collaboration and cooperation with local water agencies and well owners. These assessment integrates existing water-quality data (such as DHS public supply well water-quality data), with data collected specifically as part of the study. In addition, the GAMA program monitors a broader suite of constituents, at much lower detection limits, than required by DPH. Samples are analyzed for chemical constituents that include major ions, trace elements, nutrients, volatile organic compounds, pesticides, and pharmaceuticals, to define the quality of water in the ground-water basins. Naturally occurring isotopes (tritium, carbon-14, and helium-4) also were measured in samples to help identify the source and age of the sampled ground water. A tiered analytical approach is used to balance spatial coverage and analytical intensity (number of constituents analyzed)."

The Santa Clara River Valley study included sampling between April, 2, 2007 and June 7, 2007; 54 wells were sampled. The study unit consisted of the portion of the Santa Clara River Valley which includes the Ojai Valley, Upper Ojai Valley, Ventura River Valley, Pleasant Valley, Arroyo Santa Rosa Valley, Las Posas Valley, and Simi Valley ground-water basins (all of these are located outside the area addressed by this SNMP), and Santa Clara River Valley which is the focus of this SNMP. The results and analysis from the sampling were reported in USGS Scientific Investigations Report 2011-5052. Of the 54 wells sampled for the Santa Clara River Valley study, eleven (11) wells were located in the East Subbasin. The location of the GAMA sampling points are shown on Figure 14. The GAMA sampling and analysis did not include the constituents identified as CECs in the LARWQCB Salt and Nutrient Plan Guidance document.

7.3.3 Monitoring Program Goals

The goals of the SNMP monitoring program should be consistent with the GWMP goals. The SNMP monitoring goals are a subset of the overall GWMP goals and should provide a tool for on-going tracking of salt and nutrient concentration trends, concentration trends of selected CECs, and monitoring of salt and nutrient loads which contribute to the quality of the groundwater. Section 5 provides a description of historical and current salt and nutrient concentrations in groundwater. Using the salt balance method, future salt and nutrient concentrations in groundwater were predicted based on projected water use and land use changes through the year 2050 (see Section 6.0). The purpose of the salt and nutrient monitoring program is to obtain consistent on-going data to monitor the actual effects of land use changes and groundwater management policies on groundwater quality in the East Subbasin.

7.4 Sampling Locations

Proposed wells for the SNMP monitoring wells are shown on Figure 15 and listed on Table 1. The wells were selected to

1) Provide a sampling location down-gradient of potential salt and nutrient contributors such as wastewater discharge locations, stormwater outfalls, and septic tank areas, and

2) Allow evaluation of the contribution to groundwater quality from individual subunits down-gradient of the confluence of the subunits moving to the western end of the East Subbasin.

The proposed number of sampling locations should be reviewed after sufficient data is collected to allow evaluation of water quality trends to determine whether a fewer number of selected key wells could provide the necessary on-going data to evaluate salt and nutrient loading.

7.5 Water Quality Parameters

Various agencies collect groundwater quality data in accordance with specific reporting needs. The selected suite of analytes for the SNMP monitoring program will consist of Total Dissolved Solids (TDS), Chloride, Nitrate, Sulfate, and Ammonia. In addition, selected chemicals of emerging concern (CECs) will be included in baseline data collection. Long-term sampling of CECs will be established from evaluation of the baseline data set and on proposed revisions to the SWQCB Recycled Water Guidelines. A discussion of CEC selection for monitoring is presented in Section 7.2.15.

7.6 Sampling Frequency

The recommended sampling frequency is semi-annual (two sampling periods per year). The semi-annual sampling frequency will allow for evaluation of seasonal wet weather and dry weather effects on groundwater quality. The proposed sampling frequency should be reviewed after sufficient data is collected to evaluate potential seasonal trends.

7.7 Quality Assurance/ Quality Control

For purposes of this plan, quality assurance (QA) is defined as the integrated program designed to assure reliability of monitoring and measurement data. Quality control (QC) is defined as the routine application of specified procedures to obtain prescribed standards of performance in the monitoring and measurement process (ASTM D-18). The responsible parties, their assigned staff and consultants tasked with collecting and submitting data will be responsible for assuring that precision, accuracy, and

completeness of data collected as part of this monitoring program are known and documented, including the calibration and maintenance of all field equipment.

7.8 Database Management Plan

The purpose of this data management plan is to establish guidance for data filing, storage, and selected or alternate management point security during the implementation of the monitoring program. All data will be submitted to the CLWA, filed and stored in a Project File, entered into a comprehensive computer database (East Subbasin Salt and Nutrient Management Plan Database), and presented in a geographic information system (GIS). Detailed procedures for the management of data are discussed in the following sections.

7.9 Project Files

A Project File that stores all technical documents should be established. Technical documents include, but are not limited to, the following:

- All correspondence to/from regulatory agencies;
- Memoranda containing technical information or documentation of technical decisions;
- Reports;
- Field data sheets;
- Field logs/daily reports;
- Laboratory reports;
- Computer files of technical data;
- Minutes of meetings with regulatory agencies;
- Permits;
- Legal documents;
- Press clippings;
- Fact sheets;
- Photographs;
- Calculations; and
- QA/QC reports.

Information regarding each document will be entered into a computer database and the document filed in the Project File.

7.10 Storage and Security

Active monitoring program files will be maintained at CLWA and technical records will be stored and secured in locking file cabinets (or alternate management point). Prior to storage, records will be assigned a sequential number and entered into the project reference database. The database will include the following items of information for each document to assist in retrieval:

- Document number,
- Date document was generated or received,
- Type of document,
- Author and corporation,
- Addressee,
- Subject (description of document contents), and
- Source of document.

7.11 File Access

Once placed in the Project File, records will be checked out by placing a checkout card in the file in place of the project record. Immediate access will be limited to assigned personnel and designated representative of the SNMP team, their assigned technical consultant and their legal representative. Entities outside of the above referenced groups can obtain the records with the permission of the IRWMG.

7.12 Project Database

Data will also be stored, organized, and secured in the East Subbasin Salt and Nutrient Management Plan Database created specifically for this study. The database will be installed on a single computer at the CLWA other RWMP approved designated location, which will serve as the main database and can also be available on a secure file transfer protocol (ftp) site. All data entry will be made to the main SNMP database and copied to the project specific ftp site.

Types of data stored in the computer database may include, but are not limited to, technical information such as groundwater levels, groundwater production volumes, groundwater and surface water quality analytical data, and recycled water discharges and application. If programs designed for other operating systems are used for data compilation etc., the data files will be transferable to an IBM compatible format. Specific technical programs used for data analysis will be selected based on the specific technical question to be answered.

7.13 Maintenance

The database will be maintained by a Database Manager. This individual will be responsible for the implementation, testing, documentation, and security of the database. The Database Manager will ensure that data entered into the database is complete and correct. The Database Manager also will provide a central storage location for data files and documentation.

7.14 Documentation

Documentation should be prepared regarding the database files and file structure. The documentation should outline the protocol for QC, data entry, data analysis, and manipulation of the data. The objective of documentation is to provide enough information for individuals unfamiliar with the data to work efficiently within the database. It also provides a clear work history to simplify data reconstruction, if necessary.

7.15 Security

Proper back-up and security measures will be taken to prevent accidental loss of data and tampering with the database. Exact duplicates of working files will be made at least once each work session. The backup files will be stored in a separate physical location from the working files. Both the backup and working files will be kept in a locked storage area.

Data protection through the use of passwords will be employed whenever possible for working and backup files. The password protection will be removed when files are submitted for permanent storage.

7.16 Data Analysis and Reporting

An annual SNMP groundwater conditions report should be prepared. The report could be included as a technical memorandum as part of the annual Santa Clara Valley Water Report. An assessment of salt and nutrient conditions with regard to projected groundwater quality trends provided in the SNMP should be prepared and provided in the annual report.

7.17 Groundwater Level Monitoring

7.17.1 Groundwater Level Monitoring Locations and Frequency

Groundwater level monitoring will be carried out by the agency responsible for the selected monitoring point. The monitoring protocol should be consistent for all wells selected for the SNMP monitoring

program. The locations of monitoring wells to be used for water level monitoring are shown on Figure 15. Groundwater levels and frequency will be measured in the wells as listed on Table 1. Measurements should be made on a monthly basis to enable evaluation of water level trends for individual wells, in addition to groundwater flow patterns and hydraulic gradients for the East Subbasin will be analyzed with this data.

The majority of the wells selected for this monitoring program are active LACDPW monitoring wells. The wells should be fully recovered before water level measurements are made in the wells. This is defined as no less than 12 hours of the pump being shut off prior to static water level measurement being collected. For inactive wells or LACDPW monitoring wells, if they are in the vicinity of an active pumping well, the amount of groundwater recovery time required to reach static conditions should be documented and this amount of time should be allotted prior to collection of static water level measurements by field personnel prior to each monthly monitoring event.

The procedure used by each monitoring agency for the use of groundwater level measurement instruments may vary slightly but the basic scientific methods are the same. Measurements obtained using a calibrated electric water level sounder or sonic meter should be made to the nearest 0.1 ft relative to an established reference point (RP) at the top of each well casing or sounding tube. Groundwater level measurements should be compared in the field to previous measurements and re-measured if significantly different. Measurements should be recorded in the field with a permanent ink pen on an appropriate form and will be converted to groundwater elevations by subtracting the depth to water from the reference point elevation.

7.18 Monitoring Well Information

The following detailed well information should be compiled in order for the well information to be submitted into the CASGEM Online Submittal System as suggested by the 2010 UWMP.

- Basin name / number,
- Local well ID,
- State Well Number,
- Reference Point Elevation (ft NAVD88),
- Reference Point description,
- Ground Surface Elevation (ft amsl),
- Method of Determining Elevation,
- Accuracy of Elevation Method,
- Well coordinates (latitude/longitude in decimal degrees),
- Method of Determining Coordinates,
- Accuracy of Coordinate Method,

- Well Completion Type (single or multi-completion),
- Total Depth (feet),
- Top and Bottom of Screened Interval,
- Aquifer Monitored, and
- Written Description of Well Location.

7.19 Groundwater Elevation Information

Groundwater elevations for each monitoring well should be compiled in order to allow input into the CASGEM Online Submittal System. The data should include the following:

- Well identification number,
- Measurement date,
- Reference point elevation of the well (feet),
- Elevation of land surface datum at the well (feet),
- Depth to water below reference point (feet),
- Method of measuring water depth,
- Measurement Quality Codes,
- Measuring agency identification,
- Measurement time (PST/PDT with military time/24 hour format), and
- Comments about measurement, if applicable.

In addition, it is recommended that a survey of reference point elevation be conducted on all monitoring wells in the groundwater monitoring network to ensure accurate water level elevations.

7.20 Basin Water Quality Monitoring

Determining the ongoing salt and nutrient loads to the watershed will be accomplished through semi-annual monitoring of surface water and groundwater quality. The data will be used to calculate the annual salt and nutrient load to the watershed and ultimately to the groundwater. The compiled data will be used to annually refine the salt and nutrient long-term projections provided in Section 6 of this report. The subsections below provide a brief description of the water quality monitoring program.

7.20.1 Groundwater Quality Monitoring

Groundwater quality monitoring will be accomplished using selected alluvial aquifer and Saugus Formation wells. The selected wells will provide water quality data which is spatially representative of the aquifers in the specific subunits within the overall East Subbasin. The location of the wells selected

to monitor the alluvial aquifer are shown on Figure 15. Wells within the Saugus Formation are limited in number and are located in the western portion of the East Subbasin – South Fork Subunit. Future wells, drilled in the Saugus Formation should be considered for the monitoring program if they can provide data that represents areas of the Saugus Formation not represented by the existing wells.

7.20.1.1 Areas of Surface Water and Groundwater Connectivity

The alluvial aquifer is recharged from percolation of surface water from the Santa Clara River. Therefore, the entire Santa Clara River bed is a potential source of connectivity to the underlying groundwater system. During high groundwater conditions, surface water may be in direct hydraulic continuity with groundwater. Groundwater monitoring points were selected to allow characterization of the groundwater in the alluvial aquifer underlying the Santa Clara River throughout the East Subbasin in order to determine the impacts of surface water quality on groundwater quality within the specific subunits which underlie the Upper Santa Clara River.

7.20.1.2 Areas of Large Recycled Water Projects

There are currently no large[2] recycled water projects in the East Subbasin. The 2002 Recycled Water Master Plan prepared for CLWA recommends that future recycled water projects to be economically viable, should be concentrated in the western portion of the East Subbasin in proximity to the Water Reclamation Plants (see Figure 10). Use of recycled water in this area will limit the expense for future infrastructure needed to transport recycled water to potential users. The selected monitoring wells will provide sampling points to evaluate the impact of increasing recycled water use in the proposed area of recycled water use.

7.20.1.3 Treated Wastewater Recharge Areas

Treated wastewater is currently discharged by permit directly into the Santa Clara River. Discharges from both the Valencia and Saugus Wastewater Reclamation Plants occur year around. The 2010 UWMP reports that the combined production of both Water Reclamation Plants in 2010 was 20.19 MGD or 22,616 acre-ft. The combined plant capacity is 28.1 MGD or 31,472 acre-ft/yr. Treated wastewater will continue to be discharged into the Santa Clara River, decreasing the volume of discharge as new areas for recycled water application come online.

Surface water sampling is carried out by the Sanitation District and the data will be included in the SNMP Monitoring Program Database. Groundwater monitoring points were selected to evaluate the

[2] The Recycled Water Policy or the LARWQCB – SNMP Guidance Document does not provide a definition for "large" recharge projects. However, the intent is to specifically monitor groundwater recharge projects using recycled water, therefore, the specific monitoring program would be prepared as a part of the permitting process.

impact of surface discharge of recycled water to the alluvial aquifer. The selected monitoring points are located downstream of the discharge points. Comparison of water quality in the alluvial aquifer upstream and downstream of the discharge points as well as during wet and dry climactic periods will allow characterization of the impact of recycled water discharges on the alluvial aquifer. An analysis of long-term trends of water quality parameters will be conducted to evaluate the impact of both long-term dry and wet conditions on groundwater conditions.

7.20.2 Previous Surface Water Quality Monitoring

A brief description of previously proposed surface water quality monitoring programs and previous monitoring programs is provided below.

7.20.2.1 Comprehensive Water Quality Monitoring Plan for the Santa Clara River Watershed (2006).

The development of the 2006 Comprehensive Water Quality Monitoring Plan for the Santa Clara River Watershed was initiated in November 2003 by the Ventura County Watershed Protection District (VCWPD), under the direction of the SWRCB. The monitoring plan provides the basis for a proposed monitoring system for the entire Santa Clara River Watershed. AMEC Earth and Environmental, Inc. was retained by VCWPD to compile and review existing water quality data, determine data gaps, and develop a Comprehensive Monitoring Plan (CMP) for the Santa Clara River.

The goals of this plan were to:

1) Develop baseline conditions for the watershed,
2) Have a mechanism to measure improvements or degradations in the water quality; and
3) Provide sufficient information to assist the project steering committee in making important management decisions regarding the watershed.

The objectives of the CMP, therefore, were to gather existing monitoring data for the Santa Clara River, assemble a comprehensive data base, identify data gaps, evaluate the constituents monitored and make recommendations regarding modifications to existing monitoring protocol and procedures necessary to ensure development of a comprehensive water quality monitoring program. The main purpose of the CMP was to develop baseline conditions for the entire Santa Clara River watershed and have a mechanism to measure improvements or degradations in the watershed. A slightly modified systematic sampling strategy, which typically selects locations that are separated by regular intervals along a waterbody, was considered to be the most effective sampling design for the CMP baseline study.

The monitoring point selection strategy, therefore, was based on: 1) Selected downstream points of Santa Clara sub-basins; 2) System morphology; and 3) Historical data availability. Although considered

important, land use was not considered in the selection of monitoring locations because it was determined that the systematic approach to monitoring would capture the impacts of a variety of land uses.

Also, in consideration that TMDLs are a primary concern with regard to the allocation and use of future data, the CMP concluded that siting and/or location of monitoring stations should include locations at or slightly downstream of real-time USGS gaging stations. With this proposed approach, the CMP determined that pollutant loads from different sub-watersheds or tributaries could be evaluated and flow measurements could be accessed at will through the USGS National Water Information System (NWIS).

Section 5.1.1 of the CMP entitled "Spatial Sampling: Selection of Preliminary Sampling Locations," states that preliminary sampling locations for the CMP were selected using the following strategy:

1) For major tributaries to the Santa Clara River (e.g., Mint Canyon), select a downstream [historical] monitoring location nearest to the junction with the Santa Clara River.
2) For the Santa Clara River, select a historical station that is slightly downstream of the tributary/Santa Clara River fork (beyond the mixing zone).
3) Select any additional locations along the Santa Clara River from historical or active Stations that will provide information identified as a data gap in the Data Gap Analysis.

The proposed monitoring stations within the East Subbasin area (stream Reach 5, Reach 6, and Reach 7), as shown on Figure 46 of the CMP are reproduced on Figure 16 of this report. In accordance with the sampling approach outlined above, the CMP recommended the use of nine (9) existing USGS gaging stations, two (2) Surface Water Management Ambient Monitoring Program (SWAMP) monitoring stations, and proposes the development of a new surface water monitoring station for San Francisquito Creek, immediately north of the confluence with the Santa Clara River.

7.20.2.2 Santa Clara River Watershed Monitoring Program Friends of the Santa Clara River (2007)

This document is dated October 27, 2007 and provides the results of a short term surface water monitoring program conducted on the Santa Clara River. The executive summary of the document states the following:

"This Final Report presents the results of a volunteer citizen monitoring water quality program (Santa Clara River Monitoring Program) conducted from November 2004 to October 2007 by Friends of the Santa Clara River (FSCR) under State Water Resources Control Board Agreement Number 04-128-554-1 in support of the 2004 Santa Clara River Nutrient TMDL. The program consisted of monthly monitoring of

the river's mainstem at six sites distributed from Soledad Canyon to just above the Victoria Avenue bridge near the City of Oxnard. Monitoring took place during 22 consecutive months with a completeness rate of over 95% for all parameters measured except for stream discharge (77%) due to high flows or extensive aquatic plant growth blanketing the stream channel. The following parameters were measured in the field: flow, temperature, dissolved oxygen, pH, conductivity, total dissolved solids, and turbidity. Grab samples were taken for dissolved inorganic nutrients that were analyzed by the Schimel Laboratory at the University of California at Santa Barbara. Nutrient analytes included ammonia-nitrogen, nitrate-nitrogen, total dissolved nitrogen, ortho-phosphate, and total dissolved phosphorus."

Sampling Location SC-13 is located east and outside the East Subbasin while sampling location SC-10 is located approximately one-mile east of the intersection of the Santa Clara River and Interstate 5. The document concludes that the wide distribution of sampling sites does not allow for monitoring of specific landuse types and only broad generalizations of sources can be inferred. The data from the report can be used to augment other historical surface water sampling data for the specific time period. According to Mr. Ron Bottorff of the FSCR, the sampling program was terminated after publication of the 2007 report.

7.20.2.3 Santa Clarita Valley Sanitation District of Los Angeles County - Santa Clara River Watershed-Wide Monitoring Program and Implementation Plan (2011)

The executive summary of the document states:

This report presents a design for an integrated regional monitoring program for the Santa Clara River watershed, the Santa Clara River Watershed Monitoring Program (SCRWMP). This report also constitutes the response of the Santa Clarita Valley Sanitation District of Los Angeles County (Sanitation District) to requirements IX.A and I.N of Monitoring and Reporting Programs (MRPs) Board Order No. R4-2009-0075 and Board Order No. R4-2009-0074, adopted by the California Regional Water Quality Control Board, Los Angeles Region (LARWQCB) for the Saugus (CA0054313) and Valencia (CA0054216) Water Reclamation Plants, respectively. The SCRWMP fulfills the fundamental purpose of providing a framework for monitoring at the watershed scale in three ways:

- *Expanding the monitoring of ambient conditions related to key beneficial uses to the entire watershed*
- *Improving the coordination and cost-effectiveness of disparate monitoring efforts*
- *Providing a framework for periodic and comprehensive assessments of watershed condition*

The monitoring plan states that the program design was developed by a multi-stakeholder workgroup and was modeled on analogous efforts in the nearby San Gabriel River and Los Angeles River

watersheds, the San Gabriel River Regional Monitoring Program (SGRRMP) and the Los Angeles River Watershed Monitoring Program (LARWMP). The SCRWMP addresses five key management questions:

1. What is the condition of streams in the watershed?
2. Are resources at areas of unique interest being protected and getting better or worse?
3. Are receiving waters near discharges meeting water quality objectives?
4. Is it safe to swim?
5. Are locally caught fish safe to eat?

The Santa Clara River Watershed-Wide Monitoring Program and Implementation Plan proposed sampling approaches to address Questions: 1, 2, and 3 above will include sampling and development of data. A subset of this data can be incorporated into the SNMP Monitoring program database and used for Salt and Nutrient load analysis. However, surface water sampling under the Question 2 approach should include both wet and dry seasons flow to evaluate the range of salt loading based on climatic conditions. With regards to salt and nutrient loading, we agree with the sufficiency of a monthly sampling frequency for the surface water sampling stations sampled by the Sanitation District, but do not agree with eliminating sampling point River Station RE. The water quality plot for Ammonia presented in the monitoring document clearly shows attenuation of water quality parameters is occurring between River Stations RD and RE (see plot on page 45 of that document). The fate of the water parameters within the groundwater system should be evaluated before River Station RE is made redundant. In addition, the annual proposed sampling frequency under the approach for Question 1 is not sufficient for the salt and nutrient management analysis.

7.20.3 Proposed Surface Water Quality Monitoring

The proposed surface water monitoring in the East Subbasin watershed is outlined on Table 2 and the locations are shown on Figure 17. A recommended monitoring suite for Constituents of Emerging Concern is shown on Table 3. In addition, ongoing data collection activities that should be added to the SNMP database are discussed in the sections below.

7.20.3.1 Stormwater Quality Monitoring

Currently, stormwater quality monitoring for the Santa Clara River is conducted by LACDPW for their MS4 Storm sewer permit at sampling location S29 located near the Interstate 5 and the Santa Clara River (also referred to as Old Road Bridge). Sampling at this location provides data to characterize the overall surface water quality of the Santa Clara River as a result of all contributions. Sampling at this location does not provide data to characterize the water quality contribution from specific potential contributors such as upstream areas outside the East Subbasin or water quality from both residential and commercial storm drains. Existing surface water quality sampling for potential salt and nutrient

contributions from residential and commercial storm drains should be incorporated into the surface water quality monitoring program.

7.20.3.2 Treated Wastewater Discharge Quality Monitoring

Treated wastewater discharge quality monitoring is carried out by LACSD who is responsible for the wastewater discharges. Monitoring is carried out in accordance with the existing permits for the WRP facilities. Ongoing water quality data collection for the treated wastewater discharges will be incorporated in the SNMP monitoring program data set for tracking salt and nutrient loads in the watershed from that source.

7.20.3.3 Recycled Water Quality Monitoring

Recycled water quality is monitored by the LACSD who produces and provides the initial distribution of the recycled water. Recycled water quality data collected by LACSD will be incorporated into the SNMP monitoring program data set and used to track salt and nutrient loading in the watershed.

7.20.3.4 Other Constituents of Concern

The Recycled Water Policy includes a provision for annual monitoring of Emerging Constituents/ Constituents of Emerging Concern (e.g., endocrine disrupters, personal care products or pharmaceuticals) (CECs) consistent with recommendations by CDPH and consistent with any actions by the State Water Board taken pursuant to paragraph 10(b) of the Policy. The SWRCB "Suggested Elements" for Salt and Nutrient Management Plans includes identifying CECs and their respective sources.

The Final Blue Ribbon Panel report entitled "Monitoring Strategies for Chemicals of Emerging Concern (CECs) in Recycled Water" provides a list of recommended health based, performance based, and surrogate indicator parameters for Groundwater Recharge Project monitoring. There are currently no groundwater recharge projects using recycled water. However, treated wastewater is discharged directly to the Santa Clara River and percolates to the alluvial aquifer system. Therefore, CEC monitoring will be conducted in wells down-gradient of wastewater discharge points. Currently only approximately 300 acre-ft/yr is being used for non-potable landscape irrigation. In the future approximately 17,000 acre-ft/yr could be available for landscape irrigation within the watershed. Based on the initial CEC monitoring, future monitoring locations for CECs may require consideration in areas of large scale application of recycled water.

The recommended monitoring of the constituents of concern for groundwater recharge projects, monitoring frequency, and the evaluation methodology of monitoring results as recommended by the

Blue Ribbon Panel will be incorporated as part of the SNMP monitoring program and are listed in Table 3 (see Section 8.2, Section 8.3, and Section 8.4 of the Blue Ribbon Panel Report).

7.20.4 Climatological Monitoring

7.20.4.1 Precipitation Stations

The precipitation stations listed below are the two primary weather stations located within and near the East Subbasin (see Figure 6). Data from these precipitation stations will be collected annually and included in the project database.

- Piru 2 ESE with data from 1959.
- Newhall S FC32CE with data from 1906.

7.20.4.2 Eto Data

Eto values will be collected from CIMIS station No. 204 which began recording in 2007.

7.20.5 Surface Water Flow Monitoring

7.20.5.1 Stream Gages

Stream flow gages maintained and operated by the USGS LADPW are located throughout the East Subbasin. The gages are listed below by USGS gage number or Los Angeles County Department of Public works identification numbers. The locations of gages are shown on Figure 6.

- USGS Gaging Station 11108500 – Blue Cut –Gage - SANTA CLARA RIVER AT L.A.-VENTURA CO. LINE CA
- USGS Gaging Station 11109000 – Las Brisas Bridge Gage - SANTA CLARA R NR PIRU CA
- USGS Gaging Station 11108134 – Castaic Lake
- LACDPW Gage F377-R - BOUQUET CANYON CREEK AT URBANDALE AVENUE
- LACDPW Gage F328-R - MINT CANYON CREEK AT FITCH AVENUE (Also, identified as USGS – Gaging Station 11107770- MINT CYN C A SIERRA HWY NR SAUGUS CA)
- LACDPW Gage F93 - SANTA CLARA RIVER AT LANG RAILROAD BRIDGE (Also identified as USGS Gaging Station 11107745 - SANTA CLARA R AB RR STATION NR LANG CA).
- LACDPW Gage F92C-R - SANTA CLARA RIVER AT OLD ROAD BRIDGE

The data collected from the gages should be collected annually and included as part of the East Subbasin Salt and Nutrient Management Plan monitoring program database. Additionally, recorded release data from Castaic Lake and Castaic Lagoon collected by the DWR should be obtained annually and incorporated in the project database.

7.20.5.2 Treated Wastewater Discharge to Santa Clara River

Treated wastewater volumes discharged into the Santa Clara River is recorded by the LACSD and reported annually to the LARWQCB. The data reported by the Sanitation District should be obtained annually and included as part of the East Subbasin Salt and Nutrient Management Plan monitoring program database.

7.21 Groundwater Production Monitoring

Groundwater production data is recorded by the water purveyors within the subbasin. The annual production data should collected annually from, or entered annually, by each water purveyor to be included as part of the East Subbasin Salt and Nutrient Management Plan monitoring program database.

7.22 Annual Calculation of Salt and Nutrient Loads

7.22.1 Annual Calculation of Subunit Water Balance

The annual water balance for each groundwater subunit should be calculated on an annual basis and provided as a part of the SNMP Annual Technical Memorandum. The calculation of the annual water balance for each subunit will be used to calculate annual salt load entering and leaving the East Subbasin.

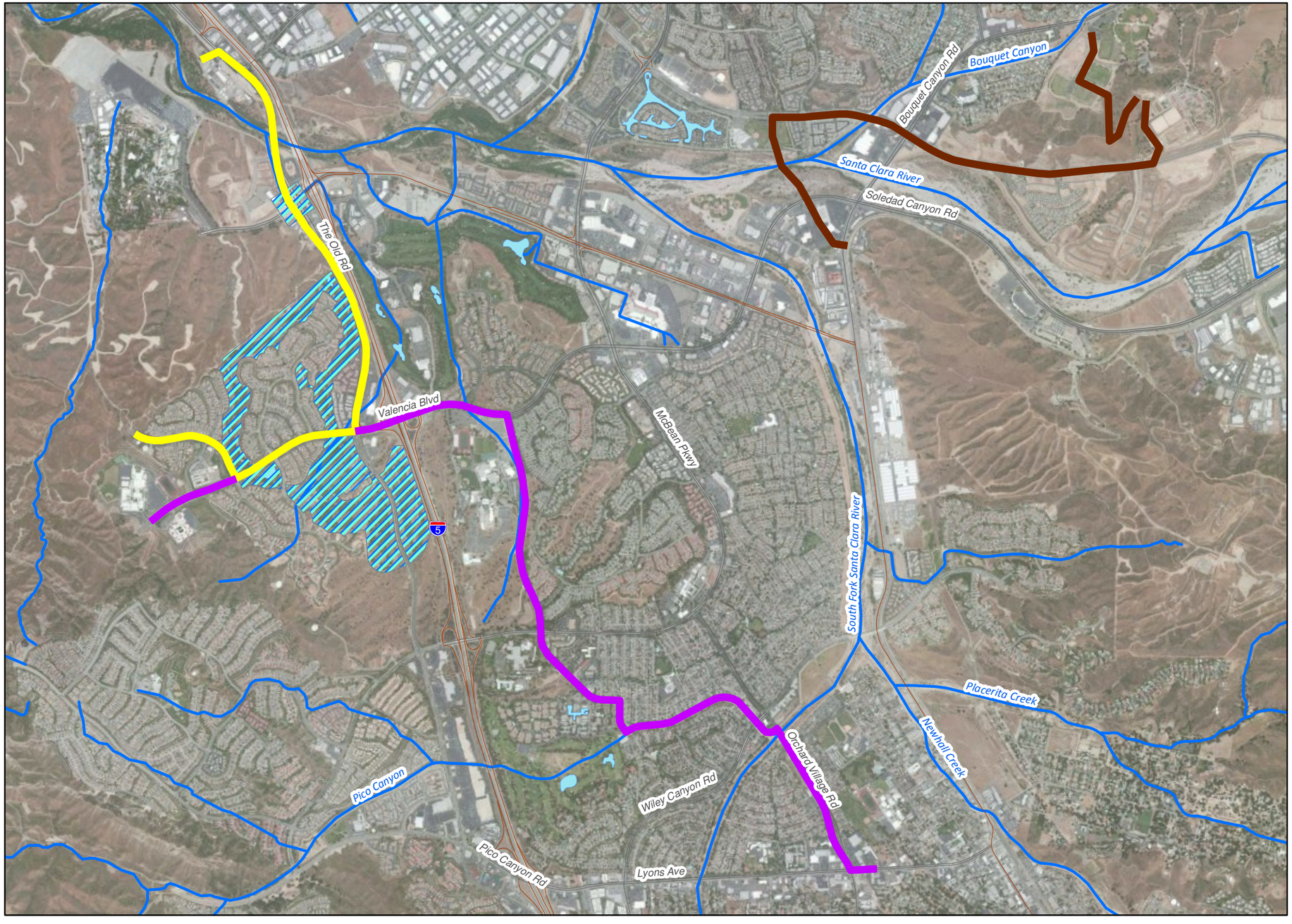
7.22.2 Annual Calculation of Salt and Nutrient Source Loading

The salt and nutrient loading balance sheets reported in Section 6.0 can be updated annually using the data set from monitoring program. An annual salt and nutrient balance can be conducted to track and confirm the salt and nutrient loads projected in Section 6.0. The results of the annual salt and nutrient balance should be incorporated into an annual technical memorandum to be included in the annual SCV Water Report which will provide an annual analysis of salt and nutrient loading and water quality conditions in the East Subbasin by subsidiary subbasin and stream reaches.

UPPER SANTA CLARA RIVER INTEGRATED REGIONAL WATER MANAGEMENT GROUP

SALT AND NUTRIENT MANAGEMENT PLAN
SANTA CLARA RIVER VALLEY EAST SUBBASIN

RECYCLED WATER USE AREA AND PROPOSED INFRASTRUCTURE

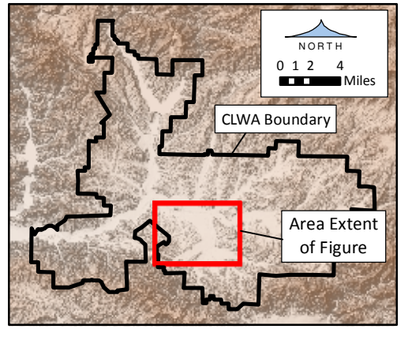


EXPLANATION

- Existing Recycled Water Infrastructure
- Proposed Phase 2A - Recycled Water Infrastructure
- Proposed Phase 2C - Recycled Water Infrastructure
- Current Areas of Recycled Water Use

DRAFT

Castaic Lake Water Agency (CLWA) Inset



15-Oct-12

Prepared by: DWB. Map Projection: UTM 1983, Zone 11.

NORTH
0 2,500 5,000 Feet

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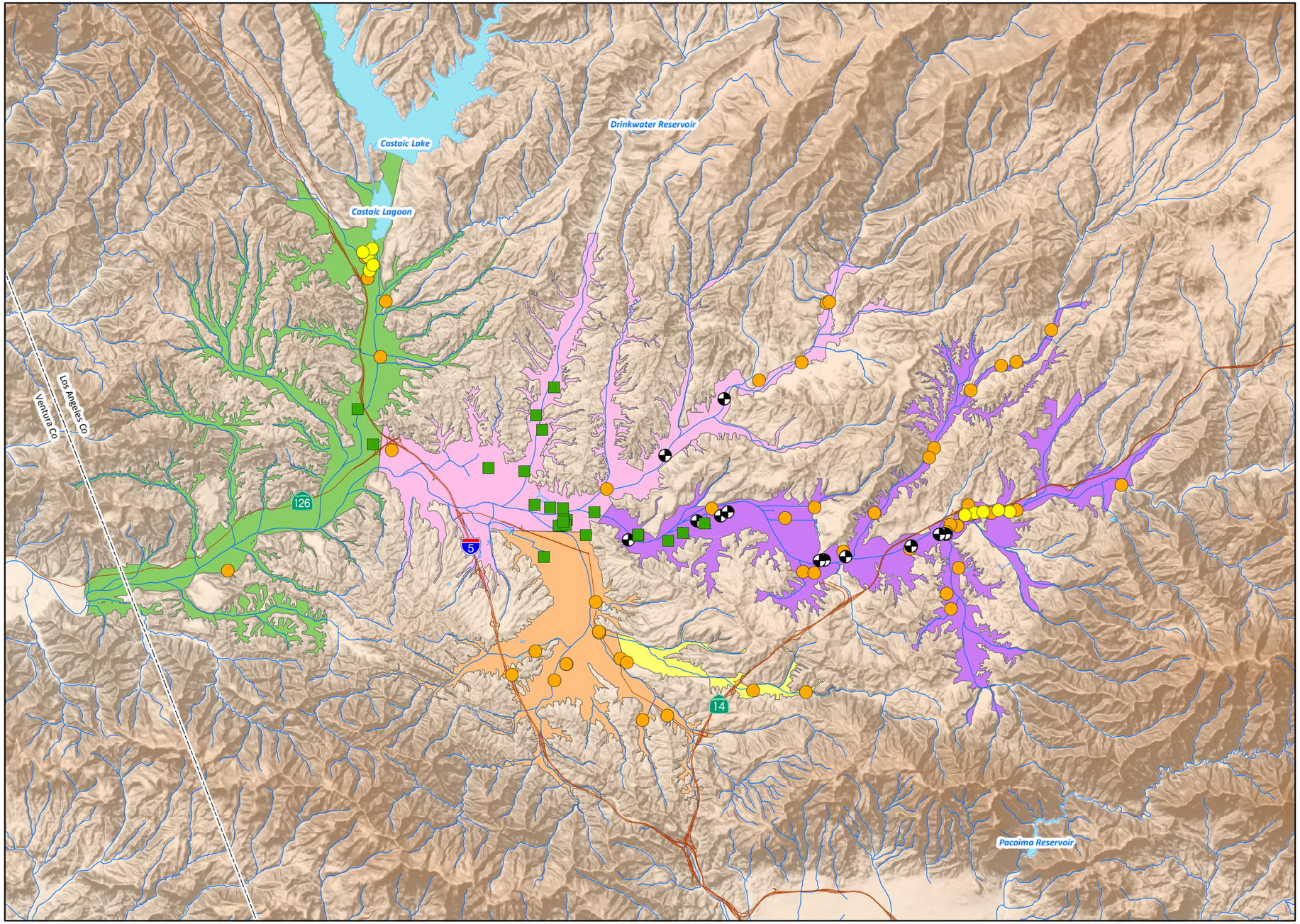
Figure 10

GIS_proj/castaic_lake_SNMP_6-12/6_CastaicSNMP_Fig_10_recycled_water_infrastructure_10-12.mxd

UPPER SANTA CLARA RIVER INTEGRATED REGIONAL WATER MANAGEMENT GROUP

SALT AND NUTRIENT MANAGEMENT PLAN
SANTA CLARA RIVER VALLEY EAST SUBBASIN

EXISTING GROUND WATER LEVEL MONITORING LOCATIONS ALLUVIAL AQUIFER



EXPLANATION

Castaic Lake Water Agency Boundary

Wells with Available Water Level Data by Owner

- LA County Flood Control District
- Newhall County Water District
- Santa Clarita Water Division
- Valencia Water Company

LARWQCB Ground Water Subunit - With Basin Objectives (mg/L)

- Castaic Valley
- Santa Clara-Mint Canyon
- Santa Clara-Bouquet and San Francisquito Canyons
- South Fork
- Placerita Canyon

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28-Jun-12

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NORTH

0 2 4 Miles

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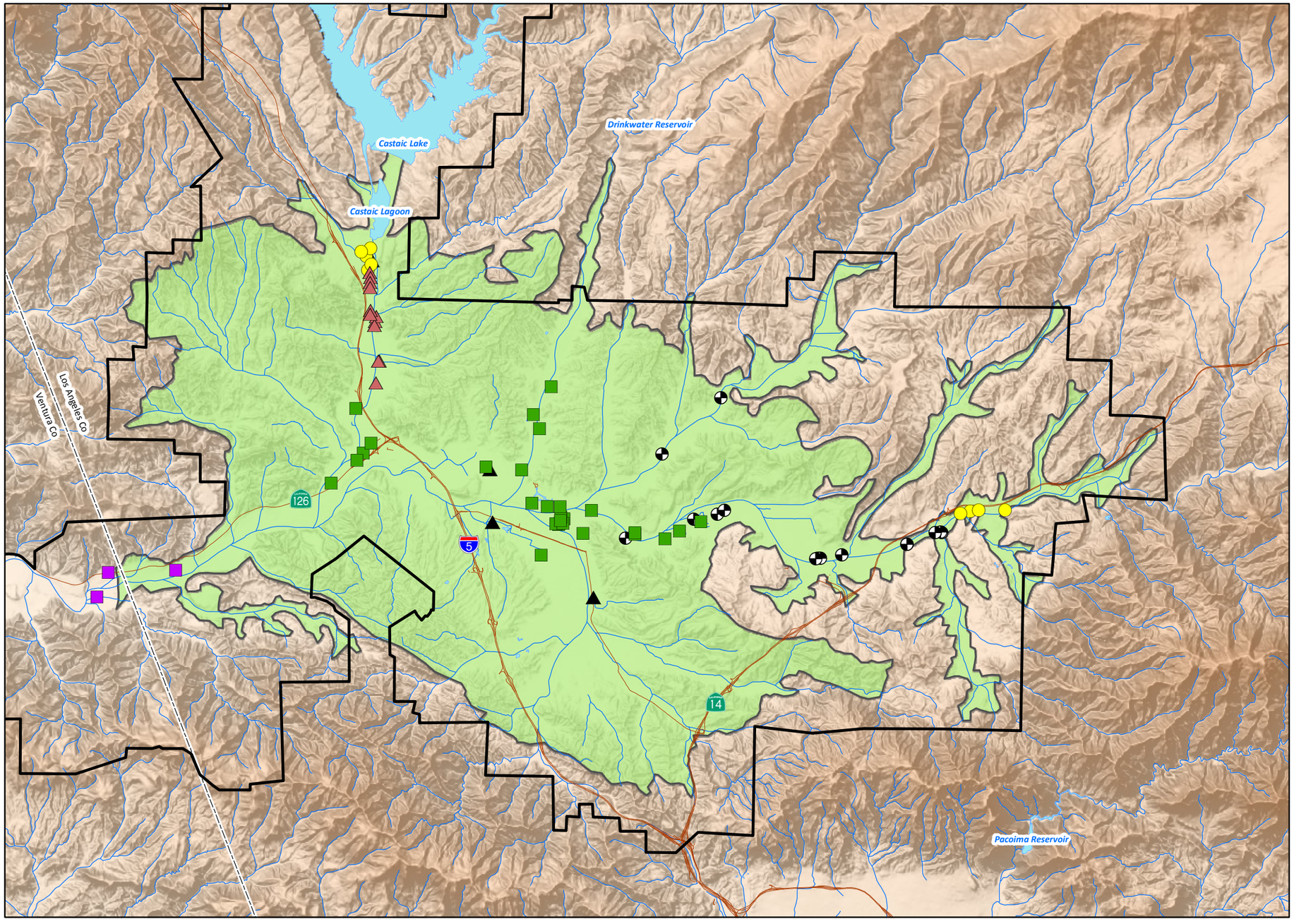
Figure 11

GIS_proj/castaic_lake_SNMP_6-12/6_CastaicSNMP_Fig_11_gw_mon_network_10-12.mxd

UPPER SANTA CLARA RIVER INTEGRATED REGIONAL WATER MANAGEMENT GROUP

SALT AND NUTRIENT MANAGEMENT PLAN
SANTA CLARA RIVER VALLEY EAST SUBBASIN

EXISTING GROUND WATER QUALITY MONITORING LOCATIONS ALLUVIAL AQUIFER



EXPLANATION

- Castaic Lake Water Agency Boundary
- Santa Clara River Valley East Ground Water Subbasin

Wells with Available Water Quality Data by Owner

- Newhall County Water District
- Newhall Ranch Sanitation District
- Santa Clarita Water Division
- Valencia Water Company
- Wayside Honor Ranch
- Other

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15-Oct-12

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NORTH

0 2 4 Miles

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Figure 12

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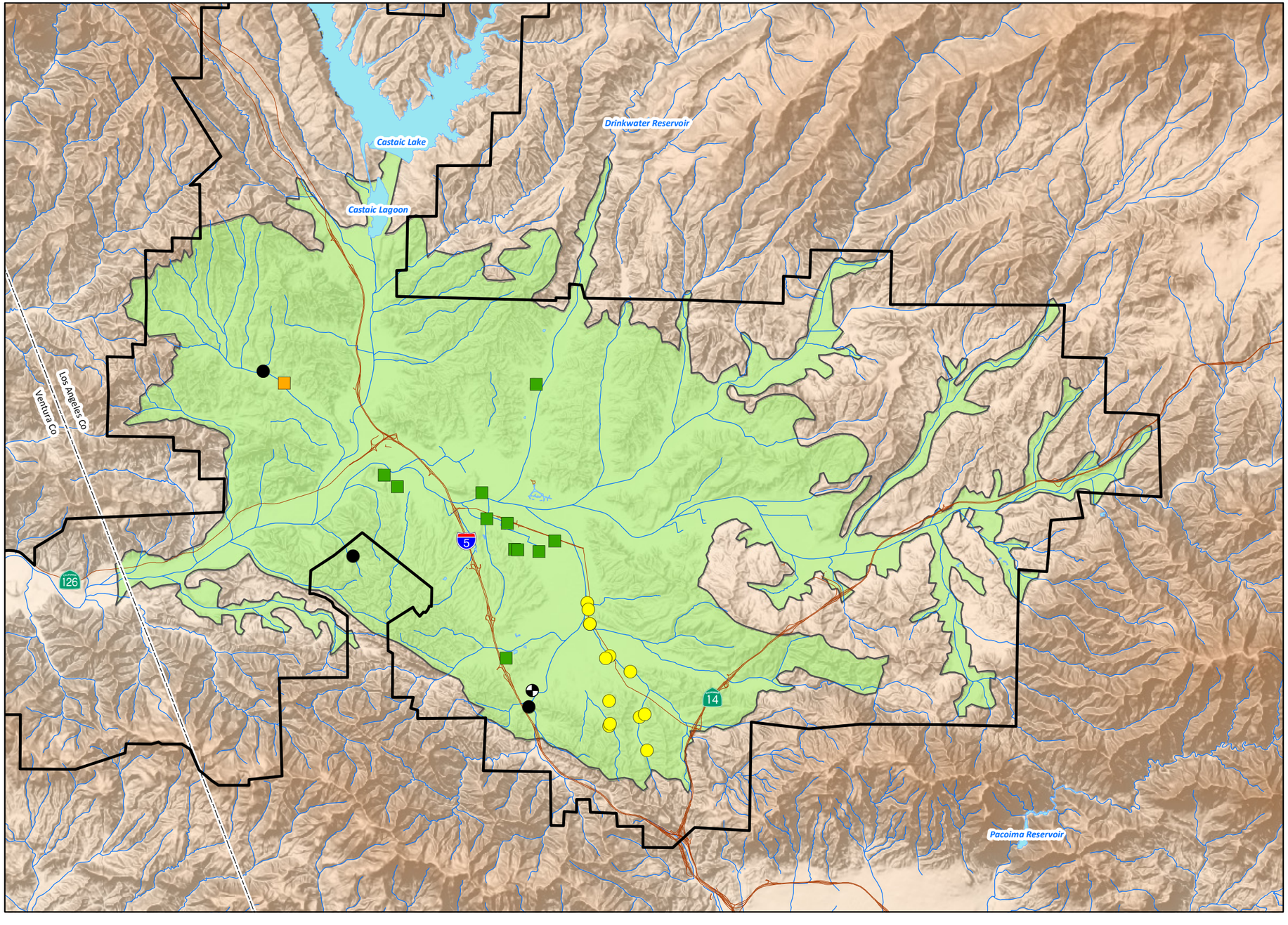
UPPER SANTA CLARA RIVER INTEGRATED REGIONAL WATER MANAGEMENT GROUP

SALT AND NUTRIENT MANAGEMENT PLAN
SANTA CLARA RIVER VALLEY EAST SUBBASIN



EXISTING GROUND WATER LEVEL MONITORING LOCATIONS SAUGUS FORMATION

EXPLANATION

- Castaic Lake Water Agency Boundary
- Santa Clara River Valley East Ground Water Subbasin

Wells with Available Water Level Data by Owner

- LA County Waterworks District No. 36
- Newhall County Water District
- Santa Clarita Water Division
- Valencia Water Company
- Private

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NORTH

0 2 4 Miles

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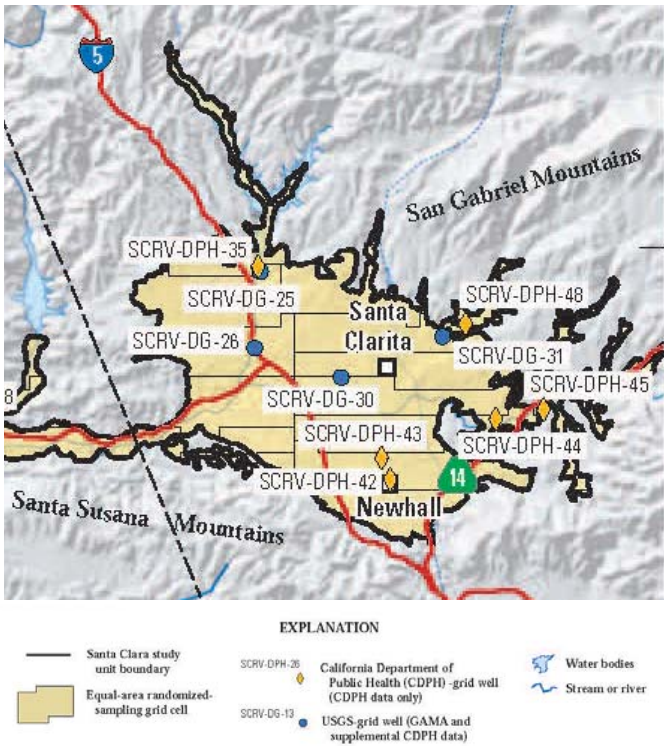
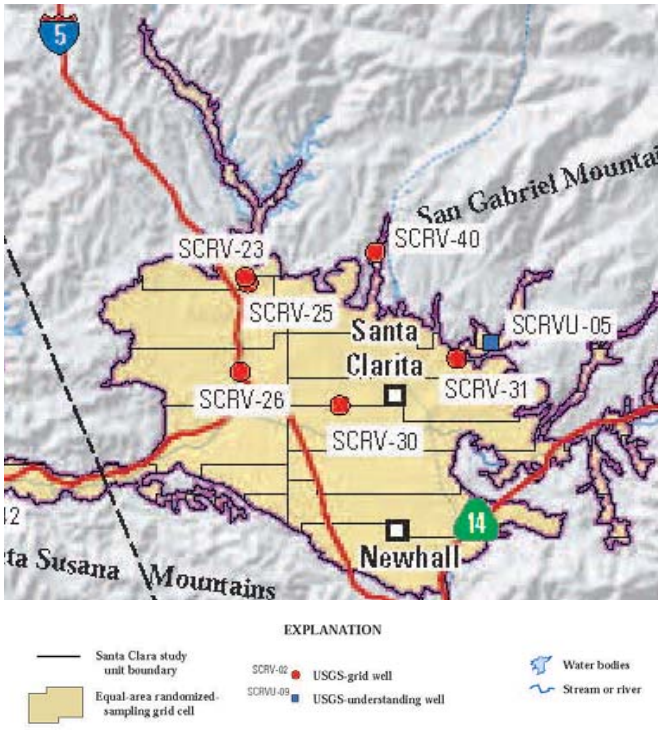
Figure 13

GIS_proj/castaic_lake_SNMP_6-12/6_CastaicSNMP_Fig_13_saugus_mon_network_10-12.mxd

GAMA Program CDPH and USGS Wells



GAMA Program USGS Grid and Understanding Wells



Source: Status and Understanding of Groundwater Quality in the Santa Clara River Valley, 2007: California GAMA Priority Basin Project. USGS Scientific Investigations Report 2011–5052

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Drawn: LB	UPPER SANTA CLARA RIVER REGIONAL WATER MANAGMENT GROUP
Checked: JK	LOCATIONS OF CALIFORNIA GAMA PROGRAM SAMPLING
Approved:	
Date: 15-OCT-12	

DRAFT
Figure
14

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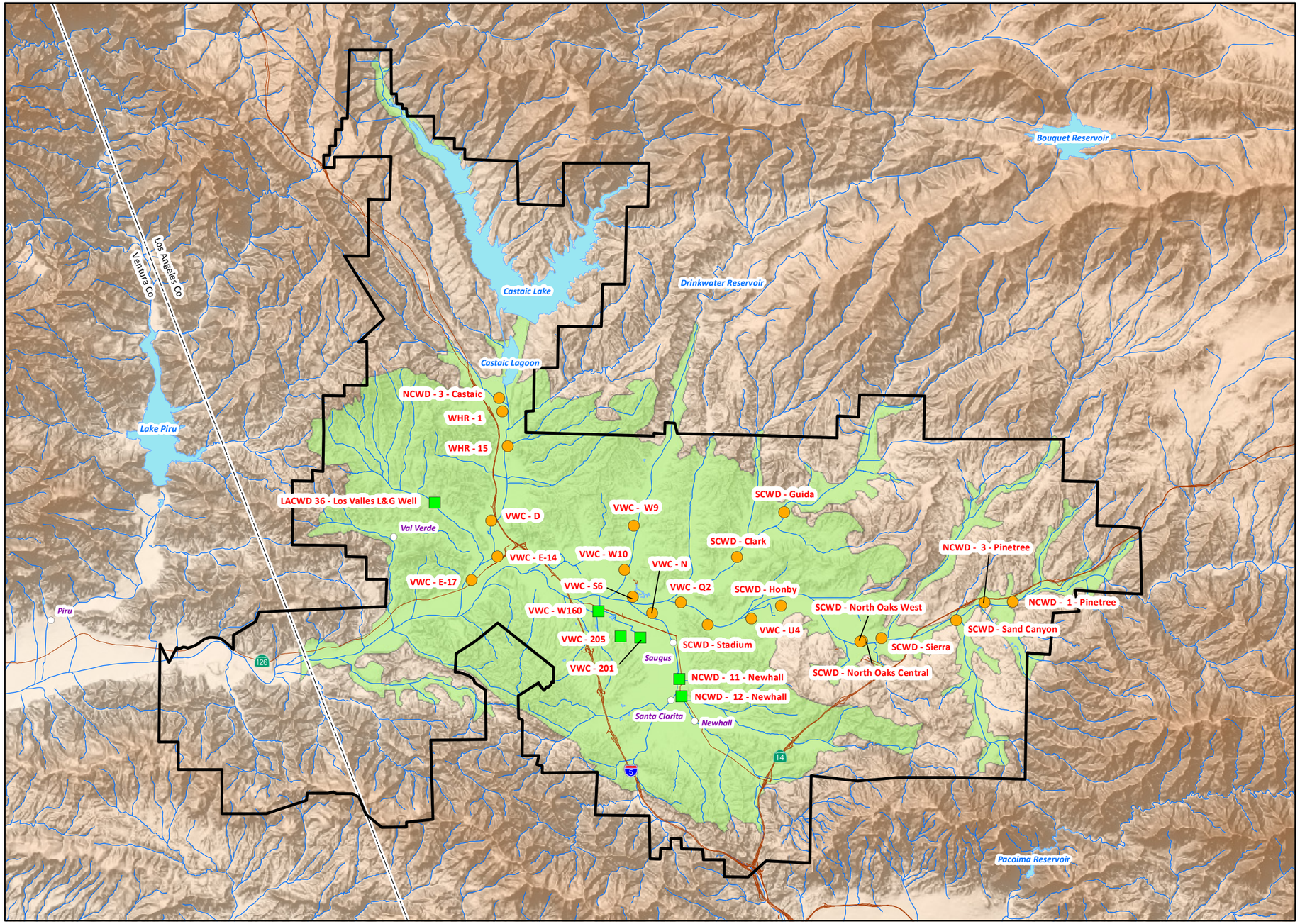
UPPER SANTA CLARA RIVER INTEGRATED REGIONAL WATER MANAGEMENT GROUP

SALT AND NUTRIENT MANAGEMENT PLAN
SANTA CLARA RIVER VALLEY EAST SUBBASIN



PROPOSED GROUND WATER MONITORING NETWORK

EXPLANATION

Castaic Lake Water Agency Boundary

Santa Clara River Valley East Ground Water Subbasin

Proposed Ground Water Monitoring Network by Owner

- Alluvial Aquifer
- Saugus Aquifer

Owner	
LACWD	LA County Waterworks District No. 36 - Val Verde
NCWD	Newhall County Water District
SCWD	Santa Clarita Water Division
VWC	Valencia Water Company
WHR	Wayside Honor Ranch

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NORTH

0 2 4 Miles

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Figure 15

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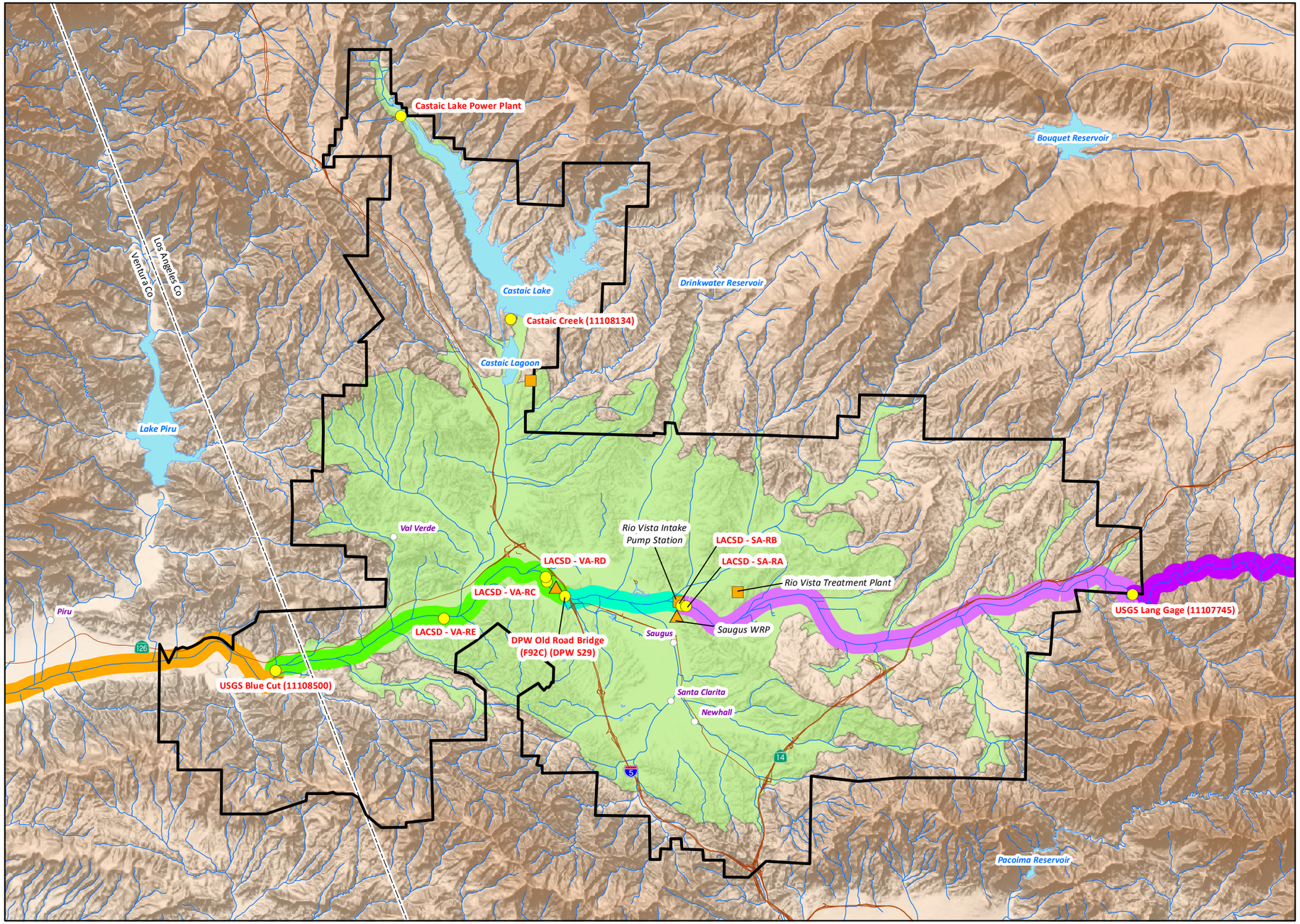
Source: AMEC; Comprehensive Water Quality Monitoring Plan for the Santa Clara River Watershed, March 2006. Figure 46

DRAFT Figure 16	Drawn: LB	UPPER SANTA CLARA RIVER REGIONAL WATER MANAGMENT GROUP	GEOSCIENCE
	Checked: JK	COMPREHENSIVE SURFACE WATER QUALITY MONITORING PLAN - AMEC, 2006	GEOSCIENCE Support Services, Incorporated P.O. Box 220, Claremont, CA 91711 Tel: (909) 451-6650 Fax: (909) 451-6638 www.gssiwater.com
	Approved:		
	Date: 15-OCT-12		

Projects\Castaic Lake Water Agency\01) SNMP_Report\Figures\Fig_16_CMP_SW_Mon_locs.ai

UPPER SANTA CLARA RIVER INTEGRATED REGIONAL WATER MANAGEMENT GROUP

SALT AND NUTRIENT MANAGEMENT PLAN
SANTA CLARA RIVER VALLEY EAST SUBBASIN



PROPOSED SURFACE WATER MONITORING NETWORK

EXPLANATION

- Castaic Lake Water Agency Boundary
- Santa Clara River Valley East Ground Water Subbasin
- Proposed Surface Water Monitoring Network

Owner Abbreviation

DPW	LA County Department of Public Works
LACSD	LA County Sanitation District
USGS	United States Geological Survey

- Water Treatment Facility
- Water Reclamation Plant

Santa Clara River Reaches (Number, Name)

- Reach 4b (Between Blue Cut Gaging Station and the Confluence Between Piru Creek)
- Reach 5 (Blue Cut)
- Reach 6 (Highway 99)
- Reach 7 (Bouquet Canyon)
- Reach 8 (Above Lang Gaging Station)

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NORTH

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Figure 17

GIS_proj/castaic_lake_SNMP_6-12/6_CastaicSNMP_Fig_17_prop_surfwater_mon_network_10-12.mxd

Table 1 - Proposed SNMP Monitoring Wells and Sampling Frequency

Water Well Identification for Proposed Key Well (See Figure 7-4 for Map Locations)	Well Owner	Type of Well	Water Quality Constituent							Proposed Water Quality Sampling Frequency	Proposed Water Level Sampling Frequency
			Ammonia	Boron	Chloride	Nitrate (as NO3)	Sulfate	TDS	CECs*		
Santa Clara Bouquet Canyon Subunit											
SCWD-Clark	SCWD	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
SCWD-Guida	SCWD	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
VWC-Well N	VWC	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
VWC-Well Q2	VWC	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
VWC-Well S6	LACSD/VWC	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
VWC-Well W9	VWC	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
VWC-Well W10	VWC	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
Santa Clara Mint Canyon Subunit											
SCWD-Honby	SCWD	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
SCWD-North Oaks Central	SCWD	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
SCWD-Sand Canyon	SCWD	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
SCWD-Sierra	SCWD	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
NCWD- 1 - PINETREE	NCWD	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
NCWD- 3 - PINETREE	NCWD	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
VWC- U4	VWC	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
Castaic Valley Subunit											
WHR-1	PETER PITCHESS HONOR RANCHO. LAFCO. SHER	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
WHR-15	PETER PITCHESS HONOR RANCHO. LAFCO. SHER	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
VWC- D	VWC	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
GWSI-MW-1	GSWI - Committee	Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
Need Control in Lower Castaic Valley (West End) - One or Two Preferably		Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
South Fork Subbasin											
Need Three Control Wells in South Fork		Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
Placerita Subunit											
Need Three Control Wells in Placerita		Alluvial	X	X	X	X	X	X	X	Semi-Annually (Wet / Dry Period)	Monthly
Saugus Aquifer											
NCWD- 13 - Newhall	NCWD	Saugus	X	X	X	X	X	X	NA	Semi-Annually (Wet / Dry Period)	Monthly
NCWD- 12 - Newhall	NCWD	Saugus	X	X	X	X	X	X	NA	Semi-Annually (Wet / Dry Period)	Monthly
VWC- 201	VWC	Saugus	X	X	X	X	X	X	NA	Semi-Annually (Wet / Dry Period)	Monthly
VWC- 205	VWC	Saugus	X	X	X	X	X	X	NA	Semi-Annually (Wet / Dry Period)	Monthly
NCWD- W160	VWC	Saugus	X	X	X	X	X	X	NA	Semi-Annually (Wet / Dry Period)	Monthly
LACWD 36-Los Valles L&G Well	LACWD 36	Saugus	X	X	X	X	X	X	NA	Semi-Annually (Wet / Dry Period)	Monthly

* The Selected CECs will be sampled for both semi-annual events for all alluvial wells for the first year of sampling. After the first year of sampling and analysis, the results of the analyses should be reviewed to evaluate whether the selected suite and sampled wells should be refined.

Cells in yellow reflect additional sampling beyond what is currently being conducted.

See Figure 1 and 2 for Monitoring Locations.

See Table 3 for suggested CECs to monitor.

Table 2 Proposed SNMP Surface Water Sampling Locations and Sampling Frequency

Surface Water Sampling Locations	Owner	Water Quality Parameters							
		Ammonia	Boron	Chloride	Nitrate (as NO3)	Sulfate	TDS	CECs*	Proposed Water Quality Sampling Frequency
Reach 5									
Lang Gaging Station	USGS	x	x	x	x	x	x	x	Semi-Annually (Wet / Dry Period)
Reach 6									
SA-RB	Sanitation District	x	x	x	x	x	x	x	Semi-Annually (Wet / Dry Period)
Saugus WRP Effluent	Sanitation District	x	x	x	x	x	x	x	Semi-Annually (Wet / Dry Period)
SA-RA	Sanitation District	x	x	x	x	x	x	x	Semi-Annually (Wet / Dry Period)
Reach 7									
Valencia WRP Effluent	Sanitation District	x	x	x	x	x	x	x	Semi-Annually (Wet / Dry Period)
VA-RC	Sanitation District	x	x	x	x	x	x	x	Semi-Annually (Wet / Dry Period)
VA-RD	Sanitation District	x	x	x	x	x	x	x	Semi-Annually (Wet / Dry Period)
S29	LACDPW	x	x	x	x	x	x	x	Semi-Annually (Wet / Dry Period)
VA-RE	Sanitation District	x	x	x	x	x	x	x	Semi-Annually (Wet / Dry Period)
Blue-Cut (11108500)	USGS	x	x	x	x	x	x	x	Semi-Annually (Wet / Dry Period)

***** The Selected CECs should be sampled for both semi-annual events for the first year of sampling. After the first year of sampling and analysis, the results of the analyses should be reviewed to evaluate whether the selected suite and sampling locations should be refined.

Cells in yellow reflect sampling beyond what is currently being conducted.

See Figure 3 for Monitoring Locations.

See Table 3 for suggested CECs to monitor.

Table 3 - Chemicals Identified as CEC Monitoring Priority

Compound	Health-based MRL (ng/L)	Health-based MRLpractical (ng/L)	Performance indicator MRL (ng/L)
17beta-estradiol	0.09	1	1
NDMA	0.1	2	2
Caffeine	35	50	50
Triclosan	50	50	50
Sucralose	N/A	N/A	100
Iopromide	N/A	N/A	50
DEET	N/A	N/A	50
Gemfibrozil	N/A	N/A	50

These constituents were composed by SWRCB's CEC Panel within the Final Report dated June 2010 (Monitoring Strategies for Chemicals of Emerging Concern (CECs) in Recycled Water). These constituents were identified as chemicals that should be prioritized for present CEC Monitoring.