



**BOARD OF DIRECTORS  
SAN LORENZO VALLEY WATER DISTRICT  
AGENDA  
April 19, 2018**

**MISSION STATEMENT:** Our Mission is to provide our customers and future generations with reliable, safe and high quality water at an equitable price; to create and maintain outstanding service and community relations; to manage and protect the environmental health of the aquifers and watersheds; and to ensure the fiscal vitality of the San Lorenzo Valley Water District.

Notice is hereby given that a meeting of the Board of Directors of the San Lorenzo Valley Water District will be held on **Thursday, April 19, 2018 at 5:00 p.m.**, Felton Community Hall, 6191 Highway 9, Felton, CA 95018.

*In compliance with the requirements of Title II of the American Disabilities Act of 1990, the San Lorenzo Valley Water District requests that any person in need of any type of special equipment, assistance or accommodation(s) in order to communicate at the District's Public Meeting can contact the District Secretary's Office at (831) 430-4636 a minimum of 72 hours prior to the scheduled meeting.*

*Agenda documents, including materials related to an item on this agenda submitted to the Board of Directors after distribution of the agenda packet, are available for public inspection and may be reviewed at the office of the District Secretary, 13060 Highway 9, Boulder Creek, CA 95006 during normal business hours. Such documents are also available on the District website at [www.slvwd.com](http://www.slvwd.com) subject to staff's ability to post the documents before the meeting.*

**1. Convene Meeting/Roll Call**

**2. Additions and Deletions to Closed Session Agenda:**

*Additions to the Agenda, if any, may only be made in accordance with California Government Code Section 54954.2 (Ralph M. Brown Act) which includes, but is not limited to, additions for which the need to take action is declared to have arisen after the agenda was posted, as determined by a two-thirds vote of the Board of Directors (or if less than two-thirds of the members are present, a unanimous vote of those members present).*

**3. Oral Communications Regarding Items in Closed Session:**

*This portion of the agenda is reserved for Oral Communications by the public for items which are on the Closed Session portion of the Agenda. Any person may address the Board of Directors at this time, on Closed Session items. Normally, presentations must not exceed three (3) minutes in length, and individuals may only speak once during Oral Communications. No actions may be taken by the Board of Directors on any Oral Communications presented; however, the Board of Directors may request that the matter be placed on a future agenda. Please state your name and town/city of residence at the beginning of your statement for the record.*

4. Adjournment to Closed Session

*At any time during the regular session, the Board may adjourn to Closed Session in compliance with, and as authorized by, California Government Code Section 54956.9 and Brown Act, Government Code Section 54950. Members of the public will be given the opportunity to address any scheduled item prior to adjourning to closed session.*

- a. CONFERENCE WITH LEGAL COUNSEL- EXISTING LITIGATION  
Government Code Section 54956.9(d)(1)  
Holloway v. Showcase Realty Agents, Inc. et al.  
(Santa Cruz Superior Court Case No. CV180394; 6th District Court of Appeal Case Nos. H043704, H043492).
- b. CONFERENCE WITH LEGAL COUNSEL- EXISTING LITIGATION  
Government Code Section 54956.9(d)(1)  
[Vierra](#) v. San Lorenzo Valley Water District, et al.  
(Santa Cruz Superior Court Case No. 18CV00890)
- c. CONFERENCE WITH LEGAL COUNSEL-ANTICIPATION OF LITIGATION  
Initiation of litigation pursuant to Government Code Section 54956.9(d)(4);  
One case  
Potential initiation of lawsuit for injunction against Director Smallman to prevent future unauthorized disclosures of the District's confidential and legally protected information
- d. PUBLIC EMPLOYEE PERFORMANCE EVALUATION  
Government Code Section 54957  
Title: District Manager

Closed Session Note:

**The Brown Act prohibits the disclosure of confidential information acquired in a closed session by any person present and offers various remedies to address willful breaches of confidentiality. These include injunctive relief, disciplinary action against an employee, and referral of a member of the legislative body to the grand jury. It is incumbent upon all those attending lawful closed sessions to protect the confidentiality of those discussions. Only the legislative body acting as a body may agree to divulge confidential closed session information; regarding attorney/client privileged communications, the entire body is the holder of the privilege and only a majority vote of the entire body can authorize the waive of the privilege.**

5. Convene to Open Session at 6:30 p.m.

6. Report of Actions Taken in Closed Session

7. Additions and Deletions to Open Session Agenda:

*Additions to the Agenda, if any, may only be made in accordance with California Government Code Section 54954.2 (Ralph M. Brown Act) which includes, but is not limited to, additions for which the need to take action is declared to have arisen after the agenda was posted, as determined by a two-thirds vote of the Board of Directors (or if less than two-thirds of the members are present, a unanimous vote of those members present).*

8. Oral Communications:

*This portion of the agenda is reserved for Oral Communications by the public for items which are not on the agenda. Please understand that California law (The Brown Act) limits what the Board can do regarding issues raised during Oral Communication. No action or discussion may occur on issues outside of those already listed on today's agenda.*

*Any person may address the Board of Directors at this time, on any subject that lies within the jurisdiction of the District. Normally, communication must not exceed three (3) minutes in length, and individuals may only speak once during Oral Communications.*

*If you wish to speak on a non-agendized item, please submit a 'speaker slip' to the District Secretary. It is not required, but individuals who have submitted a 'speaker slip' will be given priority. Time for Oral Communications at the start of the meeting will be limited to 15 minutes in total. If there are additional speakers, the Board will continue Oral Communications after the Consent Agenda.*

*Any Director may request that a matter raised during Oral Communication be placed on a future agenda.*

9. New Business:

*Members of the public will be given the opportunity to address each scheduled item prior to Board deliberations. The Chairperson of the Board may establish a time limit for members of the public to address the Board on agenda items.*

- a. LOMPICO ASSESSMENT DISTRICT OVERSIGHT COMMITTEE APPLICATIONS  
Discussion and possible action by the Board regarding LADOC applications.
- b. SANTA CRUZ WATER DEPARTMENT/SAN LORENZO VALLEY WATER DISTRICT SAN LORENZO RIVER AND NORTH COAST WATERSHEDS SANITARY SURVEY  
Discussion and possible action by the Board regarding SCWD/SLVWD river and watersheds update.
- c. FIRST ANNUAL GROUNDWATER SUSTAINABILITY AGENCY SUMMIT  
Discussion and possible action by the Board regarding attendance of the Groundwater Sustainability Agency Summit.
- d. LETTER FROM B. HOLLOWAY REGARDING ALLEGATIONS OF BROWN ACT VIOLATIONS  
Discussion and possible action by the Board regarding a letter from B. Holloway regarding allegations of Brown Act violations.

- e. IDEA PROPOSAL FOR ERADICATION OF FRENCH BROOM ON THE OLYMPIA WATERSHED PROPOSAL  
Discussion and possible action by the Board regarding an Idea Proposal by Director Smallman.
- f. IDEA PROPOSAL-MODIFICATION OF THE BEAR CREEK WASTEWATER COLLECTION AND TREATMENT INTO A SEPTIC TANK EFFLUENT SYSTEM  
Discussion and possible action by the Board regarding an Idea Proposal by Director Smallman.
- g. REQUEST FOR ATTORNEY REPRESENTATION BY DIRECTOR SMALLMAN  
Discussion and possible action by the Board regarding a request for attorney representation by Director Smallman pursuant to Government Code section 995.

10. Unfinished Business:

***Members of the public will be given the opportunity to address each scheduled item prior to Board deliberations. The Chairperson of the Board may establish a time limit for members of the public to address the Board on agenda.***

- a. ENGINEERING AND DESIGN SERVICES CONTRACT NEGOTIATIONS  
Discussion and possible action by the Board regarding Engineering and Design Services contract negotiations.
- b. AWARD OF BID FOR DISTRICT WIDE 2-WAY RADIO SYSTEM  
Discussion and possible action by the Board regarding the award of bid for 2-way radio system.
- c. AWARD OF BID FOR CONJUNCTIVE USE FISH CONSULTANT  
Discussion and possible action by the Board regarding the award of bid for conjunctive use fish consultant.
- d. CONJUNCTIVE USE SUB-GRANT AMENDMENT  
Discussion and possible action by the Board regarding the conjunctive use sub-grant amendment.
- e. PIPE INSTALLATION APPROVAL ON HIGHWAY 9 IN BROOKDALE  
Discussion and possible action by the Board regarding approval of pipe installation on Highway 9 in Brookdale.

11. Consent Agenda:

***The Consent Agenda contains items which are considered to be routine in nature and will be adopted by one (1) motion without discussion. Any item on the consent agenda will be moved to the regular agenda upon request from individual Directors or a member of the public.***



- a. MINUTES FROM BOARD OF DIRECTORS MEETING  
MARCH 15, 2018.  
Consideration and possible action by the Board to approve minutes from the March 15, 2018 BoD meeting.
- b. CALIFORNIA SPECIAL DISTRICT'S ASSOCIATION CREDIT CARD  
ISSUED BY UMPQUA BANK  
Consideration and possible action by the Board to authorize a CSDA Credit Card issued by Umpqua Bank.

12. District Reports:

*No action will be taken and discussion may be limited at the Chairperson's discretion. The District encourages that questions be submitted in writing ([bod@slvwd.com](mailto:bod@slvwd.com)) on items listed in the District Reports. Questions submitted, if any, will be posted in the next available District Reports, along with a reply.*

- DEPARTMENT STATUS REPORTS  
Receipt and consideration by the Board of Department Status Reports regarding ongoing projects and other activities.
  - Administration/Engineering
  - Finance
  - Environmental
  - Operations
- COMMITTEE REPORTS
  - Future Committee Agenda Items
  - Committee Meeting Notes/Minutes
    - 1. Admin Committee 3.14.18
    - 2. Environmental Committee 3.20.18
    - 3. Special Budget & Finance Committee 4.9.18
    - 4. Admin Committee 4.11.18
- DIRECTORS REPORTS
  - Director's Communication
  - Future Board of Directors Meeting Agenda Items

13. Written Communication:

- Email from S. Wharton - 3.9.18
- Letter from D. Loewen-4.10.18

14. Informational Material:

- COURT TAKES ISSUE - Press Banner 3.9.18
- PLANNING FOR CONJUNCTIVE USE - Press Banner 3.23.18
- PROBATION WATER TANK - Press Banner 3.30.18
- BOULDER CREEK GETS PROACTIVE - Press Banner 4.11.18
- TAXPAYER DOES HAVE STANDING - Press Banner 4.11.18

## 15. Adjournment

### Certification of Posting

I hereby certify that on April 13, 2018 I posted a copy of the foregoing agenda in the outside display case at the District Office, 13060 Highway 9, Boulder Creek, California and at the Highlands Park Senior Center, said time being at least 72 hours in advance of the meeting of the Board of Directors of the San Lorenzo Valley Water District (Government Code Section 54954.2).

Executed at Boulder Creek, California on April 13, 2018

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Holly B. Hossack  
District Secretary

## M E M O

**TO:** Board of Directors

**FROM:** District Manager

**SUBJECT:** LOMPICO ASSESSMENT DISTRICT OVERSIGHT COMMITTEE  
(LADOC) APPLICATIONS

**DATE:** April 19, 2018

### RECOMMENDATION:

It is recommended that the Board review the attached applications and choose one to replace April Crittenden who resigned from the LADOC.

### BACKGROUND:

The merger of Lompico County Water District and San Lorenzo Valley Water District was completed on June 1, 2016. The Local Agency Formation Commission (LAFCO) condition of the merger was that SLVWD create a Lompico Oversight Committee.

On May 19, 2016 the District modified Section 14 - 'Committees' of the Board Procedure Manual to include a Lompico Oversight Committee, later becoming the Lompico Assessment District Oversight Committee (LADCO).

The District appointed the five charter members of the LADOC.

1. April Crittenden
2. John Grunow
3. Lydia Hammack
4. Ruth Shaw
5. Antoinette (Toni) Norton

April Crittenden resigned from the LADOC at the beginning of 2018 leaving an empty space on the committee. The District advertised for applicants for the open position and received 3 applications (see attached).

### STRATEGIC PLAN:

Element 5.2 Funding Infrastructure Replacement  
Element 6.2 Increase Civic Understanding and Engagement

### FISCAL IMPACT:

None

## Holly Morrison

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**From:** Andrew Rippert <andrew.rippert@gmail.com>  
**Sent:** Monday, March 05, 2018 1:40 PM  
**To:** Holly Morrison  
**Subject:** Lompico Assessment District Oversight Committee  
**Attachments:** Scan001 (32).pdf

Hello,

Attached please find my application to be part of the Lompico District Oversight Committee. I have been a homeowner in Lompico since 2015 and don't plan on going anywhere anytime soon.

I used to work in environmental consulting and would love to have a better understanding of what projects are being prioritized for our area.



# Lompico Assessment District Oversight Committee Application Form

Thank you for your interest in participating in LADOC.

Members of the public play a vital role in shaping the District and your willingness to contribute time and effort is greatly appreciated.

Please send your completed application to the District Secretary, 13060 Hwy. 9, Boulder Creek, CA 95006 or to [harrison@slvwd.com](mailto:harrison@slvwd.com)

## Personal Details

Name: Andrew Rippert Mr. ☒ Mrs. ☐ Miss ☐ Ms. ☐  
Postal Address: 354 Lenore Way, Lompico, 95018  
Telephone: (Home) \_\_\_\_\_ (Mobile) 203 610 0702

E-Mail: Andrew.rippert@gmail.com

## The Committee

This committee will be made up of 5 individuals interested in assisting in an advisory role to review matters of revenue and expenses directly related to Assessment District 2016-1 projects. We ask that you be a customer of the former Lompico water district.

## Why You Want to Participate

- Concerned that local community does not value sound, healthy infrastructure
- B.S. in Environmental Engineering
- Desires more information on direction of SLVWD in Lompico

## Andrew C. Rippert

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354 Lenore Way  
Felton, CA, 95018

Phone: (203)-610-0702  
Andrew.Rippert@gmail.com

### Education and Training

- B.S., Environmental Engineering: Municipal Processes, University of New Hampshire, Durham, New Hampshire, 2005
- Asbestos Building Inspector
- DOT 8-hour Hazardous Materials Management

### Profile

I am currently serving as the Hazardous Waste Manager at the University of California, Santa Cruz. Previously I have worked as an Environmental Engineer with over 8 years of experience as a consultant with private and federal clients on RCRA and CERCLA sites. I have served as the field lead on environmental investigations and remedial actions, as well as authored field sampling plans, remedial investigation summaries, and managed field sampling databases throughout the United States.

### Representative Projects

#### University of California, Santa Cruz - 2015 to Present

##### *Hazardous Waste Manager, Santa Cruz, CA*

Responsible for management of all hazardous waste generated on campus

- Responsible for management of all hazardous waste generated on campus
  - Responsible for making all waste determinations on campus as they arise
  - Collection, segregation, storage and shipment of all hazardous wastes on campus and satellite campuses
  - Authored on-line hazardous waste training program for campus
  - Provide in person environmental compliance training for hazardous material users and hazardous waste generators, as needed
  - Assisted in procuring systemwide hazardous waste services agreement for all UC Campuses
  - Lead role in campus Emergency Response Team, leading trainings and responding to incidents as they arise
  - All administrative requirements pertinent to a large-scale hazardous waste generator, including biennial reports, hazardous materials business plans, and hazardous waste manifests
  - Responds to industrial health and environmental complaints as they arise
  - Management of hazardous waste services contractors on campus
  - Lead point of contact during regulatory compliance inspections

## Andrew C. Rippert

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### CH2M, Inc. – 2008 to 2015

*Site Environmental Manager, NASA Santa Susana Field Lab, Los Angeles, CA.*

Responsible for fence-to-fence Environmental Compliance on behalf of NASA.

- Responsible for management of all waste generated by NASA at facility
  - Classification of all waste generated using site history and interpretation of analytical data
  - Oversight of characterization and shipment of all waste materials generated
  - Compliance with site SWPPP and RCRA permits
  - Maintained subcontracts and managed budgets for all general and waste transportation subcontractors
- Managed all permit-driven groundwater monitoring events
- Primary Emergency Response contact for facility
- Primary Regulatory Agency contact for all site audits
- Provided budget estimates for environmental compliance and waste management for all field projects conducted on site

*Field Team Manager, NASA Santa Susana Field Lab, Los Angeles, CA.*

2011 – 2013

Field Lead for expansive Soil and Soil Vapor Characterization project.

- Lead multi-disciplinary teams in the collection of over 1,500 soil, soil vapor, rock core, and groundwater samples throughout high-profile site
- Developed excellent working relationship with regulators through weekly regulator observation of field activities
- Responsible for implementing all Field Sampling Plans including
  - Staffing and Budget Tracking
  - Sample Database Management
  - Primary contact for all subcontracted laboratories
  - Quality Control - ensured all samples were collected and documented according to quality control plan and standard operating procedures (SOPs)
- Established SOPs and trained field staff on proper sample collection procedures and documentation

*Field Team Manager, NASA Marshall Space Flight Center, Huntsville, AL.*

2011 – 2012

Sampling Team Lead for Remedial Excavation

- Managed multiple sampling crews supporting remedial excavation of contaminated soil within active facility
- Tracking, characterization, and preparation of all containers of excavated material, shipping as many as 35 roll-off containers per day to disposal facilities
- Staffing, training, and daily oversight of crews
- Responsible for collection, management, interpretation, and presentation of all confirmation and waste characterization data to client and technical team

## Andrew C. Rippert

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*Environmental Engineer, Hanford Site, U.S. Department of Energy, Richland, WA*  
2010 – 2011

Field Sampling Plan Author and Field Characterization Lead

- Implemented field screening program using X-ray fluorescence to expedite characterization and remediation of waste sites
- Authored field sampling plans for characterization of sites contaminated with both radiological and non-radiological contaminants
- Performed technical reviews of SOPs and scope of work documents for drilling events.
- Managed analytical data from field sampling events
- Provided support for other document leads by creating figures and implementing GPS data using ArcGIS
- Performed oversight of drilling, remedial excavation, and sample collection teams

*Environmental Engineer, Various Military Installations, U.S. Air Force, CA*  
2008-2010

Author of Field Sampling Plans, Remedial Investigation Reports, Drilling, Stormwater Sampling

- Authored field sampling plans and remedial investigation characterization summaries to address data gaps on disposal pits, pipelines, and former process areas with both radiological and non-radiological contaminants
- Oversight of drilling, soil, soil vapor, groundwater sampling and monitoring well installation. Lead contact during soil vapor sampling techniques for EPA audits
- Collection of stormwater and sewer samples during precipitation events, authored reports summarizing data for client and regulatory agencies

**URS Corp. – 2006 to 2008**

*Environmental Engineer, Active Refinery; Motiva Enterprises; Delaware City, Delaware.*  
2006–2008

Junior Environmental Engineer

- Construction and operation of two pilot groundwater treatment systems designed to promote aerobic biodegradation of MTBE and petroleum hydrocarbons
- Designed and implemented study directly demonstrating system's positive effect on MTBE biodegradation
- Performed low-flow sampling of monitoring wells
- Interpreted microcosm studies evaluating the effects of different terminal electron acceptors for aerobic and anaerobic biological treatment of MTBE and TBA
- Authored routine groundwater monitoring and remedial system performance reports
- Oversight of rotosonic and direct-push drilling for installation of monitoring wells
- Installed and maintained pressure transducers and pumps as part of constant-rate aquifer test



## Andrew C. Rippert

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*Environmental Engineer; Former Industrial Facility, Pennsylvania DEP, Doylestown, Pennsylvania.*  
2006–2008

Junior Environmental Engineer

- On-site point of contact for client and community parties on high-profile active commercial site
- Field Team Lead for routine groundwater sampling events
- Managed the storage and disposal of investigation derived wastes
- Performed step-drawdown and packered interval testing of fractured bedrock aquifer
- Modeled and implemented tracer study to determine perceived breakthrough time for constant-rate aquifer test
- Installed and maintained pressure transducers during aquifer testing activities
- Prepared work plans and coordinated subcontractors for field effort involving well installation, drilling, geophysical investigation, and packered interval testing in fractured bedrock aquifer

### Languages

English

Mandarin Chinese (novice)

### Professional Registrations

Engineer in Training: New Hampshire #4247

*References Available Upon Request*



# Lompico Assessment District Oversight Committee Application Form

RECEIVED  
APR 04 2018  
SAN LORENZO VALLEY  
WATER DISTRICT

Thank you for your interest in participating in LADOC.

Members of the public play a vital role in shaping the District and your willingness to contribute time and effort is greatly appreciated.

Please send your completed application to the District Secretary, 13060 Hwy. 9, Boulder Creek, CA 95006 or to [harrison@slvwd.com](mailto:harrison@slvwd.com)

## Personal Details

Name: Lola Henry Mr. ☐ Mrs. ☒ Miss ☐ Ms. ☐

Postal Address: P.O. Box 66 Felton, Ca 95018

Telephone: (Home) 831-335-7920 (Mobile) 831-566-6788

E-Mail: Lannahenry@comcast.net

## The Committee

This committee will be made up of 5 individuals interested in assisting in an advisory role to review matters of revenue and expenses directly related to Assessment District 2016-1 projects. We ask that you be a customer of the former Lompico water district.

## Why You Want to Participate

I have lived in Lompico for 47 years. In 2008 ran for the Lompico County Water District board and served until June 1, 2016. I ran for the board because I heard the district had financial problems and thought I could help because of my financial background. I soon realized the district was too small to survive, not enough money, no reserves and not enough water. In 2010 Chris Kelgus and I approached SLVWD to talk about merging. I continued to be involved with the merger talks until passed May 2016. Making me the most qualified to be on the Lompico Oversight Committee. I want to continue to serve the people of Lompico.

## Holly Morrison

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**From:** Mary Ann LoBalbo <maryann.lobalbo@comcast.net>  
**Sent:** Thursday, April 05, 2018 11:52 PM  
**To:** Holly Morrison  
**Subject:** Lompico Oversight committee Application LoBalbo-Mary Ann  
**Attachments:** LoBalbo-M-LADOC Application 2.28.18.pdf

Hello,

Here is my application for the Lompico Oversight Committee.

Please let me know if there is anything else I need to do and if you have received this.

Thank you and have a great day!

Mary Ann LoBalbo

831 566-3385



# Lompico Assessment District Oversight Committee Application Form

Thank you for your interest in participating in LADOC.

Members of the public play a vital role in shaping the District and your willingness to contribute time and effort is greatly appreciated.

Please send your completed application to the District Secretary, 13060 Hwy. 9, Boulder Creek, CA 95006 or to [hmorrison@slvwd.com](mailto:hmorrison@slvwd.com)

---

## Personal Details

Name: Mary Ann LoBalbo Mr. ☐ Mrs. ☐ Miss ☐ Ms. ☒

Postal Address: PO Box 501 Felton, CA 95018

Telephone: (Home) (831)335-1117 (Mobile) (831)566-3385

E-Mail: Maryann.LoBalbo@comcast.net

## The Committee

This committee will be made up of 5 individuals interested in assisting in an advisory role to review matters of revenue and expenses directly related to Assessment District 2016-1 projects. We ask that you be a customer of the former Lompico water district.

## Why You Want to Participate

Hello,

My name is Mary Ann LoBalbo and I live in Lompico and was a customer of Lompico Water Company prior to becoming part of SLV Water. I was part of the Lompico Water Company on a few committees and went to many meetings because I wanted to know and be apart of the community water company.

I did apply the first time for this committee, but was sick and could not make the meeting a few years ago. I have gone to a meeting or two with this committee when it was first formed, but life got busy with some family matters at the time.

Things a much better and would enjoy working with the team. I currently work for the County in the Department Public Works as the Accounts Payable Supervisor. I also owned my own business and have taken multiple accounting classes and excel. I feel I could be a great asset helping to analyze the information we receive from SLV. I understand great customer service and enjoy talking to the community to bring information to them so they too can understand when needed.

thank you and I look forward to hearing from you soon!! Mary Ann LoBabo

## MEMO

TO: Board of Directors

FROM: District Manager

PREPARED BY: Environmental Manager

SUBJECT: Sanitary Survey

DATE: April 19, 2018

### **RECOMMENDATION:**

It is recommended that the Board review and accept the 2018 Sanitary Survey which has been submitted to the Department of Public Health.

### **BACKGROUND:**

Sanitary surveys are required by the California Department of Public Health (DPH) to be completed for each watershed that is a drinking water source. Updates are required every five years per the State of California Surface Water Treatment regulations (Chapter 17, Title 22). These requirements incorporate the Surface Water Treatment Rule (SWTR) mandated by the United States Environmental Protection Agency (EPA) and enforced by DPH as a primacy agency for federal regulations.

This sanitary survey includes the San Lorenzo Valley and North Coast watersheds, all within Santa Cruz County, California (Figure 1-1). The first sanitary survey for this area was completed in 1996 by Camp Dresser & McKee, was updated in 2001 by the City of Santa Cruz Water Department (SCWD or City), and subsequently updated in 2006. This sanitary survey update is based on numerous discussions with utility and regulatory staff, review of various reports, an evaluation of historic and recent water quality monitoring results, and analyses of the ongoing management practices within the watershed area.

A watershed sanitary survey is a detailed evaluation of surface water sources and their vulnerability to contamination. It is more comprehensive than a Source Water Assessment (SWA) and can be used in place of a SWA to fulfill the requirements of California's 1996 Drinking Water Source Assessment and Protection (DWSAP) Program. Whereas a SWA ranks and inventories possible contaminating activities (PCAs) located within the source area, a sanitary survey provides more background, descriptive information, and review of all relevant monitoring data.

Specific sanitary survey requirements are:

- Conduct a sanitary survey of the watershed(s) at least every five years.
- Describe the hydrological conditions of the watershed, summarize source water quality data, describe activities and possible contamination sources, and identify any significant changes since a previous survey was conducted.
- Describe watershed control and management practices.

**Potential Contaminant Sources:** As discussed this 2018 Sanitary Survey in Section 3, Section 6.2 and summarized in Table 6-2, there are a number of contaminant sources that can contribute

sediments, pathogens, and chemicals that are potentially significant to drinking water quality which include:

- Cannabis Cultivation
- Wastewater and Urban Runoff
- Confined Animal Facilities
- Unauthorized Activity
- Roads including Timber Harvest Roads
- Mining/Quarry Activities
- Geologic Hazards and Fires including landslides after significant rains
- Chemical Spills

It is recommended that the board review and accept the sanitary survey.

FISCAL IMPACT:

FY 17/18: \$11,000

2015 STRATEGIC PLAN:

Strategic Element 1.0 - Water Supply Management

Strategic Element 2.0 - Watershed Stewardship





**Santa Cruz Water Department**

*in association with*

**San Lorenzo Valley Water District**

## San Lorenzo River and North Coast Watersheds Sanitary Survey Update

February 2018

**Kennedy/Jenks Consultants**



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## **Kennedy/Jenks Consultants**

2350 Mission College Boulevard, Suite 525  
Santa Clara, California 95454  
650-852-2800  
FAX: 650-856-8527

### **San Lorenzo River and North Coast Watersheds Sanitary Survey Update**

February 2018

Prepared for

#### **City of Santa Cruz**

715 Graham Hill Rd.  
Santa Cruz, CA 95060

In association with  
San Lorenzo Valley Water District

K/J Project No. 17680004\*00

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## Executive Summary

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The narrative below is a high-level summary of the major Watershed Sanitary Survey topics discussed in detail in this Watershed Sanitary Survey (WSS) Update for the City of Santa Cruz Water Department (SCWD) and the San Lorenzo Valley Water District (SLVWD), which merged with the Lompico County Water District in 2016.

Watersheds and Water Supply Systems: - The City of Santa Cruz (City) owns 3,640 acres, and SLVWD owns 2,231 acres, and also owns, through merger with the Lompico County Water District about 13 acres of additional land of the estimated 76,400 total acres within the San Lorenzo River upstream of the Tait Street diversion. Land ownership provides the ability to influence water quality management activities within the lands under agency control including prohibitions on timber harvest. In addition, there are other entities including Santa Cruz County, State of California Parks (Parks), and non-profit organizations such as Sempervirens Fund that can own, regulate and/or protect watershed lands for water quality benefit. Almost one-quarter of the lands in the San Lorenzo River are under ownership by entities that retain them as preserves.

The North Coast watershed sources fall under a range of public and private ownership with associated benefits and challenges, such as public access and associated water quality risks. The 7,600 acres of the North Coast watershed sources are mostly under private ownership. However in 2011, a large swath of the CEMEX properties were acquired by a group of private organizations which results in the protection of an additional 8,532 acres of land, called San Vicente Redwoods, some of which drains into the upper reaches of Laguna Creek. Only a portion of this land is upstream of the City's diversion. The land is owned by the Sempervirens Fund and Peninsula Open Space Trust (POST) with funding support from Save the Redwoods League, the Nature Conservancy, the Santa Cruz County Land Trust, and a number of foundations. The San Vicente Redwoods lands is currently under the management of the Land Trust of Santa Cruz County and includes plans for a park ranger program. Access to the San Vicente Redwoods may be provided through the adjacent federally owned Cotoni Coast Dairies National Monument which will be managed by the US Bureau of Land Management. In addition, the quarry in the Liddell Springs watershed which is one of the City's North Coast sources is also privately owned.

Potential Contaminant Sources: As discussed in Section 3, Section 6.2 and summarized in Table 6-2, there are a number of contaminant sources that can contribute sediments, pathogens, and chemicals that are potentially significant to drinking water quality which include:

- Cannabis Cultivation
- Wastewater and Urban Runoff
- Confined Animal Facilities
- Unauthorized Activity
- Roads including Timber Harvest Roads
- Mining/Quarry Activities
- Geologic Hazards and Fires including landslides after significant rains
- Chemical Spills
- Pesticides and Herbicides

Watershed Management Activities: As discussed in Section 4, watershed management jurisdiction in the San Lorenzo and North Coast watersheds is distributed; the majority of the watershed is governed by Santa Cruz County and/or regulated by Federal and state agencies such as National Oceanic and Atmospheric Administration (NOAA) Fisheries, US Army Corps of Engineers, California Regional Water Quality Control Board (RWQCB), Parks, California Department of Forestry and Fire Protection (CalFire), and California Department of Fish and Wildlife (CDFW) with the water purveyors jurisdiction limited mostly to those areas that they have land ownership as summarized earlier. In addition, local non-governmental organizations can play a role in watershed protection and water quality improvement as partners as well as individually.

Watershed management includes regulatory activities and management/planning activities which are detailed in Section 4. Regulatory activities include the County's ordinances on cannabis cultivation, wastewater management, water quality, riparian and sensitive habitats; State regulations on beneficial use and permitting of stormwater, urban runoff, riparian zone construction, and timber harvest by the California Regional Water Quality Control Board (RWQCB); and federal water quality regulations for waste discharge and wetland filling. Specific discussion regarding the non-drinking water quality regulatory activities is discussed further below.

Management and planning activities also occur at the local, state and federal levels and include the City's draft watershed lands management plan that can include patrol of riparian areas; the County's General Plan, cannabis cultivation ordinances and regulations that are under development, San Lorenzo River Watershed, Wastewater, and Nitrate Management Plans as well as County road maintenance manuals; the activities of local non-governmental organizations to educate and work with landowners on horse stable management, fire protection, and water quality improvement; and State fire and fuel management plans within the State Parks as well as on other lands. Collectively, these regulations and watershed management plans generally provide a high level of oversight of activities that impact and improve water quality which is supported by the water quality data. However, coordination between the entities and their activities can be improved upon.

In addition, City staff has been creative in implementing measures that have the potential to directly improve water quality. Measures include spearheading the San Lorenzo River 2025 collaborative effort for habitat restoration and watershed protection; wildfire planning; funding riparian area patrols as well as establishing conservation agreements on private lands that allow City staff to patrol upstream of drinking water diversions. These efforts include restoring and improving the waterway especially as related to fisheries habitat improvements. On a broader San Lorenzo River watershed basis, the City has partnered with non-governmental organizations (NGOs) such as the Resource Conservation District of Santa Cruz County (RCD) to educate watershed users by installing watershed identification signs and signs at creek crossings and watershed divides; has vastly increased its watershed interpretive and outreach programming in recent years. The City has also been involved in significant fire preparedness work on its watershed lands surrounding Loch Lomond Reservoir. Other water quality improvement activities of NGOs including participation in a county-wide Fire Safe council as well as continuing to support efforts by organizations such as Sempervirens Fund and POST's efforts to acquire and protect watershed lands; both of which provide significant benefit to drinking water quality.

Non- Drinking Water Regulatory Challenges: Regulatory challenges such as water quality Total Maximum Daily Loads (TMDLs) administered by the RWQCB and fisheries-related Habitat Conservation Plans (HCP) administered by National Oceanic And Atmospheric (NOAA)- National Marine Fisheries Service (NMFS) as well as weak enforcement of County and State regulations within the watersheds continue to challenge the City. For example, implementation of TMDLs for pathogens and nutrients will ultimately benefit water quality but the City must rely on many other individuals to remove these constituents. In addition, implementation of the instream flow targets for HCPs, described in greater detail in Section 2.3.5, may limit the City's use of their high quality North Coast water sources which will increase reliance on other sources with higher total organic carbon and resulting disinfection challenges.

Water Quality Data Summary: Water quality data for the period from 2011-2016 found in Figures and Tables in Section 5 indicate no unexpected changes in total coliform, turbidity, or nitrate concentrations in the City's North Coast or the San Lorenzo River watershed sources for the City or SLVWD; expected seasonal and dry/wet year variations have occurred. The North Coast sources, in particular Liddell Spring, have continued to have lower total coliform levels when compared to the San Lorenzo River sources.

Conclusions and Recommendations: The San Lorenzo and North Coast watersheds are generally providing a high water quality, with some expected variability during the wet season, particularly during the heavy winter rains of 2016-2017. The agencies closely manage the high turbidity events by bypassing stormflows, using stored water and/or alternative sources, that, when combined with the water treatment processes at the WTPs, are delivering a consistently safe drinking water to the residents. However, the City faces some future regulatory challenges as well as interest in wintertime flows for regional water supply reliability, may make it more difficult to continue to meet the drinking water regulations. The City has evaluated the water quality data in greater detail and has identified some potential changes, for discussion with Division of Drinking Water (DDW) staff, which can be implemented to ensure it continues to meet drinking water regulations in the future.

More specific conclusions and recommendations are discussed in Section 6 and summarized in Table 6-4 and include activities such as continuing:

- Coordination of acquisition and review of water quality monitoring data, particularly as it relates to cannabis cultivation
- Implementation of County wastewater management and other management plans, cannabis regulations, road maintenance manual, and ordinances as well as coordinating with County agencies such as Emergency Response for toxic spills
- Review of developments in the watersheds including accessory dwelling units in rural areas, especially near diversions
- Support of local non-governmental organizations in public education and implementation of best management practices for roads and confined animals as well as land acquisition for preserves
- Improving collaboration with state regulatory agencies with regard to timber harvests, forest fuel management, illegal cannabis cultivation (especially State Water Resources Control Board regulations), and fisheries habitat improvement

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## SECTION 1:INTRODUCTION

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Sanitary surveys are required by the State Water Resources Control Board, Division of Drinking Water (DDW) formerly the California Department of Public Health to be completed for each watershed that is a drinking water source. Updates are required every five years per the State of California Surface Water Treatment regulations (Chapter 17, Title 22). These requirements incorporate the Surface Water Treatment Rule (SWTR) mandated by the United States Environmental Protection Agency (EPA) and enforced by DDW as a primacy agency for federal regulations.

This sanitary survey includes the San Lorenzo River and North Coast watersheds, all within Santa Cruz County, California (Figure 1-1). The first sanitary survey for this area was completed in 1996 by Camp Dresser & McKee, was updated in 2001 by the City of Santa Cruz Water Department (SCWD or City), and subsequently updated in 2006 and 2013. The sanitary surveys include content for the SLVWD and the Lompico County Water District (LCWD) which merged with SLVWD in 2016<sup>1</sup>, which share portions of the San Lorenzo River watershed. This sanitary survey update is based on numerous discussions with utility and regulatory staff, review of various reports, an evaluation of historic and recent water quality monitoring results, and analyses of the ongoing management practices within the watershed area.

### 1.1 Study Area

Figure 1-1 illustrates the approximate watershed boundaries of the San Lorenzo River and North Coast watersheds, all within Santa Cruz County. The San Lorenzo River is the watershed for numerous water purveyors including SCWD and SLVWD. The North Coast watersheds included in this study provide water only to the SCWD. Several large surface water intakes are located throughout the study area.

### 1.2 Watershed Sanitary Survey Requirements

A watershed sanitary survey is a detailed evaluation of surface water sources and their vulnerability to contamination. It is more comprehensive than a Source Water Assessment (SWA) and can be used in place of a SWA to fulfill the requirements of California's 1996 Drinking Water Source Assessment and Protection (DWSAP) Program. Whereas a SWA ranks and inventories possible contaminating activities (PCAs) located within the source area, a sanitary survey provides more background, descriptive information, and review of all relevant monitoring data.

Specific sanitary survey requirements are:

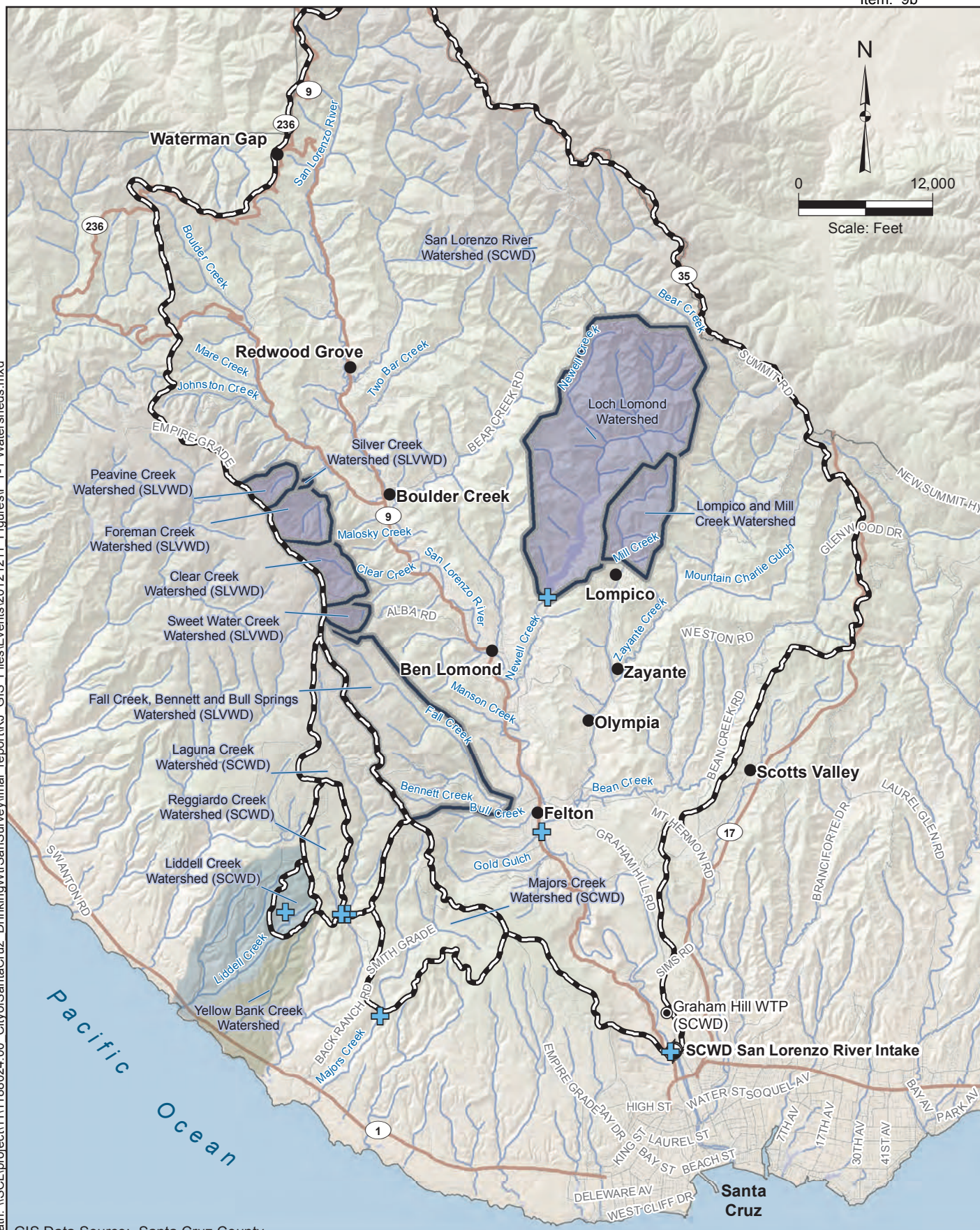
- Conduct a sanitary survey of the watershed(s) at least every five years.
- Describe the hydrological conditions of the watershed, summarize source water quality data, describe activities and possible contamination sources, and identify any significant changes since a previous survey was conducted.
- Describe watershed control and management practices.

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<sup>1</sup> Reference to SLVWD includes the areas previously known as Lompico County Water District which merged with SLVWD in 2016.



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GIS Data Source: Santa Cruz County

- Area Locations
- Graham Hill WTP
- + Santa Cruz Water Department Diversions
- ⊕ City of Santa Cruz Wells (GWUDI only)

- Santa Cruz City Water Supply Watersheds
- Sub-Watershed

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**San Lorenzo Valley and  
North Coast Watersheds**

- Evaluate compliance with the SWTR with a focus on disinfection requirements.
- Recommend corrective actions to maintain or improve water quality.

### **1.3 Objectives**

The objectives of this project are to:

- Prepare a stand-alone document that complies with the DDW requirements to update the 2013 watershed sanitary survey.
- Identify potential sources where chemical and microbiological contaminants may enter the water supply.
- Establish the baseline information needed for a watershed management program.
- Recommend actions to enhance water quality protection and watershed management.

The drinking water purveyors involved in this project should use this report to compare existing water quality conditions with future monitoring data, implement practices to improve water quality, and reduce the risk of source water contamination.

### **1.4 Participating Drinking Water Utilities**

Two drinking water utilities are participating in this project because they receive surface water from the San Lorenzo River watershed area. The water purveyors that participated in this update include:

- City of Santa Cruz Water Department
- San Lorenzo Valley Water District (merged with LCWD in 2016)

### **1.5 Report Organization**

This report follows the format in the *Watershed Sanitary Survey Guidance Manual* as required by DDW so that it conforms with reports developed by other suppliers for their watershed areas. Specific sections are:

Section 1: Introduction

Section 2: Watershed and Water Supply System

Section 3: Potential Contaminant Sources in the Watersheds

Section 4: Watershed Management and Control Practices

Section 5: Water Quality Regulations and Evaluation

Section 6: Conclusions and Recommendations

Figure 1-1, located at the front of this report, illustrates the approximate watershed boundaries, key subwatersheds, location of the large raw water intakes, primary roadways, and streams within the study area.

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## SECTION 2: WATERSHEDS AND WATER SUPPLY SYSTEMS

### 2.1 Watershed Description

The San Lorenzo River and North Coast watersheds and water purveyors which use surface water are described in this section. The watershed area, subwatersheds within the San Lorenzo Valley, and approximate land areas are listed in Table 2-1.

<b>Table 2-1: Watershed Areas and Drinking Water Purveyors Served <sup>(1)</sup></b>			
<b>Watershed Area</b>	<b>Utilities Served</b>	<b>Watershed Area<sup>(3)</sup></b>	
		<b>Acres</b>	<b>Square Miles</b>
San Lorenzo River (upstream of the SCWD intake in Santa Cruz)	SCWD, SLVWD <sup>(2)</sup>	74,000	115
<b>Subwatersheds</b>			
Loch Lomond Reservoir on Newell Creek	SCWD and SLVWD	5,728	8.95
Fall Creek, Bennett and Bull Springs	SLVWD	2,600	4.1
Sweetwater Creek	SLVWD	180	0.3
Clear Creek	SLVWD	460	0.7
Foreman Creek	SLVWD	500	0.8
Silver Creek	SLVWD	20	0.03
Peavine Creek	SLVWD	230	0.4
Lompico Creek (currently unused)	SLVWD	1,470	2.29
<b>North Coast Watersheds</b>			
Liddell Spring	SCWD	3,994	6.24
Laguna Creek	SCWD	2,560	4.0
Reggiardo Diversion	SCWD	3,584	5.60
Majors Creek	SCWD	2,500	3.9
<sup>(1)</sup> Figure 1-1 shows the study area primary watersheds and subwatersheds within the San Lorenzo River, the North Coast watersheds, and the general locations for each utility.			
<sup>(2)</sup> Numerous other drinking water purveyors with less than 200 service connections use surface water from this watershed.			
<sup>(3)</sup> The watershed area is the drainage area above the intakes and not the full watershed for the water body			

#### 2.1.1 Regional Hydrologic Setting

The project area includes the San Lorenzo River watershed and the North Coast watersheds which include Majors Creek, Laguna Creek, and Liddell Creek watersheds in north central Santa Cruz County. The City diverts water from Reggiardo Creek, which provides a minimal amount of flow, into Laguna Creek where a larger diversion exists. The San Lorenzo River watershed is the largest contiguous watershed area in the area with an overall area of about 74,000 acres or 115 square miles above the San Lorenzo River Intake in Santa Cruz. The smaller North Coast watersheds are west of the City of Santa Cruz and drain the coastal side of Ben Lomond Mountain<sup>2</sup>. The North Coast watersheds have a total area of about 7,000 acres, or approximately 11 square miles. The SCWD maintains the Loch Lomond Reservoir on Newell Creek-- a tributary to the San Lorenzo River, located near the town of Ben Lomond.

<sup>2</sup> Because Ben Lomond Mountain is so asymmetrical, with a steep eastern face, it is likely that subsurface flows from near its crest drains eastward into the San Lorenzo Valley (see Hecht, 1978; Johnson, 1999). Hence, headwardmost portions of the Laguna and Majors topographic watersheds may be recharge areas to San Lorenzo Valley sources.

## 2.1.2 Prior Studies

The City and County of Santa Cruz, as well as the area water purveyors, have conducted evaluations of watershed management, water supply, and water quality protection. Key existing information sources include hydrologic and water quality studies conducted by the County of Santa Cruz, U.S. Geological Survey, U.S. Army Corps of Engineers, Central Coast Regional Water Quality Control Board (Regional Board), California Department of Water Resources, local water purveyors, and consulting specialists. Much of this work is considered and cited in several summary reports (Ricker, 1994; Hecht and others, 1991; Camp Dresser & McKee, 1994; Swanson, 2001; and the San Lorenzo River Watershed Plan Update, 2001). Recent studies have included a US Department of Agriculture low-level water quality analysis in 2012, SCWD water quality analyses for contaminants of emerging concern and studies related to karst geology in 2016. Pertinent findings of these investigations are incorporated into this report.

Streamflow in the area has been measured by several resource agencies throughout the last several decades. On the San Lorenzo River, the U.S. Geological Survey (USGS) operates long-term stream gages at Big Trees (at the Henry Cowell State Park entrance road) and at Santa Cruz (near the SCWD San Lorenzo River intake in Santa Cruz) as shown on Figure 1-1.

In the past, USGS operated gages for multi-year periods at: San Lorenzo River near Boulder Creek, Boulder and Bear Creeks near Boulder Creek, Newell Creek (prior to the construction of Loch Lomond Reservoir), Zayante Creek at Zayante, Bean and Carbonera Creeks in Scotts Valley, and Branciforte Creek in Santa Cruz. In the North Coast watersheds, the USGS operated gages for multi-year periods at: Majors Creek, Laguna Creek, and San Vicente Creek, an adjoining watershed of similar size immediately to the west of Laguna Creek.

From 2000 to the present, the City established ten gaging stations within the study area to help manage the water resource and in-stream habitat, some of which occupy former USGS gaging stations. Two gages are located within the San Lorenzo River watershed: on Newell Creek, above and below Loch Lomond. Eight gages are located in the North Coast watersheds: three gages are on Laguna Creek; three gages are located on Majors Creek; and two gages are located on Liddell Creek. Some of these stations are equipped with specific conductance and temperature sensors or have had such measurements made routinely over the past several years. Historically, Scotts Valley Water District had two gaging stations on Bean Creek near Scotts Valley: one at Mount Hermon Camp, and the other upstream at Mount Hermon Road (former USGS site); these gages may restart soon.<sup>3</sup>

Water quality stations were operated for several years at the San Lorenzo River gages by the USGS or the California Department of Water Resources (DWR).<sup>4</sup> Water quality and instantaneous flow were monitored intermittently in Kings, Two Bar, Love, Fall, and Lompico Creeks, and on lower Zayante Creek below Bean Creek, although no daily records were developed. Much of the USGS water-quality information has been summarized in a report by Sylvester and Covay (1978). Santa Cruz County has routinely sampled an array of other stations in the San Lorenzo River watershed. The City regularly samples water quality from San Lorenzo River sources (Loch Lomond, the Felton Diversion, and the intakes in Santa Cruz) and from North Coast sources (Liddell Spring, Laguna Creek, and Majors Creek). The City measures turbidity, with varying frequency, for each of its water sources. The SLVWD regularly samples water quality at each point of diversion: Clear Creek, Peavine Creek, Sweetwater

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<sup>3</sup> Bean Creek at Mount Hermon is a continuous turbidity monitoring station, while upstream Bean Creek at Mount Hermon Road is a continuous specific conductance monitoring station.

<sup>4</sup> DWR also sampled the coastal streams for water quality on a monthly, and then on an intermittent basis, during the 1960s and 1970s.

Creek and Foreman Creek. Meters have been installed on all diversions to measure diverted water. Bypass flows are metered electronically on Clear Creek and data is available online at: <http://www.balancehydrologics.com/clear/>. SLVWD completed Parts I- Existing Conditions and II- Goals, Objectives, and Policies of the Watershed Management Plan for the SLVWD watersheds in 2009 and 2010 respectively.

SLVWD staff sample at the Lompico Creek intake structure; these data are recorded and kept on-site in case Lompico Creek is used as a water supply in the future.

While streamflow gaging has diminished in the San Lorenzo Valley over the past 25 years, the number of stations at which water-quality sampling is conducted generally remained consistent, although periodic changes to frequency of sampling and the number of constituents tested can occur, particularly for special studies.

### **2.1.3 Significance of Storms, Droughts, Geology, and Baseflow**

Streamflow in the Santa Cruz Mountains varies seasonally. About 85 percent of annual rainfall occurs in the six months from December through May. Winter precipitation generally does not increase streamflow until after soil saturation occurs, following the initial rains of the season, with the highest flows typically occurring from late December through March. Streamflow declines sharply after the winter rains cease. Snows are relatively rare in the Santa Cruz Mountains and do not create a snowmelt-runoff season. Since the 2013 WSS Update, California and the western states have been affected by a multi-year drought with below average rainfall starting in 2012 and continuing into the fall of 2016. The drought was followed by an extremely wet winter with precipitation from October 2016 to March 2017 at 162 percent of average.

The longest continuous period of record for streamflow in the area is the USGS gage on the San Lorenzo at Big Trees located just south of Felton (USGS Station No. 11160500). This gage has operated since 1937 and measures discharge from about 85 percent of the watershed upstream of the SCWD San Lorenzo River intake in Santa Cruz. The maximum recorded discharge was 30,400 cfs (19,600 million gallons per day or 'mgd') on December 23, 1955. The minimum instantaneous daily discharge was 5.6 cfs (3.6 mgd) on July 27 and 28, 1977, during an intense drought. The annual mean runoff for the period of water year 1937 to water year 2017 is 128 cfs (83 mgd). As described earlier, the recent above average water year resulted in high stream flows in the San Lorenzo River. January – March 2017 experienced ten distinct, major storm systems that produced very significant peak flows, five of which registered higher than 10,000 cubic feet per second at times. The highest events on January 10 and February 7 resulted in flooding and some damage of critical water system infrastructure.

Surface water quality in the San Lorenzo River watershed fluctuates seasonally in relation to streamflow. During periods of high runoff, sediment and organic debris, urban runoff, animal wastes and wastewater from septic systems enter the surface water system. High levels of turbidity and pollutants during these events can limit the source water available for treatment. During dry periods and droughts, groundwater sustains baseflow to the area streams. The groundwater quality varies widely because of both geologic and human influences. As groundwater contributes to streamflow, it may carry dissolved constituents from the bedrock formations, discharges from septic systems, and other constituents that have percolated into the aquifer.

In general, water quality in the San Lorenzo River watershed is primarily influenced by the three geologic subareas bounded by the Zayante and Ben Lomond faults (c.f., Battleson, 1966; Ricker and others, 1977; Sylvester and Covay, 1978). North of the Zayante fault, streams

draining the older sedimentary formations contain relatively high concentrations of dissolved solids (c.f., Philips and Rojstaczer, 2001). The upper watersheds of the San Lorenzo River, and Kings, Two Bar, Bear, Zayante and Newell Creeks are all underlain mainly by erosive sedimentary formations, principally the Butano sandstone, Two Bar shale, Rices mudstone, Vaqueros sandstone, and Lambert shale.

South of the Zayante Fault and east of the Ben Lomond fault, streams originate in the younger sedimentary formations and contain water of intermediate quality. Rainfall runoff tends to occur slowly because of the higher permeability soils that have developed on parts of the Santa Margarita sandstone, Lompico sandstone and Purisima formation (most commonly a water-bearing sandy shale, but locally quite sandy). These geologic formations are shown on Figure 2-4 and discussed further in Section 2.3. Less permeable geologic formations in these eastside streams include the Monterey formation and the Santa Cruz mudstone. The high rates of recharge and relatively large available groundwater volumes within the Santa Margarita sandstone have resulted in extensive development of its water resources. Use of wells has lowered ground-water levels and diminished streamflow, altered the direction of groundwater flow, and helped to induce increases in the dissolved solids ('salts') and nitrate levels in this aquifer, originating (respectively) from ground-water inflow from deeper aquifers and from partial recharge from leach fields or other sources that contribute human or livestock wastes. The larger streams with seasonal baseflows from these formations include Bean, Zayante, Lompico, and Love Creeks.

West of the Ben Lomond fault, San Lorenzo tributary streams drain the igneous and/or metamorphic rocks, have relatively lower concentrations of dissolved solids and tend to provide high quality water at reasonably constant rates. The weathered upper zone of the rocks (principally granodiorite, quartz diorite, schist, and limestone/marble karst) exposed on Ben Lomond Mountain serves to recharge precipitation and provide dry-season baseflow to the streams that drain the east side of Ben Lomond Mountain. These include Jamison, Peavine, Foreman, Malosky, Clear, Fall, and Shingle Mill Creeks, and Hubbard and Gold Gulches, as well as Bennett Corvin, and Pogonip Springs. Flows in Boulder Creek during dry seasons or drought years are also sustained primarily by flows emanating from these crystalline rocks. Hare Creek and upper Boulder Creek drain similar watersheds from Ben Lomond Mountain, but are underlain by sedimentary rocks generally yielding much lower rates of summer baseflow (Hecht, 1977).

In the North Coast watersheds, surface water in the streams are also influenced by the same crystalline rocks of Ben Lomond Mountain. In addition, the Lompico sandstone, Monterey formation, and Santa Margarita sandstone overlay the crystalline rocks of Ben Lomond Mountain and provide ground-water storage and baseflow to the streams. Sinkholes and cavernous fractures (i.e. karst formations) occur in several parts of the Laguna and Majors Creek watersheds and at Liddell Spring, which serves as the most distant and reliable North Coast source of water for the SCWD. These karst formations provide subterranean connectivity between the Laguna and Liddell watersheds, essentially increasing the Liddell Spring drainage area by up to 2,000 acres (P.E. LaMoreaux & Associates Inc., 2005a). Upstream of the City's diversion, Majors Creek has been generally and actively incising into the underlying alluvium and weathered sedimentary rocks since at least the 1960s (Hecht and others, 1968; Hecht, 1978), contributing waters that are typically more turbid than in Laguna Creek or at Liddell Spring (Camp Dresser McKee, 1996).

## **2.2 Land Use and Water Quality**

This subsection describes land use and aspects of the natural setting that may affect potential contaminant sources. In general, there have been limited changes to land uses in the watershed since the 2013 sanitary survey.

### **2.2.1 Land Use**

There are a variety of land uses in the watershed including: timber production, quarrying, agriculture, ranching, rural residential and unincorporated communities with urban densities as found on Figure 2-1. Almost one-quarter of the San Lorenzo River watershed lands are in public or private ownership for natural resource conservation. In the 1960's and 1970's, Santa Cruz County experienced rapid growth in both population and development. The San Lorenzo Valley entered a period of transition from primarily seasonal vacation homes to full-time residences which are nearly complete today. The subsequent pressure on existing infrastructure and natural systems has led to several water quality issues worthy of note

During the period of rapid growth, year-round residential occupancy of properties that were originally developed for summer use increased which resulted stress on on-site disposal systems in the San Lorenzo River watershed. Systems designed for seasonal use struggle with both the added load and the issue of higher groundwater during the winter months that has been found to communicate undesirably with the disposal systems. At the same time, new residential development occurred which added more on-site disposal systems at increased density.

Existing and new development activity occurring in steep and remote areas of the watersheds increasing runoff and erosion, leading to increases in sedimentation and persistent turbidity in water supply streams. The resulting water quality issues also impact riparian corridors and can thus be attributed both to decisions made at the level of individual lots with respect to grading and land clearing as well as cumulative impacts of widespread development. Similarly, activities and development in the riparian areas can also impact water quality in a manner similar to those in steep and remote areas.

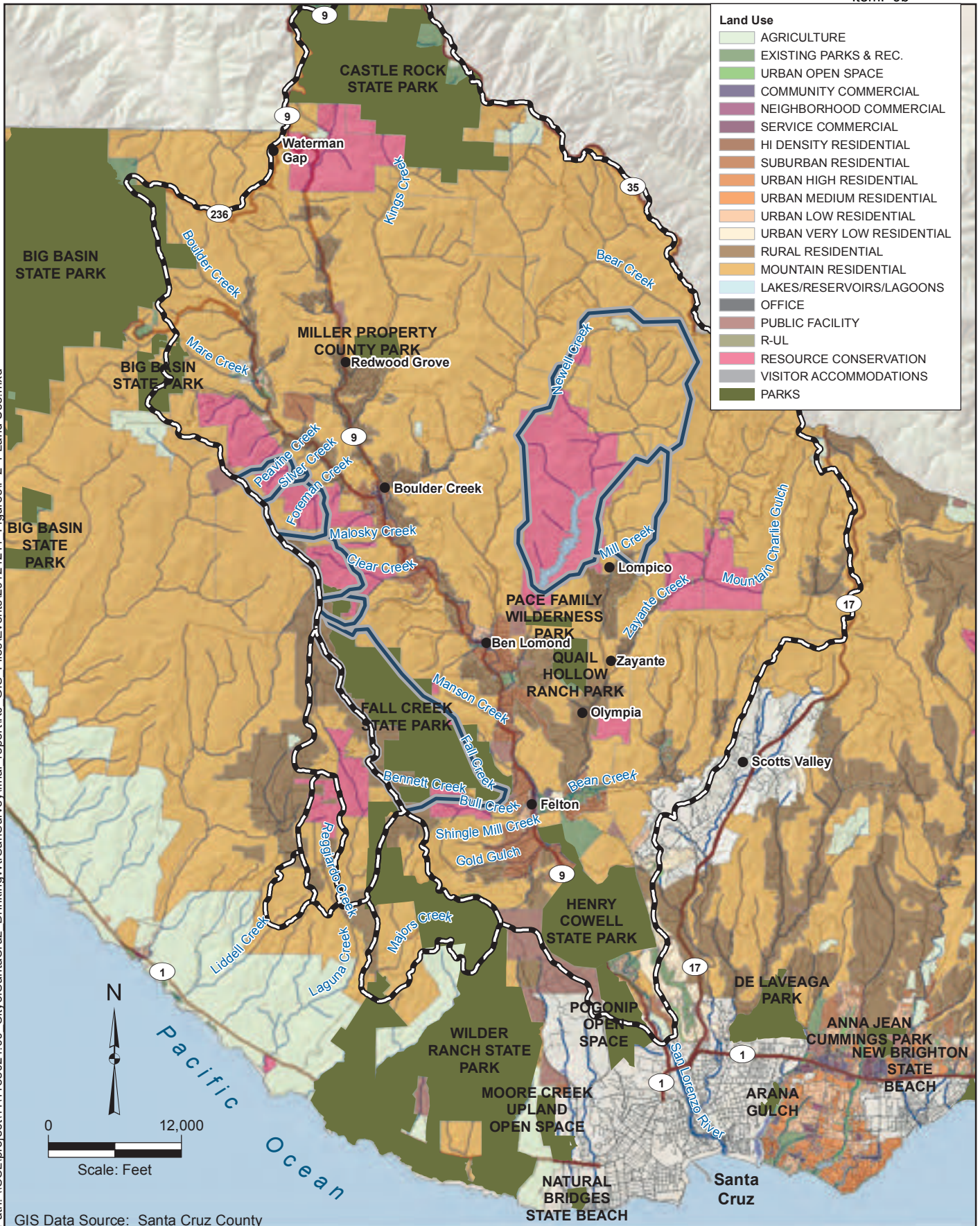
Furthermore, continuous use of unpaved roads to access residences, especially in wet periods, contributes both sediment and turbidity to receiving waters. Partially offsetting these trends is growing acreage of lands no longer open to logging, most significantly in the headwaters of the San Lorenzo River and on lands of the San Lorenzo Valley Water District and the City of Santa Cruz Water Department. In addition, additional effort related to riparian area enhancement is envisioned as discussed in Section 4.9.

Many of the same dynamics have affected land use in the North Coast watersheds, although the initial proportion of seasonal homes was much lower. Residential growth has been steady through the past 40 years but has flattened in recent years. As in the San Lorenzo River watershed, virtually all wastewater disposal is through leach fields, so the volume and areas of watershed affected are growing.

Figure 2-1 shows the general developed areas within the watersheds as well as the protected public park lands within the San Lorenzo River watershed. As detailed in the following sections, regulations related to Accessory Dwelling Units (2.2.2 Residential), the impacts of cannabis cultivation in the San Lorenzo River watershed (2.2.3 Agricultural), and potential public access of additional lands (2.2.6 Recreation) are land use changes with water quality impacts.



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- Area Locations
- ▬ Santa Cruz City Water Supply Watersheds
- ▬ Sub-Watershed
- ▬ Lakes
- ▬ Stream
- ▬ Streets

Santa Cruz Water Department  
WSS Update

Land Use

## 2.2.2 Residential

Within the survey area, the majority of the population is concentrated along Highway 9 on the floor of the San Lorenzo Valley. Steep slopes and rugged terrain have long been a significant constraint to commercial and residential development in all areas of Santa Cruz County. As a result, the county is rural in character, heavily forested, and visually dominated by open space.

The 2015 ACS 5-year population estimate indicated a population of 41,814 people in the San Lorenzo Valley (Census Tracts 1203 through 1209), which is 0.7 percent greater than the population of 41,538 reported in the 2010 census. The 2015 census gave a population for the North Coast (Census Tract 1202) of 4,405, an increase of just 2.9 percent compared with the 2010 census population of 4,283. The actual population in the North Coast water supply watersheds is significantly less than the census tract value because the latter includes residents of Davenport, Swanton, and dispersed residences along Highway 1 which lie outside of the small watersheds above the SCWD intake structures.

Within the San Lorenzo Valley, the majority of the population lives in unincorporated communities located along the San Lorenzo River. Felton, Ben Lomond, Brookdale, and Boulder Creek stretch out along State Highway 9. Other communities have developed along major tributaries to the San Lorenzo, including the areas along Zayante Creek and Lompico Creek. Several closely-packed residential communities which originated as summer 'encampments' also exist in the area. These include the Paradise Park, Forest Lakes, Mount Hermon, Riverside Grove and San Lorenzo Park subdivisions. Conventional 1960s and 1970s subdivision communities established throughout the Valley include: the Boulder Creek Golf and Country Club, Galleon Heights, Bear Creek Estates, Quail Hollow and Glen Arbor, and the portions of Rollingwood and Pasatiempo which lie within the San Lorenzo watershed. There are, in fact, relatively few valleys without a few clusters of homes, now typically occupied year-round. More recently, stand-alone mountain residences have been arrayed along most ridgelines.

The population in the North Coast drainages is far less than that of the San Lorenzo Valley. The largest area in the North Coast drainage with a concentrated population is known as Bonny Doon. Most of the population lives in rural and mountainous areas, mainly along the major roads: Empire Grade, Smith Grade, and Bonny Doon and Martin Roads.

Scotts Valley population was estimated to be 10,774 in its 2015 Urban Water Management Plan. Scotts Valley is an incorporated city within the San Lorenzo watershed but most of the city lies beyond the eastern edge of the sanitary survey area, within the Carbonera Creek and Branciforte Creek subwatersheds. However, key commercial and industrial centers of Scotts Valley drain to Bear Creek, which is within the study area.

The County of Santa Cruz Health Services Agency estimates that just under 13,500 parcels in the San Lorenzo River watershed are served by individual on-site wastewater disposal systems, most of which meet current standards (John Ricker, personal communication, 2011). Residences in the North Coast watersheds are also served by septic systems. However, there are relatively few community or institutional wastewater treatment and disposal systems within the survey area due to the remote nature and dispersed population of the watershed. Community on-site disposal systems serve: Bear Creek Estates, Boulder Creek Golf and Country Club (County Service Area (CSA) 7), the Mt. Hermon Association, and Big Basin State Park. Institutional disposal systems are in service at: the San Lorenzo Valley Unified School District, Camp Harmon, Camp Campbell and at several other camps or conference centers in the San Lorenzo Valley. More recently Rollingwood (CSA 10), has been connected to the City of Santa Cruz wastewater collection, treatment, and ocean disposal system.

Zoning and land development standards for the unincorporated portions of the county reflect an area-wide awareness of the potential adverse effects of wastewater disposal and other development-related impacts on water supply. Within the area, mountain residential is the lowest density range, where minimal services are available. These areas include various open space and natural resource conservation areas unsuitable for more intense development. Rural residential areas are the next highest density range, requiring access from roads maintained to rural road standards. Suburban residential areas require service from a public water system to develop at the highest allowed density. The most densely populated areas along Highway 9 — Felton, Paradise Park, and Boulder Creek — have been developed at density levels typical of many urban areas despite their rural surroundings. County policies designate that these communities be limited to urban low density development unless community disposal systems are available. Santa Cruz County established CSA 12 in 1989 to promote better septic system management and maintenance and imposes an annual fee to fund the on-site wastewater management program.

In addition, regulation related to Accessory Dwelling Units (ADU) are under development at both the state and county level in an effort to address affordable housing challenges in the region. However, an increase in ADU development may pose future challenges especially in rural areas since the adequacy of aging, existing septic systems may be insufficient to meet both health and environmental needs. In addition, rural unpaved roads continue to be a likely contributor of sediments and adding ADU can increase traffic and impacts of roads on water quality.

### **2.2.3 Agricultural Uses and Animal Grazing**

Agricultural acreage in the San Lorenzo River and North Coast watersheds is limited because of the steep topography and limited tillable land. Following the widespread initial logging of the late 1800's and early 1900's, apples and other orchard fruits were, however, planted on the flatter newly opened slopes throughout the subject watersheds. Much of this acreage has been abandoned and now supports chaparral, second growth redwood forests, and residential development.

Vineyards and Christmas tree farms occupy the largest amount of agricultural acreage in the watersheds of interest tracked by the agricultural commissioner. Other agricultural uses such as cannabis are not currently tracked. Licensed cannabis cultivation, when regulations are complete, is expected to increase significantly. Expansion of the cannabis industry in the San Lorenzo River watershed is likely to result in further land clearing with grading and pesticide/herbicide use, increased upstream water use, as well as additional traffic on rural roads, many of which are unpaved. Reduced availability of water in the San Lorenzo River may require the City to use Loch Lomond more which also has impacts on raw water quality especially as it relates to Total Organic Carbon (TOC).

Majors Creek has the most significant agricultural land use of the tributary watersheds as shown on Figure 2-1. The lowest coastal terraces, downstream of the SCWD supply intakes in the North Coast watersheds, are used for pasture or are cultivated for brussel sprouts and other row crops. Agricultural activity along the coast does not extend into the watersheds of the supply intakes. Agricultural or animal grazing is limited to that associated with residential uses in the SLVWD subwatersheds. Limited cattle grazing occurs in the North Coast drainages. Grazing leases are held on private lands and vary from year to year. Horses, on the other hand, are commonly kept by rural residents, and by several commercial stables. Confined animals are considered to be a potential source of nitrogen and pathogens (c.f., Hecht and others, 1991; White and Hecht, 1993, Ricker 1995, Ivanetich, 2006) and can also contribute to persistent turbidity in the area's streams.

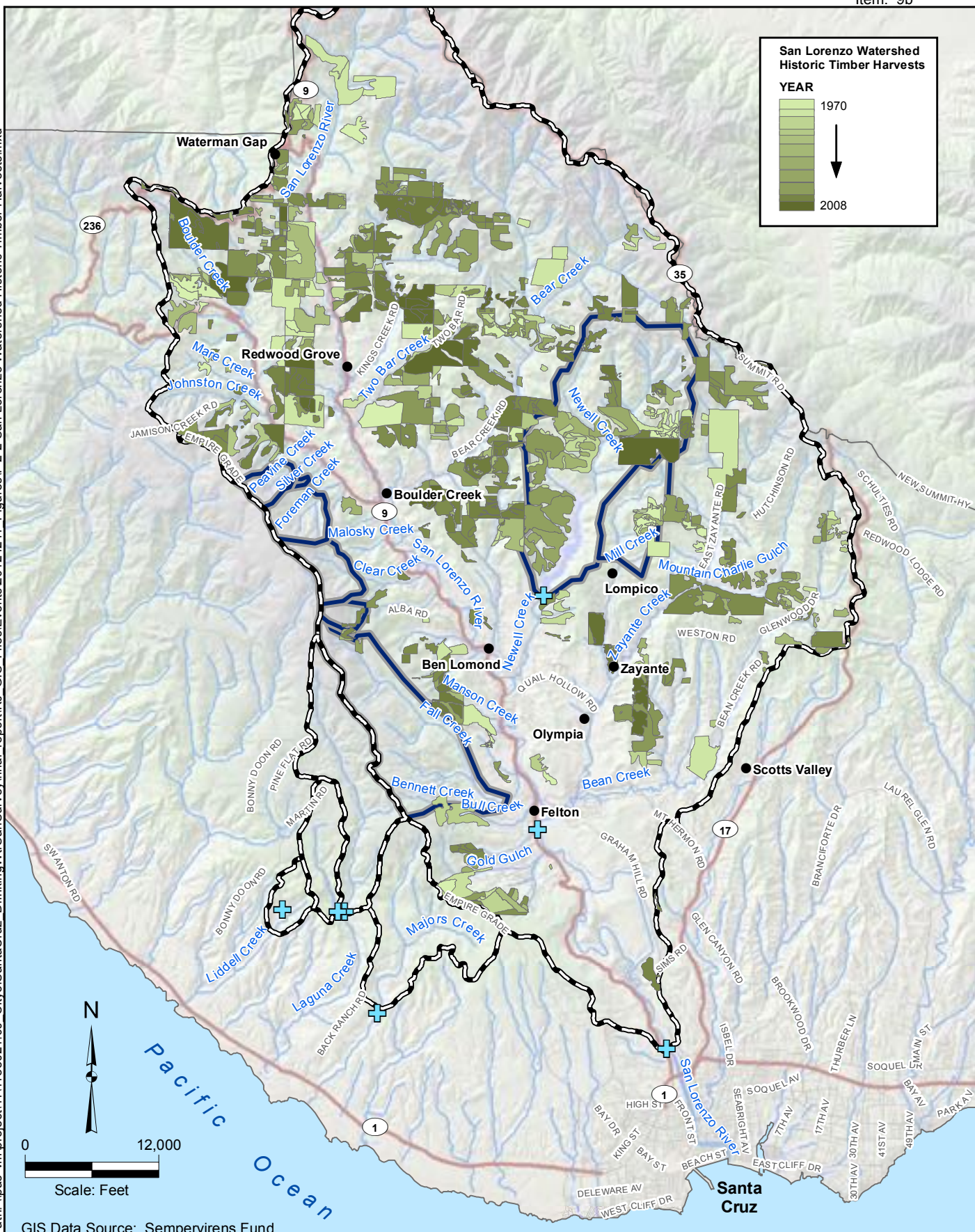


## **2.2.4 Timber Harvests**

Timber resources historically formed the foundation of the major industry in the Santa Cruz Mountains as shown on Figure 3-3. Timber harvests continue in many parts of the watersheds, and the average timber harvest size in the San Lorenzo River watershed from 2006 to 2008 was about 400 acres. A history of timber harvests from the 2013 WSS update is shown graphically on Figure 2-2 based on information provided by Sempervirens Fund; Sempervirens representatives confirmed that they do not have updated information. Recent CalFire data on timber harvests indicated that there are two under process as of 2017 in the Bean Creek watershed and other timber harvests in the San Lorenzo River watershed were completed within the 2013-2016 time frame as discussed in Section 3.11.

Both the San Lorenzo Valley Water District and the City of Santa Cruz have stopped timber harvesting on their respective watershed lands, instead managing their watershed lands for source water protection and for open-space uses. SLVWD ceased timber harvesting since the 1970s and adopted a prohibition on timber harvesting in 1986. SLVWD continues to cooperate in several different ways with Sempervirens Fund and other conservation groups to limit harvesting in their water-supply watersheds. Major cessations of harvesting have occurred or are in the process of occurring through this cooperative set of efforts in the SLVWD watershed lands on the east slope of Ben Lomond Mountain, in the upper San Lorenzo watershed, and in the upper Lompico watersheds.

Path: \\pao-vm\project\111188024\_00\_CityofSantaCruz\_DrinkingWaterSurvey\final\_report\KJ\_GIS\_Files\Events\2012\12\11\_Figures\F 2-2 San Lorenzo Watershed Historic Timber Harvests.mxd



### **2.2.5 Mining**

Sand mining is the major mineral extraction activity in the survey area, although a number of operations have been closed over the past decade, most recently the CEMEX Bonny Doon marble (locally called 'limestone') and shale mine. There are several active sand operations in the vicinity of Scotts Valley. Decomposed or weathering granitic rock is mined at Felton Quarry. Sand is still mined at the Quail Hollow Quarry. However, mining activities have been discontinued since 2004 at the Olympia and Hanson ('Kaiser') Quarries although reclamation and monitoring activities continue. A landslide in the vicinity of Conference Drive below the Hanson Quarry had significant movement in winter 2017 which resulted in sand erosion into Bean Creek and downstream. There are no commercial or informal instream gravel mining operations in the subject watersheds.

Exploratory drilling for oil and gas has been conducted throughout the survey area, principally during the 1950s and 1960s. No current or shut-in (potentially re-activatable) production is reported. The principal water-effects of drilling have been unquantified increases in the salinity of the local stream system associated with deep, highly saline waters emanating from several abandoned boreholes (c.f., Hecht, 1975). Naturally-occurring asphaltum or bituminous sandstone outcrops at the edges of the Majors Creek watershed, where it was mined about 100 years ago. No effects on waters of Majors Creek have been reported.

### **2.2.6 Recreation**

Santa Cruz and its surroundings have served as a center of recreation for more than 150 years. In the San Lorenzo River Valley, much of the recreation is focused on summer use of the streams and riparian corridors. Use of the San Lorenzo River and its tributaries includes swimming in natural pools, canoeing, fishing, hiking, and equestrian activities. Visitor use – especially the traditional river-based water-contact recreation – is both a motivation for cleaner streams as well as a secondary contributor to bacteria, nitrate, and possibly turbidity levels.

The California Department of Parks and Recreation manages about 15 percent of the watershed, including Henry Cowell (including Fall Creek), Castle Rock and portion of Big Basin Redwood State Parks. See Figure 2-1 for locations of parks and open space within the Santa Cruz City Water Supply Watersheds. Managers continue to pursue restoration projects, when funds allow, and completed removal of a leaking earthen dam and series of culverts on Tin Can Creek. Since there was no spillway for the 45-foot dam, there had been gullying and consistent erosion around the structure. Managers also continue to use controlled burns to maintain open grasslands (Portia Halbert, personal communication, 2012), and typically burn areas every other year, mostly in the Waddell and Wilder Creek watersheds (Tim Hyland, personal communication, 2012).

City-operated recreation facilities at Loch Lomond will continue to emphasize boating, picnicking, and trail uses. However, concerns by first responders at the city and state levels regarding fire risk and access for emergency response are likely to limit additional public access beyond that which is already available.

Recreational use of the Majors and Laguna Creek watersheds covered by the survey are diffuse and typical of rural residential areas, concentrated along the roads and trails. Significant portions of the southeastern side of the Majors Creek watershed are within the sectors of the Grey Whale Ranch and Wilder Ranch State Park that will likely remain closed to visitor use during the coming five years as there are insufficient resources to maintain and patrol trails (T. Hyland, 2018). Public access and recreation are limited in the SLVWD watersheds except for the Fall Creek, Bennett and Bull Springs portion of the SLVWD watershed which are largely

within the Fall Creek State Park which has hiking and equestrian trails. Additional discussion regarding the potential water quality threats from recreation occurs in Section 3.1.2.

Off road vehicles and mountain-bike use can be locally common. Trail (bike, horse, and hiker) and off-road vehicle use can be sources of erosion adding to background levels.

In recent news, 5,800 acres of land surrounding the coastal City of Davenport were designated as the Cotoni-Coast Dairies National Monument in May 2016. Relatively few people have seen this land since public access has been limited for more than a century. The Bureau of Land Management (BLM) is expected to develop a plan to manage traffic, trash, and public safety. In speaking with the BLM staff, it is understood that the lands, regardless of its status as a monument will likely be accessible to the public, pending federal approval and funding. However, in April 2017, a Presidential Executive Order has resulted in review of the formation of this National Monument. In addition, the former CEMEX property adjacent to the National Monument has also been preserved as the San Vicente Redwoods and will also have future public access. Although much of these lands are downstream of the City intake, concerns remain that public access can result in increased fire danger, and other risks that could impact water quality.

### **2.2.7 Reservoir Sedimentation**

Sedimentation rates in Loch Lomond Reservoir are small relative to its capacity, perhaps because the watershed of the reservoir is maintained primarily in open space, and are not expected to constrain the water supply functions of the reservoir for many years to come. The City has commissioned four separate sedimentation surveys of Loch Lomond by USGS, beginning in 1971 (Brown, 1973), followed by a 1982 survey by Fogelman and Johnson (1986), and then a 1998 survey by McPherson and Harmon (2000).

The most recent 2009 sedimentation survey by McPherson and others (2009) used a new, state-of-the-art method combining bathymetric scanning with multibeam-sidescan sonar, and topographic surveying with laser scanning (LiDAR) to obtain information about temporal changes in the upper reach of the reservoir where the water is shallow or the reservoir may be dry, as well as to obtain information about shoreline changes throughout the reservoir. Results indicate that this method accurately captures the features of the wetted reservoir surface and along the shoreline that affect the storage capacity calculations. Comparison of the 2009 reservoir-bed surface with the surface defined in 1998 indicates that sedimentation is occurring throughout the reservoir. About 320 acre-feet of sedimentation has occurred since 1998, as determined by comparing the revised 1998 reservoir-bed surface, with an associated maximum reservoir storage capacity of 8,965 acre-feet, to the 2009 reservoir bed surface, with an associated maximum capacity of 8,646 acre-feet. This sedimentation is more than 3 percent of the total storage capacity that was calculated on the basis of the results of the 1998 bathymetric investigation.

## **2.3 Natural Conditions and Water Quality**

The San Lorenzo River watershed and the North Coast water supply drainages are located in north central Santa Cruz County, California. These watersheds drain runoff from the Santa Cruz Mountains into the Pacific Ocean at or near the north end of Monterey Bay (see Figure 1-1).

The Santa Cruz Mountains extend south to southwest for about 100 miles from San Francisco to the Pajaro River. The ridge of the Santa Cruz Mountains rises between San Francisco Bay

and the Santa Clara Valley on the east and the Pacific Ocean on the west. The topography of the area is moderately rugged, with elevations ranging from sea level to over 2,600 feet along the crest of Ben Lomond Mountain, and over 3,300 feet at several locations along the northeastern edge of the watershed. Steep slopes of over 30 percent are common, and most of the streams discussed in this report flow through deep canyons cut into bedrock. This is particularly true in the San Lorenzo River watershed, whose many streams are deeply shaded by a dense growth of redwood and Douglas fir trees.

The region has a Mediterranean climate with cool, dry summers and moderate-to-heavy rainfall in the winter months from November through March. Average annual rainfall ranges from about 30 inches along the coast to about 50 inches along the ridge of Ben Lomond Mountain. Coastal fog is common during the summer months and tends to spread inland at night.

The crest of Ben Lomond Mountain forms the topographic divide between the San Lorenzo River watershed to the east and the North Coast watersheds (Majors and Laguna Creeks) to the west. Coastal terraces, in the North Coast drainages, are a mosaic of grasslands, oak woodlands, steep forested canyons, and chaparral.

### **2.3.1 Soils and Geology**

The area is underlain by a complex mosaic of alluvial and terrace deposits of Quaternary age; mudstone, shales, and sandstones of tertiary age; and fractured granitic rocks, schists, and metamorphosed limestones. Soils are highly variable, with a dense mosaic, depending on the underlying parent materials, and other factors such as climate, aspect, vegetation cover, and local relief. Alluvial and terrace soils of varying ages have formed on the alluvial and terrace deposits along nearly all of the major streams. Some of these soils have well-developed clay subsoils, inhibiting use of leach fields.

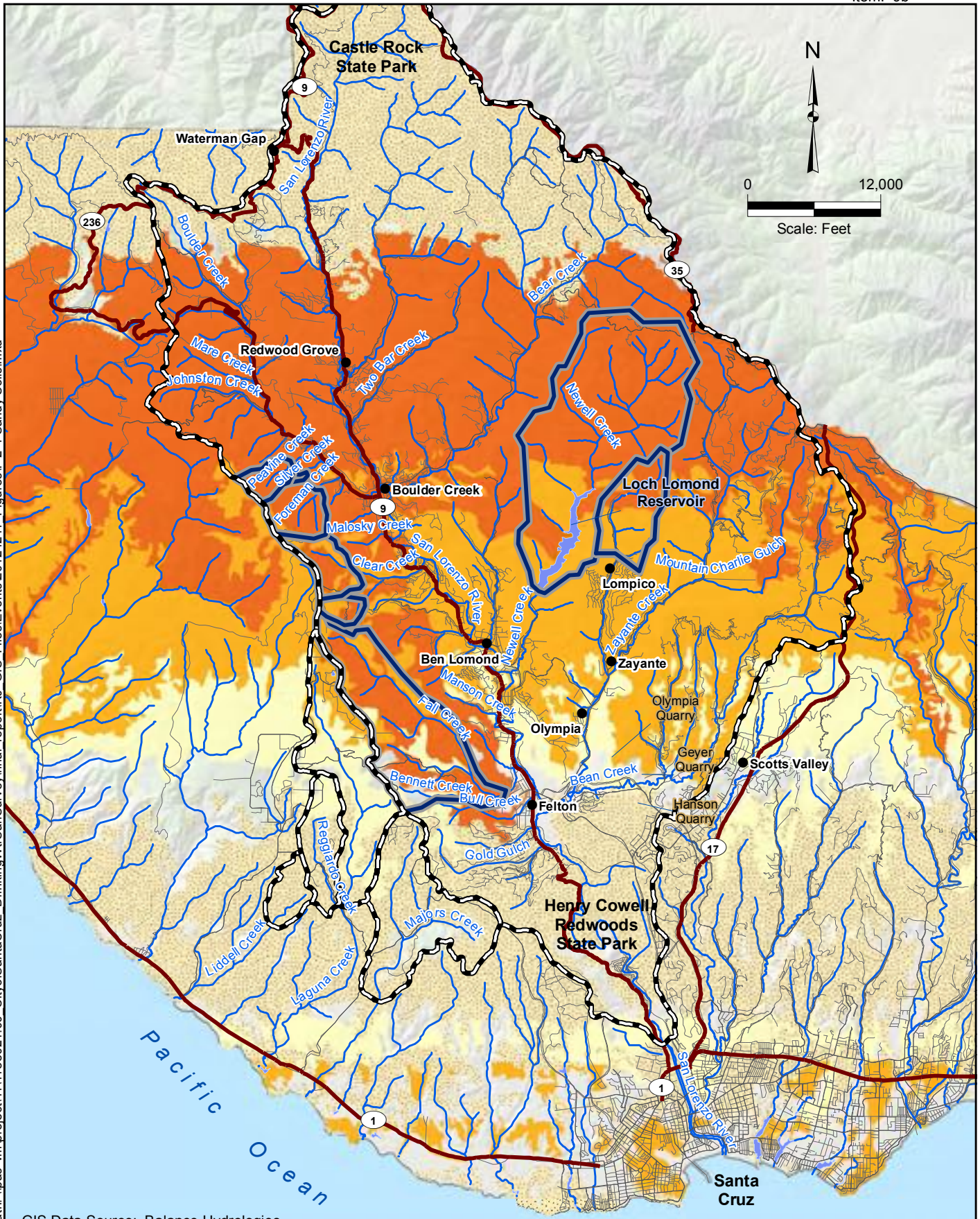
In the most general terms, soils underlain by permeable sandstones, as well as igneous and metamorphic rocks, are deep and well-drained. These loamy and sandy loam soils are found throughout the heavily forested reaches of the survey area. Soils formed from the Santa Margarita and several other sandstone formations are also sandy, deep, and well drained as shown on Figure 2-3. In the sandy soils, organic-matter content and cation exchange capacities are often about 15 to 25 percent of those found in many forest soils in coastal California. Sandy soils can infiltrate quickly which can pose a threat to groundwater and/or base flow if septic systems are located on sandy soils.

Santa Cruz County has been providing training and information on approaches and technologies to control erosion in these soils, and to improve nitrogen and pathogen removal in discharges from septic systems. Soils formed from mudstones and shales also tend to be deep, yet somewhat less well-drained. Overall, soil depth is often limited by shallow bedrock, steep slopes and the gradual loss of topsoil to erosion.

In the alluvial areas of the San Lorenzo and North Coast watersheds, soils are also deep and well drained, although soil depth may be limited by low-permeability layers of fines. In the marine terraces of the North Coast, soils are characterized as deep to very deep and range from well-drained to somewhat poorly drained where claypans have developed. As in the San Lorenzo Valley, depths vary with slope and aspect.



Path: \\pao-vm\project\111188024\_00\_CityofSantaCruz\_DrinkingWtrSanSurvey\final\_report\KJ\_GIS\_Files\SanSurvey\final\_report\F 2-4 Sandy Soils.mxd



GIS Data Source: Balance Hydrologies

- Area Locations
- Stream
- Streets
- Lakes
- Santa Cruz City Water Supply Watersheds
- Sub-Watershed

- Sandy Soils**
- Hyper Sandy > 6"/hr
  - Very Sandy > 2"/hr
  - Sandy > 0.6"/hr
  - Sandy, shallow Limited Recharge

**Santa Cruz Water Department  
WSS Update**

**Sandy Soils**

Naturally-occurring cadmium occurs in portions of the Monterey shale and (to a much lesser extent) Santa Cruz mudstone geologic units. Because cadmium is tightly bound to minerals and clays in the local soils, elevated levels of cadmium are seldom if ever encountered in the water diverted from either the San Lorenzo River or North Coast watersheds. Higher levels are found in stream sediments and vegetation, and cadmium can be bioconcentrated by organisms living in the sediments and soils. The distribution of cadmium in western Santa Cruz County is explained in Golling (1983). Zinc and other trace elements often co-occurring with cadmium are not reported to be elevated in the local soils and sediment derived from the Monterey formation. The same formations tend to be rich in phosphorus, which is widespread in the streams of all surveyed watersheds. With organic carbon also abundant, the ecosystems of these streams are nearly always nitrogen-limited (Aston and Ricker, 1979 Butler, 1978).

Portions of the watershed areas are underlain by karst geology which poses a different type of risk to water quality because the large voids in karst allow for direct connection of contaminants to drinking water. Recent work by the City to map karst springs and marble outcrops associated with karst are overlain on Figure 2-4 which indicates that the Liddell Creek, Laguna Creek and portions of the Fall Creek, Bennett and Bull Springs watersheds exhibit these features.

### **2.3.2 Faults and Seismic Activity**

Faulting and seismicity pose a potential geologic hazard in the Santa Cruz Mountains. The San Andreas fault parallels the northern boundary of the project area approximately two miles to the north. Numerous faults cross the project area. In the San Lorenzo Valley, the most notable faults include: the Zayante fault, which runs primarily east-west, crossing Loch Lomond; Ben Lomond fault, with a trace roughly paralleling the San Lorenzo River from Santa Cruz to the Boulder Creek area; and the Butano fault, which crosses the northern, highest portions of the San Lorenzo watershed. No recent movement has been recorded on any of the three faults but these faults, as shown on Figure 2-4 control groundwater flow and quality in the region.

The principal fault in the North Coast area is the San Gregorio fault zone, which trends north-northwestward several miles offshore from the mouths of Laguna and Majors Creeks. It is active and has sustained recurrent activity for several million years.

Santa Cruz County experiences low-level seismic activity on a regular basis. The most significant recent event was the 1989 Loma Prieta earthquake. Significant damage to structures, roadways, and utilities occurred, including damage to water systems occurred following the magnitude 7.1 Loma Prieta earthquake. Landslides, debris flows, and the reconstruction of residences and infrastructure contributed to persistent turbidity in area streams and surface waters for a period thereafter. Future seismic activity should be anticipated and this expectation should be a major factor in public policy and management of local water supplies.

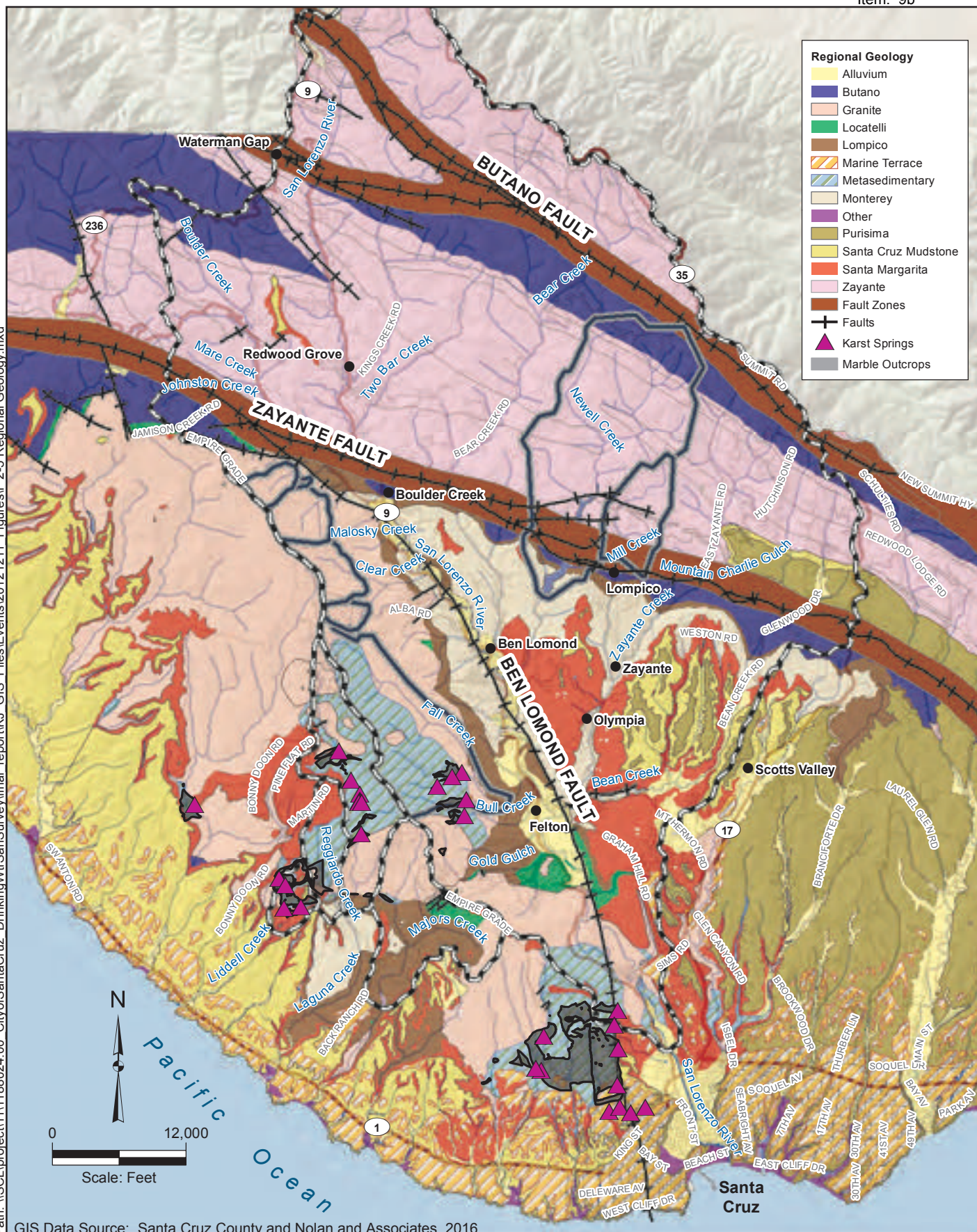
In the past three years, the closest significant earthquake to the San Lorenzo Valley region occurred in San Juan Bautista with a magnitude of 4.2. Even a moderate earthquake in this area could result in death, property damage, and economic upset as well as water quality upsets, particularly after a wet winter which resulted in landslides.

### **2.3.3 Volcanic Activity**

While known for their seismic activity, the Santa Cruz Mountains are highly unlikely to experience any volcanic activity in the foreseeable future.



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GIS Data Source: Santa Cruz County and Nolan and Associates, 2016

**Santa Cruz Water Department  
WSS Update**

- Area Locations
- Santa Cruz City Water Supply Watersheds
- Sub-Watershed
- Lakes
- Stream
- Streets

**Regional Geology**



### **2.3.4 Vegetation**

The watershed lands evaluated in this survey area are dominated by dense forests consisting of a mix of deciduous and evergreen trees and hardy shrubs. Second growth coast redwood is the dominant forest species in the steep canyons, particularly where coastal fog can supply summer moisture. Several species of oak, as well as Douglas fir, tanoak, and madrone form mixed stands on drier slopes and aspects. Some ridges are covered by dense chaparral, composed mainly of manzanita and chamise. Ponderosa pine, a forest species not generally found in the Coast Range, forms a distinct community in the locations where the coarse sands of the Santa Margarita formation are exposed.

While scattered grasslands can still be seen in the San Lorenzo River watershed, most have been converted to residential uses or have reverted to chaparral and second growth forests. The coastal terraces support larger grasslands, but are also subject to the same sorts of residential development pressures and conversion to chaparral and coastal scrub. Within the area grasslands, few native bunchgrasses are found, having long ago been replaced by the exotic annual grasses introduced by early European settlers.

Riparian plant communities are established along all streams in the surveyed watersheds, although human activity or debris from unstable slopes often encroaches in these areas. Several species of willow and alder, as well as big leaf maple, box elder, sycamore, and cottonwood are the most common tree species. California blackberry, poison oak, stinging nettle, in addition to numerous species of sedge and rush, make up much of the understory streambank vegetation. In disturbed riparian areas, non-native vegetation such as French broom, English or cape ivy, poison hemlock, periwinkle, and acacia have become established and compete with native species. These riparian zones are thought to play vital roles in protecting and maintaining water quality in most of the water supply watersheds.

### **2.3.5 Wildlife**

Numerous wildlife species inhabit the California Coastal Ranges. The steep topography, extensive open space, and vegetation communities that range from aquatic and riparian to woodland and chaparral, provide a wide range of habitats for terrestrial and avian species. The area supports such mammalian species as: black-tail deer, mountain lion, bobcat, gray fox, California ground squirrel and a variety of other small terrestrial mammals. A number of non-native species have become established in the Santa Cruz Mountains, including bullfrogs, New Zealand mudsnail, wild pig, Norway rat, common opossum, and feral domestic dogs and cats.

The number of bird species found in the Santa Cruz Mountains reflects the variety of habitats and the location along the Pacific Coast migratory route of waterfowl and songbirds. The riparian habitats fringing the San Lorenzo River and the smaller streams of the region have the highest breeding bird density of all habitat types in the area. Several species of wading birds live in the area, including great blue heron, green heron, and black crested night heron. Belted kingfishers, Stellar's jays, and wood ducks are also residents. Raptors are common throughout the area and include red-shouldered hawks, red-tailed hawks, and Coopers hawks, while occasionally golden eagles can also be encountered in the watershed. Wild turkey sightings have increased in the last several years since the 2013 Update.

Reptile and amphibians are also abundant in local riparian habitats. Notable species in the County include the western pond turtle, California red-legged frog, legless lizard, and several species of salamander although specific presence in the watersheds varies.

The San Lorenzo River supports many species of fish. Steelhead trout and coho salmon are considered native to the coastal streams in Santa Cruz County and the San Lorenzo River supports the region's largest steelhead run. Once a hotbed for anglers, the San Lorenzo fisheries have suffered a decline, widely thought to result from sedimentation and other land-use effects. In 1964 the estimated run consisted of 20,000 steelhead (Ricker, 1979). Runs of 500 to 1,500 adult steelheads are more typical of current conditions. Coho salmon, with a historically smaller run, have also declined. Since 1981, coho have been intermittently observed in the San Lorenzo River, though local populations are on the verge of extirpation. Both steelhead and coho are federally listed as threatened under the Endangered Species Act, while coho are listed by the State under the more-critical 'endangered' designation. The primary threats to these species include: loss of high quality rearing and spawning habitats due to flow reductions and excessive fine sediment loads; and barriers to migration due to dams, culverts, and flow-depleted critical riffles (Alley and others, 2004).

The SCWD is currently engaged in negotiations for an instream flow agreement that supports a pending Habitat Conservation Plan (HCP) in order to operate and maintain water facilities while considering the needs of these endangered species. The streamflow restoration elements of the HCP, especially in the San Lorenzo River at Tait Street and Laguna Creek, are intended to maximize instream habitat using the City's existing infrastructure. To accommodate, natural flow variations, flow targets vary monthly by hydrologic year type (wet to critically dry) as well as by naturally occurring seasonal variations. These minimum instream flow targets have been developed to maintain all life history stages (spawning, incubation, rearing, and migration) of steelhead and coho salmon. As of March 2017, there is a one year agreement on instream flows. It is expected that these minimum instream flow targets will decrease availability of the North Coast sources, including Laguna Creek, and increase dependence on San Lorenzo River water stored in Loch Lomond which has higher organic carbon resulting in higher potential for formation of disinfection by products.

## **2.4 Water Supply Systems Background**

### **2.4.1 History**

The San Lorenzo Valley and North Coast Watersheds provide drinking water for numerous communities in the Santa Cruz area. Table 2-2 lists the water supply sources and general treatment processes used by the purveyors participating in this sanitary survey update (SCWD and SLVWD). These purveyors use surface water and have over 200 total service connections. Table 2-3 lists the same information for non-participating purveyors many of which have less than 200 service connections. All the purveyors listed in Tables 2-2 and 2-3 use surface water in the San Lorenzo Valley Watershed. The following sections focus on the larger utilities, listed in Table 2-2, which include SCWD and SLVWD. The watershed areas for each participating utility are shown on Figure 1-1.

**Table 2-2: Summary of Drinking Water Purveyors Serving Surface Water With More Than 200 Service Connections in the Study Area**

<i>Utility Name and Number of Service Connections</i>	<i>Surface Water Sources</i>	<i>Treatment Process</i>	<i>Average Flow</i>	<i>Primary Disinfectant</i>	<i>Last DDW Inspection Report</i>
Santa Cruz Water Department (City of Santa Cruz)	San Lorenzo River/Loch Lomond Reservoir and North Coast Springs & Creeks	Conventional Filtration at the Graham Hill WTP	10 mgd (from 2015 UWMP)	Chlorine	June 2016
24,534 Service Connections		Microfiltration at Loch Lomond WTP	7 gpm/15 gpm maximum	Chlorine	June 2010
San Lorenzo Valley Water District	Clear Creek, Foreman Creek, Peavine Creek, and Sweetwater Creek	Lyons WTP - (Trident Microfloc) 1,200 gpm WTP w/Conventional Treatment Equivalency	1.92 mgd (includes use of groundwater sources)	Chlorine	Feb-2012
5,868 Service Connections			(2000 - 2008 Average Production)		
San Lorenzo Valley Water District - Felton	Fall Creek, Bull Springs and Bennett Spring	Kirby WTP - CPC Microfloc-Trimite TM-350	1.0 mgd capacity	Chlorine	May 2012
1,355 Service Connections					
Lompico County Water District (merged with SLVWD in 2016)	Lompico Creek below Mill Creek, SLVWD Connection	Mill Creek WTP – Off line	Microfiltration	Chlorine	-Sept 2011
500 Service Connections					

Data source: Waterboards.ca.gov

Data source: 2009 SLVWD Water Supply Master Plan

Note to Reviewers: Big Basin MWC participated in the 1996 sanitary survey and is included in Table 2-3.

**Table 2-3: Summary of Small and Non-Participating Drinking Water Purveyors in the San Lorenzo River Watershed**

<b>Name</b>	<b>Watershed Location</b>	<b>Number of Connections</b>	<b>Filtration System/Type</b>	<b>Disinfection Strategy</b>	<b>Other Comments</b>
Big Basin Water Company	Four surface sources; Jamison Springs (No. 1 and 2), Corvin Springs, Well No. 5 (horizontal under the influence of surface water)	593	Jamison WTP; Conventional Processes with Capacity to Treat 150 gpm (Neptune Microfloc/ Trimite)	Chlorine	--
Brackenbrae Mutual Water Company <sup>(1)</sup>	North of Boulder Creek	24	Package WTP (3M bag filter)	Chlorine	Protected streams and spring
Forest Springs Mutual Water Company <sup>(1)</sup>	North of Boulder Creek	128	Sedimentation only	Chlorine	Spring source
Bonnymede Mutual Water Company <sup>(1)</sup>	On Reggiardo Creek	10	--	Ozone	--
Olympia Mutual Water Company <sup>(1)</sup>	n/a	n/a (<200)	Filtration	Chlorine	Annexation with SLVWD in progress
Quaker Center	Near Ben Lomond	Non-Community System (<200) 1	Package WTP (3M bag filter)	Chlorine	--
River Grove Water System <sup>(1)</sup>	Near Felton	25	Slow sand filtration	Chlorine	--

Data source: 1996 Sanitary Survey  
Data source: Waterboards.ca.gov  
n/a = Information is not applicable for this project.

<sup>(1)</sup> Small water companies represented by Santa Cruz County

## **2.4.2 Santa Cruz Water Department (SCWD)**

As described in greater detail in Section 2.6, generally, the private water companies that preceded the City of Santa Cruz began establishing water rights to area streams and underflow in the late 1800s. The riparian rights to the North Coast sources were purchased from downstream landowners. The City has appropriative rights to San Lorenzo River water via licenses. These licenses allow the withdrawal of water at the San Lorenzo River Intake in Santa Cruz for delivery to the Graham Hill water treatment plant and the Felton diversion for storage at Loch Lomond Reservoir. In 1960, Newell Creek Dam was constructed to create Loch Lomond Reservoir, with a then-reported capacity of 8,500 of acre-feet.<sup>5</sup> Jointly, these three surface water sources are the primary supply for the City.

Source water development and the supply history of the Santa Cruz Water Department through 1986 were described in detail in the 1996 sanitary survey. During 1986, the City upgraded the Graham Hill Water Treatment Plant (WTP) to improve treatment performance. Improvements consisted of replacing the filter media; modifying the chemical feed systems, flocculators, monitoring and control system, and sludge collectors; and installing tube settlers in the sedimentation basins. There have been a few changes in the SCWD water supply and treatment system that have occurred since the 2013 sanitary survey update including replacement and rehabilitation of wells at the Tait wellfield and rehabilitation and upgrades at the Graham Hill WTP which are discussed in Section 2.7.

## **2.4.3 San Lorenzo Valley Water District (SLVWD)**

The SLVWD, originally the San Lorenzo Valley County Water District, was formed by a special election of the residents of Santa Cruz County on April 3, 1941. At that time the boundaries were established to include 58 square miles of the San Lorenzo Valley in the Santa Cruz Mountains. During the late 1940's, the SLVWD purchased large areas of land with an initial intent of potential reservoir development; as philosophies changed these lands were later preserved for watershed protection in the early 1980s. In 1958, the SLVWD sold 2,500 acres of land to the City of Santa Cruz for the placement of Loch Lomond Reservoir.

Major events in the development of the current SLVWD water supply system are described in detail in the 1996 sanitary survey. The District has not used springs as water sources since 1993 when the Lyons surface water treatment plant was constructed. More recent developments include the annexation of the Mañana Woods Mutual Water Company and the acquisition of protected lands in the Malosky Creek watershed both of which occurred in 2006 and are described in the 2006 watershed sanitary survey.

In 2008, SLVWD acquired the Felton Water System from California-American Water Company. Felton is supplied water from two (2) spring sources and one (1) surface water diversion. The spring sources are Bennett Spring and Bull Spring. The surface water source is Fall Creek.

Supply water from the combined springs is routed through a raw water transmission line to the Kirby Street Water Treatment Plant. Supply water from Fall Creek is also routed through separate raw water transmission line to the Kirby Water Treatment Plant (Kirby WTP). The Kirby Street Water Treatment Plant was brought on line in January 1997 to meet the requirements of the Surface Water Treatment Rule. The nominal capacity of the Kirby Street Water Treatment Plan is 1.0 mgd using two (2) 350 gpm rated, two stage filtration constant adsorption clarification/tri-media filtration units (CPC Microfloc-Trimite TM-350). Disinfection is

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<sup>5</sup> Re-surveys indicate a current capacity of about 8,600 acre-feet above the spillway elevation (McPherson, 2011)

provided at the Kirby Street Water Treatment Plant by contact mixing with sodium hypochlorite prior to introduction into the treated water distribution system.

The area formerly served by LCWD is now a part of the SLVWD North system and has approximately 500 service connections (which has not changed as of 1996) , which generally surrounds the Lompico area. Lompico is shown just east of the Loch Lomond Reservoir in Figure 1-1.

Through the merger with LCWD, SLVWD now owns the 425-acre Lompico headwaters property, which previously supplied water to the community of Lompico. The lands were first purchased by the Sempervirens Fund which then transferred the purchased land to LCWD prior to the merger with SLVWD.

## **2.5 Water Sources**

### **2.5.1 Santa Cruz Water Department**

The existing SCWD water supply system is described in detail in the 2015 Urban Water Management Plan. The SCWD supply system is comprised of four main production elements: (1) the North Coast streams and Liddell Spring; (2) the San Lorenzo River (San Lorenzo River Intake, Tait Wells and Felton Diversion); (3) Loch Lomond Reservoir on Newell Creek; and (4) the Live Oak wells. All but the Live Oak wells system, entirely a groundwater supply source, are described in the following paragraphs. The main water supply facilities are shown on Figure 1-1.

### **2.5.2 North Coast**

The North Coast water supply system consists of surface diversions from three coastal streams and one natural spring located approximately six to eight miles northwest of downtown Santa Cruz. These sources are Liddell Spring, Laguna Creek, Reggiardo Creek, and Majors Creek. A few changes to the facilities described in the 1996 sanitary survey have been made including repairs at the Majors Dam following a failure and sediment transport improvements including new drain valves and operational improvements required by CDFW at Laguna and Majors Creeks. Rehabilitation and maintenance of the diversions, several of which were damaged in the 2017 winter storms, is currently being initiated. A brief summary follows, for reference. More detailed descriptions are found in the 1996 sanitary survey.

*Liddell Spring* — Liddell Spring, is a natural spring used for water supply. The spring box/diversion is located at elevation 584 feet. Water from the spring is directed through a 10-inch steel pipeline into the Coast Pipeline for transmission to the SCWD service area.

*Laguna Creek and a tributary, Reggiardo Creek* — Flows from Reggiardo Creek, which are quite limited, are captured at a diversion dam located at elevation 630 feet. Diversions from Reggiardo Creek are diverted through about 850 feet of pipeline to Laguna Creek and are not monitored separately from Laguna Creek. Combined flows from Laguna Creek and diversions from Reggiardo Creek are captured at a concrete and limestone dam located at elevation 623 feet on Laguna Creek. The original dam constructed in 1890 is still in use today. These diversions are sent through 12,400 linear feet of 14-inch steel pipeline to the junction with the transmission pipeline from Liddell Spring. The junction is known as the Laguna-Liddell "Y".

*Majors Creek* — Flow from Majors Creek is diverted from a concrete dam located at elevation 352 feet. As noted earlier, a dam failure in the winter of 2011, was repaired to restore the

original diversion in the summer of 2011. Diversions from Majors Creek are conveyed through 11,300 linear feet of pipeline varying between 10 and 16 inches in diameter before joining the main Coast Pipeline along Highway 1. Because the Majors Creek diversion is located at a much lower elevation than the other North Coast sources, use of the Majors Creek Diversion has historically been limited by the available supply from the other North Coast sources (i.e. the Majors Creek flows can enter the Coast Pipeline only when the head from the other sources is low). Reduced production at Laguna and the need for fish bypass flows, allows more of Majors Creek flows to enter the Coast Pipeline.

Water from the North Coast diversions flows by gravity to the SCWD system via the Coast Pipeline, which varies from 16 inches in diameter between the Laguna-Liddell "Y" and Majors Creek up to 24 inches in diameter near Bay Street Reservoir. Projects have been underway over the last 10 years to replace badly deteriorated sections of the Coast Pipeline with the most recent project completed in 2017.

Water from the Coast Pipeline is boosted at the Coast Pump Station to the Graham Hill WTP for treatment.

### **2.5.3 San Lorenzo River – Intake in Santa Cruz and Tait Wells**

San Lorenzo River flows are diverted at the Intake in Santa Cruz just north of Highway 1. Water is diverted at a concrete check dam into a screened intake sump where three vertical turbine pumps are used to pump the water to the Graham Hill WTP. Two of the pumps are converted to a variable frequency drive (VFD) to better match pump output to demand and available flow while one pump is set at a constant speed. These pumps are located in the same building as the pumps for the North Coast diversions. High flows during winter of 2017 have scoured the river bottom in the vicinity of the intake allowing for inspection which indicated that some damage has occurred. This downcutting may have had some water quality benefit as the river flow now has greater velocity in the vicinity of diversion.

The San Lorenzo River Intake in Santa Cruz also includes three production wells, located on the east side of the river. Two replacement wells, Tait Well No. 1B and Tait Well No. 3B were drilled in 2016 and are about 89 feet deep. One well, Tait Well No. 4, was rehabilitated in 2016, and is 71 feet deep. These wells are tied to the City's appropriative rights for San Lorenzo River flows as there is evidence that the Tait wells are hydraulically connected to the river. The DDW classifies water from the Tait wells as GWUDI (Ground Water Under Direct Influence of Surface Water).

Water produced by the Tait wells is also delivered to the San Lorenzo River intake sump at the Coast Pump Station. The ground water is then pumped into a common transmission pipeline used to convey water from both the North Coast and San Lorenzo River sources to the Graham Hill WTP for treatment.

### **2.5.4 San Lorenzo River - Felton Diversion**

There have been no major changes or modifications to this system in the last five years. The Felton Diversion is located on the San Lorenzo River just downstream of the Zayante Creek confluence, which is approximately five river miles north of the Coast Pump Station and San Lorenzo River Intake. The diversion structure consists of an inflatable rubber dam to divert flows into a screened intake sump. Flows are then pumped through the Felton Booster Station into Loch Lomond for storage via the Newell Creek Pipeline. The desired diversion rate is regulated

by using different combinations of the three pumps at the Felton Diversion and the five pumps at the Felton Booster Station.

### **2.5.5 Loch Lomond Reservoir on Newell Creek**

The Loch Lomond Reservoir was created by the construction of Newell Creek Dam, located about ten miles north of Santa Cruz and northeast of the town of Ben Lomond. The reservoir was constructed in 1960, and currently has a maximum storage capacity of about 8,600 acre feet.<sup>6</sup> Loch Lomond is the only major reservoir in the San Lorenzo River watershed. There have been no major changes in this system in the last five years.

Newell Creek Dam is an earthfill dam, 190 feet high and 750 feet long at the crest. The spillway crest is at elevation 577 feet. Releases from the reservoir are made through outlet works on the upstream face of the dam. Water released from Loch Lomond for use by SCWD is conveyed to the Graham Hill WTP through the Newell Creek Pipeline. The water flows by gravity from the reservoir to the Felton Booster Station, approximately 4.3 miles downstream of the dam. The water is then pumped at Felton Booster Station to clear a ridge in Henry Cowell State Park at an elevation of about 580 feet. To meet fluctuating head and flow conditions, five pumps and alternative valving configurations that allow various pump combinations are available at the Felton Booster Station.

### **2.5.6 SLVWD**

Clear Creek, Foreman Creek, Peavine Creek, Silver Creek, and Sweetwater Creek are the primary surface water sources for the Lyons WTP which serves the northern portion of SLVWD's service area. The current average stream diversion yearly total is about 900 acre-feet from these sources. SLVWD has appropriative rights to these creeks. These sources are perennial creeks and are located west of Highway 9 along the Ben Lomond Mountain. The watersheds of the creeks are contiguous and rugged with extremely steep slopes. The watersheds above the creek intakes are largely uninhabited. In addition, the SLVWD's Felton system is served by Fall Creek and Bennett and Bull Springs. The approximate location of each creek intake and watershed area is illustrated in Figure 1-1.

The original surface water source for the Lompico portion of the SLVWD north system was Lompico Creek, downstream of the Mill Creek confluence which has a watershed area of about 1,470 acres. SLVWD now has the appropriative water rights for Lompico Creek which dates to the mid-1940's. The estimated population for the service area is about 1,500 people. The average drinking water use is about 0.10 mgd, which is supplied SLVWD. The drought of 2011-2015 reduced Lompico Creek flows; there was no flow in 2015. The supply insufficiency precipitated first an emergency connection between LCWD and SLVWD and ultimately resulted in the merger with SLVWD. In 1996, LCWD constructed a new water treatment plant (WTP), a microfiltration unit, to comply with SWTR requirements; the WTP is currently offline. The Lompico Community Center sponsors a community creek clean-up event annually.

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<sup>6</sup> Per a 2009 survey discussed in Section 2.2.7



## 2.6 Water Rights

### 2.6.1 SCWD

Table 2-4 lists the SCWD water rights, as listed in the 2015 Urban Water Management Plan. There have been no changes in the SCWD water rights since the preparation of the 1996 sanitary survey although SCWD is developing and submitting filings for a change to the water rights that would allow direct diversion at Felton for delivery to the Graham Hill WTP. The HCP that is under preparation, as discussed earlier, may limit diversions from some of SCWD's most important water sources.

**Table 2-4: Summary of SCWD Water Rights**

<i>Source</i>	<i>Period</i>	<i>Maximum Diversion Rate (cfs)</i>	<i>Fish Flow Requirement (cfs)</i>	<i>Annual Diversion Limit (mg/year)</i>
North Coast <sup>(1)</sup> Liddell Spring Laguna/Reggiardo Creeks Majors Creek	Year-round	No limit	None	None
San Lorenzo River				
Intake and Tait Wells	Year-round	12.2	None	None
Felton Diversion to Loch Lomond Reservoir	September	7.8	10	977
	October	20	25	
	November-May	20	20	
	June-August	---	---	
Loch Lomond Reservoir on Newell Creek				
Collection	September-June	No limit	---	1,825
Withdrawal	Year-round	---	1	1,042

<sup>(1)</sup> Water rights for the North Coast Sources are pre-1914 rights containing all downstream rights. Therefore, the SCWD may divert up to the full natural flow of each stream. SCWD owns all downstream riparian water rights on the North Coast sources.

It should be noted that the drought emergency starting in 2014, required SCWD file for a Temporary Urgency Change with the State Water Resources Control Board, Division of Water Rights for relief from the bypass and release requirement at Loch Lomond Reservoir in order to maintain water in storage to meet the community's needs for water for essential health and safety needs. In addition, SCWD is initiating a Water Rights Reliability Project process to conform water rights that will change the place of use of the San Lorenzo River water and allow flexibility in the use of the various surface waters available to Santa Cruz.

## **2.6.2 Other Utilities**

Table 2-5 summarizes the water rights for the larger utilities in the watershed area in the San Lorenzo Valley watershed. The large utilities, such as SLVWD, have more than 200 service connections. The smaller utilities have less than 200 service connections and are monitored by the County Health Services Agency. This table also lists the limiting flow rates or diverted flow rates from the different surface waters, if applicable.

**Table 2-5: Summary of Surface Water Rights for Utilities With More Than 200 Service Connections**

<i>Utility</i>	<i>Source(s)</i>	<i>Rights</i>	<i>Limitations</i>
Santa Cruz Water Department (SCWD)	San Lorenzo River Intake and Tait Wells	Year-round use; There are no fish flow requirements or annual flow limitations based on water rights but limitations are proposed under the minimum instream flow targets under the HCP (see Section 2.3.5)	12.2 cfs (7.9 mgd) maximum withdrawals per day.
	Felton Diversion	Can divert 20 cfs (12.9 mgd) from October through May to Loch Lomond	Must provide at least 25 cfs in October and 20 cfs from November through May for fish flows. Maximum allowable diversion is 977 mgd .
	Loch Lomond Reservoir	Can withdraw year-round	1 cfs September thru June; greater of 1 cfs or equal to inflow July thru August; into Newell Creek ; 5,600 acre-feet annual collection with 3,200 acre-feet maximum annual withdrawal;
	Coast sources including Liddell Spring, Laguna/Reggiardo Creeks, and Majors Creek	Fully appropriated rights There are no fish flow requirements or annual flow limitations based on water rights but bypass flows are proposed and currently provided under the minimum instream flow targets under the HCP (see Section 2.3.5)	None
San Lorenzo Valley Water District (SLVWD)	Clear Creek, Foreman Creek, Peavine Creek, Sweetwater Creek,	Fully appropriated rights	None
	Fall Creek, Bennett and Bull Springs	Fully appropriated rights Not to exceed 1.7 cfs and 345 mg/year	Required minimum bypass flows vary from 0.05 – 1.5 cfs, depending on the cumulative monthly runoff of the San Lorenzo River, as measured at the Big Trees gage; cannot divert once Big Trees drops below 20 cfs per seniority
SLVWD	Lompico Creek	Appropriative Rights	Diversion of up to 24,000 gallons per day of surface water and must have 0.1 cfs bypass

Source: DDW Annual Inspection Reports and State Water Resources Control Board Water Rights Database

*Note to Reviewers:* Info for Big Basin MWC is not included in this table but was included in the 1996 survey.

### **2.6.3 SLVWD**

SLVWD has pre-1914 appropriative water rights to divert from the northern tributaries to the San Lorenzo River and appropriative water rights transferred during SLVWD's acquisition of the Felton System for Fall Creek and Bennett and Bull Springs.

The appropriative water right to divert up to 24,000 gallons of surface water at the Lompico Creek intake structure was originally owned by LCWD but has now been transferred to SLVWD since the 2016 merger. Historically, LCWD did not exceed their allowable diversion.

### **2.6.4 Water Quantity**

Table 2-6 summarizes the water sources and the quantity of water available for each large utility. This table lists the surface water sources for each utility, the approximate average surface water supply capacity for the source, the total supply capacity (including ground water), and the total average day use. Each of the large utilities has a limited supply of water for drinking water purposes. For example, SCWD has about 11.4 to 15.7 mgd of combined ground and surface water available for drinking water purposes, of which about 75 percent comes from flowing surface diversions, about 5 percent from groundwater and the remaining 20 percent from water stored in Loch Lomond at the present time. The average day use from 2015 was about 6.7 mgd, with a potential average demand in 2030 of up to 8.8 mgd (2015 UWMP: Tables 4-4). Although average water demand appears to be met with the available supply, during periods of drought, flows in the San Lorenzo River and coast sources run low and cannot support average dry-season demands. This situation can stress the system, especially given the unpredictable nature of climate conditions. SCWD will be challenged to consistently provide and achieve the desired supply capacity, especially during extended drought periods, under the minimum instream flow targets for the HCP, and in the future with the current supply sources.

Although efforts are made to maximize the volume of water available from surface water sources, especially the San Lorenzo River, after a storm event, the City operates under a maximum turbidity level for withdrawal from the San Lorenzo River sump of 10 NTU at the Coast Pump Station; the sump is a blend of San Lorenzo River and Tait well water. During first flush storm events in the early season, turn outs are bypassed as soon as it starts raining. The City is considering a winter diversion program that could be used for in-lieu conjunctive use of groundwater to improve seawater intrusion conditions which may result in adjustments to the turbidity criteria.

**Table 2-6: Summary of Water Sources Available for Utilities With More Than 200 Service Connections**

<i>Utility</i>	<i>Source(s)</i>	<i>Average Surface Water Supply</i>	<i>Average Groundwater Supply</i>	<i>Average Supply Available</i>	<i>Demand Average (mgd)</i>	<i>Notes</i>
City of Santa Cruz Water Dept.	San Lorenzo River	1,882 mgd	N/A	3,252 mgd	10	Total supply available depends on annual rainfall
	Loch Lomond Reservoir	595 mgd	N/A			
	Coast Sources including Liddell Spring, Laguna/Reggiardo Creeks, and Majors Creek	637 mgd				
	Beltz Wells <sup>(2)</sup> (Active wells only)	N/A	138 mgd			
San Lorenzo Valley Water District	Clear Creek, Foreman Creek, Peavine Creek, Sweetwater Creek	1.2 mgd	N/A	5.0 mgd	1.9 mgd	Most of the demand is in surface water service area (about 70 percent)
	Quail Hollow, Olympia, and Pasatiempo Wells	N/A	3.3 mgd			
	Fall Creek, Bennett and Bull Springs	0.5 mgd	N/A			
Lompico County Water District (merged in 2016 with SLVWD)	Lompico Creek	0.06 mgd	N/A	0.12 mgd	0.082 mgd	
	Well Sources (3 wells) SLVWD Connection	N/A	0.06 mgd			

Mgd= million gallons per year; mgd = million gallons per day

Source: 2015 Urban Water Management Plan

N/A - Not applicable

<sup>(1)</sup> Tait Street wells are considered a surface water because they are hydraulically influenced by the San Lorenzo River flow.

## 2.6.5 Source Management

Each of the utilities in the area manages their sources in an attempt to satisfy the water demands for their specific systems. All utilities are dependent upon the surface flows from the various creeks, streams, and springs that make up their drinking water source. Factors such as highly turbid water caused by stormwater runoff make the water more difficult to treat, requiring diversion of the source to be discontinued until the water quality returns to acceptable levels. For example, SCWD does not use water from the San Lorenzo River Diversion during storm events when the sump turbidity which is blend of San Lorenzo River and Tait Wells exceeds

about 10 NTU. When flows are diminishing towards the end of a storm and/or on the receding limb of the hydrograph, turbidity of about 25 NTU is diverted. Also, SLVWD does not use highly turbid water at their Lyon and Kirby WTPs during high-turbidity periods.

One of the major issues that continues to face SCWD is the proposed in-stream flow requirements for Endangered Species Act (ESA) requirements under the HCP will be established on some of the North Coast streams, potentially reducing the volume of flow available from these sources. As discussed in Section 2.3.5, the consequence of reduced North Coast flows would be higher reliance on water from Loch Lomond Reservoir, which has a higher TOC concentration, and hence a higher potential for formation of disinfection byproducts (DBP). DBP formation can be managed/inhibited/ from both the treatment perspective by carefully selecting source water for lower TOC as well as in the distribution system where regular water sampling occurs for DBP compliance.

City staff has continued to discuss, at a conceptual level, the implications of ESA in-stream flow requirements as well as potential future winter water production for regional water supply reliability, which could include modifying the treatment process and/or constructing horizontal wells at the San Lorenzo River diversion -- both of which are activities that will require many years to plan and implement. In addition, Graham Hill WTP improvements to meet LT2 and Stage 2 rule requirements were evaluated in 2010. These improvements include alternatives that could be implemented to meet more stringent D/DBPR requirements and reduce the higher levels of DBP that are associated with elevated TOC concentrations.

Water utilities must therefore balance the need to satisfy their customer demand with the requirement to comply with drinking water regulations. Most utilities, large and small, experience difficulty in treating highly-turbid water, and therefore prepare and adjust for such operations before, during, and after storms events as does SLVWD.

## **2.7 Facilities**

### **2.7.1 Raw Water Reservoirs**

With the exception of small diversions in creeks and streams, the only large raw water reservoir in this study area is Loch Lomond, which is managed by SCWD. This roughly 8,600 acre-foot capacity reservoir, located on Newell Creek northeast of Felton and east of Ben Lomond, also stores San Lorenzo River water diverted at the Felton Diversion structure. The SLVWD is entitled by contract to receive a portion of the water stored in Loch Lomond.

SCWD recently launched a project to either rehabilitate or replace the inlet/outlet pipeline that serves the Loch Lomond Reservoir. A valve on this pipeline was inspected in 2012 and was found to be stuck partially open and no longer operable. An interim plan was agreed to with Division of Safety of Dams in 2015 and the potential design options for the project are currently being considered.

### **2.7.2 Intakes/Conveyance Systems**

The locations of major water intakes are shown in Figure 1-1. Table 2-7 describes the intake and conveyance systems for the large utilities. Note that the San Lorenzo Valley and North Coast watersheds have extensive intake and conveyance systems needed to efficiently use the readily available supply of water in this area. Many of the intake structures have been

constructed to prevent contamination from outside sources. Some of the key intake and conveyance systems are discussed below.

**Table 2-7: Summary of Conveyance/Intake Facilities for Utilities With More Than 200 Service Connections**

<i>Utility</i>	<i>Source</i>	<i>Intake Details</i>	<i>Pipeline Dimensions</i>	<i>Pump Station Capacity</i>	<i>Other</i>
City of Santa Cruz Water Department	San Lorenzo River Intake	Combination concrete check dam and screened intake sump with vertical turbine pumps on wells	Varies	7.8 mgd	
	San Lorenzo River - Felton diversion	Inflatable rubber dam, screened intake pump	N/A	Felton Diversion P.S. at 2,850 gpm	Diverts water to Loch Lomond
	Loch Lomond Reservoir	Large earthen dam with multi-stage outlet tower	44,000 lf pipeline; 18 to 27 inches diameter	Gravity flow to Felton with Felton Pump Station at 13.5 MGD	Used in specific months to augment supply or when other sources have high turbidity that is difficult to treat
	Coast sources	These sources have small diversion structures or a protected spring box	Diameter varies - total pipelines	Gravity flow	Gravity flow to the Coast pump station then; pumped to GHWTP
	Majors	Concrete full-span dam with wire screened intake	10"	Gravity flow	Gravity flow to the Coast pump station then; pumped to GHWTP
	Laguna	Concrete/stone full span dam with wire screened intake	14"	Gravity flow	Gravity flow to the Coast pump station then; pumped to GHWTP
	Reggiardo	Concrete/stone full span dam with wire screened intake	8"	Gravity flow	Gravity fed to Laguna impoundment
	Liddell	Concrete/Corrugated Aluminum springbox with wire screened intake	16"		Gravity flow to the Coast pump station then; pumped to GHWTP
San Lorenzo Valley Water District	Clear Creek	Protected spring box at elev 1250 ft.	8-inch pipe to Foreman Creek	N/A	Gravity flow to Lyon WTP
	Sweetwater Creek	Protected spring box at elev. 1230 ft.		N/A	Gravity flow to Lyon WTP
	Peavine Creek	Small diversion structure at elev 1264 ft.	8 in. pipeline to Foreman Creek	Gravity	Gravity flow to Lyon WTP , Christmas tree farm in watershed
	Foreman Creek	Small diversion structure at elev 927 ft.	8 in. pipeline to WTP	Gravity	Gravity flow to Lyon WTP, small subdivision in headwaters
	Fall Creek	Small wire screen structures	8-inch	500 gpm	Gravity flow to Kirby WTP, Fall Creek St Park
	Bennett Spring	Protected spring box	4-inch	N/A	Gravity flow to Kirby WTP
	Bull Spring	Protected spring box for #1 and #2	4-inch	N/A	Gravity flow to Kirby WTP,
Lompico County Water District (merged with SLVWD in 2016)	Lompico Creek	Secured, screened structure adjacent to creek impoundment dam with concrete deep well and 1 HP pump	2" PVC Raw water line to holding tank 260-ft away	30 gpm Pump	N/A

N/A Not applicable or available.

*Note to Reviewers:* Info for Big Basin MWC is not included in this table but were included in 1996.

### 2.7.2.1 SCWD

Figure 1-1 shows approximate intake locations for the SCWD system. These include pipelines from the North Coast watershed and the San Lorenzo Valley. The details of these intakes and conveyance systems are described in Section 2.5 and in the 1996 sanitary survey.

### 2.7.2.2 SLVWD

Figure 1-1 shows the locations of the surface water sources used by the SLVWD. The Sweetwater Creek and Clear Creek intakes have been relocated further upstream on each creek to minimize the impact from human activity. However, this relocation has also moved the intakes closer to Empire Grade Road and reduced the runoff area. The impact of this relocation should be beneficial unless there is a significant chemical spill upstream of one or both intakes.

SLVWD has an intake, currently unused, on Lompico Creek below the Mill Creek confluence. About 15-20 houses are located upstream of the intake structure. Originally, the LCWD obtained about 25% of its water from the Lompico Creek surface intake and the other approximately 75% is obtained from groundwater wells. Should Lompico Creek be used in the future, relocation of the creek intake structure upstream of existing houses and installation of fish passage facilities is recommended.

### 2.7.3 Treatment Plants/Processes

The water treatment plant facilities for the large utilities in the watershed study areas are summarized in Table 2-8 and are described in more detail below.

**Table 2-8: Summary of Surface Water Treatment Facilities for Utilities With More Than 200 Service Connections**

Utility/Treatment Plant (Capacity)	Subject Watershed Source(s)	Pretreatment Process	Coagulant/ Flocculation Process	Sedimentation	Filtration (Rate)	Disinfection
Santa Cruz Water Dept. Graham Hill WTP <sup>(1)</sup> (24 mgd)	San Lorenzo River, Loch Lomond, and North Coast sources	Potassium permanganate or chlorine for oxidation, powdered activated carbon and potassium permanganate for taste and odor removal	Alum and cationic polymer Horizontal paddle mixers	Conventional - enhanced using tube settlers	Dual media (6gpm/ft2)	Sodium Hypochlorite with liquid chlorine back-up <sup>(2)</sup>
San Lorenzo Valley Water District - Lyon WTP (1.0 mgd)	Clear Creek, Foreman Creek, Peavine Creek, Sweetwater Creek	Chlorine for oxidation	Adsorption clarification/ filtration (Neptune Trident Microfloc)	Adsorption onto floating media which is equivalent to sedimentation	3 Multi-media filters at 350 gpm rating each (6gpm/ft2)	Sodium Hypochlorite
San Lorenzo Valley Water District - Kirby WTP (0.5 mgd)	Fall Creek, Bennett and Bull Springs	Sodium Hypochlorite	Adsorption clarification/ filtration (Neptune Trident Microfloc)	Adsorption onto floating media which is equivalent to sedimentation	2 – filters at 350 gpm rating	Sodium Hypochlorite
San Lorenzo Valley Water District – Mill Creek WTP (on standby)	Lompico Creeks	None	None	None	Microfiltration membrane 0.5 gpm/m2 of membrane area	Chlorine Post-treatment



Source: DDW Annual Inspection Reports

N/A = Not applicable

<sup>(1)</sup> Beltz WTP is not included because it is a groundwater source and Loch Lomond Recreation Area WTP is not included because it is a transient non-community water system.

<sup>(2)</sup> Orthophosphate is added for corrosion control in the water distribution system to prevent leaching of lead and copper

*Note to Reviewers:* Info for Big Basin MWC is not included in this table but was included in 1996.

### **2.7.3.1 SCWD**

Figure 2-5 represents the approximate layout of the facilities at Graham Hill Water Treatment Plant site. The Graham Hill WTP is a conventional treatment plant with key processes such as preoxidation, coagulation, carbon/potassium permanganate contactors (for taste and odor control), flocculation, sedimentation, filtration, and disinfection. These processes are fully described in the 2016 Inspection Report by DDW. Recent upgrades at the Graham Hill WTP include upgrades to the filter and replacement of tube settlers.

The Loch Lomond Reservoir Recreational Area (LLRRA) water system uses a microfiltration system to provide water for park users and the caretakers of the reservoir watershed. This system produces about 15 gallons per minute (gpm) of reservoir water through a microfiltration unit, equivalent to about 20,000 gallons per day. The microfiltration membranes were last replaced in 2010.

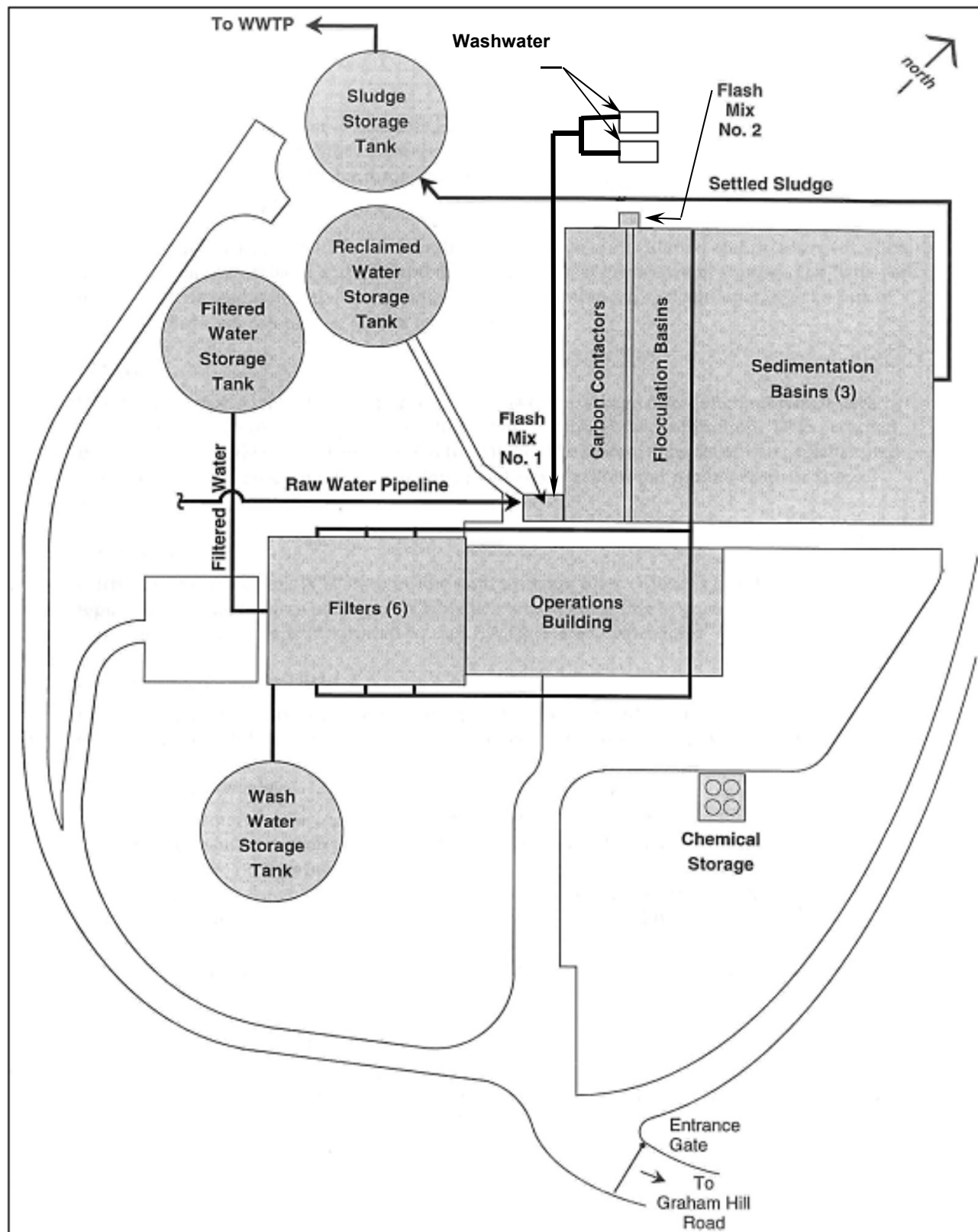
SCWD also operates two treatment facilities that serve the the Live Oak (previously Beltz) Wells. These facilities are only used to treat groundwater and are not fully described in this update. Details on the Live Oak Wells Filtration Plant are provided in previous surveys.

### **2.7.3.2 SLVWD**

SLVWD constructed the Lyon WTP in 1994, a two-stage package filtration plant which uses floating media to remove floc particles followed by a granular media filtration. DDW accepted this process as equivalent to conventional treatment. The system consists of three prefabricated adsorption, clarification, and filtration units each rated at 420 gpm. Due to piping system constraints, however, the maximum treated water production rate is 1,150 gpm.

In addition, SLVWD operates the Kirby WTP in Felton which is described in Section 2.4.3

The Lompico Creek water source was treated with a a pressure filtration system with microfiltration facilities for the Mill Creek WTP constructed by LCWD in 1996. While the treatment system is currently unused, it can treat surface water from Lompico Creek using a sand trap for pre-treatment, followed by a cartridge filter, then to a 400-gallon equalization tank that provides a constant flow rate to the microfiltration membranes. Following membrane filtration, the water passes through granular activated carbon for taste and odor control and disinfected with sodium hypochlorite before entering the disinfection system. SLVWD staff find that the relatively low flows do not merit the high labor effort necessary to operate the treatment facilities.



Source: CDM - Camp Dresser & McKee Inc., 1996

**Figure 2-5 Process Layout of the Graham Hill Water Treatment Plant, Santa Cruz Water Department.**

## 2.7.4 Pipeline Data, Capacity

Table 2-9 summarizes the pipeline data for each of the large utilities. Table 2-10 lists the distribution system reservoirs for each of the large utilities. The distribution system storage capacity for these utilities appears sufficient to account for short-duration periods when the lower quality water is diverted and water treatment facilities are not used. The maximum storage capacity for these utilities is about two to ten times more than the average daily use, with SCWD typically at the lower end of that range. Therefore, each utility has enough storage to allow a short-term period when water treatment facilities are not operational.

**Table 2-9: Summary of Distribution Systems for Utilities With More Than 200 Service Connections**

<i>Utility</i>	<i>Number of Service Connections</i>	<i>Total Pipeline Length</i>	<i>Notes</i>
City of Santa Cruz Water Department	24,523 in 11 pressure zones	300 miles (4 in. to 18 in.)	Satellite disinfection available at 4 locations
San Lorenzo Valley Water District	6,000 in 23 pressure zones 1,300 in 6 pressure zones for Felton System 484 in 3 pressure zones in Lompico System	155 miles (SLVWD 125 miles, Felton 30 miles, Lompico System 32 miles) (2 in. to 16 in.)	Satellite disinfection available at 2 locations

*Note to Reviewers:* Info for Big Basin MWC is not included in this table but was included in 1996.

**Table 2-10: Summary of Distribution System Storage Reservoirs for Utilities with more than 200 Service Connections**

<i>Utility</i>	<i>Reservoir Name</i>	<i>Capacity (Gallons)</i>
City of Santa Cruz Water Department (16 reservoirs total)	Carbonera	1,000,000
	University #5	2,000,000
	University #4	400,000
	University #2	1,000,000
	Bay St. (2 tanks)	12,000,000
	DeLaveaga 1	1,000,000
	DeLaveaga 2	1,000,000
	S.C Gardens 1	250,000
	S.C Gardens 2	250,000
	Rollingwoods	270,000
	Pasatiempo 1	750,000
	Pasatiempo 2	300,000
	Finished Water Tank @ GHWTP	1,000,000
San Lorenzo Valley Water District (37 reservoirs total)	Echo	1,000,000
	Reader	150,000
	Brookdale	750,000
	Big Steel	1,400,000
	Lyon	3,000,000
	Little Lyon	250,000
	Blue Ridge	40,000
	Huckleberry	125,000
	Bear Creek Estates	75,000
	Ralston	10,000
	Eckley	4,000
	Blackstone 1	11,000
	Blackstone 2	11,000
	Highland	60,000
	Nina 1	64,500
	Nina 2	64,500
	South 1	9,000
	South 2	9,000
	South 3	9,000
	South 4	9,000
	Spring	65,000
	Swim 1	10,000
	Swim 2	10,000
	Quail 1	211,000
	Quail 2	240,000
	University	51,000
	Reagon	500
	Probation	100,000
	Lower Pasatiempo	100,000
	Upper Pasatiempo	100,000
	Blue Tank	65,000
	Charlie Tank	45,000
	Felton – Kirby	250,000
	Felton - Blair	255,000
	Felton - El Solyo	20,000
	Felton – McCloud	284,000
	Felton Acres	100,000
Lompico County Water District (merged with SLVWD in 2016)	Clear well	48,000
	Tank 1	65,000
	Tank 2	100,000
	Tank 3	100,000
	Tank 4	100,000
	Tank 5	100,000
	Tank 6	100,000

### 2.7.5 Satellite treatment facilities

Besides small chlorination systems for numerous wells used throughout the area, the main satellite treatment facilities are chlorination facilities used by SCWD at the University Reservoir. Satellite chlorination equipment is housed in a separate room from the source. SCADA systems are used to control and monitor these facilities. The targeted chlorine residual leaving these facilities to the appropriate pressure zones is about 0.5 mg/l of free chlorine. SLVWD has a similar facility at one of its reservoirs.

## 2.8 Emergency Plans

Most utilities experience periodic emergencies that disrupt water treatment or water supply. The SWTR requires utilities to develop standard and emergency response plans for specific types of emergency episodes. These include chemical spills, fires, equipment failure, serious power failure, and deliberate water fouling. Some emergency plans may include responses to seismic episodes, floods, and droughts. In addition, the Bioterrorism Act of 2002 requires that drinking water systems serving a population greater than 3,300 (or 1,000 service connections) complete a vulnerability assessment in regard to terrorist activity and modify their emergency plans to reduce the risk posed by terrorist attacks.

Most of the utilities in the study area have developed emergency response plans as part of the Operations Plans for each WTP. Also, the County uses the emergency response dispatch, NETCOMM, to notify drinking water utilities of chemical spills, fires, and other emergencies in the watershed. The Emergency Plan includes a response when episodes are notified via the 911 emergency telephone number. However, SCWD staff has indicated that notifications are not always made; therefore a recommendation to have an annual discussion with emergency response dispatchers has been made. Specific emergency plans for each utility are discussed below.

### 2.8.1 SCWD

The SCWD issued a revised *Emergency Operations Plan* in 2013, which addresses natural and man-made disasters such as earthquakes, tidal waves, flood, fire, vandal-caused disasters, and chemical spills. This *Emergency Operations Plan* would be used in the event of contamination of the water supply by acts of terrorism or vandalism. The response to equipment failures and serious power failures at the WTP is included in the September 2016 GHWTP Operations Manual.

SCWD has conducted a seismic risk evaluation called the Earthquake Response Procedures for the Newell Creek Dam and Other Critical Structures. This information is available in the 2005 *General Emergency Plan* SCWD also has a Water Shortage Contingency Plan which was adopted by resolution of the Santa Cruz City Council in August 2016 and an Ordinance (Santa Cruz Municipal Code Chapter 16.01) that implements water shortage regulations and restrictions. Both of these documents are included as appendices to the 2015 *Urban Water Management Plan* and call for an aggressive conservation effort and public relations program to reduce the drinking water demand of the customers during emergencies.

In addition, SCWD conducted a comprehensive assessment of the Newell Creek Dam and spill way concurrent with an update to the dam Emergency Action Plan.. During the winter of 2017, SCWD increased dam inspections from monthly to daily during the heaviest rains. The dam was also inspected at a reconnaissance level by the Division of Safety of Dams in Spring 2017 as a precaution; the state inspection identified potential geologic, structural or performance issues

that could pose a risk during a flood event. It is anticipated that these risks will be further studied and remedies proposed during the comprehensive dam assessment currently underway.

The broader 2015 *Santa Cruz County Operational Area*<sup>7</sup> *Emergency Management Plan* addresses the consequences of any emergency or disaster which may occur within the County. The plan also provides a means by which State and Federal assistance is requested if necessary. Depending on the size and complexity of the incident, an emergency operations center (EOC) may be activated under the direction of the Santa Cruz County Office of Emergency Services. The Santa Cruz Operational Area transitioned to a Standardized Emergency Management System (SEMS) in 2007 that is compliant with the National Incident Management System (NIMS). NIMS was developed by the Department of Homeland Security to improve national readiness to respond to not only terrorist events but all types of disasters (Santa Cruz County Office of Emergency Services, 2005).

### **2.8.2 SLVWD**

SLVWD recently updated their emergency response plans which are contained in the *Lyon WTP Operations Plan*. This plan includes a response to most natural disasters and chemical spills in the watershed. For other emergencies, SLVWD can rely on the County EOC infrastructure.

Prior to the merger, LCWD had an Emergency Response Plan which SLVWD should review and update prior to active use of the WTP and intakes. Some emergency response measures available for the Lompico portion of the North System include:

- For fires, SLVWD has maintained fire breaks around all treated water reservoir sites.
- For emergency power, a trailer-mounted emergency generator that will provide 30 kilowatts power is available for use at booster stations which are outfitted with quick-disconnect emergency-hookup switches.
- For earthquakes, five of the six water storage tanks have been rehabilitated with restraint hold-downs and flexible fittings to minimize any lateral movement. All structures within the original LCWD facilities have been evaluated for seismic risk.

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<sup>7</sup> The Santa Cruz Operational Area consists of the County and all political subdivisions within the County.

## Section 3: POTENTIAL CONTAMINANT SOURCES IN THE WATERSHEDS

### 3.1 Survey Methods

The survey consisted of a combination of discussions and meetings with several County staff and Water Department staff, update calls to selected agencies, and a review of several agency websites and files. Contacts are listed in Table 3.1. The survey work was also supplemented with additional data and report review and discussions with various agency staff. This section discusses the specific potential contaminant sources.

**Table 3-1: Santa Cruz Watershed Sanitary Survey Contacts**

Category	Contact	Agency	Phone Number
<i>Drinking Water Regulations/Treatment Processes/Quality Control</i>	Jan Sweigert	CA DDW(Monterey)	(831) 655-6934
	Querube Moltrup	CA DDW (Monterey)	(831) 655-6936
<i>General Watershed Information</i>	Chris Berry	SCWD	(831) 420-5483
	John Ricker	SCCo Environmental Health Services	(831) 454-2750
	Jen Michelsen	SLVWD	(831) 430-4625
	Chris Spohrer	CA Parks and Recreation	(831) 359-7420
	Matt Johnston	Santa Cruz County Planning	(831) 454-3114
<i>Drinking Water Production/Treatment</i>	Dustin Holtzclaw	SCWD	(831) 420-5461
	Brian Lee	SLVWD	(831) 430-4625
	Troy Boone	SCCo Environmental Health Services	(831) 454-3069
	David McNair	Scotts Valley Water District*	(831) 438- 2363
	Rachel Arias	Big Redwood State Park MWC*	(831) 335-6311
	Michael Stus	Sequoia Seminar*	(831) 336-5060
	Bob Runyan	Quaker Center*	(831) 336-8333
<i>Urban Runoff</i>	Dale Pollock	Mt. Hermon* * = non-participants in this Sanitary Survey	(831) 430-1204
	Rachael Fatoohi Bridget Hoover	SCCo Monterey Bay National Marine Sanctuary	(831) 454-2810 (831) 647-4217

**Table 3-1. Santa Cruz Watershed Sanitary Survey Contacts (cont'd)**

<b>Category</b>	<b>Contact</b>	<b>Agency</b>	<b>Phone Number</b>
<i>Land Use (Agricultural, etc.)</i>	Matt Johnston John Ricker David Sanford Jennifer Michelsen Whit Haraguchi	SCCo Planning Department SCCo Environmental Health Services SCCo Agricultural Commissioner SLVWD USDA NRCS	(831) 454-3114 (831) 454-2750 (831) (831) 430-4627 (831) 227-2901
<i>Concentrated Animal Facilities</i>	John Ricker Chris Berry Jennifer Michelson Angela Gruys Jennifer Harrison Howard Kolb	SCCo Environmental Health Services SCWD SLVWD SCCo RCD Ecology Action RWQCB	(831) 454-2750 (831) 420-5483 (831) 430-4627 (831) 464-2950 (831) 425-1404 (831) 549-3332
<i>Pesticide and Herbicide Use</i>	Kris Griffin Tom Barnett Steve Tjosvold Dawn Harman Chris Berry Gar Eidam Juan Hidalgo Bill Keller	CalTrans - Landscape Specialist CalTrans - Santa Cruz Area Supt UC Cooperative Extension SCCo Road Maintenance SCWD SCWD, Loch Lomond SCCo Agricultural Commissioner Boulder Cr. Golf and Country Club	(805) 549-3124 (831) 476-1351 (831) 763-8013 (831) 477-3999 (831) 420-5483 (831) 335-2586 (831) 227-2901 (831) 338-3717
<i>Wild Animals</i>	Chris Spohrer Jennifer Michelson Gar Eidam Chris Berry Don Kelly Chris Wilmers	CA DPR SLVWD SCWD, Loch Lomond SCWD CDFW Warden UCSC	(831) 359-7420 (831) 430-4627 (831) 335-2586 (831) 420-5483 (831) 649-2942 (650) 208-5766
<i>Quarries</i>	Chris Berry David Carlson Terry Tompkins Barry Hecht	SCWD SCCo Planning Department SCWD Balance Hydrologics	(831) 420-5483 (831) 454-3173 (831) 420-5454 (510) 704-1000
<i>Solid and Hazardous Waste Disposal Facilities</i>	Scott Carson  Jose DeAnda Tim Fillmore Tom Sayles Thea Tryon Kasey Kolassa	SCCo Environmental Health Services  SCCo Environmental Health Services SCCo Environmental Health Services RWQCB RWQCB SCCo Public Works Department	(831) 454-2758  (831) 454-2759 (831) 454-2761 (805) 542-4640 (805) 542-4776 (831) 454-2377



**Table 3-1. Santa Cruz Watershed Sanitary Survey Contacts (cont'd)**

<b>Category</b>	<b>Contact</b>	<b>Agency</b>	<b>Phone Number</b>
<i>Timber Harvesting</i>	Matt Johnston	SCCo Environmental Health Services	(831) 454-3114
	Jennifer Michelson	SLVWD	(831) 430-4627
	Chris Berry	SCWD	(831) 420-5483
	Rich Sampson	Cal Fire	(831) 335-6742
	Terris Kastner	CDFW	(408) 365-1066
	Sheila Shoderberg	RWQCB	(805) 542-3592
<i>Recreation</i>	Gretchen Illif	SC Co Parks	(831)-454-7908
	Chris Spohrer	CA Parks and Recreation	(831) 359-7420
	Jennifer Michelson	SLVWD	(831) 430-4627
	Chris Berry	SCWD	(831) 420-5483
	Mauro Garcia	City of Santa Cruz Parks and Recreation	(831) 420-5366
<i>Unauthorized Activity</i>	Chris Berry	SCWD	(831) 420-5483
	Gar Eidam	SCWD	(831) 335-2586
	Jennifer Michelson	SLVWD	(831) 430-4627
	Matt Johnston	Santa Cruz County Planning	(831) 454-3114
	Jose DeAnda	SCCo Environmental Health Services	(831) 454-2759
	John Buchanan	Cal Fire	(831) 423-0528
	Rich Sampson	Cal Fire	(831) 335-6742
<i>Traffic Accidents and Spills</i>	Scott Carson	SCCo Environmental Health Services	(831) 454-2758
	Jose DeAnda	SCCo Environmental Health Services	(831) 454-2759
	Rebecca Supplee	SCCo Environmental Health Services	(831) 454-2761
<i>Geologic Hazards</i>	Joe Hanna	SCCo Planning Department	(831) 454-3175
<i>Fire</i>	Tim Hyland	CA Parks and Recreation	(831) 335-6384/345-3331
	Gar Eidam	SCWD, Loch Lomond	(831) 335-2586
	Chris Berry	SCWD	(831) 420-5483
	Chris Spohrer	CA Parks and Recreation	(831) 359-7420
	Jim Rust	Cal Fire	(831) 335-6723
	Mike Gagarin	Cal Fire	(831) 427-2430
	Jennifer Michelson	SLVWD	(831) 430-4627
	Chief John Stipes	Zayante Fire Dept.	(831) 335-5100
<i>Wastewater</i>	Forest Revere	SCCo Public Works	(831) 454-2407
	Troy Adams	City of Scott's Valley	(831) 438-0732
	Rick Rogers	SLVWD	(831) 430-4624
	Dale Pollock	Mt Hermon	(831) 430-1204
	Harvey Packard	RWQCB	(805) 542-4639
	John Ricker	SCCo Environmental Health Services	(831) 454-2750
	Cheryl Wong	SCCo Environmental Health Services	(831)-454-3219

## 3.2 Wastewater

A number of communities and organizations are served by package wastewater treatment systems that discharge to common leachfields as shown on Figure 3-1. These entities include: County Service Area No. 7 in the vicinity of the Boulder Creek Golf and Country Club, Bear Creek Estates, the Mt. Hermon Association, the San Lorenzo Valley Unified School District, Camp Harmon, Camp Campbell and several other camps and conference centers. Recently, County Service Area No. 10 - Rollingwood Estates was connected to the City of Santa Cruz wastewater treatment plant which discharges the wastewater through the City of Santa Cruz ocean outfall.

However, the great majority of the residences and businesses in the San Lorenzo River watershed are on individual or community (e.g., trailer parks) septic systems. The dispersed rural population in the North Coast watersheds is served by individual septic tank and leachfield systems. There are no direct discharges of municipal wastewater to surface waters in the San Lorenzo Valley or North Coast watersheds.<sup>8</sup>

As shown on Figure 2-1, the majority of the SLVWD watershed areas are either in a state park or is protected land designated as Resource Conservation Land Use. The state park has hiking trails but no wastewater facilities as the nearby park entrance station, outside of the drainage, has visitor facilities. Only a small portion of the SLVWD watershed lands are designated rural residential with associated septic systems; these lands are near the upper watershed, quite a distance from the diversion locations.

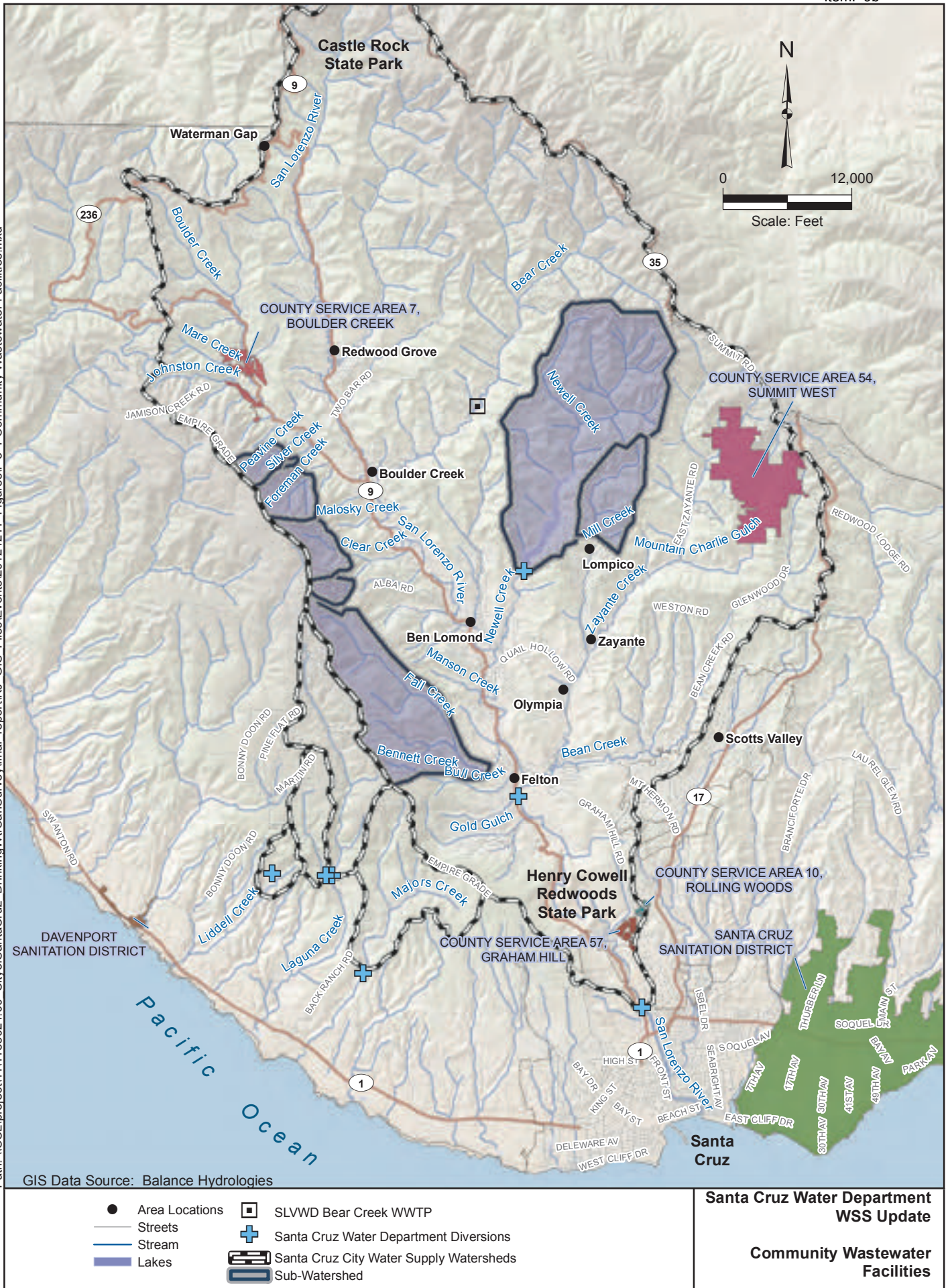
Septic systems have the potential to contaminate surface water either by percolation of wastewater through the soil into ground water which recharges surface water, or by direct surface runoff. If septic systems are improperly designed or installed in highly-permeable soils, such as sandy soils noted earlier, wastewater constituents can leach into ground water and from there seep into nearby surface waters. Surface water contamination from septic systems can also occur by system 'failure', or insufficient percolation rates leading to ponding and surfacing of effluent. A 'failing' septic system can allow large amounts of nutrients, viruses and bacteria to contaminate nearby surface waters. The portions of the San Lorenzo Valley that overlie high permeability soils has a higher probability of nitrates entering groundwater from the individual septic systems through excessively rapid percolation to ground water rather than by system failures as a result of the sandy soils discussed in Section 2.3.1. It is estimated that 11% of septic systems are located in high permeability soils.

There are about 15 homes upstream of the Lompico Creek intake currently unused, one of which was documented as failing in the 1996 sanitary survey. Since the LCWD merger with SLVWD, this water source is no longer used. However, if the former LCWD intake were to be reactivated, septic system performance should be reviewed.

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<sup>8</sup> The Watkins Johnson site in Scotts Valley, has had declining levels of TCE and PCE that have been treated and released. The site owners are currently negotiating with the USEPA to formally close the site.

Path: \\SCL\project\111188024.00\_City of Santa Cruz\_Drinking Water Survey\final\_report\KJ\_GIS\_Files\Events\2012\1211\_Figures\F 3-1 Community Wastewater Facilities.mxd



Surface water contamination by nutrients and coliform bacteria from septic systems in the San Lorenzo Valley has been intensively studied. The 1979 Watershed Management Plan identified improperly functioning septic systems as one of the major pollutants sources to the San Lorenzo River. In 1995, the County Board of Supervisors and the Regional Board adopted the Wastewater Management Plan for the San Lorenzo River Watershed which has been considered a model for the on-site septic wastewater management standards in the State under AB 885 as discussed in Section 4.9.

The Wastewater Management Plan contains management practices to prevent further degradation of water quality from septic systems and corrective measures to improve existing systems and reduce the loading of pollutants to the San Lorenzo River. The County implements a series of activities including septic tank pumping reporting to manage on-site wastewater systems as discussed in Section 5. Many of these measures were emplaced after extended field trials at sites throughout the valley under a range of soil and slope conditions. Since 2010, the County has approved over 130 septic upgrades for remodel, 78 alternative septic repairs, over 60 minor septic or monitoring well repairs, and over 680 repairs to septic systems or wells for a total over about 950 septic systems that have been repaired/modified in the watershed (John Ricker, personal communication 2017).

Recent estimates indicate that wet season septic failures rates are less than 0.5%. About 50 complaints/year regarding septic systems have been recorded in the San Lorenzo River Watershed, which is significantly less than the 130-160 failures per year recorded in the 1990s. Of those 50 complaints, about 50 percent had documented failures requiring improvements. Furthermore, the rate of new septic system addition has also reduced from about 15 systems per year down to 4 systems per year which further reduces the risk of water quality contamination from septic systems. Since 2010, the County has approved 11 new alternative septic systems and 34 new septic systems, some of which have enhanced treatment, in the San Lorenzo River and North Coast watersheds which equates to about 5 systems per year (John Ricker, personal communication, 2017). Since 2015, the County has provided a septic evaluation service to potential home buyers.

Review of the County's inspection and complaint records indicate that, within the watersheds, there were 8 complaints with septic -related failure or violations, in 2013 – 2014; 6 in 2014 – 2015, 19 in 2015 – 2016, and 28 in 2016-2017. Some cases in 2015-2016 and 2016-2017 were pending resolution.

### **3.2.1 Contaminants of Concern**

Contaminants in wastewater can be divided into those that present an acute health risk and those that may pose a chronic, or long-term health risk. An acute health risk is posed by the presence of pathogenic microorganisms. A chronic health risk is posed by excessive concentrations of compounds present in the source water or formed in the water treatment process.

Wastewater contains a number of pathogenic microorganisms responsible for causing diseases, such as hepatitis, typhoid, cholera, dysentery, salmonella, giardiasis, and cryptosporidiosis. In a properly functioning septic system, the effluent is treated by the soil and the microorganisms are



removed. If the system is not functioning properly, incompletely treated effluent may enter streams, or reach ground water.

Wastewater also contains high concentrations of nutrients and organic carbon. Most nitrogen in wastewater is converted to the nitrate form, which is highly soluble and readily transmitted through the soil to ground or surface waters. Nutrients can stimulate biological productivity in surface waters leading to high concentrations of organic carbon at downstream water intakes. Organic carbon combined with disinfectants used at water treatment plants produces trihalomethanes (THMs), five haloacetic acids (HAA5) and other disinfection byproducts (DBP) which can have long-term health implications. Excessive algal growth, promoted by introducing additional nitrate into a natural system in which phosphorus is widely available, also causes taste and odor problems in drinking water systems.

Blooms of blue-green algae (cyanobacteria), which form in nutrient-rich, non-turbulent waters, could cause more serious problems as some of these organisms produce harmful toxins. In September 2009, the EPA finalized its Drinking Water Contaminant Candidate List to include cyanobacteria which prioritizes this issue for further investigation. Usually, management practices to control taste and odor help to reduce the likelihood of toxic blue-green algal blooms; however, prevention is the preferred method because some types of treatment can rupture the cells and release the toxins.

County policy requires permitting of greywater sumps and includes connection of all greywater to an adequately sized septic system for the winter time when irrigation demands are low. SB 1258 passed in 2008 directs the California Department of Housing and Community Development to develop a more wide-ranging set of greywater standards for both indoor and outdoor uses than current law allows. These standards are expected to be incorporated in California Plumbing Code updates. Proposed standards include consideration of source water protection through containment on the site where generated and disposed of, prohibition on ponding and runoff, and prohibition of the use of greywater containing infectious (e.g. diapers) or hazardous contaminants. Both the County and the City provide guidance for use of graywater systems.

A greywater system collects and disposes of wastewater from systems such as the washing machine, shower, and bathroom sink. Greywater sumps are used by some homeowners to reduce loadings on a septic system with inadequate leaching capacity and to be able to reuse greywater for landscape irrigation. Although greywater contains fewer pathogens, solids, and nutrients than toilet wastes, it can still present a significant health hazard. According to the County Health Services Agency, bacterial concentrations in greywater from shower or bath water can reach 400,000 fecal coliforms/100 milliliter (ml) and 3 million total coliforms/100 ml. Washing machine wastewater can range from 2,000 to 10 million fecal coliforms/100 ml. In addition, there are roughly 200 enteric virus/Liter (L) of undisinfected greywater from showers and baths and 3,000 viruses/L from washing machines.

As noted earlier, the County requires building permits for installation of a greywater system while for projects and County records indicate that since 2012, 2 new greywater systems and 5 minor greywater system repairs were permitted. Within the City limits, Laundry to Landscape systems requires registration with the City Public Works Department by submitting an Installation and Maintenance Agreement form.

### **3.2.1.1 Bacteria**

A number of studies have been conducted to evaluate the proportion of the bacterial contributions resulting from wastewater discharge versus the proportion resulting from other sources, including waterfowl, livestock, pet waste, failing septic systems, sewer system leaks, encampments, and urban runoff. Ground-water monitoring conducted in Boulder Creek and as part of the County's ongoing monitoring program has shown that fecal coliform levels decrease to background levels more than 25 feet from septic systems. Beginning in 1981 the County has assessed fecal coliform concentration in shallow ground water underlying developed areas. The absence of fecal coliforms indicates that incidents of bacterial contamination of surface waters do not result from cumulative contamination of ground water but result from failures and discharges to the ground surface from individual systems.

Rapid detection of failing septic systems under the Wastewater Management Program, especially through the 1990s and the resulting system repairs and/or upgrades have substantially improved dry-season bacteria levels in the San Lorenzo River upstream from Santa Cruz (Santa Cruz County, 2003). As discussed below in Section 3.3 (urban runoff), results of recent microbiological source tracking indicate that birds are by far the major source of microbial contamination in the river, although human waste is a significant contributor, particularly during the wet season and downstream from suburban areas, such as Felton, and within the City of Santa Cruz (Ricker and Peters, 2006).

Blue-green algae (cyanobacteria), which are closer to bacteria than algae, have occasionally been reported in Loch Lomond Reservoir during warm summer conditions.

### **3.2.1.2 Nitrate**

Although nitrate concentrations in the San Lorenzo River had increased five to seven times over background levels (Ricker, 1995), as discussed in Section 5, it was estimated that 50 to 80 percent of this increase is attributable to nitrate from wastewater (Ricker, 1989). Approximately two thirds of the nitrate load in the river comes from the area of the watershed underlain by the highly permeable Santa Margarita sandstone. Unlike bacteria, there has been a significant cumulative release of nitrate from septic systems in the watershed, particularly in areas underlain by sandy soils.

A Nitrate Management Plan was first implemented in 1995 and was subsequently formalized as a total maximum daily load (TMDL) for nitrate in 2000 as a result of the rising nitrate levels and is discussed in Section 4.9.1. The extensive effort in improving wastewater management since 1995 has also resulted in reduced nitrate levels. More recently, nitrate levels in the San Lorenzo River are not apparently increasing and County staff has indicated that further reductions to nitrate concentrations will be challenging (J. Ricker, Personal Communication, 2012). Since San Lorenzo River water is pumped to Loch Lomond Reservoir, the linkage between nitrate, algae production and the resulting odors and disinfection-by-product precursors will continue to be a challenge, especially for the SCWD as well as for SLVWD.

## **3.2.2 San Lorenzo River Watershed**

The Regional Water Quality Control Board is responsible for permitting and management of wastewater systems that discharge greater than 20,000 gallons per day (gpd). As part of County

Service Area No. 7, the County-operated Boulder Creek Wastewater Treatment Plant serves the neighboring country club, 18-hole golf course, tennis facilities, restaurant and pro shop, as well as about 200 townhouses and residences built along the fairways. The collection system includes 24 miles of 6- and 8-inch gravity mains, a 4-inch PVC force main, and five lift stations. The plant was upgraded to tertiary treatment in 1996 and has a capacity of 104,000 gpd. The treated effluent is pumped to a leachfield, where it is disposed of by subsurface discharge. In the past, tertiary treated water has also been delivered to the Boulder Creek Golf and Country Club, blended with raw water and used for irrigation. Since 2010, process improvements to reduce the nitrate concentration, improved distribution of effluent to the leachfield, as well as force main upgrades to reduce spills between the treatment plant and leachfield have been implemented. (J. Ricker, Personal Communication, 2012). The force main and other improvements have particularly reduced spills to Boulder Creek.

The Bear Creek Estates Wastewater Treatment Plant, which is owned and operated by the SLVWD, serves units 3, 4, and 5 of Bear Creek Estates. SLVWD has a waste discharge permit to treat up to 12,000 gallons per day of wastewater, then discharge it to a community leachfield. In 2005, SLVWD installed improvements for nitrogen removal pursuant to the Regional Water Quality Control Board's minimum discharge requirement of 50 percent nitrogen removal, prior to subsurface disposal. Heavy winter rains in 2016-2017 resulted in groundwater infiltration resulting in overflows which have been reported to the RWQCB and County. SLVWD is considering a replacement of the WWTP to provide more reliable treatment. In addition, there are about 150 septic systems within 3 of the SLVWD source water sheds (SLVWD Watershed Management Plan, 2010).

The Mt. Hermon Association is another significant community wastewater disposal system in the watershed. The Mt. Hermon Association is served by a sequential batch reactor package plant that treats wastewater from a hotel, cabins and homes. The plant has a permitted capacity of 63,000 gpd but operates at about 45,000 gpd. Treated effluent is pumped uphill and discharged to a community leachfield above the plant. More recently, the Rollingwood subdivision of about 30 homes, near Scotts Valley has been connected to the City of Santa Cruz Wastewater Treatment Plant.

Significant institutional wastewater disposal systems in the San Lorenzo Valley include those serving Camp Harmon, Camp Campbell and other organized camps, as well as the San Lorenzo Valley Unified School District (high school, junior high school, elementary school) facility in Felton. The latter system is unique in that treated effluent is further polished in a constructed wetland prior to being discharged to a leachfield.

There are also approximately 13,292 individual septic systems in the San Lorenzo watershed including Carbonera and Branciforte Creeks (J. Ricker, 2017). The density of systems is higher than that of any other comparable area in California watershed. Overall, the density of development in the creek bottoms, both along the river itself and on the river's tributaries, is quite high. Many residences were originally used as summer homes and are now occupied year-round. Some homes were built with part of the building supported by stilts, over the floodplain. In many areas the density is akin to urban areas in California which are served by municipal sewer systems.

There are a number of limitations to on-site disposal systems in the San Lorenzo Valley watershed, as described in the 1995 *Wastewater Management Plan*:

- Approximately 55 percent of the developed parcels are less than 15,000 square feet and 11 percent are less than 6,000 square feet. This significantly limits the size of leachfields and the opportunity to install back-up/replacement leachfields.
- Two-thirds of the systems are substandard in size and did not meet the repair standards of 1995. Significant improvements have been made to at least 3,000 systems since 1986.
- About 40 percent of the systems were constructed before 1975 and have not experienced significant additions (i.e. remodels/expansions/subdivisions) or do not have second leachfields.
- About 14 percent of the systems are located less than 100 feet from a stream.
- Winter ground-water levels are less than 10 feet from the surface in 30 to 50 percent of the systems and less than 3 feet from the surface in 3 to 6 percent of the systems.

The County has conducted numerous surveys and evaluations of the septic systems in the watershed since 1986. The County has continued to have a low frequency of septic-system surveys since the late 1990s, as relatively few changes were reported and the value of continuing the surveys does not compete effectively with enforcement or other County Environmental Health Service priorities (John Ricker, personal communication, 2017). Because there is real value to neighborhood- or community-scale discussion, the community-scale results from the 1996 sanitary survey are included and updated as appropriate<sup>9</sup>:

**Kings Creek** - The greater Kings Creek area includes 800 developed parcels in the neighborhoods of Wildwood, Redwood Grove, River Rights, Lower Kings Creek, Sunbeam Woods, Blue Ridge, Madrona and Sequoia Drives, Lower Two Bar Creek, and Juanita Woods. This area has soils with significant clay content, high winter ground-water levels, small lots, and steep slopes. Despite potential significant constraints to septic systems, over 80 percent of the systems were found to be performing without any signs of failure during the wet winter of 1986. During the wet winter of 1993, the overall failure rate was below 2 percent. Most of the failing systems could be adequately upgraded using conventional systems. The *Wastewater Management Plan* concludes that a community system is not feasible because it lacks a disposal site.

**Boulder Creek** - The Boulder Creek area includes the developed areas centered around downtown Boulder Creek and extending a short distance up the valleys along Bear Creek, Boulder Creek, and the San Lorenzo River. This area has relatively permeable alluvial soils with some localized areas of clay soils. Winter ground-water levels are less than 10 feet below the surface in most of the area. Ground-water underlying Boulder Creek probably contributes

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<sup>9</sup> Balance Hydrologics staff also reviewed the long-term data provided by the County and City for indications that the 1989 Loma Prieta earthquake or the storms of 1995 and 1998 may have damaged sufficient systems to make a difference in bacterial or nitrate loadings. Neither constituent appears to have been affected by the three events queried



nitrate to the San Lorenzo River. There have been repeated instances of septic system failure, with discharge of untreated effluent to roadside areas and eventually to the San Lorenzo River. During the early period of the County's wastewater management program, the river downstream from Boulder Creek had the highest incidence of contamination by sewage of any area in the watershed. Conditions have improved significantly during recent years. During the winters of 1987 and 1988, 85 percent of the parcels surveyed were performing adequately and 4 percent were found to have surfacing sewage. In 1991, re-inspection of systems repaired as a result of the survey found that 90 percent were performing satisfactorily, and 95% of the systems were performing adequately in 1999 and 2001 (John Ricker, personnel communication, 2007). A feasibility study was conducted for a community sewage disposal system for the downtown area but it was found to be too costly. A community service district provides a regular pumpout service for the downtown area, with disposal outside of the watersheds.

**Ben Lomond** - The Ben Lomond area includes 780 developed parcels. There are no constraints to septic system performance in most of the Ben Lomond area. Historically the water quality in Ben Lomond has been the best of any developed area in the watershed. The survey conducted from 1989 through 1991 showed a 1 percent failure rate. In 1993, the failure rate was down to 0.5 percent. A community sewage disposal system is not warranted because of the cost and the low incidence of problems in this area.

**Glen Arbor** - The Glen Arbor area includes 500 parcels south of Ben Lomond. The area consists of three distinct zones; an upland area underlain by the Santa Margarita sandstone, an area of relatively steep slopes, and a lower area on well drained soils of the river terrace. Although the upland systems perform well, the effluent discharged to the highly permeable sandy soils contributes to elevated nitrate levels in the river. The lower portions of Glen Arbor have contributed to bacterial contamination of the river caused by high ground water and some pockets of clay soil. In recent years, a number of systems have been repaired. During the 1990 through 1993 surveys, a failure rate of 2 percent was found. A community disposal system was judged to be infeasible because of high cost and potential impacts on the Quail Hollow ground-water basin. Most homes in the Glen Arbor area were constructed during the late 1960s through late 1980s. Relatively few changes in the number of homes or of waste disposal systems since the early 1990s (White and Hecht, 1993) suggests that little if any change in effects on downstream community water supplies would be expected.

**Felton** - The Felton area includes 820 developed parcels. This area was surveyed in 1989 and 1991. Much of the Felton area is on a broad alluvial flat, with high ground water and small lot sizes being the main constraints to proper septic system functioning. Failure rates in 1993 were 0.6 percent. El Solyo Heights is a separate neighborhood of 80 developed parcels at the north end of Felton. Failure rates in this area were 13 percent in 1989. Constraints to proper septic tank functioning include high ground water, clay soils, shallow depth to bedrock, moderate slopes, and presence of cuts and fills. Alternative systems are being required on a case by case basis. A community disposal system feasibility study concluded that there was not an adequate disposal site and that the project would be too costly to justify.

**Brook Lomond** - The Brook Lomond area consists of 120 developed parcels between Ben Lomond and Brookdale. This area has permeable alluvial soils with high ground water and some areas of clay soil. In the 1987 survey, 6 percent of the parcels were found to have failing septic systems. The County recommends improved onsite disposal rather than a community disposal system.

**Forest Lakes** - The Forest Lakes area includes 970 developed parcels immediately south of Felton. This area has small lots, and localized pockets of high ground water and dense clay soils. The 1990 and 1991 survey found a failure rate of 2 percent. There has been no indication of wastewater contamination in Gold Gulch, the stream that drains most of the area. Because of the scattered occurrence of problem parcels, community collection and disposal is not a feasible alternative to onsite treatment.

The two most significant potential impacts of wastewater disposal on the drinking water supplies in the San Lorenzo watershed are the release of pathogenic organisms and excessive nutrients. However, close focus to wastewater management by the County as well as connection of some on-site systems to community wastewater treatment with off-site disposal has reduced the risk of contamination by wastewater.

Wastewater facilities in the SVLWD, are limited to residential septic systems, none of which are located near the diversion locations.

### **3.2.3 Loch Lomond Reservoir Subwatershed**

Most of the watershed is owned by the City of Santa Cruz and the structures under the City's jurisdiction are park visitor facilities and the ranger's residence. There are a handful of homes on parcels not held by the City and two wineries and several medical marijuana grow facilities that drain to Loch Lomond Reservoir; all of which are served by septic systems. County staff has noted road development in these headwater areas (see Section 3.15.3). Loch Lomond stores wastewater from its recreational areas in vaults, which are pumped periodically and transported to the City Wastewater Treatment Plant.

### **3.2.4 North Coast Watersheds**

Most septic systems in the North Coast watersheds are not anticipated to be a significant source of contamination because of: (a) very low residential densities, (b) a highly-dispersed pattern of residential settlement, and (c) soils and underlying geologic units which are generally loamy or crystalline and favorable for the use of conventional on-site systems. Scattered areas in these watersheds have substrates with limited percolation rates, principally in some of the older soils along Empire Grade (including the Pineridge subdivision), some shallow soils along Ice Cream Grade, and small areas underlain by shales in the upper Majors watershed. Karst, which is associated with subsurface connectivity through the limestone, can occur in portions of the watersheds including the upper portions of the Liddell Spring and Laguna Creek drainages as shown on Figure 2-4. These areas are sparsely populated and it is not known if wastewater sources directly overlie karst areas. The largest community in the area, Bonny Doon, does not drain to the watersheds of Laguna or Majors creeks.

The water quality data presented in Figure 5-2 in Section 5 indicate that the annual geometric mean of the total coliform bacteria concentrations in the Laguna and Majors Creek watersheds have varied from 177 MPN/100 ml up to 936 MPN/100 ml over the past 10 years. Liddell Spring's total coliform data are consistently lower with a geometric mean of less than 10 MPN/100ml. The County's 2006 microbiological source tracking effort (Ricker and Peters, 2006) did not collect data for North Coast streams but instead focused on the San Lorenzo River watershed, where development is concentrated and is the subject of a pathogen TMDL. The

County has also focused bacteriological testing on County beaches at the River mouth and to the south, which receive the greatest number of visitors. Failing septic systems are a potential source of increased coliforms in these streams, as are wildlife, waterfowl and livestock.

The nitrate data presented in Section 5 shows an increasing trend in annual median nitrate concentrations in Liddell Spring and Majors Creek over the past 30 years, with no long-term trend distinguishable in Laguna Creek. However, data from the past five years (2001-2006) shows a slight increasing trend in Laguna Creek, while median nitrate concentrations in Liddell Spring and Majors Creek appear to be declining.

The hydrogeologic report on the Bonny Doon quarry (Watkins-Johnson, 1992) indicated that nitrate concentrations were high (over 6 mg/l as nitrogen) in monitoring wells upgradient of the quarry. Because very little development exists upstream of this facility, the report suggested without elaboration that septic systems or a former poultry operation along Smith Grade as the sources of this nitrate.<sup>10</sup> Among other potential sources are explosives in use at the quarry. The likely sources of nitrate in the Laguna Creek and Majors Creek watersheds are the same as for microbial contamination.

### **3.2.5 Significance**

After many years of study, the County and the Regional Board have concluded that the large majority of existing septic systems do not consistently contribute significantly to dry-season microbial concentrations measured in surface waters. Occasionally, failing septic systems are responsible for significant localized degradation of bacterial quality in surface waters during summer months. However, bacterial contributions from septic systems are probably greater during or following wet periods when runoff can convey surfacing sewage from failing systems to the San Lorenzo River. Efforts made since 1995 to improve septic system performance have reduced the septic failure rate and therefore the water quality degradation related to septic systems. As noted earlier, the elevated bacteria levels in Lompico Creek are indicative of septic system pollution and have resulted in higher treatment levels.

The San Lorenzo Nitrate Management Plan (Ricker, 1995) concluded that an estimated 84 percent of the nitrate load in the River resulted from human activities in the watershed. Two-thirds of the nitrate was attributed to wastewater discharges, particularly from septic systems in the highly-permeable Santa Margarita sandstone.

## **3.3 Urban Runoff**

Urban runoff is that portion of stream flow originating from urban or densely-suburbanized areas. Most urban runoff occurs during storms; however, inter-storm period nuisance flows from urbanized areas can account for significant components to flow during those times. Urban runoff flows and contaminant concentrations are highly variable. Some factors affecting this variability include duration and intensity of rain events, specific urban land use (residential, commercial, industrial), and the length of the preceding dry period during which pollutants build

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<sup>10</sup> The former poultry farm, in a highly karstic area locally known as the 'sinkhole plain', was discontinued at least 30 years ago, and should no longer seriously be considered as a discernible source of nitrogen in this sanitary survey.

up on the land surface. In addition to specific land uses, the atmosphere and automobiles are significant contributors to the contaminant load in urban runoff.

In October 1990, the EPA issued final regulations requiring NPDES Municipal Stormwater permits for urban runoff from cities with a population of 100,000 or greater, from certain types of industries, and from construction sites which involve a land disturbance of greater than 5 acres (Phase I). Although there are no cities this large in Santa Cruz County, the Central Coast office of the Regional Board, which administers the NPDES stormwater permit program, worked with County and municipal staff in anticipation of future regulations. In 1999, EPA expanded the NPDES Municipal Stormwater permit program to require permits for urban runoff discharges from cities with a population of less than 100,000 and from industries or construction sites which result in a land disturbance of from 1 to 5 acres (Phase II). The City and County subsequently developed comprehensive Storm Water Management Plans (SWMPs) describing compliance with the new regulations. The plans were submitted and approved by the Regional Board with applications for coverage under the Phase II permit. The County of Santa Cruz also joined the Central Coast Regional effort to develop hydromodification criteria by October 2012. Additional details about urban runoff regulations are included in Section 5 of this sanitary survey.

Watersheds in the study area are relatively unindustrialized, so there are few facilities which must comply with the state's NPDES General Industrial Stormwater permit program. The state permit requires industrial facilities to implement pollution prevention measures and to collect monitoring data during rainfall events. Each industrial facility files a Notice of Intent (NOI) which certifies that it will comply with these permit requirements. There is currently little oversight and enforcement of the industrial stormwater permit program because most of the state's effort has been channeled into simply identifying facilities which should be under permit. Types of industrial facilities which must file a NOI to comply with the state permit include: manufacturers (food, textiles, lumber, paper, chemicals, petroleum, rubber, plastic, metals, stone, clay, glass, machinery, electric, electronic, equipment, instruments, cement, phosphate, asphalt, fertilizer); confined animal facilities with over 700 animals; printing operations; recyclers; landfills; mining operations; transportation businesses (such as bus and trucking companies and airports); petroleum bulk plants; all NPDES wastewater dischargers with a design flow greater than 1.0 million gallons per day; Superfund sites; and steam electric power generator facilities.

A list of active industrial stormwater permittees in Santa Cruz County was downloaded from the SWRCB database in January 2012. Only 77 facilities county-wide have filed a NOI with the SWRCB. Most of these are located in Watsonville (28) and the City of Santa Cruz (24), outside of the sanitary survey study area. In Scotts Valley, both a computer technology manufacturer and a construction site in the Bean Creek watershed have filed for a NOI. In Felton, five companies have filed for a NOI within the San Lorenzo watershed: Granite Construction Company (for work in the Felton Quarry), Granite Rock Company (for an industrial site), Santa Cruz County (for improvements on Graham Hill Road), Hillcrest Vineyard, and Chevron Environmental Management (for the construction of automotive service shop). Lastly, in Ben Lomond, the San Lorenzo Valley School District also filed for a NOI (for their bus transportation yard). Quarries in the Scotts Valley and Bonny Doon area are not in the SWRCB database. The historic airport in Scotts Valley is inactive, while the one in Bonny Doon may receive occasional use by small private aircraft.

Since 2009, any construction activities greater than 1 acre requires permitting under the revised statewide Construction General Permit (CA 2009-0009-DWQ.) The local jurisdictions (City and

County) have construction best management practices that are required for smaller projects to control erosion and sediments that could negatively impact water quality.

### **3.3.1 Contaminants of Concern**

The urban runoff contaminants of most concern to drinking water are microbial organisms and suspended sediments. Sources of microbes in urban runoff include: animal wastes from pets, birds and rodents; human waste from sewer system leaks and encampments; diffuse (nonpoint source) runoff, and decaying organic material in storm drains. Suspended sediment levels are often high in urban runoff because of the ease of mobilization and transport of small particles on impervious surfaces. In addition, suspended sediments are higher in runoff from erosion from newly-developed areas prior to establishment of vegetation. Suspended sediments in urban runoff contribute to high turbidities in the stream system during wet weather and also are significant because contaminants may be adsorbed to the sediment particles and transported into the streams. Note that construction of new impervious surfaces in urban areas can result in higher peak flows which, without mitigation, can lead to increased in-stream erosion and turbidity.

Other common contaminants of concern in urban runoff include: metals (notably copper, lead, and zinc), hydrocarbons, and pesticides. These contaminants can be significant to aquatic life in the receiving stream but at the levels found in the Santa Lorenzo River, have not been shown to be of exceptional significance to the drinking water quality.

### **3.3.2 San Lorenzo River Watershed**

The urbanized population in the San Lorenzo River watershed centers on the communities of Boulder Creek, Ben Lomond, Brookdale and Felton. There are also pockets of development in the Boulder Creek Golf and Country Club area, along Newell Creek (Rancho Rio), lower Bear Creek, Zayante Creek, Lompico Creek, and Paradise Park, and in numerous small valleys confluent with the San Lorenzo River. Rural residential areas along Bean Creek Road at the fringes of Scotts Valley are also experiencing growth. The rest of the watershed, as noted above, is sparsely populated.

Many houses and residential areas were built during several speculative vacation housing booms in the 1890s, 1900s and from 1920 to 1940. A large percentage of existing homes were built before 1960. More recent housing has been primarily for year-round residences. Many of the older vacation homes were built very close to the creeks. Further development within the riparian corridors is currently limited, requiring County exemptions. Riparian corridors now extend out to the edge of the riparian woodland if the woodland is extensive enough to have been mapped on County vegetation maps. Otherwise, they are defined to be 50 feet from the high water mark for a perennial stream, less for an intermittent stream, and more in the coastal zone area. As discussed in Section 3.13.2, violations of County riparian corridor disturbance ordinances occurs but limited enforcement resources are available to limit potential damage. Most new housing has been infills or on rural acreage, with few if any major subdivisions within County jurisdiction. Future residential growth is expected to be mostly accommodated with minor land divisions.

The San Lorenzo River watershed is in Zone 8 of the Santa Cruz Flood Control District. Drainage in the towns along Highway 9 consists of a combination of sheet flow, roadside swales and ditches, and some inlets and piping in low spots. In smaller population centers, the engineered drainage system consists mostly of cross culverts to move stormwater across roads. There is an urban runoff control structural feature, a detention basin, and several check dams downstream of the Rancho Rio subdivision. These facilities were installed by the County Planning Department after construction of the subdivision to minimize the considerable erosion resulting from disturbance of this sandy area.

The County's Water Resources Program has been sampling the San Lorenzo River since 1968 for chemical and microbial constituents. The program currently includes collection and analysis of weekly samples from 15 regular sites throughout the County as well as at an additional 30 locations weekly for trend evaluation and source tracking. Heavy metals (e.g., zinc, copper, cadmium, and lead) and toxic organic compounds, such as pesticides and PCBs, have often been detected at low levels in ambient receiving waters of the San Lorenzo River watershed and occasionally at higher levels in storm drain discharges. Because these constituents can bioconcentrate in tissues, the County conducted a study focused on sampling sites in the lower River, including analysis of tissues from freshwater clams (Ricker and others, 2001). The results were generally consistent with previous monitoring studies in the watershed, the region, and the State (c.f. EPA Nationwide Urban Runoff Program): low levels of pesticides and PCBs (at 2 to 7 percent of hazardous thresholds), elevated concentrations of cadmium and zinc (both of geologic origin); and elevated levels of lead (potentially from prior use in gasoline or from the prior use of lead shot at a gun range near Castle Rock State Park). In all cases, concentrations were below levels of biotic or regulatory concern.

Bacteria levels in the San Lorenzo River have often exceeded County water quality objectives and on May 8, 2009, the San Lorenzo River Watershed Pathogen TMDL was approved by RWQCB Central Coast Region. However, bacteria levels in the upper watershed are typically much lower than those at the mouth of the river, and recent monitoring data show considerable improvement in dry-season bacteria levels, which in summer months, now generally meet standards for safe swimming at locations upstream from Santa Cruz (John Ricker, personal communication, 2012). Bacteria concentrations during storm events remain high, and are more elevated at downstream stations (i.e. at Felton vs upstream Sycamore Grove station), reflecting proportionally greater contributions from suburban and urban areas than from more rural areas. Despite progress in reducing bacteria levels, the Regional Board combined the TMDLs for the Branciforte Creek/San Lorenzo River Estuary with the TMDL for the Lompico Creek/upper San Lorenzo River watershed, based on elevated bacteria levels at two locations on the River during summer 2006, and higher-than-expected bacteria levels in 2005-2006 sampling.

Funded by a Proposition 13 grant from the SWRCB, the County analyzed over 2,000 water samples collected from 2002-2004 in storm drains, stream reaches, and beaches in an effort to identify the source and causes of elevated bacteria levels (Ricker and Peters, 2006). Ribotyping, a method of microbiological source tracking that differentiates human *E. coli* from other types of *E. coli*, was employed to discriminate between fecal coliform sources. Overall, birds were found to account for over 50 percent of bacterial contamination in samples from the San Lorenzo River, and 64 percent of summer bacteria samples in the upper watershed. In contrast, human waste was identified in approximately 11 percent of all samples, and in none of the dry-season samples from the upper watershed. Human contributions in the River were

found to increase significantly between Sycamore Grove and the mouth, due to inflows from urban areas, and were higher in wet weather when runoff scours storm drains and mobilizes waste from developed areas, encampments and the occasional failing septic system. Decomposing organic materials and sediments in storm drains were found to provide a good environment for bacteria to thrive and multiply.

Work in coastal San Mateo County (Ivanetich and others, 2006) was also able to distinguish fecal bacteria originating from dog, deer, horse, seagull and human sources. It is notable that the Santa Cruz County microbial source assessment study found that dogs alone accounted for about 7 percent of the dry-season bacteria in the upper watershed, and about 12 percent of wet-weather bacteria at Felton (Ricker and Peters, 2006). Waste from domestic animals such as cats, dogs and chickens probably contribute greatly to the high fecal coliform counts in the first flush of stormwater through urbanized areas. The County has not conducted further ribotyping work since the 2006 watershed sanitary survey. Further inquiries into sources and travel pathways of pathogens in the San Lorenzo Valley watershed, in particular, would be worthwhile, with special attention to streams reaches downstream of densely-urban communities and in areas receiving summer baseflow from sandy aquifers.

### **3.3.3 Loch Lomond Reservoir and the Upper Newell Creek Watershed**

Urban runoff into Loch Lomond is effectively limited to contributions from Bear Creek Road, which are minor in magnitude. However, urban runoff constituents from the water pumped from the San Lorenzo River to Loch Lomond may be present in Loch Lomond.

### **3.3.4 North Coast Watersheds**

There are no major towns in the North Coast watersheds. The Bonny Doon Airport is a small landing strip for private planes.

### **3.3.5 SLVWD**

Based on conversations with staff from the SLVWD, there is no urban runoff that influences surface water in their watersheds. Most of the roads within the watershed of the SLVWD are district owned and maintained or are private access roads. Only the staff of the SLVWD has access to District roads.

There are approximately 20 residences located above the unused Lompico Creek surface water intake, if the intake is brought into service, urban runoff potential should be evaluated. and/or the intake should be moved upstream as planned.

### **3.3.6 Significance**

Overall, urban runoff directly contributes a significant part of the total microbial load in the river system during summer and winter, it enriches summer baseflows with added nutrients, and it contributes some part of the sediment load entering the River during rain events.

Most development in the San Lorenzo Valley is residential. Many of the residents seek a rural lifestyle, and the contributed contaminants (microbes from both domestic and wild animals,

nutrients, sediment) may best be seen in that light. There are homes in the four main communities that are very close to and positioned well above the stream system, such that contaminants can move rapidly from neighborhood areas in the main communities into the channels. In these areas, source control to reduce runoff as well as redirecting runoff to areas for infiltration has particular value as a way of reducing contaminants. In particular, the results of the microbial source tracking study show that efforts to minimize or prevent dry-season runoff from landscape irrigation and other human activities would reduce transport of bacteria and other contaminants to storm drains and the River during the summer months when dilution is minimal and recreational use is at its peak.

Development overlying sandy soils contribute a disproportionate volume of nutrients which enter the streams through the sandy aquifers. As discussed further in Sections 5 and 6 later, nutrient concentrations are elevated during summer months in the streams with appreciable sandy soil areas in their watersheds, offering different source-control opportunities in the sandy areas away from the streams. Because sandy soil areas occur in both the North Coast and San Lorenzo watersheds, efforts to address the particular issues of sandy soils can be especially effective over a period of decades. There are few industrial facilities or large expanses of paved areas.

### **3.4 Agricultural Land Use**

Santa Cruz is a strongly agricultural county. However, the majority of the existing row-crop acreage is located along the coast, in the Pajaro Valley in South County and on the marine terraces of the North Coast, neither of which extend into the watersheds of this survey. Commercial cropping with the study area watersheds is presently limited to small areas of vineyards and Christmas tree farms. Both watershed areas once supported widespread cultivation of apples and other orchard fruits wherever suitable sites with deep soils and southern exposures were found, but most such areas had already gone out of commercial production before the onset of extensive pesticide use in orchards began during the early 1960s. In scattered locations throughout the study area row crops are grown on a commercial or horticultural basis but these operations are on limited acreage and typically use organic practices. As discussed earlier regulation of cannabis cultivation is currently underway and potentially poses significant water quality threats if not appropriately managed.

#### **3.4.1 Contaminants of Concern**

The primary contaminant of concern from these types of agricultural uses is sediment from erosion of fallow or improperly tilled land and from eroding drainages downstream from cultivated areas. Other potential contaminants include nutrients, pesticides, herbicides, and organic matter in stormwater runoff.

#### **3.4.2 San Lorenzo River Watershed**

In the San Lorenzo Valley, vineyards and Christmas tree farms occupy the largest agricultural acreage. Several established vineyards exist in the area; in Felton (Hallcrest Vineyard and the Organic Wine Works), next to Bear Creek Road on the ridge above Loch Lomond (Byington, David Bruce, and Bear Creek Vineyards), and in side valleys near Boulder Creek (P & M Staiger and Equinox), along Bear Creek in Scotts Valley (Roudon Smith Vineyard), up Highway 9 near



Waterman Gap (Ahlgren) and along the top of the watershed divide at Skyline Boulevard (Zayante Vineyard). Small personal vineyards are commonly seen on larger residential parcels with adequate sunlight. Land clearing for vineyards has the potential to be problematic, if not done correctly, e.g., poor drainage design, improper grading, and inadequate erosion control. Santa Cruz County regulates agricultural grading in an effort to protect water quality but has limited enforcement resources to monitor grading in general.

Unlike vineyards, Christmas tree farms are operated with little cultivation or disturbance to the soil surface. Field visits to several of these operations throughout the watershed showed that annual grasses, forbs and bracken serve as a cover crop between rows of spruce and fir. The roads in the tree farms are intermittently used, with the greatest use generally during the two months prior to Christmas.

To a lesser extent, apples and other tree fruits are still grown in the old and declining orchards in the sunnier aspects of the Santa Cruz Mountains. According to County Agricultural Commission staff, little to no new commercial acreage has been developed during the last two decades. The existing orchards tend to be managed organically or with few applications of chemical pesticides or fertilizers, and minimal tillage.

Small commercial greenhouse operations and flower farms exist along Bean Creek and in the San Lorenzo Valley. Rhododendrons are no longer grown in the Bean Creek subwatershed, nor elsewhere in the San Lorenzo Valley (Roberta Haver, former owner, personal communication, 2006). Pesticide use is minor. University of California Agricultural Extension staff indicated that the primary potential contaminant in these container greenhouses is nitrogen, which is flushed through the containers by proper irrigation, and which exceeds crop needs typically by 20 percent during each watering. These operations are located on the extremely permeable Santa Margarita sandstones, which provides the excellent drainage needed for these uses, but which may permit the greenhouses to become a source of nitrogen to both Bean Creek and the Santa Margarita aquifer.

### **3.4.3 Loch Lomond Reservoir Subwatershed**

In addition to the vineyards described above, there is are also small medical cannabis operations in the Loch Lomond subwatershed. In the past, small-scale diversions associated with covert cannabis plantations have been reported on tributaries that drain into Newell Creek and Loch Lomond.

### **3.4.4 North Coast Watersheds**

The coastal terraces of northern Santa Cruz County are one of the classic agricultural areas of California, supporting far more cultivated acreage than the San Lorenzo Valley. The crops are grown mainly on the lowest two terraces along Hwy 1, *below the diversion points* on the North Coast streams. These areas are farmed primarily for brussel sprouts and (less frequently) artichokes. Both crops require the unique climate dominated by marine fog found on these lower terraces. Other crops include lettuce, strawberries, broccoli, and flowers.

Four vineyards operate in the North Coast, the Bonny Doon and McHenry Vineyards, and recently the Rancho Madera Roja<sup>11</sup> in the upper Liddell Creek watershed and Redwood Meadows Ranch Winery and Beauregard Vineyards in the upper Majors Creek watershed. Cattle are occasionally grazed on the mosaic of grasslands, oak/madrone woodland, and mixed evergreen forests which separate the belt of row crops along the coast from the residential areas and orchards of the Empire Grade portion of the Bonny Doon area. A small portion of this area drains to Majors Creek upstream of the intake. Some Christmas tree farms are also located in Bonny Doon, near the northern end of Empire Grade.

### **3.4.5 SLVWD**

The only known commercial agriculture known to be present is a Christmas Tree farm along Upper Empire Grade Road within the Foreman Creek watershed. There has been no contamination observed due to this farm's operations.

There are no known commercial agricultural land uses within the Lompico Creek watersheds.

### **3.4.6 Significance**

As a minor land use in the water supply watersheds, agricultural production does not appear to be a major source of concern at present and in the foreseeable future. The two most visible crops in the watersheds, Christmas trees and grapes, tend to be grown at higher elevations, along ridges and in areas above the fog line, away from the major streams. Past observations at Christmas tree farms in the survey area suggest that these are unlikely to be major sources of contamination, or erosion. Vineyards, on the other hand, are typically located on slopes with loose, sandy soils, and controlling weeds by harrowing between rows leaves soils exposed to rainfall and rill erosion. Marginal to poor drainage design and inadequate erosion control can result in vineyards being a source of sediment and persistent turbidity. Some vineyards use organic practices; others employ pesticides to a light or a moderate degree.

Cultivation of other crops is less likely to affect the quality of water supplies, because of the minimal acreage of land under cultivation and the generally low level use of pesticides. Pesticide and herbicide use is discussed in Section 3.7.

## **3.5 Grazing Livestock**

Watersheds in the study area are primarily forested or vegetated brushlands of various types, so the extent of grazed areas is also limited, particularly in the San Lorenzo watershed. The North Coast watersheds are better suited for livestock and have had several cattle and dairy operations working in the subject water supply drainages. Throughout the watersheds, impacts from grazing cattle are less than those of confined horses, except in areas where cattle are watered from streams. This section includes discussion of cattle and individual or small horse groupings; the main discussion of horses as they affect water quality is within Section 3.6.

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<sup>11</sup> The lack of erosion control in the winter of 2008 resulted in a violation, but the issue has since been resolved (Chris Berry, personal communication, 2012).

### **3.5.1 Contaminants of Concern**

Erosion and waste products are of primary concern. Where unfenced, destruction of streambanks and wetland vegetation by grazing animals causes an increase in erosion, indirect loss of channel stability (eventually generating pulses of sediment entering directly into the creeks), and persistent turbidity. Manure, urine, and pathogens such as cryptosporidium from young calves, may be introduced directly into streamflow year round, with elevated rates of transport into waterways during wet periods.

### **3.5.2 San Lorenzo Valley**

Residential development of the valley bottoms, stream terraces, and sunny ridgelines in the survey area puts a premium on "buildable" land. This trend, combined with the gradual succession from grassland to chaparral, in the absence of wildfire, has gradually reduced cattle and sheep operations in the San Lorenzo Valley.

No active commercial cattle operations are known in the San Lorenzo watershed, other than occasional use of small acreages in the Bean Creek subwatershed. Equestrian use is widespread in the watershed and horses are kept on residential parcels and at commercial or boarding stables. The latter facilities typically have more horses but also have larger pastures for grazing (and dispersal of animal wastes). As a result of the low numbers, grazing animals pose a minor threat to the water quality of the San Lorenzo watershed. Concentrated animals such as horse stables upstream of water intakes pose a greater threat and are discussed in Section 3.6.2.

### **3.5.3 Loch Lomond Reservoir and upper Newell Creek watershed**

No grazing animals were encountered in the Loch Lomond area during prior visits to the lake and upper watershed. The City does not allow riding animals in the watershed area.

### **3.5.4 North Coast Watersheds**

As discussed above, a limited amount of rangeland drains to Majors Creek upstream of the City's diversion structure, including the northern parts of Grey Whale Ranch. These areas seem to be grazed intermittently, principally by individual horses or small groups of horses, with occasional cattle grazing (apparently) under lease arrangements. Most of these grasslands are located along ridgelines or on slopes distant from the streams, reducing but not eliminating the potential for contributing nutrients, pathogens, and sediment to the streams. Further downstream on Liddell Creek, beyond the boundaries of the survey area, issues of livestock management are being addressed by the County. Trails, and roads used as trails, do come close to the main stem and east fork of Majors Creek; these could prove to be a small, but perhaps growing, source of sediment and pathogens.

### **3.5.5 SLVWD**

There is no commercial grazing livestock present within the SLVWD. Based on conversations with staff from the district, indicated that there may be a limited number of residences that may have goats and chickens, but these would be unlikely to impact the watershed.

As in the SLVWD, there is no known commercial grazing livestock present within the Lompico Creek Watershed although horses are known to be present at one residence within the watershed and there are some chickens and goats at other homes. It is believed that that it would be highly unlikely for any runoff from these residences to reach Lompico Creek.

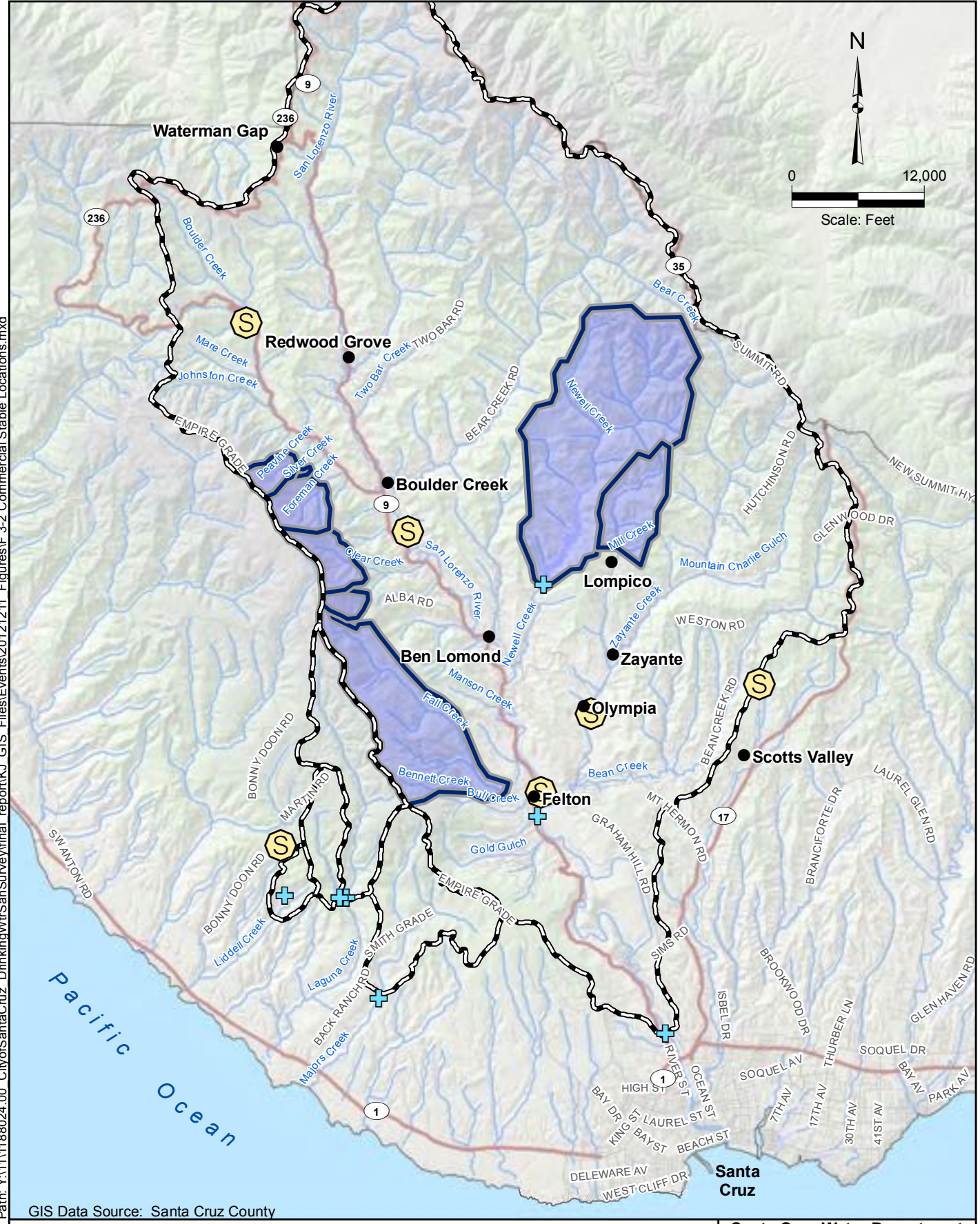
### **3.5.6 Significance**

The San Lorenzo River Pathogen and Nitrate TMDL list livestock as sources of the respective constituents. Pathogenic microorganisms are the major source of concern when contact between grazing animals and water supplies occurs. Hecht and others (1991) identified horses as a significant contributor to the San Lorenzo Valley nitrate budget and the County has taken measures to assess and control equine nitrate contributions to both surface and ground waters (c.f., the 1995 Wastewater Management Plan and the 2001 Watershed Management Plan Update) to reduce costs of treatment for taste and odor problems. Where access to water is limited only to streams, degradation of habitat and bank stability is evident (see also Section 3.6). Development of improved water sources for grazing animals has played a significant part in limiting erosion impacts on water quality. Fencing, which is associated with water source improvements also reduce the impacts of manure and urine by creating buffer zones between grazing animals and waterways. That said, percolation of urine, especially in areas overlying sandy soils may be a source of nutrients from grazing livestock. Since 2005, the Santa Cruz County Resource Conservation District has partnered with a local non-governmental organization to provide resources in a Livestock and Land program, described in greater detail in Section 3.6.1 to assist homeowners in proper management measures to reduce water quality impacts of livestock and small agricultural activities.

## **3.6 Concentrated Animal Facilities**

While traveling through the watershed it is apparent that although there are a number of commercial stables which house larger numbers of horses as found on Figure 3-2, there are also many residences that support one or two horses, despite small lot sizes and/or limited acreage suitable for pasturing horses or applying manure. While many of these small residential facilities are well-managed, it is also common to observe corral areas that are bare or partially denuded of vegetation from overgrazing, and manure management is often limited to stockpiling on site. Conditions contrast with the commercial facilities, which tend to have greater capacity to manage drainage and manure accumulations responsibly, in part because of their greater visibility and liability.

Path: Y:\1111188024.00\_CityofSantaCruz\_DrinkingWtrSanSurvey\final\_report\KJ\_GIS\_Files\Events\2012\211\_Figures\F 3-2 Commercial Stable Locations.mxd



GIS Data Source: Santa Cruz County

- Area Locations
- + Santa Cruz Water Department Diversions
- ⬜ Santa Cruz City Water Supply Watersheds
- ⬜ Sub-Watershed
- ⬜ Stables

**Santa Cruz Water Department  
WSS Update**

**Commercial Stable  
Locations**

Figure 3-2



### **3.6.1 Contaminants of Concern**

Horses are considered a major source of pathogens and nitrogen and can also contribute to persistent turbidity in the water supply watersheds. While horses were a relatively newly-recognized concern during the 1996 sanitary survey, some important actions were taken to protect water quality and improve care of the animals.

One key step was publication of *Horsekeeping: A Guide to Land Management for Clean Water*, in 2001 (CABRCD, 2001). This manual for horse owners, developed by the Council of Bay Area Resource Conservation Districts and the USDA NRCS, explains water quality concerns, provides technical assistance with design and implementation of structural control measures, and includes a directory of conservation-related resources for further exploration. Based on use of this manual, and with funding from the SWRCB through Propositions 13 and 50 (Manure and Erosion Prevention), the Santa Cruz County Resource Conservation District (RCD) and Ecology Action developed a Livestock and Land Program to educate owners about best management practices to improve manure management. Working with both commercial and residential facilities, and coordinating with the Santa Cruz County Horsemen's Association, the Program has provided technical assistance and cost-sharing to install filter strips, energy dissipaters, and other practices at a number of demonstration sites. Previously, the RCD reported that these measures have also been widely-installed at residential sites following owner attendance at technical trainings and workshops sponsored by the Program, and through outreach via a Peer Leader Program (Angela Stuart, personal communication, 2007). Currently, lack of funding has limited significant outreach.

Ecology Action estimated that raw manure loads were reduced by 328,500 pounds per year in 2007 as a result of the nutrient management practices implemented at horse facilities, such as manure bunkers, regraded pastures and/or paddocks to re-direct runoff to a filter area, exclusionary fencing, retention/sediment basins, and reduction in numbers of animals living in properties (Rose, 2011). Load reductions have increased since 2009 as the program reaches more owners (Nick Sudano, personal communication, 2012). From 2006 to 2009, eleven individual horse facility improvement projects were implemented in the San Lorenzo Watershed. Manure management plans are required for new development with greater than four horses and complaints. Ecology Action, in coordination with the RCDs, continues to support manure management through its Livestock and Land Program.

It is estimated that the equine population in the survey area has not changed over the last five years based on permitting of facilities and review of commercial stable listings. While many more horses are now boarded in private paddocks or boarding facilities with control measures in place than was the case at the time of the 1996 sanitary survey, City and County staff still report problems, particularly with new ownership and unpermitted facilities such as one upstream of the City's Majors Creek diversion (Chris Berry, personal communication, 2017). Throughout the subject watersheds, stables or paddocks are sometimes located on the edges of properties, often in swales and along waterways. This bare ground can be a source of sediment, and offers minimal breakdown of manure and nitrogen uptake by plants. The net result is often a rapid transport of these pollutants into surface and shallow ground waters during periods of rain.

### **3.6.2 San Lorenzo Watershed**

The County does not maintain a comprehensive inventory of stables but staff estimate that there may be more than 300 horses in large stables within the San Lorenzo River watershed, and an equal number in smaller residential stables (John Ricker, personal communication, 2012). While numbers of animals at commercial stables vary from year to year, some of the largest stables are Covered Bridge, formerly Chaparral Stables (70 to 100 horses) in Felton, Eddy Ranch (40 to 50 horses) on Bear Creek, Zayante Equestrian Center, formerly Horse Haven (20 to 40 horses) on Zayante Creek, Glenwood Equestrian Center (20 to 25 horses) on Bear Creek, and Lichen Oaks (15 horses) in Quail Hollow. A review of commercial stables indicates that there have been no changes since 2012. Additionally, the Santa Cruz County Horsemen's Association operates a regular calendar of events at the Graham Hill Showgrounds, including overnight and short-term stays for multiple animals.

Livestock in riparian areas also occurs. It has also been noted there is a flock of sheep grazing the riparian areas on private lands adjacent to the San Lorenzo River upstream of the City's Tait intake.

### **3.6.3 Loch Lomond Reservoir Subwatershed**

No confined animal facilities are reported or were noted in this watershed.

### **3.6.4 North Coast Watersheds**

The numbers of animals kept in the North Coast watersheds are not available. Some homes are on one to five acre parcels, often with one or two horses, several chickens, and other domestic animals. Areas of bare soil are sometimes seen in the paddocks and associated areas. The Vigne Farms is a commercial stable located in Bonny Doon which is not in the surface drainage to Liddell Spring. However, the underlying karst in the area may provide a subsurface conduit to Liddell Spring. The County regulates the facility which has covered, concrete floored manure storage and surface water monitoring as a condition of approval. Continued attention by regulatory and NGOs to manure management at confined animal facilities, especially those near surface waters upstream of diversions is an important element of pathogen and nitrate control.

### **3.6.5 SLVWD**

There are no known concentrated animal facilities within the SLVWD.

### **3.6.6 Significance**

The San Lorenzo River Pathogen and Nitrate TMDLs list domestic animals/stables as sources of the respective constituents. Wastes from horses have been estimated to contribute significantly to the pathogen and nitrogen load in the region's upper watersheds. One systematic study (Hecht and others, 1991) estimated that horses in the San Lorenzo Valley contributed nitrogen equal to one fifth or more of the amount released from septic systems. The San Lorenzo Nitrate Management Plan estimated that livestock and stables contributed about 6 percent of the nitrate load in the River (Ricker, 1995). The microbial source assessment found

that horses were responsible for 10 percent of the wet weather *E. coli* samples at the Felton station but less than 2 percent of the wet weather *E. coli* load downstream (Ricker and Peters, 2006). No bacteria contributions from horses were noted in dry season samples. Most other types of confined animal facilities do not appear to be a major concern in the subject area except those located close to riparian areas such as the sheep upstream of the Tait diversion.

Both commercial stables and backyard paddocks can be found in almost all sub-watersheds of the San Lorenzo and North Coast water supply drainages, and animal wastes receive less treatment than human wastes and are more easily mobilized into streams. These facts suggest that effective manure management at all times of the year, but especially during winter and spring months, is critically important in reducing nitrogen and pathogen transport to ground and surface waters. Nitrate data, described in Section 5, indicate that nitrate concentrations have declined and stabilized in recent years suggesting that livestock management, as well as other management measures, has been successful in improving water quality.

### **3.7 Pesticide and Herbicide Use**

Pesticides and herbicides are chemical compounds specifically formulated for their lethal effects on animal and plant life. Pesticides and herbicides are used in: (1) agriculture, (2) rights-of-way along roadsides, (3) landscaped areas such as parks and golf courses, (4) for structural pest control, and (5) by individuals. Volumes of specific chemicals used annually for the first four uses are represented in the reported use information collected by the County Agricultural Commissioner and reported to the State Department of Pesticide Regulation (DPR). The fifth use, by individuals in the home and garden, is unreported. Thus, a complete accounting of the chemicals used or the amounts applied is unavailable. The toxicity of compounds available to individuals – and generally to licensed professional applicators as well – has decreased markedly since the late 1980s.

All pesticides and herbicides used by licensed applicators (such as crop dusters, landscape maintenance professionals, and structural control businesses) are reported and sales of “restricted” chemicals are also reported by distributors. The Department of Pesticide Registration determines whether a pesticide/herbicide is classed as restricted based on its potential hazard to humans, animals, crops, or the environment in general. The County Agricultural Commissioner enforces related laws and regulations within the county, issues Restricted Materials Permits, and collects the use data which is then reported to the DPR. In addition, the City’s Integrated Pest Management (IPM) policy guides pesticide and herbicide use on City-managed lands. Using a limited data set, the RWQCB has listed the San Lorenzo River under CWA Section 303d for a suite of pesticides and prepared a TMDL in 2014 for chlorpyrifos on Zayante Creek and the San Lorenzo River below Felton.

Comprehensive information on the specific types and locations of pesticide and herbicide use throughout the North Coast and San Lorenzo River watersheds was not developed for the original 1996 sanitary survey or any subsequent updates. Logically, such use will be a tiny fraction of the applications throughout Santa Cruz County. Most pesticides for which regional records are kept are used for agricultural activities in the Watsonville area and in the marine terrace agriculture downstream of the North Coast watersheds, rather than within the North Coast and San Lorenzo watersheds. Similarly, most of the reported structural pest control use will be from the urban and industrial areas which are mostly outside the survey watersheds; i.e.



the Cities of Santa Cruz, Watsonville, and Scotts Valley. However, the San Lorenzo River has been 303d listed for the organophosphate insecticide, chlorpyrifos (source unknown), indicating that residues from commercial and/or residential applications are regularly reaching the river.

In 2012, the USDA conducted a water quality study for a range of insecticide, herbicide, fungicide, and metabolite compounds at the low parts per trillion detection levels. Out of over 4,000 treated water samples analyzed weekly over nine months, only two detectable results were found and at levels 1,000 times lower than the public health goal set for the compound. The diligence paid to pesticide/herbicide use in the watersheds indicate that the raw water remains at a low risk for contamination from these compounds.

### **3.7.1 Contaminants of Concern**

While all pesticides and herbicides can be considered undesirable in a drinking water source, the legacy pesticide, chlordane, and the organophosphate pesticide, chlorpyrifos, are of greatest concern as shown by the 303d listing and TMDL prepared in 2014 is for these constituents recently established by the Regional Board. Other specific chemicals of concern are the synthetic organic chemicals (SOC) regulated under the Phase II/V Rules (see Section 5). The Phase II/V pesticides and herbicides are those which EPA has established requirements for drinking water (see Section 5).

### **3.7.2 San Lorenzo River Watershed**

The most sensitive right-of-way in the watersheds, because of its proximity to the San Lorenzo River is State Highway 9 maintained by the California Department of Transportation (Caltrans). Caltrans staff report that herbicide use along Highway 9 has been reduced 50 percent or more since the early 1990s under the agency's NPDES permit for roadside vegetation maintenance (Kris Griffin, personal communication, 2012). Targeted applications of less-toxic materials at low rates immediately adjacent to fixed safety hardware (e.g., signposts, guardrails, reflectors), maintaining a minimum 20-foot buffer between the spray zone and the edge of live streams or the River. Caltrans staff currently applies two herbicides annually, both in late fall/early winter: a systemic pre-emergent, Goaltender 2 (oxyfluorfen), and a more typical pre-emergent, Oust (sulfometuron methyl), that also has some post-emergent properties. Oxyfluorfen disperses readily in water, is slightly mobile and is acutely toxic to aquatic organisms but practically non-toxic to terrestrial biota and birds. Sulfometuron methyl is also readily dispersible in water and moderately mobile, but practically non-toxic to both aquatic and terrestrial biota. Both materials are moderately persistent.

Caltrans uses spot treatments as needed with the broad spectrum (non-selective) systemic herbicide Roundup (glyphosate), and the selective (broadleaf) systemic herbicide Garlon 4 (triclopyr) for brush control in the highway right-of-way, to remove woody vegetation such as blackberries, poison oak and tree seedlings before they interfere with visibility or impinge on the roadway. Roundup has been considered to be one of the more benign herbicides from a drinking water point-of-view, because the active ingredient, glyphosate, is practically non-toxic to aquatic and terrestrial biota and effectively immobile, being strongly adsorbed to soil. However, recent research suggests that at least one of the inert ingredients in Roundup has higher toxicity. Triclopyr is slightly soluble in water, moderately persistent, potentially mobile, and slightly toxic to mammals but highly toxic to aquatic biota.

Vegetation maintenance along County roads in the San Lorenzo River watershed has relied on targeted mowing since the Board of Supervisors passed a moratorium on roadside herbicide spraying in May 2005 (Dawn Harman, personal communication, 2012).

Because mowing is far more labor intensive than spraying, mowing efforts concentrate on maintaining safe sight distance at critical intersections, road curves and other areas. While roadside maintenance in riparian areas involves herbicides to clear brush for flood control purposes, the County is exploring alternatives, such as organic substances, to reduce the environmental impact of conventional spraying. When used, herbicides are typically applied using a brush on the cut branch to minimize overuse.

The four State parks in this watershed are: Big Basin Redwoods State Park, Castle Rock State Park, Fall Creek State Park<sup>12</sup> and the Henry Cowell State Park. These parks use very little pesticides and herbicides as they are mostly preserved natural environments with very little landscaped area.

The four County parks in this watershed are: Felton Covered Bridge, Highlands Park, Ben Lomond Mill Street Park, and Quail Hollow Ranch. The County uses essentially no pesticides and herbicides – only one application of Roundup was used along fence lines and on baseball fields at Pinto Lake and Polo Grounds Parks last year and both these parks are outside of the survey area (Gretchen Illif, personal communication, 2012).

The golf course at the Boulder Creek Golf and Country Club is managed based on IPM principles and use of least toxic materials at the lowest rates feasible. The course employs two licensed pesticide applicators and primarily uses broadleaf weed control herbicides and fungicides (Bill Keller, personal communication, 2007). Confront (Triclopyr and Clopyralid), a post-emergent selective (broadleaf) herbicide is applied to fairways annually. Greens are treated approximately monthly from April to October with fungicides, rotating products regularly to inhibit build-up of resistance. The fungicides currently used comprise the contact fungicide Daconil Weatherstik (Chlorothalonil), which is mixed with one of several systemic fungicides: Banner Maxx (Propiconazole), Signature (Fosetyl-Aluminum) or Heritage (Azoxystrobin). The active ingredient in each of these products has low to very low mammalian toxicity. Triclopyr, clopyralid, propiconazole and fosetyl-aluminum are slightly toxic to practically non-toxic to aquatic species, while azoxystrobin and chlorothalonil are extremely toxic to fish and aquatic invertebrates.

SLVWD is in the process of preparing an Integrated Pest Management Plan for its watersheds. (J. Michelsen, Personal Communication, 2017).

### **3.7.3 Loch Lomond Reservoir and upper Newell Creek watershed**

The Loch Lomond Recreation Area is mostly non-landscaped and uses mechanical weed control for road right-of-way and other park maintenance. Although no pesticides, herbicides, or fertilizers are applied in these areas, consistent with the City of Santa Cruz policy, City policy will allow applications of Roundup, an herbicide containing glyphosate, on the firebreaks/ridgetops if necessary to reduce fuel loads; the City has historically applied Roundup

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<sup>12</sup> More correctly, the Fall Creek unit of Henry Cowell State Park. Popular nomenclature use

as part of its fire preparation program. The need to reduce forest fuel loads in an effort to reduce fire and therefore sediment is balanced with the use of Roundup and associated water quality impacts. In addition, a volunteer program to reduce invasive French broom to allow space for native vegetation to control erosion has also been implemented in conjunction with the local American Fisheries Society.

The City has attempted several methods to control algae (primarily blue-green algae or cyanobacteria) in the reservoir. Historically, pesticides containing copper as the active ingredient were successfully used.

At present, the City uses a combination of sodium bicarbonate and hydrogen peroxide (PAK 27). When algal blooms do occur or are predicted to occur, chemical algaecide applications are made to the Loch Lomond Reservoir to protect against degradation of beneficial uses (e.g., objectionable taste and odor, production of disinfection by-product precursors and cyanotoxins, and oxygen depletion and subsequent fish kills). These algaecide applications are regulated by an NPDES permit and implementation is described in the City's Aquatic Pesticide Application Plan (Chris Berry, personal communication, 2012).

#### **3.7.4 North Coast Watersheds**

Use of pesticides and herbicides in these watersheds is likely to be very small as agriculture and landscaped areas are a very minor land use, and there are no large urban areas or major thoroughfares. Pesticides are not being used within the SCWD managed watershed lands, consistent with City policies favoring mechanical and other IPM control methods.

#### **3.7.5 SLVWD**

SLVWD's watershed management plan, restricts, and where feasible, excludes the use of pesticide or herbicide within SLVWD lands. SLVWD also supports the minimal and restricted use of herbicides and pesticides in the District's service area as well as contributing to the control of herbicide and pesticide use in the greater San Lorenzo River watershed.

#### **3.7.6 Significance**

The RWQCB's decision to place the San Lorenzo River on the 303d list for chlordane and the 2014 TMDL for chlorpyrifos suggest pesticides and herbicides as well as chemicals are becoming a contaminant source of concern. However, SCWD has provided written input to the RWQCB that the dataset on which the 303d list is limited since pesticides or herbicides have not been detected in the raw water for the SCWD at their diversions. In the TMDL report, RWQCB acknowledged SCWD's comment and noted that for chlorpyrifos, the detections are located downstream of the SCWD intakes.

## **3.8 Wildlife**

### **3.8.1 Contaminants of Concern**

Wildlife may pose a threat of contamination to public water supplies under certain conditions. The likeliest condition is the contact between water supply sources and animal or waterfowl waste. The potential for transmission of waterborne pathogens such as Giardia cysts and Cryptosporidium oocysts varies with fluctuations in wildlife populations. While considered a potential problem, the relative importance is lessened when compared with the impacts of domestic and confined animals.

### **3.8.2 San Lorenzo Valley, North Coast Watersheds, and SLVWD**

The wild animals that have the greatest potential impact in the San Lorenzo Valley and the North Coast watersheds are wild pig, black tailed deer, California ground squirrel, and the other local terrestrial mammals. NRCS District Conservationist Rich Casale stated that he has seen evidence of pig populations in every part of Santa Cruz County. Where there has been a noticeable increase in wild pig populations, there can be erosion problems caused by the foraging and wallowing habits of this species. SCWD staff noted increased sightings of wild turkey and more bullfrogs at Loch Lomond. While there has been historical wild animal activity in the vicinity of their constructed intakes, especially the Foreman intake, SLVWD staff indicate that pigs no longer appear to be as rampant a problem. Past activity may be associated with residential development encroaching on the wildlands, thereby reducing hunting, or wetter-than-normal conditions prevalent during the decade prior to the previous update contributing to growing populations.

California ground squirrels are a minor potential source of sediment and fecal coliform bacteria. Ground squirrels are a source of bank instability in grassland areas and along levees and earthen dam structures. This instability often necessitates eradication efforts that when done by rodenticides may be a source of chemical contamination to adjacent water sources. In small spring systems, it was noted that occasionally other rodents, like the dusky footed woodrat and deer mice, as well as a variety of lizards may foul water supplies when they die and decompose in water sources. This issue illustrates the need for vigilance on the part of the small-scale water suppliers and spring owners.

### **3.8.3 Significance**

Pigs and other wild animal populations do not appear to have a great potential for contamination of surface waters at this time.

## **3.9 Quarries/Mine Runoff**

There are four quarries in the San Lorenzo River watershed and one quarry in the Liddell Spring watershed that could impact the quality of public drinking water supplies. Mineral extraction in the San Lorenzo River watershed consists of rock, gravel, and sand for the construction and glass industries.

The quarries are regulated under California's Surface Mining and Reclamation Act (SMARA) and by the County's Mining Ordinance. The County Mining Ordinance requires that the application package be submitted to the water purveyor in the drainage area of the quarry. The County inspects the quarries four times each year and the state inspects them annually. The County conducts an extensive review each five years. At that time, the County Planning Commission can impose conditions on the quarry as part of the Certificate of Compliance. The Regional Board issues NPDES permits that set limits on contaminants that can be discharged to surface waters from quarries.

### **3.9.1 Contaminants of Concern**

Sediment, nitrate, dissolved metals and minerals are all contaminants of concern related to quarry operations. The Felton Quarry has historically been a source of dissolved minerals, sulfate, iron, and manganese in moderately elevated concentrations while the Bonny Doon Quarry for limestone, which recently closed, was associated with high sulfate, turbidity, sediment and nitrate. The other quarries in the watersheds are closed but may be a source of sediment if not properly maintained. Each quarry is discussed further in Section 3.9.2.

### **3.9.2 San Lorenzo River Watershed and SLVWD**

This section presents existing conditions of the four quarries in the San Lorenzo River watershed. Again, two quarries are still active (Felton and Quail Hollow) and two are presently inactive (Hanson and Olympia).

**Felton Quarry** - Felton Quarry, mined by Granite Construction Company, is a 262-acre granite quarry rising in elevation from 550 feet at the eastern edge to 1,550 feet at the northwest corner. The Felton Quarry mineral deposit, a spatially-limited unit of fractured and stained granitic rock (mapped as adamellite, also known as alaskite), is located on the southeastern side of Ben Lomond Mountain. The quarry consists of an active open pit, an asphalt plant, a washwater recirculation system, a polymer clarifier system, and settling ponds. It produces both decomposed granite used in construction and a stained aggregate marketed as a high-value landscaping rock under the 'California Gold' trademark.<sup>13</sup>

Mining occurs on approximately 85 acres of the site (Carlson, 2005). The quarry has been active since the early 1970s, and has been operated under the present permit for 31 years with an additional 19 years of feasible mining projected. Limestone Brook drains through the center of the site in a southerly direction forming the headwaters of Gold Gulch, which flows east to the San Lorenzo River. Washwater is recirculated and stored in three detention ponds. It is not discharged except during major storm events. Stormwater runoff from the site is also stored in the three on-site detention ponds. Prior to major storm events, water is pumped from the ponds and discharged to Gold Gulch to increase pond capacity for stormwater runoff. The ponds are designed to handle a 2-hour, 100-year storm, providing a median detention time of at least 20 to 40 minutes. During extreme storm events the capacity of the detention ponds is exceeded and stormwater flows out of the ponds to downstream receiving waters. Discharges to surface

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<sup>13</sup> See Hecht, 1978 for a discussion of the hydrogeologic and weathering conditions which have led to deep weathering and the lightly-stained rock mined at the site.

waters are regulated under an NPDES permit issued by the Regional Board. The quarry submits quarterly discharge reports to the Regional Board.

Granite monitors groundwater and surface-water quality twice each year at a number of monitoring locations. Ground-water levels are measured in nine wells and samples are collected for pH and conductivity. Surface water samples are collected at 16 locations including the settling ponds, springs, Gold Gulch, and Limestone Brook. All samples are analyzed for pH and specific conductance. Selected samples are analyzed for general water quality parameters such as total dissolved solids, calcium, and sulfate. In April 1995, a sample was collected from the effluent of the clarifier and analyzed for the 13 priority pollutant metals. Most of the metals were not detected. Lead and nickel were detected at concentrations well below drinking water standards. High concentrations of sulfate, calcium, iron, and manganese have been detected in the ground-water basins of Limestone Brook and Gold Gulch. County requirements call for developing a set of protective measures should water quality change by more than 20 percent. The Felton Quarry has controlled erosion at the site by revegetation with native plants.

Historically there was concern that the quarry's operations might affect the water supply of the Forest Lakes Mutual Water Company, as the quarry's product of partly-weathered rock is part of the source aquifer for the Company's wells. A hydrogeologic assessment study (Hecht, 1978) showed that there was no impact on ground-water levels; however, the operator drilled a new well for Forest Lakes MWC that provides 18 acre-feet of water to the water district each year. Conditions of approval for the quarry require that if the water supply were to diminish, Granite would be required to provide a new water supply to this purveyor.

**Quail Hollow** - The Quail Hollow Quarry encompasses 240 acres and is located on Quail Hollow Road near the community of Ben Lomond (Carlson, 2005). Mining is estimated to continue for decades from the present and is permitted for a maximum production rate of 250,000 tons per year. The Santa Margarita Sandstone is mined for sand which is used in the construction industry; however the Quail Hollow quarry is locally unique in that it also contains fine, industrial grade sand used by the glass industry (Carlson, 2005). The quarry consists of an open pit, a washwater recirculation system, and detention ponds. In 1998, the Planning Commission certified an EIR for the project and approved the Mining Approval and Certificate of Compliance.<sup>14</sup> In 2007, the first permit review since the 1998 approval was conducted and staff concluded that the quarry was in substantial compliance with the Conditions of Approval (Carlson, 2007). Additional best management practices were installed to better manage stormwater runoff. The capacity of the site to retain stormwater runoff has been exceeded under extreme conditions, such as occurred during the 2016-2017 wet season, and further improvements to the storm water pond system have been implemented and additional improvements are planned to better manage and treat stormwater runoff before it leaves the site (Carlson, 2018).

In 2008, Graniterock finalized the Long Term Management and Maintenance Plans (LTMMP), which was a stipulation of their 1998 Mining Approval and Certificate of Compliance. The purpose of the Plan is to implement the conservation goals of the Habitat Conservation Plan by describing the management and maintenance actions that will be undertaken to preserve

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<sup>14</sup> There are actually two Approvals for the Quail Hollow Quarry and two corresponding sets of conditions of approval. The approval for the "Current Mining Area" was in 1994, and that for the "Future Mining Area" was in 1998.

conservation and reclaimed areas of the mine in perpetuity (Carlson, 2008). The LTMMMP calls for a more comprehensive monitoring program to include, invasive species mapping, vegetation community mapping and plant species mapping, as well as an adaptive and research-oriented approach that will allow management to be refined and improved as new information is obtained.

**Hanson Quarry** - The Hanson Quarry is a 275-acre quarry in the Bean Creek watershed mining the Santa Margarita sandstone. The quarry consists of an open pit, a washwater recirculation system, a polymer clarifier system, and four settling ponds. Operations at this facility ceased in 2004, and since then, a number of reclamation activities have occurred at the site including implementation revegetation activities and an approved basin management plan. The processing plant, and fuel and oil storage tanks have been removed. The quarry floor was graded and large-scale plantings have been completed. A major repair of storm damage to Conference Drive at the quarry entrance was completed in 2006, and this included installation of major drainage improvements to handle runoff that had been handled by the former processing plant water recycling system. Studies have been conducted to assess the feasibility of using the former quarry pit as a recharge facility in association with a larger conjunctive use ground-water program for the lower San Lorenzo River. There is no specific project, or funding for a project, at this time. In addition, the Hanson Quarry contains some preserved *sandhills* habitat and undisturbed areas around the east, south, and west rim of the quarry pit are covered by conservation easement (David Carlson, personal communication, 2012).

**Olympia Quarry** - Olympia Quarry occupies 210 acres. The quarry consists of an open pit, wash water recirculation system, sand loading facilities, and a detention pond. Operations were discontinued at this facility in 2002. Reclamation and revegetation of the site remains stalled due to difficulty aligning reclamation plans with United States Fish and Wildlife Service requirements to protect two on-site endangered species – the Mt. Hermon June beetle and the Zayante band-winged grasshopper (David Carlson, personal communication, 2012).

### **3.9.3 Loch Lomond Reservoir and the upper Newell Creek watershed**

There are no quarries in this watershed.

### **3.9.4 North Coast Watersheds**

**Bonny Doon Quarry** - The Bonny Doon Quarry, purchased by CEMEX, is located immediately upslope and up-watershed of the SCWD Liddell Spring intake. Quarry operations started in August 1970 and, in January 2010, CEMEX officially decided to cease operations and the property was purchased by a group of local non-governmental organizations for preservation as described earlier. Since closure of the mine, the mine operator has been working to implement the approved reclamation plan. Several amendments to the reclamation plan are needed to address current conditions not addressed in the original approved plan. Various technical studies are in process addressing the changed conditions. Water quality monitoring during major reclamation activities may be advisable. (Carlson, 2018).

Nitrate sources have been previously reported upgradient of the quarry (Watkins-Johnson, 1992). The same study also reports that the quarry area ground-water was affected by nitrate before the commencement of quarry operations. Time-series data dating back to the 1970's

indicates a slight upward trend in background nitrate concentrations of Liddell Spring discharge. The source(s) of nitrate which reaches Liddell Spring, if it is indeed increasing, has however not yet been identified. Closure of the Bonny Doon Quarry should be taken into account in considering sources of nitrate at Liddell Spring.

### **3.9.5 Significance**

Within the four quarries in the San Lorenzo River watershed, occasional heavy sedimentation can occur because of exceedance of settling pond capacities during major storms. This condition is not likely to change in the foreseeable future. The potential water quality impact is more significant with the operational quarries at Felton and Quail Hollow. With the closure of the Bonny Doon quarry, Liddell Spring water quality will no longer be negatively impacted by blasting events. The Peninsula Open Space Trust and Sempervirens Fund with other organizations acquired the San Vicente Redwoods from CEMEX in the winter of 2011. In 2014, these organizations joined with others to collaborate on the Living Landscape Initiative design for a plan that protects wildlife habitat, recreation and sustainable timber harvesting for the 8,500-acre property which includes the Bonny Doon quarry site. As noted earlier, allowing public access to these lands increases risk of wildfire with associated water quality risks

## **3.10 Solid and Hazardous Waste Disposal Facilities**

In California, there are three main categories of waste disposal facilities: (1) solid waste disposal facilities, (2) hazardous waste treatment, storage, and disposal (TSD) facilities, and (3) illegal dump sites. Solid waste facilities are regulated by the California Department of Resources, Recycling and Recovery (CDRRR, formerly the State Integrated Waste Management Board), although pollution problems are handled by the Regional Boards. Hazardous waste facilities are overseen by the State Department of Toxic Substances Control (DTSC). The County removes trash and abandoned articles from illegal dump sites.

There is one closed solid waste facility in the San Lorenzo River watershed, discussed below. A review of Geotracker, the database of TSD facilities showed there are no new active TSD facilities in any of the watersheds and that the former Santa Cruz Lumber Company and Valeteria Dry Cleaners sites in Felton remain under state oversight.

### **3.10.1 Contaminants of Concern**

Leachate from waste disposal facilities is a liquid formed as infiltrating rainwater seeps through the landfilled material mobilizing a variety of contaminants. Leachate is typically a highly mineralized liquid containing heavy metals, dissolved solids, nutrients, and organic chemicals. The composition of leachate from any particular landfill will depend on the nature of the decomposing landfilled materials. Although regulations aim to minimize or eliminate leachate from contaminating the underlying groundwater and nearby surface waters, complete leachate control is difficult to achieve.



### **3.10.2 San Lorenzo River Watershed**

There are no active solid waste disposal facilities in the watershed. The County provides trash pick-up service in all the watersheds and transports the material to one of the two operating landfills, both of which are outside the watershed areas for this study.

There is one closed County landfill, the former Ben Lomond Landfill. This facility was in operation since the early 1950s and was classified first as a Class II Landfill, then later as a Class III Landfill. The landfill ceased acceptance of waste in July 1991 and it is now used as a transfer station and recycling center and is known as the Ben Lomond Transfer Station. It is located on the north side of Newell Creek, downstream of Loch Lomond, in the highly permeable Santa Margarita sandstone which is underlain in this area by the south-southeast dipping Monterey shale.

Requirements for management of active landfills, closure of landfills, and air and water quality testing are described under Subchapter 15 of the California Code of Regulations. The CDRRR implements source reduction and recycling requirements, waste handling and landfill design, and waste disposal standards. Landfills are to be designed and closed to permit no off-site movement of leachate. Both active and inactive solid waste disposal sites are required to conduct monitoring specifically to identify the content of any leachate leaving the site and whether there are water quality problems posed by the site. The monitoring results are reported to the Regional Board in Solid Waste Assessment Test (SWAT) reports.

The entire Ben Lomond Landfill is now under a clay cover. Regional Board staff report this cover has been effective in reducing the cadmium levels. Closure measures include gas extraction, installation of a sedimentation basin, and installation of a drainage system. The County submitted a closure plan to the Regional Board in 1996.

There is a ground-water plume beneath the Ben Lomond Landfill but concentrations of most monitored constituents are at low levels. A few VOCs are detected above MCLs in three of the wells close to the landfill perimeter. Downgradient groundwater monitoring wells, however, show no evidence of VOC contamination. Monitoring of Newell Creek shows some increases in mean constituent concentrations from upstream to downstream of the landfill, including an apparent increase in turbidity. Leachate inflow into Newell Creek would be unlikely to cause the turbidity increase; this apparent increase may have some other source, possibly erosion within the Rancho Rio subdivision on the opposite creek bank.

### **3.10.3 North Coast Watersheds and the Loch Lomond Reservoir**

There are no identified and no permitted waste disposal facilities in any of the other watershed areas.

### **3.10.4 Significance**

Waste disposal facilities most likely are not a significant threat to the water quality of the San Lorenzo River or the creeks in the North Coast watershed. There are no hazardous waste disposal facilities in any of the watersheds. The closed Ben Lomond Landfill in the Newell Creek watershed appears to have created a low-concentration groundwater plume with a few

elevated VOCs but the plume does not appear to be migrating into the creek. There is an apparent turbidity increase in the creek from upstream to downstream of the landfill. The landfill leachate, however, is unlikely to be the source of this turbidity increase.

### **3.11 Timber Harvests/Logging**

Logging is part of the land-use mosaic and tradition in Santa Cruz Mountains. Most old-growth redwood had been cut by 1915. Douglas fir and hardwoods have also been extensively logged. Timber harvests were historically an integral part of the local economy but have been superceded in recent decades with other activities.

Logging was a major land-use in the watersheds historically although actual timber harvest activities have generally declined over the last several decades and are now focused largely in the San Lorenzo River watershed. Nearly half the County is zoned for timber production. Logging is done of both hardwoods (mostly for firewood) and redwoods and Douglas fir (for lumber). Virtually all logging in the watershed study area is on privately owned lands and is limited to selection harvests with no clear cutting allowed. The City of Santa Cruz has discontinued timber harvesting within its watershed lands. The San Lorenzo Valley Water District has sold much of its timberlands to Sempervirens Fund and has policies against harvesting on remaining watershed lands. No known timber harvests have occurred in the Lompico County Water District watershed in the recent past. Much of the Timber Production Zone (TPZ) land, which is land designated as suitable for commercial logging, is owned by individuals with relatively small acreages. Only a few private companies and the SCWD own TPZ lands in areas greater than 2,500 acres. Thus, the location of logging changes every year, depending on the decisions of many individual land owners and the price of timber. Some TPZ lands are retired from timber harvesting, particular those in public ownership. Conservation groups (e.g., Save the Redwoods) continue to purchase forested acreage, retiring it from timber production. Some smaller water purveyors continue to sell timber; logging is not allowed in the State or County parks.

On private lands, the California Department of Forestry and Fire Protection (Cal Fire) is responsible for regulating timber harvesting by enforcing the regulations of the 1973 California Forest Practice Act, contained in Title 14 of the California Code of Regulations as revised in January 2017. The logging season is generally April 15 through October 15, but tree-cutting may continue all year long, and Cal Fire may approve winter operations. Prior to 1983, counties could regulate timber harvesting within their county area. Then, SB856 prohibited local regulation and reserved jurisdiction to the state under the Cal Fire. At that time, special County rules were incorporated into the Forest Practice Act and includes Forest Practice Rules Section 926 Santa Cruz County rules that apply within the boundaries in Santa Cruz County and include consultation with water agency representatives.

The basic structure of the Cal Fire requirements are:

1. A Sustained Yield Plan is required for TPZ lands greater than 2,500 acres, describing the attributes of the timber and how the land will be managed to sustain the land as a productive timber area producing a certain number of board feet per year. The SCWD has developed a timber management plan which is similar to a sustained yield plan for

its TPZ lands in the Loch Lomond, Laguna Creek, and Zayante Creek watersheds, but has discontinued harvests. This plan is discussed further in Section 4.

2. A Timber Harvest Plan (THP) or Non-industrial Timber Management Plan (NTMP) is required for each specific project on all parcels if the product is to be sold. The plan submitter must retain a registered professional forester (RPF) to prepare the THP. The skill of the RPF directly affects the water-quality effects of each cut. Actual logging is usually put out for bid to logging companies. THPs are discussed in some detail below.
3. Certain exemptions from the THP process are allowed. Parcels less than 3 acres do not require a THP but must abide by cutting standards and other requirements for the Cal Fire district. Exemptions from the THP requirement are also allowed for Christmas tree cutting, and removal of dead or diseased trees, removal of trees within 150 feet of a residence for fire control. Clear cutting for conversion to other land uses (such as orchards or vineyards) can be done. However, this practice now requires a report from a registered professional forester and Cal Fire now inspects to verify conversion.

Cal Fire Southern SubDistrict requirements, which the THPs must show they meet, include conformance with cutting standards, return cycle cutting, slash treatment, road construction and design, and post-logging erosion-control measures. The San Lorenzo River and North Coast watersheds are in Cal Fire's Southern SubDistrict of the Coast Forest District. Cutting standards for this District allow only selective harvesting. The registered professional forester determines the level of cut within District standards and marks individual trees. Portions of the North Coast watersheds are in Coastal Commission special treatment areas and must comply with additional rules. A specific area may be logged no more than once every 10 years. All slash must be cut to rest a maximum of 18 inches off the forest floor.

Permanent, seasonal, and temporary roads are the three categories of roads recognized by Cal Fire. Permanent roads are asphalted or otherwise surfaced. Seasonal roads are dirt roads on which erosion control features must be installed by October 15. Temporary roads are physically destroyed or blocked after the logging. Most road construction in the watersheds for timber harvesting is of seasonal roads. Road building plans must be discussed in detail in the THP including use of soil generated during the road building. The THP must identify the installation of erosion control features for roads, such as water bars. Water bars are a swale/berm combination that cut across roads to act as a cross drains. Additional erosion control features include construction of outfacing slopes (outsloping) on roads, avoiding inside slope drainage, and "armoring" susceptible areas to dissipate energy from storm flow.

Post-disturbance erosion control is site specific. The application of straw, wood chips, hydromulch, slush, or fabrics to a skid road or other feature is dependent on such factors as slope, proximity to a watercourse, rating of the watercourse as to sensitivity, and professional judgment. Since the early 1990s, stream crossings have received particular attention and care, with respect to not only inhibiting sediment delivery during washouts but also protecting adult passage of salmonids.

Cal Fire requires that erosion-control features be maintained for an additional 1 to 3 years after completion of the first winter after harvest. Cal Fire staff inspect a logging operation a minimum of three times: before, during, and after the harvest. However, they can and do inspect more frequently if appropriate. After the harvest is closed, Cal Fire inspects the roads during the

extended maintenance period. Beyond this period Cal Fire cannot control any subsequent destruction or non-maintenance of the roads.

### **3.11.1 Contaminants of Concern**

Timber harvesting is responsible primarily for the contribution of additional sediment through erosion from logging roads. With the sediment, nutrients and bacteria are also introduced into the streams. The relationship between timber harvesting and sediment yield is poorly defined and related to specific site conditions including geology, slope, and stream proximity as well as specific timber harvesting practices. Limited local studies have been conducted to measure effects of erosion from timber harvesting roads.<sup>15</sup> One field-based study in the Zayante, Newell, and Love Creek watersheds (Swanson and Dvorsky, 2001) suggests that roads related to timber entry (past and present) are sources for perhaps 30 to 50 percent of sediment delivered to the creek system, with values differing substantially by (a) subwatershed, (b) sandy vs. non-sandy soils, and (c) inner gorge versus hillslope location.<sup>16</sup> Similarly, no local data are available addressing the relationship of timber harvests and road construction in general (as well as other surface-disrupting activities) on dissolved organic carbon, a constituent of concern in water treatment.

### **3.11.2 San Lorenzo River Watershed**

Timber harvests occur throughout the surveyed watersheds, but primarily in the San Lorenzo River watershed. Virtually all portions of this watershed are affected as timber resources as designated by the County are in a large portion of the watershed (Figure 3-3). Using the GIS data displayed on Figure 2-2, a compilation of historic permitted timber harvests in the San Lorenzo River Valley developed by Sempervirens Fund shows that 893 acres of the 71,900 acres in the watershed – or about 1.2 percent -- were likely harvested commercially during 2007 and 2008 after which Sempervirens' has not collected data. This can be compared to the average annual timber harvest of about 280 acres per year for the period from 2001 – 2006 to about 447 acres per year for 2007 and 2008. When a five-year running average of timber harvest acreages is calculated, the number of acres that have been harvested appear to be declining since a peak acreage of timber harvest in the early 1990s.

There are some indications that recent increases in timber prices is resulting in some increase in timber harvest. A review of CalFire timber harvest plan (THP) database indicate that there are three active THP reviews underway in Bean, Carbonera, and Kings Creek totaling on about 262 acres. In the years from 2012-2016, a review of the CalFire THP information indicates 1- 2 THPs are permitted per year in the SCWD and SLVWD watersheds. In addition, there are increasing concerns that timber harvest (permitted or not) that supports cannabis cultivation should be monitored closely in the next years as the County initiates regulation.

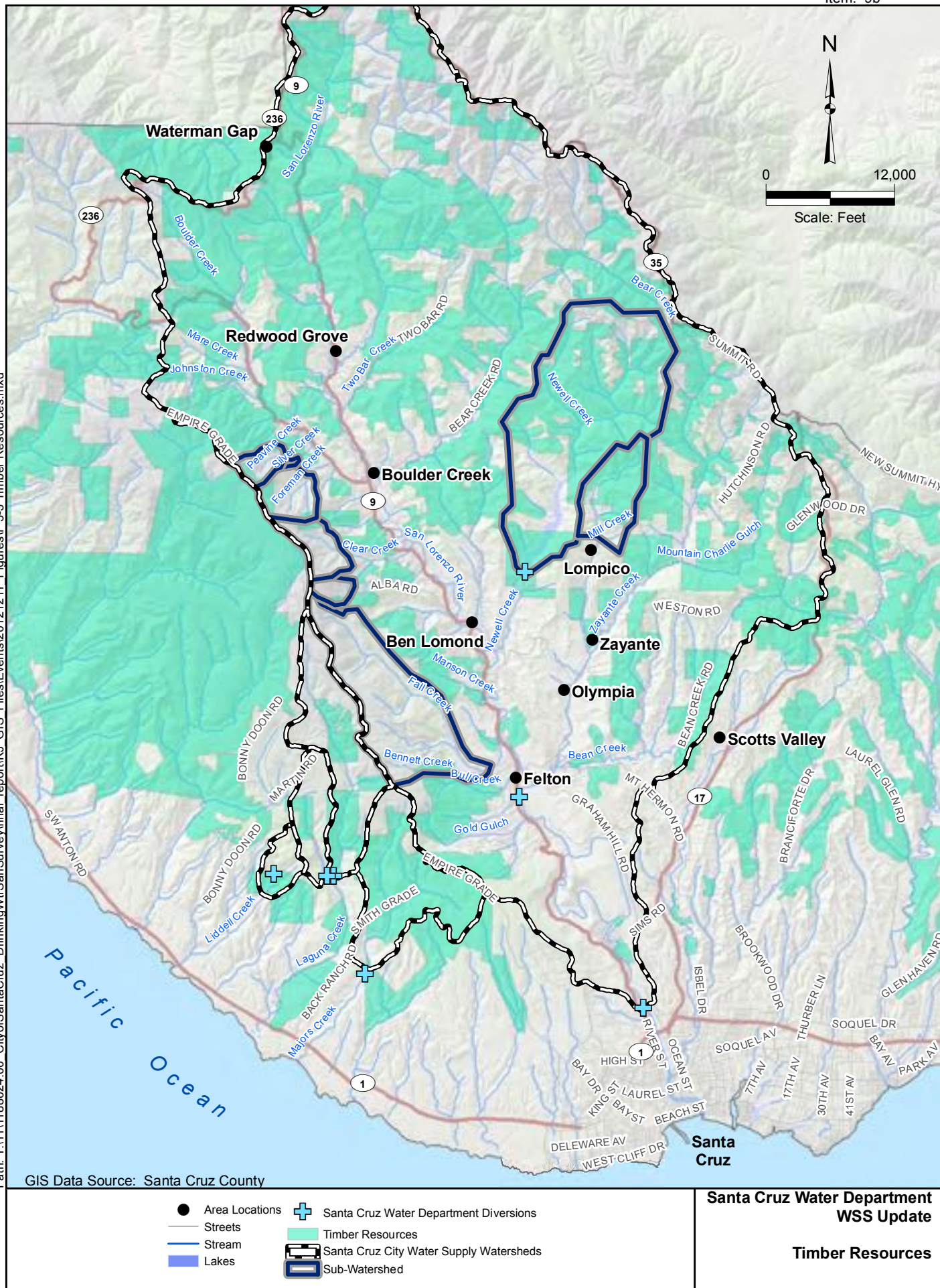
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<sup>15</sup> The County Planning Department once applied for and was awarded a 205j grant to study this issue, but could not find a landowner willing to cooperate in field monitoring. The grant funds were returned to the state.

<sup>16</sup> Values are approximate, as the study area considered in this report is not truly representative of the two surveyed watershed, but these findings are both important and applicable; table ES-1 from the report provides additional information.



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There is no known timber harvesting that occurs within the SLVWD other than a Christmas Tree farm that exists on the Upper Empire Grade within the Foreman Creek watershed. This operation does not compare to the size and scale of a timber harvesting operation, and it is unlikely to impact the watershed to the extent of a commercial timber harvesting operation. If there were to be any timber harvest within any of the SLVWD watershed lands, the District would be notified and proper planning and inspection would be assessed. SLVWD has a prohibition on commercial timber harvest on District lands.

### **3.11.3 Significance**

The cumulative impact of timber harvests, both at individual sites and cumulatively on downstream channels, must be considered significant, although the reduction in acreage of timber harvest in recent years, which is one indicator of water quality risk associated with timber harvest, has somewhat reduced the potential water quality impact. In addition to the timber harvest itself and the slopes and soils of the harvest lands, the primary potential problem arises with erosion resulting from the roads constructed to access the logging area, particularly after Cal Fire oversight ceases and erosion control measures may not be maintained. Cal Fire requirements do not limit road density within a watershed. NOAA fisheries uses road density (measured as the ratio of miles of road per square mile (mi./sq. mi.) of watershed) as an indicator of watershed conditions in salmonid habitat assessments. NOAA fisheries has found that road densities greater than 3 mi./sq. mi. may indicate impaired ecosystem function (NMFS, 1996). In addition, Swanson (2001) found that legacy and current logging roads are the source of 30 to 50 percent of sediment delivered to the Zayante Creek. If extended throughout the sanitary survey study areas, as is reasonable based on underlying soils and geology, Swanson's study compels attention.

As noted earlier, Cal Fire recently issued 2017 Forest Practice Rules that includes topics specific to the Southern District and the Regional Board has issued Order no. R3-2012-0008 which is a General Conditional Waiver of Waste Discharge Requirements Timber Harvest Activities in the Central Coast Region. Timber Harvest Plans or Non-industrial Timber Management Plans are required by Cal Fire prior to approval which address erosion and sediment control. These documents should be reviewed to evaluate whether they are sufficient to address the specific geologic concerns.

### **3.12 Recreation**

Principal recreational activities in the watersheds include swimming, fishing, hiking, and horseback riding. Recently, there has been a surge of interest in mountain biking occurring on trails in the watersheds including development of illicit trails upstream of the City's water intakes. Water contact recreation (swimming) occurs primarily during fair weather and relatively warm temperature conditions, conditions typical of May through October on both the San Lorenzo River and some of the tributaries. The peak water-contact recreation season is traditionally from the Memorial Day through the Labor Day weekend and is limited to natural swimming holes as temporary rubber dams are limited by CDFW; however, a summer dam on Zayante Creek exists at Mount Hermon just upstream of the Bean Creek confluence. In addition, weekend use is generally more intensive than weekday use. Swimming and wading has been listed as the most popular recreational activity in the watersheds. Recent water quality sampling has found the insect repellent DEET in the San Lorenzo River at Felton in September,

November, and December 2015 which could potentially be associated with recreational activity. Hiking, mountain biking, and horseback riding are more year-round activities (County General Plan).

### **3.12.1 Contaminants of Concern**

Water-contact recreation is a potential source of viruses, pathogens, and bacteria, principally from the introduction of human fecal matter (most likely from infants and children) directly into the stream. Hiking, mountain biking, and particularly horseback riding, can contribute to erosion and increased turbidity, especially where conducted off established trails and at stream crossings. Human access to watersheds also exacerbates fire hazard. Fishing activity is limited to catch-and-release steelhead, except at Loch Lomond, and is unlikely to be a source of contaminants. In addition, live bait at Loch Lomond is limited to night crawlers to prevent invasive species introduction.

### **3.12.2 San Lorenzo River Watershed**

There are three state parks, four county parks, one City recreation area, one private country club, and several public and private swimming holes within the watersheds. Water contact recreation is prohibited in the City recreation area but is widespread elsewhere in the creek system. The state parks include Castle Rock State Park, the Henry Cowell State Park, and a small portion of the Big Basin Redwoods State Park. The state parks are essentially open spaces. Big Basin Redwoods State Park has more than 18,000 acres with many miles of trails for hiking, biking, and horseback riding, 147 developed campsites, 6 trail camps, and 36 tent cabins. Castle Rock State Park has more than 5,000 acres and 32 miles of trails for hikers and equestrians. Camping is for backpackers only. Henry Cowell State Park consists of two units; a main park area of about 1,800 acres and the Fall Creek Unit which has about 2,500 acres and has about 20 miles of trails. Some trail sections are designated for horses, leashed dogs, or bicycles but most trails are for hiking. There is also a 112-unit campground. Illicit recreational uses in Henry Cowell State Park and adjacent lands have recently increased, particularly mountain biking off the designated trails; reduced state funding and closure for state parks will further reduce enforcement of park regulations. The City has been working with the State Parks staff to set up stake outs to improve enforcement of regulations. (C. Berry, 2017. Personal Communication) There is significant concern that additional demands for access for recreation including mountain biking will exacerbate erosion and other water quality concerns.

The County parks include the Felton Covered Bridge County Park (playground, covered bridge, horse trail access, volleyball); Highlands County Park (senior center, swimming pool, picnicking, playing fields, nature trail); Ben Lomond Mill Street Park (picnicking, small playing field); and Quail Hollow Ranch County Park (equestrian facility).

The Boulder Creek Golf and Country Club is a private facility which provides an 18-hole golf course as well as other recreational facilities, such as tennis courts and a swimming pool.

Historically, there were several small dams constructed across creeks to afford summer swimming holes at locations that included, San Lorenzo Woods, Bear Creek Scout Camp, Gold Gulch in Forest Lakes, and Zayante Creek in Mt. Hermon. Swimming holes are now limited to natural swimming holes which are located in less accessible portions of the watershed although

illegal dams constructed of cobbles and plastic are frequently constructed. The County Health Services Agency continues to monitor coliform bacteria along the creek system and uses the data to issue health advisories against swimming, when coliform counts are high. The coliform data can indicate sewage contamination from failing septic systems, urban runoff, domestic animal wastes, wildlife, birds, and/or water contact recreation itself.

### **3.12.3 Loch Lomond Reservoir and the upper Newell Creek watershed**

Loch Lomond Recreation Area occupies the east side of the reservoir and is owned and operated by the SCWD. Recreational use averages around 55,000 visitors per year. There is day use only, with picnicking, fishing, and boating as the primary activities. Only electric powered boats and manually paddled boats such as rowboats are allowed. There is no water contact recreation allowed

Wastewater is trucked out of the recreation area and virtually no pesticides or herbicides are used in the area. The park is open from March 1 to September 15 and on weekends after Sept 15 until the second weekend in October from 6 AM roughly to sunset (varying times). In private lands of the upper Newell Creek watershed, there are a few septic systems to serve homes and wineries.

### **3.12.4 North Coast Watersheds**

There are several recreation areas or regional parks in the North Coast watersheds such as the recently formed San Vicente Redwoods, some of which drains into the Laguna watershed, California Fish and Wildlife's Bonny Doon Ecological Reserve which drains into the Reggiardo and Laguna Creeks; the Wilder Ranch State Park, some of which drains Majors Creek and the Coast Dairies State Park which is located on the lower portions of Laguna Creek. In addition, there are informally established horse trails in the watersheds.

### **3.12.5 SLVWD**

The Fall Creek State Park is available for day use, and is located just upstream of the Fall Creek intake. Since this area is only available for day use, there is a limited chance of contamination occurring. Recreation activities consist mainly of family picnics and hiking. The road along fall creek is gated just past the campground, so vehicles other than SLVWD vehicles, do not have access beyond Fall Creek State Park.

The Olympia Wellfield is open to hiking and equestrian use. There are no surface water diversions on site.

Recreational use is restricted within other areas of the SLVWD lands but are occasionally subject to illicit use by hikers and mountain biking to which the District responds by deterring trespass through various methods.

Lompico Creek has limited recreation activities within its watershed. There is a small pool below the Lompico Creek intake that local children swim in during warmer months which should be evaluated should Lompico Creek be used. Other activities that may exist in the watershed are limited to hiking and possibly some mountain biking.



### 3.12.6 Significance

Many recreational activities are relatively benign and non-polluting. Large recreational areas, especially those which are mostly open space like Henry Cowell State Park, or are managed specifically for water quality such as the Loch Lomond Recreation Area, appear to enhance water quality. As discussed above, bacterial water quality appears to improve as the water passes through large open space parks (Henry Cowell State Park) or resides in a reservoir for extended periods (Loch Lomond Reservoir).

Recreational activities generally considered of most significance involve water contact recreation. However, an evaluation of the County fecal coliform bacteria data conducted during prior watershed sanitary surveys, conducted by the County Health Services Agency, found no significant increase in bacteria in the swimming areas of the San Lorenzo River system.

An examination of the geographical distribution of the County fecal coliform data from 2012-present continues to show that the urbanized portions of the river system, generally between Boulder Creek and Felton, have fairly similar average and median values. Historically, there has been an apparent trend of decreasing coliform counts through reaches that pass through the State Parks, which are mostly open space. Current data indicate that total coliform counts at Loch Lomond are lower than the counts at the Tait Street and Felton Diversions as shown in Section 5. The County's wastewater management program evaluation found no significant increases of fecal coliform bacteria in the swimming areas of the San Lorenzo River system, indicating that water contact recreation at parks and designated recreation areas is not a significant source of the bacterial load in the river (John Ricker, personal communication, 2017). The potential for erosion from hiking, horseback riding, and mountain biking may also be significant and has been observed in locations such as Henry Cowell State Park and upstream of the Tait diversion on the San Lorenzo River. Illegal trespass and damage caused by recreational activity, particularly unauthorized equestrian and off-road vehicle use, was an issue in the Olympia Wellfield of the San Lorenzo Valley Water District, but additional patrol, fencing, and blocking of access with appropriate horse crossings has improved protection of biotic and water resources of the property (SLVWD, 2010).<sup>17</sup> Downhill biking continues to be increasingly popular biking-induced damage (including the building of illegal jumps) has stirred controversy in the San Lorenzo River Watershed (Betsy Herbert, personal communication, 2012). There are few signs to alert bikers coming from legal trails on UCSC's upper campus that they are entering closed trails under state park control, and law enforcement has issued tickets to riders exiting Henry Cowell State Park onto Highway 9. Signage has been vandalized and/or removed in Henry Cowell State Park which requires monitoring and replacement.

There are a limited number of formal trails in the county for downhill bikers such as in the Soquel Demonstration Forest and a few other locations which cannot meet demand. There have been preliminary conversations between officials and bikers represented by the Mountain Bikers of Santa Cruz over building a park on federal land maintained by the Bureau of Land Management near Davenport at the Cotoni Coast Dairies National Monument. More recently, a mountain bike park is proposed for development in an open space at the Mount Hermon

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<sup>17</sup> SLVWD does not actively manage much of its land for recreational purposes; however, in 2011, SLVWD approved limited recreational use (equestrian, walking, and dog walking) on the Olympia watershed property.

Association properties where there currently is an adventure park with ziplining and ropes course.

### **3.13 Unauthorized Activity**

Unauthorized activities are found at varying levels throughout the San Lorenzo Valley and North Coast watersheds and include unpermitted grading, illegal timber harvests, and unauthorized dumping of solid and liquid wastes, often associated with homeless encampments. Area resource managers find that land clearing, road construction, and maintenance by individual landowners are the primary sources of avoidable erosion. Cannabis cultivation, which has occurred illegally, is soon to be regulated is known to occur and is associated with many of the above activities and also poses a fire risk as discussed in Section 3.16.

Homeless encampments can also be a source of human waste and are the subject of targeted enforcement.

#### **3.13.1 Contaminants of Concern**

Generally, sediment caused by eroding land is the primary contaminant of concern, though illegal human waste discharges also contribute pathogens, particularly to the San Lorenzo River and illegal clearing for cannabis cultivation can also contribute chemicals and fuels. In 2011, Cal Fire opened 22 cases of unpermitted timber harvest against illegal cannabis cultivation in the Santa Cruz Mountains; it is not known how many of these cases are in the San Lorenzo or North Coast watersheds. By contrast, Cal Fire opened 3 cases of unpermitted timber harvest in 2010. In addition to the fire and erosion risk, chemical spills including pesticides, herbicides, and fuels pose additional water quality threats.

#### **3.13.2 San Lorenzo River Watershed**

Numerous violations of the Santa Cruz County Erosion Control Ordinance can be seen throughout the subject watersheds, primarily in connection with roads. County staff estimate that in the project area, there are scores of "active" violations of the County Grading and Erosion Control, the Riparian Habitat Protection, and the Sensitive Habitats Protection Ordinances. In addition, several large illegal roads in the Bear Creek and King Creek watersheds remain open and are a significant source of sediment and persistent turbidity. County enforcement staff do their best to obtain compliance for these situations, however with limited resources, violations are prioritized based upon severity and overall threat to life and safety. For larger land clearing or grading violations it may take years to ultimately resolve the violation due to many factors including the magnitude of the violation as well as the property owner's willingness and financial ability to comply.

Besides grading and brush clearing by individual landowners, unpermitted timber harvests for firewood occasionally occur in the watersheds. Illegal timber harvests are seen by resource managers as causing more aesthetic damage than water supply damage.

Other unauthorized activities that may have an adverse impact on water quality are associated with homeless encampments in and around the San Lorenzo River from the Highway 1 bridge to Paradise Park. Reports on homelessness in Santa Cruz County indicate that the homeless

population has likely increased by almost 15 percent since 2015 to an estimated homeless population of 2,249 in 2017. It should be noted that this is a reduction since 2011 when the homeless population was estimated to be 2,771 (Applied Survey, 2017).

The upper portion of this corridor is upstream of the Tait Street intake, the downstream limit of the survey area. The wooded riparian area just upstream of the Tait Street Diversion has historically been used as an informal settlement with efforts made by the City to resolve homeless issues with multiple approaches including providing social services. Because there is a lack of sanitary facilities in the vicinity of the encampments, these sites may be a source of human waste. The City has increased patrols in the area, and has been actively negotiating with riparian landowners upstream of the Tait Street intake for the right to conduct maintenance and restoration along the river (Chris Berry, personal communication, 2012). Homelessness is a complex issue, and while cleaning up one site does not solve the underlying problem, it is significant that the City has been working to keep riparian areas clean. Encampments in the Pogonip remain an issue and have been addressed with increased patrols; they likely have less of an adverse impact on San Lorenzo River water quality than those along the river because of the greater distance.

### **3.13.3 Loch Lomond Reservoir Subwatershed**

While the upper Newell Creek watershed is sparsely populated, a number of rural residential parcels have been developed. Formerly almost inaccessible, this area was cited by County resource planners as an area to watch. Old roads have been regraded to provide better access for the few households that have developed. Because of this new increased intensity of use, including year-round use, City staff has seen increased damage from vehicles to roadways in the last several years.

### **3.13.4 North Coast Watersheds**

County enforcement staff indicated that numerous violations of the grading and erosion control ordinances, sensitive habitat protection ordinance, and timber harvest plans have occurred in the North Coast area. Sedimentation of Majors Creek has been cited as evidence of a general trend towards erosion and illegal grading and a potential TMDL is discussed further in Section 4.9. Although the general consensus was that violations are widespread throughout the subject watersheds and will continue, legacy logging roads are still considered the primary sediment source.

### **3.13.5 SLVWD**

There has been no sign of unauthorized activity within the SLVWD. There are no regular or recurring inspections of the entire SLVWD lands because much of the watersheds are inaccessible to SLVWD staff, however, the staff do make visits to diversions sights and intakes approximately once per week when intakes are in service and prior to placing an out of service intake into service. Signs are posted throughout the watersheds that notify the public that the streams and surrounding areas are used for public water supply. Signs of vandalism have been rare, and most intakes are accessed by roads that are gated to control access by the public. With the exception of the Fall Creek intake and the Bennett Spring intake, intakes are not fenced but are behind gated roads. A few intakes are only accessed by roads that cross private

lands, for which the District has easements in order to cross. Per conversations with SLVWD staff, no signs of dumping or illegal activity have been witnessed by the staff or have been reported to the district. SLVWD staff have noted that there is the possibility of illegal cannabis grows in the Upper Lompico Watershed Reports are usually forwarded to Santa Cruz County so that they may look into potential unauthorized activity.

### **3.13.6 Significance**

Unauthorized activities are significant sources of sediment from eroding property in the watersheds. Small-scale grading and timber harvest frequently use poor practices which lead to barren, unprotected roads, yards, etc. Illegal cannabis cultivation can contribute chemicals and fuels in addition to sediments. Pending regulation of cannabis cultivation may mitigate some of the water quality impacts through implementation of best management practices. Finally, homeless encampments can increase the concentration of microbial and particulate contaminants in streams, and are identified as a source contributing to water quality objective violations in the San Lorenzo River Pathogen TMDL.

### **3.14 Vehicle Upsets and Spills**

Vehicle upsets are potential sources of contamination of hazardous materials into surface waters through the spilling or rupturing and subsequent discharge of the materials being transported. In addition to spilling of any cargo being carried, collisions can release petroleum products from the vehicles themselves. Factors that affect the level of risk for vehicle spills include overall traffic volume, amount of hazardous materials being transported, highway characteristics, and road conditions. There are no prohibitions on the transport of hazardous materials within the study area watershed.

There are two major transportation routes suited for heavy vehicles, both in the San Lorenzo River watershed. State Highway 9 is the major traffic route through the San Lorenzo Valley, while State Highway 17 skirts the eastern edge of the San Lorenzo watershed (see Figure 1-1). There are no major transportation routes in the North Coast watersheds. Empire Grade Road skirts the east boundary – and the west boundary of the San Lorenzo River watershed -- but is not as heavily traveled as Highways 9 and 17. The risk for spills is generally present, and several spills were noted by City staff including an event that resulted in a fish kill in Brookdale, near the Clear Creek and the San Lorenzo River, cars that had entered the creek near Lompico, and the application of fire-fighting foam some of which entered the creek during the wildfires described in Section 3.16.

The Santa Cruz County Hazardous Materials Area Plan was updated in January 2017 and summarizes how local agencies have planned, prepared, and will respond to such an event in Santa Cruz County. The document is an annex to the County Operational Area Plan describing how county resources will be utilized to deal with many different kinds of emergencies affecting the county. Any public safety official on scene can declare a hazardous materials incident, and should immediately call 911. The dispatchers at 911/NetCom (Santa Cruz Consolidated Emergency Communications Center) will route the call to the appropriate local agency. Depending on its size and significance, the incident could be handled by local fire departments, by specialized hazmat teams, or coordinated by an operational area Emergency Operations Center. County staff then preliminarily assess the nature of the contamination, how far it has

gone, and whether it has entered a waterway. County staff will then request assistance from the CDFW if a waterway is affected and will directly notify the downstream water user if appropriate. City staff report that timely notification from the County is an ongoing area of concern and continues not to be performed in a consistent manner (Chris Berry, personal communication, 2017).

### **3.14.1 San Lorenzo River Watershed**

Within the town of Felton, there are three known ground-water contamination plumes which are seeping into the San Lorenzo River. These are the only sites known to be impacting stream water quality. They are under the jurisdiction of the Regional Board.

#### **3.14.1.1 Valeteria Dry Cleaners (6539 Highway 9)**

This site was identified when perchloroethylene (PCE) was detected in the San Lorenzo River in 1985 (0.5 µg/l). Further monitoring tracked the PCE, in 1988, to a spring near this dry cleaner shop which continues to show evidence of PCE in the 2017 Annual Report. The source was determined to be contamination of soils in the dry cleaner's septic system and leachfield originating during the 1960s. The owner conducted a remediation which included removal of sludge within the on-site waste disposal system, steam-cleaning the redwood septic tank, and backfilling with sand. The remediation proved insufficient, and the site was re-excavated in 2002 (U.S. EPA, 2002). The leachfield was then relocated and contaminated soil was exported. Groundwater monitoring results continue to show elevated PCE and TCE concentrations at a location approximately 20 feet upgradient of the San Lorenzo River, and downstream San Lorenzo River monitoring results also show low PCE concentrations. This suggests that the wastes released at the site have migrated, and may continue migrating downgradient. The responsible party is now required to submit a Corrective Action Plan to evaluate and select remedial alternatives for controlling groundwater contamination plume from further migration and impacting the river and for complete cleanup of the groundwater contaminations (Briggs, 2011). The Felton Diversion, which is about 1 mile downstream of the dry cleaner's, has detected PCE as high as 1.7 µg/L on November 1, 2011 relative to an at-the-tap maximum contaminant level of 5.0 µg/L. According to the State of California Geotracker web site, this site continues to be open as remediation continues.

#### **3.14.1.2 Chevron Underground Storage Tank Leak (6325 Highway 9)**

A ground-water plume beneath this site caused by a leaking underground storage tank is contaminating a nearby seep to the river. Chevron has installed an interception sump which collects the seepage. In the seep, recent levels of total purgeable hydrocarbons have been measured at 67 to 7,400 µg/L and benzene has been measured at 2 to 1,700 µg/L, which were consistent with historical concentrations (Stantec Consulting Corporation, 2011). During dry weather, this system appears to be effective in intercepting much of the gasoline-contaminated ground water. During long wet periods, however, the effectiveness is limited. Monitoring occurs quarterly. Currently, Chevron is doing bi-weekly free product pump outs and high-vacuum groundwater extractions on a regular basis and is in the process of getting a commingled plume agreement with the Cornerstone property at 6320 Hwy 9, Felton. Until this is completed, Chevron will continue the groundwater monitoring (Tom Sayles, personal communication, 2012). According to the State of California Geotracker web site, this site is eligible for closure.

#### **3.14.1.3 Sturdy Oil (former Exxon Station) Storage Tank Leak(s) (6225 Graham Hill Road)**

The former Exxon Station near the Covered Bridge in Felton reported leaking conditions in 2000. A ground-water cleanup program was initiated, and, following a brief uptick in gasoline and MTBE concentrations in early 2005, this site is now deemed currently in compliance, with ongoing quarterly monitoring. The on site concentrations of MTBE has dissipated over time, due to the high solubility of MTBE in water, to non-detect concentrations. Residual MTBE concentrations have moved down-gradient and appear to be centered around an off-site monitoring well (Hydro Analysis, 2011). According to the State of California Geotracker web site, this site has been closed.

#### **3.14.1.4 Other Sites with Potential Plumes**

Watkins-Johnson operates an extraction and remediation program at its manufacturing facility next to Bean Creek in western Scotts Valley. Watkins-Johnson used a variety of chemicals in the manufacture of industrial furnaces and electronic parts. Past operations resulted in contamination of the underlying Santa Margarita sandstone with methylene chloride, chloroform, and TCE. The plume contributed TCE to Bean Creek. The site is overseen by the EPA and has an ongoing remediation system which consists of several pumping wells and treatment by granular activated carbon adsorption. The treated water is considered contaminant-free and is either recharged to the aquifer through a leach field, re-used on-site as non-process cooling water, or discharged to Bean Creek. In addition to monitoring the treated discharge, Bean Creek is monitored at one upstream and two downstream sites. Contaminants are now non-detectable in Bean Creek. According to the State of California Geotracker web site, this site continues to be open with remediation and monitoring continuing.

### **3.14.2 Significance**

The existing County system is used to report and clean-up traffic accident and other surface spills. Notification of the downstream water user is part of the response process although it is inconsistent and City staff made efforts to improve notification. Remediation occurred at all four groundwater contamination sites and resulted in a lessening of the contaminant levels seeped to the river at three sites, and possibly at the fourth.

## **3.15 Geologic Hazards**

The two main geologic hazards affecting the quality of drinking water in the study area are earthquakes and landslides. These, along with other infrequent or less challenging geologic hazards, are discussed in this section.

### **3.15.1 Seismic Events**

Few areas of the state are as familiar with the effects of an earthquake on public water supply systems as Santa Cruz County. Santa Cruz County purveyors had to repair a substantial number of emergency main breaks and re-sanitize their distribution systems in the days immediately following the 1989 Loma Prieta event. Observed or potential effects on water supply sources include:

Significant changes in the flow of springs — The yield of Liddell Spring reportedly increased to about 8 to 10 mgd for two months following the October 17, 1989 earthquake and returned to normal, less than 2 mgd, in March 1990. The yield of the nearby quarry spring is reported to have doubled. Many other streams and springs in the region reported similar responses.

Source water quality may change — The mineral quality of most of the northern San Lorenzo tributaries changed noticeably following the 1989 event, and seem to be gradually returning to pre-event conditions. The bacterial pathogen levels of any of the surface sources can potentially change as surface soils and debris are dislodged and enter the stream system. This is particularly a risk with the sources emanating from karstic watersheds. Also, soils and surficial debris can be dislodged by seiches (waves in lakes generated by earthquakes or landslides), and enter Loch Lomond.

Constituent release from reservoir-bottom sediments — While not reported after the 1989 earthquake, other earthquakes could potentially cause the release of gases, pathogens, and oily substances, all of which were observed in Searsville Lake near Palo Alto following the 1906 earthquake (Lawson and others, 1908).

### **3.15.2 Significance**

Seismic events are a significant potential source of contamination and structural damage to existing water supply systems throughout the project area. The ability of treatment plants to anticipate and respond to damage to their own facilities, while also responding to fluctuating water quality and quantity, is a critical factor in the overall management of drinking water in the project area.

### **3.15.3 Landslides and Other Major Slope Instabilities**

Landslides are prevalent throughout the Santa Cruz Mountains, and particularly in the San Lorenzo Valley. Nonetheless, the SCWD and other purveyors have been quite successful in maintaining continuity of service and in avoiding the elevated turbidity and other water quality problems associated with landslides upstream of water intakes. This record reflects, in part, an awareness of the chronic landslide hazard which prevails throughout the subject watershed, and the judgment of senior staff of the purveyors in avoiding water sources which are especially prone to landslides. Large slope instabilities, including landslides, do occur periodically within the subject watersheds, and are expected to keep recurring. Landslides constrain local water systems well beyond concerns over turbidity. Sediment entering the channels limits habitat values that can result in regulatory burdens including need for greater in-stream flow, change in release timing, and other water agency action that can limit water availability in the long-term. For example, the sandy material which has been entering Bean Creek for the past 20 years from the Mount Hermon slide does not appear to elevate turbidities either at the Felton Diversion or at San Lorenzo River Intake at low flows, although the sandy sediment does complicate and add to the cost of diversions and causes other critical environmental damage. Hence, landslides might be seen as constraining water supplies both *when (and just after) they occur* as well as *during the subsequent period when habitat is impaired* downstream -- generally the following spring and summer, when water may not be divertible because it is needed to sustain sufficient habitat.

During the past several decades, there have been a number of very large landslides along nearby streams in settings similar to those which prevail near certain intakes. In addition to the Mount Hermon slide, and Bean Creek slides in general, two examples are:

Baldwin Creek — A very large rock fall completely dammed and impounded Baldwin Creek. Based on observations made by project staff in 1968, the rockfall may have occurred during the prior 10 or 20 years. The setting in which this rockfall occurred is very similar geologically to those found near the Majors Creek intake and along Laguna Creek downstream of the intake.

Love Creek Landslide — In January 1982, a landslide occurred in moderately dipping fractured Monterey shales, such as occur upstream of a number of other areas west of Highway 9 between San Lorenzo Valley High School and Boulder Creek.

The heavy rains in 2017 were associated with significant landslide activity in the watersheds. Some study work by the US Geological Survey is underway to evaluate the landslide activity.

### **3.15.4 Weather-related Events**

Occasional major wind storms or snow falls can introduce a very large amount of organic debris to the watersheds upstream of the intakes. For example, a snowstorm during the first week of January 1974 broke off an astounding number of branches, mainly of oaks and other hardwoods, many of which fell directly into the stream system and decomposed in place. Access to intakes was greatly inhibited for a period of several days to a week or longer.

A series of small to moderate landslides occurred during the winter storms of 2017, greatly impacting the watershed lands and facilities of SCWD and SLVWD. The combination of several years of drought followed by extremely wet conditions with many severe storms with heavy rainfall seemed to produce optimum conditions for landslides and slope failures that significantly impacted diversions, pipelines, and treatment facilities.

### **3.15.5 Significance**

Landslide and slope failures are common occurrences in the Santa Cruz Mountains. The greatest potential impact is at points of diversion and immediately upstream. Major landslides may occur as a result of seismic activity and/or rainfall throughout the subject watersheds and it can be difficult to differentiate weather related impacts from landslides as they often occur in similar time periods. Damage to intakes, pipelines and stream channels in their vicinities may render such facilities inoperable from a period of days to several weeks. In the case of several smaller purveyors, such an occurrence could prevent the delivery of treated surface water to their service areas.

## **3.16 Fires**

The California Department of Forestry and Fire Protection (CalFire) is responsible for fire suppression and management in State Responsibility Areas (SRAs) and the Santa Cruz County Fire jurisdiction. Outside of SRAs, local governments typically have jurisdiction, e.g., fire districts in Boulder Creek, Felton, Ben Lomond, Zayante, and Scotts Valley. Since the last



watershed survey, there have been two major wildfires, Loma Fire (485 acres) and Bear Fire, (391 acres) in Santa Cruz County.

As discussed in the 2013 survey, the CalFire San Mateo-Santa Cruz Unit, RCD for San Mateo County, and Santa Cruz County developed the Community Wildfire Protection Plan (CWPP), a strategic plan identifying risks and hazards associated with wildland fires in the wildland urban interface (WUI) based on input from local stakeholders and the general public and adopted by the Board of Supervisors for both counties (CALFIRE and others, 2010). The plan identifies some critical resources such as Lexington Reservoir but omits Loch Lomond and makes recommendations aimed at preventing and reducing both infrastructure and ecosystem damage associated with wildland fires.

Fuel reduction projects identified in the CWPP receive priority for federal funds. The funding is made available primarily through the California Fire Safe Council's grant clearinghouse. The Fire Safe Council (FSC) provides resources for local communities to form their own FSC. Since 2008, the Soquel, South Skyline, and Bonny Doon FSCs have formed, each of which has submitted roadside and neighborhood shaded fuel breaks project proposals to the CWPP. In addition, a county-wide FSC was formed in 2017 in order to ensure that prevention services can be provided county-wide. Fire management in the region is primarily done on a small-scale, working with FSCs and landowners on projects to reduce fuels and create defensible space. The FSCs are also leading update of the CWPP.

The 2016 Wildfire Safety Recommendations to the Cannabis Cultivation Choices Committee (C4) convened by the Santa Cruz County Board of Supervisors, indicates that while cannabis related fires are not specifically tracked by Santa Cruz County Fire or CAL FIRE, the consensus among the Incident Commanders of recent wildland fires is that 2014 saw a 35% increase in cannabis related fires over dozens in 2013. While 7 of the 11 fires were controlled before they reached ¼ acre; compared to the statewide wildfire average of 98%. The remaining 4 grew to 4, 6, 7, and 22 acres. The cannabis related 22-acre Castle Rock Fire in 2008, required air tankers and helicopters to suppress the fire, which drove the cost to \$20 million. Containment prevented the spread of the fire, up steep brushy slopes to consume the entire Skyline Boulevard area. A cannabis related fire off Lost Valley Road in 2014 burned within 1300 feet horizontally and 1000 feet vertically of the 125 homes in the Los Cumbres residential neighborhood above. (Santa Cruz County Cannabis Cultivation Choices Committee, 2016). Similarly the 4,500 acre Loma Fire in 2016 was caused by a generator used in cannabis grow and the 400 acre Bear Fire in 2017 was in an area within ½ mile of a cannabis grow. Wildfire safety recommendations to the C4 notes that regulation of cannabis cultivation needs to include permanent permitted residence that are compliant with building and fire codes to mitigate the threat of wildfire. Other activities and recommendations are discussed in Sections 4 and 6 respectively.

### **3.16.1 San Lorenzo River Watershed**

The San Lorenzo watershed contains substantial areas of fire-adapted vegetation, reported to burn at historical intervals of typically 40 to 80 years (Hecht and Kittleson, 1998). Several fires occurred in the 1930's and 1940's, with a large fire known as the Sawmill Fire in the 1950's. One other fire of note was the Love Creek fire in 1970. Numerous small fires occur every year, including the Bear Fire near Boulder Creek in October 2017 yet in total, they have not had much impact on reducing total fuel load. The approximately 400-acre Bear Fire is suspected to be a

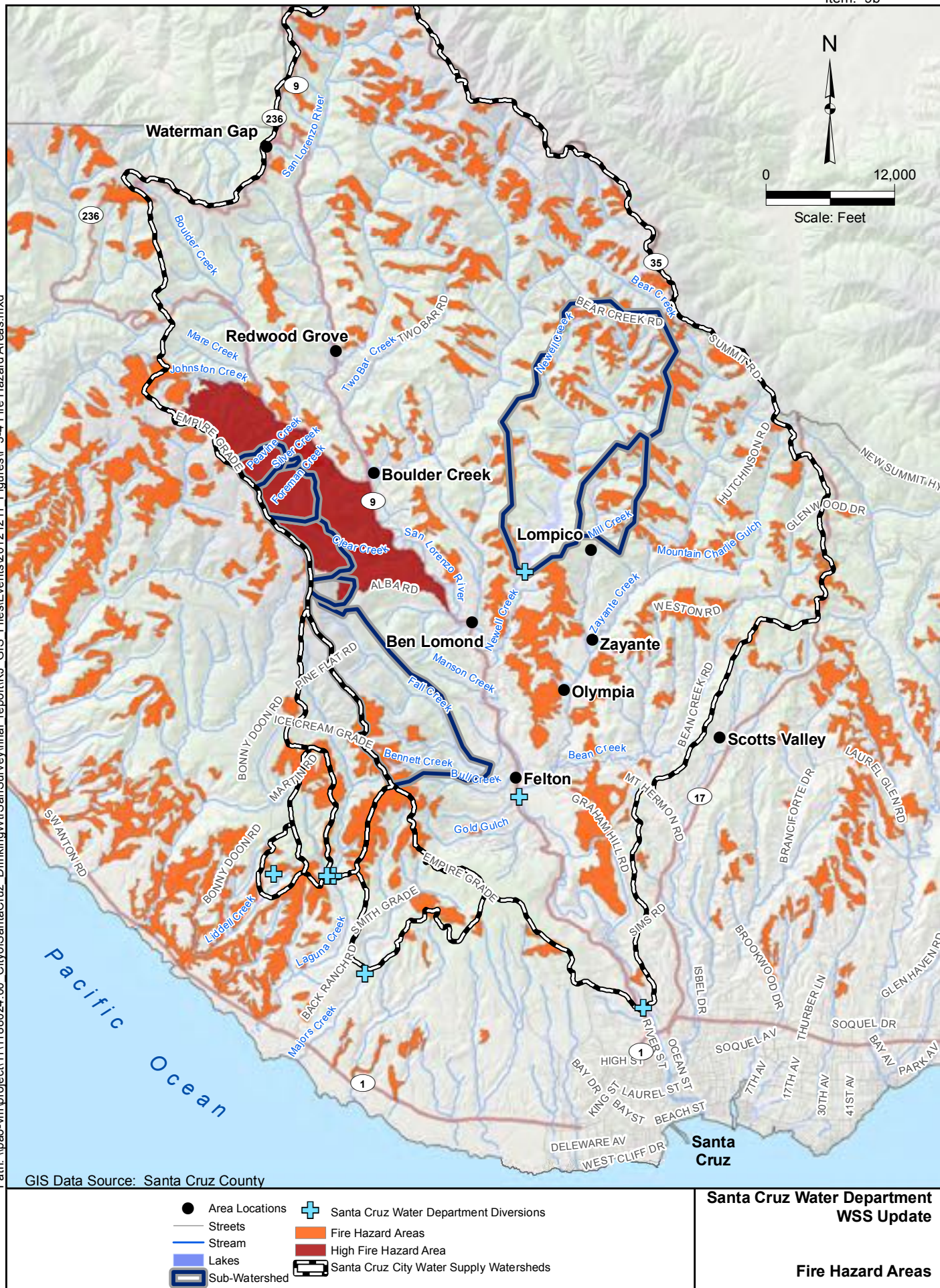
consequence of a lack of code enforcement creating an environment where fire could easily spread in a rural area. City fire was part of mutual aid for the Bear Fire and specifically asked for a fire line to be developed to keep it away from Loch Lomond Reservoir. The potential for a large-scale fire with multi-year consequences for water supply remains which could be exacerbated by sudden oak death syndrome as well as vegetation stressed by drought.

### **3.16.2 Loch Lomond Reservoir and the upper Newell Creek watershed**

The City has taken several steps to address fire hazards within Loch Lomond and other watersheds that may fill gaps in the CWPP. The City has a draft fire plan for watershed properties and routinely meets with fire chiefs to review maps, keys, gates and field conditions, ensuring access to City watershed property for fire suppression and minimizing wildfire hazards. Additionally, the City installed a weather station at Loch Lomond to aid in decisions of how to prepare for potential fire and the Ben Lomond/Lompico fuel break was expanded in 2016 and plans made to improve the Loch Lomond/Love Creek fuel break in 2018. Maintenance of fuel breaks including cutting brush and removing dead trees occurs as needed in the winter; with periodically more intensive fuel management efforts also occur. (G. Eidam, personal communication, 2017)

No significant fires were noted in the Loch Lomond subwatershed since 1959, which burned about 1,000 acres on both sides of the lake. Evidence of this fire can be seen on the east side of the lake, where numerous snags have been left to tower above the regrowth.

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### **3.16.3 North Coast Watersheds**

Brushfires in the North Coast watersheds have occurred periodically, both by human sources (i.e., arson, prescribed burns) and lightning fires. The 2008 Martin Fire was predominantly fuel-driven, and March through June rainfall amounts were the lowest ever recorded for the area, about eight percent of normal (Gordon and Ferreira, 2009). Since the fire, the Regiardo Creek crossing has been completed, a new fuel break in Bonny Doon was completed in cooperation with CalFire in 2016.

### **3.16.4 SLVWD**

There have been no recent fires within the SLVWD subwatershed lands.

### **3.16.5 Significance**

There are three issues related to fire in the subject watershed.

First and foremost, the absence of wildfire increases the chance of a major event which could seriously alter surface hydrology and sedimentation in any or all subject water supply streams. Elevated levels of turbidity are likely to persist from several months to several years following an extensive fire. Because turbidities persist much longer in reservoirs than in springs or run-of-the-stream diversions, post-fire turbidity persistence may prove to be more challenging for the SCWD, which draws heavily upon Loch Lomond Reservoir during the summer. Experience with major floods or fires has shown that reservoirs of similar size can remain turbid throughout the summer (or two) following an extensive burn or other disruptive event. Wildfires can also result in increased Total Organic Carbon which contribute to disinfection by product issues.

Second, fire suppression activities include creation of temporary roads and firebreaks that can be a source of persistent sedimentation and turbidity if not properly abandoned following fire events. Recent philosophies with post fire restoration has avoided traditional reseeding of burned slopes and mulching exposed soils because of changes to the vegetation community that result in reduced biodiversity and potential for a more fire prone landscape in the future. Therefore, the use of erosion control techniques is balanced against the potential for significant erosion to occur following a wildfire.

Third, fire retardants can have adverse effects on water quality. Historically, retardants used by Cal Fire have included borate salts and bentonite clay in water. Borate salts are long lasting, but they are also phytotoxic and soil sterilants. Bentonite clay is less persistent. Use then shifted to ammonium-based fire retardants, which as a group accounted for nearly all chemical retardants used to control wildland fires. The retardant now used by CalFire is Phos-Chek, which is a dry powder made of diammonium sulfate and ammonium phosphate that gets mixed with non-potable water at the air attack base (Hollister, San Andreas, or Sonoma) and then dropped by fixed-wing airplanes along ridgelines or other control points to retard the fire from spreading (Angela Bernheisel, personal communication, 2012). If the retardant is applied directly to stream surfaces, it may cause fish mortalities (Buhl and Hamilton, 1998) and alter aquatic conditions by elevating nitrogen and causing eutrophication downstream (Camp and others, 1996). However, CalFire avoids drops along water courses (Angela Bernheisel, personal communication, 2012).



Fire suppressant foams applied by fire trucks and helicopters may have adverse impacts on water quality, and are more toxic to aquatic biota than the ammonium-based fire retardants (Gaikowski and others, 1996). Application requires leaving a buffer between the spray zone and live streams. Studies by the US Forest Service have shown that the water quality impacts of these materials vary with three elements: the characteristics of the application (i.e., how much dropped and where), the characteristics of the site (steepness, vegetation types, extent of riparian stream cover), and the characteristics of streamflow (higher, turbulent flows result in better mixing, dilution, and reduced toxicity to aquatic life). In general, it can be said that adverse water quality impacts decrease as the distance of application from a stream increases.

The inevitability of a major wildfire has been echoed by state, county and local natural resource managers. When a major fire does occur, water resources may suffer immediately and significantly as homes, roads and infrastructure are rebuilt. In subsequent years, the water utilities will likely see a decrease in turbidity and sedimentation, as vegetation becomes re-established and reconstruction activity decreases. Hulda McLean, a former County supervisor and owner of Rancho Los Osos in lower Waddell Creek, emphasized the importance of turbidity persistence after the 1948 Pine Mountain fire by noting that it took five years before Waddell Creek ran clear at any time during the winter months – a lesson on the effects of a watershed-scale fire (Hecht and others, 2010).

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## **SECTION 4: WATERSHED MANAGEMENT AND CONTROL PRACTICES**

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### **4.1 Introduction**

This section summarizes existing policies and control measures of the various entities which manage, control or influence land and resource use in the San Lorenzo and North Coast watersheds. The control measures discussed in this section are those watershed management practices that may impact water quality of the San Lorenzo River and its tributaries, as well as the SCWD's water supply on the North Coast.

The following sub-sections, which in large part follow the structure of the AWWA *Watershed Sanitary Survey Guidance Manual*, are included in Section 4:

- Water Utility Management Practices
- Inspection and Surveillance of the Watersheds
- Key County Watershed Management Activities
- Watershed Control Authority
- Open Space Policies
- Erosion Control/Soil Management Policies
- Fire Management
- Santa Cruz County Riparian Corridor and Wetlands Protection Ordinance
- Pertinent State and Federal Legislation

Sub-sections of this chapter continue to evolve with the completion of each survey update but the chapter generally maintains the organization dictated by the AWWA manual referenced above. The details of several sub-sections have not changed since the previous reports and are thus only summarized in the present sanitary survey. Table 4-1 lists the general policies and practices that impact water quality in the project study area and summarizes their effectiveness. Generally, while there appears to be a comprehensive group of regulations, policies, and practices in place that can be used to manage watershed activities, more active input by the City as proposed in Section 6 could improve the effectiveness of these activities, especially in light of upcoming legalization of Cannabis cultivation activities and associated state and local regulation.

**Table 4-1: Updated Summary of Policies and Practices Which Impact Water Quality**

Agency/Utility	Primary Watershed Objective	Policies or Controls Which Impact Water Quality	Effectiveness of Policies and Practices
Water Utilities – notably City of Santa Cruz Water Department and San Lorenzo Valley Water District	<ul style="list-style-type: none"> <li>• Protect drinking water supply.</li> <li>• Protect water quality of drinking water sources and manage to minimize quality change.</li> <li>• Manage to avoid microbiological and chemical contamination.</li> <li>• Manage drinking water source areas for environmental quality.</li> </ul>	<ul style="list-style-type: none"> <li>• Control or disallow public access to watershed lands.</li> <li>• Manage secure intake structures.</li> <li>• Implementation and growth of the SCWD Watershed program.</li> <li>• Advocacy and environmental review of proposed projects in watershed lands.</li> <li>• Conservation easements or licenses on private lands</li> </ul>	<ul style="list-style-type: none"> <li>• SCWD Watershed program is resulting in the collection of valuable data which are used to plan for more effective lands management.</li> <li>• Continued success in working with other agencies/groups on projects which enhance water quality protection measures including the multiagency San Lorenzo River 2025 to improve the river and includes the Riparian Conservation Program to improve stream conditions in the County jurisdiction.</li> <li>• Increased patrolling of source facilities is helping to minimize impacts associated with trespassing and illicit land use.</li> </ul>
Santa Cruz County (e.g., Parks, Health Services Agency, Planning Department)	<ul style="list-style-type: none"> <li>• General Plan established a regulatory approach to plan future development.</li> <li>• Regulate septic systems.</li> <li>• Protect riparian and wetland systems.</li> <li>• Regulate erosion control practices.</li> <li>• Regulate small water systems.</li> <li>• Regulate cannabis cultivation</li> <li>• Provides for open space access.</li> </ul>	<ul style="list-style-type: none"> <li>• County General Plan.</li> <li>• Ordinances for Cannabis cultivation, erosion control, water quality control, riparian corridor/wetlands protection, sensitive habitat</li> <li>• Surveillance of parks.</li> <li>• Control illegal or mis-implemented grading, development and dumping.</li> <li>• Reduce nitrates, pathogens and sediment in streams.</li> <li>• San Lorenzo River Watershed management plan.</li> <li>• County Forest Practice Rules.</li> <li>• Wastewater/Nitrate management plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Cannabis cultivation regulations</li> <li>• Grading/erosion control ordinance can be too cumbersome to small homeowners or small projects.</li> <li>• Exceptions to ordinances often granted and enforcement is limited.</li> <li>• San Lorenzo Watershed management plan is well thought out and presents tangible recommendations for betterment of water quality.</li> <li>• Turbidity, nitrate and pathogen monitoring in support of the 303(d) impairment listing is providing needed data to track trends and responses to implemented projects.</li> <li>• Insufficient staffing has been exacerbated by budget cuts.</li> </ul>
California Dept. of Forestry and Fire Protection (Cal Fire)	<ul style="list-style-type: none"> <li>• Suppress wildland fires (fire protection division).</li> <li>• Control logging (resource management division).</li> <li>• Fire preparedness</li> </ul>	<ul style="list-style-type: none"> <li>• Prescribed burning to minimize impact of larger fires.</li> <li>• Require Timber Harvest Plans for logging of more than 3 acres.</li> <li>• Fuel management</li> <li>• Monitor and enforce forest practice rules.</li> <li>• Coordinate fire fighting efforts.</li> </ul>	<ul style="list-style-type: none"> <li>• Several wildfires have occurred in the area in 2008, 2009, and 2017 as discussed in Section 3.16.</li> <li>• Excessive fuel levels and substantial urban/rural interface area could result in severe wildfire.</li> <li>• Harvest Plans are comprehensive, though follow through, especially in critical years after the harvest is often not sufficient.</li> <li>• Some harvests cause roadway erosion.</li> <li>• Timber harvest plan rules should provide water quality protection.</li> </ul>



<b>Table 4-1 Updated Summary of Policies and Practices Which Impact Water Quality</b>			
<b>Agency/Utility</b>	<b>Primary Watershed Objective</b>	<b>Policies or Controls Which Impact Water Quality</b>	<b>Effectiveness of Policies and Practices</b>
California State Water Resources Control Board and the Regional Water Quality Control Board - Central Coast Region (SWRCB and RWQCB)	<ul style="list-style-type: none"> <li>• Adopt area-wide water quality control plans (Basin Plans).</li> <li>• Control/coordinate water quality issues.</li> <li>• Control quality and quantity of discharges from wastewater treatment facilities, stormwater, and construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Enforcement power to issue permits with specific water quality requirements.</li> <li>• Enforcement power of State Water Code.</li> <li>• Issue NPDES permits to specific entities for waters-of-the-state discharges.</li> <li>• Establish water quality objectives.</li> <li>• Impaired Water Body listings and Pathogen, Nitrate and Sediment TMDL for San Lorenzo River.</li> <li>• Provide some funding for septic tank system improvements.</li> <li>• Administering Phase II NPDES and Construction Stormwater regulations.</li> </ul>	<ul style="list-style-type: none"> <li>• Regional Board is coordinating with County's efforts to reduce nitrates. Approved nitrate TMDL and Sediment TMDL in 2000 and 2003, respectively.</li> <li>• Pathogen TMDL approved in 2009 and chlorpyrifos TMDL in 2014.</li> <li>• Implementing programs to emphasize watershed protection from both point and non-point discharges.</li> <li>• Regional Board was more active in the review of Timber Harvest Plans and attendance pre harvest inspections from a water quality perspective in the years prior to 2007 but activity appears to have declined in recent years.</li> <li>• Implementation of Stormwater Management Plan by RWQCB for county and cities under Phase II NPDES permit</li> </ul>
California Department of Fish and Wildlife (CDFW)	<ul style="list-style-type: none"> <li>• Protect fish and wildlife.</li> <li>• Permit diversions from waterways.</li> </ul>	<ul style="list-style-type: none"> <li>• Enforcement power of state code.</li> <li>• Limit diversions from waterways.</li> <li>• 1600 permits now require CEQA review.</li> <li>• Fisheries Restoration Grants Program is viable mechanism for drinking water source protection.</li> </ul>	<ul style="list-style-type: none"> <li>• CDFW has specific regulations to control water quality.</li> <li>• CDFW has initiated Watershed Enforcement Program with Watershed Enforcement Teams for cannabis to improve enforcement of applicable regulations that affect water quality</li> <li>• Staff turnover may limit effectiveness.</li> </ul>

<b>Table 4-1 Updated Summary of Policies and Practices Which Impact Water Quality</b>			
<b>Agency/Utility</b>	<b>Primary Watershed Objective</b>	<b>Policies or Controls Which Impact Water Quality</b>	<b>Effectiveness of Policies and Practices</b>
Cal-Trans and County Public Works	<ul style="list-style-type: none"> <li>Construct and maintain primary and secondary roadways.</li> <li>Respond to accidents and landslides.</li> <li>Design of drainage systems and in-stream habitat improvements</li> </ul>	<ul style="list-style-type: none"> <li>Minimize herbicide use.</li> <li>Avoid dumping debris into streams from roads projects.</li> <li>Quick response to chemical spills.</li> </ul>	<ul style="list-style-type: none"> <li>Storage, sidecast, and transfer of roadway debris can lead to increased sediment in streams.</li> <li>Endangered Species Act requirements may improve road practices.</li> <li>Implementing projects which improve in-stream salmonid habitat and riparian habitat in conjunction with roads projects.</li> </ul>
National Marine Fisheries Services (NMFS or NOAA Fisheries) under US Department of Commerce	<ul style="list-style-type: none"> <li>Protection-restoration of special status species (Coho Salmon and Steelhead Trout) in the San Lorenzo and North Coast watersheds.</li> </ul>	<ul style="list-style-type: none"> <li>Implement and enforce the Endangered Species Act (ESA).</li> </ul>	<ul style="list-style-type: none"> <li>City of Santa Cruz plans to issue a draft Habitat Conservation Plan in 2018 for steelhead and coho to address ESA related issues related to operations of the City's water facilities.</li> <li>Sediment reduction which benefits listed salmonids will improve turbidity in raw water.</li> <li>Potential source loss from the north coast surface sources through ESA compliance will result in a degradation of the City's raw water supply quality and limit production flexibility.</li> </ul>
United States Fish and Wildlife Service (USFWS) under US Department of the Interior	<ul style="list-style-type: none"> <li>Protection-restoration of special status species (Red-legged Frog, etc.) in the San Lorenzo and North Coast watersheds.</li> </ul>	<ul style="list-style-type: none"> <li>Implement and enforce the Endangered Species Act.</li> </ul>	<ul style="list-style-type: none"> <li>City of Santa Cruz is presently engaged in ESA related negotiations as a part of the City's draft Habitat Conservation Plan.</li> </ul>

## 4.2 Water Utility Management Practices

The SCWD, the SLVWD, the California Department of State Parks, Santa Cruz County Parks, and some private landowners of camps and timber properties are the largest watershed property managers in the project area as shown on Figure 2-1; however, several of the smaller water purveyors own and/or manage land adjacent to their wells, springs and surface water intakes. Watershed management practices vary for each utility agency. The SCWD, for example, manages its lands to maintain optimal water quality and to limit recreation at the Loch Lomond Reservoir. SLVWD also manages its watershed lands, through administration of their Watershed Management Plan, to maintain optimal water quality, limit access, and minimize potential land disturbances.

### 4.2.1 Jurisdiction

The jurisdictional area of this sanitary survey is within Santa Cruz County. Within the sanitary survey watersheds, the City of Santa Cruz serves the Pasatiempo and Sycamore Grove areas.

The other water utilities participating in the Sanitary Survey are located in the San Lorenzo River watershed and are in unincorporated portions of Santa Cruz County, except for a portion of the middle Bean Creek watershed within the City of Scotts Valley. Most of the City of Scotts Valley drains to the San Lorenzo River via Carbonera Creek and Branciforte Creek, which flow into the San Lorenzo River below the SCWD Tait Street Diversion. This portion of Scotts Valley shares most watershed management issues with the San Lorenzo Valley but was not part of the 2012 watershed sanitary survey.

## **4.2.2 Watershed and Reservoir Management Practices**

### **4.2.2.1 City of Santa Cruz Water Department**

The SCWD owns watershed land in the Newell Creek (2,880 acres), Zayante Creek (880 acres), and Laguna Creek (240 acres) watersheds.

The SCWD has a Watershed section comprised of the Water Resources Management and Recreation workgroups. The primary objective of the Water Resources Management workgroup is to focus on environmental compliance with applicable State and Federal regulations related to the source water watersheds and SCWD operations. The Watershed section coordinates the activities at Loch Lomond with the Water Resources Management staff focusing on outreach and the Recreation staff assisting with interpretive events, watershed land patrols and watershed/creek sign programs.

Within the last several years, a recreation area study to expand recreation at Loch Lomond was conducted but input from Calfire indicated that additional recreation is not advised because of the increased risk of fire. The SCWD has conducted a watershed lands assessment of natural resources in order to make more informed decisions regarding management of watershed lands for water quality and quantity protection and protection of special status species and their habitats. In addition, the SCWD partnered with the Santa Cruz RCD in a program for watershed identification and signage at creek crossings, educational outreach programs to the San Lorenzo Valley schools, and the State of the San Lorenzo River Symposium annual workshop.

The Loch Lomond Recreation Area (LLRA) is managed for water quality as well as recreational benefits. One of the most significant reservoir practices is management of blue-green algae (cyanobacteria) blooms at Loch Lomond Reservoir through the use of PAK 27™ – a non-copper-based algaecide. PAK 27™ is characterized as an environmentally safe algaecide/algaestat which produces oxygen and hydrogen peroxide by-products, neither of which are reported to be harmful to aquatic species, such as fish, or other forms of algae, such as green algae or diatoms. However, it is also important to consider that a recent ruling by the State Water Resources Control Board grants the City of Santa Cruz an exception for the use of copper-based algaecides, if the need arises (Water Quality Order No. 2013-002-DWQ, General Permit No. CAG990005). In addition to blue-green algae management, wastewater is trucked out of the recreation area, human body contact recreation is not allowed at the reservoir, and no cattle or horses are permitted in the watershed.

#### **4.2.2.2 San Lorenzo Valley Water District**

The SLVWD service boundaries encompass 37,120 acres in the San Lorenzo Valley watershed, including a small portion of the Pescadero drainage which is northwest of the San Lorenzo River watershed. Watershed lands owned by the SLVWD include approximately 1,623 acres in one continuous piece on Ben Lomond Mountain, around the tributaries of the San Lorenzo River that supply the SLVWD's surface water (Clear Creek, Sweetwater Creek, Peavine Creek, Foreman Creek, and Silver Creek), and in the Malosky Creek and Harmon Creek drainages. The SLVWD also owns approximately 163 acres in the recharge area of its Olympia wellfield. Marked trails on these watershed areas are used by horse riders. SLVWD now has some deeded riparian lands from nearby private land owners on Lompico Creek that will not be developable and could protect Lompico Creek if it is used as a source in the future. In early 2012, SLVWD initiated a formal agreement with the Santa Cruz Land Trust to provide patrol service. The primary concerns continue to focus on trespassers and off-road vehicles. Public access is limited.

Timber harvesting continues to not be permitted on SLVWD watershed lands. No pesticide/herbicide use is permitted on SLVWD lands. Watershed Lands Acquisition

The SLVWD purchased the 188-acre Malosky Creek property from Sempervirens Fund in 2006. This property had been on the District's list of most wanted watershed acquisitions for years. The District's 5-mile long pipeline crosses the property. As part of the transaction, the SLVWD agreed to retire the timber rights on the property. The SLVWD has had a no-commercial logging policy on its watershed lands since the 1980s.

SLVWD acquired the Felton Water System from California-American Water Company in 2008 which also included about 252 acres in the Fall Creek watershed that supply the Felton water system. The 2016 acquisition of LCWD included about 500 acres of Lompico Creek watershed lands.

In addition, as discussed in the Executive Summary, the acquisition of the 8,532 acres of CEMEX lands on the North Coast watersheds by a number of land preservation organization has resulted in the potential for protection of habitat and water quality, particularly for the community of Davenport but, with additional public access, could increase the risk of fire and resulting water quality challenges. Future activities to acquire lands and easements to protect water quality are discussed in Section 6.

### **4.3 Inspection and Surveillance of the Watersheds**

Inspection and surveillance of watershed lands in the project area are performed by numerous agencies, depending on ownership and type of use. For example, State Parks regulations are enforced by Parks staff. County Parks, like Quail Hollow County Park (about 300 acres), are managed by County Parks personnel. Surveillance of the purveyor-owned watershed lands is conducted by the water purveyors themselves. In addition, the SCWD staff has advocated for increased patrols in the Pogonip Preserve open space area upstream of the Tait Street diversion as well as acquiring licenses which have expanded the ability to monitor and control activities on private lands upstream of the City's Tait St. intake. Efforts to prioritize limited patrol resources towards water quality remain a challenge. The remainder of the project area is under the jurisdiction of Santa Cruz County.

Within the Loch Lomond subwatershed, the City has instituted a comprehensive security program that includes installing cameras with motion sensors and infrared capability, fences, and gates on the City's portion of the watershed and increased patrols. The City has also installed a weather station at Loch Lomond to improve preparation for fire. As of 2017, there were 4 full-time rangers, one of whom lives at Loch Lomond, 2 full time ranger assistants, and 2 seasonal ranger assistants. The ranger and ranger assistants conduct patrols by truck, all-terrain vehicle or on foot with a focus on high use areas.

The County of Santa Cruz's Planning Department, Health Services Agency, and Department of Public Works develop and enforce water-quality related county ordinances and provide review and permitting of development plans, timber harvest plans, erosion control plans, quarry plans, and maintenance of county roads. The Santa Cruz County Fire Department and the Office of Emergency Services participate in the development of fire-related development standards and post-fire restorations efforts, in addition to the review and updating of the countywide Disaster Contingency Plan and Critical Fire Hazard Maps.

#### **4.4 Key County Watershed Management Activities**

As previously mentioned, Santa Cruz County developed a comprehensive management plan for the San Lorenzo River watershed in 1979. The San Lorenzo River Watershed Management Plan was updated in 2001 through a collaborative process with the Regional Board, a citizen and landowner group, and other agencies. The ongoing efforts by the County and the completed update to the watershed management plan underscore the continued efforts of the County to implement practices, programs and ordinances which aim to improve water quality in the San Lorenzo River watershed. Pertinent efforts and data from those efforts will be used for the purposes of this report to summarize water quality and watershed management activities in the San Lorenzo River watershed.

#### **4.5 Watershed Control Authority**

Policies and control measures adopted by the governmental agencies are described in this subsection. All the watersheds in this area are located in Santa Cruz County, and are therefore subject to the policies adopted by the County *General Plan*. Key goals and policies outlined in the *General Plan* are described below.

##### **4.5.1 The County General Plan and the Local Coastal Program (LCP)**

The 1994 Santa Cruz County General Plan and the Local Coastal Program (LCP) is a combined planning document that serves two primary purposes and have not been updated since the 2013 watershed sanitary survey. First, it establishes a regulatory framework against which all proposed development is measured. Second, it serves as a vision statement for the desired future of the county. The *General Plan* was prepared to meet the requirements of both the State Planning Laws and the Coastal Act.

The *General Plan* sets up numerous goals, objectives, policies, and programs related to the protection of water resources and sensitive habitats. The County adopted an *ecosystem* approach while drafting ordinances pertinent to water quality concerns. In other words, there is

a clear understanding that by preserving and enhancing the natural systems of the county, a secure and safe drinking water supply will most likely be obtained. *General Plan* elements that contain goals most pertinent to the protection of water resources are as follows: Chapter 5 - Conservation and Open Space, Chapter 6 - Public Safety and Noise, and Chapter 7 - Parks Recreation and Public Facilities. The *General Plan* Conservation and Open Space, Public Safety and Noise, and Parks and Recreation and Public Facilities elements have not been updated since 1994. The Safety, Noise and Housing elements were scheduled for updated in 2015 and the Land Use, Circulation and Community Design were scheduled for updated in 2016 and 2017.

#### **4.5.2 Wastewater Discharge**

Wastewater discharge requirements for point source discharges from wastewater treatment plants or from industrial facility plants directly to receiving streams are established through National Pollutant Discharge Elimination System (NPDES) permits administered by the Regional Board under the federal Clean Water Act. These NPDES permits control the discharge by establishing numerical effluent limitations for specific constituents and parameters which the treatment plant or industrial facility must meet. The constituents for which effluent limitations are established are specific to the type of discharge. Suspended solids and coliform bacteria may be regulated, depending on the type of plant or facility. Each NPDES permittee collects data which it reports to the Regional Board on a regular basis. This self-monitoring data demonstrates compliance status with the specific effluent limitations.

Wastewater discharges to septic systems are regulated by the County within guidelines established by the Regional Board. Although no changes have been made to the County Sewage Disposal Ordinance, policies have been adopted to provide for tighter oversight and maintenance of alternative technology systems. In addition, a State-revolving fund was historically used to promote the use of such systems through a low-interest loan program. However, this loan program is no longer available.

The County's comprehensive Wastewater Management Program previously served as a model for draft statewide wastewater management and was adopted by the State Water Resources Control Board.

The SWRCB adopted state-wide On-site Wastewater Treatment (septic) policy in 2012 as required under AB 885, detailed in Section 4.9.2.4, will provide some strengthening of local septic regulations, particularly within the area 2,500 ft upstream from a surface water intake.

#### **4.5.3 Stormwater Regulations**

Municipalities with populations greater than 100,000 and certain classes of industries (including construction sites which involve a land disturbance of more than 1 acre) are regulated under the NPDES Phase I permit program administered by the Regional Board. Municipal permits are specific and individual to the municipality in question, but all contain provisions for management of specific activities (e.g., construction, new development planning, industries, illicit discharges, public agency activities such as street sweeping and public education) and for monitoring. Certain classes of industries are required to file a Notice of Intent (NOI) to comply with the provisions of the State General Industrial Stormwater NPDES Phase I Permit. The industry

makes this notification to the SWRCB and, thereafter, is expected to comply with the general permit provisions which focus on pollution prevention and good housekeeping measures. Construction sites with a land disturbance greater than 1 acre must file a NOI with the SWRCB to comply with provisions of the state General Construction Activities Stormwater NPDES (Order No. 2009-0009 DWQ). This permit focuses on sediment control and waste management. The SWRCB maintains a database of industries and construction sites which have filed NOIs.

The County of Santa Cruz and the City of Santa Cruz have each completed and submitted a complete Phase II NPDES application to the Regional Board, and the Regional Board approved their submitted Storm Water Management Plans in 2009. The County and City both require construction phase and post-construction phase erosion control plans for construction projects encompassing an area of less than 1 acre and for which grading is part of the construction plan. The plans typically must include best management practices (BMPs) which protect against illegal discharge of pollutants to the creeks and streams in the project area. The Phase II regulations provide support for existing County and City ordinances which establish the criteria for protection of water quality and natural resources.

The County adopted its current Stormwater Management Program in 2010 that meets the established requirements of the statewide NPDES Permit and serves as the Stormwater Pollution Prevention Plan for the County and the City of Capitola. Related to the Stormwater Management Program, County Ordinance No. 5117 added Chapter 7.79 Runoff and Pollution Control to the Santa Cruz County Code in 2012. The City completed a Stormwater Management Plan Guidance Document in July 2013 and has included an Ordinance for Stormwater and Urban Runoff Pollution Control as part of the municipal code since 2003 with updates through 2012.

#### **4.5.4 Mines and Quarries**

Surface discharges from both active and inactive mines to receiving streams are regulated by the Regional Board under the Waste Discharge Requirement permit program. Permit conditions for discharges from active mines usually allow only inert or non-hazardous waste releases. Mines typically meet these requirements by implementing various best management practices.

Regulation of mine and quarry operations in the watershed study area is covered under the County Mining ordinance. Mineral Resource Areas are designated by the State Geologist and State Mining and Geology Board. The County classifies these areas as within the County Mineral Zone Extraction District (M-3) and requires environmentally sound quarry operations and reclamation practices in accordance with the state Surface Mining and Reclamation Act (SMARA), which emphasizes the primacy of post-reclamation uses and the need to plan and limit mining to be compatible with such uses. Development on M-3 lands is restricted to mining and other compatible uses. Compliance with the California Environmental Quality Act (CEQA) for mining operations is required. Mining operations adjacent to riparian corridors must be conducted in accordance with the Riparian Corridor and Wetlands Protection ordinance. Quarry operations are overseen by the County Planning Department Quarry Coordinator. There have been no changes made to the County Mining Ordinance since completion of the 1996 sanitary survey.

#### **4.5.5 Animal Keeping Regulations in Santa Cruz County**

The County of Santa Cruz does not currently have a specific ordinance regulating domestic and confined animals in residential and rural areas. General animal keeping and breeding regulations, however, are outlined in the County Code under Chapter 13.10, Part VI, Article IV (animal regulations). The Article provides regulations for animal enclosures (stables and paddocks), care of animals (animal hospitals and kennels), animal keeping (horses, cows, sheep, etc.) different types of animal raising (family raising, poultry, bird, turkeys, etc.) and biomedical animal operations.

#### **4.5.6 Recreational Activities and Policies**

Agencies which administer the recreational and open space areas in the watershed study area include the County Parks Department, the Boulder Creek Recreation and Park Department, the California Department of Parks and Recreation, and the SCWD. Management policies in the SCWD's Loch Lomond Recreation Area were previously described in Section 4.2.2. In addition, the City prepared a draft Parks Master Plan 2030 which is out for public review as of September 2017 and focuses on recreation opportunities inside the City limits while acknowledging opportunities within the County. One element of the draft Parks Master Plan is acknowledgement of the need to create a legal, supervised campground for homeless to deter sleeping in parks and along the San Lorenzo River.

Overall, recreational policies and open space policies in the watershed are described in the County's *General Plan*. Since the *General Plan* has not been updated since 1994, recreational policies and open space policies have not changed since completion of the 1996 sanitary survey. It should be noted that County Parks Department initiated a Strategic Planning process in 2017.

The County Health Services Agency continues to routinely monitor creek and river swimming areas in the San Lorenzo Valley for fecal coliform bacteria. This monitoring is conducted to obtain information on when to issue advisories avoiding swimming areas, and is part of larger County-wide program. The State parks in the watershed study area are essentially open spaces. The County *General Plan* promotes cooperation with state activities and specifically encourages expansion of state ownership at the Fall Creek and Henry Cowell park units.

### **4.6 Open Space Policies**

The Santa Cruz County *General Plan* goals for open space protection are as follows:  
"To retain the scenic wooded, open space and rural character of Santa Cruz County; to provide a natural buffer between communities; to prevent development in naturally hazardous areas; and to protect wildlife habitat and other resources."

Within the project watersheds, the majority of the population is concentrated along Highway 9 on the floor of the San Lorenzo Valley. Steep slopes and rugged terrain have long been a significant constraint to commercial and residential development in all areas of Santa Cruz County. As a result, the area is rural in general character, heavily forested, and visually dominated by open and undeveloped space.



Henry Cowell Redwoods State Park, the Fall Creek unit of Henry Cowell, Castle Rock State Park, and Big Basin Redwood State Park are all managed as public open space. The water purveyors' watershed lands are managed for water resource protection, and to a limited extent, for recreation. Several land trusts, including the Santa Cruz County Land Trust and the Sempervirens Fund own and/or manage open spaces in the project area.

A portion of the University of California Santa Cruz - Upper Campus and the Pogonip Open Space are adjacent to Henry Cowell Redwoods State Park in the San Lorenzo Valley. Several summer camps, conference centers, and retreats operate small water systems and own watershed lands. Private owners hold the remainder of lands in the project area.

#### **4.7 Erosion Control/Soil Management Policies**

The County has an Erosion Control Ordinance with the purpose of eliminating and preventing conditions of accelerated erosion that may lead to degradation of water quality, loss of fish habitat, damage to property, loss of topsoil and vegetative cover, disruption of water supply, and increased danger from flooding. The policies in the ordinance that are intended to protect water supply are as follows:

- Streams or drainage courses shall not be obstructed or disturbed except for approved road crossings, unless disturbance of a drainage course will improve overall site design and be consistent with the purpose of the ordinance.
- Erosion control measures specified in, or pursuant to, this ordinance, shall be in place and maintained at all times between October 15 and April 15.
- Runoff from activities subject to a building permit, land division permit, or development permit shall be properly controlled to prevent erosion and adequate for runoff from a ten-year storm.
- Land clearing shall be kept to a minimum and vegetation removal shall be limited to that amount necessary for building, access, and construction.

When no land development permit has been issued, the following types of land clearing require an erosion control plan:

- Any amount of clearing in a sensitive habitat.
- One-quarter acre or more of clearing in the Coastal Zone if also in a least disturbed watershed, a water supply watershed, or an area of high erosion hazard.
- One acre or more of clearing in all areas not included in the above items.

When a land development permit has been issued, land clearing may be done in accordance with the approved development plan; however, approval of land clearing requires that "all disturbed surfaces shall be prepared and maintained to control erosion and to establish native or naturalized vegetative growth compatible with the area."

Despite the fact that the Erosion Control Ordinance has not changed since the 2013 sanitary survey update, new stormwater discharge regulations under Phase II of the NPDES permitting system administered by the Regional Board are followed by both the City and the County through administration of various permits, including most notably construction permits. Both entities require erosion control plans covering the construction and post-construction phases of projects that are less than one acre in size. The erosion control plans are developed to protect against illegal discharge of sediment and other contaminants to creeks, streams and other water bodies. Projects larger than one acre in size are regulated by the SWRCB, while the Region Boards and the local storm water jurisdictions (County or City) that issue development/building, grading and other permits implement sediment and erosion controls on projects less than an acre. Enforcement efforts remain limited by staff availability at all levels.

#### **4.7.1 Roads**

Caltrans and the County Department of Public Works are responsible for roadway maintenance on specific corridors. Both agencies have policies to truck roadway debris to designated dump sites. For example, they should not “broad-cast” or “side-cast” debris to the side of any road, especially roads near streams. However, significant winter storms such as occurred in 2017 can generate significant land slide material which can be difficult to move in a timely manner and can pose a water quality risk as a new storm comes into the area. Also, some county roads are owned jointly and shared among residents in rural areas. The County has established numerous roadway associations to tax residents and fund maintenance, culvert design and construction for these roads. This keeps the County in control of the maintenance activities and proper techniques are typically followed to mitigate erosion. The County’s Road Maintenance Manual links directly to the FishNet 4C Roads Manual: Guidelines for Protecting Aquatic Habitat and Salmon Fisheries for County Road Maintenance published by the Fishery Network of the Central California Coastal Counties which indicates the sensitivity to proper road maintenance activities to minimize water quality impacts.

In addition, when funding has been available, the Santa Cruz County Resource Conservation District (SCCRCD) has historically undertaken a private roads rehabilitation program aimed at identifying those private road segments (after being approached by private landowners or roads associations) which contribute sediment to creeks and streams and further identifying repair schemes for the sediment contributing road segments. As a partner in this effort, the Coastal Watershed Council has developed a Rural Roads Sediment Inventory Manual which Council and Conservation District staff can use while conducting roads inventory work. In addition, the SCCRCD applied for and obtained funding that allowed rural road erosion control projects, some of which are also described in Section 5.5 to continue starting in around 2008 are continuing through 2016. As of 2017, funding for rural roads is not available.

#### **4.8 Fire Management**

The *General Plan* fire management objective is “to protect the public from the hazards of fire through citizen awareness, mitigating the risks of fire, responsible fire protection planning, and built-in systems for fire protection and suppression.”

The San Lorenzo Valley and North Coast watersheds are within the jurisdiction of Cal Fire, locally headquartered on Highway 9 in Felton. Cal Fire is equipped to suppress wildland fires

throughout the project area. Local fire districts take primary responsibility for fighting domestic and commercial fires in their specific areas of jurisdiction. At the county level, the Santa Cruz County Fire Marshall is responsible for the coordination between neighboring fire districts, particularly during first alarm response. The Santa Cruz County Office of Emergency Services provides communication and warning services to area residents and fire districts. As discussed in Section 3.16, a Community Wildfire Protection Plan has been developed and is in the process of update by the Fire Safe Council.

Prescribed burning by the California Department of Parks and Recreation at the perimeters of Henry Cowell Redwoods State Park and Big Basin State Park were conducted in 2016 and 2017 to minimize the potential spread of a major conflagration either into or out of the parks. Prescribed burns are also used to promote fire-tolerant native vegetation threatened by invasive non-natives.

In addition, the City has prepared a draft Fire Plan for watershed properties to improve fire management planning on City properties. The City has also focused on maintaining fuel breaks and roads in their watershed. Maintenance has included the use of herbicides at the ridge top firebreaks as part of an integrated pest management (IPM) approach to fire preparedness.

## **4.9 Other Local, State and Federal Regulations**

In addition to the topic-specific watershed management practices, activities, and controls described in previous sections, other surface water quality environmental regulations exist that affect how water purveyors can meet drinking water quality regulations within the San Lorenzo River and North Coast watersheds.

### **4.9.1 Local Regulations**

#### **4.9.1.1 Santa Cruz County Water Quality Control Ordinance [1974]**

Santa Cruz County developed a water quality ordinance in 1974 to manage the turbidity level of natural waters in relation to projects which may impact these turbidity levels. Numerical criteria were established in relation to the impact on natural water turbidity levels from the implementation of any project. If the criteria are exceeded due to activity of any permitted project, then the project is deemed to be in violation of the permit. The County criteria are valid unless more stringent permit criteria are established by the California Department of Fish and Wildlife or the Regional Water Quality Control Board.

#### **4.9.1.2 Santa Cruz County Riparian Corridor and Wetlands Protection Ordinance**

The purpose of this ordinance is to eliminate or minimize encroachment into the riparian corridors of Santa Cruz County to preserve, protect, and restore riparian corridors. No development activities are allowed within the riparian corridor other than those allowed through the following key exemptions and exceptions:

### Exemptions

- The continuance of any pre-existing nonagricultural use, provided such use has not lapsed for a period of one year or more. This includes changes of uses which do not significantly increase the degree of encroachment into or impact on the riparian corridor as determined by the Planning Director.
- The continuance of any pre-existing agricultural use, provided such use has been exercised within the last five years.
- Control or eradication of a pest as defined in Section 5006, Food and Agriculture Code, as required or authorized by the County Agricultural Commissioner.
- Drainage, erosion control, or habitat restoration measure required as a condition of County approval of a permitted project.

Exceptions are granted on a case by case basis after a filing with the County and based on findings by the Zoning Administrator that include that there are special circumstances affecting the property; that the exception will not be detrimental to the public or injurious to other downstream properties and is in accordance with ordinance. Conditions may be imposed that include maintenance of a protective vegetated strip between the activity and the water body; installation and maintenance of water breaks, sediment and erosion control including reseeding and other surface treatments and sediment catch basins.

The ordinance has not been updated since the 2013 sanitary survey but the County Fish and Wildlife Advisory Commission (formerly Fish and Game Advisory Commission) is currently considering changes to recommend to the County Board of Supervisors. The Santa Cruz County Fish and Wildlife Commission and the National Marine Fisheries Service (NMFS) have recommended to the Board of Supervisors that the County code regarding protection of riparian corridors be strengthened with new standards for streamside development and with targeted implementation and enforcement in water supply and coho salmon recovery watersheds and receives periodic updates on environmental compliance topics at their meetings. In 2014, the Santa Cruz County Planning Department initiated a Code Compliance roundtable to coordinate work programs among the Fish and Wildlife and Water Advisory commissions as well as the Commission on the Environment. In addition, the City is leading a Riparian Conservation Program effort through the San Lorenzo 2025 Initiative in areas adjacent to the critical water ways in the County jurisdiction as discussed in Section 6.

In addition, since 2003, a Stream Care Guide has been available by Santa Cruz County Planning Department

<http://www.sccoplanning.com/Portals/2/County/Planning/env/streamcare.pdf?ver=2013-09-16-134201-870> that provides information for homeowners on maintaining and improving the riparian corridors.

#### **4.9.1.3 Santa Cruz County Sensitive Habitat Protection Ordinance**

The purpose of the Sensitive Habitat Protection Ordinance is to minimize the disturbance of biotic communities which are rare or especially valuable because of their special nature or role

in an ecosystem. Lakes, wetlands, estuaries, lagoons, streams, rivers, and riparian corridors are among the habitats considered sensitive.

Sensitive habitat policies of interest to this survey include:

- No toxic chemical substance shall be used in such a way as to have deleterious effects on the habitat unless an emergency has been declared, or such use has been deemed necessary by the California Department of Fish and Wildlife to eliminate or reduce a threat to the habitat itself, or a substantial risk to public health will exist if the toxic chemical substance is not used.
- The Agricultural Commissioner, when reviewing an application to use a restricted material, shall consider the potential effects of the material on a sensitive habitat, and mitigation measures shall be required as necessary to protect the habitat. No approval shall be issued if adverse impacts cannot be mitigated.
- A biotic assessment shall be required for all development activities and applications in areas of biotic concern.
- No development activity shall commence until approved, unless such activity has been reviewed concurrently with the review of a development or land division permit.

Any development within any sensitive habitat area shall be subject to the following conditions:

- All development shall mitigate significant environmental impacts.
- Dedication of an open space, conservation easement, or equivalent measure shall be required as necessary to protect the portion of a sensitive habitat which is undisturbed by the proposed activity or to protect a sensitive habitat on an adjacent parcel.
- Restoration of any area which is a degraded sensitive habitat or has caused or is causing the degradation of a sensitive habitat shall be required, provided that any restoration required shall be commensurate with the scale of the proposed development.

No new development shall be allowed adjacent to marshes, streams, and bodies of water if such development would cause adverse impacts on water quality which cannot be mitigated or will not be fully mitigated by the project proponent. Development that has received a riparian exception according to the provision of the Riparian Corridor and Wetlands Protection Ordinance may be exempted from the provisions of this ordinance if the Planning Director has determined that the activity has received a review that is equivalent to the review required by the Sensitive Habitat Protection Ordinance.

Finally, the City and County are in the process of developing a Karst Protection Zone Policy with a formal request from the City to the County in late 2016. Karst is known to occur in several areas of Santa Cruz County, primarily in Bonny Doon, Felton, and the southeastern end of Ben Lomond Mountain in the vicinity of Pogonip and UCSC as shown on Figure 2-4. Since karst aquifers have unique recharge properties, current regulations designed for non-karst aquifers having fairly regular porosity, transmissivity, and hydraulic conductivity provide inadequate protection (Berry, 2016, Personal Communication,).

#### **4.9.1.4 Draft Santa Cruz County Cannabis Cultivation Ordinance**

Santa Cruz County has drafted a Cannabis cultivation ordinance and an accompanying draft Environmental Impact Report (EIR) to provide specific, local regulation resulting from the statewide legalization of cannabis. The comments for the EIR closed on October 31, 2017 and the ordinance will likely be finalized in 2018. The City has provided numerous comments and suggestion to the ordinance including support for requirement of metering and reporting of onsite water sources and/or valid water rights associated with surface water diversion; prohibitions on use of generators, licensing parcels with outstanding code violations, and manufacturing of concentrates on cultivation sites; adding grounds for revocation of licensing; and alignment with state requirements for water resource protection plans and/or adherence to site-specific environmental protection standards (especially with regard to activities in water bodies critical to anadromous fish) including adherence to existing County environmental codes.

#### **4.9.2 California State Regulations**

##### **4.9.2.1 California Porter-Cologne Water Quality Act [1969]**

The California State Water Resources Control Board (State Board) and the nine California Regional Water Quality Control Boards (Regional Board or RWQCB) have the authority in California to protect and enhance water quality, both through their designation as the lead agencies in implementing the Section 319 nonpoint source program of the federal Clean Water Act (CWA), and from the state's primary water-pollution control legislation, the Porter-Cologne Water Quality Control Act. The Porter-Cologne Water Quality Act is the state law governing nonpoint-source water quality regulation. The State Water Resources Control Board (SWRCB) has responsibility for the State's water quality and water rights programs. State policies set forth by the SWRCB are administered by nine Regional Water Quality Control Boards. The Porter-Cologne Act refers to the Regional Boards as "principal state agencies with the primary responsibility for the coordination and control of water quality" (Section 13001). The Regional Boards are also directed to adopt water quality control plans (Basin Plans) for all regions within the State. Santa Cruz County is within the Central Coast Region, which includes San Luis Obispo, Monterey, Santa Barbara and San Benito Counties, along with small portions of Santa Clara, San Mateo, Kern and Ventura Counties.

CWA Section 303, discussed in Section 4.9.3 that follows, and the Porter-Cologne Water Quality Control Act establish water quality objectives for all waters in the State. These objectives are implemented locally through Water Quality Control Plans, the National Pollutant Discharge Elimination System (NPDES) permits for discharges to receiving waters, and waste discharge requirements (WDRs) for discharges to land.

In addition to obtaining WDRs for wastewater treatment plant discharges, individual or NPDES permits must be obtained for stormwater discharges. The NPDES Municipal Stormwater Permit program is divided into Phase 1 regional permits for municipal separate storm sewer systems (MS4's) servicing populations greater than 100,000, and a statewide Phase 2 (Small MS4) program covering populations less than 100,000. Industrial dischargers in specific industries are required to obtain coverage under site-specific NPDES Industrial Stormwater Permits. Construction sites where disturbance to more than 1 acre is proposed must obtain coverage under the NPDES Construction General Permit.

Land management activities that have the potential to affect water quality and are not covered under the NPDES program are regulated by the Regional Boards under the authority of the Porter-Cologne Act. The Regional Board issued a general conditional waiver of WDRs for timber harvest activities that are not subject to individual conditional waivers or WDRs. The conditional waiver was renewed in 2012 under Order No. R3-2012-0008. The general conditional waiver boosts the role of the Regional Board in review of THPs during the Cal Fire approval process and requires notification by timber harvesters once the THP has been approved. In addition, the waiver's Monitoring and Reporting Program results in post-harvest inspections by Regional Board staff. The level of activity of Regional Board staff is limited by budget priorities.

Water quality impacts of cannabis cultivation has also become a focus of the Regional Board as a result of recent Cannabis legalization in California and a permitting process for commercial cannabis cultivators is expected to be in place in January 2018.

#### **4.9.2.2 California Environmental Quality Act (CEQA) [1970]**

CEQA was modeled after the National Environmental Policy Act (NEPA) and establishes the state's basic framework for the environmental review of new development projects. CEQA provides the effected agencies and the public with a role in the review of proposed development and sets forth standards of significance when evaluating the potential effects of projects. CEQA requires that potential significant impacts be identified and mitigated

#### **4.9.2.3 California Department of Fish and Wildlife**

The California Department of Fish and Wildlife is responsible for the regulation of impacts to wetlands, rivers, and lakes through the mandate of Sections 1601-1603 of State Fish and Wildlife Code. The department is required to review projects with the potential to divert or obstruct natural flows of waters in streambeds and wetlands. Alteration of wetlands, river, streams and lakes must be done with the permission of the Department of Fish and Wildlife, which places conditions of approval on the proposed action to mitigate any adverse effects to the habitat to be altered.

The Department of Fish and Wildlife also regulates the hunting and trapping of wild and feral pigs on public and private lands. The Department of Fish and Wildlife developed a Memorandum of Understanding to control the pig population. The memorandum includes requirements for disposal of pig carcasses, reporting program results, and maintenance of specific records.

#### **4.9.2.4 Statewide On-Site Wastewater Treatment Policy Assembly Bill (AB) 885**

In 2000, the California Legislature passed AB 885, which requires the State Water Quality Control Board to adopt regulations for the operation of on-site wastewater treatment systems (OWTS). The policy took effect in May 2013. Designed to ensure that surface waters and groundwater are not contaminated by septic systems, the policy provides minimum OWTS standards for local agency OWTS management programs and indicates that permits for OWTS in the same drainage as and within 1,200 feet of surface water intake be reviewed by the public water system owner. and the permit application also be provided to the CDDW Drinking Water

Program. The policy indicates that these agencies shall have 5 days from receipt of the permit application to provide recommendations and comments to the permitting agency.

Several other key state acts affect the management of pollutants and the potential impacts to water quality that may result from their use:

- Pesticide Contamination Act [1967]
- Forest Practice Act [1973]
- Subdivision Map Act [1974]
- Hazardous Waste Control Act [1982]
- Underground Storage and Hazardous Waste Substances Act [1983]
- Safe Drinking Water and Toxic Enforcement Act [1986]
- Integrated Waste Management Act [1989]

### **4.9.3 Federal Regulation**

Federal provisions pertinent to the sanitary survey are described below. Drinking water regulations are discussed in Section 5.

#### **4.9.3.1 Clean Water Act – NPDES and TMDL**

The Federal Water Pollution Control Act of 1972, also known as the Clean Water Act (CWA), was enacted to "restore and maintain the chemical, physical, and biological integrity of the Nation's water." Some concerns exist that enforcement of the CWA could weaken under the 2017 presidential administration. The CWA established the NPDES permit program described above under California regulations; California's typically more stringent regulation may mitigate changes at the federal level.

The CWA also includes Section 303(d), which specifically requires states to identify those water bodies not meeting established water quality goals relative to a pollutant or a suite of pollutants. Once a water body is found to not meet applicable water quality goals, it must be added to the 303(d) list as an impaired water body and a TMDL must be developed for the specified pollutants. 303(d) listing recommendations are made by the Regional Board and approved by the State Board. The San Lorenzo River is 303(d) listed for nutrients (1996), pathogens (1998), sediment (1998), chlordane (2010), chlorpyrifos (2010) and PCBs (2010), and the Lower Newell Creek is listed for pH (2010). Based on the 303(d) listing for nutrients, pathogens and sediment in the San Lorenzo River, TMDLs have been adopted for nitrate (2000), pathogens (2009), sediment (2003) and chlorpyrifos (2014). The sources contributing chlordane, chlorpyrifos and PCBs to the San Lorenzo River and sources contributing pH to Lower Newell Creek have not been identified and adoption of TMDLs for these constituents is not anticipated until 2021.

#### **4.9.3.2 CWA 303d list and Total Mass Daily Loads**

Table 4-2 that follows provides a summary of the Total Mass Daily Loads that have been approved or are in process through 303d impaired water body listing for the waterways in the watershed.



**Table 4-2: 303d List/TMDLs Summary Status and Drinking Water Relationship**

TMDL	Status of Regulation	Relation to Drinking Water	Impact/Benefit to Water Treatment	Regional Implications
San Lorenzo River Pathogen TMDL	A pathogen TMDL was approved for the San Lorenzo River in May 2009 due to impairment of water contact recreation beneficial use. 2016 303d list added specific pathogens of Enterococcus, E. Coli, Fecal coliform	Implementation of the TMDL will improve SCWD's source water quality.	Improved water quality potentially reduces water treatment costs.	Implementation of the TMDL requires the County, City of Santa Cruz and City of Scotts Valley to potentially invest additional resources in management of: wastewater (especially for on-site systems), stormwater, and riparian-area homeless encampments.
San Lorenzo River Sediment TMDL	A sediment TMDL was approved for the San Lorenzo River in May 2003 due to impairment of fish and wildlife beneficial use. RWQCB staff recommend revision of the existing numeric targets to sediment and biological indicators.	Implementation of the TMDL will improve TSS and turbidity, which will improve SCWD's source water quality.	Improved water quality potentially reduces water treatment costs.	Implementation of the TMDL requires the County, City of Santa Cruz and City of Scotts Valley to invest additional resources in stormwater management improvements especially as they relate to upstream sediment discharge and hydromodification.
San Lorenzo River Nitrate TMDL	A nitrate TMDL was approved for the San Lorenzo River in September 2000 due to potential to adversely affect municipal and domestic water supply beneficial use and water contact and non-contact water recreation beneficial uses.	While nitrate is not violating the drinking water standard for nitrate, implementation of the TMDL will improve SCWD's source water quality. Nitrate can create taste and odor problems through the promotion of biological growth. Biological growth is also a concern as it can lead to higher TOC concentrations and higher potential for DBP formation as well as increased growth downstream that results in a higher upstream regulatory burden for the City with respect to threatened and endangered species.	When taste and odor often associated with algae blooms, were a problem, SCWD had to spend \$60,000/year on treatment of the problem. Additional studies would be necessary to assess the connection between nitrate/biological growth and water treatment	There are likely secondary impacts (i.e. biological growth formation at the Lagoon) from nitrate concentrations; therefore, the river is still considered impaired for nitrate. Nitrate levels continue to vary year to year. To decrease nitrate levels will require additional investment in nitrate reduction measures.
San Lorenzo River Chlorpyrifos TMDL	TMDL adopted May 29, 2014 with impairments in San Lorenzo River (below Zayante Creek confluence near Felton), Branciforte and Zayante Creek and Arana Gulch. 2010/2011 data indicate that numeric targets are currently being met	Chlorpyrifos, if present, may not be removed by current treatment and may require additional treatment	Chlorpyrifos removal may be accomplished by adsorption onto activated carbon and potentially breakdown with strong oxidants like free chlorine and peroxide.	Chlorpyrifos may be detrimental to aquatic life.
San Lorenzo River 303d listings for Chlordane, Chloride, PCBs, Sodium	Regional Board 2016 303d list revisions include maintaining chlordane and PCBs on list, and addition of chloride and sodium based on sample of SLR at Laurel St downstream of Tait to 303d list	Like chlorpyrifos, chlordane, if present, may not be removed with current treatment and may require additional treatment; Chloride/sodium likely not a raw water issue	Chlordane removal may be accomplished by adsorption onto activated carbon and potentially breakdown with strong oxidants like free chlorine and peroxide.	Chlordane may be detrimental to aquatic life.
Proposed San Lorenzo River 303d Listing for Temperature	Regional Board 2016 response to comments indicated that temperature is a medium priority with a 2023 target TMDL Completion date	Temperatures are already elevated in some locations beyond tolerance for some salmonids, and can contribute to algae blooms	Increased temperature when combined with available nutrients can result in algae blooms with associated increases in TOC and result in DBP formation	Elevated temperatures will be exacerbated as effects of climate change are manifested with longer, hotter, dry seasons.
Proposed Newell Creek (Lower) 303d listing for pH	Regional Board 2016 Fact sheet indicate that a 2027 target TMDL completion date, based on 1971-2006 SC County data	Nominal changes for pH adjustment may be required	Nominal impact	Potential impacts to cold freshwater habitat
Proposed Loch Lomond 303d List for Mercury	Regional Board Decision 51458 indicates that no listing is indicated at this time	Mercury could be associated with sediments that would likely be removed with current treatment	Limited water treatment impact anticipated	Mercury could bioaccumulate in downstream aquatic life

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#### **4.9.3.3 Section 404 Wetland Filling and/or Dredging Permit Program**

Section 404 of the CWA regulates the discharge of dredged and fill material into wetlands and water of the United States, and establishes a permit program to ensure that such discharge complies with environmental requirements. The 404 permit process is administered by the U.S. Army Corps of Engineers (ACOE) and the U.S. Environmental Protection Agency (EPA).

The activities regulated by Section 404 include channel construction and maintenance, filling wetlands to create development sites, transportation improvements, and water resource projects. Some activities that may adversely impact wetlands and rivers, such as drainage or ground-water pumping, are often conducted without discharging dredged or fill material and are not regulated under Section 404. The exemptions to Section 404 that are pertinent to the sanitary survey study area include: normal farming, ranching and silvicultural practices; maintenance and emergency repair of levees and bridges; construction or maintenance of farm or stock ponds; construction of temporary sedimentation basins; and construction or maintenance of farm and forest roads, if best management practices are followed.

#### **4.9.3.4 Endangered Species Act Section 7 and Section 10**

Compliance with the federal Endangered Species Act is required for all activities that have the potential to impact special status species identified as threatened or endangered. The Act provides for the conservation of species that are threatened or endangered throughout all or a significant portion of their range, and the conservation of the ecosystems on which they depend. Section 7 of the act requires consultation by any federal regulator with the USFWS and NOAA fisheries prior to the approval of an authorization or permit. Section 10 of the act allows for consultation to occur between non-federal entities and the federal regulators USFWS and NOAA fisheries without a nexus to a federal authorization or permit.

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## SECTION 5: WATER QUALITY REGULATIONS AND EVALUATION

### 5.1 Water Quality Regulations

The U.S. Environmental Protection Agency (EPA) and/or state agencies regulate the water quality of drinking water systems. EPA delegates primary enforcement responsibility for drinking water program implementation and enforcement to the State. In California, the State Water Resources Control Board, Division of Drinking Water (DDW) (formerly Department of Public Health) is the primacy agency for drinking water regulations. To maintain primacy, the authority to enforce drinking water regulations, under the Safe Drinking Water Act (SDWA), DDW must adopt drinking water regulations at least as stringent as the Federal regulations and meet other relevant criteria. State drinking water regulations may be more stringent than the federal regulations, but not less stringent.

The City of Santa Cruz 1996 Watershed Sanitary Survey provides a detailed account of the development of water quality regulations in the United States. Subsequent updates to the 1996 sanitary survey in 2001, 2006, 2013 describe a number of regulations that were the most current at the time those documents were written. These regulations still apply. The paragraphs below provide a brief summary of the main surface water quality regulations.

**Table 5-1: Regulatory Schedule**

Rules	FEDERAL		STATE	
	Promulgation Date	Compliance Date	Promulgation Date	Compliance Date
Revised Total Coliform Rule	February 2013	April 2016	February 2017 (CA)	April 1, 2016 (effective date for federal Revised Total Coliform Rule)
Federal Groundwater Rule	August 2009	August 2011		August 2011
Federal Long Term 2 Enhanced Surface Water Treatment Rule <sup>(1)</sup>	January 2006	October 2012 (for < 100,000 population)	February 2013	July 2013
Stage 2 Disinfectants and Disinfection Byproducts Rule <sup>(1)</sup>	December 2005	April 2012	December 2011	June 2012 (effective date)
Drinking Water Arsenic Rule	January 2001	January 2006		November 2008
Radionuclides Rule	December 2008	December 2003		June 2006
Interim Enhanced Surface Water Treatment Rule	December 1998	January 2002	Anticipated in 2007	January 2008
Stage 1 Disinfectants and Disinfection Byproducts Rule	December 1998	January 2004	June 2006	June 2006
Surface Water Treatment Rule	June 1989	December 1990		

<sup>(1)</sup> Each of these two rules include data collection tasks with "early compliance dates" six months after the publication date for sampling plans, and 24 months after rule promulgation for both data collection and report submission.

### **5.1.1 Surface Water Treatment Rule (SWTR)**

The Surface Water Treatment Rule (SWTR) was implemented to provide protection against Giardia cysts and pathogenic enteric viruses. The federal SWTR requires that the water treatment process achieve a minimum of 99.9 percent (3-log) removal and/or inactivation of Giardia cysts and 99.99 percent (4-log) removal and/or inactivation of enteric viruses. This must be accomplished through a combination of physical removal and disinfection. The DDW generally requires that the water treatment process provide the minimum removal and/or inactivation requirements for Giardia and viruses in the federal SWTR (99.9 percent (3-log) for Giardia cysts and 99.99 percent (4-log) for viruses).

The Department of Public Health (DPH), the agency name prior to becoming DDW, published a guidance document, "Surface Water Treatment Staff Guidance Manual" in May 1991 that summarizes the treatment requirements in the SWTR as adopted by the State in the California Code of Regulations (CCR). Appendix B of the DPH guidance manual establishes guidelines for determining when source waters will require more than the minimum levels of 3-log Giardia and 4-log virus removal. The guidance indicates that treatment can be based on total coliform levels and that for water sources with significant sewage, recreation or agricultural hazards where median monthly total coliform concentration exceeds 1,000 MPN/100 ml, treatment must provide 4-log Giardia removal and 5-log virus removal.

Based on sampling performed during August 1996 through March 1998, DDW concluded that SCWD should be required to meet the higher level of treatment of 4-log Giardia removal and 5-log virus removal as described in the July 13, 1998 letter to SCWD. This requirement would be in effect at GHWTP until a watershed sanitary survey or continued monitoring could demonstrate that lesser levels of treatment should be required. A report was completed in 2013 documenting additional analysis conducted for the SCWD found in Appendix A, and DDW has accepted that the 4-log Giardia removal can be reduced to 3.0-log removal since the GHWTP filters were demonstrated to provide 1-log removal for Giardia through a combination of reducing the inactivation requirement and increasing the removal credits. The 5-log virus removal is not proposed to be changed. If necessary, additional chlorine contact time could be implemented at the risk of increased DBP formation with an associated expense on the order of \$25 – 40 million to comply with BMP limits. Historic high raw water pathogen levels on Lompico Creek resulted in 4-log Giardia and 5-log virus removal requirements; this water source is not currently in use. In addition to further protect public health, significant effort has been made in identifying and managing pathogen sources.

As indicated in previous sections, a pathogen TMDL was been established for the San Lorenzo River in 2009 and progress has been made in reduced pathogen levels. However, SCWD recognizes that median monthly total coliform levels still exceed 1,000 MPN/100 ml at times as shown in Section 5.4.1. SCWD is in the process of reviewing source water quality data to evaluate how often the median monthly total coliform level is consistently less than 1,000 MPN/100 ml; this information will enhance SCWD's Source Selection Procedure as another level of protection. The goal of the Source Selection Procedure is to guide when each of the source waters would be suitable for treatment to ensure that the total coliform MPN would be less than 1,000 MPN/100 ml (for each of the source waters and hence also for the blend). This should enable the City to reliably select source water that only require 3-log Giardia and 5-log virus reduction as requested in Appendix A.

### **5.1.2 Interim Enhanced Surface Water Treatment Rule (IESWTR)**

The final federal Interim Enhanced Surface Water Treatment Rule (IESWTR) was published in the Federal Register on December 16, 1998 and became effective in January 2002. California adopted the IESWTR in January 2008. The California IESWTR includes several additional monitoring requirements that create a more stringent filtered water performance standard. The IESWTR includes a 2-log *Cryptosporidium* oocyst removal requirement which can be achieved by maintaining filtered water turbidity less than or equal to 0.3 NTU in at least 95 percent of the filtered water samples collected during each month. As discussed in the 2016 filter performance study conducted (found in Appendix A), 95<sup>th</sup> percentile filter turbidity data are consistently less than 0.3 NTU which meets the IESWTR requirements.

### **5.1.3 Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)**

The LT2ESWTR was published in the Federal Register on January 5, 2006. The draft State LT2ESWTR was last revised on February 8, 2012. The State adopted the LT2ESWTR on July 1, 2013. Prior to State adoption of the LT2ESWTR, DDW was responsible for monitoring water suppliers for compliance with the rule, and the EPA was responsible for enforcement of the rule.

The LT2ESWTR requires that all water supplies collect source water data on *Cryptosporidium*, and it sets new treatment requirements that include treatment plant performance standards for each water supply based on the relative risk due to presence of *Cryptosporidium* in the source water.

### **5.1.4 Stage 1 and Stage 2 Disinfectants/Disinfection Byproducts Rule**

In conjunction with the federal IESWTR, the USEPA promulgated another new drinking water regulation on December 16, 1998: the Stage 1 Disinfectants/Disinfection Byproducts Rule (Stage 1 D/DBPR). The State of California adopted the Stage 1 D/DBPR in June 2006. The Stage 1 D/DBPR focuses on controlling production of DBPs, while also meeting disinfection requirements. It revised the THM MCL, created a new MCL for HAA5, and also included MCLs for bromate and chlorite as part of the new regulations. The Total THM (TTHM) MCL was reduced from 0.1 mg/l (100 µg/l) to 0.080 mg/l (80 µg/l). The HAA5 MCL was set at 0.060 mg/l (60 µg/l). The bromate MCL was set at 0.010 mg/l (10 µg/l) and the chlorite MCL was set at 1.0 mg/l. In addition, the Stage 1 DBPR included maximum residual disinfectant levels (MRDLs) for chlorine at 4.0 mg/L (as Cl<sub>2</sub>), chloramine at 4.0 mg/L (as Cl<sub>2</sub>), and chlorine dioxide at 0.80 mg/L (as ClO<sub>2</sub>). For SCWD, D/DBPR1 requires that the system-wide running annual average (RAA) concentration based on the quarterly samples for TTHM be less than 80 µg/L and for HAA5 be less than 60 µg/L.

The Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 D/DBPR) was published in the Federal Register on January 4, 2006. The THM and HAA5 MCLs remain at 80 µg/l and 60 µg/l, respectively, but the new Stage 2 D/DBP Rule differs from the Stage 1 Rule by requiring that each of the locations monitored meet the TTHM and HAA5 concentration limits based on its individual locational RAA. This approach, referred to as the locational running annual average (LRAA), differs from current requirements, which determine compliance by calculating the

running annual average of samples from all monitoring locations across the system. Given SCWD's more stringent Giardia and virus reduction requirements, which are discussed in Section 5.1.1, it may be difficult to meet the LRAA DBP requirements in the Stage 2 D/DBPR. Moreover, the Stage 2 D/DBPR may be even more difficult to meet in the future if the City has to use a source water that is higher in DBP precursors because the other North Coast water sources are not available for environmental reasons; other regulatory forces that affect treatment are summarized in Table 4-2.

The State of California adopted the D/DBPR1 four and one-half years after the rule's compliance date (January 1, 2002), and 9 years after the rule was published in the Federal Register. During this four and one-half year period, the DDW was responsible for monitoring water suppliers for compliance with this rule, and the EPA was responsible for enforcement of the rule. The D/DBPR2 was adopted to be effective in June 2012.

### **5.1.5 Revised Total Coliform Rule**

The Revised Total Coliform Rule (RTCR) was published by US EPA on 13 February 2013 as a revision to the 1989 Total Coliform Rule (TCR). Minor corrections were published on 26 February 2014. All public water systems must comply with the RTCR starting 1 April 2016. California is embarking on its RTCR process and California water agencies will comply with the original TCR as well as the provisions of the federal RTCR until California can adopt the RTCR.

One of the main provisions of the RTCR is the setting of a treatment technique based on total coliforms and *E. coli*, and an MCL for *E. coli*. The RTCR also includes requirements for monitoring total coliforms and *E. coli*, provisions for allowing transition from the existing TCR to RTCR, requirements for seasonal systems, requirements for assessments and corrective actions, public notification requirements for violations and specific language to be included in Consumer Confidence Reports should a *E. coli* MCL violation occurs.

## **5.2 Water Quality Constituents of Concern**

EPA, as well as DDW, has developed Maximum Contaminant Limits (MCLs) for over 100 organic and inorganic compounds, some occurring naturally in water supplies but many occurring as a result of contamination. Major sources of contamination include discharges from manufacturing processes, leaks from storage or disposal containers, and runoff from areas treated with pesticides. Treatment techniques are available for removing these contaminants from water supplies. Protecting source waters from contamination, however, is often more effective than treatment at eliminating contaminants. A list of MCLs for compounds regulated by EPA and DDW is included in Appendix B.

MCLs are developed based upon a number of factors including health risk, analytical detection limits, effectiveness of the best available treatment, and economic considerations. Federal maximum contaminant level goals (MCLG) are set at the level in which no adverse health effects are seen; in many cases, this is zero. In addition, California sets public health goals (PHG), which for carcinogens represents a 1 in 1,000,000 lifetime risk. Both MCLG and PHG are found in Appendix B1.



### **5.2.1 Cryptosporidium and Giardia**

There have been no significant regulatory changes associated with Giardia since 2006. However, as discussed in Section 5.1.1, SCWD was able to demonstrate filter performance that provided a 1-log Giardia credit towards the, 4-log Giardia reduction.

Cryptosporidium is specifically addressed in the IESWTR adopted by California in 2008 and in the LT2ESWTR published by EPA in 2006. The IESWTR includes a Maximum Contaminant Level Goal (MCLG) for Cryptosporidium set at zero, and the treatment technique standard will require systems that use conventional filtration treatment to achieve at least a 2.5-log removal of Cryptosporidium oocysts up to a total of 5.5 log depending on the bin classification. Additionally, the LT2 ESWTR required facilities to undergo a two-year Cryptosporidium monitoring plan to determine if source water quality requires additional treatment for removal/inactivation which was completed in March 2009 by SCWD. Recent monitoring is reported in Table 5-19.

### **5.2.2 Turbidity**

The IESWTR strengthened previous turbidity performance regulatory requirements. The following are current regulatory standards for turbidity, which serve to demonstrate compliance with pathogen log removal requirements.

Individual Filter Effluent (IFE): Facilities are required to conduct continuous turbidity monitoring for each individual filter and submit an exceptions report to DDW if:

- IFE has a turbidity level greater than 1.0 NTU based on two consecutive measurements taken 15 minutes apart
- IFE turbidity is greater than 0.5 NTU at the end of the first 4 hours of filter operation, based on two consecutive measurements taken 15 minutes apart.
- Combined Filter Effluent (CFE): The turbidity level of the filtered water is required to be less than or equal to 0.3 NTU in at least 95 percent of the measurements taken each month and not to exceed 1.0 NTU at any time. Compliance is based on measurements taken at four-hour intervals.

### **5.2.3 Disinfection and Disinfection Byproducts**

The current Stage 1 Disinfectants and Disinfection Byproducts Rule (D/DBPR) for total trihalomethanes (TTHMs) and the five haloacetic acids (HAA5) MCLs are 80 µg/L and 60 µg/L, respectively. The Stage 1 D/DBPR compliance is based on a system-wide running annual average (RAA). The Stage 2 D/DBPR includes more stringent regulatory requirements for TTHM and HAA5. The Stage 2 D/DBPR requires that each water purveyor perform an Initial Distribution System Evaluation (IDSE) to identify locations in their distribution system that are most vulnerable to DBP formation. The RAA MCLs will remain in effect and an additional limit of 80 µg/L of TTHMs and 60 µg/L of HAA5, based on a locational running annual average (LRAA) at sites identified in the IDSE, will be instituted. The IDSE plan prepared by SCWD was

submitted by April 1, 2007 and identified monitoring and other actions necessary to comply with the Stage 2 D/DBPR; the monitoring was completed, and the report submitted in July 2009.

The Stage 1 D/DBPR set MCLs for bromate (10 µg/L), and chlorite (1.0 mg/L). The Stage 2 D/DBPR does not change the existing MCLs for these DBPs. Since the water purveyors do not use ozone or chlorine dioxide at their WTPs, these two MCLs should not impact treatment operations. DBPs are of concern primarily in the distribution system but DBP precursors, discussed below, are related to source water quality.

#### **5.2.4 Total Organic Carbon (TOC)**

The Stage 1 D/DBPR requires applicable systems that use conventional filtration treatment to remove a certain target level of TOC (DBP precursor) by enhanced coagulation. The required removal level is based on Source Water alkalinity and TOC concentration.

There has been no further significant regulatory change associated with this constituent since 2010. While there have been no water treatment regulatory changes, other surface water quality regulations discussed in Section 4 may have the potential to restrict SCWD to source water with higher concentrations of TOC, which may require changes to SCWD operations.

#### **5.2.5 Perchlorate**

Previously regulated through the establishment of a public health goal (PHG) and a notification level of 6 µg/l, perchlorate is now a contaminant of concern with a respective, enforceable, MCL in the state of California. As of October 2007, water systems in the state are required to produce water at or below this concentration.

#### **5.2.6 Arsenic Rule**

The final federal Arsenic Rule, published by EPA on January 22, 2001, established the MCL for this constituent at 0.010 mg/L (10 µg/L). The Rule was to become effective on March 23, 2001, 60 days after publication. The rule established that the revised MCL for arsenic is 0.010 mg/l (10 ug/l) and became enforceable on January 23, 2006.

The State of California completed drafting the Revised Drinking Water Standard for Arsenic, which became effective on November 28, 2008 and officially adopted an MCL equivalent to the EPA standard of 0.010 mg/l.

### **5.3 Groundwater Regulations**

Although these regulations do not apply to the surface water sources directly within the City's control, they may be applicable to well sources within the Santa Cruz system (e.g. Beltz wells) and SLVWD's Manana Woods wells and are thus included here for completeness. In addition to those detailed below, recent changes include invalidation of the California hexavalent chromium regulation, effective September 2017 and the addition of a MCL for 1,2,3 - Trichloropropane (1,2,3- TCP) at 5 parts per trillion adopted on July 18, 2017.

### **5.3.1 Radionuclides Rule**

The Federal Radionuclides Rule was promulgated in December 7, 2000 and the MCLs published therein became effective in December 2003. Additionally, by the end of 2007, four quarters of initial monitoring are required for each entry point to the distribution system of agencies treating groundwater. The state Radionuclide Drinking Water Regulations became effective June 11, 2006.

### **5.3.2 Groundwater Rule**

On August 9, 2000 EPA proposed a rule specifying the appropriate use of disinfection in ground water and addresses other components of ground water systems to assure the protection of public health. The Ground Water Rule (GWR) establishes multiple barriers to protect against bacteria and viruses in drinking water obtained groundwater sources and will establish a targeted strategy to identify groundwater systems at high risk for fecal contamination. The GWR provides four elements that target risks to the system. The rule requires regular sanitary surveys, source water monitoring when a positive sample occurs its TCR monitoring, corrective actions upon evidence of fecal contamination, and compliance monitoring.

The California Groundwater Rule became effective on August 18, 2011.

### **5.3.3 Groundwater Replenishment using Recycled Water**

The federal government does not regulate the use of recycled water, and leaves regulation up to the state. The California Groundwater Replenishment using Recycled Water Rule was promulgated and adopted in 2014 and establishes requirements for Groundwater Replenishment Reuse Projects (GRRPs), which are projects that involve the use of recycled water for the replenishment of a groundwater basin for use as a source of water supply. Requirements include sampling of the aquifer prior to operation of the GRRP, retention of recycled water prior to recharge, maps of the GRRP and area of effects, a hydrogeological assessment of the GRRP's setting, and a plan to mitigate the potential effects of contamination on water supply due to the GRRP. Permits to operate a GRRP must be approved by both the DDW and the Regional Board.

## **5.4 Water Quality Evaluation**

The following subsections summarize the key water quality concerns in the San Lorenzo River and North Coast watersheds based on review of data available from SCWD databases. Generally, the discussion focuses on microbiological parameters, turbidity and sediment, and nitrates. Other parameters discussed are odors, organic contamination and general mineral and metals content.

A major reason for emphasizing total coliform, turbidity, and nitrate is because of the findings from previous studies and field surveys and because the River is listed as impaired for each of these parameters, with TMDLs already being implemented (pathogens, sediment, and nitrate). Coliform bacteria are the primary microbial group measured to determine the health of a drinking water supply. Total coliform bacteria are considered a good general indicator of contamination but do not indicate specific contamination sources. The turbidity parameter is

used commonly in drinking water treatment to quantify water quality, primarily because it is easily measured and provides virtually instantaneous results. Also, high turbidity has been correlated with high protozoa (and bacteria) concentrations in some waters. Nitrate has been a targeted parameter in the subject watersheds, mostly because of the predominance of septic tanks as the domestic wastewater treatment technique, especially from systems located on or near highly permeable soils. Elevated nitrate levels promote algal growth which, upon decay, produces taste and odor compounds that increase water treatment costs. Nitrate-rich water also favors growth of cyanobacteria, some of which produce harmful toxins.

### **5.4.1 Coliform Bacteria**

Coliform bacteria data are evaluated in this subsection. SCWD analyzes source water weekly, with each source sampled 2 to 3 times per month. SLVWD also samples raw water bi-weekly and weekly respectively. Each sample is analyzed for total coliform and *E. coli* data but SCWD does not measure fecal coliform, a subset of total coliform bacteria, also known as thermotolerant coliforms. The County has measured, among other microbiological parameters, total and fecal coliform bacteria, but discontinued fecal coliform in favor of *E. coli*.

Drinking water and sanitary microbiological experience has established the presence or absence of coliform bacteria as an indicator of the sanitary quality of drinking water supplies. The significance of coliform tests and the interpretation of results are well authenticated and have been used as a basis for standards of bacteriological quality of water supplies (Standard Methods for the Examination of Water and Wastewater, 21st Edition).

Most drinking water purveyors determine the most probable number (MPN) of total coliform and *E. coli* bacteria present in the drinking water sources of supply. All purveyors are also required to determine the presence or absence of total coliform and fecal coliform bacteria in the distribution system.

Total coliform bacteria are a relatively broad group, which includes species that can live for extended periods outside a host body. These sometimes-termed “environmental” coliform bacteria are present in waters exposed to urban development and wildlife activities. Drinking water utilities are required to resample the distribution system in areas where detectable total coliforms are found and eliminate any fecal coliform in the distribution system, as described in the water quality regulation portion of this section. The presence of fecal coliform in the distribution systems can indicate contamination or an improper disinfection process at the treatment works.

Thermotolerant (formerly fecal) coliform bacteria can be present in the gut and feces of warm blooded animals, soil, and organically enriched waters and are detected in the laboratory by the characteristic of fermenting lactose to produce gas at 44.5°C. This differentiation yields valuable information concerning the possible source of pollution in water sources.

The fecal coliform to fecal streptococci (FC:FS) ratio has been used to determine if the contamination source originated from human wastes. A ratio greater than 4 was considered indicative of human contamination. Conversely, a ratio less than 0.7 suggested the contamination was non-human related and most likely livestock, poultry or wildlife. This tool has been questioned of late because of variable survival rates among the fecal streptococcus

species, and some researchers do not recommend the use of the FC:FS ratio to evaluate bacteria origin.

Current efforts to differentiate sources of bacterial contamination focus on use of QPCR (quantitative polymerase chain reaction) analysis. The County of Santa Cruz previously used ribotyping, a method of microbiological source tracking that differentiates human *E. coli* from other types of *E. coli*, to assess the source and causes of elevated bacteria levels at local beaches (Ricker and Peters, 2006). Overall, of 1200 bacterial isolates tested between 2002 and 2004, only 15 percent could not be attributed to a particular source. Study results relevant to this sanitary survey update include findings that: contamination by birds was a dominant source of bacteria in both upstream and urban (lower River) locations; cracks in storm drains and sewer pipes, as observed by videography, could facilitate cross-contamination; storm drains and sumps appear to promote incubation and multiplication of bacteria; bacteria loadings from human, pet and livestock wastes, while significant, are much lower than avian loadings; and human contributions in the River were much higher in wet weather, when runoff scours storm drains and mobilizes waste from developed areas, encampments and the occasional failing septic system as well as exacerbating high groundwater levels that can come into septic leach lines. *E. Coli*, cryptosporidium and giardia are discussed in Section 5.4.6.14.

#### **5.4.1.1 SCWD Surface Water Sources**

As discussed in Section 4 earlier, on May 8, 2009, the San Lorenzo River Watershed Pathogen TMDL was approved by RWQCB Central Coast Region, where fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200 MPN per 100 mL, nor shall more than 10 percent of samples collected during any 30-day period exceed 400 MPN per 100 mL (for the San Lorenzo River and Estuary, Branciforte Creek, Camp Evers Creek, Carbonera Creek and Lompico Creek). The City does not measure fecal coliform.

The results of an analysis of total coliform data for SCWD's San Lorenzo River and North Coast sources are presented on Figures 5-1 and 5-2. Figure 5-1 shows the annual geometric mean of total coliform since water year 2011 for SCWD's San Lorenzo River sources (Loch Lomond, Felton Diversion, and Tait Street).<sup>18</sup> With the exception of 2011 values along the San Lorenzo River are greater than 1,000 MPN/100 ml, and vary slightly over time. Values from Loch Lomond are less than 1,000 MPN/100 ml, but have been increasing since 2013. This suggests that the type of water year can influence total coliform in Loch Lomond, where drier years or years following a dry year; and very wet years, like 2017 have higher values.

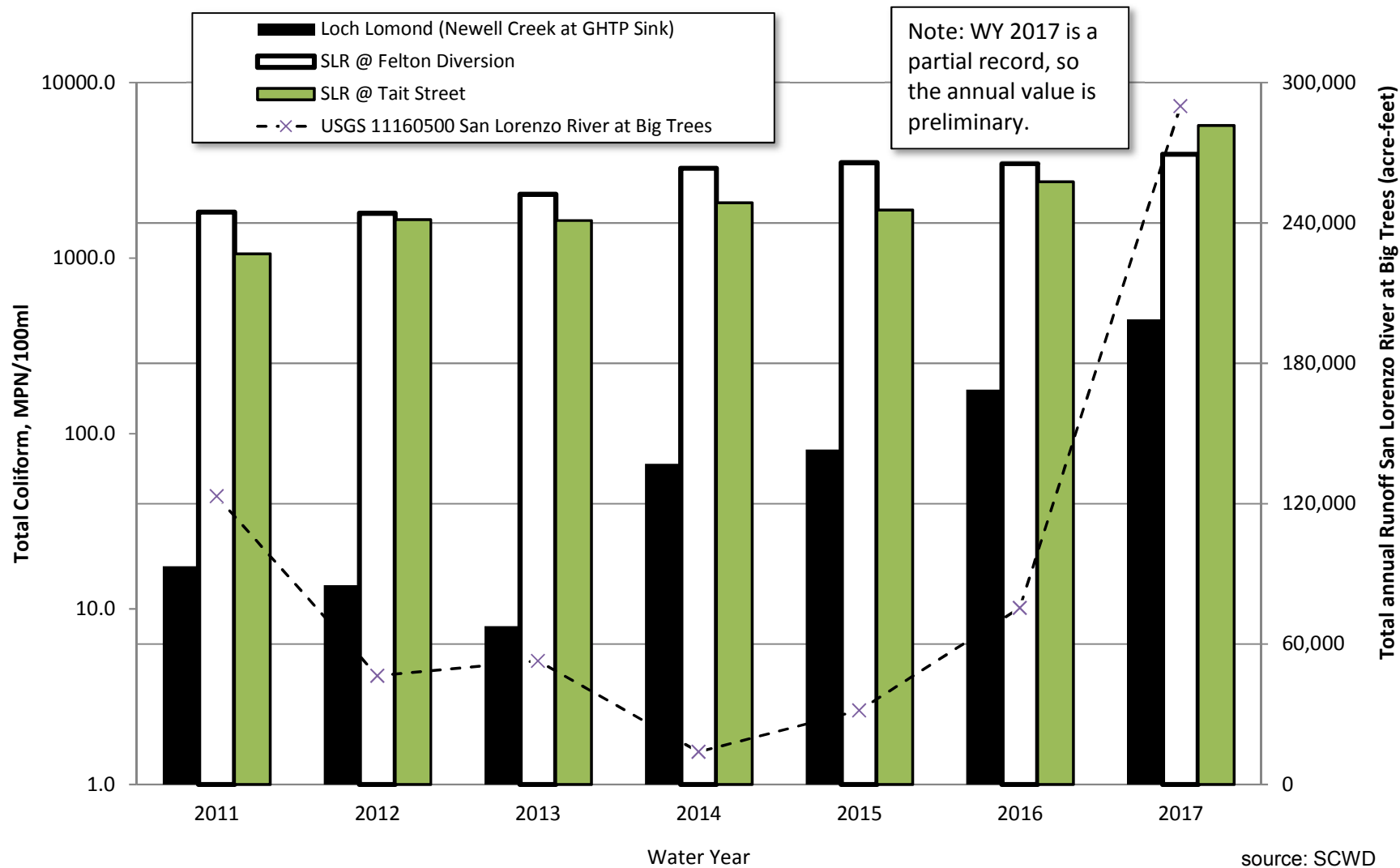
Figure 5-2 shows the annual geometric mean of total coliform since water year 2011 for SCWD's North Coast sources (Liddell Spring, Laguna Creek, and Majors Creek). Values for North Coast sources are generally lower than the Felton Diversion or Tait Street sources, with Liddell Spring and Laguna Creek almost one order of magnitude lower. Values for Majors Creek significantly fluctuated during the period of 2011 through 2017, decreasing by about an order of magnitude from 2011 through 2014 and increasing from 2014 to similar levels as the Felton Diversion or Tait Street sources anticipated for 2017. A nearby commercial equestrian facility could be associated with this fluctuation. The City prefers the use of the North Coast sources,

<sup>18</sup> A geometric mean, unlike an arithmetic mean, tends to dampen the effect of very high or low values, which is helpful since levels may vary anywhere from 10 to 10,000 over a given period.

when available, because of the lower coliform levels and therefore higher source water quality. However, as discussed earlier, other environmental surface water regulations related to fisheries recovery may restrict the availability of the North Coast water sources in the future.

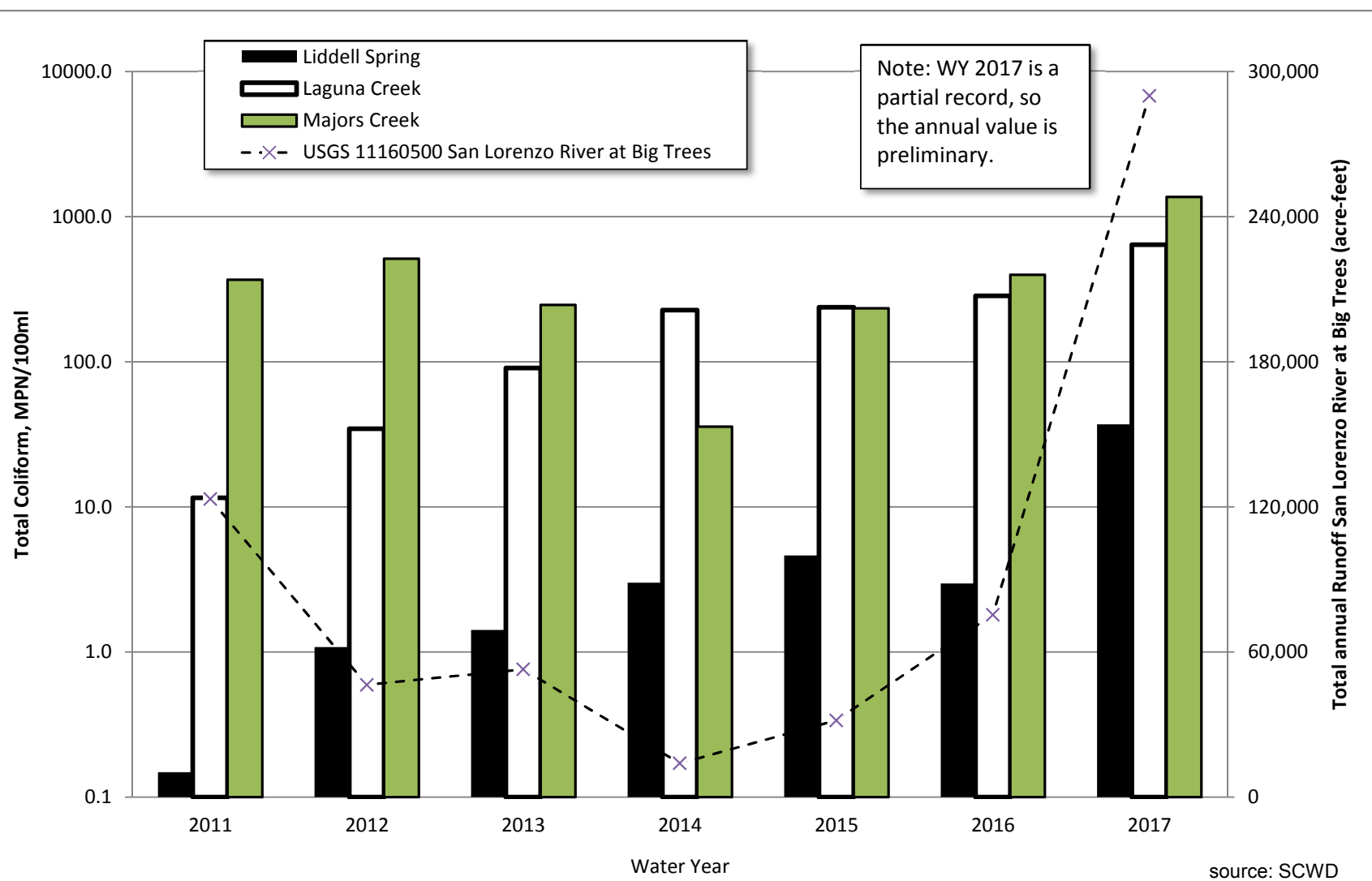
#### **5.4.1.2 SLVWD Surface Water Sources**

The Annual Geometric Mean of Total Coliform for sources from the SLVWD is graphically represented on Figure 5-3. The data presented is from 2011 to June 2017. In 2013, SLVWD modified their coliform analytical method to be one that reports in Colony Forming Units (CFUs) which reports a definitive number, while MPN reports the probability of occurrence. Results seem to be rather consistent from year to year, however the 2013 water year results are slightly elevated based on the limited data (two results) have been made available thus far. The annual geometric mean was calculated from bi-weekly data collected over the separate water years. Periods where data were unavailable or simply labeled as “Present” or “Absent” were left out of the geometric mean calculations. The following raw water sources were included in the graph: Bennett Springs, Bull Springs-1, Bull Springs-2, Clear Creek, Fall Creek, Foreman Creek, Peavine Creek, and Sweetwater Creek. SLVWD staff has continued to sample Lompico Creek on a limited basis for bacteriological parameters with total coliform values > 2,200 MPN/100 mL and E coli values ranging from 2 up to 579.4 MPN/100 mL in 2014 and 2016.

**Figure 5-1**

**Annual geometric mean of total coliform in the SCWD's San Lorenzo River Sources, 2011-2017 (through February 2017)**

Common maximum thresholds for data analysis were 23, 230, 2400, and 24000 MPN/100ml. Common minimum thresholds for data analysis were 1, 1.1, and 4.5 MPN/100ml. SCWD uses the San Lorenzo River at Big Trees as an index of water supply conditions. According to its classification system, WYs 2011 & 2016 were normal, 2012-2015 were critically dry and 2017 was wet.



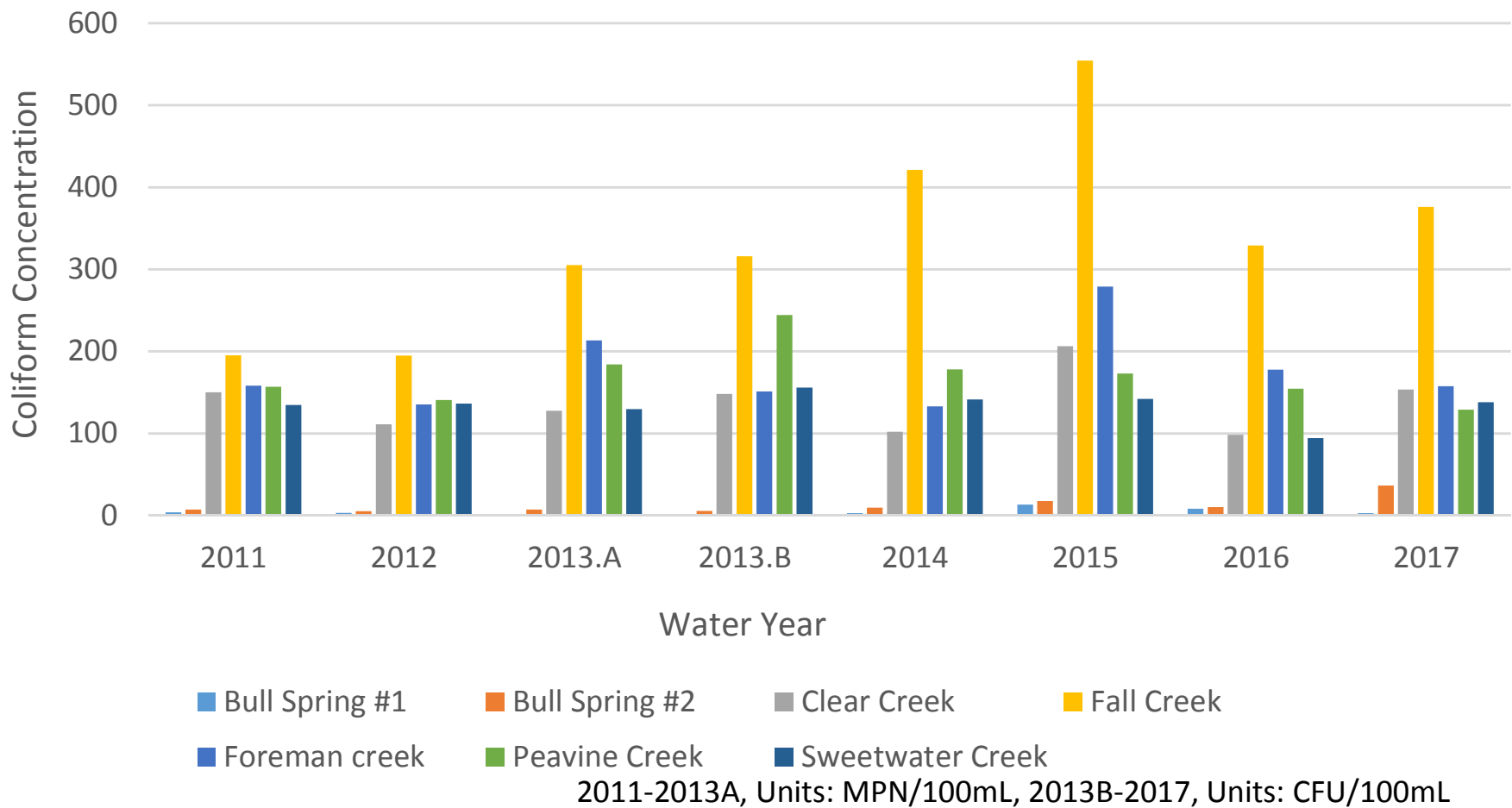
**Figure 5-2**

**Annual geometric mean of total coliform in the SCWD's North Coast Sources 2011-2017 (through February 2017).**

Common maximum thresholds for data analysis were 23, 230, 2400, and 24000 MPN/100ml. Common minimum thresholds for data analysis were 1, 1.1, and 4.5 MPN/100ml. SCWD uses the San Lorenzo River at Big Trees as an index of water supply conditions. According to its classification system, WYs 2011 & 2016 were normal, 2012-2015 were critically dry and 2017 was wet.



Figure 5-3: Annual Geometric Mean of Total Coliform from Detectable Results for SLVWD, 2011-2017



## 5.4.2 Turbidity

Disruption of the river and creek beds, small to large landslides, and runoff from barren earth areas tend to extend high turbidity events, especially in high rainfall/runoff years. These are common occurrences in California caused by the geology, topography, and climate. Many of the water utilities experience treatment problems during the initial few days of high stormwater runoff periods. It is often useful to distinguish 'persistent turbidity' as a set of issues with different causes and likely responses. The definition of persistent turbidity as accepted by the County for quarry facilities is turbidity which precludes diversions for more than about 3 days for smaller streams, and up to 5 days for the San Lorenzo River after a significant storm. In Liddell Spring, according to the 1964 County-CEMEX contract, persistent turbidity increases in turbidity over the baseline which exceed 2 units for 48 hours following the storm event. Usually, persistent turbidity occurs in streams receiving a continuing supply of fine-grained sediment from banks, tributaries, or cutslopes. The continuing supply often can be traced to a particular disturbance, such as a landslide, poorly-executed timber harvest, road failure, or large wildfire. In addition, review of turbidity data during active quarry operations at Bonny Doon in the Liddell Springs watershed indicated blast-related turbidity spikes which have ceased since closure of the quarry (E. Bean, 2017).

Because high turbidity has correlated with increased protozoa concentrations in some surface waters, it is prudent to have some contingency treatment plan during the initial "flush" of the wet year. Avoiding highly turbid water and relying on alternative sources in the short-term seems to be good, well-practiced policy and is implemented in the City's Source Selection Policy to the greatest extent possible.

Streams which experience extensive disturbances (such as might be caused by a major landslide or fire) are often 10 to 100 times as turbid as baseline, or best-case conditions, at least for the first year or two following the event. The same streams which take longer to clear after a storm are usually also affected by excess turbidity persisting into late spring or early summer. These include creeks downstream from large impoundments which can continue to be turbid for a year or longer.

As summarized earlier in Section 4, on May 16, 2003, the RWQCB Central Coast Region adopted a TMDL for sediment for the San Lorenzo River, Carbonera Creek, Lompico Creek and Shingle Mill Creek and incorporated the TMDL and associated Implementation Plan into the Basin Plan.

The RWQCB documented various actions implemented by the City, County, and RCD to reduce sediment loading over the past five years, namely reducing the risk of culvert failure and road erosion (Rose, 2011):

- The City completed culvert removals/improvements in the Newell Creek watershed, estimated to prevent up to 500 yards of sediment from being discharged to Newell Creek over this time period.
- The County used GIS to prioritize erosion problems based on soils and high erosion hazards and implemented six high-priority sediment reduction projects, including five cross-culvert repairs along Kings Creek and one culvert retrofit along Gold Gulch.

Implementation of these projects will reduce the risk of culvert failure and the deposition of an estimated 2,378 cubic yards of sediment. The County also completed two other sediment reduction projects on Upper East Zayante and Glenwood Drive estimated that they will reduce sediment transported into the San Lorenzo River watershed by 0.54 tons/year and 3.58 tons/year respectively.

- The RCD implements a rural roads erosion control assistance program, which provides technical and cost share assistance to private road associations to facilitate the implementation of erosion control projects using best management practices to reduce sediment delivery associated with roads. This program also provides education and outreach workshops and trainings that promote the stewardship of healthy watersheds. Between December 1, 2006 and November 30, 2009, the RCDSCC rural roads erosion control assistance program implemented 16 erosion control projects on rural non-county roads in the San Lorenzo River watershed. Additionally, four demonstration projects were completed in October 2010. Over the next 10 years, these projects will prevent approximately 5,837 tons of sediment from entering the San Lorenzo River.

Parke and others (2010) monitored streamflow and suspended-sediment in water year 2009 and 2010 and used sequential rating-curve analysis<sup>19</sup> to compare sediment-transport rates over the past three decades for Zayante Creek, the San Lorenzo River, and Soquel Creek. A substantial decrease in transport at a given flow can be seen in each case, although lumping all the 1970s and 1980s data probably disproportionately increases the earlier yields, as this period includes several episodic or disruptive events, most notably the January 1982 storms.<sup>20</sup> With possible load reductions between 464- and 106-percent, it is important to note that these differences are large relative to the 24- to 27-percent reductions sought as part of the San Lorenzo Sediment TMDL staff report. This may be extremely challenging as winters with significant rainfall, such as occurred in 2017, can trigger landslides throughout the County which are associated with large sediment loads.

To demonstrate progress towards achieving load-based allocations and beneficial use protection, RWQCB staff recommended revision of the San Lorenzo Sediment TMDL to replace existing numeric targets with the sediment and biological indicators recommended in Herbst et al. (2011) (Rose, 2011) although no action has been taken as of 2017.

#### **5.4.2.1 SCWD Surface Water Sources**

SCWD currently has some capability to use different water sources if turbidity increases for one or more of the sources for reasons other than rainfall (e.g., landslides). This source water flexibility can be offset by requirements to meet fish flows, particularly in the North Coast sources. During heavy rain events, however, all surface sources and Liddell Spring are often not used due to elevated turbidity, leaving Loch Lomond Reservoir as the only source with

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<sup>19</sup> An increase in sediment transport at a given flow generally means that more sediment is readily available on the bed for transport, and (generally) that habitat conditions have deteriorated; conversely, less transport at a given flow is usually associated with improvements in bed conditions and in the relative success of erosion-control efforts.

<sup>20</sup> Episodic events do increase sediment yields and do temporarily move sediment-rating curves 'upward', or to the left (Hecht, 2007), sometimes substantially.

which to meet customer demands. During moderate events Liddell and Laguna can be available for use. The evaluation findings are:

Figure 5-4 and Figure 5-5 show the turbidity measurements from July 2011 to March 2017 for the San Lorenzo River and North Coast sources, respectively. There is no apparent overall increasing or decreasing trend over the entire period and variations appear to be storm-related, as expected.

Figures 5-6 and 5-7 show similar data as above, but is a 10-sample running average to clarify the trends over the past 5 years. With the exception of the events in late 2016, early 2017, Loch Lomond shows relatively lower storm-related increases in turbidity than the other sources. All other sources, except Majors Creek, show relatively higher storm-related increases in turbidity in normal and wet years as compared with dry years, e.g., 2016 versus 2013.<sup>21</sup> The North Coast sources experience significantly less turbidity than the San Lorenzo River sources. Overall, these North Coast sources provide consistent low turbidity, treatable water.

#### 5.4.2.2 SLVWD Surface Water Sources

SLVWD provided a single result per year for Turbidity, so no continuous plot of Turbidity has been provided. Table 5-2 below, shows the turbidity results taken from eight raw surface water sources within SLVWD. With the exception of the 2008 results, most of the data between 2009 and 2012 was sampled in the month of April or early May.

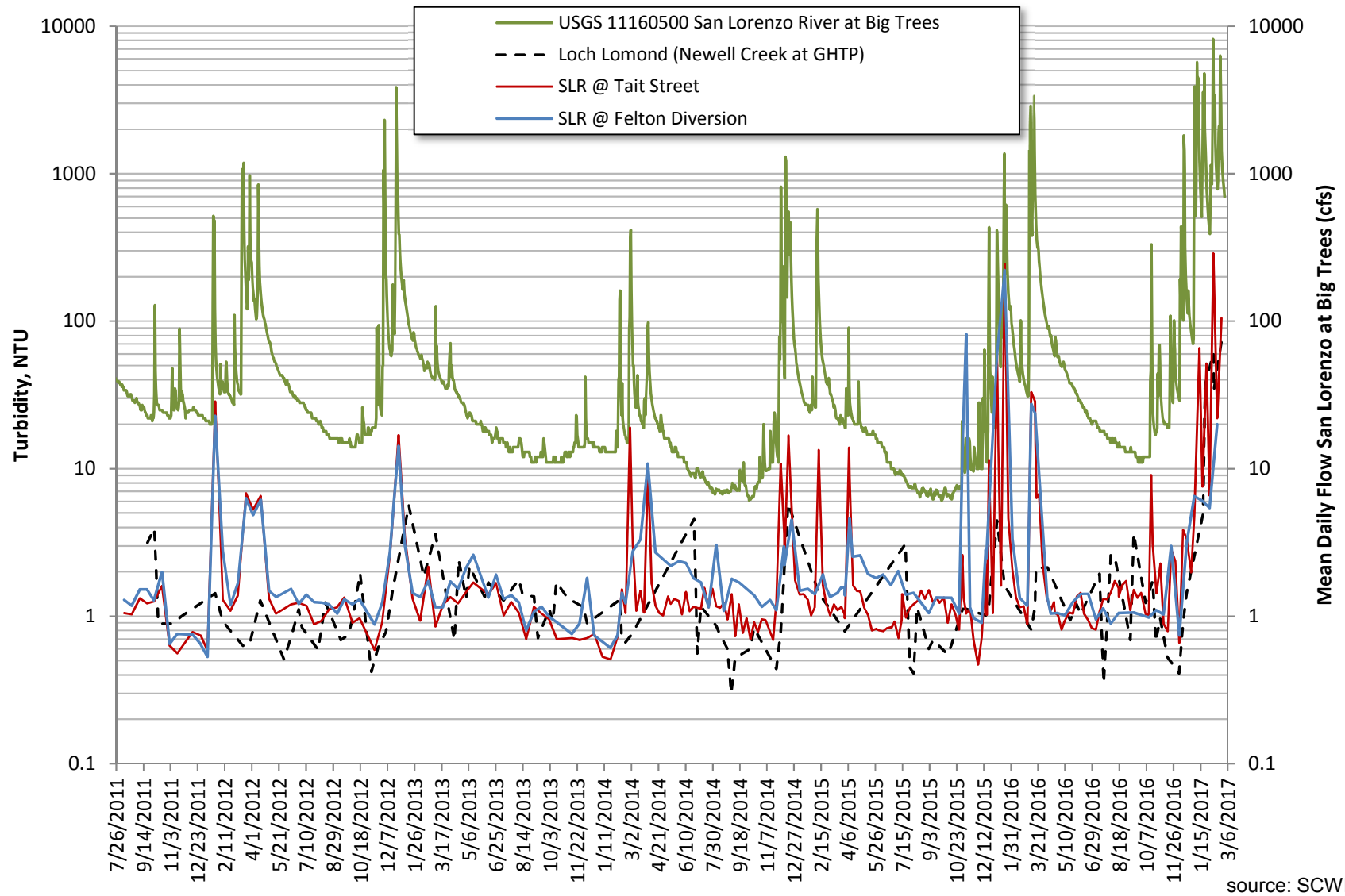
**Table 5-2: Turbidity Results for SLVWD (Unit: NTU)**

Year	Bennett Spring	Bull Spring #1	Bull Spring #2	Clear Creek	Fall Creek	Foreman Creek	Peavine Creek	Sweetwater Creek	Lompico Creek
2011	0.39	0.51	0.48	0.54	1.5	0.72	1.9	1.4	0.98
2012	0.52	0.48	NR	0.72	1.3	0.63	1.1	2.2	1
2013	0.56	0.49	NR	0.53	1	0.61	14	0.8	0.8
2014	0.28	0.37	0.49	0.43	0.72	0.52	1.1	0.8	0.96
2015	0.28	0.42	0.35	0.4	0.56	0.55	0.68	0.42	6.8
2016	0.23	0.42	0.34	NR	0.58	0.28	1.3	1.2	0.45
2017	0.28	0.31	1.1	3.2	4.7	< 0.10	1.1	5	NR

Source<sup>1</sup>: SLVWD

Note: NR = Not Recorded

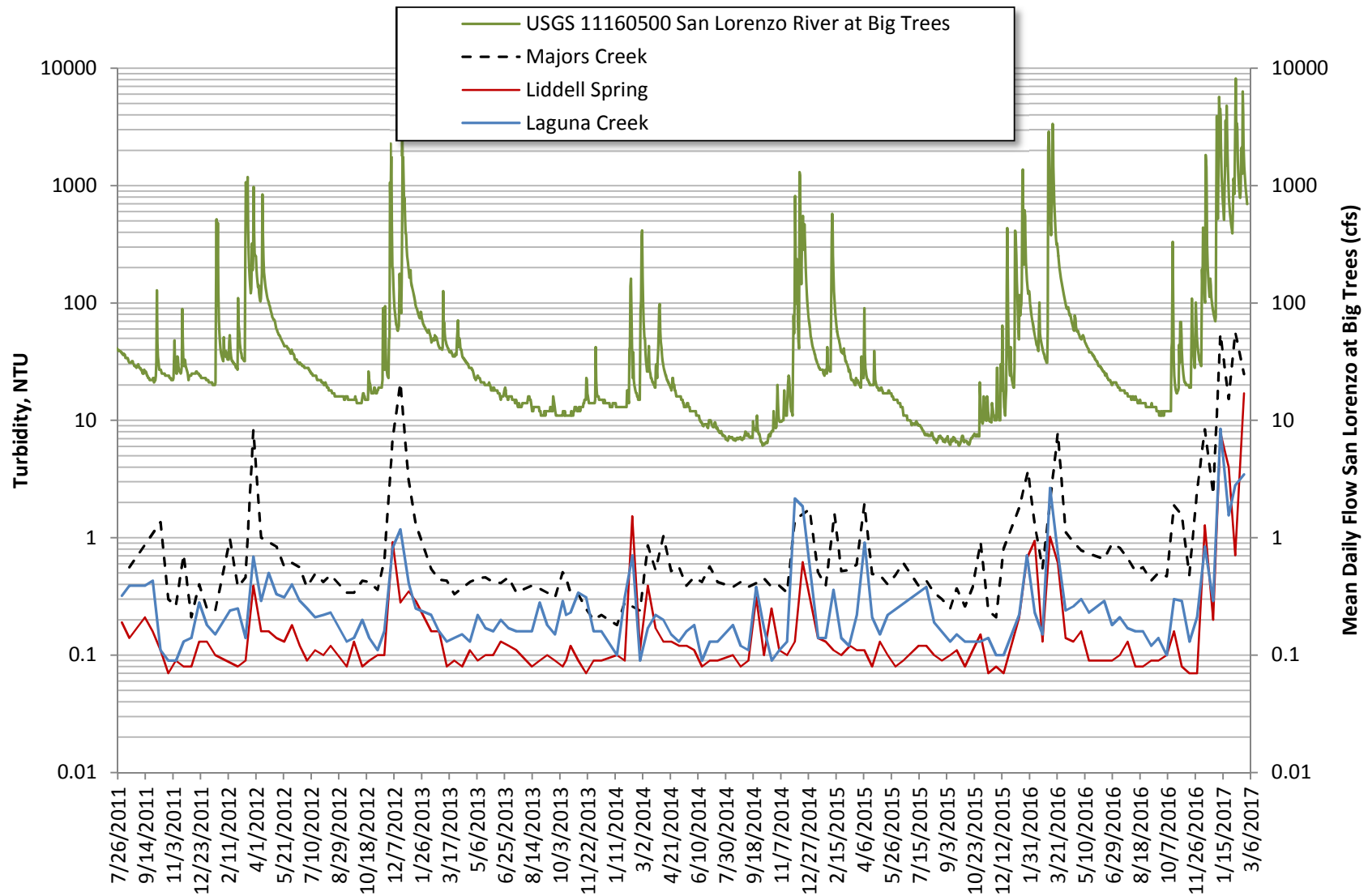
<sup>21</sup> At Majors Creek, however, continuous turbidity data shows that flows of 2 to 3 cfs can elevate turbidity to 10 NTU (Hastings, unpublished data). Based on field reconnaissance of Upper Majors Creek, there appears to be a chronic supply of sediment, much of which from the East Branch, underlain by weakly cemented Lompico sandstone that weathers by scour and mass wasting. Measurable sources of sediment were found in-channel storage (behind logjams or filling pools) (Hastings and Strudley, 2011).



**Figure 5-4**

**Turbidity in SCWD's San Lorenzo River Sources, 2011-2017 (through February 2017)**

Turbidity data is collected once or twice a month. Mean daily flows from San Lorenzo River at Big Trees are shown for reference to sediment transport conditions.

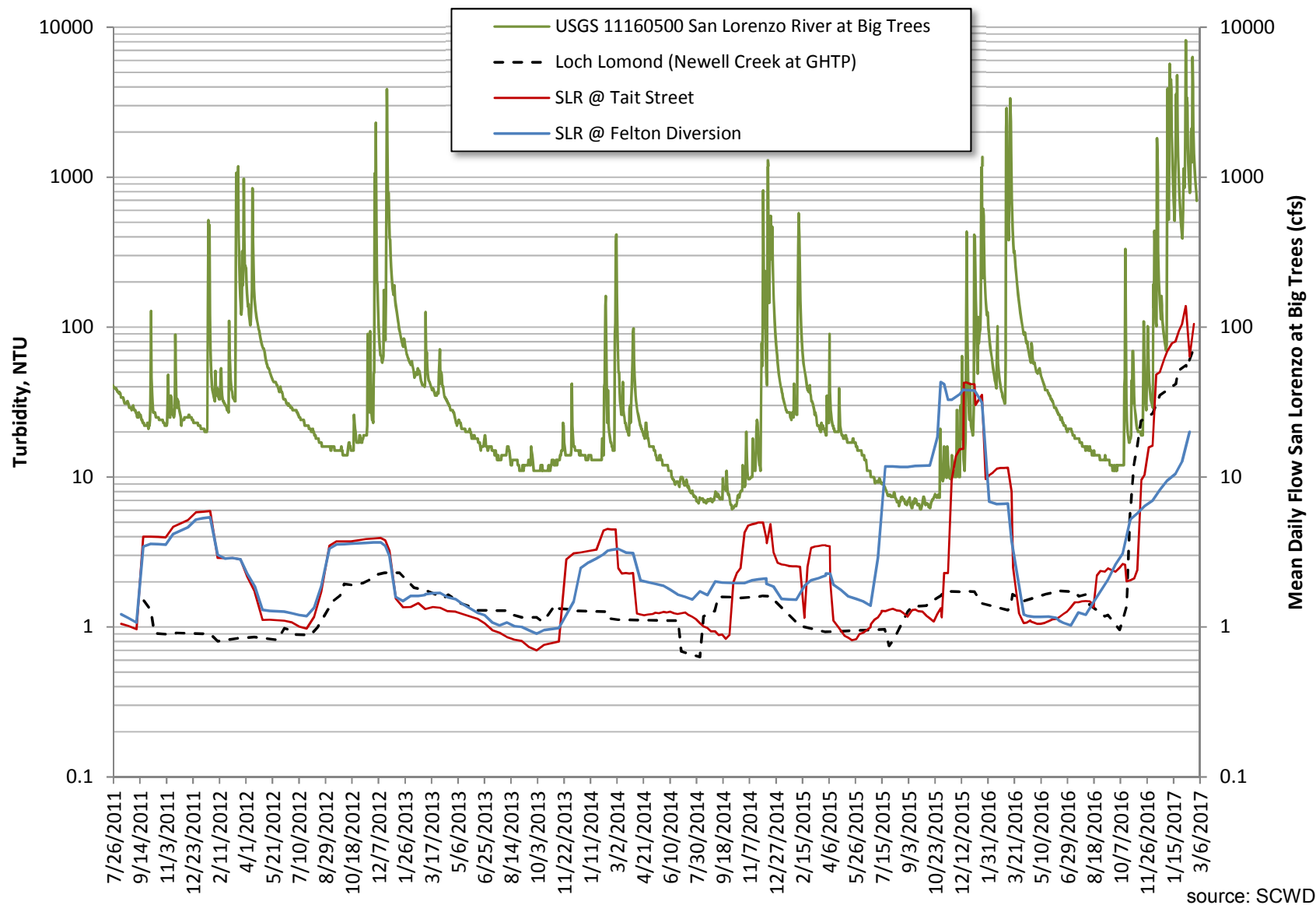


source: SCWD

**Figure 5-5**

**Turbidity in SCWD's North Coast Sources, 2011-2017 (through February 2017)**

Turbidity data is collected once or twice a month. Mean daily flows from San Lorenzo River at Big Trees are shown for reference to sediment transport conditions.

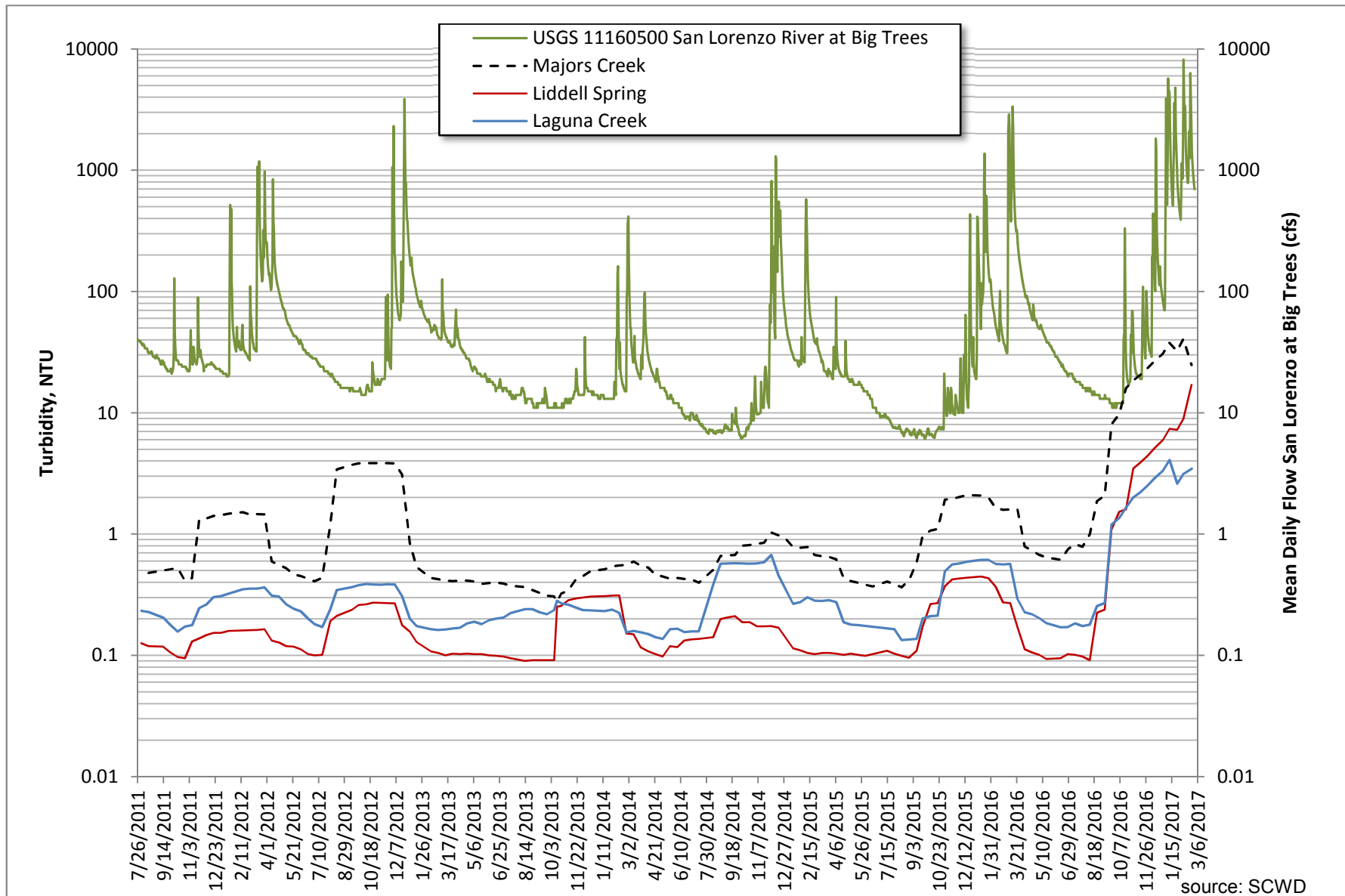


source: SCWD

**Figure 5-6**

**Turbidity in SCWD's San Lorenzo River Sources, 2011-2017 (through February 2017).**

Ten point running average shown for clarity; data taken at varying intervals. Mean daily flows from San Lorenzo River at Big Trees are shown for reference to sediment transport conditions.



**Figure 5-7**

**Turbidity in SCWD's North Coast Sources, 2011-2017 (through February 2017)**

Ten point running average shown for clarity; data taken at varying intervals. Mean daily flows from San Lorenzo River at Big Trees are shown for reference to sediment transport conditions.



### 5.4.3 Nitrate

The MCL for nitrate in drinking water is 10 mg/L as nitrogen, or 45 mg/L as nitrate. The nitrate concentrations in the surface water systems located within the watersheds do not approach this limit. However, in response to the 303(d) listing for nutrient impairment and implementation of the resulting nitrate TMDL, the County and the Regional Board have implemented numerous management and regulatory actions to reduce nitrate loadings to the river and tributary creeks. The primary source of nitrate is from septic leach fields located in sandy soil areas (Santa Margarita sandstone), mostly located east of the San Lorenzo River. Other key sources are septic systems near waterways, a community leach field at the Boulder Creek Country Club, and the Scotts Valley nitrate plume. Table 5-3 provides a summary of the nitrate data provided. Additional graphs and narrative for each water purveyor follows.

**Table 5-3: Summary of Nitrate Data Evaluated**

Utility/Location	Nitrate (mg/L as N)				No. of Samples	Water Year	
	Average	Median	Low	High		From	To
<b>Santa Cruz Water Department<sup>1</sup></b>							
Liddell Spring	1.32	1.30	1.05	1.94	42	2011	2017
Laguna Creek	0.37	0.38	0.00	0.78	47	2011	2017
Majors Creek	1.26	1.35	0.00	2.00	41	2011	2017
Loch Lomond	1.09	1.08	0.00	1.84	48	2011	2017
SLR @ Tait Street	1.39	1.51	0.00	2.28	78	2011	2017
SLR @ Felton	2.16	2.17	0.92	3.17	52	2011	2017
<b>San Lorenzo Valley Water District<sup>2</sup></b>	YEAR						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	< 0.1	< 0.1	< 0.1	NR	< 0.10	0.13	< 0.10
Bull Springs-1	< 0.1	< 0.1	< 0.1	< 0.10	0.11	< 0.10	< 0.10
Bull Springs-2	<0.1	NR	NR	NR	NR	NR	NR
Clear Creek	NR	< 0.1	< 0.1	< 0.10	< 0.10	< 0.10	< 0.10
Fall Creek	NR	<0.1	NR	< 0.10	< 0.10	< 0.10	< 0.10
Foreman Creek	NR	<0.1	NR	< 0.10	< 0.10	< 0.10	< 0.10
Peavine Creek	NR	< 0.1	< 0.1	< 0.10	< 0.10	< 0.10	< 0.10
Sweetwater Creek	NR	< 0.1	NR	< 0.10	< 0.10	< 0.10	0.15
Lompico Creek	ND	ND	ND	ND	ND	ND	NR

<sup>1</sup>Source: SCWD

<sup>2</sup>Source: SLVWD, 2017 data is 6 months Note: NR = Not Recorded; ND = Non-detectable  
SLR = San Lorenzo River

#### **5.4.3.1 SCWD Surface Water Sources**

SCWD has monitored the nitrate levels in its water sources since the late 1960's. The following paragraphs describe the key findings of the nitrate evaluation.

Figure 5-8 shows the nitrate data over the past 6 years for the SCWD's San Lorenzo River sources. While values are higher for the two river sources compared to Loch Lomond, values for Loch Lomond reached nearly the same levels as the other two sources in 2015, which was a very dry year with relatively high contributions of groundwater (versus direct runoff) to streams.<sup>22</sup> In early 2017, which saw record-level rain events, values for all three sources were significantly reduced compared to previous years. Overall, sample concentrations are less than 1.0 mg/L as N and have remained relatively unchanged since 2017.

Figure 5-9 shows the nitrate trend over the past 6 years for the SCWD's North Coast sources. While Laguna Creek has the lowest concentrations, values for Laguna Creek spike in early 2017 during the record rain events, while values for Majors Creek are significantly reduced. Liddell Springs does not have any nitrate spikes since CEMEX ceased operation of the quarry in 2010. Values are similar for the San Lorenzo River and North Coast sources.

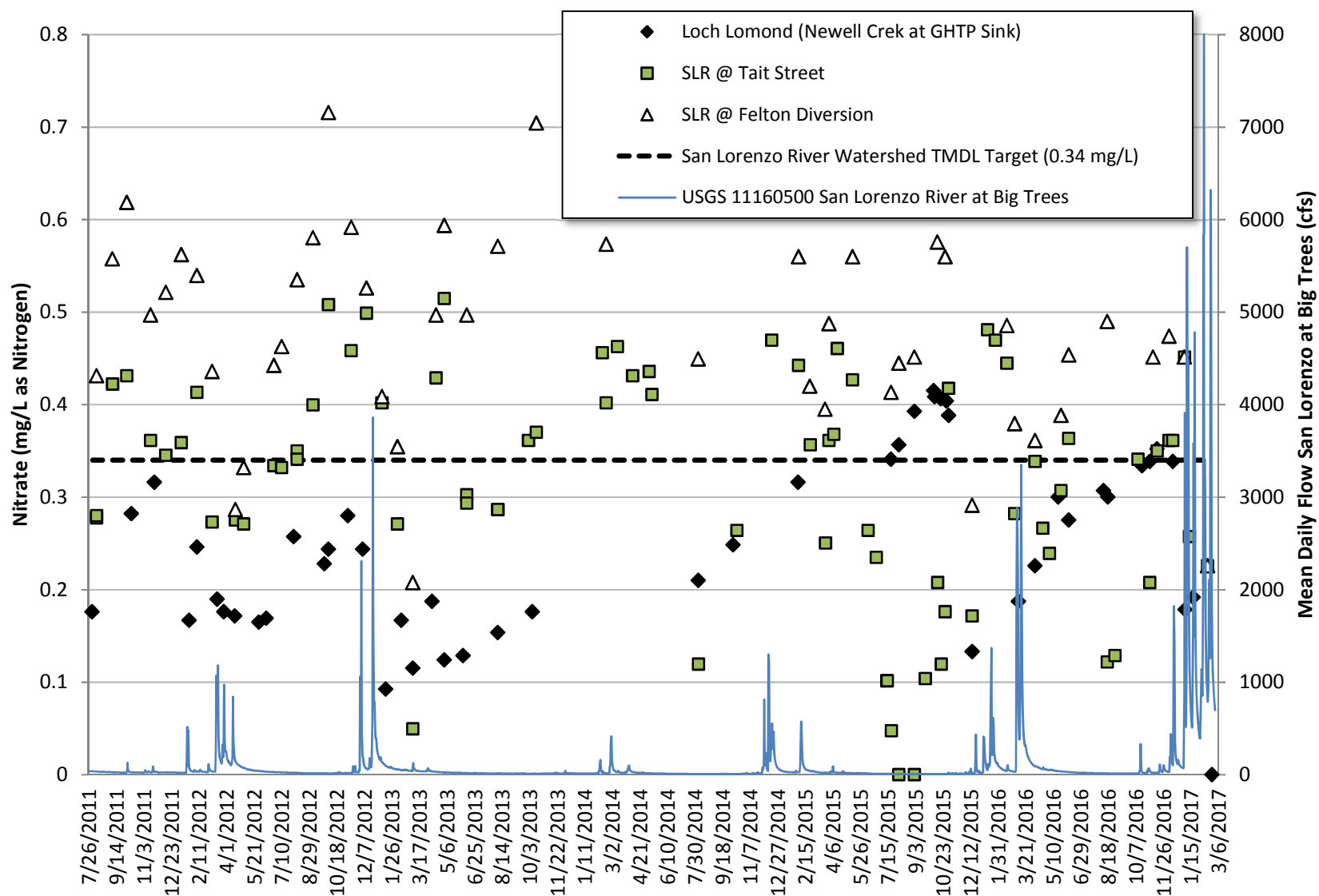
Figure 5-10 provides an additional historic perspective on nitrate concentrations. Three time-based lines of best fit have been provided for the data with the first-time period from 1967 to 1990 that indicates potential increasing trend in nitrate, a second-time period from 1991 to 2010 that shows levelling of nitrate, while a third from 2011-2017 that indicates a potential decreasing trend after a jump from 2010 to 2011. Long-term evaluation of nitrate data should be continued in the future to assess the continued focus on water quality, and particularly on-site wastewater management, that has occurred since about 1995.

#### **5.4.3.2 SLVWD Surface Water Sources**

The summary of nitrate data for the SLVWD surface water sources is included in Table 5-3. The nitrate results were often found to be below reporting limits, and for this reason no graph illustrating these results was provided.

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<sup>22</sup> Groundwater typically has a higher dissolved ion concentration than direct runoff, which presumably enters the channel shortly after precipitation with little residence time in the groundwater reservoir and limited contact with soil or vegetation.

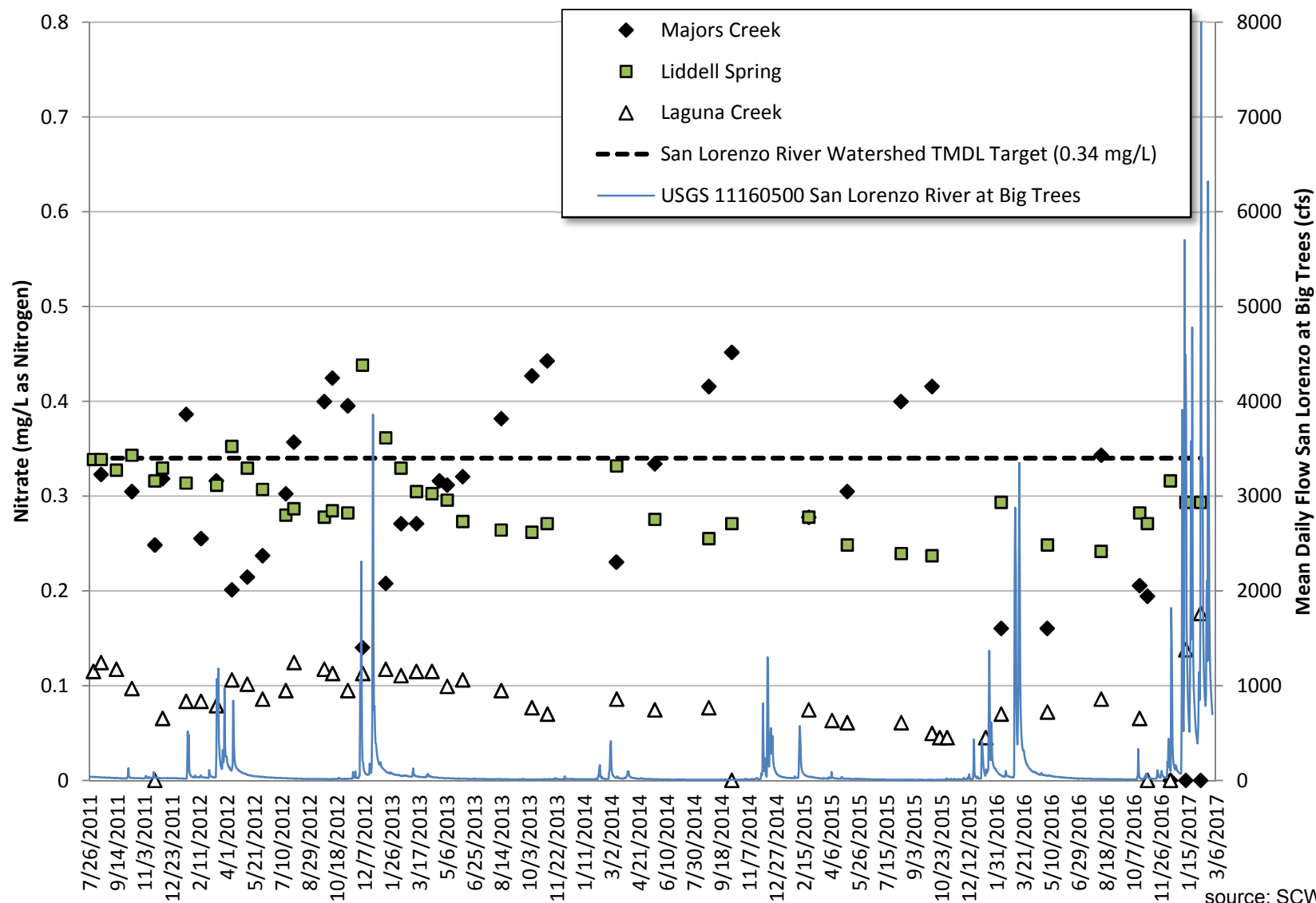


source: SCWD

**Figure 5-8**

**Nitrate Concentrations in the SCWD San Lorenzo River Sources, 2011-2017  
(through February 2017)**

Mean daily flows from San Lorenzo River at Big Trees are shown for reference to runoff conditions



source: SCWD

**Figure 5-9**

**Nitrate Concentrations in the SCWD North Coast Sources, 2011-2017  
(through February 2017)**

Mean daily flows from San Lorenzo River at Big Trees are shown for reference to runoff conditions

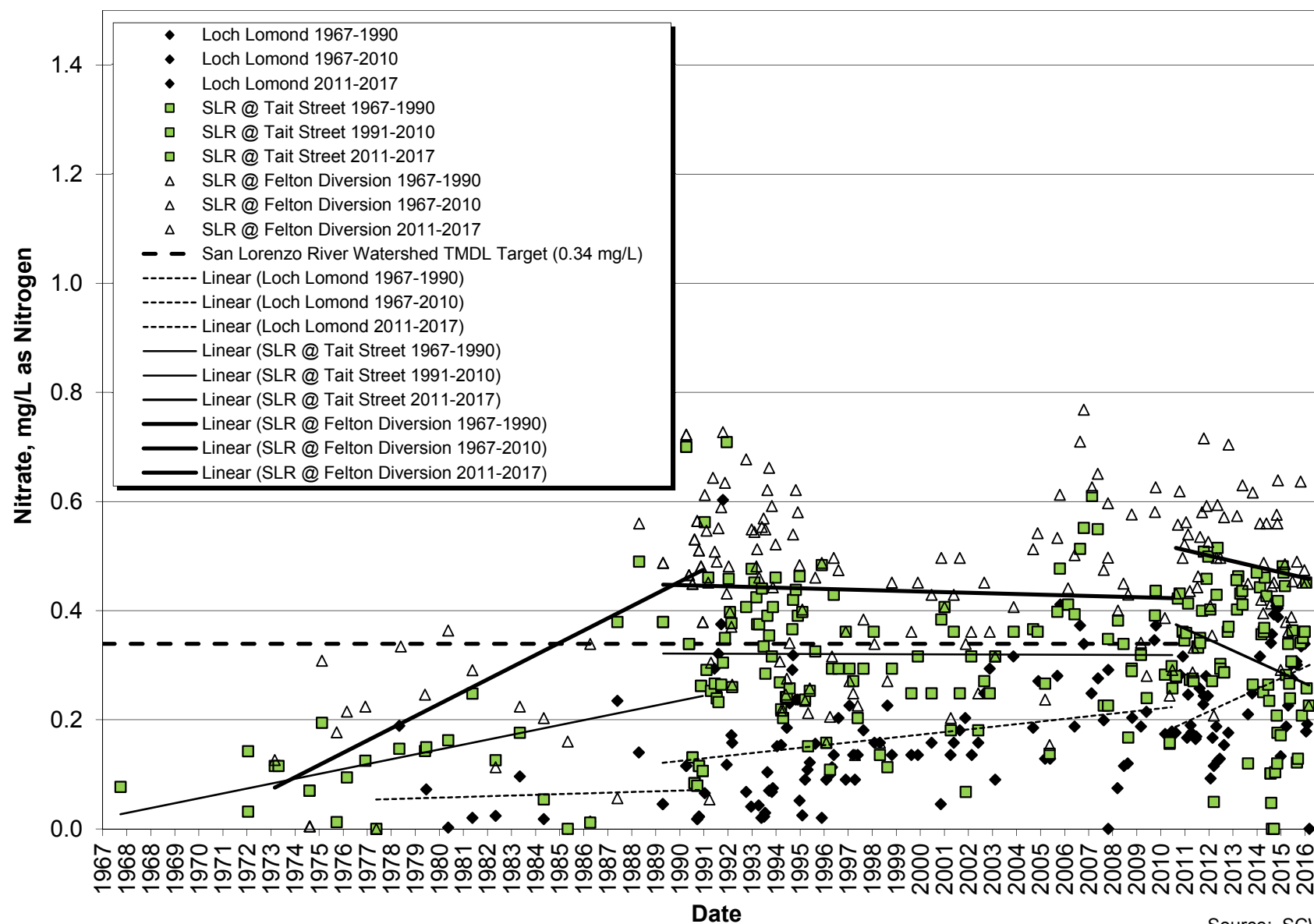


Figure 5-10.

**Nitrate Concentrations in the SCWD San Lorenzo River Sampling Sites, 1967-2017**

Numbers in parenthesis are median values.

Trend lines drawn for each site based on a linear best fit.

#### **5.4.4 Odors**

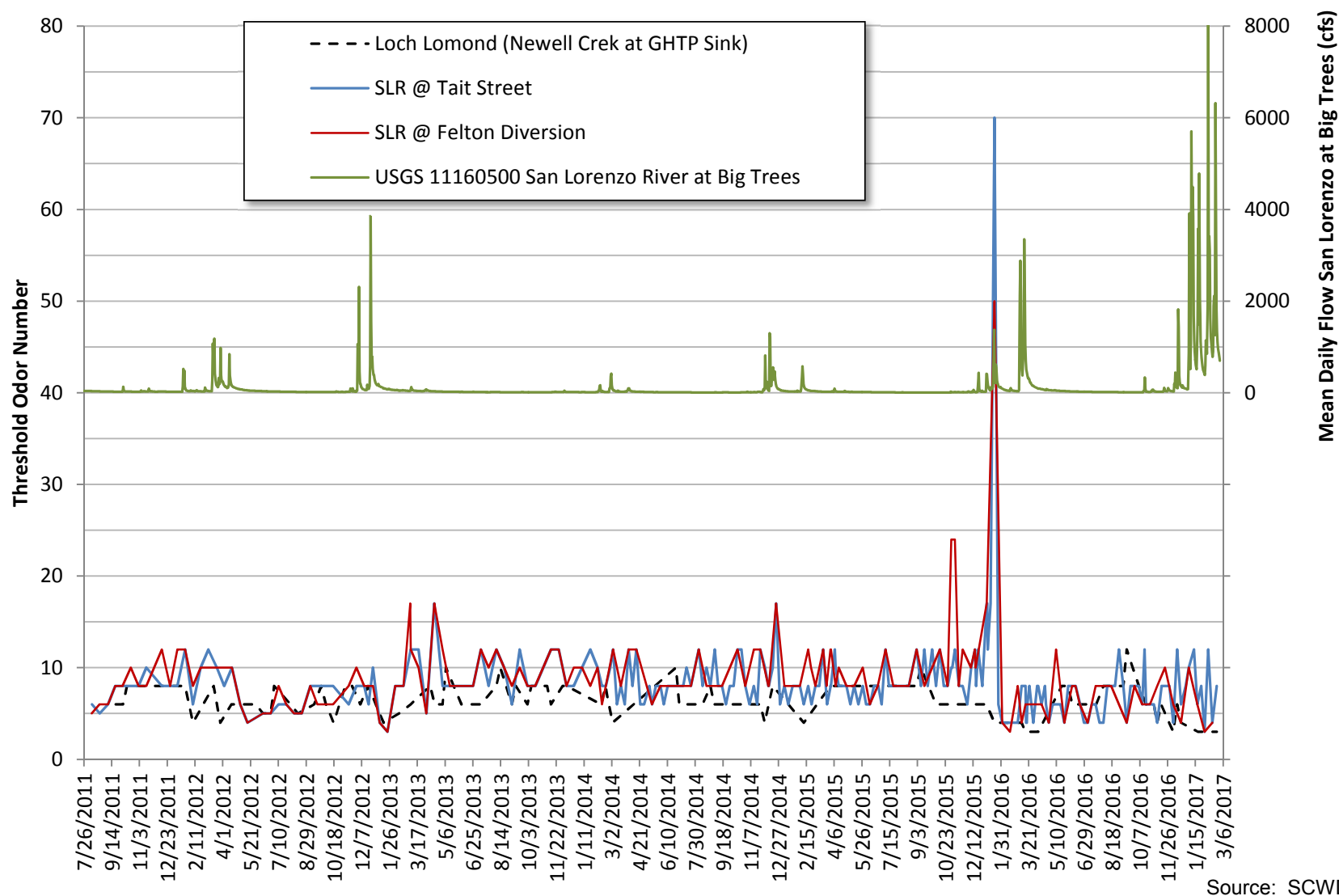
Odors of raw water typically relate to natural organic matter and algae degradation products. The SCWD has extensive data on the Threshold Odor Numbers (TON) parameter. Raw and treated TONs were monitored more aggressively starting in the mid-1980s, primarily because of customer complaints.

Figure 5-11 shows TON values for the SCWD's San Lorenzo River sources over the last 6 years. TON at Loch Lomond, Tait Street, and the Felton Diversion appear relatively constant, which may align with both a focus on odor control [?] and a stabilizing in the nitrate concentrations and therefore a relatively lower algae production rate. A significant spike in early 2016 for Tait Street and Felton Diversion may be attributed to the first significant rain event after the historic three-year drought prior. Values following that event for all sources dropped to lower values immediately after.

Figure 5-12 shows TON values for SCWD's North Coast sources over the same 6-year period. TON at Liddell Spring is much lower than at Laguna and Majors Creeks. Values are higher for the San Lorenzo River than the North Coast sources.

#### **5.4.5 Organic Contaminants**

Generally, state-mandated Title 22 sampling reports indicate very little presence of contamination of surface water sources with man-made organic constituents. The four contamination sources described in previous sections, the dry-cleaner, two service stations, and manufacturing facility have historically discharged PCE, TCE, TPH, benzene or toluene to surface or groundwater of the San Lorenzo River Watershed. Trace amounts of tetrachloroethylene (PCE) have been detected at the San Lorenzo River Henry Cowell Park Bridge in 2012 and 2013 with values ranging from 0.51-0.67 ug/L, which is much less than the 5 ug/L MCL. No other detections of organic compounds have been documented; as discussed in Section 3.7.2, a USDA study discontinued sampling for herbicides and pesticides when little evidence of these chemicals was found. As previously mentioned in Section 3, corrective and/or modified action is currently under review or in development for the active sites by the RWQCB.

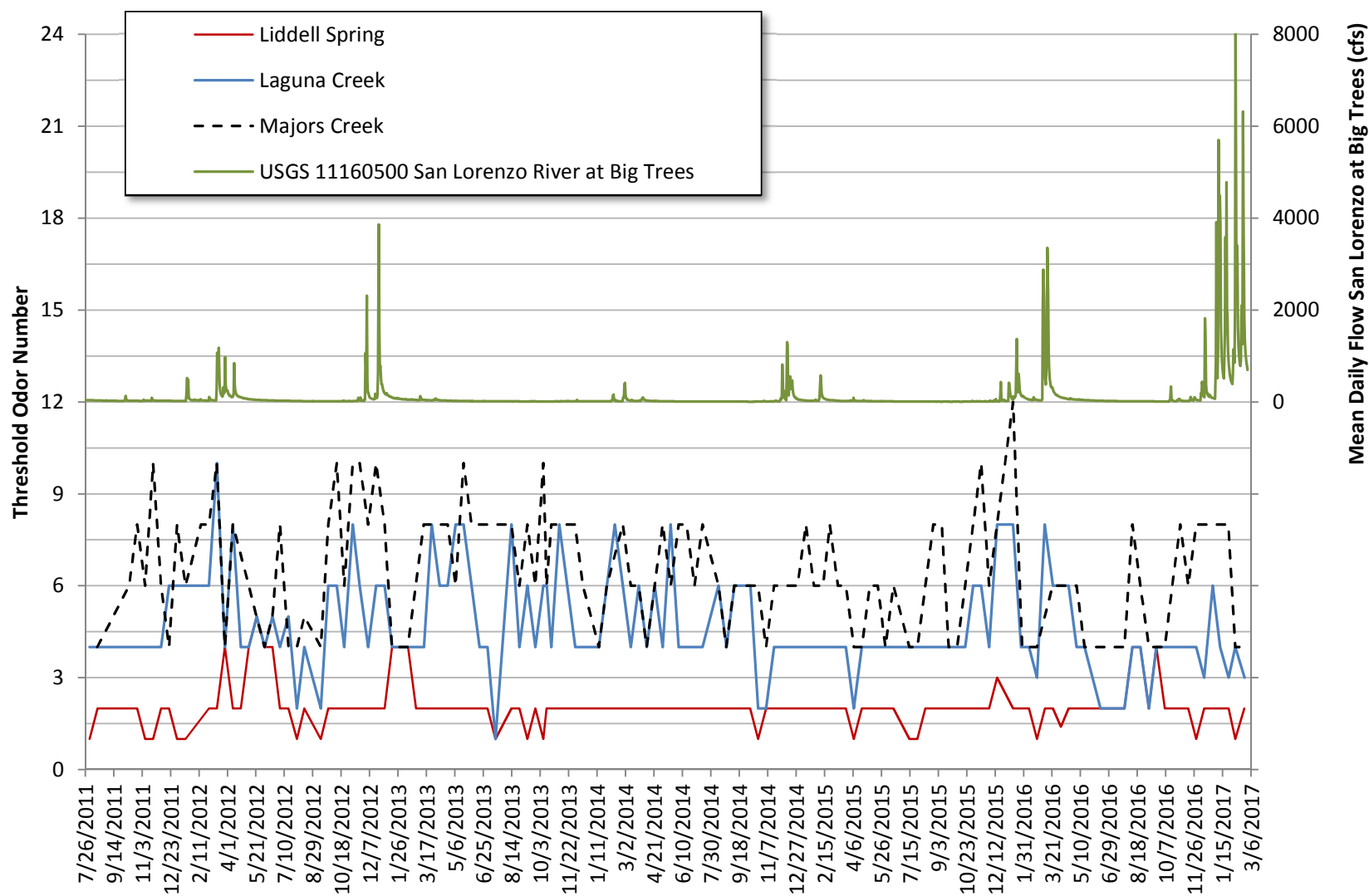


Source: SCWD

**Figure 5-11**

**TON measured in SCWD's San Lorenzo River Sources, 2011-2017 ( through February 2017)**

Odor data is collected twice a month. Mean daily flows from San Lorenzo River at Big Trees are shown for reference to runoff conditions. Values greater than or equal to 20 correspond with significant rainfall, with the highest numbers during severe storm events.



Source: SCWD

**Figure 5-12**

**TON measured in SCWD's North Coast Sources, 2011-2017 ( through February 2017)**

Odor data is collected twice a month. Mean daily flows from San Lorenzo River at Big Trees are shown for reference to runoff conditions. Values greater than or equal to 20 correspond with significant rainfall, with the highest numbers during severe storm events.



## 5.4.6 Other Water Quality Parameters

Tables 5-4 through 5-17 summarize the recent historical data for other water quality parameters in the general mineral category. The data includes summary tables for Total Hardness, calcium, magnesium, sodium, potassium, alkalinity, sulfate, chloride, fluoride, pH, Total Dissolved Solids (TDS), conductivity, color, and Methylene Blue Active Substances (MBAS), which are indicative of soaps/detergents:

### 5.4.6.1 Total Hardness

Table 5-4: Total Hardness — Most data indicate that most area surface waters are moderately hard, with values around 140 to 270 mg/l as CaCO<sub>3</sub>. One SCWD source, Liddell Spring, has average and median hardness values of above 250 mg/l as CaCO<sub>3</sub>. This is most likely caused by the extensive limestone (karst) geology in the spring vicinity. SLVWD samples were generally one time per year. Most SLVWD creek waters have significantly lower hardness than SCWD waters, while spring waters are similar to Liddell Spring.

**Table 5-4: Total Hardness Summary of Available Data (mg/L as CaCO<sub>3</sub>)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	269.3	258.0	223.0	400.0	135	2011	2017
Laguna Creek	137.3	142.0	56.0	174.0	132	2011	2017
Majors Creek	134.4	141.0	44.0	178.0	129	2011	2017
Loch Lomond	159.8	162.5	110.0	186.0	106	2011	2017
SLR @ Tait Street	148.0	152.0	60.0	188.0	237	2011	2017
SLR @ Felton Diversion	150.1	152.0	64.0	188.0	150	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
Bennett Spring	220	230	220	NR	220	NR	NR
Bull Springs-1	290	290	270	290	280	300	260
Bull Springs-2	210	220	230	240	260	220	210
Clear Creek	46	50	58	60	68	44	38
Fall Creek	97	98	110	110	110	92	91
Foreman Creek	49	52	61	65	71	46	42
Peavine Creek	58	66	79	80	85	68	50
Sweetwater Creek	68	73	86	80	94	63	68
Lompico Creek	98	110	140	190	200	180	NR

<sup>1</sup>Source: SCWD

<sup>2</sup>Source: SLVWD, NR = Not Recorded

### 5.4.6.2 Calcium

Table 5-5: Calcium — This table lists similar results as for hardness; moderate values for most sources (e.g., about 45 mg/l) except for Liddell Springs (e.g., above 90 mg/l). SLVWD samples were generally one time per year. Several of SLVWD's calcium values that were analyzed are lower than those of SCWD

**Table 5-5: Calcium Summary of Available Data (mg/L)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	97.1	93.0	78.0	130.0	10	2011	2017
Laguna Creek	41.9	45.0	15.0	57.0	10	2011	2017
Majors Creek	41.2	43.5	12.0	60.0	10	2011	2017
Loch Lomond	46.2	45.0	30.0	57.0	11	2011	2017
SLR @ Tait Street	41.8	43.0	29.0	48.0	12	2011	2017
SLR @ Felton Diversion	42.5	45.0	30.0	47.0	11	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	77	80	77	NR	77	NR	NR
Bull Springs-1	82	82	79	85	80	86	73
Bull Springs-2	< 1.0	NR	NR	NR	NR	NR	NR
Clear Creek	ND	NR	NR	NR	NR	NR	NR
Fall Creek	30	30	33	35	34	31.5 <sup>3</sup>	28
Foreman Creek	ND	NR	NR	NR	NR	NR	NR
Peavine Creek	ND	NR	NR	NR	NR	NR	NR
Sweetwater Creek	ND	NR	NR	NR	NR	NR	NR
Lompico Creek	24	28	33	45	50	43	NR

Source<sup>1</sup>: SLVWD

Source<sup>1</sup>: SCWD, \* Median based on 2011-2017 values

Source<sup>2</sup>: SLVWD, : NR = Not Recorded; ND= Non-Detectable

<sup>3</sup> Average of March and April 2016 values

### 5.4.6.3 Magnesium

Table 5-6: Magnesium — Magnesium concentrations are low compared to calcium. This indicates most of the total hardness is from calcium, as expected considering the geologic formations throughout the watershed area. SLVWD's Bull Springs source was slightly higher in magnesium than those of SCWD.

**Table 5-6: Magnesium Summary of Available Data (mg/L)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	11.2	11.0	8.5	16.0	10	2011	2017
Laguna Creek	5.1	5.2	2.8	6.6	10	2011	2017
Majors Creek	3.7	3.8	2.8	4.7	10	2011	2017
Loch Lomond	10.6	11.0	7.4	14.0	11	2011	2017
SLR @ Tait Street	8.9	8.7	7.0	11.0	12	2011	2017
SLR @ Felton Diversion	8.7	8.6	7.2	10.0	11	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	7.3	7.9	7.4	NR	7.4	NR	NR
Bull Springs-1	20	20	18	20	19	21	18
Bull Springs-2	13	15	15	16	18	15	13
Clear Creek	4.1	4.6	5.4**	5.5	6.1	4	3.2
Fall Creek	5.1	5.7	6.1	6.3	6.6	5	5.1
Foreman Creek	5.3	5.8	6.8	7.2	6.9	5	4.4
Peavine Creek	5.8	6.8	8.0**	8	8.6	6.85	5
Sweetwater Creek	6.2	6.4	7.4	6.7	7.6	5.5	6.2
Lompico Creek	9	10	13	18	17	17	NR

Source<sup>1</sup>: SCWD, \* Median based on 2011-2017 values

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded, \*\* indicates Intraday Average

#### 5.4.6.4 Sodium

Table 5-7: Sodium — The average sodium content in SCWD waters ranges from about 10 to 25 mg/l. Lompico Creek had sodium analyses in the range of 18 to 28 mg/L which are higher than the other SLVWD's sources and more similar to most of SCWD's sources.

**Table 5-7: Sodium Summary of Available Data (mg/L)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	11.9	12.0	10.0	14.0	10	2011	2017
Laguna Creek	10.3	10.5	7.0	13.0	10	2011	2017
Majors Creek	15.1	16.5	8.6	20.0	10	2011	2017
Loch Lomond	22.9	24.0	13.0	31.0	11	2011	2017
SLR @ Tait Street	24.8	25.5	13.0	33.0	12	2011	2017
SLR @ Felton Diversion	25.0	27.0	13.0	30.0	11	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	6.7	7.1	7	NR	6.7	NR	NR
Bull Springs-1	8	9	9.2	9.4	9	8.9	7.7
Bull Springs-2	8.8	10	10	9.9	11	9.4	8.7
Clear Creek	7.6	8.3	9.5**	9.5	10	6.9	6.9
Fall Creek	8.2	9.5	10	9.6	10	9.25 <sup>3</sup>	8.4
Foreman Creek	7.5	8.3	9.5	9.4	9.8	6.7	7.4
Peavine Creek	8	9.4	10**	10	11	8.7 <sup>3</sup>	7.6
Sweetwater Creek	9.2	10	11	10	11	8.6	9.2
Lompico Creek	20	18	22	24	28	24	NR

Source<sup>1</sup>: SCWD\* Median based on 2011-2017 values

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded, \*\* indicates Intraday Average <sup>3</sup> Average of March and April data

#### 5.4.6.5 Potassium

Table 5-8: Potassium — The typical potassium content in SCWD waters is about 2 mg/l. Lompico Creek had potassium in a range from 1.1 to 1.4 mg/L which is slightly lower than SLVWD and SCWD values.

**Table 5-8: Potassium Summary of Available Data (mg/L)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	2.1	2.0	1.7	2.5	10	2011	2017
Laguna Creek	2.1	2.1	1.8	2.5	10	2011	2017
Majors Creek	2.0	2.0	1.6	2.7	10	2011	2017
Loch Lomond	2.3	2.3	1.9	2.8	11	2011	2017
SLR @ Tait Street	2.4	2.3	2.0	3.0	12	2011	2017
SLR @ Felton Diversion	2.1	2.1	1.9	2.6	11	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	2.1**	2.2	2.2	NR	2	NR	NR
Bull Springs-1	1.8**	1.8**	2.0**	2.0**	1.8**	1.7**	1.6**
Bull Springs-2	1.5**	1.6**	1.7**	1.7**	1.6**	1.5**	1.5**
Clear Creek	1.6**	1.6**	2.0**	2.0**	2.0**	1.6**	1.5**
Fall Creek	1.9**	1.8**	2.1**	2.0**	1.9**	1.9**	2.0**
Foreman Creek	1.8**	1.8**	2.2**	2.1**	2.2**	1.6**	1.8**
Peavine Creek	2.2**	2.5**	2.8**	2.6**	2.7**	2.45**	2.2**
Sweetwater Creek	2.0**	2.0**	2.2**	2.1**	2.2**	1.7**	2.1**
Lompico Creek	1.4	1.1	1.2	1.3	2	1.3	NR

Source<sup>1</sup>: SCWD \* Median based on 2011-2017 values

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded, \*\* indicates Intraday Average

#### 5.4.6.6 Alkalinity

Table 5-9: Alkalinity — Alkalinity varies widely in SCWD, presumably because of high runoff periods. The average values for Liddell Springs is 207 mg/l as CaCO<sub>3</sub>, due to karst bedrock geology, and about 105 to 130 mg/l as CaCO<sub>3</sub> for the other sources. Lompico Creek had an alkalinity range from 100 to 190 mg/L which is in the mid-range of SLVWD's other water sources; again highlighting that the spring sources with their contact to karst (limestone) have higher alkalinity compared to the creeks.

**Table 5-9: Alkalinity Summary of Available Data (mg/L as CaCO<sub>3</sub>)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	207.1	208.0	102.0	234.0	135	2011	2017
Laguna Creek	131.2	136.0	44.0	164.0	132	2011	2017
Majors Creek	106.2	112.0	32.0	134.0	129	2011	2017
Loch Lomond	115.2	117.0	70.0	154.0	106	2011	2017
SLR @ Tait Street	114.1	122.0	40.0	146.0	237	2011	2017
SLR @ Felton Diversion	116.8	124.0	42.0	134.0	150	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	220	210	210	NR	220	NR	NR
Bull Springs-1	270	260	260	200	280	280	250
Bull Springs-2	210	200	220	220	260	210	210
Clear Creek	53	56	66	69	78	47	43
Fall Creek	100	95	110	110	120	90	89
Foreman Creek	56	57	67	64	82	51	48
Peavine Creek	69	72	86	86	100	71	58
Sweetwater Creek	76	79	95	93	110	72	70
Lompico Creek	100	120	140	170	190	180	NR

Source<sup>1</sup>: SCWD

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded

#### 5.4.6.7 Sulfate

Table 5-10: Sulfate — The secondary MCL for sulfate is 250 mg/l. The maximum value measured in annual samples of SCWD water was 210 mg/l in Liddell Spring. Averages range from 14 to 72 mg/l. Lompico Creek had sulfate in the range from 17 to 29 mg/L while the other SLVWD sources had sulfate values are lower than both SCWD and Lompico Creek.

**Table 5-10: Sulfate Summary of Available Data (mg/L)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	72.4	57.4	43.1	210.0	28	2011	2017
Laguna Creek	14.3	14.9	5.7	17.6	35	2011	2017
Majors Creek	36.8	36.9	10.0	54.0	28	2011	2017
Loch Lomond	72.2	73.9	52.0	83.0	36	2011	2017
SLR @ Tait Street	52.1	48.8	32.7	81.0	59	2011	2017
SLR @ Felton Diversion	52.6	48.0	32.8	84.6	36	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	9.3	11	9.6	NR	12	16	NR
Bull Springs-1	8	8.6	9.1	9.4	10	9.6	7.4
Bull Springs-2	6.9	8	9.1	9.7	11	8.6	6
Clear Creek	2.4	3	3	3.6	4.1	2.8	2.2
Fall Creek	7.3	8.2	9.2	10	11	9.1	5.9
Foreman Creek	3.6	4.3	5.2	8	4.7	3.7	2.7
Peavine Creek	2.2	2.7	3.2	3.4	3.8	2.75	2
Sweetwater Creek	3.1	3.7	3.8	4.3	4.4	4.2	2.8
Lompico Creek	17	21	24	34	29	25	NR

Source<sup>1</sup>: SCWD

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded

#### 5.4.6.8 Chloride

Table 5-11: Chloride — The secondary MCL for chloride is 250 mg/l. The maximum value measured in SCWD water was 34 mg/l (at Tait Street). Averages range from 10 to 27 mg/l. Lompico Creek had chloride in the range of 16 to 25 mg/L, which is lower than the other SLVWD sources but similar to Majors Creek and Loch Lomond.

**Table 5-11: Chloride Summary of Available Data (mg/L)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	10.8	11.0	8.5	11.9	30	2011	2017
Laguna Creek	10.5	10.6	7.1	12.2	35	2011	2017
Majors Creek	16.2	16.7	9.2	17.8	28	2011	2017
Loch Lomond	16.1	16.9	7.3	19.0	36	2011	2017
SLR @ Tait Street	26.7	26.5	9.1	37.2	59	2011	2017
SLR @ Felton Diversion	27.2	26.8	9.9	36.2	36	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	6.9	7.5	7.5	NR	7.1	6.8	NR
Bull Springs-1	8.7	9	9.9	9.9	9.5	9	8.7
Bull Springs-2	9.3	10	10	10	10	8.8	9.6
Clear Creek	5.6	5.8	6.3	8.1	6.6	5.1	5.5
Fall Creek	7.1	7.4	8	8.3	7.9	6.8	7.5
Foreman Creek	5.4	5.2	6.2	7	6.2	4.5	5.7
Peavine Creek	5.6	5.4	6	6.6	5.7	5.15	6.1
Sweetwater Creek	5.9	6.3	6.6	7.4	6.6	5.6	6.3
Lompico Creek	16	17	19	19	25	16	NR

Source<sup>1</sup>: SCWD

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded



#### 5.4.6.9 Fluoride

Table 5-12: Fluoride — The primary MCL for fluoride is 2.0 mg/l (see Appendix B). The maximum value measured in annual samples of SCWD water is 0.30 mg/l in Loch Lomond. Averages range from 0.07 to 0.27 mg/l, with the North Coast sources having lower levels than the San Lorenzo River. Lompico Creek had fluoride in the range from 0.15 to 0.29 mg/L which is higher than most of the SLVWD and SCWD sources but similar to Loch Lomond.

**Table 5-12: Fluoride Summary of Available Data (mg/L)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	0.08	0.09	0.00	0.14	30	2011	2017
Laguna Creek	0.07	0.08	0.00	0.11	35	2011	2017
Majors Creek	0.07	0.08	0.00	0.13	28	2011	2017
Loch Lomond	0.27	0.27	0.21	0.31	35	2011	2017
SLR @ Tait Street	0.17	0.18	0.12	0.20	58	2011	2017
SLR @ Felton Diversion	0.18	0.18	0.14	0.20	36	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	0.087	0.1	0.095	NR	0.1	NR	NR
Bull Springs-1	0.11	0.12	0.11	0.11	0.12	0.11	0.15
Bull Springs-2	0.11	0.12	0.12	0.11	0.12	0.11	0.14
Clear Creek	0.057	0.061	0.075	0.071	0.077	0.061	0.066
Fall Creek	0.058	0.06	0.07	0.067	0.081	0.064	0.081
Foreman Creek	0.077	0.085	0.092	0.091	0.08	0.086	0.084
Peavine Creek	0.071	0.08	0.083	0.081	0.086	0.084	0.074
Sweetwater Creek	0.053	0.059	0.079	0.084	0.091	0.064	0.064
Lompico Creek	0.15	0.2	0.19	0.25	0.24	0.29	NR

Source<sup>1</sup>: SWD

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded

#### 5.4.6.10 pH

Table 5-13: pH — The pH values for SCWD waters have ranged from 6.8 to 8.4 units, with median values between 7.3 and 8.1. Lompico Creek had pH levels in the range of 7.6 to 8.2 which is similar to the other SLVWD sources waters but at the upper end of pH for the SCWD source waters.

**Table 5-13: Summary of Available pH Data (units)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water<sup>1</sup> Department</i>							
Liddell Spring	7.3	7.4	6.8	7.8	135	2011	2017
Laguna Creek	8.1	8.1	7.5	8.3	132	2011	2017
Majors Creek	7.9	7.9	7.2	8.2	129	2011	2017
Loch Lomond	7.4	7.3	7.0	8.4	106	2011	2017
SLR @ Tait Street	7.9	7.9	7.4	8.2	238	2011	2017
SLR @ Felton Diversion	7.8	7.8	7.5	8.1	150	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	7.45	7.6	7.55	7.3	7.55	7.4	7.4
Bull Springs-1	7.6	7.4	7.35	7.45	7.35	7.25	7.45
Bull Springs-2	7.7	7.8	7.7	7.65	7.5	7.5	7.65
Clear Creek	7.75	8	7.85	7.85	7.65	7.8	7.7**
Fall Creek	7.85	8.2	8.15	8.25	8.1	8.1	8.1
Foreman Creek	7.8	8.0	7.8	7.85	7.9	7.95	7.7**
Peavine Creek	7.9	8.05	8.1	8.1	8.0	8.08**	7.85**
Sweetwater Creek	7.85	7.95	7.95	7.9	7.8	7.95	7.9**
Lompico Creek	8.0	8.2	8.2	8.0	7.6	8.0	NR

Source<sup>1</sup>: SCWD

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded, \*\* indicates Intraday Average

#### 5.4.6.11 TDS and Conductivity

Tables 5-14 and 5-15: TDS and Conductivity — The secondary MCL for TDS is 500 mg/l. The maximum value measured in annual samples of SCWD water is 540 mg/l at Liddell Spring, with averages ranging from 177 to 368 mg/l. Lompico Creek had TDS values in the range from 190 to 280 mg/L which is in the middle of the TDS range of the other SLVWD sources and lower than many values in the SCWD watersheds. Conductivity (or specific conductance) can be used as a surrogate parameter for TDS. The secondary MCL for specific conductance is 900 umhos/cm, while the maximum value observed was 540 umhos/cm at Liddell Spring. Median values from all SCWD sources have ranged from 210 to 329 umhos/cm.

**Table 5-14: Total Dissolved Solids Summary of Available Data (mg/L)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	367.5	329.0	293.0	540.0	11	2011	2017
Laguna Creek	177.1	189.0	80.0	250.0	11	2011	2017
Majors Creek	201.8	210.0	90.0	276.0	11	2011	2017
Loch Lomond	260.5	270.0	180.0	310.0	14	2011	2017
SLR @ Tait Street	259.9	260.0	200.0	320.0	17	2011	2017
SLR @ Felton Diversion	261.1	261.0	200.0	310.0	16	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	270	250	250	NR	280	NR	NR
Bull Springs-1	310	300	310	320	350	350	280
Bull Springs-2	260	240	280	280	320	280	250
Clear Creek	84	80	78	100	120	90	88
Fall Creek	140	140	150	180	180	140	140
Foreman Creek	92	82	88	110	130	98	94
Peavine Creek	90	96	110	140	140	115	110
Sweetwater Creek	100	110	100	130	150	110	110
Lompico Creek	190	210	220	270	280	280	NR

Source<sup>1</sup>: SCWD

Source<sup>2</sup>: SLVWD

**Table 5-15: Conductivity Summary of Available Data (µmhos/cm)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	484.5	450.0	390.0	785.0	135	2011	2017
Laguna Creek	267.0	265.0	130.0	365.0	132	2011	2017
Majors Creek	291.6	290.0	120.0	405.0	129	2011	2017
Loch Lomond	377.0	355.0	290.0	480.0	106	2011	2017
SLR @ Tait Street	370.7	370.0	160.0	490.0	238	2011	2017
SLR @ Felton Diversion	362.6	360.0	170.0	500.0	150	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	450	440	450	NR	460	NR	NR
Bull Springs-1	530	520	530	550	560	580	510
Bull Springs-2	420	420	470	520	530	450	430
Clear Creek	130	130	160	170	180	120	110
Fall Creek	230	220	260	270	270	220	210
Foreman Creek	56	57	67	64	82	51	48
Peavine Creek	150	160	200	220	220	165	140
Sweetwater Creek	170	180	210	220	240	170	170
Lompico Creek	280	330	380	450	500	440	NR

Source<sup>1</sup>: SCWD

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded

#### 5.4.6.12 Color

Table 5-16: Color — Apparent color of SCWD source waters has been as high as 800 units, with the higher values from the San Lorenzo River sources. Median values range from 2 to 22 units. Treated water typically has very little or no detectable color. Lompico Creek had a range of color units from 100 to 190 units which is among the higher values when compared to the other source waters of the SCWD. The other SLVWD sources are very low by comparison.

**Table 5-16: Apparent Color Summary of Available Data (units: CU)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	2.8	2.0	1.0	28.0	135	2011	2017
Laguna Creek	6.3	4.0	2.0	36.0	132	2011	2017
Majors Creek	13.4	8.0	3.0	140.0	129	2011	2017
Loch Lomond	22.4	18.0	8.0	120.0	106	2011	2017
SLR @ Tait Street	40.8	20.0	10.0	700.0	238	2011	2017
SLR @ Felton Diversion	43.9	20.0	8.0	800.0	150	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bull Springs-1	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Bull Springs-2	< 3.0	NR	NR	< 3.0	< 3.0	< 3.0	< 3.0
Clear Creek	3	3	< 3.0	< 3.0	< 3.0	NR	< 3.0
Fall Creek	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Foreman Creek	5	3	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Peavine Creek	7	3	30	< 3.0	< 3.0	< 3.0	< 3.0
Sweetwater Creek	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Lompico Creek	100	120	140	170	190	180	NR

Source<sup>1</sup>: SCWD

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded

### 5.4.6.13 MBAS

Table 5-17: MBAS (Foaming Agents) — The MCL for MBAS, or foaming agents, in drinking water is 0.5 mg/l. The maximum measured in annual samples of SCWD waters is 0.07 mg/l, with averages ranging from 0.00 to 0.01 mg/l. Of the SLVWD values measured, the MBAS values were very low

**Table 5-17: MBAS Summary of Available Data (mg/L)**

<i>Utility/Location</i>	<i>Average</i>	<i>Median</i>	<i>Low</i>	<i>High</i>	<i>No. Samples</i>	<i>Sample Dates (WY)</i>	
<i>Santa Cruz Water Department<sup>1</sup></i>							
Liddell Spring	0.00	0.00	0.00	0.00	6	2011	2017
Laguna Creek	0.00	0.00	0.00	0.00	6	2011	2017
Majors Creek	0.00	0.00	0.00	0.00	6	2011	2017
Loch Lomond	0.00	0.00	0.00	0.00	7	2011	2017
SLR @ Tait Street	0.00	0.00	0.00	0.00	13	2011	2017
SLR @ Felton Diversion	0.01	0.00	0.00	0.07	10	2011	2017
<i>San Lorenzo Valley Water District<sup>2</sup></i>	Year						
	2011	2012	2013	2014	2015	2016	2017
Bennett Spring	< 0.025	NR	ND	NR	ND	NR	NR
Bull Springs-1	< 0.025	NR	NR	< 0.025	< 0.025	< 0.025	< 0.025
Bull Springs-2	NR	NR	NR	< 0.025	< 0.025	< 0.025	< 0.025
Clear Creek	< 0.025	NR	NR	< 0.025	< 0.025	< 0.025	< 0.025
Fall Creek	< 0.025	< 0.025	NR	< 0.025	< 0.025	< 0.025	< 0.025
Foreman Creek	< 0.025	NR	NR	< 0.025	< 0.025	< 0.025	< 0.025
Peavine Creek	< 0.025	NR	NR	< 0.025	< 0.025	< 0.025	< 0.025
Sweetwater Creek	< 0.025	NR	NR	< 0.025	< 0.025	< 0.025	< 0.025
Lompico Creek	ND	ND	ND	ND	ND	ND	NR

Source<sup>1</sup>: SCWD

Source<sup>2</sup>: SLVWD, Note: NR = Not Recorded, ND= Non-Detectable

#### 5.4.6.14 E. Coli, Cryptosporidium and Giardia

As part of the LT2 sampling, SCWD conducted sampling for *E.coli*, *Cryptosporidium* and *Giardia* for all of their raw water sources, for the period from 2011-2017 for *E. Coli* and 2016 through 2017 for *Cryptosporidium* and *Giardia*. SLVWD's sampling was from 2016-2017 using the Lyon WTP Influent sample point, which is made up from a combination of Foreman Creek, Sweetwater Creek, Clear Creek and Peavine Creek. During the months of March and April of 2017, Foreman Creek was the only raw source online at the Lyon WTP. Total coliform data are also reported in Section 5.4.1.

**Table 5-18: SCWD E. Coli, Cryptosporidium and Giardia**

<b>Contaminant</b>	<b>Average</b>	<b>Median</b>	<b>Low</b>	<b>High</b>	<b>No. Samples</b>	<b>Sample Dates (WY)</b>	
<i>Santa Cruz Water Department</i>							
E. Coli	228.5	52.0	1.0	24,810	660	2011	2017
Cryptosporidium	0.12	0.05	0.00	0.50	14	2016	2017
Giardia	0.09	0.00	0.00	0.30	14	2016	2017
<i>San Lorenzo Valley Water District</i>							
E. Coli	179.9	160.7	146.4	272.3	10	2016	2017
Cryptosporidium	0.8	0	0	4	10	2016	2017
Giardia	0.2	0	0	1	10	2016	2017

#### 5.4.6.15 Constituents of Emerging Concern (CEC)

In 2015, SCWD initiated quarterly sampling at five locations including raw and treated water sampling locations as well as a first flush sampling of the San Lorenzo River at Felton and at Tait and analyzed them for 96 Constituents of Emerging Concern including herbicides, artificial sweeteners, personal care products, and pharmaceuticals. Most of the CECs (76) were never detected in source water, while the remainder were detected at very low levels. Like other water utilities, the SCWD uses a multi-barrier approach to protecting drinking water quality including source water protection, effective water treatment, and careful management of the treated water delivery system. The CEC study is contained in Appendix C.

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## **SECTION 6: CONCLUSIONS AND RECOMMENDATIONS**

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This section begins by discussing conclusions related to the Surface Water Treatment Rule (SWTR) and AWWA/DHS *Guidance Manual*, then presents specific conclusions related to contaminant sources, monitoring programs, and overall watershed management. Section 6.5 provides a summary of activities, some of which are detailed in Section 6.4, that SCWD and SLVWD can focus on over the next five years that contribute to maintaining and improving source water quality.

### **6.1 SWTR Disinfection Compliance Requirements**

The SWTR requires a minimum of 4 log (or 99.99 percent) virus and 3 log (99.9 percent) Giardia cyst removal/inactivation. DDW requires utilities that report monthly median total coliform concentrations greater than 1,000 MPN/100 ml to increase the minimum level of pathogen inactivation at their treatment plant. Previously, there was a 13 July 1998 letter from DDW's predecessor agency DHS, to SCWD requiring a 5 log (or 99.999 percent) virus and 4 log (99.99 percent Giardia) cyst removal/inactivation because the SCWD's August 1996 to March 1998 median monthly total coliform concentrations exceeded 1,000 MPN/100 ml in 12 out of 16 months. The SCWD has collected bi-monthly total coliform samples from the intakes of each water source and since 1996, and has also monitored total coliform and *E. coli* in the blended water as well as *E. coli* in the individual sources entering the Graham Hill Water Treatment Plant (GHWTP). As discussed earlier, in 2012 and 2013, SCWD submitted to DDW an evaluation of GHWTP filter performance data that resulted in a 1-log Giardia treatment credit.

As shown in Section 5.4.1, raw water total coliform for the utilities have ranged in the moderate to high (> 1,000 MPN/100 ml) concentrations, particularly in areas downstream of urbanization. It also should be noted that crypto and Giardia data presented in 5.4.6.14 indicate very low presence of these pathogens, relative to the total coliform. The waters sources that generally have stream intake structures located upstream of human developed areas (e.g., SLVWD) or downstream from open space areas typically have lower total coliform. The higher total coliform in raw water indicate that removal and inactivation of 4 log viruses and 3 log Giardia cysts is appropriate. The utilities continue to collect and evaluate total coliform data to verify the log removal and inactivation requirements for each system. As improvements are made to the upstream watershed, the data may suggest that review of the requirements are merited.

The one raw water source of most concern is the SCWD San Lorenzo River Intake in Santa Cruz. Between 2011-2017, the highest annual median values of total coliform were measured at the San Lorenzo River sources as have occurred in prior years as shown on Figure 5-1. Felton Diversion water is not pumped directly to GHWTP, rather is pumped to Loch Lomond Reservoir on Newell Creek for storage before use at GHWTP. Loch Lomond water, which is piped directly to the GHWTP, has relatively lower coliform levels; therefore meriting higher concern regarding the diversion at Tait Street as a source water.

The San Lorenzo River sources are not usually used during the first seasonal rains when turbidity, color and coliform counts can be significantly increased. The San Lorenzo River sources are put back into service after turbidity (which has an instantaneous reading and is a surrogate for coliform) and color return to baseline levels. When used, San Lorenzo River Intake is usually blended with North Coast and/or water from the Tait Wells, both of which

contain significantly lower total and *E.coli* coliform concentrations. The SCWD continually evaluates the need to modify the required level of treatment and disinfection, especially if in-stream flow requirements for fisheries result in source adjustments that do not allow the source blending that currently occurs.

## **6.2 Significant Contaminant Sources**

From the survey findings, there are several sources of contaminants, detailed in Section 3, that are potentially significant to the drinking water sources (especially the San Lorenzo River). These sources include:

- wastewater including discharges from failing septic systems that can contribute pathogens and nutrients;
- urban runoff;
- confined animal facilities/stables;
- unauthorized activity including homeless encampments that can contribute microbial contaminants, illegal mountain bike trails contributing erosion and sediments;
- agriculture including cannabis cultivation (currently illegal, but soon to be regulated) which contributes many pollutants including sedimentation from soil disturbance for roads and cultivation, increased nitrate, pesticides/herbicides and increased water diversions from cultivation; it is expected that some operations will be permitted, but that unpermitted operations will also continue;
- timber harvest; and
- geologic hazards which can contribute sediments.

Recent listing by the Regional Water Quality Control Board of some pesticides/herbicides as impairment to the San Lorenzo River have changed pollution from pesticides from a non-significant to a significant contaminant source. While a TMDL for chlorpyrifos has been developed for the lower San Lorenzo River, SCWD and USDA sampling discussed earlier do not indicate this constituent is occurring very frequently as discussed in Section 5.4.5.

The contaminants on the Regional Board listings extend beyond the constituents found in the drinking water regulations which also poses complexities in managing these contaminants because they are not all under the control of the water purveyors. Table 6-1 associates the existing and proposed TMDLs found in Table 4-1 with the contaminants associated with these sources and the management actions currently undertaken in the watershed to address the TMDL sources. Discussion of individual sources of contamination follow in the sections that follow.

Table 6-1. Total Mass Daily Load (TMDL) Projects and Primary Sources: San Lorenzo Valley, Loch Lomond Reservoir and Upper Newell Creek, and North Coast Watersheds and Associated Management Activities							
		Potential Contaminant Sources and Associated Management Activities					
	Target	Wastewater (septic systems)	Livestock/ stables	Urban runoff	Timber harvests/ logging (including THP roads)	Geologic Hazards and Fires	Unauthorized activity (e.g., small-scale grading and homeless encampments)
				Includes Public/Private Roads			
San Lorenzo River Watershed <sup>1</sup>							
Pathogen TMDL (May 8, 2009)	Fecal coliform 30-day log mean < 200 MPN, where 10-percent of samples < 400 MPN	•Continued implementation of the County Wastewater Management Program which may further improve meeting nitrogen and pathogen TMDLs.	•Ecology Action's Livestock and Land program has reduced manure loads.	•City adopted a stormwater ordinance •City, County and Scotts Valley have stormwater management plans	not applicable	not applicable	•City working to obtain conservation easements on private lands in the County adjacent to creeks in order to limit unauthorized activities •City has increased funding for patrols of riparian corridors upstream of the Tait St. •Sheriffs department conducts homeless camp cleanups on an as needed basis
Sediment TMDL (May 16, 2003)	The sediment TMDL target is currently based on numeric targets for pool volumes for fish habitat and particle size and percent of fines for spawning gravel. RWQCB staff recommends revision of the San Lorenzo Sediment TMDL to replace existing numeric targets with the sediment and biological indicators recommended in Herbst and others (2011). <sup>2</sup>			•County and City implemented 8 culvert repairs/retrofit projects which reduce sediment load •RCD implemented a rural roads erosion control assistance program. •County riparian, grading, erosion control ordinances •City stakeholder and school outreach including signage on creek crossings •City regulatory interaction including timber harvest review, County code violations, etc. •City retains certified erosion control specialist for road mgmt			
Nitrate TMDL (September 15, 2000)	Nitrate as nitrate levels <1.5 mg/L. (Nitrate as nitrogen levels < 0.34 mg/L.)	• Continued implementation of the Wastewater Program has resulted in significant declines in on-site wastewater system failure rates and stopped the rise of nitrate. •SWRCB has adopted policy for on-site wastewater treatment systems pursuant to AB885. • Sewering of areas close to sanitary sewer collection systems has occurred on a periodic basis.					
Chlorpyrifos TMDL	TMDL adopted May 29, 2014 with impairments in San Lorenzo River (below Zayante Creek confluence near Felton), Branciforte and Zayante Creek and Arana Gulch. 2010/2011 data indicate that numeric targets are currently being met			Urbanized areasand roadways are likely contributors			
Chlordane TMDL	TMDL to be developed by 2021						
PCBs TMDL	TMDL to be developed by 2021						
Temperature TMDL	TMDL to be developed by 2023						
Newell CreekWatershed							
pH 303d List	TMDL to be developed by 2027						
Loch Lomond							
Proposed Mercury 303d List	No TMDL date indicated at this time						
Notes							
<sup>1</sup> Date approved by RWQCB							

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### **6.2.1 Significance of Contaminants**

Distinguishing between significant and less-than-significant contaminant sources is often difficult but is important, especially in Santa Cruz County, which is 100 percent reliant on local streams and aquifers for its water sources – a relatively rare situation in most of California. As described in the Watershed Sanitary Survey Guidance Manual, the significance of a potential contaminant source is intended to be comparative within the watershed and can be evaluated on a case-by-case basis. The relative significance of a contaminant source can be based on the relative health significance, the distance to the intake, the magnitude of the contaminant source as well as other factors. Microbial contaminants may result in acute illnesses while many chemical contaminants result in chronic illnesses.

Another burden in assigning contaminant significance is that some sources become significant only during years of extreme conditions or following episodic events. An additional threshold in establishing significance is the possibility that one or more sources may be permanently lost or lost long-term to any number of causes. Within this context of significance, a discussion of each contaminant source and potential recommendations are provided in the following paragraphs. Table 6-2 summarizes the significant contaminant sources and their relevance to the SCWD's water sources.

<b>Table 6-2. Potential Contaminant Sources and Recommendations: San Lorenzo Valley, Loch Lomond Reservoir and Upper Newell Creek, and North Coast Watersheds</b>				
<b>Contaminant Source</b>	<b>San Lorenzo Valley</b>	<b>Loch Lomond Reservoir and upper Newell Creek</b>	<b>North Coast</b>	<b>Information supporting significance</b>
✓ denotes significance				
Wastewater (septic systems)	✓	✓		Elevated nitrate in streams, downstream of more densely populated areas
				Elevated coliform counts downstream of urban areas.
Urban Runoff <sup>1</sup>	✓	✓		-Elevated coliform bacteria downstream of urban areas. Reduced coliform through open space areas. Baseline fecal coliform bacteria mostly attributed to non-human sources; in the San Lorenzo River no human contributions were identified in dry season sampling. Ribotyping found birds account for the majority of bacterial contamination. - Urban runoff is also associated with other pollutants as well as increased erosion. Urbanization over sandy soils is particular concern because they are prone to substantially more sedimentation than other soils and reduced recharge can increase concentration of constituents in groundwater.
Concentrated Animal Facilities	✓		✓	Horses are considered a major source of pathogens and nitrogen and can also contribute to persistent turbidity in the water supply watersheds. Hecht and others (1991) estimated that horses in the San Lorenzo Valley contributed nitrogen equal to one fifth or more of the amount released from septic systems.
Public/Private Roads and Timber Harvests	✓		✓	The primary potential problem arises with erosion resulting from the roads constructed to access residences and logging areas. Another major regional challenge especially specific to the San Lorenzo watershed is to reduce sediment delivery from erosion of road treads. Deep, multi-branched gully systems tend to develop on roads cut into weathered slopes within (especially) the Vaqueros and Butano sandstones. The gullies are left to continue growing, or are temporarily filled during spring re-opening of harvest areas only to re-erode with the next wet season.
Unauthorized Activity	✓	✓	✓	Small-scale grading and timber harvests frequently use poor practices, which increases sediment loading to the surface water streams. Trespass by vehicles and mountain bikes also results in erosion and sedimentation. Homeless encampments adjacent to waterways can be a source of human waste. Illicit methamphetamine laboratories and cannabis cultivation occur in the watershed.
Quarries	✓		✓	Of the 4 quarries in the San Lorenzo River Watershed, Felton and Quail Hollow Quarries are still active. Reclamation at Hanson Quarry is presently underway, while reclamation at Olympia Quarry is stalled due to endangered species issues. Mining ceased at the CEMEX Bonny Doon Quarry in the Liddell Springs Watershed, and reclamation is underway. Until reclamation is complete, closed mines can still impact water supplies.
Geologic Hazards and Fires	✓	✓	✓	•Elevated sediment loading during the wet season, frequently caused by landslides or slumping of roads. •Persistent turbidity may be experienced for several months to several years following a major watershed-scale fire.
Vehicle Upsets and Spills (LUSTs)	Potential		Potential	• Valetaria Dry Cleaners LUST monitoring results in downstream San Lorenzo River show occasional PCE detections in 2012 and 2013 and ongoing groundwater detection in 2017 suggesting wastes released at the site have migrated, and may continue migrating downgradient - remediation is ongoing; while Chevron, Sturdy Oil, Watkins-Johnson show no indication of contamination within the stream network; and •The potential exists for significant chemical spills caused by traffic accidents and in recent years several accidents have affected local waterways. City staff report that timely notification from the County is an ongoing area of concern and is not consistently performed in a functional manner.
Pesticide and Herbicide Use	✓			-RWQCB TMDL for chlorpyrifos and recommendation to list San Lorenzo River for chlordane -City has continued its herbicide use to maintain fuel breaks on ridge tops for fire preparedness. -When algal blooms do occur or are predicted to occur, chemical algacide applications are made to the Newell Creek Reservoir to protect against degradation of beneficial uses
Agricultural Land Use	Potential	Potential		While a small percent (Less than one tenth of one percent) of area of the watersheds is cultivated; illegal and legal cannabis grows occur and may increase. Some expansion of agricultural use in the Majors Creek watershed has occurred. Wineries may require National Pollutant Discharge Elimination System (NPDES) permits for process waters. Legal cannabis cultivation will make this a more significant source with water diversions, pesticide/herbicide/fertilizer use, and access road construction.
<b>Notes</b>				
<sup>1</sup> Point source discharges regulated by the RWQCB do not exist in the watershed area				
<sup>2</sup> These recommendations are supportive of the draft Habitat Conservation Plan for Steelhead and Coho Salmon that has been prepared by the				

### **6.2.1.1 General Land use and Urbanization Conclusions**

As discussed in Section 3.2, the San Lorenzo Valley has a large number of septic systems, on both sandy and non-sandy soils as well as some systems that overlie karst; septic systems are recognized as a major source of nitrate to the river and its tributary streams. Wastewater, urban runoff, and horses, other domestic animals and pets also contribute to elevated nitrate levels. Microbial contaminants are associated with failing septic systems, urban runoff, and horse stables.

The County's wastewater management program endeavors to address problem septic systems, promoting system upgrades where feasible, requiring alternative systems where appropriate, and encouraging connection to wastewater treatment/disposal systems that discharge outside the watershed as has occurred at the Rollingwoods subdivision. The Bear Creek Estates package plant, serving 54 homes, was upgraded in 2005 yet still experienced spills during the heavy rains of 2017. SLVWD is considering upgrading the WWTP to improve operational reliability. The package plant at Boulder Creek Golf and Country Club was upgraded to reduce nitrates and wastewater spills from the force main. Implementation of the San Lorenzo River Nitrate TMDL and the County's Nitrate Management Plan shows evidence of stabilizing nitrate concentrations per Figure 5-10 and may be indicating potential reductions in nitrate in the recent past in water quality improvements.

Previous studies have indicated that septic systems, wildlife, livestock and pets, and urban runoff are all significant sources of microbial contaminants in the San Lorenzo River. More recently, homeless encampments adjacent to the rivers and tributaries have also been identified as a source of microbial contamination.

The County's microbial source tracking study showed that, based on ribotyping, birds are the primary source of elevated levels of coliform bacteria in the San Lorenzo River. The San Lorenzo Valley does not have a system of curbs, gutters and storm drains to convey runoff to the River; it should be noted that roadways with curbs, etc can also have unintended consequences of concentrating runoff if not well maintained, especially during storms. Water quality impacts of road runoff can be mitigated by protecting existing open space areas near stream banks to filter runoff, to focus public education on source control and prevent contamination of runoff, and to maintain the water treatment plants in optimal working condition. When considering the contaminant reduction in the six stream miles in Henry Cowell Redwoods State Park between southern Felton and northern Santa Cruz, it may also be that the reaches of undeveloped stream between the communities which are characteristic of many areas of the San Lorenzo Valley – are one reason why nitrate and bacterial loadings have remained at lower levels than many experts predicted in the past.

### **6.2.1.2 Water Utilities Influenced**

Utilities which obtain surface water from an urbanized watershed area are influenced by both septic system and urban runoff discharges to area streams. These include primarily the Santa Cruz Water Department and selected areas of the San Lorenzo Valley Water District including Lompico Creek.

### **6.2.1.3 Wastewater Discharge Recommendations**

To minimize the impacts from wastewater treatment discharges, primarily septic systems, recommended actions include:

- The County should continue implementation of the Wastewater Management Plan and revise in accordance with AB885 as discussed in Section 4.9. Records of inspections and upgrades should be kept in both tabular and in map form, preferably on the County's GIS system to allow focus on problem areas especially those overlying sandy soils and/or karst.
- Purveyors should continue to collect, tabulate and review the water quality data on a frequent basis (e.g., annually) to evaluate the effectiveness of ongoing management programs. These data should be reviewed in collaboration with the County Environmental Health and the Regional Water Quality Control Board so that appropriate follow-up action can be taken by the appropriate agency.
- The drinking water purveyors should inform County Environmental Health when elevated coliform or nitrate levels are detected in raw water sources. The need for an update of the nitrate study that resulted in the County's 1995 Nitrate Management Plan should be evaluated.
- Water purveyors should review development plans for sites upstream of source water intakes to verify that measures are in place that will address key issues such as septic system discharges and urban runoff. Specifically, SCWD (and secondarily, SLVWD) should work with County Environmental Health and Planning to review proposed developments upstream of their intakes, such as the San Lorenzo River Intake, to verify that acceptable control measures planned and that mitigation measures have been appropriately implemented and maintained.

### **6.2.1.4 Urban Runoff Recommendations**

Recommendations to control water quality impacts from urban runoff include:

- Evaluate development of best management practices such as low impact development (LID), and management measures directed at the unique properties of sandy soils and karst within watersheds, which call for a common set of measures to minimize nutrient loads, maintain aquifer recharge and the resulting baseflow, minimize erosion, sedimentation, and channel incision, and protect springs/seeps/wetlands and riparian-zone resilience during dry months and dry years.
- The County should implement of the SWMP in the watersheds as accepted by the Regional Board. This includes conversion of existing urbanized areas to LID, especially in areas of high water quality benefit.
- Coordinate with Santa Cruz Integrated Regional Water Management (IRWM) program on stormwater management including implementing public education/involvement program to minimize contaminant loading from stormwater runoff. The IRWM program can be used to supplement efforts by the purveyors and the County to inform customers and watershed residents of the ongoing water quality and supply issues. Many residents are not aware or do not appreciate the dual nature of the San Lorenzo Valley – a rural



residential area, locally approaching urban densities, and the central water-supply source for the region.

- The County should improve its enforcement of ordinances (e.g. grading, riparian corridor and wetlands protection, sensitive habitat protection, and water quality control) in coho recovery and water supply watersheds to maximize and protect riparian setbacks from drainageways and streams.
- The County should proceed with its planned strengthening of the riparian ordinance discussed in Section 4.9.1.2.

## **6.2.2 Confined Animal Facilities**

### **6.2.2.1 Conclusions**

Horses, the main confined animals in both the North Coast and San Lorenzo River watersheds, can be a major source of wet season nitrate and bacteria levels in surface waters, and a contributor to persistent turbidity as well. Nutrients and pathogens can be mobilized from uncovered manure piles. Trails which cross stream channels degrade stream banks and facilitate direct contamination of surface waters. Similar effects are observed where paddocks adjoin waterways and horses traverse stream banks to reach the water. The County, the NRCS, the RCD, Ecology Action and various equestrian and watershed groups have developed programs to educate horse owners and assist them with design, installation and funding of measures to control pollution from horsekeeping. The County requires that manure management programs are developed for all new permittees and is also able to apply its riparian ordinance to provide the buffers and access management required to minimize nutrient, bacterial, and sediment loadings to surface waters. Although this is an area where substantial improvements have been realized since the original 1996 sanitary survey, primarily through voluntary methods that are discussed in Section 3.6.2, continued sustained effort is needed on both education regarding voluntary programs as well as on enforcement of existing ordinances by the County.

### **6.2.2.2 Water Utilities influenced**

Utilities which draw surface water downstream from bankside stables or areas intensively used by horses can observe higher turbidity and coliform counts. These entities include the Santa Cruz Water Department and the San Lorenzo Valley Water District.

### **6.2.2.3 Confined Animal Facilities Recommendations**

It is recommended that the voluntary measures such as the Livestock and Land Program, with particular focus on horse owners near the waterways, be continued and supported. In addition, it is recommended that the County track complaints and permit violations as well as conduct periodic inspection and monitoring targeting those stables closest to the streams and river. Prior to enforcement, it is suggested that these stable owners should be made aware of the voluntary programs, and only if non-compliance consistently and broadly occurs should enforcement (including referral to the RWQCB) or development of an ordinance be considered. If developed, an ordinance should include simple and effective control measures coordinated through user groups and/or non-regulatory entities with stricter enforcement reserved for significant non-compliance. As an alternative to enforcement, opportunities to develop

conservation easements and/or partnerships with land trusts and alternative funding should be considered. Horse stable runoff control practices should be implemented regularly, but particularly emphasized during the fall months in order to minimize contaminant loading during the next rainy season.

### **6.2.3 Unauthorized Activity**

#### **6.2.3.1 Conclusions**

Activities, such as non-permitted grading and mountain biking outside of designated areas, cause significant sediment loading to streams as well as posing a fire threat, drawing valuable first responder resources, and introducing invasive species. Homeless encampments can contribute microbes. As discussed in Section 3.13.1, illegal cannabis cultivation in the watershed appears to be increasing, although may be moving to indoor cultivation which has fewer water quality impacts but produces more greenhouse gas as a result of the energy usage for lighting and ventilation. Legal cannabis cultivation is expected to increase once County regulations are finalized. Cannabis cultivation contributes a range of contaminants including sediments from tree removal and grading, chemicals/nutrients, sanitary waste as well as diverting water valuable to ecosystems and others. Illegal water diversions can require SCWD to use Loch Lomond when other higher quality sources are not available. The cumulative impact of such activities in and near channels can significantly increase turbidity and other water quality threats in streams.

Changes to the City municipal code in 2004 facilitated code enforcement by authorizing SCWD rangers to take enforcement actions on City-managed lands that may be outside of the City limits (eg Loch Lomond and the San Lorenzo River). In addition a conservation easement/license program has been established to expand the City's enforcement area to private lands between the San Lorenzo River Intake and Sycamore Grove and is a part of the City's Riparian Conservation Program. Coordination with other officials in the watershed, e.g. State Parks has occurred and should continue.

#### **6.2.3.2 Water Utilities Influenced**

Utilities which use surface water collected from developed and undeveloped watershed areas are influenced by unauthorized activities. This includes the Santa Cruz Water Department, San Lorenzo Valley Water District, and the Lompico County Water District prior to its 2016 merger with SLVWD, as well as smaller purveyors throughout the survey area.

#### **6.2.3.3 Unauthorized Activities Recommendations**

As discussed in Section 3.13, unauthorized activities are considered a chronic and ongoing source of contamination. It is recommended that:

- Outreach to homeowners, perhaps through the existing programs such as Lands and Livestock, be continued regarding negative impacts of grazing
- Improved collaboration with State Parks, CDFW, CalFire, and/or non-governmental agencies, regarding other threats so that water utilities can be prepared for potential contaminants.

- The SCWD should continue to patrol and advocate for and support removal of homeless encampments, education of the mountain biking community regarding water quality impacts of illegal trails, as well as developing conservation easements/licenses on riparian properties.
- Seeking compliance with existing ordinances and providing education and enforcement should be prioritized, with water-quality protection in mind.

## **6.2.4 Roads**

### **6.2.4.1 Conclusions**

As discussed in Section 3.3 Urban Runoff, Section 3.11 Timber Harvests/Logging, and Section 3.15 Geologic Hazards, roadways are a source of a range of contaminants including sediments and chemicals. This includes roads maintained by private landowners, as part of roads associated with residences and timber harvest and management, as well as public roads maintained by the County Public Works Department, and by Caltrans. Clearing of landslide debris on roadways and poor maintenance of public and private roads increase erosion and sediment loading to local streams. Roads which require recurrent replacement due to failure of the underlying slopes disproportionately contribute to sedimentation, turbidity, and persistent turbidity.

### **6.2.4.2 Water Utilities Influenced**

All of the drinking water purveyors which rely on surface water supplies located downstream from any roadway are influenced by this source.

### **6.2.4.3 Roadway Maintenance Recommendations**

In the past, Caltrans and the County Public Works Department have taken significant measures to improve roadway debris control and general maintenance. This includes developing suitable practices to stabilize and dispose of landslide material and to control runoff from stockpiled material. The County, in consultation with water agencies, should identify areas suited to establish additional road maintenance service sites, and mechanisms to quickly move stockpiled material to long-term storage areas, such as has been implemented at the Cabrillo Quarry in Aptos.

As discussed in Section 4.7.1, the County has a Road Maintenance Manual that is used for road maintenance activities to minimize water quality impacts. In addition, the RCD and the NRCS have developed a Rural Roads Sediment Inventory Manual which evaluated rural private roads and developed a maintenance training program which has acquired a statewide reputation over the past 10 years. These programs and manuals help assure that appropriate measures are being implemented on both private and public roads and can be a resource for those individuals embarking on licensing of legal cannabis cultivation. The County has also secured grants to evaluate improved roadside maintenance practices in riparian areas (herbicide reduction/elimination) and to prepare a new manual for road maintenance practices (erosion and sedimentation reduction). Herbicide use on road right of ways, discussed in Section 3.7.2, are likely the largest source of herbicides in the watersheds, therefore herbicide reduction should be a priority to the County. The inventory of potential sediment sources along county

roads in the San Lorenzo Watershed identified priority projects for designed, permitting and implementation through the Integrated Watershed Restoration Program (IWRP) with funds from the Coastal Conservancy, State water bonds such as Proposition 1, and other sources.

Roads do, however, remain a major source of turbidity, and road systems periodically contribute large volumes of sediment when culverts are blocked or when concentrated runoff from roads cause incision: (a) into slopes between the road and the stream network, and (b) within the channels, by concentrating runoff and magnifying peak flows in streams.

It is recommended that:

- The County continue to use and augment the road maintenance measures and procedures developed by CalTrans and Public Works including measures to control the downstream incision and bank erosion described above, as well as pesticide and herbicide use measures;
- Water purveyors support the rural road program to private residential and timber-harvest roads within the County (especially those in proximity to diversions and intakes).

#### **6.2.4.4 Timber Harvests Roadway Recommendations**

The recommendations stated above for roadway maintenance should also be applied to roads allowing access for timber harvests by CalFire, owners, and other participants in THP review. Other recommendations are:

- For major portions of road networks, owners should require properly abandoned or rested (closed until next harvest) roads after logging activities are completed and regulatory agencies should confirm this with monitoring. This includes blocking access to the area and restoring road cuts to the original slopes, especially in areas where road densities exceed 3.0 miles per square mile (as recommended by NOAA Fisheries) within portions of a particular watershed within the THP ownership and adjacent to it.
- Purveyors should advocate for follow-up restoration of roads from NOAA fisheries road density analysis for key water-supply watersheds, using NOAA fisheries threshold of 3 mi./sq. mi. as an indicator of ecosystem health.
- Purveyors and the County should work with CalFire to aggressively enforce existing requirements to minimize area damage and maintain roadways, especially in segments close to streams, especially for emergency exemptions for salvage logging in high erosion hazard areas.
- Support effort to prohibit salvage logging in key municipal and public water district watersheds.
- Monitor RWQCB implementation of 2012 updated conditional waiver of waste discharge requirements for timber harvests.
- The SCWD and other water purveyors should lobby for inclusion in the official THP review team, rather than be limited to an advisory role particularly for those harvest that have high potential water quality risk.

## **6.2.5 Mining/Quarry Activities**

### **6.2.5.1 Conclusions**

Quarries have been identified as a potential source of sediment during major storm events, reportedly caused by the failure of on-site settling/retention ponds to contain event stormwater runoff.

In the North Coast watersheds, Bonny Doon Quarry operations, specifically blasting, have caused and contributed to periodic turbidity and nitrate spikes at Liddell Spring which pose challenges at the SCWD's water treatment plant.

However, as discussed in Section 3.9, the Bonny Doon Quarry is now closed and undergoing reclamation. Therefore, this sediment source has decreased. In addition, nitrate data collected at Liddell Spring since 1967 suggests that background nitrate levels at the Spring had been steadily increasing from about 0.3 mg/l in the late 1960s to values above 1.0 mg/l in the 1990s. More recent data from 2001 to 2011 as shown on Figure 5-8 show a peak value of 2.3 mg/l in 2001 with most values around 0.5 mg/l. A possible source of some of the elevated nitrate levels could be from quarry blasting (ammonium nitrate) at Bonny Doon Quarry – however, this was never confirmed and unlikely to be an issue with closure of the quarry.

### **6.2.5.2 Utilities influenced**

The SCWD has been periodically influenced by turbidity increases in the Liddell Spring source. In the San Lorenzo River watershed, the SCWD is affected by sediment contributions from the one active sand quarry (Quail Hollow), one rock quarry (Felton) and from discontinued quarries (Olympia and Hanson) should stormwater containment facilities fail.

### **6.2.5.3 Quarries and Mines Recommendations**

- The SCWD should advocate for water quality monitoring during closure and reclamation.
- The SCWD should also continue to review staff and EIR reports including closure and post-closure water quality monitoring reports.
- Quarry operators and downstream water users should also:
  - Develop trends of water quality data collected. This will help to identify effectiveness of implemented BMPs or any failure of on-site treatment practices, as well as promote meaningful input from purveyors into appropriate modifications of conditions during the 5-year permit-renewal process through the County.
  - Establish specific water quality objectives for springs and streams located downstream of quarries and request additional water quality data, if and where necessary.

- Inspect quarries routinely, including visits in the fall period to verify the capacity and condition of on-site settling/retention ponds and erosion control structures, and that these are prepared for heavy rainfalls.

## **6.2.6 Geologic Hazards and Fires**

### **6.2.6.1 Conclusions**

Landslides are the most frequently occurring geologic event affecting the drinking water supply, causing elevated turbidities following major storm events. Earthquakes and erosion from fire areas can severely increase sediment and natural organic matter loading to surface waters, both initially and during the process of 'recovery' from these episodic events. Finally, erosion following major fires, floods, landslides and possibly droughts or earthquakes can disrupt use of some or many surface water intakes for periods ranging from several months to several years, or deliver a pulse of sediment to the channel which may take years to dissipate.

### **6.2.6.2 Utilities influenced**

All utilities which use surface water can be influenced by geologic hazards and fires in these watersheds. Water treatment plant operators are usually aware of the potential turbidity spikes that may occur through review of online turbidity information.

### **6.2.6.3 Recommendations**

Many of the recommendations from Section 6.2.4 for Roads are relevant for Geologic Hazards. Further recommendations regarding fires, some of which were discussed in Section 4.8, include:

- Continue to manage fuels and reduce wildfire hazards.
- For the watershed that drains to Loch Lomond the City should continue to meet with fire management staff to communicate changes to security, field conditions, and other information necessary for fire management as well as incorporate recommendations of the fire plan for watersheds, when completed, for future reports.
- Enhance collaboration with CalFire on improving Community Wildfire Protection Plan (CWPP) projects and lobby for Loch Lomond recognition as an asset at risk under CWPP.
- Maintain fuel breaks on watershed lands including development of an Integrated Pest Management Program to address appropriate herbicide application for fuel break maintenance.
- Most purveyors drawing upon surface or spring supplies should anticipate extended turbidity events following a large fire in their watersheds. Planning should focus on alternative sources of supply during the months or years following the fire, and for protecting diversion or distribution facilities from post-fire erosion and slope instability.

## **6.2.7 Chemical Spills**

### **6.2.7.1 Conclusions**

Three ground-water chemical plumes in Felton have been reasonably contained by contemporary standards. Supplemental remedial activity is imminent at the former Chevron and Exxon stations, and may take place at the Valeteria site as well. The potential remains for chemical spills on highways, on major County roads such as Felton Empire Road or Smith Grade.

### **6.2.7.2 Utilities influenced**

All utilities which obtain surface water from developed watershed areas are potentially influenced by spills on local roadways which should be managed by halting water diversion until clean-up has been completed and the pollutant has passed. In addition, long-term discharges such as from leaking underground tanks can be a source that eventually make their way to the creeks and rivers. Currently, the Santa Cruz Water Department is the only utility which has detected any solvent-type chemicals in the water. One chemical, PCE has been detected at levels 5 to 10 times below the regulated limit at the Felton Diversion, and not at any intake used to supply water directly to the treatment plant.

### **6.2.7.3 Recommendations**

In an effort to minimize the impacts of chemical spills, it is recommended that:

- Increased raw water for testing of chemical contaminants, especially those that may be associated with cannabis cultivation
- Collaboration with the Santa Cruz County Hazardous Materials Interagency Team (SCHMIT). regarding notification of long-term spills and advocate for control of hazardous materials transport be improved through periodic calls/meetings. SCHMIT responds to major hazardous materials incidents county-wide and is staffed by hazardous materials technicians from several area fire departments r; and
- Continue efforts to communicate with dispatchers at NetCom and on-scene responders to discuss water agency spill notification procedures.

## **6.2.8 Pesticides and Herbicides**

### **6.2.8.1 Conclusions**

While the RWQCB established a TMDL for chlorpyrifos for the lower San Lorenzo River including the area of the San Lorenzo River Intake and is recommending that the San Lorenzo River be listed as impaired for chlordane as well as for PCBs, the occurrence of pesticides/herbicides has been low as discussed in Section .5.4.5. However, data are limited to a few samples and chemical usage in the past has been limited.

#### **6.2.8.2 Utilities influenced**

All utilities which obtain surface water from watershed areas are potentially influenced by pesticides/herbicides, especially as illegally used for cannabis cultivation and for other agriculture such as vineyards, in the watershed.

#### **6.2.8.3 Recommendations**

In an effort to minimize the impacts of pesticide/herbicide use, it is recommended that:

- Continued implementation of an Integrated Pest Management Program to address appropriate herbicide application for fuel break maintenance.
- Coordinate with agricultural users (e.g. legal cannabis cultivation, vineyards and tree farms) to identify sources.
- Advocate for organic only agriculture in the watershed.
- Consider periodic pesticide/herbicide scans of raw water to identify in alignment with timing of application for vineyard/tree farm cultivation for potential frequency and severity of water quality impact.

#### **6.2.9 Agricultural Land Use**

Although agricultural acreage continues to remain very small in both total acreage and individual operations, legalization of cannabis cultivation raises concerns with potential for significant effects on water supply remains. Therefore this topic has been moved to the significant category with the future legal cannabis cultivation described earlier. Non cannabis agricultural has some relatively low risk. Vineyards potentially pose more a more serious challenge than Christmas tree plantations or organic vegetable farms, due to tillage disruption of steep slopes that result in erosion and use of chemicals for pest control. The chemical contributions from agriculture are discussed in Section 6.2.8.

### **6.3 Potential Contaminant Sources That Are Not Significant**

Table 6-3 lists the potential contaminant sources which are not deemed to be significant contributors affecting public health at this time. The table lists the supporting information and exceptions when noted. Given the particular Santa Cruz County environment, most of these sources could become significant at times, conditions, or with events discussed above (Section 6.1). Conclusions for these potential contaminant sources are discussed in the following paragraphs.



**Table 6-3: Potential Contaminant Sources Less Significant: San Lorenzo Valley, Loch Lomond Reservoir and Upper Newell Creek, and North Coast Watersheds**

<b>Contaminant Source</b>	<b>Supporting Information</b>	<b>Exceptions</b>	<b>General Conclusion</b>
Wildlife	SLVWD staff indicate that feral pigs no longer appear to be an erosion problem near intakes.		Pigs and other wild animal populations do not appear to have a great potential for contamination of surface waters at this time.
Solid/Hazardous Waste Facilities	The Ben Lomond municipal landfill closed in 1987. No known hazardous waste facilities exist in the watershed.	Any remaining plume is not deemed a threat to water supply. County has needed to remove naturally-occurring cadmium which leaches from shales as a result of their exposure to the atmosphere as a result of landfill excavating activities.	Down-gradient monitoring indicates no contamination of surface waters.
Recreation	Recreational activities generally considered of most significance involve water contact recreation. However, an evaluation of the County fecal coliform bacteria data, conducted by the County Health Services Agency, found no significant increase in bacteria in the swimming areas of the San Lorenzo River system. Bacterial water quality appears to improve as the water passes through large open space parks (Henry Cowell State Park) or resides in a reservoir for extended periods (Loch Lomond Reservoir).	The introduction of fecal matter from horses may be significant, especially at stream crossings. The potential for erosion from hiking, horseback riding, and mountain biking may also be significant.	There is an apparent trend of decreasing coliform counts through reaches that pass through the State Parks, which are mostly open space. Erosion control measures have spread quickly throughout the survey area, both on public and private lands. Law enforcement has begun issuing tickets to bikers using illegal trails.

### **6.3.1 Wildlife**

The County's microbial source assessment study identified birds as the major contributor to elevated bacteria levels in the San Lorenzo River and tributary streams as discussed in Section 6.2.1.1. Other wildlife was also found to be a significant source of bacteria. Along with the SLVWD, all utilities with surface and/or spring water intakes in the upper watershed are potentially influenced by birds and other wild animals in the area. If wildlife access at diversions is occurring, fencing and providing alternative water supply should be considered.

### **6.3.2 Grazing Animals and Livestock**

Grazing is not widespread in the subject watersheds. Most of the existing grazing occurs away from local streams.

### **6.3.3 Solid or Hazardous Waste Facilities**

The one closed landfill in the San Lorenzo River watershed (the Ben Lomond Landfill) does not appear to be contaminating the nearest stream, Newell Creek. Overall, illegal dumping is not a significant contaminant source in any of the watersheds, with respect to drinking water quality.

### **6.3.4 Recreational Uses**

The long-term fecal coliform data indicates that swimming may not appreciably impact the microbiological water quality of the streams. In addition, the number of summer swimming holes has decreased as inflatable dams for recreational swimming have been limited in the watershed; a summer dam on Zayante Creek has been observed in recent years and other informal swimming holes may have come into use in 2017 since heavy rains may have continued the runoff period. County monitoring of swimming holes have not indicated significant water quality problems. (J. Ricker, 2017) The most potentially significant recreational activities are horseback riding, trail maintenance and use of off-road vehicle of various types and sizes, all of which constitute locally significant sources of sediment. The continued vehicle use on City property and illicit recreational use in Henry Cowell State park may increase erosion and sedimentation. To the extent that these trails and uses are routed away from stream channels, or are at least separated from them by setbacks or open space areas, sediment and microbial contributions to the adjoining streams will be reduced.

The City conducted a study for expansion of recreational use at Loch Lomond, which concluded, with input from Cal Fire, that additional recreational use is not advisable because of the increase to fire risk as well as other risks associated with access.

### **6.3.5 NPDES Point Sources**

Only small wastewater facilities exist in the San Lorenzo watershed. These include the 1970s-vintage package treatment plant at the Boulder Creek Golf and Country Club, the Bear Creek Estates Wastewater Treatment Plan constructed in 1986 and upgraded in 2008, and the new facility at the San Lorenzo Valley schools in Felton. As noted earlier, SLVWD is considering upgrades at Bear Creek to improve operational reliability. These facilities are currently located

with on-site wastewater disposal and operated in a manner to minimize downstream water quality impacts. Furthermore, the Country Club is investigating the feasibility of reclaiming treated wastewater to a quality suitable for on-site irrigation.

## **6.4 Other Conclusions and Recommendations**

### **6.4.1 Water-Quality Monitoring**

#### **6.4.1.1 Conclusions Regarding Water Quality Monitoring Programs**

The drinking water purveyors participating in this study conduct the required monitoring for raw surface water quality. Results are submitted to regulatory agencies, and in many cases will be available to the public through various purveyor and County web sites. Bacterial data, collected weekly, are routinely tabulated with some analysis now conducted by staff. The County website makes beach water quality data readily available to the public for assessing risk for water contact recreation, however long-term river data are less available in a form that allows for evaluation. Budget and staffing constraints continue to limit the ability to improve sharing of water quality data beyond what is currently available. The data collected by individual agencies are sufficient for water treatment plant operators to make real-time operating decisions regarding bypass of high turbidity source waters.

#### **6.4.1.2 Recommendations Regarding Water Quality Monitoring Programs**

Water purveyors should consider the following improvements to their monitoring programs:

- Weekly raw water blend and bi-weekly source water total coliform and *E. coli* data collection should be continued.
- As described earlier under Section 6.2.9 for Pesticides and Herbicides, the raw water-quality data programs should be augmented for pesticides and herbicides, particularly from legal cannabis cultivation, because of the potential vulnerability of the water source to this type of contamination. Augmentation should intrinsically include electronic recordation and dissemination of data.
- Evaluate the data regularly to identify any adverse or improving trends and the underlying cause(s) of significant changes.
- Store the data in computerized systems to facilitate easier transmittal of the data to other agencies or to generate graphical water quality trends. The data can then be electronically transferred to a lead agency/utility for routine evaluations.
- As discussed in Section 6.2.6 – Mining/Quarry Activities, current utility water quality databases should be augmented with data collected by quarry operators or other projects responsible for water-quality monitoring in surface or ground waters in either watershed. One potential quarry related monitoring activity is during reclamation grading of the closed Bonny Doon Quarry, which could require significant earth moving.
- Purveyors and the County should seek an assessment of water-quality trends following episodic events, such as large wildfires, earthquakes, and major storms such as occurred in 1982, 1998, 2012 and 2017, such that trends may be anticipated,

contingency plans developed, and any needed interties or backup facilities identified. Western Santa Cruz County appears to have an unusual number and range of such events, and the experience from such events in and near the County could be readily distilled such that responses to these types of events can be readily planned and implemented.

- Prepare for the next watershed sanitary survey update in 5 years by carefully noting and recording concerns or problem areas, and implementing control measures applicable to specific watershed conditions.

## **6.4.2 Watershed Management Practices**

### **6.4.2.1 Conclusions Regarding Watershed Management Practices**

Established policies, ordinances, and regulations in the County's General Plan are available to improve surface water quality that are implemented by the County's Health Services Agency and Planning Departments. As noted in the prior sanitary survey updates, the City has engaged in watershed management activities with a formal emphasis on source protection since 1997, and as discussed in Section 4.2.2.1, has a pool of staff that includes some full-time positions and support from other City staff such as ranger patrols and others that provide education and outreach. The City developed a comprehensive draft watershed lands management plan which includes no commercial logging on City watershed lands. SLVWD updated its watershed plan in 2010 and has had a no-commercial logging policy in place since 1985. The County updated its Watershed Management Plan for the San Lorenzo River Watershed in 2001.

County and local non-profit organizations efforts have led to numerous structural improvements and involvement with citizen groups to educate the general public, most notably during prior County-wide effort to develop watershed assessment and enhancement plans for selected watersheds, including the San Lorenzo Valley. Recent activities include a City-led coordinated effort called San Lorenzo River 2025 which targets action to improve riparian habitat that can leverage several resources including the County, RCD and non profits. Multiple staff commitments, however, tend to interfere with watershed management program progress. Therefore, it seems prudent to dedicate County staff to a watershed management program or to augment program activities with water purveyor and local non-profit organization staff. Local non-profits have been successful, for example, in engaging private horse owners in improving stable and manure management.

### **6.4.2.2 Recommendations for Water Utilities**

Most of the ongoing watershed management efforts are coordinated by County staff as part of the wastewater management program, regional erosion-control efforts, and programs to promote salmonid recovery. Therefore, the drinking water utilities should continue to be active in current watershed management programs, in part to meet the specific objectives for drinkable waters. Some programs to consider, many of which are discussed in prior recommendations are:

Public Education/Relations —Formalize coordination with local non-governmental organizations on public education program may be effective at minimizing soil disruption, improving erosion

control practices, and reducing urban runoff contamination. Purveyors can increase programs to mail educational pamphlets or develop informational websites.

Increase Watershed Surveillance — Staff should report activities within the watershed which can impact water quality. For example, utilities can establish and publicize a watershed "hotline" telephone number to report illegal, unauthorized, or detrimental activities.

Political Support — Water utilities should enhance existing political support through activities such as collaboration on management plan activities, commenting on pending and proposed regulation, and inviting representatives to watershed focused events.

Special Sandy Soil Provisions – An *integrated* program meshing use of BMPs and other measures designed to minimize the erosion, sedimentation, nutrient and pathogen issues of Zayante and other sandy soils, plus protect the ground water, wetlands, and valuable stream habitats that they support should be developed and implemented. It will mean more recharge of aquifers with lower level of contaminants, less sand in streams, more water in wetlands and channels, and less maintenance of public facilities, in addition to cleaner water.

Road Restoration based on Road Density Analysis - Lobby Board of Supervisors and County Management to develop and fund road restoration program based on road density analysis for key water-supply watersheds developed as an indicator of ecosystem health. Identify grant funding to support these and other activities that benefit water quality and the Coho Recovery Plan.

San Lorenzo Valley Watershed Management Plan In 2001 County Environmental Health completed an update of the update to the 1979 Watershed Management Plan. Water utilities should emphasize to their staff and customers the benefits likely to accrue to drinking water quality from successfully achieving the programs goals. They should also continue their participation in the program, support implementation through the County's Integrated Regional Water Management Plan, and to help shape subsequent updates.

#### **6.4.2.3 Recommendations for Watershed Managers**

Other issues the County and water utilities should consider when developing watershed management programs include:

Continue to investigate and implement feasible management practices. Descriptions of alternative practices are available from numerous sources, especially from such agencies as the American Water Works Association (AWWA) and Water Environment Federation (WEF). Both of these agencies have recently sponsored research projects and conferences to assist communities improve watershed management and protection.

Publicize the programs and materials: These are available from the Resource Conservation District, other County agencies, and local non-governmental organizations which describe specific practices to control erosion from hillsides and roadways, stabilize slopes, construct silt fences construct spring boxes, and to site, construct and maintain septic or advanced on-site waste-disposal systems:

Investigate methods to integrate watershed management projects with other benefits. Some of the projects to enhance watershed management may be able to obtain Federal and State funding if other benefits (e.g., fishery improvements and groundwater storage) are integrated into the existing watershed management program. Several watershed management projects

are funded using this approach especially through the Department of Water Resources Integrated Regional Water Management (IRWM) program. Through IRWM program the City and County staff are able to meet with other agencies and utilities to discuss watershed management funding needs for specific programs. This includes establishing guidelines to propose projects to councils, boards, etc., and to request support from non-conventional sources for pilot programs, etc.

Development of a holistic approach to manage areas with sandy soils – As described earlier, these measures which (a) limit erosion, (b) reduce sedimentation of streams and drainage improvements, (c) maintain needed recharge to the sandy aquifers, critical to the region's drought-year water supply, (d) sustain sufficient recharge to protect water quality and control nitrate accumulation in the aquifers, and (e) allow springs and wetlands supported by these aquifers to maintain their functions and values.

### **6.4.3 Emergency Plans**

All water purveyors now have vulnerability assessments, and have or are updating emergency plans linked to 911 and emergency services agencies. Continued maintenance and updating of these plans as well as conduct of emergency drills by the purveyors is needed. Improved maps are available to emergency crews through the County's GIS services, and via web-based mapping and aerial photography available through commercial websites at all times. As discussed in Section 6.2.8, continued efforts to improve notification of water utilities of chemical spills, and other water quality emergencies by dispatchers and on-scene planning is an important element of emergency planning.

## **6.5 Summary of Activities**

Implementation of the broad range of recommended actions (as described in Section 6.4) is outside of SCWD's direct control; therefore collaboration with other agencies and non-governmental organizations is likely the most feasible means as reallocation of, or possibly additions to, existing staff is unlikely to occur. In addition, the City should continue to seek opportunities to identify and apply for funding for projects/programs that could be implemented by City law enforcement and Watershed staff as well as by non-governmental organizations. Therefore, the drinking water utilities and County should discuss the watershed issues with other entities and develop an implementation plan, including the need for additional staffing, for the selected management practices. The attached Table 6-4 summarizes the activities and identifies some preliminary timelines so that it can be used as a checklist for periodic review.

**Table 6-4 Worksheet of Recommended Watershed Management Activities and Actions**

		AGENCY PARTNERS																			Significant Contaminating Activities Targeted With Action											
		CITY			Santa Cruz County																											
		SCWD	Parks	SLVWD	Parks	Env Health	Sheriff	Planning	Public Works	RCD of SC	State and Federal Wildlife Agencies	Cal Fire	State Parks	RWQCB - Central Coast	Federal Agencies (eg NMFS)	CWC (Coastal WS Council)	Fire Safe Councils	MGA/SMGA	Local Clubs (eg VWC)	Sempirviens/POST/TNC	Wastewater (septic systems)	Urban Runoff <sup>1</sup>	Concentrated Animal Facilities	Unauthorized/ Illegal Activities	Cannabis Cultivation	Timber Operations	Geological/ Landslides	Wildfire (preparedness)	Pesticide and Herbicide Use			
Action Items																																
SLR 2025 Partnership Program Activities including:																																
Habitat Restoration and Watershed Protection including application of City Riparian Conservation Program in County areas/Coho Recovery Plan/ Advocate for wider riparian buffers in County projects and County riparian ordinance update	L		P		S			S		S	S	S				S					X	X	X		X	X				X		
Wildfire Planning and Readiness	S		P			S	S			S		L	S				S							X	X	X		X	X			
Flood Protection and Sea Level Rise	S		S		S			S	S													X										
Public access to natural areas	S		S	L									S											X					X			
Riparian Conservation Program																																
Establish Existing conditions and Assessment Data and Mapping; evaluate preparation of watershed report card	S		S							S				S							X	X	X	X	X	X	X	X	X	X		
Riparian Habitat Protection including Existing Code Compliance Roundtable (CCR) and Creek School (eg Create opportunities for RCD training/follow up on roads, confined animals, other before formal enforcement)	S		S		S	S	L			S	S	S						S		X	X	X	X	X	X		X	X	X	X		
Active Conservation including Identifying key parcels for land use agreements that will likely result in water quality benefit	S		S					S		S			S					S	S		X	X	X	X	X	X	X	X	X	X		
Education and Outreach for Riparian Conservation	L	S	P/L		S					S			S					S				X		X			X		X			
Increase presence in watershed lands including riparian areas (e.g. upstream of Tail at Sycamore Grove and near and within State Parks land) re homeless, MTB, other unauthorized activities	L	S	S	S		S					S	S	L						S			X		X	X		X	X				
Review Emergency Plans for notification and contact info update. Discuss regular meeting with NETCOMM and first responders to share contacts and recent occurrences	L		S		S						S	S										X		X								
Confirm Karst protection language updates in County ordinances	L		P		S		S/L				S								S		X		X		X							
Meet with other local/state agencies to discuss Cannabis including: status of permits, complaints, inspection findings, and follow up (eg support existing code compliance round table)	S		S		L	S	S				S	S									X	X		X	X	X	X	X	X	X		
Locate cannabis grows using County and State Data, target inspection (including downstream wq) based on proximity to intakes (i.e. upper Newell Creek, upstream of SLVWD intakes, etc.) and adapt testing/inspection accordingly; report to task force	S		L		S		L				S	S									X	X			X		X	X	X	X		
Support sustainable agriculture in the water supply watersheds including consideration of third party certification, development of water resource protection or other farm management plans	S		S		S		L				S	S										X			X			X				

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**Appendix A: Engineering Report to Demonstrate that  
GHWTP Filters meet Turbidity Performance  
Requirements for Increased Giardia Log  
Removal Credit  
SCWD Graham Hill WTP Operations Permit  
Assistance**

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6 June 2013

**Technical Memorandum**

To: Mr. Terry Tompkins, SCWD

From: Julia Sorensen Lund, PE  
Todd Reynolds, PE  
Craig Thompson, PE

Subject: Engineering Report to Demonstrate that the GHWTP Filters meet the Turbidity Performance Requirements for Increased Giardia Log Removal Credit  
SCWD Graham Hill WTP Operations Permit Assistance  
KJ 1268001\*00



**Introduction and Background**

The Santa Cruz Water Department's (SCWD) Graham Hill Water Treatment Plant (GHWTP) is a conventional surface water treatment plant with pre-oxidation, taste and odor treatment with permanganate and powdered activated carbon, rapid mix (flash) coagulation, flocculation, sedimentation, granular media filtration, free chlorine disinfection, and corrosion control. The GHWTP receives source water supplies from three North Coast sources (Laguna Diversion, Liddell Springs, and Majors Diversion), the San Lorenzo River (Tait St Diversion, Tait Wells, and Felton Diversion via Newell Creek Reservoir), and Newell Creek Reservoir (Loch Lomond Reservoir). The raw source water entering the GHWTP for treatment often is a blend of the different sources.

Since 1998, the California Department of Public Health (CDPH) has required the GHWTP to achieve an increased level of pathogen removal and inactivation – a total of 4-log Giardia cyst and 5-log virus reduction – through filtration and disinfection to be in compliance with the California Surface Water Treatment Rule (SWTR). The basis for the increased removal-inactivation requirements is historically elevated levels of total coliform in the source water, primarily in the San Lorenzo River source water to the GHWTP.

The GHWTP has been able to meet the increased requirements by providing pathogen inactivation (1.5-log Giardia inactivation) through the addition of chlorine ahead of the settling basins to achieve the required disinfection CT (disinfectant concentration times contact time). However, the reaction of natural organic matter and the chlorine disinfectant in the settling basins creates disinfection byproducts (DBP) that are regulated by the Stage 2 Disinfectants and Disinfection Byproducts Rule (Stage 2 D/DBPR). As more water from Loch Lomond is treated at the GHWTP, the higher levels of organics in this water could lead to higher levels of DBPs.

The SCWD needs to meet SWTR requirements to control both acute microbial health risks from pathogens (Giardia, Cryptosporidium, and viruses) and chronic health risks from chlorinated DBPs. Complying with both the SWTR and the Stage 2 D/DBP Rules requires a balance

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between providing removal and inactivation of pathogens while minimizing the formation of DBPs that come from the pathogen inactivation (disinfection) process.

**Potential to Increase the Giardia Removal Credit for the GHWTP Based on Filter Performance**

Kennedy/Jenks Consultants (Kennedy/Jenks) worked with SCWD staff to review the GHWTP source water quality data, to evaluate plant operations and performance data, and to identify opportunities for potential changes to the GHWTP operations permit, operations and facilities to help reduce DBP formation. In July 2012, Kennedy/Jenks completed the Graham Hill Water Treatment Plant Operations Permit Assistance Study Draft Report (Draft Report). One of the objectives in the Draft Report was to evaluate and provide supporting data for the SCWD to request an increase in the current GHWTP Giardia log removal credit from 2.5-log to either 3-log or 3.5-log based on treatment plant and filter performance data. The Draft Report evaluated filter performance data from February 2011 through March 2012.

SCWD submitted the Draft Report to the CDPH for review and consideration. CDPH provided a letter response, dated 8 March 2013, with review comments indicating that the GHWTP may qualify for and obtain additional Giardia log removal credit under an amendment to the Operating Permit. SCWD staff and Kennedy/Jenks met with CDPH staff on 4 April 2013 to further discuss the potential to obtain additional Giardia log removal credit for the GHWTP.

The basis for obtaining additional Giardia log removal credit, as discussed in the Draft Report and described in the CDPH letter, is as follows:

"The USEPA Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) provides for conventional surface water treatment plants to receive additional 0.5-log Giardia removal credit if the filter performance consistently achieves a 95<sup>th</sup> percentile combined filter effluent (CFE) of 0.15 nephelometric turbidity units (NTU) or lower, based on recorded turbidity measurements collected at fifteen (15) minute intervals. An additional 0.5-log Giardia removal credit is allowable if the individual filter effluent (IFE) performance also consistently achieves a 95<sup>th</sup> percentile turbidity of 0.15 NTU or lower, based on recorded turbidity measurements collected at fifteen (15) minute intervals."

Therefore, by demonstrating that the existing conventional filters reliably meet the turbidity performance requirements outlined above, the GHWTP could receive up to an additional 1-log of Giardia removal credit (0.5-log for CFE performance and 0.5 log for IFE performance).

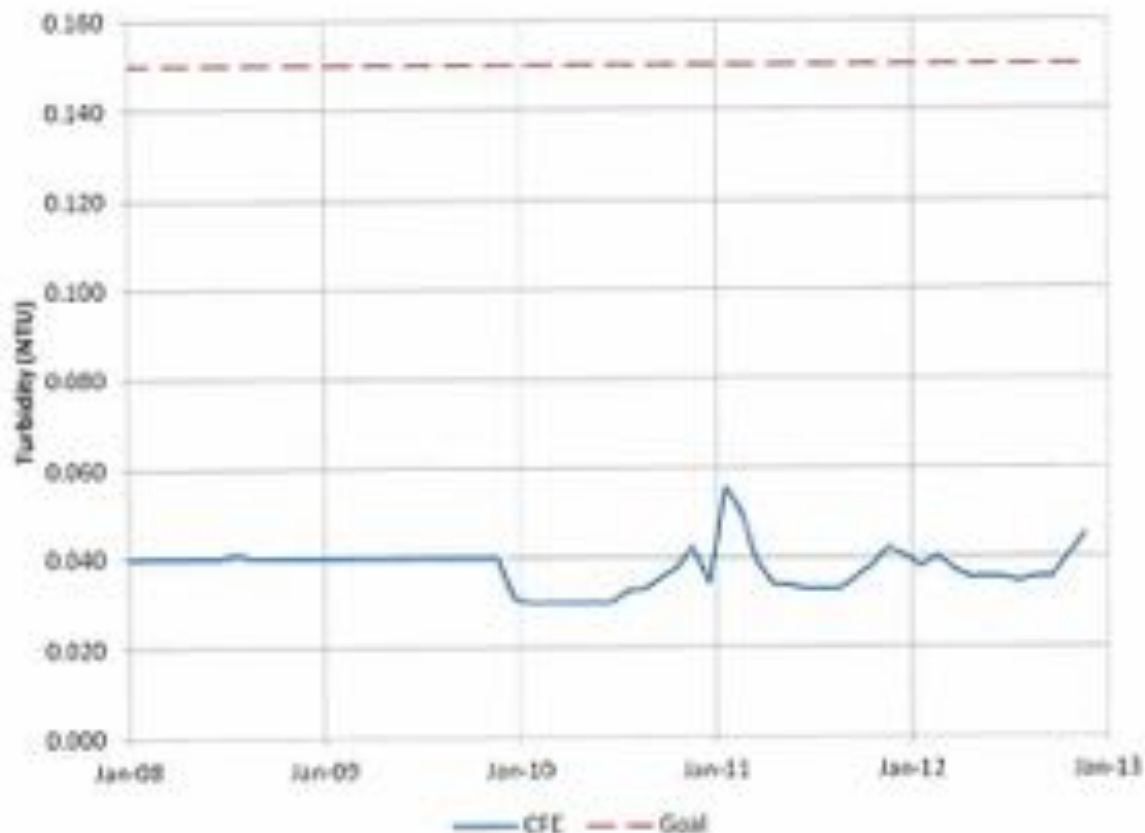
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**Figure 1** CFE Turbidity Monthly 95<sup>th</sup> Percentile Values, 2008 to 2012



As shown in Figure 2 and Table 1, the IFE filter performance consistently achieves a 95<sup>th</sup> percentile of 0.15 NTU or lower, based on recorded turbidity measurements collected at fifteen-minute intervals. The 95<sup>th</sup> percentile IFE turbidity data over the five year period have greater variability but are 0.15 NTU or lower. It is possible that some of the IFE turbidity peaks (such as the ones in July 2009, September 2009 and July 2010) correspond to maintenance or calibration events. Unusual turbidity data was only reviewed with SCWD for peaks exceeding 0.15 NTU.

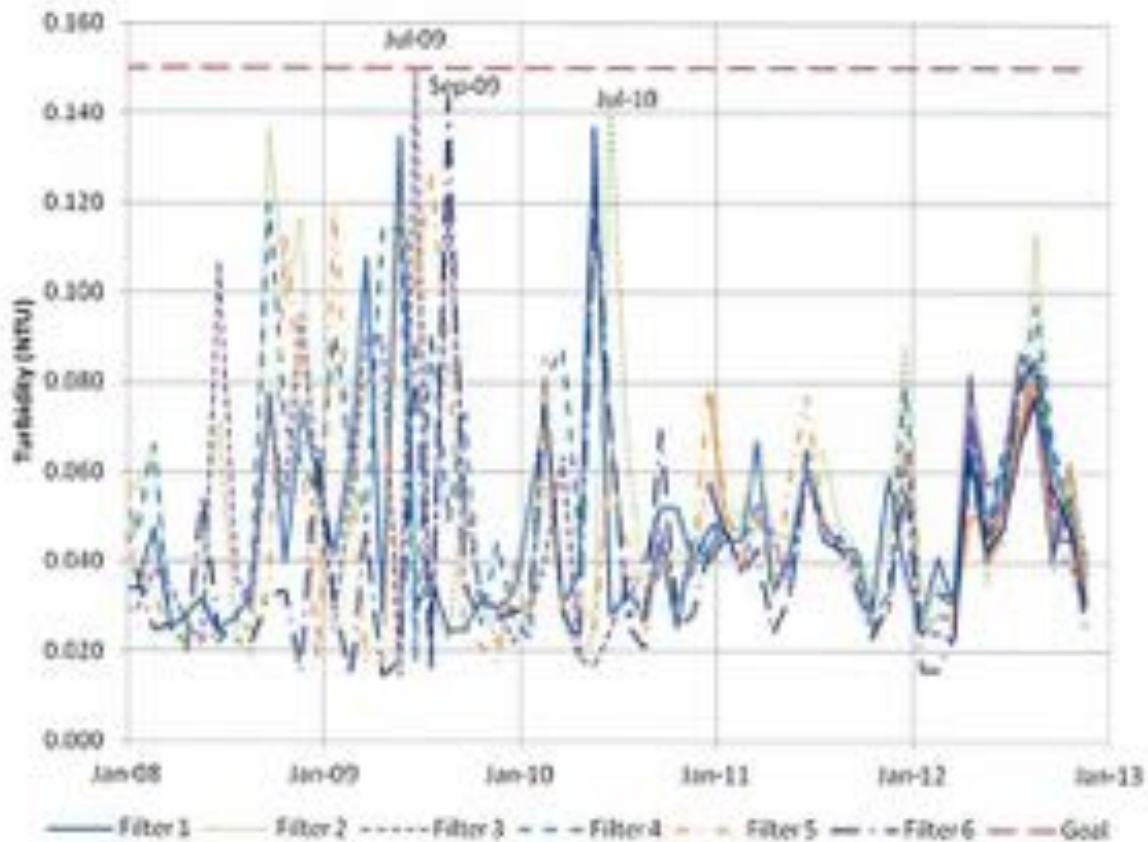


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Figure 2 IFE Turbidity Monthly 95<sup>th</sup> Percentile Values, 2008 to 2012



Based on the five years of CFE and IFE filter turbidity performance data, the existing GHWTP conventional filters reliably meet the performance requirements to receive an additional 1-log of *Giardia* removal credit.

Monthly maximum turbidity values also were reviewed to confirm that the GHWTP complied with the LT2ESWTR requirement that no individual filter may have a measured turbidity greater than 0.3 NTU in two consecutive measurements taken 15 minutes apart after four hours of operation. Based on the five years of IFE filter turbidity performance data, the GHWTP meets that requirement also.

Table 1 95th Percentile Turbidity Data, January 2008 to December 2012

Month	Filter <sup>(a,b)</sup>					
	1	2	3	4	5	6
Jan-08	0.034	0.059	0.029	0.056	0.066	0.050
Feb-08	0.034	0.056	0.029	0.047	0.041	0.037
Mar-08	0.048	0.066	0.038	0.066	0.033	0.025
Apr-08	0.025	0.036	0.034	0.024	0.025	0.026
May-08	0.028	0.022	0.027	0.028	0.022	0.020
Jun-08	0.032	0.047	0.022	0.032	0.021	0.055
Jul-08	0.025	0.071	0.107	0.022	0.024	0.024
Aug-08	0.028	0.023	0.037	0.027	0.027	0.022
Sep-08	0.032	0.019	0.029	0.016	0.024	0.022
Oct-08	0.077	0.136	0.074	0.120	0.035	0.032
Nov-08	0.040	0.098	0.055	0.071	0.112	0.033
Dec-08	0.075	0.117	0.095	0.062	0.074	0.045
Jan-09	0.059	0.042	0.056	0.055	0.018	0.065
Feb-09	0.042	0.024	0.029	0.090	0.119	0.031
Mar-09	0.063	0.048	0.056	0.063	0.062	0.014
Apr-09	0.108	0.081	0.090	0.049	0.017	0.047
May-09	0.029	0.076	0.090	0.115	0.018	0.015
Jun-09	0.135	0.033	0.015	0.114	0.119	0.018
Jul-09	0.029	0.118	0.149	0.018	0.100	0.088
Aug-09	0.037	0.031	0.017	0.091	0.127	0.016
Sep-09	0.025	0.023	0.122	0.049	0.088	0.143
Oct-09	0.025	0.058	0.051	0.073	0.025	0.035
Nov-09	0.031	0.033	0.033	0.026	0.022	0.027
Dec-09	0.029	0.021	0.029	0.044	0.018	0.028

Table 1 95th Percentile Turbidity Data, January 2008 to December 2012

Month	Filter <sup>100</sup>											
	1		2		3		4		5		6	
Filter Side <sup>10</sup>	LS	RS	LS	RS	LS	RS	LS	RS	LS	RS	LS	RS
Jan-10	0.033		0.036		0.022		0.027		0.040		0.029	
Feb-10	0.053		0.036		0.029		0.023		0.026		0.030	
Mar-10	0.074		0.060		0.040		0.081		0.096		0.075	
Apr-10	0.030		0.027		0.053		0.088		0.028		0.029	
May-10	0.038		0.018		0.018		0.046		0.033		0.021	
Jun-10	0.137		0.024		0.017		0.115		0.025		0.123	
Jul-10	0.028		0.240		0.024		0.068		0.062		0.070	
Aug-10	0.033		0.062		0.037		0.028		0.043		0.026	
Sep-10	0.028	0.040	0.033		0.026		0.031		0.028		0.021	
Oct-10	0.044	0.052	0.040		0.048		0.038		0.040		0.070	
Nov-10	0.025	0.052	0.043		0.032		0.031		0.033		0.026	
Dec-10	0.045	0.040	0.039		0.040		0.038		0.040		0.028	
Jan-11	0.040	0.048	0.059	0.067	0.040	0.043	0.048	0.057	0.080	0.077	0.043	0.057
Feb-11	0.045	0.048	0.052		0.048	0.050	0.050		0.052	0.048	0.048	0.046
Mar-11	0.045		0.050		0.038		0.045		0.041		0.037	
Apr-11	0.067		0.062		0.053		0.053		0.051		0.043	
May-11	0.033		0.047		0.046		0.033		0.033		0.024	
Jun-11	0.043		0.045		0.033		0.040		0.060		0.033	
Jul-11	0.061		0.063		0.060		0.063		0.077		0.065	
Aug-11	0.049		0.065		0.046		0.045		0.048		0.045	
Sep-11	0.043		0.048		0.045		0.046		0.043		0.043	
Oct-11	0.043		0.043		0.038		0.040		0.040		0.035	
Nov-11	0.029		0.035		0.026		0.025		0.027		0.023	
Dec-11	0.059		0.046		0.029		0.034		0.028		0.031	
Jan-12												
Feb-12												
Mar-12												
Apr-12												
May-12												
Jun-12												
Jul-12												
Aug-12												
Sep-12												
Oct-12												
Nov-12												
Dec-12												



95th Percentile Turbidity Data, January 2008 to December 2012

Month	Filter <sup>Jan</sup>												CPE <sup>Jan</sup>
	1		2		3		4		5		6		
	LS	RS	LS	RS	LS	RS	LS	RS	LS	RS	LS	RS	
Jan-12	0.038		0.088		0.065		0.079		0.067		0.057		0.040
Feb-12	0.036		0.027		0.024		0.024		0.028		0.016		0.038
Mar-12	0.041		0.035	0.033	0.024		0.028	0.033	0.026		0.016		0.040
Apr-12	0.031	0.033	0.030	0.031	0.023	0.031	0.028	0.033	0.028	0.028	0.023	0.026	0.037
May-12	0.067	0.042	0.072	0.066	0.070	0.079	0.060	0.065	0.055	0.050	0.072	0.064	0.035
Jun-12	0.040	0.048	0.035	0.040	0.050	0.057	0.048	0.048	0.050	0.050	0.045	0.043	0.036
Jul-12	0.048	0.054	0.043	0.054	0.055	0.060	0.065	0.060	0.044	0.047	0.052	0.047	0.036
Aug-12	0.070	0.072	0.072	0.067	0.082	0.087	0.077	0.071	0.077	0.072	0.079	0.067	0.035
Sep-12	0.077	0.077	0.114	0.082	0.074	0.079	0.097	0.085	0.082	0.082	0.086	0.077	0.035
Oct-12	0.040	0.043	0.038	0.045	0.040	0.046	0.067	0.064	0.048	0.048	0.052	0.057	0.035
Nov-12	0.055	0.062	0.043	0.045	0.040	0.050	0.053	0.048	0.062	0.060	0.051	0.047	0.040
Dec-12	0.034	0.036	0.031	0.040	0.030	0.038	0.043	0.042	0.033	0.033	0.026	0.031	0.045

(a) Values from January 2008 through February 2011 and from March 2012 through December 2012 are based on data collected at 1-minute intervals that has been filtered to select a one point at 15 minute intervals (to meet the releases of CO<sub>2</sub> and to be consistent with Note (b)).

(b) Data for the period between February 2011 and March 2012 were analyzed as part of the Youth Graham Hill Water Treatment Plant Operations Permit Assistance Study, dated 30 July 2012. The 95th percentile values were calculated based on data collected at 15-minute intervals that included one hourly reading for each filter.

 (d) CFE is contained filter effluent. |

LH L5 = left side, RH = right side

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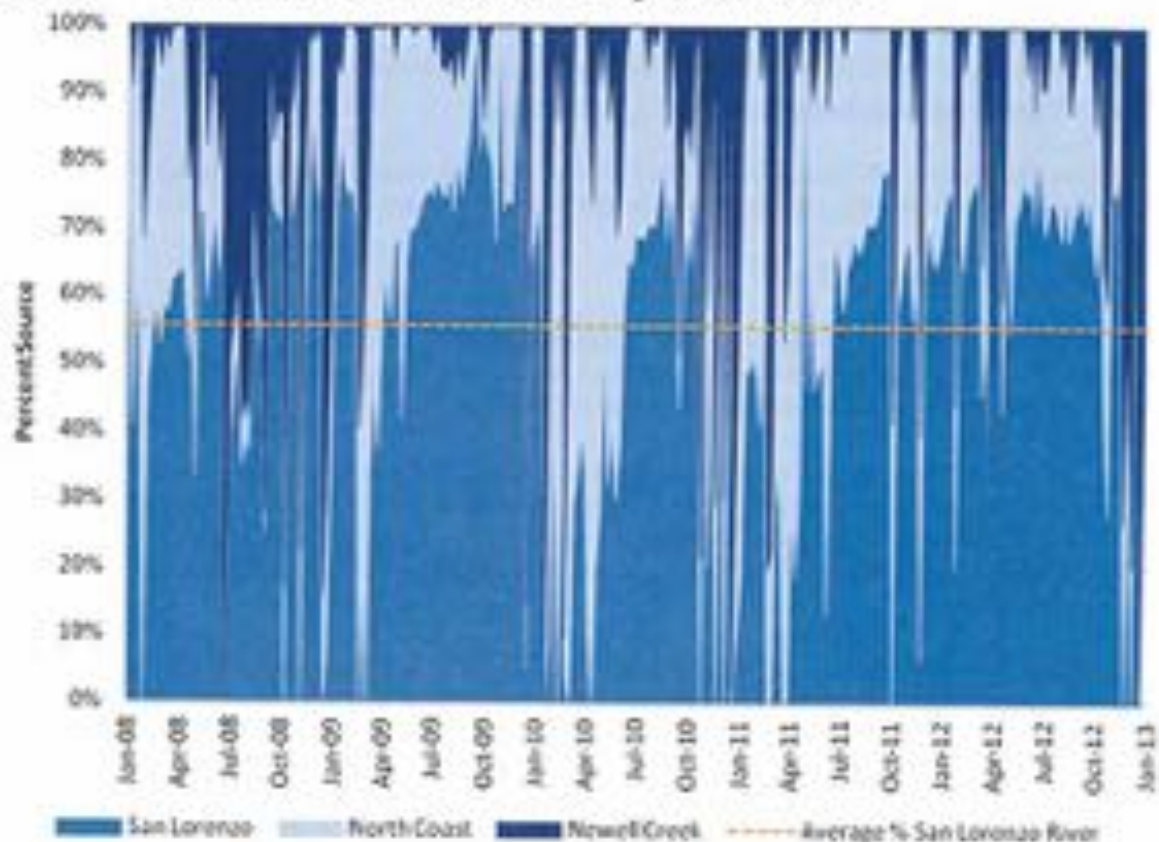
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#### Source Water Portfolio Consideration

The GHWTP receives source water supplies from the San Lorenzo River, North Coast creeks, and Newell Creek. The raw source water entering the GHWTP for treatment is often a blend of the different sources. The source water portfolio during the period from 2008 to 2012 was reviewed to understand if the consistently low turbidity in the CFE and IFE was related to a consistent source water portfolio.

Between 2008 and 2012, the San Lorenzo River was the primary source of water, providing approximately 56% of the flowrate to SCWD. The North Coast and Newell Creek sources were used more often during winter months, providing up to 65% between November and March during this period. The cumulative source water percentages for 2008 to 2012 are shown in Figure 3 below.

Figure 3 Cumulative Source Water Percentages, 2008 to 2012



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As shown in Figure 3, the source water blend to the GHWTP varied widely over this period of time. Although the amount of water from each source of water varied, the plant performance and the CFE and IFE turbidity remained consistently below the 0.15 NTU objective. The SCWD operations staff has a good understanding of the different characteristics of the various source waters and can reliably achieve the turbidity performance requirements to permit the GHWTP to receive additional *Giardia* removal credit.

### Proposed Future Filter Improvements for the GHWTP

SCWD is in the process of evaluating and recommending rehabilitation and upgrade improvements for the conventional granular media filters at the GHWTP. The improvements are expected to be designed and constructed over the next few years and may include:

- New filter underdrains that permit deeper filter media design
- Deeper multi-media that increases the ratio of bed depth to average filter grain effective size (L/d ratio) from approximately 925 to 1,100
- Air scour to improve the backwash efficiency of the filters
- Polymer addition to the backwash supply water

These improvements will permit the GHWTP to continue to reliably achieve the turbidity performance requirements and to receive additional *Giardia* removal credit.

### Summary and Conclusions

This TM serves as the engineering report, requested by CDPH in their March 2013 letter, to demonstrate that the GHWTP can reliably meet the filter turbidity requirements to receive additional *Giardia* removal credit. The findings of this TM are:

- Based on five years of operational data, the GHWTP CFE filter performance consistently achieves a 95<sup>th</sup> percentile of 0.15 NTU or lower, based on recorded turbidity measurements collected at fifteen-minute intervals. Therefore, the GHWTP meets the requirements to receive an additional 0.5-log *Giardia* removal credit for CFE filter performance.
- Based on five years of operational data, the GHWTP IFE filter performance consistently achieves a 95<sup>th</sup> percentile of 0.15 NTU or lower, based on recorded turbidity measurements collected at fifteen-minute intervals. Therefore, the GHWTP meets the requirements to receive an additional 0.5-log *Giardia* removal credit for IFE filter performance.

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Therefore, the existing GHWTP conventional filters reliably meet the performance requirements to receive up to a total additional 1-log of *Giardia* removal credit. Furthermore, planned improvements to the GHWTP filters will permit the SCWD to continue to reliably achieve the turbidity performance requirements in the future.

## **Appendix B: Primary and Secondary Maximum Contaminant Limits**

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## Appendix B1- Comparison of National Primary Drinking Water Regulations and California Drinking Water Standards

<b>MCLs, DLRs, and PHGs for Regulated Drinking Water Contaminants</b> (Units are in milligrams per liter (mg/L), unless otherwise noted.) Last Update: January 10, 2018						
This table includes: California's maximum contaminant levels (MCLs) Detection limits for purposes of reporting (DLRs) <a href="#">Public health goals (PHGs) from the Office of Environmental Health Hazard Assessment (OEHHA)</a> Also, the PHG for NDMA (which is not yet regulated) is included at the bottom of this table.					For comparison:  <a href="#">Federal MCLs and Maximum Contaminant Level Goals (MCLGs) (US EPA)</a>	
	MCL	DLR	PHG	Date of PHG	MCL	MCLG
<b>Chemicals with MCLs in 22 CCR §64431—Inorganic Chemicals</b>						
Aluminum	1	0.05	0.6	2001	--	--
Antimony	0.006	0.006	0.001	2016	0.006	0.006
Arsenic	0.010	0.002	0.000004	2004	0.010	zero
Asbestos (MFL = million fibers per liter; for fibers >10 microns long)	7 MFL	0.2 MFL	7 MFL	2003	7 MFL	7 MFL
Barium	1	0.1	2	2003	2	2
Beryllium	0.004	0.001	0.001	2003	0.004	0.004
Cadmium	0.005	0.001	0.00004	2006	0.005	0.005
Chromium, Total - OEHA withdrew the 0.0025-mg/L PHG	0.05	0.01	withdrawn Nov. 2001	1999	0.1	0.1
Chromium, Hexavalent - 0.01-mg/L MCL & 0.001-mg/L DLR repealed September 2017	--	--	0.00002	2011	--	--
Cyanide	0.15	0.1	0.15	1997	0.2	0.2
Fluoride	2	0.1	1	1997	4.0	4.0
Mercury (inorganic)	0.002	0.001	0.0012	1999 (rev2005)*	0.002	0.002
Nickel	0.1	0.01	0.012	2001	--	--
Nitrate (as nitrogen, N)	10 as N	0.4	45 as NO <sub>3</sub> (=10 as N)	1997	10	10
Nitrite (as N)	1 as N	0.4	1 as N	1997	1	1
Nitrate + Nitrite (as N)	10 as N	--	10 as N	1997	--	--
Perchlorate	0.006	0.004	0.001	2015	--	--
Selenium	0.05	0.005	0.03	2010	0.05	0.05
Thallium	0.002	0.001	0.0001	1999 (rev2004)	0.002	0.0005
<b>Copper and Lead, 22 CCR §64672.3</b>						
Values referred to as MCLs for lead and copper are not actually MCLs; instead, they are called "Action Levels" under the lead and copper rule						
Copper	1.3	0.05	0.3	2008	1.3	1.3
Lead	0.015	0.005	0.0002	2009	0.015	zero
<b>Radionuclides with MCLs in 22 CCR §64441 and §64443—Radioactivity</b>						
[units are picocuries per liter (pCi/L), unless otherwise stated; n/a = not applicable]						
Gross alpha particle activity - OEHA concluded in 2003 that a PHG was not practical	15	3	none	n/a	15	zero
Gross beta particle activity - OEHA concluded in 2003 that a PHG was not practical	4 mrem/yr	4	none	n/a	4 mrem/yr	zero



## Appendix B1- Comparison of National Primary Drinking Water Regulations and California Drinking Water Standards

Radium-226	--	1	0.05	2006
Radium-228	--	1	0.019	2006
Radium-226 + Radium-228	5	--	--	--
Strontium-90	8	2	0.35	2006
Tritium	20,000	1,000	400	2006
Uranium	20	1	0.43	2001

**Chemicals with MCLs in 22 CCR §64444—Organic Chemicals****(a) Volatile Organic Chemicals (VOCs)**

Benzene	0.001	0.0005	0.00015	2001
Carbon tetrachloride	0.0005	0.0005	0.0001	2000
1,2-Dichlorobenzene	0.6	0.0005	0.6	1997 (rev2009)
1,4-Dichlorobenzene (p-DCB)	0.005	0.0005	0.006	1997
1,1-Dichloroethane (1,1-DCA)	0.005	0.0005	0.003	2003
1,2-Dichloroethane (1,2-DCA)	0.0005	0.0005	0.0004	1999 (rev2005)
1,1-Dichloroethylene (1,1-DCE)	0.006	0.0005	0.01	1999
cis-1,2-Dichloroethylene	0.006	0.0005	0.1	2006
cis-1,2-Dichloroethylene	--	--	0.013	2017 draft
trans-1,2-Dichloroethylene	0.01	0.0005	0.06	2006
trans-1,2-Dichloroethylene	--	--	0.05	2017 draft
Dichloromethane (Methylene chloride)	0.005	0.0005	0.004	2000
1,2-Dichloropropane	0.005	0.0005	0.0005	1999
1,3-Dichloropropene	0.0005	0.0005	0.0002	1999 (rev2006)
Ethylbenzene	0.3	0.0005	0.3	1997
Methyl tertiary butyl ether (MTBE)	0.013	0.003	0.013	1999
Monochlorobenzene	0.07	0.0005	0.07	2014
Styrene	0.1	0.0005	0.0005	2010
1,1,2,2-Tetrachloroethane	0.001	0.0005	0.0001	2003
Tetrachloroethylene (PCE)	0.005	0.0005	0.00006	2001
Toluene	0.15	0.0005	0.15	1999
1,2,4-Trichlorobenzene	0.005	0.0005	0.005	1999
1,1,1-Trichloroethane (1,1,1-TCA)	0.2	0.0005	1	2006
1,1,2-Trichloroethane (1,1,2-TCA)	0.005	0.0005	0.0003	2006
Trichloroethylene (TCE)	0.005	0.0005	0.0017	2009
Trichlorofluoromethane (Freon 11)	0.15	0.005	1.3	2014
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	1.2	0.01	4	1997 (rev2011)
Vinyl chloride	0.0005	0.0005	0.00005	2000
Xylenes	1.75	0.0005	1.8	1997

**(b) Non-Volatile Synthetic Organic Chemicals (SOCs)**

Alachlor	0.002	0.001	0.004	1997
Atrazine	0.001	0.0005	0.00015	1999
Bentazon	0.018	0.002	0.2	1999 (rev2009)
Benzo(a)pyrene	0.0002	0.0001	0.000007	2010
Carbofuran	0.018	0.005	0.0007	2016
Chlordane	0.0001	0.0001	0.00003	1997 (rev2006)
Dalapon	0.2	0.01	0.79	1997 (rev2009)
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00001	0.0000017	1999
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.07	0.01	0.02	2009

5	zero
--	--
--	--
30 µg/L	zero

0.005	zero
0.005	zero
0.6	0.6
0.075	0.075
--	--
0.005	zero
0.007	0.007
0.07	0.07
--	--
0.1	0.1
--	--
0.005	zero
0.005	zero
--	--
0.7	0.7
--	--
0.1	0.1
0.1	0.1
0.005	zero
1	1
0.07	0.07
0.2	0.2
0.005	0.003
0.005	zero
--	--
--	--
0.002	zero
10	10

0.002	zero
0.003	0.003
--	--
0.0002	zero
0.04	0.04
0.002	zero
0.2	0.2
0.0002	zero
0.07	0.07



## Appendix B1- Comparison of National Primary Drinking Water Regulations and California Drinking Water Standards

Di(2-ethylhexyl)adipate	0.4	0.005	0.2	2003
Di(2-ethylhexyl)phthalate (DEHP)	0.004	0.003	0.012	1997
Dinoseb	0.007	0.002	0.014	1997 (rev2010)
Diquat	0.02	0.004	0.006	2016
Endothal	0.1	0.045	0.094	2014
Endrin	0.002	0.0001	0.0003	2016
Ethylene dibromide (EDB)	0.00005	0.00002	0.00001	2003
Glyphosate	0.7	0.025	0.9	2007
Heptachlor	0.00001	0.00001	0.000008	1999
Heptachlor epoxide	0.00001	0.00001	0.000006	1999
Hexachlorobenzene	0.001	0.0005	0.00003	2003
Hexachlorocyclopentadiene	0.05	0.001	0.002	2014
Lindane	0.0002	0.0002	0.000032	1999 (rev2005)
Methoxychlor	0.03	0.01	0.00009	2010
Molinate	0.02	0.002	0.001	2008
Oxamyl	0.05	0.02	0.026	2009
Pentachlorophenol	0.001	0.0002	0.0003	2009
Picloram	0.5	0.001	0.166	2016
Polychlorinated biphenyls (PCBs)	0.0005	0.0005	0.00009	2007
Simazine	0.004	0.001	0.004	2001
Thiobencarb	0.07	0.001	0.042	2016
Toxaphene	0.003	0.001	0.00003	2003
1,2,3-Trichloropropane	0.000005	0.000005	0.0000007	2009
2,3,7,8-TCDD (dioxin)	3x10 <sup>-8</sup>	5x10 <sup>-9</sup>	5x10 <sup>-11</sup>	2010
2,4,5-TP (Silvex)	0.05	0.001	0.003	2014
<b>Chemicals with MCLs in 22 CCR §64533—Disinfection Byproducts</b>				
Total Trihalomethanes	0.080	--	0.0008	2010 draft
Bromodichloromethane	--	0.0010	--	--
Bromoform	--	0.0010	--	--
Chloroform	--	0.0010	--	--
Dibromochloromethane	--	0.0010	--	--
Haloacetic Acids (five) (HAA5)	0.060	--	--	--
Monochloroacetic Acid	--	0.0020	--	--
Dichloroacetic Acid	--	0.0010	--	--
Trichloroacetic Acid	--	0.0010	--	--
Monobromoacetic Acid	--	0.0010	--	--
Dibromoacetic Acid	--	0.0010	--	--
Bromate	0.010	0.0050**	0.0001	2009
Chlorite	1.0	0.020	0.05	2009
<b>Chemicals with PHGs established in response to DDW requests. These are not currently regulated drinking water contaminants.</b>				
N-Nitrosodimethylamine (NDMA)	--	--	0.000003	2006
*OEHHHA's review of this chemical during the year indicated (rev20XX) resulted in no change in the PHG.				
**The DLR for Bromate is 0.0010 mg/L for analysis performed using EPA Method 317.0 Revision 2.0, 321.8, or 326.0.				

0.4	0.4
0.006	zero
0.007	0.007
0.02	0.02
0.1	0.1
0.002	0.002
0.00005	zero
0.7	0.7
0.0004	zero
0.0002	zero
0.001	zero
0.05	0.05
0.0002	0.0002
0.04	0.04
--	--
0.2	0.2
0.001	zero
0.5	0.5
0.0005	zero
0.004	0.004
--	--
0.003	zero
--	--
3x10 <sup>-8</sup>	zero
0.05	0.05

0.080	--
--	zero
--	zero
--	0.07
--	0.06
0.060	--
--	0.07
--	zero
--	0.02
--	--
--	--
0.01	zero
1	0.8

--	--
----	----

Source: [https://www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/MCLsandPHGs.html](https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/MCLsandPHGs.html)

## Table of Secondary Standards

<b>Contaminant</b>	<b>Secondary MCL (Maximum Contaminant Level)</b>	<b>Noticeable Effects above the Secondary MCL (Maximum Contaminant Level) (Maximum Contaminant Level)</b>
Aluminum	0.05 to 0.2 mg/L (Milligrams per Liter)* (Milligrams per Liter)	colored water
Chloride	250 mg/L (Milligrams per Liter)	salty taste
Color	15 color units	visible tint
Copper	1.0 mg/L (Milligrams per Liter)	metallic taste; blue-green staining
Corrosivity	Non-corrosive	metallic taste; corroded pipes/ fixtures staining
Fluoride	2.0 mg/L (Milligrams per Liter)	tooth discoloration
Foaming agents	0.5 mg/L (Milligrams per Liter)	frothy, cloudy; bitter taste; odor
Iron	0.3 mg/L (Milligrams per Liter)	rusty color; sediment; metallic taste; reddish or orange staining
Manganese	0.05 mg/L (Milligrams per Liter)	black to brown color; black staining; bitter metallic taste
Odor	3 TON (threshold odor number)	"rotten-egg", musty or chemical smell

pH	6.5 - 8.5	low pH: bitter metallic taste; corrosion high pH: slippery feel; soda taste; deposits
Silver	0.1 mg/L (Milligrams per Liter)	skin discoloration; graying of the white part of the eye
Sulfate	250 mg/L (Milligrams per Liter)	salty taste
Total Dissolved Solids (TDS (Total Dissolved Solids))	500 mg/L (Milligrams per Liter)	hardness; deposits; colored water; staining; salty taste
Zinc	5 mg/L (Milligrams per Liter)	metallic taste

\*mg/L (Milligrams per Liter) is milligrams of substance per liter of water.

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## **Appendix C:      Constituents of Emerging Concern Study**

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## **Constituents of Emerging Concern, August 2016 Report**

### **INTRODUCTION**

The mission of the City of Santa Cruz Water Department is to ensure public health and safety by providing a clean, safe, and reliable supply of water. We are passionate about providing our community with high-quality drinking water and consistently meet all regulated state and federal standards. In addition to complying with all required standards, we have begun voluntarily testing for unregulated constituents known as “constituents of emerging concern”, or “CECs.” This report provides results from our initial round of testing for CECs.

CECs typically result from pharmaceuticals, personal care products and insect repellent that enter water sources through runoff or wastewater system discharges. Some are known or suspected to be potentially endocrine-disrupting. Endocrine disruptors are chemicals that may interfere with the body’s endocrine (or hormone) system, and may produce adverse developmental, reproductive, neurological, and immune effects in both humans and in wildlife. As you will see in the attached report, the levels of CECs we found in our recent water testing are not alarming. Most are at levels equivalent to a drop of water in three Olympic-size swimming pools. That said, results from the tests help inform our planning for future water treatment.

We know that when the public turns on their tap they want to feel comfortable that their water is safe. They want to know that we’re doing all we can to protect their water at its source. They want to know that the treatment their water has received protects them from anything potentially harmful. They want to know that the infrastructure their water is delivered through is maintained, reliable and secure. This report identifies CECs that we found in recent, voluntary testing of unregulated constituents.

## **Results of the Santa Cruz Water Department Initial Testing for Constituents of Emerging Concern<sup>1</sup>**

In the fall of 2015, the Santa Cruz Water Department initiated new testing for the system's source water and treated water to begin to create a better understanding of the water quality characteristics of our community's source waters. This new testing includes looking at what trace levels of Constituents of Emerging Concern (CECs) might be finding their way into our community's drinking water supplies. This voluntary testing regime was undertaken largely to help inform planning for upcoming major investments in drinking water treatment that are necessary to address aging infrastructure at the Graham Hill Water Treatment Plant.

### **Santa Cruz's Water Supply**

The drinking water for the City of Santa Cruz comes primarily from local watersheds which include coastal streams north of the city and the San Lorenzo River. The Water Department diverts water from rivers or streams (flowing sources) and sends it to water treatment facilities for processing and delivery to customers, or stores water available during the rainy season in Loch Lomond Reservoir for treatment and delivery to customers during the dry season. Protecting public health and providing a safe and reliable supply of water to our customers is job #1 for the Santa Cruz Water Department. Drinking water produced and delivered by the Santa Cruz Water Department complies with all current state and federal drinking water regulations; a source of professional pride and personal satisfaction for the dozens of water utility employees who work every day to make this statement true.

Like other water utilities, the Santa Cruz Water Department uses a tried and true strategy called a multi-barrier approach to protecting water quality and ensuring that we produce a high quality product. The first barrier is source water protection, the second is effective water treatment – which also includes multiple barriers, and the third is careful management of the treated water delivery system that keeps water quality from degrading as it moves from the treatment plant to the customer's tap.

To provide context for the discussion about CECs covered later in this paper, a brief discussion of each of the multiple barriers follows:

<sup>1</sup>Constituents of emerging concern (CECs) is a term used to include a broad range of unregulated chemical components found at trace levels in many of our water supplies, including surface water, drinking water, wastewater, and recycled water. Other terms include "emerging constituents," "endocrine disrupting chemicals," or "pharmaceuticals and personal care products." From National Water Research Institute: <http://www.nwri-usa.org/CECs.htm>



### **Barrier #1 – Source Water Protection**

Source water assessments and active watershed management are the key elements of any effective source water protection program. On an ongoing basis the Department keeps tabs on what's going on in the watersheds from which it draws water, and every three years the Department conducts a thorough sanitary survey of the watersheds from which our community's drinking water is drawn. These efforts keep Department staff aware of changes in activities or circumstances occurring in the watershed that may be sources of contaminants: either from natural conditions such as erosion that increases sediment loading in the source water, or human-caused sources such as agricultural run-off that may introduce fertilizers, herbicides, or pesticides into the water supply sources.

### **Barrier #2 – Water Treatment**

Utilities using surface water sources (rivers, streams, lakes) are required by state and federal regulations to provide significant levels of water treatment, typically through a facility like the Department's Graham Hill Water Treatment Plant. The water treatment process is designed to specifically address the character of the water source feeding the treatment plant, for example the levels and types of microbes typically present in surface water sources, and to produce drinking water that protects public health and looks, smells, and tastes good.

### **Barrier #3 – Distribution System Management**

Over the last 20 years, water utility managers have become increasingly sensitized to the need to operate their water distribution systems in a manner that recognizes that, in effect, water is a perishable product that can't just be sent out into the distribution system and left to languish. Water sitting in distribution storage tanks or dead-end water mains will eventually become more susceptible to microbial growth. Microbial contaminants can produce water borne disease outbreaks, an obvious public health threat. In addition, water that is subject to long residence times in distribution storage tanks or parts of the distribution system that has demand may have higher levels of disinfection byproducts, which are formed by the interaction of a disinfectant such as chlorine and naturally occurring organic carbon found in many surface water sources. Like microbial contaminants in distribution systems, disinfection byproducts are the subject of state and federal drinking water regulations.

Good management of a distribution system limits these potential threats to public health, but isn't as easy to achieve as it might seem. Distribution storage tanks and standpipes that are located throughout the distribution system are designed to hold a lot of water – much more

than is needed to meet customer demand – because a lot of water is needed to support fire-fighting, should it become necessary. Balancing the need for fire flows with drinking water quality requires system operators to conscientiously cycle tanks, ensure that dead-end mains are flushed, and match treatment plant production to water system demands in a much more sophisticated manner than ever before.

### **Ability to Test for Trace Amounts of CECs-What New Technology Enables Us to Discover in Public Drinking Water Supplies**

The age of advanced technology has given humans the ability to view the world (and the universe, too) in new ways that would have been unfathomable only a relatively few years ago. By reading the newspaper or following news content online, we know that we have the technology now to do everything from discovering earth-like planets in star systems in far-away galaxies to being able to detect one drop of a compound of interest (1 drop = 0.00005 liter) in 50 million liters, which is equivalent to the volume of 15 Olympic sized swimming pools<sup>2</sup> (if the compound of interest is found at the level of 1 drop in 50 million liters, its concentration is described as 1 part per trillion or 1 nanogram per liter).

The first two elements of the multi-barrier approach described earlier makes a good framework for summarizing the results of the CEC testing that the Department has completed to date because, if present, CECs will enter the drinking water supply from the source water and the treatment provided will either effectively address them or it won't due to treatment process limitations.

The Department conducted testing for 96 different constituents, as listed in Attachment2. Most of them (76) were never detected in the source water, and the remainder were occasionally detected at very low levels. The data table for the available results is included as Attachment 1 to this document. All results are presented in nanograms per liter (1 nanogram per liter = 1 particle in a trillion particles). A cell with no entry means that that constituent was not detected in that sample. Only detected CECs are listed in Attachment 1.

<sup>2</sup> For source see slide 7 of Dr. Shane Snyder's presentation on Safe and Sustainable Water Reuse at <http://www.lottcleanwater.org/pdf/symposiumsnnyder.pdf>

## **Source Water Protection**

Relatively few of the nation's thousands of drinking water utilities have the benefit of drawing water from fully protected sources. Most utilities do what Santa Cruz has done and strategically purchase lands around critical facilities such as reservoirs and upstream of river intakes, and establish robust treatment systems to inactivate or remove microbes and naturally occurring or man-made chemicals. Not having a pristine source, however, does suggest the need to carefully monitor source water quality and take what source water protection steps can be taken to ensure a consistent and high quality source of water is provided to the water treatment plant.

Routine sanitary surveys of Santa Cruz's North Coast supplies indicate relatively low levels of development and natural or human-caused activities that could introduce contaminants into those sources of supply. On the other hand, however, the San Lorenzo River watershed has a long history of development – both for residential use, various kinds of recreational uses such as equestrian facilities, and for resource extraction uses such as timber harvesting, and sand, gravel, limestone, and granite quarrying.

While not a pristine watershed, the Department's many years of sanitary survey data for the San Lorenzo's watershed as well as water quality from the San Lorenzo source show that for the traditional issues of concern (e.g., bacteria, parasites, nitrates and sediments) the condition of the watershed and the quality of the source water are good, and generally stable or improving. Since the 1980's the County has been implementing a program to monitor and upgrade the septic systems in the watershed.

## **The CEC Sampling Program and Results**

Beginning in the fall of 2015 and on a quarterly basis thereafter, untreated water samples were collected at the Coast Pump Station for a composite of the Department's North Coast sources, San Lorenzo River at both the Tait Street and Felton Diversions, and at Loch Lomond. Treated water samples were collected from water leaving the Graham Hill Water Treatment Plant, and in one case, an untreated water sample was taken of blended source waters just before they entered the Graham Hill Water Treatment Plant. Two other "event" related samples were collected and analyzed as well. One captured what is known as the "first flush," which typically happens as the weather transitions from dry to wet sometime in the October to December time frame. The second event sample was collected in April to represent a high, stable flow in the San Lorenzo River.

All samples were prepared for shipping and sent for processing to Eurofins/Eaton Analytical lab for processing. Attachment 2 provides a list of all the CECs for which testing was completed and the method reporting limit (MRL) for each.

- **Source Water CEC Results**

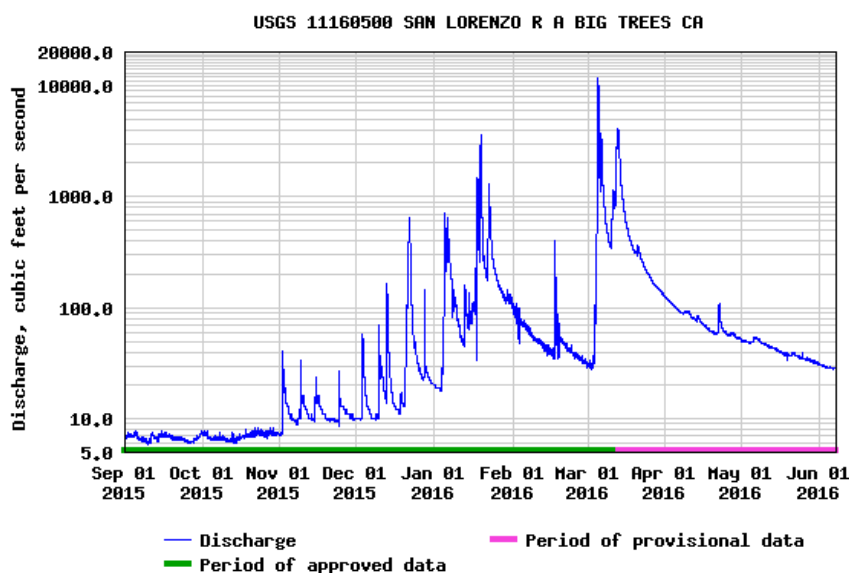
The source of CECs found in water supplies is invariably linked to human activity. For example, pharmaceuticals, personal care products, and insect repellent are all used by humans and end up in wastewater streams through human excretion or through being washed off during showering or recreational bathing in streams that are used as drinking water sources.

In Santa Cruz's case, the major sources of wastewater-related effluent which has the potential to reach the San Lorenzo River source is septic systems and the leach-fields associated with two small wastewater treatment plants in the Boulder Creek area. Prior to 1986, failing or improperly functioning septic systems in the mid and upper San Lorenzo basin were a significant source of nitrates reaching the river, and nitrates can be a significant threat to drinking water quality. In 1986, Santa Cruz County initiated a program to work with property owners to reduce the occurrence of failing septic systems as well as instituting new requirements for the construction and performance of new and existing septic systems.

The most common CECs detected in Santa Cruz untreated water source sampling are two types of artificial sweeteners, Sucralose (Splenda) and Acesulfame-K, (Sunett and Sweet One). These compounds were identified in most of the San Lorenzo River untreated water samples and are shown in **Blue type** in the sampling results provided in Attachment 1.

The most diverse set of CECs were found in the first flush samples from the San Lorenzo River collected on November 2, 2015. The first flush sample was drawn to reflect the influence of the first significant rain fall of the season on river flows and is intended to capture the impacts on water quality of both surface run-off and the rewetting of the streambed. Figure 1 is a hydrograph produced from data from the USGS Big Trees gauge that documents the transition of the river from a very low base flow during the late summer and early fall to a more typical rainy season flow pattern.

**Figure 1 – USGS San Lorenzo Big Trees Gauge Results September 1, 2015 to June 7, 2016**



Of the 20 CECs identified during the first year of sampling, 9 were only found in the first flush sample. The results table included as Attachment 1 shows these compounds and their sampling results in **Green type**. Included in this group are over-the-counter pain relievers, caffeine, two preservatives used in personal care products, one herbicide, one of the two medical imaging chemicals identified (the kind used in some x-ray testing), bisphenol A, and a prescription cholesterol drug.

The remaining compounds identified are shown in Attachment 1 in **Black type**, include DEET (a well-known insect repellent), a compound used in shampoos and soaps, two herbicides, an organic chemical used in the manufacture of dyes, some pharmaceuticals and vitamin B3, a second medical imaging chemical, pharmaceuticals to treat heart conditions and respiratory conditions such as asthma, and an antibiotic used to treat bacterial infections. These CECs were typically found more intermittently in the samples collected and also were found at lower levels than the artificial sweeteners.

Samples collected during drier months contained far fewer CECs than those collected during wetter periods. This result makes sense because the source of CECs entering the San Lorenzo supply is either surface water run-off or septic system effluent reaching the river through saturated underground water flow - both of which are less prevalent during the dry season than they are during wet periods.

## Water Treatment

Drinking water quality is highly regulated by state and federal agencies and over time new regulations have been issued to address a broad range of water quality issues. Similarly, drinking water treatment technology has also evolved over time, but because a water treatment plant is typically a water utility's most expensive and least adaptable fixed asset, many utilities are using treatment processes and facilities designed to meet water quality conditions that were identified and well understood at the time the plant was designed and constructed.

The cost and complexity of water treatment facilities and processes often results in a kind of leap-frog effect, where new treatment processes or facilities are implemented in response to current knowledge, with somewhat murky assumptions about likely treatment needs for the next 20 years. Over those 20 years, new information about water quality issues emerges, and existing treatment facilities may or may not effectively address them. If existing treatment does not effectively address the issue, addressing the issue becomes an input to the next water treatment investment cycle. Drinking water treatment in Santa Cruz is among the key infrastructure issues to be addressed in the coming decade, which makes testing for CECs now particularly relevant.

- **Treated Water CEC Results**

Treated water samples were collected as grab samples essentially at the same time as treatment plant influent water samples were collected. If the goal is to analyze the impact of water treatment on the CECs identified (if any) in the untreated water inflow to the Graham Hill Water Treatment plant, grab samples of treatment plant inflow and outflow collected at the same time won't effectively support that analysis because it doesn't take into account the approximately 8 hours of travel time between water reaching the plant and that same water emerging from treatment, ready to be delivered to customers.

As a refinement to the future sampling methodology for treated water, the treated water sample will be collected at a time that will allow for more refined analysis of the degree to which current treatment is effective in addressing CECs.

Even with this sampling limitation in mind, when compared to untreated water samples, treated water samples indicated that the current treatment process has at least some potential to eliminate or reduce the level of some CECs. In particular, the existing water treatment

process shows a reduction or, in some cases, an elimination of artificial sweeteners, DEET, and herbicides.

The results also indicate that some CECs may be less affected by current treatment. These include Atenolol (a pharmaceutical to treat heart conditions) and Iohexal (one of the two medical imaging contrasting agents found). Future testing using the revised sampling protocol will shed further light on the degree to which these or other CECs persist through the current treatment process.

With respect to the first flush sample results, only untreated water samples were evaluated for this condition. The Department typically avoids taking water from the San Lorenzo flowing sources (Felton Diversion and Tait Wells) during first flush events because of concerns about the quality of source water during the first flush and the ability of the current treatment processes to treat this water to required standards. The analytical results of this initial study, while focused only on CECs and not on the full suite of regulated constituents in drinking water, certainly support that there are reasons to be mindful about the quality of water during and immediately after first flush events.

## **Discussion of Results**

What does the presence of CECs in our community's source water and, in some cases, in our treated drinking water mean? The potential health and environmental effects for some of the CECs identified are not known, but many of those identified so far are food products or medicines which typically receive extensive testing prior to being approved for human consumption.

As an example to provide context, caffeine is a well-known stimulant that has been used by humans and evaluated for positive and negative impacts on human health in a variety of studies over the last several hundred years. The one water sample collected which tested positive for caffeine showed a value of 270 nanograms per liter (1 liter equals approximately 34 ounces). The Center for Science in the Public Interest's Caffeine Chart (see: <https://cspinet.org/caffeine-chart>) would place caffeine consumption from 32 ounces of Starbucks Coffee at 660 milligrams. A milligram per liter is one part per million, while a nanogram per liter is one part per trillion. So 660 milligrams is about 2.4 million times as much caffeine as the amount that was identified in the one first flush sample that tested positive for this constituent.

Definitive data on the human or environmental health of CECs is not available at this time, but the very fact that water utilities, including the Santa Cruz Water Department, are looking for and incorporating results of testing for these compounds into its planning demonstrates a strong commitment to providing a high quality source of drinking water to their customers. Resources available from the federal Environmental Protection Agency and the California Water Resources Control Board offer some insights about the needs for data collection on occurrence and work that needs to be done to further understand both the potential for impacts to aquatic ecosystems and human health from exposure through treated drinking water. And in California, the potential for highly purified reclaimed wastewater to become a greater part of California's water supply makes the presence and treatment of CECs in wastewater streams a clear focus of research and potential rule-making.

Another resource is the Minnesota Department of Health (MDH), which appears to have in place a robust program focused on CECs.<sup>3</sup> In 2014, MDH published an informative poster describing the work they were doing on exposure assessments for CECs, including a discussion of the relative source contribution from water for a selected group of CECs. This poster is available for review.<sup>4</sup> Another example of the resources available from the MDH is its Information Sheets on various CECs.<sup>5</sup> The Information Sheets on bisphenol A<sup>6</sup> provides some information relevant to the one positive sample, at 14 parts per trillion, for Bisphenol A found in the first flush sample of water collected at Felton Diversion on November 11, 2015.

In response to the question of, "what is the MDH guidance value for BPA in drinking water," the MDH Information Sheets states,

"based on the best available data, MDH developed a guidance value of 20 ppb. A person drinking water at or below these levels would have little or no risk of any health effects from BPA."

Twenty ppb is roughly 1,000 times the level of bisphenol A found in the one San Lorenzo River sample where this compound was found.<sup>7</sup>

<sup>3</sup> See: <http://www.health.state.mn.us/divs/eh/risk/guidance/dwec/index.html>.

<sup>4</sup> See: <http://www.health.state.mn.us/divs/eh/risk/guidance/dwec/cecpostrsra.pdf>.

<sup>5</sup> See: <http://www.health.state.mn.us/divs/eh/risk/guidance/dwec/chemunderrev.html#info>.

<sup>6</sup> See <http://www.health.state.mn.us/divs/eh/risk/guidance/dwec/acetamininfo.pdf>

<sup>7</sup> See also the MDPH Information Sheet on DEET at <http://www.health.state.mn.us/divs/eh/risk/guidance/gw/deetinfo.pdf>



## **Next Steps**

The Santa Cruz Water Department will continue to sample its water sources and work with regulatory agencies and the water industry to get a better understanding of the real and potential significance of CECs on human health. The sampling program will evolve as more is learned about how hydrologic conditions and watershed activities may influence the presence of low levels of CECs in the City's sources of drinking water. Data from the planned analyses will be made available on at least an annual basis and will be added to the information provided in this initial report.

ATTACHMENT 1

CITY OF SANTA CRUZ WATER DEPARTMENT

2015 - 2016 Constituents of Emerging Concerns Sampling Results

All Results in nanograms per Liter (1 part per trillion = 0.000000001 gram per Liter)  
Results reflect only detected compounds -- analysis included testing for 96 Constituents of Emerging Concern

Sampling Dates		9/01/15: 1st quarter						11/02/15 First Flush		12/15/15: 2nd quarter						3/01/16: 3rd quarter					4/07/16: High steady flow					6/07/16: 4th quarter					
Sampling Locations (Note: Not all sampling locations were included in every sample collection)		GHWTP (treated water)	SLR @Felton	SLR @Tait	North Coast Composite	Loch Lomond	SLR @Felton	SLR @Tait	GHWTP (treated water)	SLR @Felton	SLR @Tait	North Coast Composite	Loch Lomond	GHWTP (treated water)	SLR @Felton	SLR @Tait	North Coast Composite	Loch Lomond	GHWTP (treated water)	SLR @Felton	SLR @Tait	North Coast Composite	Loch Lomond	GHWTP (treated water)	SLR @Felton	SLR @Tait	North Coast Composite	Loch Lomond	Raw Blend (treatment plant influent)		
Chemical Type or Use with Common Name if Applicable		Detected Analytes																													
Herbicide							28																								
Artificial sweetener (Sunett and Sweet One)		55	170	130			150	140		98	99			57	100	94				21	54		24		61	95	89		68		
Beta blocker drug used to treat heart conditions							34	44	16		10			8.3	5.7	9.9		5.1													
Herbicide										6.2																					
Antibiotic															68																
Fibrate drug used to treat high cholesterol								15																							
Industrial chemical found in polycarbonate plastics and epoxy resins							14																								
Stimulant (coffee, tea, some energy drinks)							270																								
Herbicide								11		96	24	7.5	17			7.7															
Foaming agent and thickener used in cosmetics, shampoo and soaps																															
Insect repellent			30				32	13		12															20	27	33		44		
Non steroidal anti-inflammation drug (NSADI) (Advil, Motrin)							63																								
Contrast media used for x-ray imaging								34	13	27			15																		
Contrast media. IV use for CT scans							120																								
Paraben family of preservatives in personal care products (body lotion and deodorant)							13																								
Paraben family of preservatives in personal care products (body lotion and deodorant)							470																								
Non steroidal anti-inflammation drug (NSADI) (Aleve, Naprosyn)							29																								
An organic chemical used in the manufacture of a variety of other products such as dyes, some pharmaceuticals, and niacin (vitamin B3)																				12											
Artificial sweetener (Splenda)			110					230						150	300	280				150	160							190			
Methylxanthine drug used to treat lung problems such as asthma, emphysema and chronic bronchitis.										41																					

GREEN

Detected only in 1st flush event

BLUE

Frequently detected in moderate parts per trillion amounts (50-300 ng/L)

BLACK

Infrequently detected in low parts per trillion amounts (<100 ng/L)

Cells with no data = Non Detect (ND) or below Method Reporting Level (MRL)

-- eurofins  
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AT-1807

## Laboratory Report

for

City of Santa Cruz  
 Water Quality Laboratory  
 715 Graham Hill Road  
 Santa Cruz, CA 95060  
 Attention: Hugh Dalton  
 Fax: 831-420-5481

Date of Issue

11/31/2018  
 EUROFINS EATON  
 ANALYTICAL

YOM: Yolanda.O.Martin  
 Project Manager



ORELAP 4034

Report: 560847  
 Project: PPCP  
 Group: Personal Care Products  
 &CEC

- Accredited in accordance with TNI 2009 and ISO/IEC 17025:2005.
- Laboratory certifies that the test results meet all TNI 2009 and ISO/IEC 17025:2005 requirements unless noted under the individual analysis.
- Following the cover page are State Certification List ISO 17025 Accredited Method List, Acknowledgement of Samples Received, Comments, History Report, Data Report, QC Summary, QC Report and Regulatory Forms as applicable.
- Test results relate only to the sample(s) tested.
- This report shall not be reproduced except in full, without the written approval of the laboratory.



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Laboratory Data  
Report: 660847

City of Santa Cruz  
Water Quality Laboratory  
Hugh Dalton  
715 Graham Hill Road  
Santa Cruz, CA 95060

Samples Received on:  
11/04/2015 08:02

**MRL** is Method Recovery Limit

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MRL	Dilution
208-Felton Diversion (201511040048)							Sampled on 11/02/2015 1511	
LC-MS-MS • Endocrine Disruptors Positive Mode - SPE								
1210212015	22:00	876608	(LC-MS-MS)	1,7-Dimethylxanthine	NO	ng/l	10	
1210212015	22:00	876608	(LC-MS-MS)	Acetaminophen	NO	ng ■	5	
1210212015	22:00	876608	(LC-MS-MS)	Albuterol	NO	ng/L	5	
1210212015	22:00	876608	(LC-MS-MS)	Amoxicillin (semi-quantitative)	NO	ng ■	20	
1210212015	22:00	876608	(LC-MS-MS)	Androstenedione	NO	ng/L	5	
1210212015	22:00	876608	(LC-MS-MS)	Atenolol	34	ng/L	5	
1210212015	22:00	876608	(LC-MS-MS)	Atrazine	NO	ng/L	5	
1210212015	22:00	876608	(LC-MS-MS)	Azithromycin	NO (R7)	ng/L	20	
1210212015	22:00	876608	(LC-MS-MS)	Bezafibrate	NO	ng/L	5	
1210212015	22:00	876608	(LC-MS-MS)	Bromacil	NO	ng ■	5	
1210212015	22:00	876608	(LC-MS-MS)	Caffeine	270	ng/L	5	
1210212015	22:00	876608	(LC-MS-MS)	Carbadox	NO	ng/l	5	
1210212015	22:00	876608	(LC-MS-MS)	Carbamazepine	NO	ng/l	5	
1210212015	22:00	876608	(LC-MS-MS)	Carisoprodol	NO	ng/L	5	
1210212015	22:00	876608	(LC-MS-MS)	Chloridazon	NO	ng ■	5	
1210212015	22:00	876608	(LC-MS-MS)	Chlorotoluron	NO	ng ■	5	
1210212015	22:00	876608	(LC-MS-MS)	Cimetidine	NO (R7)	ng ■	5	
1210212015	22:00	876608	(LC-MS-MS)	Cotinine	NO	ng/l	10	
1210212015	22:00	876608	(LC-MS-MS)	Cyanazine	NO	ng/L	5	
1210212015	22:00	876608	(LC-MS-MS)	OACT	NO	ng/L	5	
1210212015	22:00	876608	(LC-MS-MS)	OEA OEET	NO	ng ■	5	
1210212015	22:00	876608	(LC-MS-MS)	Oxyhydroxydiphenyl	32	ng/l	10	
1210212015	22:00	876608	(LC-MS-MS)	DIA	NO	ng ■	5	
1210212015	22:00	876608	(LC-MS-MS)	Diazepam	NO	ng ■	5	
1210212015	22:00	876608	(LC-MS-MS)	Oilantin	NO	ng ■	5	
1210212015	22:00	876608	(LC-MS-MS)	Oiltiazem	NO (R7)	ng ■	20	
1210212015	22:00	876608	(LC-MS-MS)		NO	ng ■	5	
12/02/2015	22:00	876608	(LC-MS-MS)	Oluron	NO	ng/l	5	
1210212015	22:00	876608	(LC-MS-MS)	Erythromycin	NO	ng/L	10	
1210212015	22:00	876608	(LC-MS-MS)	Flumequine	NO (R7)	ng/L	10	
1210212015	22:00	876608	(LC-MS-MS)	Fluoxetine	NO	ng/l	10	
1210212015	22:00	876608	(LC-MS-MS)	Isoproturon	NO	ng/L	100	
1210212015	22:00	876608	(LC-MS-MS)	Ketoprofen	NO	ng/L	5	

Rounding on totals after 1 ummauon.  
(c) - Indicate calculated ruuh



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Laboratory Data  
Report: 560847

City of Santa Cruz  
Water Quality Laboratory  
Hugh Dalton  
715 Graham Hill Road  
Santa Cruz, CA 95060

Samples Received on:  
11/04/2015 08:02

Prepared	Analyzed	QC Ref#	Method	Analyte	Result	Units	MRL	Dilution
	12/02/2015	22:00 876608	(LC-MS-MS)	Ketorolac	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Lidocaine	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Lincomycin	NO (R7)	ng/L	10	
	12/02/2015	22:00 876608	(LC-MS-MS)	Linuron	NO (R7)	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Lopressor	NO	ng/L	20	
	12/02/2015	22:00 876608	(LC-MS-MS)	Meclofenamic Acid	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Meprobamate	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Metazachlor	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Nifedipine	NO (R7)	ng/L	20	
	12/02/2015	22:00 876608	(LC-MS-MS)	Norethisterone	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	OUST (Sulfameturon, methyl)	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Oxolinic acid	NO	ng/L	10	
	12/02/2015	22:00 876608	(LC-MS-MS)	Pentoxifylline	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Phenazone	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Primidone	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Progesterone	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Propazine	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Quinoline	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Simazine	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Sulfachloropyridazine	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Sulfadiazine	NO (R7)	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Sulfadimethoxine	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Sulfamerazine	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Sulfamethazine	NO (R7)	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Sulfamethizole	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Sulfamethoxazole	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Sulfathiazole	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	TCEP	NO	ng/L	10	
	12/02/2015	22:00 876608	(LC-MS-MS)	TCPP	NO	ng/L	100	
	12/02/2015	22:00 876608	(LC-MS-MS)	TOCPP	NO	ng/L	100	
	12/02/2015	22:00 876608	(LC-MS-MS)	Testosterone	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Theobromine	NO	ng/L	10	
	12/02/2015	22:00 876608	(LC-MS-MS)	Theophylline	NO (R7)	ng/L	20	
	12/02/2015	22:00 876608	(LC-MS-MS)	Thiabendazole	NO	ng/L	5	
	12/02/2015	22:00 876608	(LC-MS-MS)	Trimethoprim	NO	ng/L	5	

LC-MS-MS - Endocrine Disruptors Negative Mode • SPE

Rounding on totals after summation  
(c) Indicates calculated results



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Samples Received on:  
11/04/2015 08:02

Prepared	Analyzed	QC Ref#	Method	Analyte	Result	Units	MRL	Dilution
	12103/2015	1:26 876974	(LC-MS-MS)	2,4-D	28	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	4-nonylphenol- semi quantitative	NO (LS,LEJ)	ng/L	100	
	12103/2015	1:26 876974	(LC-MS-MS)	4-tert-Octylphenol	NO (LS,JE)	ng/L	50	
	12103/2015	1:26 876974	(LC-MS-MS)	Acesulfame-K	150	ng/L	20	
	12103/2015	1:26 876974	(LC-MS-MS)	Bendroflumethiazide	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	BPA	14	ng/L	10	
	12103/2015	1:26 876974	(LC-MS-MS)	Butalbital	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Butylparaben	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Chloramphenicol	NO	ng/L	10	
	12103/2015	1:26 876974	(LC-MS-MS)	Clofibric Acid	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Diclofenac	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Estradiol	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Estriol	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Estrone	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	EthinylEstradiol- 17 alpha	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Ethylparaben	NO	ng/L	20	
	12103/2015	1:26 876974	(LC-MS-MS)	Gemfibrozil	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Ibuprofen	63	ng/L	10	
	12103/2015	1:26 876974	(LC-MS-MS)	Iohexal	NO	ng/L	10	
	12103/2015	1:26 876974	(LC-MS-MS)	Iopromide	120	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Isobutylparaben	13	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Methylparaben	470	ng/L	20	
	12103/2015	1:26 876974	(LC-MS-MS)	Naproxen	29	ng/L	10	
	12103/2015	1:26 876974	(LC-MS-MS)	Propylparaben	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Sucralose	NO	ng/L	100	
	12103/2015	1:26 876974	(LC-MS-MS)	Tridocarbam	NO	ng/L	5	
	12103/2015	1:26 876974	(LC-MS-MS)	Triclosan	NO (LS,R2)	ng/L	10	
	12103/2015	1:26 876974	(LC-MS-MS)	Warfarin	NO	ng/L	5	

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**Kennedy/Jenks Consultants**



## MEMO

TO: Board of Directors

FROM: District Manager

SUBJECT: Board Member Participation, First Annual Groundwater Sustainability Agency Summit

DATE: April 19, 2018

### RECOMMENDATION:

It is recommended that the Board of Directors review this memo and by motion of the Board, authorize Directors Charles Baughman and Gene Ratcliffe to attend the First Annual Groundwater Sustainability Agency Summit.

### BACKGROUND:

In September 2014 Gov. Jerry Brown signed into law the Sustainable Groundwater Management Act. Its purpose is to ensure better local and regional management of groundwater use and it seeks to have a sustainable groundwater management in California by 2042.

Groundwater Basins were identified and required to form Joint Powers Agencies (JPAs) by the Department of Water Resources (DWR). San Lorenzo Valley Water District became part of the Santa Margarita Groundwater Agency (SMGWA). Representing SLVWD on the SMGWA Board are Dir. Baughman and Dir. Ratcliffe.

The Groundwater Sustainability Agency (GSA) is required to develop and implement a groundwater sustainability plan (GSP) to consider the interests of all of its stakeholders.

The GSA is holding its first annual summit in Sacramento June 5 - 7, 2018. Event attendance is designed to help JPAs keep up with evolving industry priorities, technologies and emerging strategies for the challenges facing our organization.

The summit will be held June 6th and 7th with an optional GSP Workshop on June 5th. The cost of the event is \$430 with an additional \$120 for the June 5<sup>th</sup> workshop.

The District's Board of Directors policy manual states the following:

Section 1.16 Training, Education Programs, Conferences and Meetings

The Board of Directors has determined that the following provisions shall be applicable to Director training, educational programs, conferences and meetings:

Directors are encouraged to attend educational conferences and professional meetings when the purposes of such activities are to improve District operation. Directors may attend, on behalf of the District, such training, educational programs, conferences and meetings as have been approved by the Board of Directors.

- (a) It is the policy of the District to encourage Board development and excellence of performance by reimbursing necessary and reasonable expenses incurred for tuition, travel, lodging and meals as a result of training, educational courses, participation with professional organizations, and attendance at local, state and national conferences associated with the interests of the District. Cash advances or use of District credit cards for these purposes is not permitted. All reimbursement of actual and necessary expenses shall be pursuant to District policy on expenditure reimbursement as stated herein.
- (b) Attendance by Directors at seminars, workshops, courses, professional organization meetings, and conferences etc. shall be approved by the Board of Directors at a public meeting prior to incurring any authorized reimbursable costs.
- (c) The District Manager or designee is responsible for making arrangements for Directors for conference and registration expenses, and for per diem. Per Diem, when appropriate, shall include reimbursement of expenses for meals, lodging, and travel. All expenses for which reimbursement is requested by Directors, or which are billed to the District by Directors, shall be submitted to the District Manager, together with validated receipts.
- (d) To conserve District resources and keep Directors' reimbursement expenses for training, educational programs, conferences and meetings within community standards for public officials, reimbursement expenditures should adhere to the following guidelines. Expenses to the District for Board of Directors' training, education programs, conferences and meetings should be kept to a minimum by:
  - 1. Utilizing hotel(s) recommended by the event sponsor in order to obtain discounted rates.
  - 2. Traveling together whenever feasible and economically beneficial.
  - 3. Requesting reservations sufficiently in advance, when possible, to obtain discounted air fares and hotel rates.
- (e) A Director shall not attend a conference or training event for which there is an expense to the District if it occurs after the Director has announced a pending resignation, or if it occurs after an election in which it has been determined that a Director will not retain a seat on the Board. A Director shall not attend a conference or training event when it is apparent that there is no significant benefit to the District.

- (f) Whenever a Director who has not previously attended a particular conference or educational program is available to attend same, that Director shall have preference for attendance over a Director who has previously attended the same program.
- (g) Upon returning from seminars, workshops, conferences, etc., where expenses are reimbursed by the District, Directors will either prepare a written report for distribution to the Board, or make a verbal report during the next regular meeting of the Board. The report shall detail what was learned at the session(s) that will be of benefit to the District. Materials from the session(s) may be delivered to the District office to be included in the District library for the future use of other Directors and staff.
- (h) Nothing in this policy shall permit the conduct of business in violation of the Ralph M. Brown Act when more than three (3) Directors attend the same event.

SUMMARY:

It is recommend that the Board of Directors review this memo and by motion of the Board, authorize Members of the Board to participate/attend in the First Annual Groundwater Sustainability Agency Summit.

STRATEGIC PLAN:

9.2 Fiscal Plan for support of Board Developement

FISCAL IMPACT:

TBD



(<https://www.facebook.com/pages/Groundwater-Resources-Association-of-California/294327849613>)



(<https://www.linkedin.com/in/groundwater-resources-association-3530b320>)



(<https://twitter.com/GRAofCalifornia>)



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# FIRST ANNUAL GROUNDWATER SUSTAINABILITY AGENCY SUMMIT

Event Details

Event Files



GRA is planning the First Annual GSA Summit for June 6-7, 2018 in Sacramento, with a slightly different GRA format to serve as a forum for GSA members to network and connect on technical and policy issues to address SGMA compliance. Summit sessions will have 1–2 topic-focused presentations followed by 4–5 brief “flash” presentations by GSAs to provide information on their approach to addressing each specific topic. Sessions planned for the GSA Annual Summit include:

- Governance – including a keynote presentation by Bill Blomquist, Professor of Political Science and Adjunct Professor of Public and Environmental Affairs, Indiana University–Purdue University Indianapolis, and author of “Dividing the Waters”
- Adaptive Management – Operating Under Unknowns
- Stakeholder Engagement Under SGMA
- Coordination – Negotiating Agreements
- Sustainability Criteria – Technical and Policy Decisions
- County and City Roles in SGMA
- Water Markets in SGMA – including a keynote by Ellen Hanak, Director of the Public Policy Institute Water Policy Center, and Senior Fellow with PPIC

### **JUST ADDED!**

#### Optional Pre-conference workshop:

GRA is working with the California Department of Water Resources and the Center for Collaborative Policy planning a Groundwater Sustainability Planning Workshop for June 5, 2018 in Sacramento. The morning will consist of presentations by DWR and other groundwater professionals, and is being structured to cover the following main topics:

- Overall Groundwater Sustainability Plan Development Workflow
- Conceptual Hydrogeological Modeling / Basin Setting
- Water Budgets
- Sustainable Management Criteria (SG, UR, MT, and MO)
- Monitoring Networks
- Addressing GW-SW Interaction (or other Sustainability Indicators?)
- Coordination/Outreach/Community Engagement

The afternoon session is being facilitated and will be structured for GSA members to jointly discuss and work through initial considerations for developing sustainability criteria for the six undesirable results (deadly sins) of SGMA.

### **Sponsor and Exhibitor Opportunities:**

Is your organization interested in sponsoring or exhibiting? Click here (<https://www.grac.org/events/183/7cd9186>) for more information on available opportunities.

For more information contact Sarah Erck (<mailto:serck@grac.org>) or Tim Parker. (<mailto:tim@pg-tim.com>)

## **EVENT JUSTIFICATION TOOLKIT**

By now you know the value of GRA event attendance for keeping up with evolving industry priorities, state-of-the-practice technologies, and emerging strategies for the challenges facing the groundwater world. In addition, GRA events offer fantastic opportunities for networking, learning from vendors exhibiting the latest tools and technologies, and exposure for your organization.

But how do you convey the value of GRA event attendance to your supervisor? Check out GRA's Event Justification Toolkit (<https://www.grac.org/files/934/download/>) for tips.

## **OPTIONAL WORKSHOP**

The moment is upon us. After years of governance and grant writing, basin boundaries and BMPs, conferences and countless public meetings, there's just one thing left to do.... write a GSP... and then there's becoming sustainable in 20 years ... but plan first!

But how?

Add the June 5, 2018 Workshop Turning Theory, Fear and Loathing into Sustainable Success (<https://www.grac.org/groundwater-sustainability-plan-preparation-workshop/>) on to your conference registration to find out!

## OPTIONAL JUNE 5 GSP WORKSHOP

**Price** \$189.00

**Options** Early-Bird Member Rate

## OPTIONAL JUNE 5 GSP WORKSHOP

**Price** \$270.00

**Options** Early-Bird Non-Member Rate

## OPTIONAL JUNE 5 GSP WORKSHOP

**Price** \$150.00

**Options** Early-Bird Student Member Rate

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### WHEN?

Wed, Jun. 6 - Thu, Jun. 7, 2018  
8:00 a.m. - 5:00 p.m.

 [Add to Calendar \(/events/ics/140\)](/events/ics/140)

### HOW MUCH?

Early-Bird Member Registration - **\$430.00**  
(ends 05/09/2018)

Early-Bird Non-Member Registration - **\$565.00**  
(ends 05/09/2018)

Early-Bird Student Member Registration - **\$120.00**  
(ends 05/09/2018)

[Register](#)

---

[Become a member \(/memberships/referer-url/?next=/memberships/applications/\)](/memberships/referer-url/?next=/memberships/applications/)

### WHERE?

**Hilton Sacramento Arden West**

2200 Harvard Street  
Sacramento, CA 95815

The Hilton Sacramento Arden West hotel would like to welcome you to beautiful, historic Sacramento, California. Located near the McClellan Airfield and just a short drive off Business 80, our hotel has the best of Sacramento within reach. Situated down the street from Arden Fair Mall and the Cal Expo, ...

[Full Description](#)



View Larger Map (<https://maps.google.com/maps?q=2200%20Harvard%20Street+Sacramento,CA+95815&ie=UTF8&hl=en&view=map&hq=&hnear=2200%20Harvard%20Street+Sacramento,CA+95815&z=14&source=embed>)

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subject=&body=Good day! Check out our event: <http://www.grac.org/events/140/>)



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NOSSAMAN LLP

## Memorandum

**TO:** Board of Directors,  
San Lorenzo Valley Water District

**FROM:** Gina R. Nicholls, District Counsel

**DATE:** April 13, 2018

**RE:** Agenda Item 9.d  
Letter from B. Holloway Regarding Alleged Brown Act Violations  
502665-0001

---

### **RECOMMENDATION**

Review the attached letter from Mr. Holloway and the controlling section of the Brown Act (Government Code section 54960.2), and approve the attached resolution authorizing a letter response to Mr. Holloway in the form provided by the Brown Act.

### **BACKGROUND**

Mr. Holloway's letter alleges that the following past actions of the District's Board violate the Brown Act:

- (1) "[R]efus[al] to allow public comment" regarding item 10 (including 10.a.2 and 10.b) on the agenda for the May 25, 2017 meeting of the Board; and
- (2) Board "discuss[ion] [of] an item of anticipated litigation—namely that Terry Vierra might sue the District—in closed session repeatedly without it being properly agendized."

The letter does not allege a Brown Act violation insofar as any discussion of the possibility that former Director Terry Vierra might sue the District would have been appropriate under closed session agenda items regarding Mr. Holloway's lawsuit against Mr. Vierra, the District, and others ("the *Holloway* lawsuit"), which has been pending for several years. The threat of a possible lawsuit by Mr. Vierra arose in the context of the *Holloway* lawsuit, and directly from that lawsuit, in connection with the Board's announcement of its decision in 2017 "to stop all financial commitment to the Political Reform Act" portion of the *Holloway* lawsuit. Mr. Vierra could have pursued his claims against the District in the context of the *Holloway* lawsuit, for example by seeking leave of court to file a cross-complaint, and accordingly any discussion of such a threat under an agenda item for the *Holloway* lawsuit would have been appropriate.

In September 2017, Mr. Vierra formalized a threat to sue the District by submitting a government claim to the District. The claim was appropriately placed on the next closed

Memorandum  
April 13, 2018  
Page 2

session agenda as a standalone item, separate and apart from the *Holloway* lawsuit. In April 2017, Mr. Vierra filed his lawsuit against the District, and that lawsuit has been appropriately placed on the closed session agenda as a standalone item. Discussion of Mr. Vierra's lawsuit will continue to be placed on the closed session agenda as a standalone item for as long as the case is ongoing.

The allegation that the Board refused to allow public comment regarding item 10 on the agenda for its May 25, 2017 meeting refers to an attempt made by the District and the Board to exercise its "great discretion" to "act[] fairly with respect to the interest of the public and competing factions, . . . in regulating the time and manner . . . of testimony by interested members of the public." (*California Attorney General's Office, The Brown Act: Open Meetings for Local Legislative Bodies* (2003), p. 19, citing Gov't Code, § 54954.3, subd. (b).) Upon introducing item 10 on the agenda (District Manager Reports), the Board Chair suggested, but did not require, "in the interest of time" that members of the Board and the public limit their comments unless there is "something urgent" or "specific questions." Several minutes later, Mr. Holloway was not allowed to comment on subsidiary item 10.b (Committee Reports) and the bill list, although he did provide public comments at other times during the meeting.

Since Nossaman was retained by the District as the new District Counsel starting in July 2017, the Board has never refused (nor attempted to refuse so far as I am aware), to allow public comment on any agenda item. I am confident that the Board is fully aware of its obligation under Government Code section 54954.3, subdivision (a), to "provide an opportunity for members of the public to directly address the legislative body on any item of interest to the public, before or during the legislative body's consideration of the item."

The Brown Act allows the Board to respond to Mr. Holloway's letter, solely for the purpose of avoiding unnecessary litigation, with an unconditional commitment that it will cease, desist from, and not repeat the challenged past actions. Pursuant to the Brown Act this commitment shall not constitute evidence that any violation has occurred.

The safest course for the Board is to provide an unconditional commitment pursuant to the Code. Since there is no likelihood that any of the alleged past actions would recur in the future, providing the required commitment will not have any effect on the District's ability to conduct future business. Furthermore, doing so is consistent with the District's ongoing intent to maintain the highest standards of transparent government.

FISCAL IMACT:  
NONE

STRATEGIC PLAN:  
N/A

Memorandum  
April 13, 2018  
Page 3

ATTACHMENTS:

1. Letter from B. Holloway
2. Government Code section 54960.2
3. Resolution No. \_\_ (17-18) and Exhibit A, Form of Response Letter

Exhibit 1

Letter from B. Holloway

891 Elsie Mae Dr.  
Boulder Creek, CA 95006

February 24, 2018

Mr. Brian C. Lee  
District Manager  
San Lorenzo Valley Water District  
13060 Central Ave.  
Boulder Creek, CA 95006

Dear Mr. Lee:

At the May 25 meeting of the Board of Directors, the bill list was included within the Finance department status report, which was item 10.a.2 on the agenda. In violation of the Brown Act, you and then-President Gene Ratcliffe refused to allow public comment on that item. Attorneys with three different local government law firms were present and a video recording is on the Community TV website.

Oral Communications on non-agendized items was item 8, but the board voted to move that to the end of the meeting. At about 8:00 minutes into the meeting, Director Hammer asked you to highlight certain items in the District Manager's report, which was item 10. At about 10:00 you referred to the Finance report. At about 11:00 you referred to the Operations report. At about 12:00 you thanked the board for getting your joke and laughing. At about 12:30 you said, "I'll shut up."

At 12:45, then-President Ratcliffe began to move on to committee reports, which was item 10.b, and I attempted to comment on the bill list. You accused me of a "disruption" that was "not appropriate." A discussion ensued involving you, former district counsel Hynes and Directors Bruce, Baughman, and Director Hammer regarding whether the public should be allowed to comment on an agendized item that isn't an action item or whether there ought to be a "new", "streamlined" process. At 16:00, then-President Ratcliffe went ahead with item 10.b. No public comment was invited or allowed on item 10 at all.

Subdivision 54954.3(a) of the Brown Act says, "Every agenda for regular meetings shall provide an opportunity for members of the public to directly address the legislative body on any item of interest to the public, before or during the legislative body's consideration of the item..." Your statement to the board to the contrary was flatly incorrect and the board's refusal to allow public

comment was violative of the Brown Act.

Next, the packet for the board meeting on January 30, 2018, refers to an August 4, 2017, newspaper story that said, "'The threat of Vierra suing the district has been brought up numerous times in closed meetings ever since I got on the board,' said [Director] Smallman." Evidently, the board of directors has discussed an item of anticipated litigation -- namely that Vierra might sue the District - - in closed session repeatedly without it being properly agendized.

Director Smallman took office in December, 2016, but didn't attend any closed sessions until 2017. The only item of Anticipation of Litigation between January and August, 2017, was item 4.b on April 20. Perhaps that was to discuss Vierra's threat, I don't know. If there are written records regarding that item of the sort described in subdivision 54956.9(e), I'd like to see them.

Subdivision 54956.9(g) says, "Prior to holding a closed session pursuant to this section, the legislative body of the local agency shall state on the agenda or publicly announce the paragraph of subdivision (d) that authorizes the closed session." There's no evidence that the board did that on April 20.

But the newspaper story referred to "numerous times", so even if the board was within its authority to hold a closed session on April 20 to discuss Vierra's threat, that wouldn't be true on other occasions. I expect that evidence will show that such closed-session discussions took place at board meetings after that date, and in particular within the past nine months.

Therefore, pursuant to section 54960.2, I request that SLVWD cease and desist from violating the Brown Act and resolve to comply in the future with subdivisions 54954.3(a) and 54956.9(g).

Sincerely,

Bruce Holloway

## **Exhibit 2**

### **Government Code Section 54960.2**

(a) The district attorney or any interested person may file an action to determine the applicability of this chapter to past actions of the legislative body pursuant to subdivision (a) of Section 54960 only if all of the following conditions are met:

(1) The district attorney or interested person alleging a violation of this chapter first submits a cease and desist letter by postal mail or facsimile transmission to the clerk or secretary of the legislative body being accused of the violation, as designated in the statement pertaining to that public agency on file pursuant to Section 53051, or if the agency does not have a statement on file designating a clerk or a secretary, to the chief executive officer of that agency, clearly describing the past action of the legislative body and nature of the alleged violation.

(2) The cease and desist letter required under paragraph (1) is submitted to the legislative body within nine months of the alleged violation.

(3) The time during which the legislative body may respond to the cease and desist letter pursuant to subdivision (b) has expired and the legislative body has not provided an unconditional commitment pursuant to subdivision (c).

(4) Within 60 days of receipt of the legislative body's response to the cease and desist letter, other than an unconditional commitment pursuant to subdivision (c), or within 60 days of the expiration of the time during which the legislative body may respond to the cease and desist letter pursuant to subdivision (b), whichever is earlier, the party submitting the cease and desist letter shall commence the action pursuant to subdivision (a) of Section 54960 or thereafter be barred from commencing the action.

(b) The legislative body may respond to a cease and desist letter submitted pursuant to subdivision (a) within 30 days of receiving the letter. This subdivision shall not be construed to prevent the legislative body from providing an unconditional commitment pursuant to subdivision (c) at any time after the 30-day period has expired, except that in that event the court shall award court costs and reasonable attorney fees to the plaintiff in an action brought pursuant to this section, in accordance with Section 54960.5.

(c) (1) If the legislative body elects to respond to the cease and desist letter with an unconditional commitment to cease, desist from, and not repeat the past action that is alleged to violate this chapter, that response shall be in substantially the following form:

To \_\_\_\_\_:

The [name of legislative body] has received your cease and desist letter dated [date] alleging that the following described past action of the legislative body violates the Ralph M. Brown Act:

[Describe alleged past action, as set forth in the cease and desist letter submitted pursuant to subdivision (a)]

**In order to avoid unnecessary litigation and without admitting any violation of the Ralph M. Brown Act**, the [name of legislative body] hereby unconditionally commits that it will cease, desist from, and not repeat the challenged past action as described above.

The [name of legislative body] may rescind this commitment only by a majority vote of its membership taken in open session at a regular meeting and noticed on its posted agenda as "Rescission of Brown Act Commitment." You will be provided with written notice, sent by any means or media you provide in response to this message, to whatever address or addresses you specify, of any intention to consider rescinding this commitment at least 30 days before any such regular meeting. In the event that this commitment is rescinded, you will have the right to commence legal action pursuant to subdivision (a) of Section 54960 of the Government Code. That notice will be delivered to you by the same means as this commitment, or may be mailed to an address that you have designated in writing.

Very truly yours,

---

[Chairperson or acting chairperson of the legislative body]

(2) An unconditional commitment pursuant to this subdivision shall be approved by the legislative body in open session at a regular or special meeting as a separate item of business, and not on its consent agenda.

(3) An action shall not be commenced to determine the applicability of this chapter to any past action of the legislative body for which the legislative body has provided an unconditional commitment pursuant to this subdivision. During any action seeking a judicial determination regarding the applicability of this chapter to any past action of the legislative body pursuant to subdivision (a), if the court determines that the legislative body has provided an unconditional commitment pursuant to this subdivision, the action shall be dismissed with prejudice. Nothing in this subdivision shall be construed to modify or limit the existing ability of the district attorney or any interested person to commence an



action to determine the applicability of this chapter to ongoing actions or threatened future actions of the legislative body.

(4) Except as provided in subdivision (d), **the fact that a legislative body provides an unconditional commitment shall not be construed or admissible as evidence of a violation of this chapter.**

(d) If the legislative body provides an unconditional commitment as set forth in subdivision (c), the legislative body shall not thereafter take or engage in the challenged action described in the cease and desist letter, except as provided in subdivision (e). Violation of this subdivision shall constitute an independent violation of this chapter, without regard to whether the challenged action would otherwise violate this chapter. An action alleging past violation or threatened future violation of this subdivision may be brought pursuant to subdivision (a) of Section 54960, without regard to the procedural requirements of this section.

(e) The legislative body may resolve to rescind an unconditional commitment made pursuant to subdivision (c) by a majority vote of its membership taken in open session at a regular meeting as a separate item of business not on its consent agenda, and noticed on its posted agenda as "Rescission of Brown Act Commitment," provided that not less than 30 days prior to such regular meeting, the legislative body provides written notice of its intent to consider the rescission to each person to whom the unconditional commitment was made, and to the district attorney. Upon rescission, the district attorney or any interested person may commence an action pursuant to subdivision (a) of Section 54960. An action under this subdivision may be brought pursuant to subdivision (a) of Section 54960, without regard to the procedural requirements of this section.

*(Added by Stats. 2012, Ch. 732, Sec. 2. (SB 1003) Effective January 1, 2013.)*

[Emphasis added.]

**SAN LORENZO VALLEY WATER DISTRICT  
RESOLUTION NO. 19 (17-18)  
RESPONSE TO BROWN ACT LETTER**

WHEREAS, the San Lorenzo Valley Water District (District) received a cease and desist letter from Mr. Bruce Holloway, dated February 24, 2018, alleging violations of the Ralph M. Brown Act ("Brown Act"); and

WHEREAS, the Board of Directors ("Board") of the District has reviewed the letter and been advised by District Counsel in open session regarding its contents; and

WHEREAS, the Brown Act allows the Board to respond to the letter, solely for the purpose of avoiding unnecessary litigation, with an unconditional commitment that it will cease, desist from, and not repeat the challenged past actions, and pursuant to the Brown Act this commitment shall not constitute evidence that any violation has occurred.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves and authorizes its President and Chairperson to issue a letter in the form of Exhibit "A" attached hereto; and

BE IT FURTHER RESOLVED that the District Manager and District Counsel are hereby authorized and directed to take all action necessary to implement this Resolution.

-----

PASSED AND ADOPTED by the Board of Directors of the San Lorenzo Valley Water District, County of Santa Cruz, State of California, on the 19th day of April, 2018 by the following vote of the members thereof:

AYES:

NOES:

ABSTAIN:

ABSENT:

---

Holly Morrison  
Secretary of the Board  
San Lorenzo Valley Water District

**Exhibit A**  
**Form of Response Letter**

VIA EMAIL AND U.S. MAIL

April \_\_, 2018

Bruce Holloway  
891 Elsie Mae Dr.  
Boulder Creek, CA 95006  
Email: [b3r1h@comcast.net](mailto:b3r1h@comcast.net)

Re: Letter to San Lorenzo Valley Water District, dated February 24, 2018

Mr. Holloway:

The Board of Directors ("Board") of the San Lorenzo Valley Water District ("District") has received your cease and desist letter dated February 24, 2018 alleging that the following described past actions of the Board violate the Ralph M. Brown Act ("Brown Act"):

- (1) Refusal to allow public comment regarding item 10 (including 10.a.2 and 10.b) on the agenda for the May 25, 2017 meeting of the Board; and
- (2) Board discussion of an item of anticipated litigation—namely that Terry Vierra might sue the District—in closed session repeatedly without it being properly agendized.

In order to avoid unnecessary litigation and without admitting any violation of the Brown Act, the Board hereby unconditionally commits that it will cease, desist from, and not repeat the challenged past actions as described above.

The Board may rescind this commitment only by a majority vote of its membership taken in open session at a regular meeting and noticed on its posted agenda as "Rescission of Brown Act Commitment." You will be provided with written notice, sent by any means or media you provide in response to this message, to whatever address or addresses you specify, of any intention to consider rescinding this commitment at least 30 days before any such regular meeting. In the event that this commitment is rescinded, you will have the right to commence legal action pursuant to subdivision (a) of Section 54960 of the Government Code. That notice will be delivered to you by the same means as this commitment, or may be mailed to an address that you have designated in writing.

Sincerely

Charles Baughman  
Chairperson of the Board of Directors

## **Idea Proposal for Eradication of French Broom on the Olympia Watershed Proposal**

Summary: This is an idea proposal to be submitted to the Environmental Committee of the San Lorenzo Valley Water District for consideration in regard to the removal of the invasive French Broom removal at the Olympia Watershed property. The criteria of this proposal is to strictly remove these plants by manual pulling with careful attention and protection of the larva of the June Beetle, an endangered species.

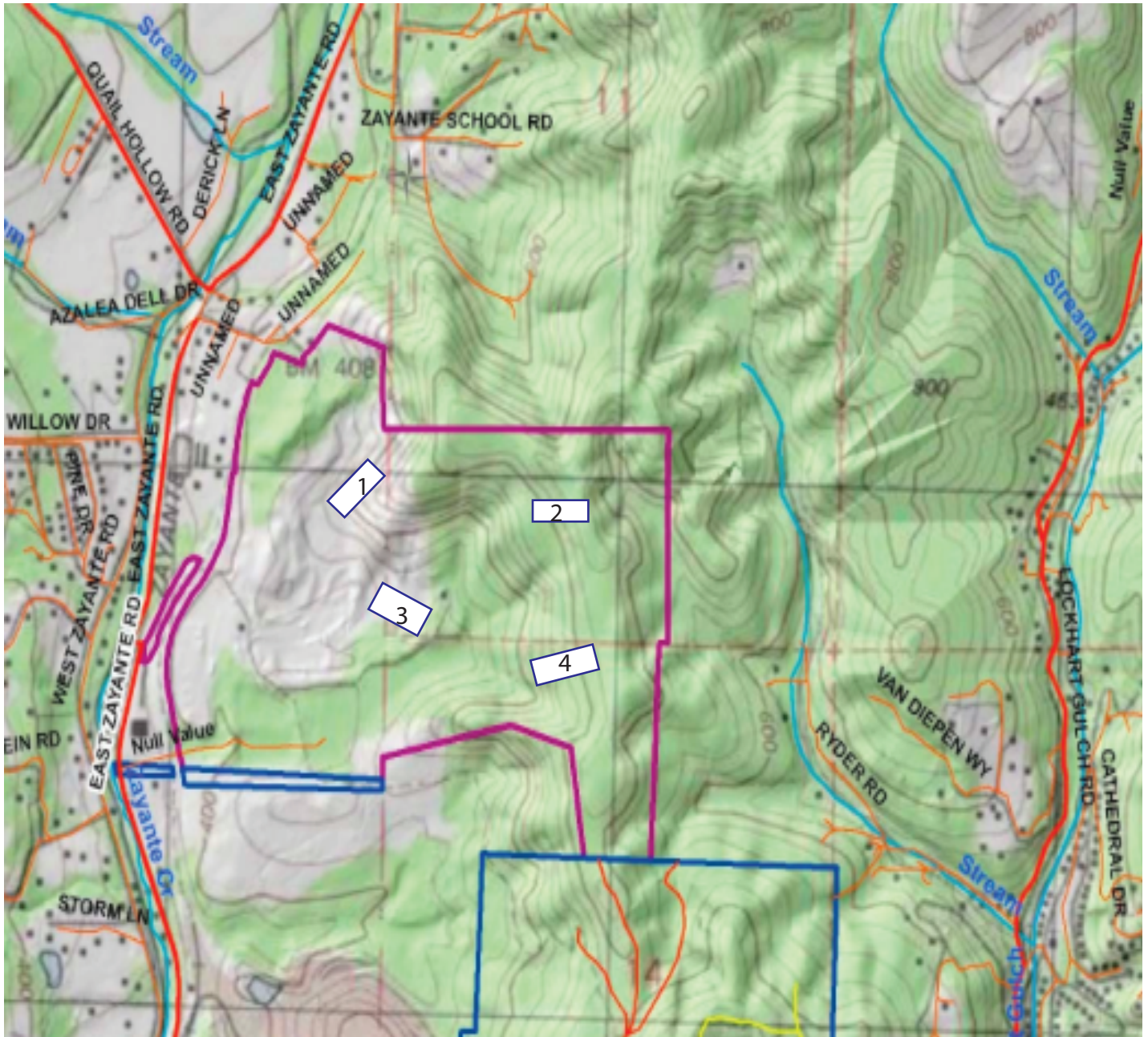
Basics: A qualified Entomologist shall direct and monitor this project. First he/she shall select test areas which will be identified staked out on the property, and he/she shall specify exact time periods when the removal shall take place. For example, four, 4, areas approximately 1 acre in size each is shown on figure 1, (see attached). Each area shall have the French Broom plants removed manually by specific requirements set out by the entomologist. Basically, the larva are carefully collected if present, or they are not. All larva collected is carefully placed underground near plant roots, either on existing plants or potted native plants replanted in place of the French Broom. Beetle populations are carefully monitored during and after. The goal of the experiment is to determine the exact amount of work to protect the larva is necessary. All areas the large adult plants are piled up and burned during a specified time. These requirements may be something such as this:

Area #1: Plants pulled and piled with no larva collection and replacement. Returning sprouts are burned, (using a propane "hog burner").

Area #2: Plants pulled and piled with larva collection and replacement. Returning sprouts hand pulled.

Area #3: Plants pulled and piled with no larva collection and replacement. Returning sprouts hand pulled.

Area #4: Plants pulled and piled with larva collection and replacement. Returning sprouts are burned, (using hand held propane "hog burner").



## **Idea Proposal- Modification of the Bear Creek Wastewater Collection and Treatment System into a Septic Tank Effluent System, S.T.E.P..**

Summary: The Bear Creek Wastewater Collection System was constructed using outdated, costly, collection and treatment of raw sewage with gravity pipelines. In the earlier 90's, in Oregon, the "STEP" system was developed which has become the standard for rural areas of 10 to +/- 500 residential properties where the construction of a typical gravity collection and treatments system in an urban area is impractical and not cost effective.

The concept is simple. A modified septic tank is fitted with a STEP pump. This pump collects clear water from the tank and pumps it into a pressurized piping collection system, instead of overflowing into a nearby leech field. The water is then pumped to an aerobic bacteria treatment system, where most of the existing equipment at the treatment plant can be utilized. The existing system has two, 2, serious, out-dated, design flaws, which are:

1. Wastewater solids are directed to pump lift stations which mix the solids into the water to the treatment, (aerobic). The solids are more effectively, and less costly, simply treated inside the septic tank, (an-aerobic).
2. The existing system combines and shifts from aerobic to an-aerobic, which far less effective than the STEP system which utilizes an-aerobic for the solids 100%, and maximizes aerobic for the effluent water, until any excess overflow is placed into the leech field piping.

The Bear Creek Estates system has numerous problems with infiltration of pipelines and inadequate treatment of the wastewater. This is an overview of exactly what is involved and a cost estimate for the modification of this system into a STEP system. It also includes an optional recycled water distribution system to provide useful water for irrigation and to further lower the amount of organic contaminants into the San Lorenzo River.

Below is a detailed explanation of each modification required. Each improvement is broken into phases which would take place during the construction project, along with an estimate of total cost.

### **Construction Phase Descriptions and Cost Estimates:**

**1. Septic Tank Installtion:** Each residence shall have a 2000 gallon polyethylene septic tank designed to accommodate a STEP pump. This tank shall be located preferably near the existing 4" gravity sewer lateral, (see figure 1). The pump shall be installed with an electrical conduit with the appropriate controls at the electrical service panel. The tank is then put into service by connecting the gravity service to the tank, and connecting the pump to the force main system. The optional, ¾" recycled water service is brought to a hose spigot near the house.

Cost Estimate: \$20,000 per residence X 56= \$1,120,000

## **2. Force Main Collection System:**

All of the lateral connection points at the six, 6", sewer main piping shall be excavated, exposed, shored, and steel plated. Any other sections of piping which can be installed before system switchover shall be completed. Installation and connection to the force main system shall not occur until modifications of the treatment plant and pump lift stations are completed. The four, 4", laterals from each residence is connected to the new septic tank. Since this tank is empty, this will allow 5 working days to install and connect to the force main collection piping.

The force main piping is to consist of a 1-1/4" effluent, and 3/4" recycled water, (optional), (see figure 2), polyethelene piping installed into the existing 4" gravity piping. The existing 6" sewer main piping shall have a 2"-3" effluent, and 1-1/2" to 2-1/2" recycled water polyetylene pipelines inserted into it. All existing manholes shall be utilized for access points and remain unmodified for future access and leak detection. All existing gravity sewer piping shall provide double containment. All connections to the pump lift stations are made, and all connections to the sewer force main and lateral piping are made. A recycled water main, (optional), shall be installed from the treatment plant by trenching in the best, shortest distance, location and connected to the previously installed distribution piping.

Cost Estimate: Effluent Piping \$250,000 Recycled Water Piping Adder: \$50,000

**3. Pump Lift Station Modifications:** A new modified pump lift station shall be installed next to the existing two lift stations, and the piping connected to them and the existing lift station abandoned. As a cost saving measure, the existing lift stations can be modified, however, it will be more difficult for transfer to the new system. These lift stations will also act as preliminary trickling filter units, (see figure 3). The lift station shall be filled with trickling filter media, the pump accessible and protected under a grating, and the lid provide with a carbon filter to allow air flow and prevent odor.

Cost Estimate: \$75,000 total.

**4. Treatment Plant Modifications:** No changes with the existing system shall be made. All changes are added onto the outlet piping which is connected to an open air reservoir equiped with floating aerators. The overflow from the reservoir is connected to the existing leech field piping. A submersible pump at the opposite end of the reservoir pumps water back to the treatment plant where it is disinfected with UV equipment, to a pump which pumps the water to the recycled water return piping, and to an irrigation system to grow orchard trees in the existing field above the leech field.

Cost Estimate: \$125,000, (Without Recycle Water equipment). \$200,000, (including RW equipment).

Total Cost: \$1,445,000

10% Engineering and Construction Management Consultants: \$144,500.

Grand Total: **\$1,589,500.**

Cost per homeowner:  $\$1,589,500/56 =$  **\$28,384**



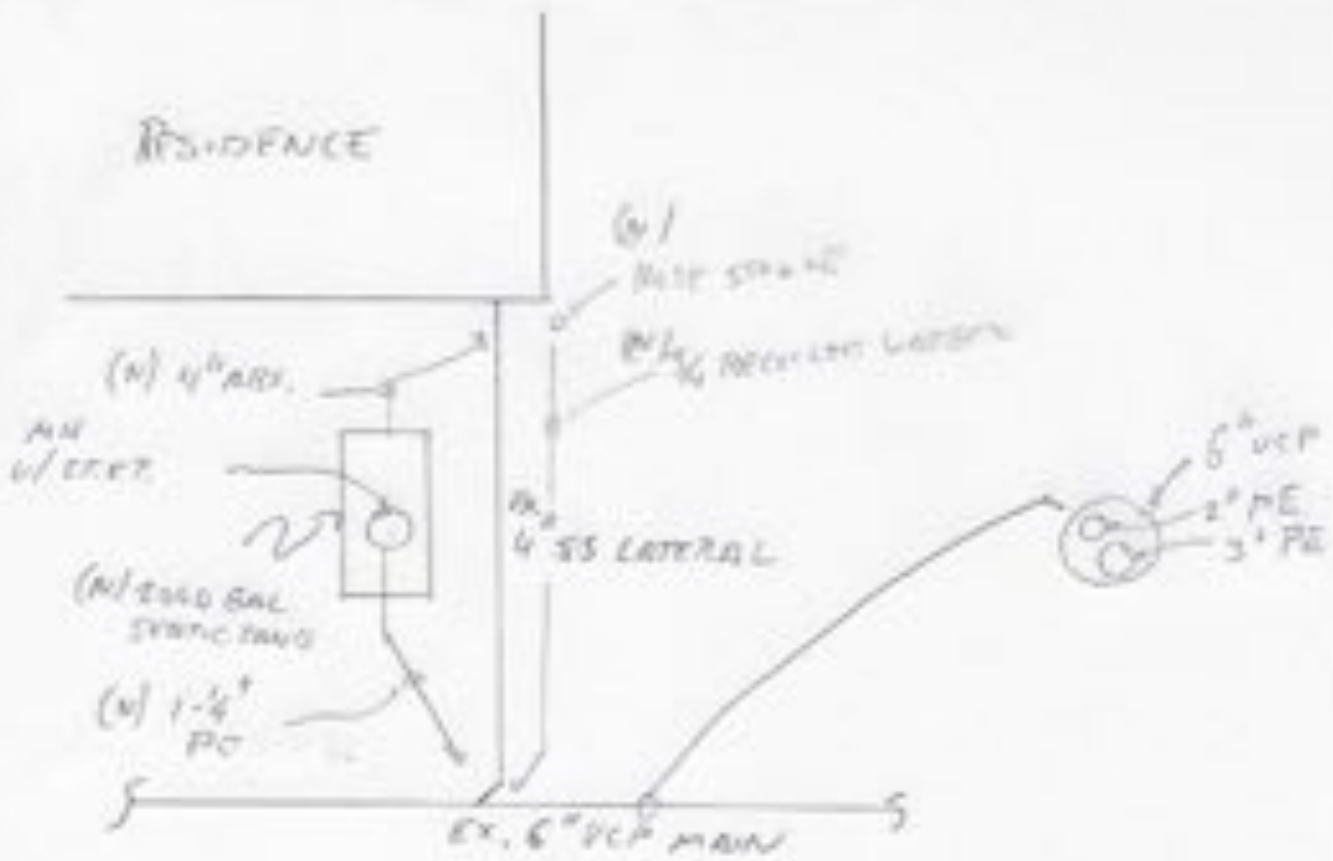


Fig. 1

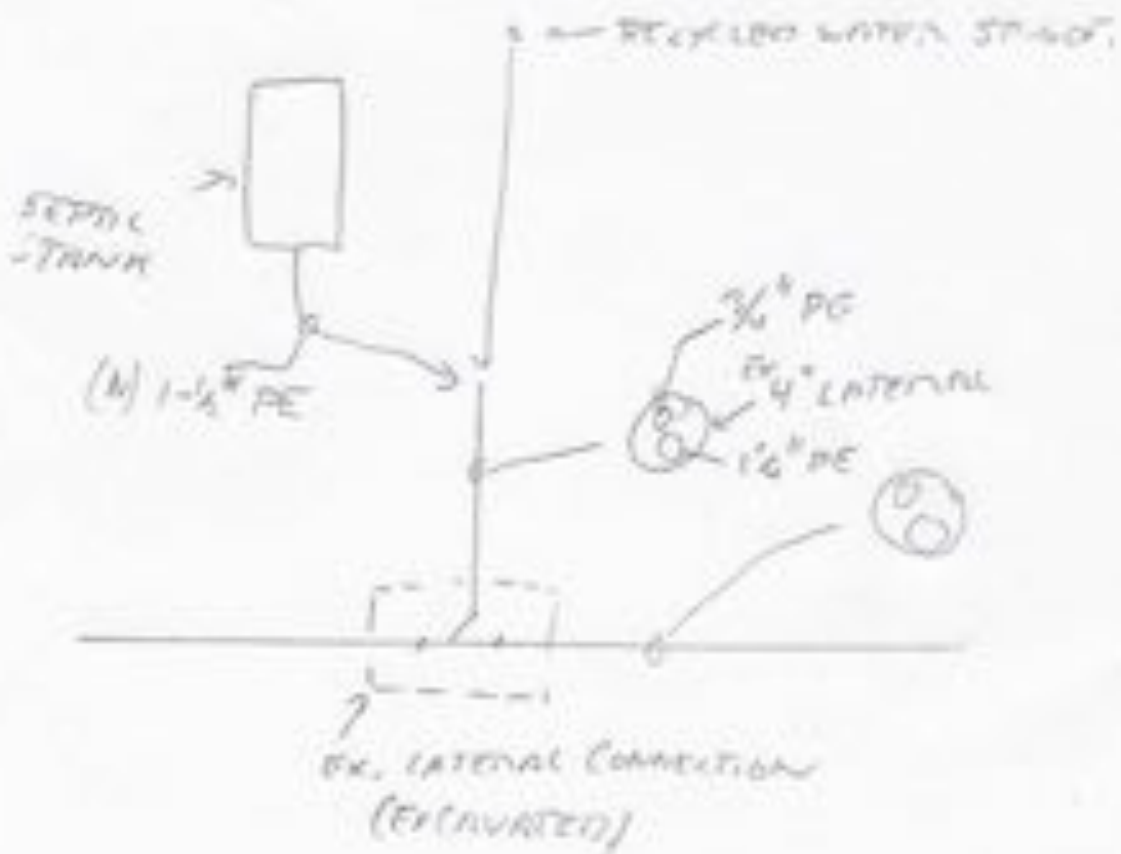
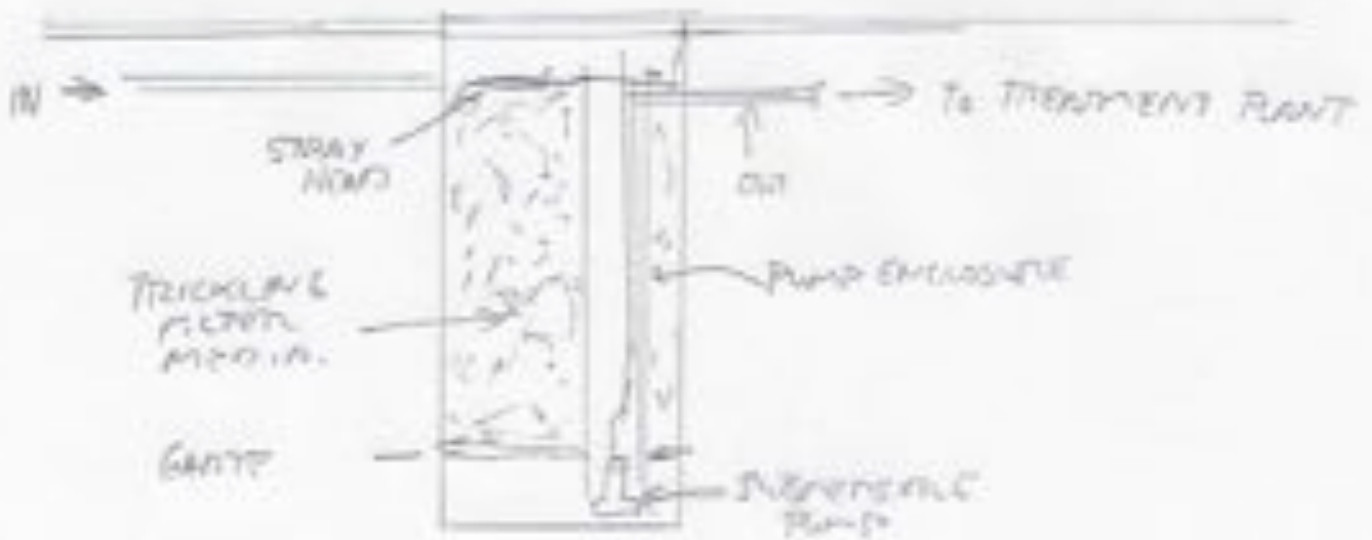
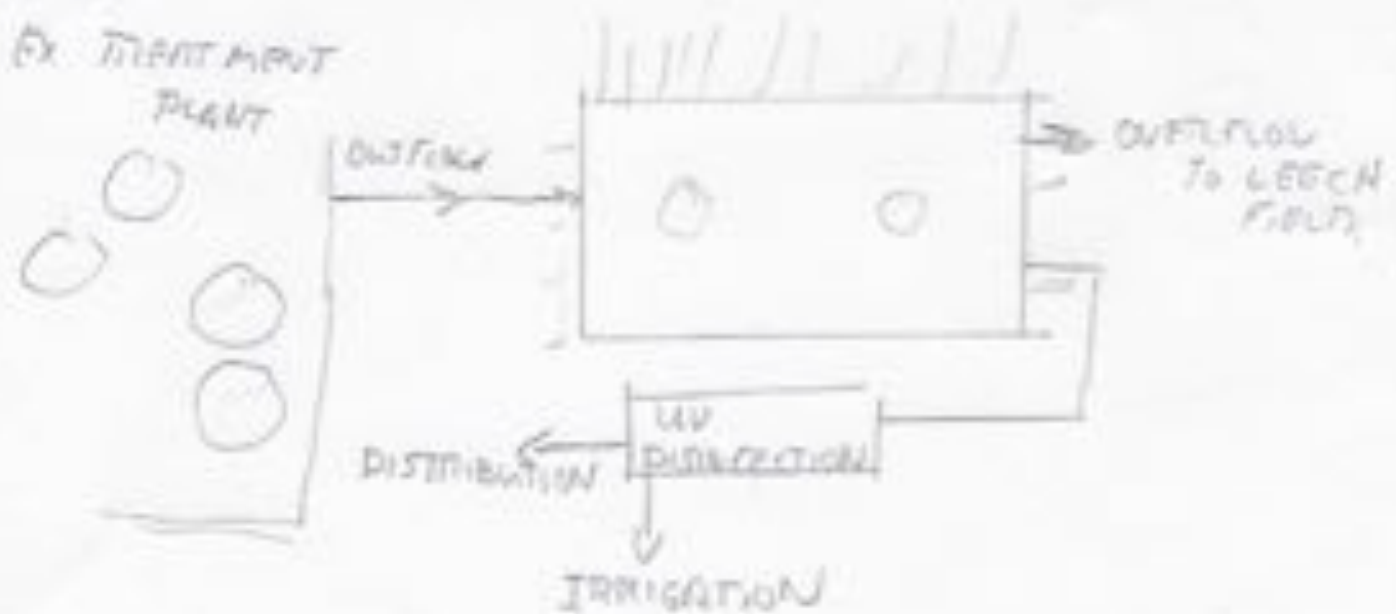


Fig. 2



P. 3 PUMP LIFT STATION



P. 4.



NOSSAMAN LLP

## Memorandum

**TO:** Board of Directors,  
San Lorenzo Valley Water District

**FROM:** Gina R. Nicholls, District Counsel

**DATE:** April 13, 2018

**RE:** Agenda Item 9.h  
Request for Attorney Representation by Director Smallman  
502665-0001

---

### **RECOMMENDATION**

Review this memorandum and the attached email correspondence and authorize me to respond to Director Smallman's request for attorney representation under Government Code section 995, with a statement that this section does not apply until and unless a lawsuit is filed.

### **BACKGROUND**

In January 2018, the District released a draft complaint against Director Smallman for alleged violations of the Brown Act—namely, unauthorized disclosures of confidential closed session information. In February 2018, the Board unanimously decided (5-0) to create an agreed statement regarding Director Smallman's unauthorized disclosures of the District's confidential information, with a goal of releasing that statement, signed by Director Smallman, to the public by the next regular Board meeting in March. The District provided a draft letter to Director Smallman on March 2, 2018, and since that time no further progress has been made.

On April 9, I received the attached email from Director Smallman, which makes a "formal request per California Government Code 995, (Copied portion of below for your reference), for the District to pay for my defense, which would include retaining an attorney of my choosing." The letter cites a 20 day limit for me to respond "in writing, and this should explain in detail why I would not be allowed paid defense by the District, and why former Director Vierra was not denied, and provided defense per the statute."

Government Code section 995 has no application here. The plain language of Section 995 clearly states that it applies when a "cross-action, counterclaim or cross-complaint" has been filed (*see also Thornton v. California Unemployment Ins. Appeals Bd.* (2012) 204 Cal.App.4th 1403), and the District's proposed complaint for an injunction against Director Smallman has not been filed.

Because no lawsuit has been filed and Government Code section 995 does not apply, the District has no obligation under Section 995.2, subdivision (b), to provide a response to Director Smallman. Nevertheless, I would like to provide a courtesy response explaining why the District cannot act on the request.

If the Board should decide to proceed with bringing a complaint against Director Smallman, after it is filed, he would be able to renew this request for defense under Government Code section 995. Then the Board would need to provide a response within 20 days. Under those circumstances, I still would not be able to recommend providing a legal defense to Director Smallman, because the allegations upon which the draft complaint are based reflect conduct outside “the scope of his employment” for purposes of Section 995.

FISCAL IMACT:

NONE

STRATEGIC PLAN:

N/A

ATTACHMENT:

1. Email Correspondence With Director Smallman

## Exhibit 1

Nicholls, Gina R.

---

From: Bill Smallman <bill@billsmallman.com>  
Sent: Monday, April 09, 2018 9:49 AM  
To: Nicholls, Gina R.  
Cc: Chuck Baughman  
Subject: RE: Draft Letter re Brown Act violations

-CONFIDENTIAL-

Hi Gina,

I'm making formal request per California Government Code 995, (Copied portion of below for your reference), for the District to pay for my defense, which would include retaining an attorney of my choosing. After trying to review the letter I was sent, I came to the conclusion that I should have a legal professional review it, and/or my edited version of it.

There is a 20 day limit for you to respond back to me in writing, and this should explain in detail why I would not be allowed paid defense by the District, and why former Director Vierra was not denied, and provided defense per the statute.

Sincerely,

Bill

Beginning paragraphs of CA Government Code 995:

Except as otherwise provided in [Sections 995.2](#) and [995.4](#), upon request of an employee or former employee, a public entity shall provide for the defense of any civil action or proceeding brought against him, in his official or individual capacity or both, on account of an act or omission in the scope of his employment as an employee of the public entity.

For the purposes of this part, a cross-action, counterclaim or cross-complaint against an employee or former employee shall be deemed to be a civil action or proceeding brought against him.

(a) A public entity may refuse to provide for the defense of a civil action or proceeding brought against an employee or former employee if the public entity determines any of the following:

- (1) The act or omission was not within the scope of his or her employment.
- (2) He or she acted or failed to act because of actual fraud, corruption, or actual malice.

(3) The defense of the action or proceeding by the public entity would create a specific conflict of interest between the public entity and the employee or former employee. For the purposes of this section, "specific conflict of interest" means a conflict of interest or an adverse or pecuniary interest, as specified by statute or by a rule or regulation of the public entity.

(b) If an employee or former employee requests in writing that the public entity, through its designated legal counsel, provide for a defense, the public entity shall, within 20 days, inform the employee or former employee whether it will or will not provide a defense, and the reason for the refusal to provide a defense.

(c) If an actual and specific conflict of interest becomes apparent subsequent to the 20-day period following the employee's written request for defense, nothing herein shall prevent the public entity from refusing to provide further defense to the employee. The public entity shall inform the employee of the reason for the refusal to provide further defense.

(a) If a state employee provides his or her own defense against an action brought for an alleged violation of [Section 8547.3](#), and if it is established that no violation of [Section 8547.3](#) occurred, the public entity shall reimburse the employee for any costs incurred in the defense.

(b) A public entity which does provide for the defense of a state employee charged with a violation of [Section 8547.3](#) shall reserve all rights to be reimbursed for any costs incurred in that defense. If a state employee is found to have violated [Section 8547.3](#), he or she is liable for all defense costs and shall reimburse the public entity for those costs.

On March 23, 2018 at 9:13 AM "Nicholls, Gina R." <[gnicholls@ncssaman.com](mailto:gnicholls@ncssaman.com)> wrote:

Bill,

Your email indicates that you're not likely to have a draft ready by Tuesday. We really need to get something from you no later than about Friday, March 30, in order to stay on track to finalize the letter by the April Board meeting. Is there something we can do to help, or resources that the District can provide to help move this forward? It is a high priority for the District, and I hope for you, to finish the letter and by doing so, put these issues behind us.

To that end, Chuck would like to schedule a meeting with you and me early in the first week of April to keep this process moving forward. I would participate by phone. What is your availability April 2nd – 4th for such a meeting?

Thank you,  
Gina

Gina R. Nicholls

Attorney at Law

NOSSAMAN LLP

777 South Figueroa Street, 34th Floor

Los Angeles, CA 90017

[gnicholls@nossaman.com](mailto:gnicholls@nossaman.com)<mailto:[gnicholls@nossaman.com](mailto:gnicholls@nossaman.com)>

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D 213.612.7815

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From: Bill Smallman [mailto:[bill@billsallman.com](mailto:bill@billsallman.com)]  
Sent: Thursday, March 22, 2018 3:05 PM  
To: Nicholls, Gina R.  
Cc: Chuck Baughman  
Subject: Re: Draft Letter re Brown Act violations

I'll try, really busy trying to get a job right now. sorry.  
On March 22, 2018 at 12:08 PM "Nicholls, Gina R."  
<[gnicholls@nossaman.com](mailto:gnicholls@nossaman.com)<mailto:[gnicholls@nossaman.com](mailto:gnicholls@nossaman.com)>> wrote:

Bill,

Chuck sent you a letter template with draft content on March 2. On March 9, you said you would try to complete your draft of the letter by March 15th, but we didn't receive anything from you. Chuck checked in with you about it after the March 15 board meeting, and now another week has passed with no draft. We need to get your draft very soon in order to review it and try to resolve any differences with you before the April board meeting. Can you send it to us by Tuesday, March 27?

Thank you,  
Gina

Gina R. Nicholls

Attorney at Law

NOSSAMAN LLP

777 South Figueroa Street, 34th Floor



Los Angeles, CA 90017

[g nicholls@nossaman.com](mailto:g nicholls@nossaman.com)<<mailto:g nicholls@nossaman.com><<mailto:g nicholls@nossaman.com>  
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## MEMO

To: Board of Directors  
From: District Manager  
Subject: Authorization to Negotiate Multi-project Engineering Contracts  
Date: April 19, 2018

### Recommendation

It is recommended that the Board of Directors review this memo and associated documentation and authorize the District Manager to negotiate time and material, not-to-exceed contracts with the three top ranked firms. Negotiated contracts will return to the Board for approval.

### Background

The District continues moving forward with its capital replacement program. As discussed at previous Board meetings, staff has issued a Request for Qualifications (RFQ, attached), with the intent of hiring three firms capable of completing design and construction management services for the projects selected to receive USDA funding and projects included in the Lompico Assessment District. Staff notified all engineering firms listed on the attached sheet and also posted the RFQ on the District's website. Seven firms responded. The responding qualification packages have been consolidated into a single file download available on the District's website.

DM requested that senior management and the Board President provide a review and ranking of submitted qualification documents. DM did not participate in the ranking due to past and current association with many of the proposing firms. The aggregate of the rankings is attached.

Staff is now requesting Board authorization to negotiate time and material not-to-exceed contracts with the top three ranked firms; MME, Schaaf & Wheeler and Frietas + Frietas. Negotiations will include dividing up the projects to each firm and establishing an appropriate billing rate structure. The total professional services fee is estimated to be about \$1,152,000 to complete all the listed projects (attached). Contracts will return to the Board for final approval.

Once we have the design firms contracted, the next step is to develop predesign reports for inclusion into the USDA loan package. WSC Engineering will be coordinating with staff and the three design firms. This effort will span multiple months. We are currently estimating that the USDA Loan package will be submitted in late summer.

USDA will require time to review the application and respond. Assuming the response is positive, an agreement will be returned to the Board. Once the Board has authorized the USDA Loan agreement full design and construction schedules will be formalized and projects will be initiated based on that schedule. Staff anticipates completion of the USDA projects within approximately three years of loan approval. Lompico Projects will remain pay-as-you go with a potential to accelerate based on District capital work load.

FISCAL IMPACT:

Professional Services - \$1,152,000 capitalized over multiple years.

Construction Cost - \$4,609,000 capitalized over multiple years.

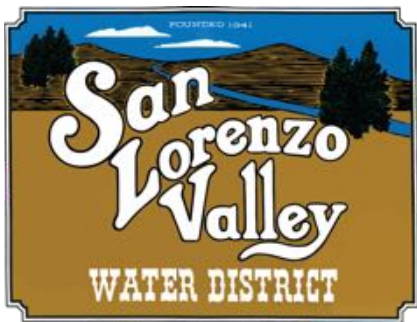
Total Cost - \$5,761,000 capitalized over multiple years.

2016 STRATEGIC PLAN:

Strategic Element 3.1 - Capital Improvement Program

Strategic Element 5.1 - Fiscal Plan for support of Strategy

Strategic Element 5.2 - Funding Infrastructure Replacement



**REQUEST FOR QUALIFICATIONS**

**TO PROVIDE:**

**PROFESSIONAL DESIGN SERVICES TO THE  
SAN LORNZO VALLEY WATER DISTRICT**

**PROJECT TITLE:**

**MULTIPROJECT ENGINEERING SERVICES**

**RESPONSE DUE BEFORE 3:00 P.M.**

**ON**

**April 5<sup>th</sup>, 2018**

**San Lorenzo Valley Water District  
13060 Highway 9  
Boulder Creek, CA 95006  
(831) 430-4624**

## I. INTRODUCTION

The San Lorenzo Valley Water District (SLVWD or District) is soliciting Statement of Qualifications (SOQ) from qualified consulting firms to design a variety of water infrastructure projects over the course of the next few years. The proposed projects include those identified in the District's approaching application for United States Department of Agriculture Loan (USDA Loan) and select projects identified in the Lompico County Assessment District Engineering Report (Lompico Projects).

The District's intent is to award multiple design contracts with a minimum of three different engineering firms; awarding a group of projects to each firm. The selected firms will be expected to complete predesign, environmental permitting, geotechnical, final design, contract bid package completion, project bid support and construction oversight for all projects in their assigned group. Each firm will be expected to provide a turn-key solution from predesign to construction oversight, including environmental permitting where necessary, and closely coordinating with the District's Operations Department.

The District has contracted with Water Systems Consulting, Inc., (WSC) to complete a USDA Loan application package, excluding predesign efforts for each project included in the package. Selected Engineering firms will be expected to coordinate with WSC for pre-design reports for those projects included in the USDA application. Pre-design reports shall include assessment of alternatives and justification for final design. The predesign reports will be prepared by the selected firm assigned to each individual project. The District anticipates submittal of predesign reports by June 30, 2018. The District then intends to stagger the design and construction of assigned projects over the next three fiscal years (FY2019, FY 2020, and FY 2021).

Projects to be assigned include, but are not limited to:

- Hihn Road Pipeline (USDA)
- Lyon Pipeline (USDA)
- Worth Lane Pipeline (USDA)
- Bennet Booster and Pipeline (USDA)
- Mill Creek (Lompico)
- Sequoia Road Pipeline (USDA)
- Felton Acres Tank and Booster Station (USDA)
- Hillside Drive Pipeline (USDA)
- Riverview Drive Pipeline (USDA)
- Lompico Interconnection (Lompico)
- Two Bar Road Pipeline (USDA)
- Orman Road Pipeline (USDA)
- California Drive Pipeline (USDA)
- Lewis Tank (Lompico)
- Madrone Tank (Lompico)
- Kaski Tank (Lompico)

Brief descriptions for the projects listed above are included as attachments to this RFQ, as is a proposed overall Gantt Chart schedule. More detailed project descriptions will be provided to selected firms as projects are assigned. If selected, Consultant shall propose a project schedule that meets or exceeds the timeline provided in this RFQ.

Selection of the firms will be based on qualifications and experience as ranked by a panel of assigned individuals (staff, Engineering Committee and/or outside experts). Firms will be assigned one or more projects by the District based on the District's review of received SOQs. Each selected firm will be expected to execute a Scope, Fee, and Time and Material contract for their assigned group of projects.

Each selected firm will commit to a minimum time three-year fee schedule. The base year fee schedule will be established by contract and a maximum inflation factor of 3% will be allowed for each subsequent year.

## II. GENERAL INFORMATION

San Lorenzo Valley Water District is a water supplier established in 1941 and serves several communities within the 136 square-mile San Lorenzo River watershed. The District owns, operates, and maintains four permitted water systems divided into three service areas. Each service area provides supplies from separate water sources. The North Service Area includes the unincorporated communities of Boulder Creek, Brookdale, Ben Lomond and Lompico (under separate water permit). The South Service Area encompasses portions of the City of Scotts Valley and adjacent unincorporated neighborhoods. The Mañana Woods subdivision became part of the South Service Area as a result of the District's annexation of the Mañana Woods Mutual Water Company in July 2006. The Felton Service Area was acquired by the District from California American Water in September 2008 and includes the town of Felton and adjacent unincorporated areas.

The District's legal boundaries encompass approximately 62 square miles. Land uses include timber, State and regional parks, water supply watersheds, rural residential, low-density urban residential and commercial, quarries, agriculture, and other open space. Within these boundaries, the District's four service areas have a combined area of approximately 26 square miles and individual areas as follows: North Service Area (20.9 square miles) and Lompico (2.5 square miles), South Service Area (0.8 square mile), and Felton Service Area (2.2 square miles). Their individual water supply systems are referred to as the North, South, and Felton Systems.

The District relies on both surface water and groundwater resources, including nine currently active stream diversions, one groundwater spring, and eight active groundwater wells. These sources are derived solely from rainfall within the San Lorenzo River watershed.

The scale and complexity of SLVWD's water distribution system reflect the San Lorenzo Valley's rugged topography, dispersed pattern of development, and widely distributed raw water sources. The District's three systems have limited above-ground storage capacity equal to a few days' average use and rely on groundwater for seasonal and year-to-year storage. The District produces and treats water based on relatively immediate water demand.

## III. SOQ REQUIREMENTS

The SOQ shall not exceed 13, 8.5" x 11" single-sided pages excluding resumes, cover letter, dividers, front and back covers. 11" x 17" pages are not allowed. SOQ must use a font size of 11 or larger, and bound into a single document. Responses to this RFQ shall be in the following order and shall include:

1. Cover Letter: Include a one-page, dated cover letter indicating the firms understanding of and interest in the project and summarizing the key components addressed within the SOQ. This document shall be signed by a person legally authorized to represent and enter into contracts for the firm. Please include name, address, telephone number, email and title for each of these persons.
2. Background: Provide a general description of your firm's background and project qualifications, including years of business, any past bankruptcy filings, and identify any contract or subcontract by the firm which has been terminated, in default, or had claims made against it that resulted in litigation or arbitration in the last five years.
3. Firm's Experience: Provide a list of tank, pipe, pump station, and intertie projects that were of a similar scope and complexity to those listed in this RFQ, and that your firm has completed work for in the past seven years. Please identify the client (the organization your firm had a contract with and who your firm invoiced for compensation) or, if your firm was a subconsultant, indicate who was the prime Consultant and their Client.

4. Staff Experience: Provide resumes describing the qualifications of the staff who will be working on these projects. Provide a list of similar projects and clients that your proposed Project Manager and/or Project Engineer(s) and other key staff have completed work for in the past seven years, including their experience in working with capital improvement water projects. Clearly link the staff and projects.
5. Subconsultant's Experience: Provide a list of all proposed subconsultants, their background and qualifications, point of contact, and degree of involvement.
6. General Approach (limit to 3 pages): Provide a concise description of your firm's understanding of the overall design services required and the work to be completed. Include options and ideas for how to streamline the projects in order to meet schedule requirements (especially pre-design reports) control costs, keep constructed work quality high, and deliver multiple successful projects concurrently if required.

#### **IV. CONSULTANT SELECTION**

A short list of Consulting firms will be invited to submit proposals based on the qualifications submitted for the work. The following weighted criteria will be used to evaluate SOQ's:

- a. 30% Understanding and approach to the work to be done
- b. 15% Experience of firm with similar kinds of work
- c. 40% Experience of staff for work to be done
- d. 10% Overall clarity and presentation of SOQ
- e. 5% Firm's Local Experience

#### **V. SELECTION PROCESS**

The District intends to enter into negotiations with the three top ranked firms. if the district can't conclude negotiations it reserves the right to move to the next most qualified firm. At this time, the District contemplates the use of a Time and Material Not to Exceed contract for the services requested. Negotiations will cover: scope of work, contract terms and conditions, office arrangements, attendance requirements and appropriateness of the proposed fee schedule.

The District will require a professional liability insurance verification for coverage of not less than \$1,000,000.00 for selected firms.

After negotiating a proposed agreement that is fair and reasonable the District Manager will present each contract to the District's Board for authorization to execute a contract with the responsive firms.

#### **VI. SELECTION SCHEDULE**

The District anticipates that the process for selection of firms and awarding of contracts will be according to the following tentative schedule:

<b>SOQ Due Date</b>	<b>April 5, 2018</b>
Interview (TBD-If Necessary)	TBD
Board of Directors Approval	<b>April 19, 2018</b>
Final Selection and Notification	<b>April 20, 2018</b>

#### **VII. SPECIAL CONDITIONS / ATTACHMENTS**

The following documents are included as attachments to provide background:

- Lompico Assessment District Engineer's Report
- List of proposed Capital Improvement Plan projects for USDA loan
- Proposed overall Gantt Chart

## **VIII. SUBMITTAL REQUIREMENTS**

1. One (1) executed original marked "ORIGINAL" in red ink and three (3) copies of the SOQ shall be submitted. Emailed SOQs will not be accepted. Submit one electronic copy of the SOQ in PDF format (on CD, DVD or Thumb Drive). The SOQ shall be signed by an individual, partner, officer or officers authorized to execute legal documents on behalf of the Firm.
2. The SOQ must be received no later than **3:00 p.m.** local time, on or before **April 5, 2018** at the office of:

**San Lorenzo Valley Water District  
13060 Highway 9  
Boulder Creek, CA 95006**

**Attn: District Secretary (Holly Morrison)**

Failure to comply with the requirements of this RFQ may result in disqualification.

Questions regarding this RFQ shall be submitted in writing to [hmorrison@slvwd.com](mailto:hmorrison@slvwd.com) by March 30, 2018. The District will not respond to questions submitted after March 30, 2018.

USDA Loan Projects	
Swim Tank	\$ 678,000
Hihn Road Pipel	\$ 90,000
Lyon Pipe	\$ 450,000
Worth Lane Pipe	\$ 120,000
Sequoia Road Pipe	\$ 120,000
Bennet Booster	\$ 390,000
Felton Acres Tank and Booster	\$ 300,000
Hillside Drive Pipe	\$ 240,000
Riverview Drive Pipe	\$ 240,000
Two Bar Road Pipe	\$ 450,000
Orman Road Pipe	\$ 300,000
California Drive Pipe	\$ 240,000
Fall Creek Fish Ladder	\$ 1,160,000
SUM TOTAL	\$ 4,778,000



<b>Project Name</b>	<b>HihnRdPipe</b>
<b>Estimated Project Cost</b>	<b>\$90,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
<b>4</b>	20
<b>1</b>	5
<b>5</b>	20
<b>4</b>	16
<b>4</b>	16
<b>5</b>	15
<b>3</b>	9
<b>5</b>	15
<b>Final Score</b>	<b>116</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

Agenda: 4.19.18  
Item: 10a

PROJECT: HIHN ROAD WATER DISTRIBUTION  
SYSTEM

PROGRAM: Water Supply - DISTRIBUTION  
SYSTEM

PRIORITY: 116

PROJECT No.

District Contact: Brian Lee

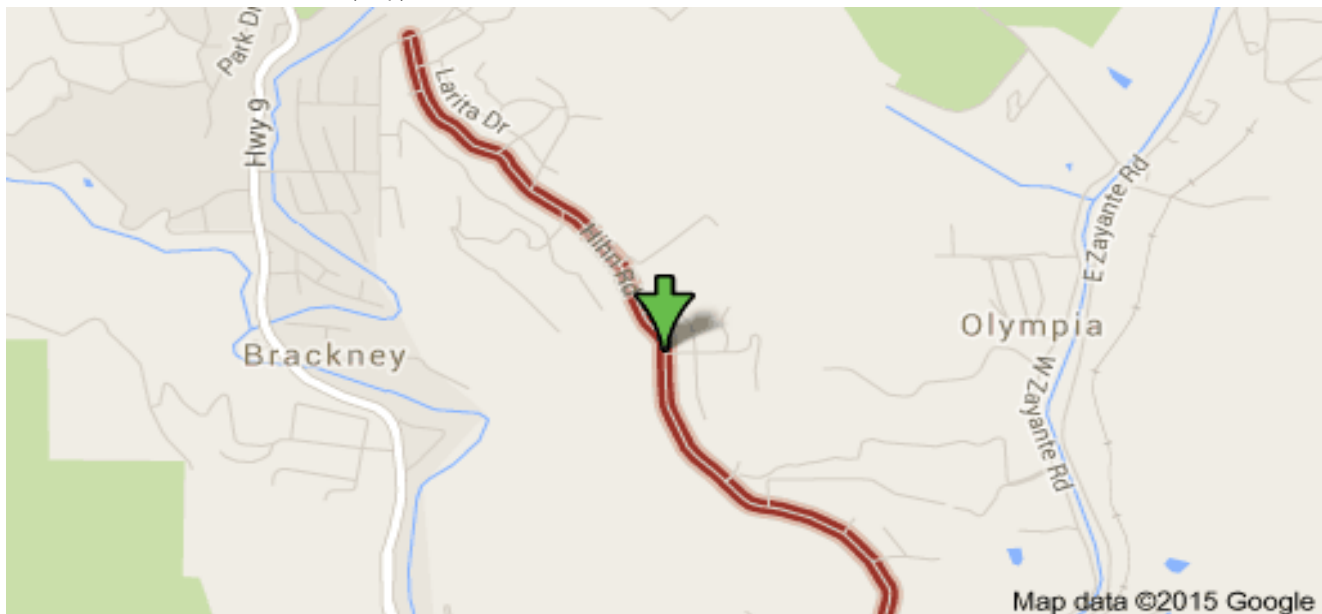
[blee@slvwd.com](mailto:blee@slvwd.com)

**PROJECT DESCRIPTION**

The Hihn Road Water Distribution System, located off Hihn Road in Ben Lomond, would be required in conjunction with the Desert Line Replacement Project. The Desert Line Replacement Project would allow the District to abandon the existing cross-country supply line commonly known as the "Desert Line". The "Desert Line" is an existing 6-inch asbestos cement water main installed above ground and traverses sensitive habitat. This project installation of 600 LF of six-inch water main, would extend water service from the higher elevation University Zone into a portion of the existing Quail Hollow Zone (Ridgeview Drive). Extension of the University Zone would provide adequate water pressure to the highest elevation homes in the vicinity of Ridgeview Drive which are currently being supplied water from the "Desert Line". The Hihn Road Water Distribution System project would transfer the water supply and distribution for approximately twelve (12) service connections from the Quail Zone to the University Zone.

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION** (map)



<b>Project Name</b>	<b>LyonPipe</b>
<b>Estimated Project Cost</b>	<b>\$450,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
<b>4</b>	20
<b>5</b>	25
<b>5</b>	20
<b>1</b>	4
<b>4</b>	16
<b>2</b>	6
<b>3</b>	9
<b>5</b>	15
<b>Final Score</b>	<b>115</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

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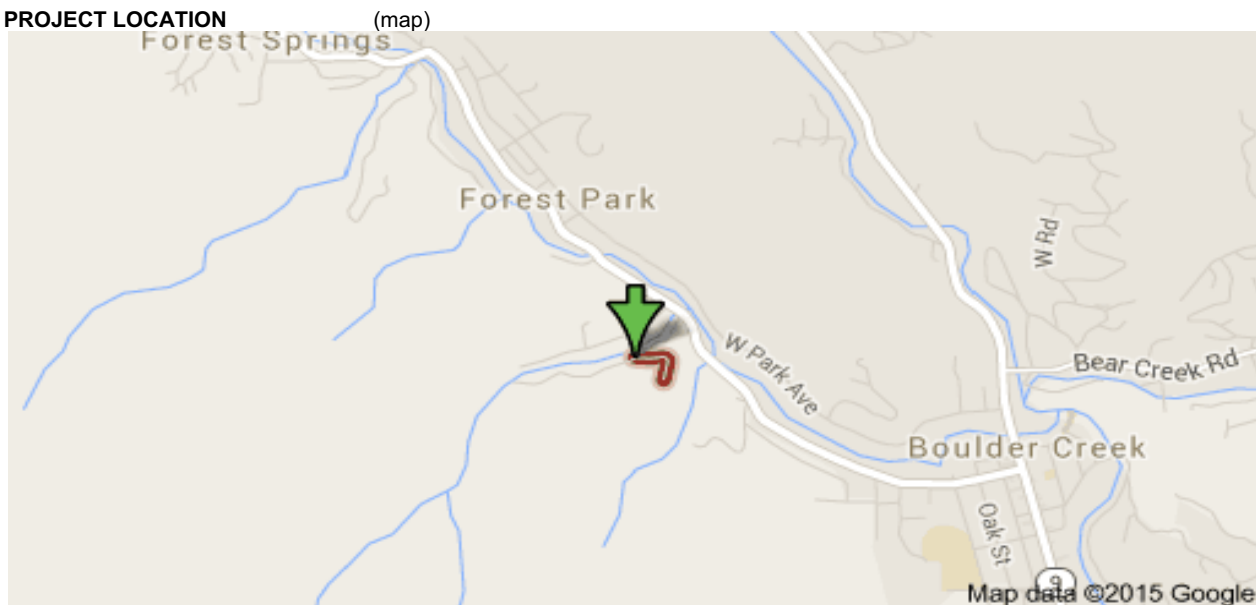
PROJECT	LYON ZONE WATER
PROGRAM	DISTRIBUTION SYSTEM Water Supply - DISTRIBUTION
PRIORITY	115
PROJECT No.	
District Contact	Brian Lee <a href="mailto:blee@slvwd.com">blee@slvwd.com</a>

**PROJECT DESCRIPTION**

Construction of approximately 3,000 lineal feet of new 10-inch water main and appurtenances thereto. This project will replace the existing 6-inch water main along Highway 236 from Big Steel Water Storage Tank to Highway 9. The existing distribution system is outside the Highway 236 right-of-way and traverses under homes. Undersized water main is the source of flow capacity restriction between Big Steel, Brookdale and Reader Zones. This project is an estimate only and needs additional study to quantify project alternatives and costs.

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION**



<b>Project Name</b>	<b>WorthLnPipe</b>
<b>Estimated Project Cost</b>	<b>\$120,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
4	20
1	5
5	20
1	4
4	16
4	12
3	9
5	15
<b>Final Score</b>	<b>101</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

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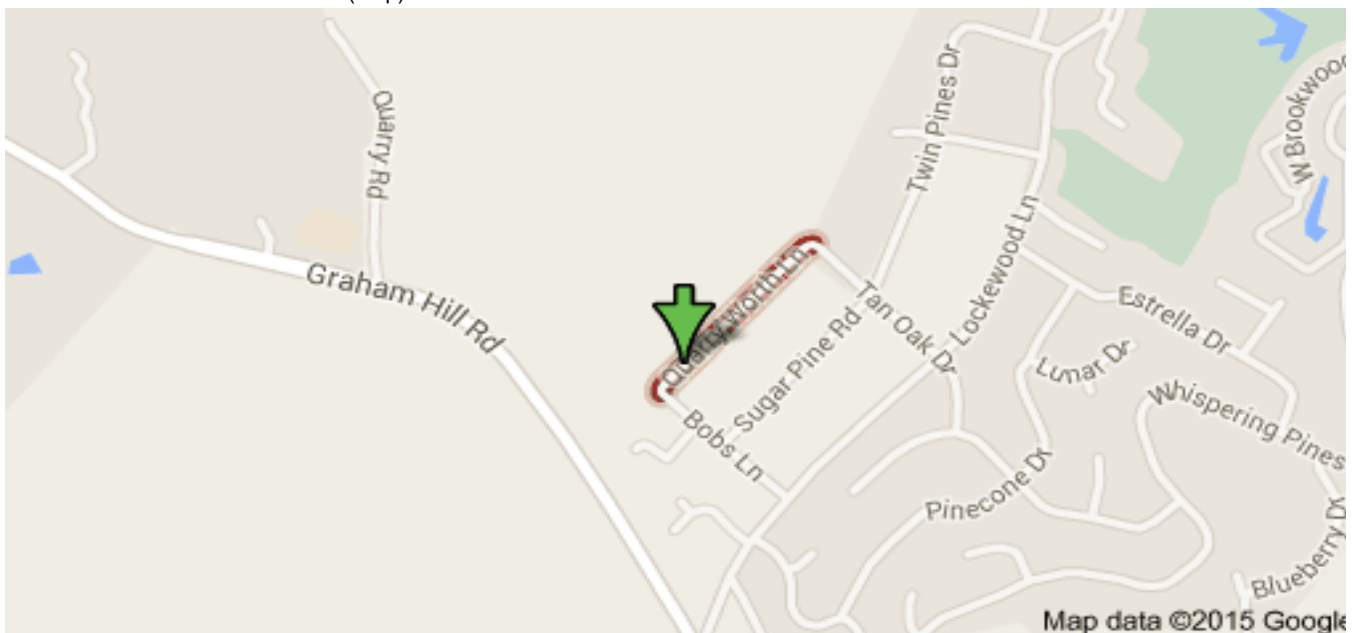
PROJECT: WORTH LANE WATER DISTRIBUTION  
SYSTEM  
PROGRAM: Water Supply - DISTRIBUTION  
SYSTEM  
PRIORITY: 101  
PROJECT No.  
District Contact: Brian Lee  
[blee@slvwd.com](mailto:blee@slvwd.com)

**PROJECT DESCRIPTION**

Construction of approximately 800 lineal feet of new 6-inch water main and appurtenances thereto. The project will fill in a break in the distribution system from Worth Lane to Lockwood Lane creating a looped main line system. Undersize water mains are the source of intermittent low water pressure, interruption of water service, and inadequate fire flow.

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION** (map)



<b>Project Name</b>	<b>SequoiaRdPipe</b>
<b>Estimated Project Cost</b>	<b>\$120,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
<b>4</b>	20
<b>1</b>	5
<b>5</b>	20
<b>1</b>	4
<b>4</b>	16
<b>4</b>	12
<b>3</b>	9
<b>4</b>	12
<b>Final Score</b>	<b>98</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

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PROJECT: SEQUOIA AVENUE WATER  
DISTRIBUTION  
PROGRAM: Water Supply - DISTRIBUTION  
SYSTEM  
PRIORITY: 98  
PROJECT No.  
District Contact: Brian Lee  
[blee@slvwd.com](mailto:blee@slvwd.com)

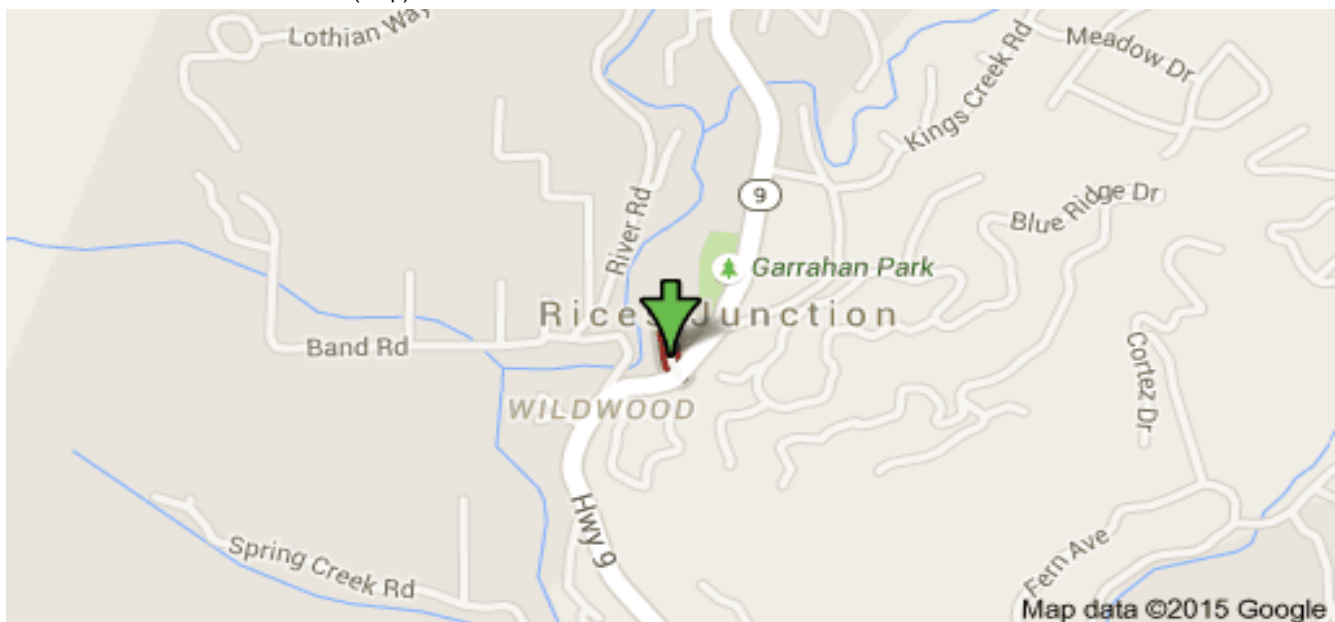
**PROJECT DESCRIPTION**

Construction of approximately 800 lineal feet of new 8-inch HDPE water main and appurtenances thereto. This project will replace existing 6-inch water main above ground cross-country between the Districts Reader Water Storage Tank and Sequoia Avenue providing a loop feed in the Reader Zone.

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION**

(map)





<b>Project Name</b>	<b>BenetBooster</b>
<b>Estimated Project Cost</b>	<b>\$390,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
<b>1</b>	5
<b>5</b>	25
<b>5</b>	20
<b>1</b>	4
<b>4</b>	16
<b>3</b>	9
<b>3</b>	9
<b>2</b>	6
<b>Final Score</b>	<b>94</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

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PROJECT: BENET BOOSTER PUMP  
STATION  
PROGRAM: Water Supply - PRODUCTION  
  
PRIORITY: 94  
PROJECT No.  
District Contact: Brian Lee  
[blee@slvwd.com](mailto:blee@slvwd.com)

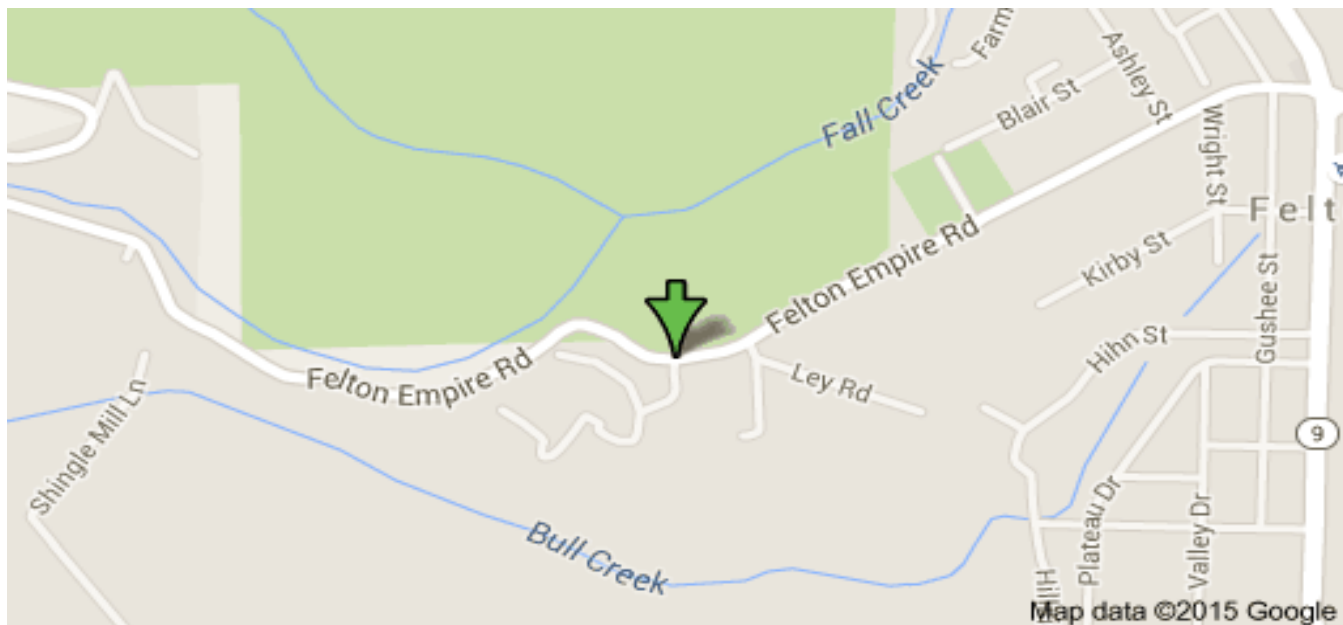


**PROJECT DESCRIPTION**

The Project consist of construction of a pumping station and the installation of approximately 4,200 lineal feet of new 4-inch HDPE pump-up transmission line, SCADA control, and appurtenances thereto. Additional rights-of-way for the pump station location may need to be obtained from private property owner prior to construction

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION** (map)



<b>Project Name</b>	<b>FeltonAcresTankandBooster</b>
<b>Estimated Project Cost</b>	<b>\$300,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
<b>4</b>	20
<b>1</b>	5
<b>5</b>	20
<b>1</b>	4
<b>4</b>	16
<b>3</b>	9
<b>3</b>	9
<b>3</b>	9
<b>Final Score</b>	<b>92</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

Agenda: 4.19.18  
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PROJECT: FELTON ACRES WATER STORAGE TANK  
AND BOOSTER PUMP STATION

PROGRAM: Water Supply - DISTRIBUTION  
SYSTEM

PRIORITY: 92

PROJECT No.

District Contact: Brian Lee  
[blee@slvwd.com](mailto:blee@slvwd.com)

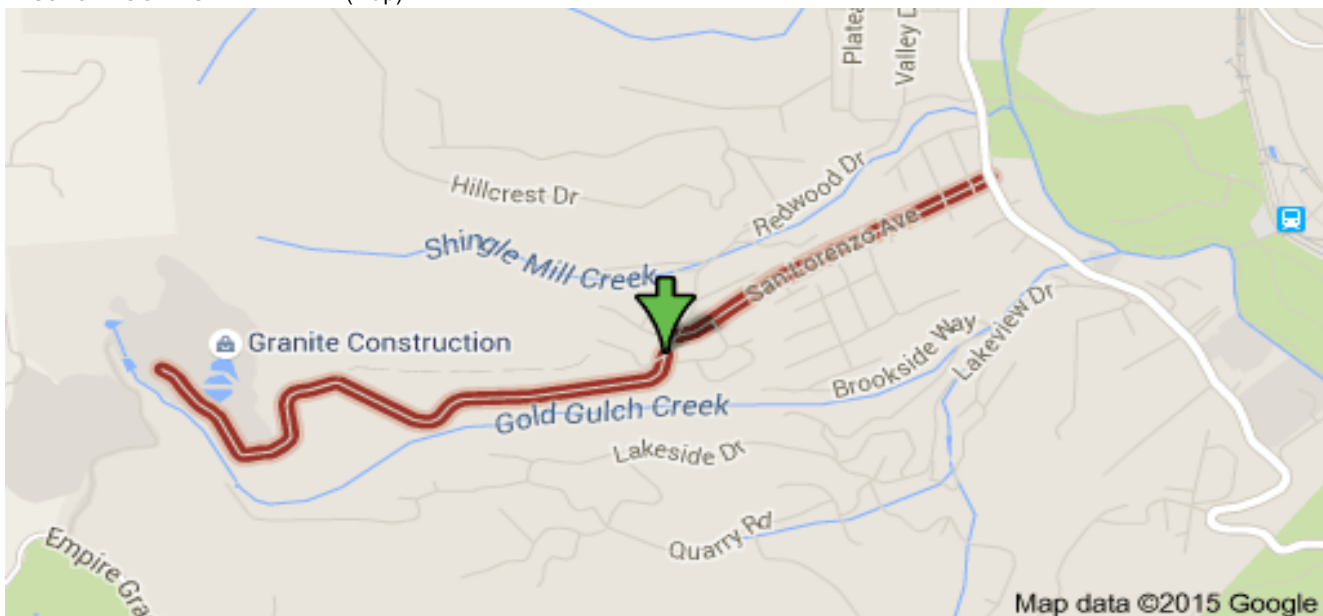


**PROJECT DESCRIPTION**

The Felton Acres Water Storage Tank and Booster Pump Station, located off San Lorenzo Avenue in Felton, is part of the water system acquired by the District in 2007 from the California-American Water Company. This facility provides water service to approximately two hundred (200) service connections in the Pine Zone. The existing storage tank consists of a 100,000 gallon redwood storage tank. The purpose of this tank is to provide a wet well for the booster pump station. The existing booster pump station, located adjacent to the water storage tank, pumps water to the Pine Tank. Two (2) 1,000 gallon steel pressure tanks are also located at this facility. The smaller tanks provide pressure system service for the Pine Zone. The redwood tank is greatly oversized for the purpose of a booster pump wet well. The redwood tank is leaking and is reaching its life expectancy. The booster pump station has reached its life expectancy and requires replacement. Further investigation is needed to understand the function of the two steel pressure tanks. The function of the two (2) pressure tanks may be eliminated by the installation of SCDA control between the Pine Tank and the Booster Pump Station.

- \* Bulit item 1
- \* Bulit item 2
- \* Bulit item 3

**PROJECT LOCATION** (map)



<b>Project Name</b>	<b>HillsideDrPipe</b>
<b>Estimated Project Cost</b>	<b>\$240,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
<b>4</b>	20
<b>1</b>	5
<b>5</b>	20
<b>1</b>	4
<b>4</b>	16
<b>4</b>	12
<b>3</b>	9
<b>2</b>	6
<b>Final Score</b>	<b>92</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

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PROJECT: HILLSIDE DRIVE WATER  
DISTRIBUTION SYSTEM  
PROGRAM: Water Supply - DISTRIBUTION  
SYSTEM  
PRIORITY: 92  
PROJECT No.  
District Contact: Brian Lee  
[blee@slvwd.com](mailto:blee@slvwd.com)

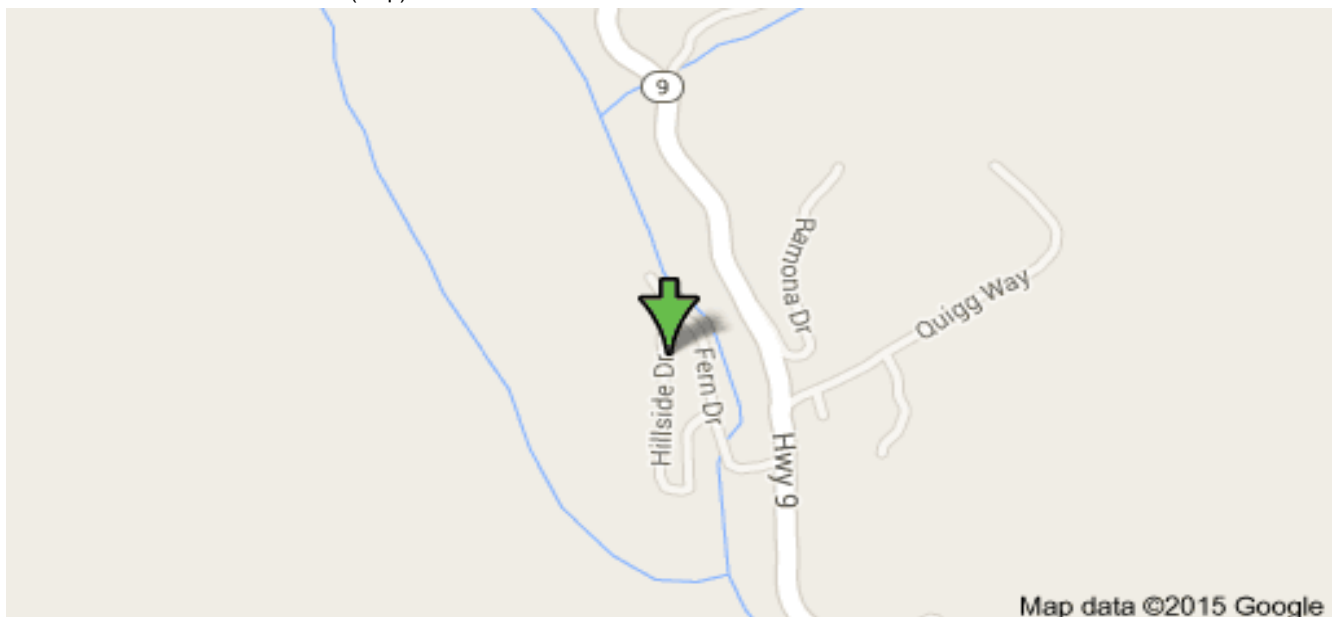
**PROJECT DESCRIPTION**

The Hillside Drive Water Distribution System, located off Hillside Drive in Boulder Creek, is part of the water distribution system acquired by the District in 1992 from the North Boulder Creek Improvement District Project (acquisition of San Lorenzo Woods Mutual Water Company and Park Mutual Water Company). The existing distribution system consists of 1,600 LF of 4- inch PVC water main which is installed in an area with geological instability. On-going ground movement has resulted in frequent damage to the existing water main. The Hillside Water Distribution System provides water service to approximately thirty (30) service connections in the North Boulder Creek Zone. The project would be installation of 1,600 LF of HDPE.

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION**

(map)



<b>Project Name</b>	<b>RiverviewDrPipe</b>
<b>Estimated Project Cost</b>	<b>\$240,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
<b>4</b>	20
<b>1</b>	5
<b>5</b>	20
<b>1</b>	4
<b>4</b>	16
<b>4</b>	12
<b>3</b>	9
<b>2</b>	6
<b>Final Score</b>	<b>92</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

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PROJECT: RIVERVIEW DRIVE WATER DISTRIBUTION  
SYSTEM

PROGRAM: Water Supply - DISTRIBUTION

PRIORITY: 92

PROJECT No.

District Contact: Brian Lee

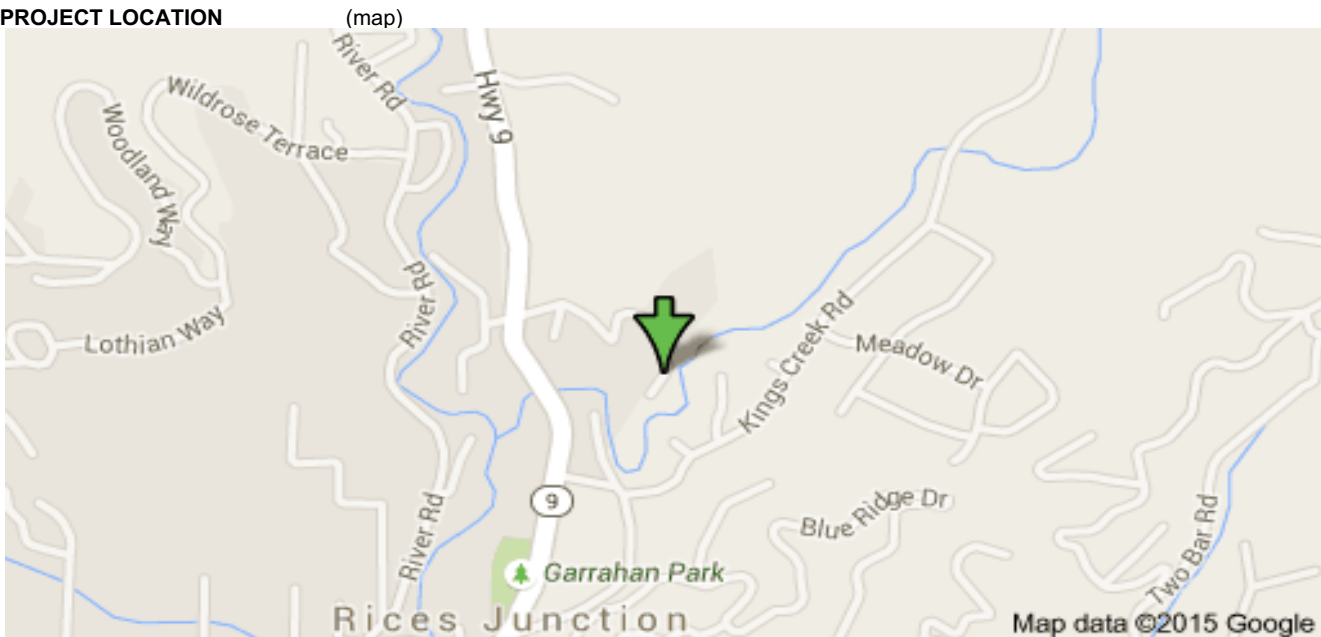
[blee@slvwd.com](mailto:blee@slvwd.com)

**PROJECT DESCRIPTION**

Construction of approximately 1,200 lineal feet of new 6-inch water main and appurtenances thereto. This project will replace the existing two-inch water main along Riverview Drive from Highway 9 to the Riverview Drive split. The project includes Highway 9 bore and jack crossing. Undersized water main is the source of intermittent low water pressure and inadequate fire flow capacity.

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION**





<b>Project Name</b>	<b>TwoBarRdPipe</b>
<b>Estimated Project Cost</b>	<b>\$450,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
<b>4</b>	20
<b>1</b>	5
<b>5</b>	20
<b>1</b>	4
<b>4</b>	16
<b>3</b>	9
<b>3</b>	9
<b>2</b>	6
<b>Final Score</b>	<b>89</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

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PROJECT: TWO BAR ROAD WATER DISTRIBUTION  
SYSTEM

PROGRAM: Water Supply - DISTRIBUTION

PRIORITY: 89

PROJECT No.

District Contact: Brian Lee  
[blee@slvwd.com](mailto:blee@slvwd.com)

**PROJECT DESCRIPTION**

Construction of approximately 3,000 lineal feet of new 8-inch water main and appurtenances thereto. This project will replace the existing 2-inch water main along Two Bar Road from approximately Redwood Christian Park to the end of the distribution system. Undersized water main is the source of intermittent low water pressure, interruption of water service, and inadequate fire flow capacity.

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION** (map)



<b>Project Name</b>	<b>OrmanRdPipe</b>
<b>Estimated Project Cost</b>	<b>\$300,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
<b>4</b>	20
<b>1</b>	5
<b>5</b>	20
<b>1</b>	4
<b>4</b>	16
<b>3</b>	9
<b>3</b>	9
<b>1</b>	3
<b>Final Score</b>	<b>86</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

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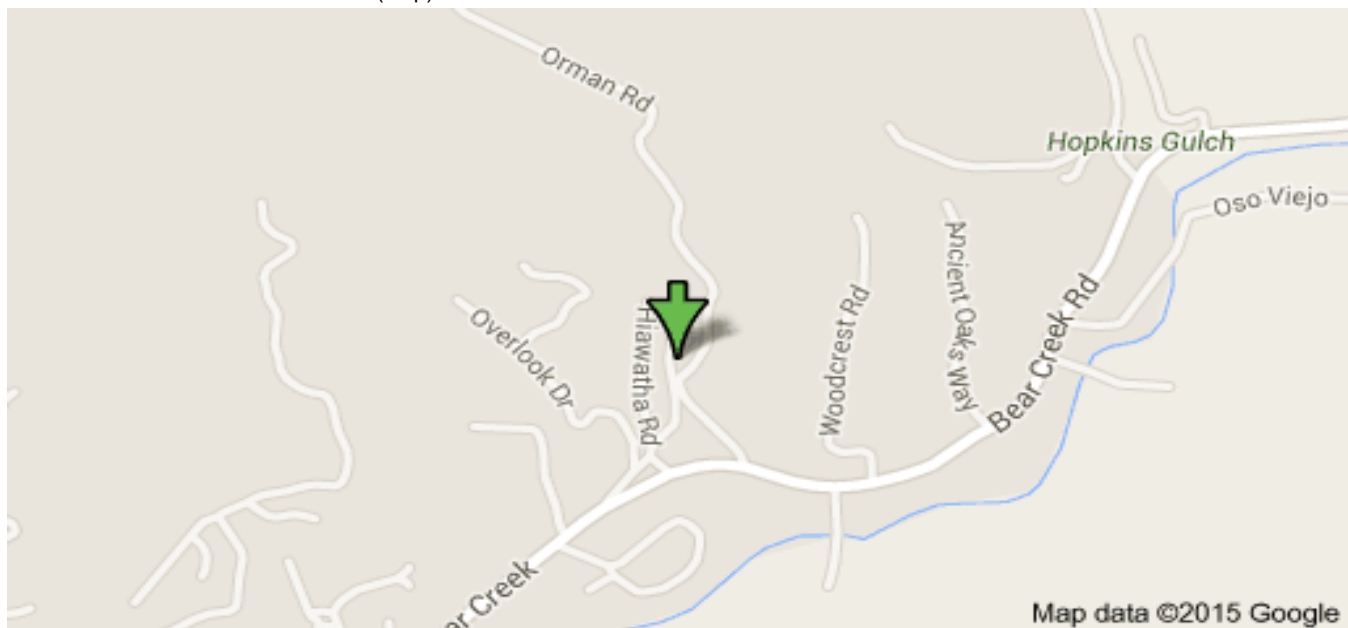
PROJECT: ORMAN ROAD WATER  
DISTRIBUTION SYSTEM  
PROGRAM: Water Supply - DISTRIBUTION  
SYSTEM  
PRIORITY: 86  
PROJECT No.  
District Contact: Brian Lee  
[blee@slvwd.com](mailto:blee@slvwd.com)

**PROJECT DESCRIPTION**

Construction of approximately 2,000 lineal feet of new 8-inch water main and appurtenances thereto. The project will replace the existing 2-inch and 1 ½-inch water main along Orman Road. Undersize water mains are the source of intermittent low water pressure, interruption of water service, and inadequate fire flow.

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION** (map)



<b>Project Name</b>	<b>CaliforniaDrPipe</b>
<b>Estimated Project Cost</b>	<b>\$240,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
1	5
1	5
5	20
1	4
4	16
4	12
3	9
2	6
<b>Final Score</b>	<b>77</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

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PROJECT: CALIFORNIA DRIVE WATER  
DISTRIBUTION SYSTEM  
PROGRAM: Water Supply - DISTRIBUTION  
SYSTEM  
PRIORITY: 77  
PROJECT No.  
District Contact: Brian Lee  
[blee@slvwd.com](mailto:blee@slvwd.com)

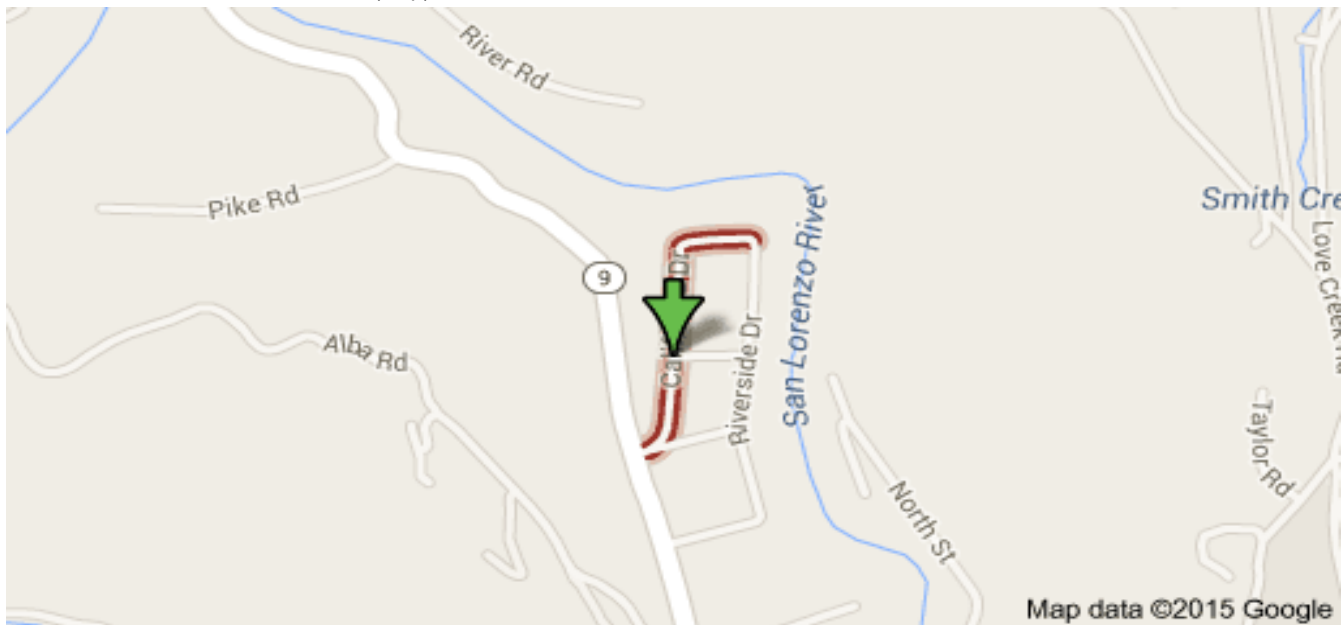
**PROJECT DESCRIPTION**

Construction of approximately 1,600 lineal feet of new 6-inch water main and appurtenances thereto. The project will replace the existing 2-inch water main along California Drive and Berkley way providing a loop system connecting into the existing 10-inch water main. Undersize water mains are the source of intermittent low water pressure, interruption of water service, and inadequate fire flow.

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION**

(map)



<b>Project Name</b>	<b>FallCreekFishLadder</b>
<b>Estimated Project Cost</b>	<b>\$800,000</b>

District Priorities	Priority	Rank				
		1	2	3	4	5
Risk of Failure/Hardship of Failure	5	No			Yes	
Water Supply Addition / Protection / Efficiency	5	No				Yes
Fire Service / Community Safety - Does this project improve fire service	4	No			Storage	Flow
Environmental Stewardship - Improve or 'fix' enviro issues	4	No			Yes	
Water Quality - Does this project protect / improve our water quality	4	No			Yes	
Estimated Cost	3	> \$1M	\$500k < x < \$1M	\$250k < x < \$500k	\$100K < x < \$250k	< \$100k
Cost Savings / Avoidance / ROI / Net Cost / Maintenance Costs / Frequency of Repair	3	No		Yes		
Population Served	3	< 50	50 < x < 250	250 < x < 500	500 < x < 1,000	> 1,000

Project Rank	Priority Score
<b>1</b>	5
<b>5</b>	25
<b>1</b>	4
<b>4</b>	16
<b>4</b>	16
<b>2</b>	6
<b>1</b>	3
<b>5</b>	15
<b>Final Score</b>	<b>90</b>

SAN LORENZO VALLEY WATER DISTRICT  
CAPITAL IMPROVEMENT PROPOSED PROJECTS LIST

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PROJECT: FALL CREEK DIVERSION FACILITY

PROGRAM: Water Supply - SOURCE

PRIORITY: 90

PROJECT No.

District Contact: Brian Lee

[blee@slvwd.com](mailto:blee@slvwd.com)



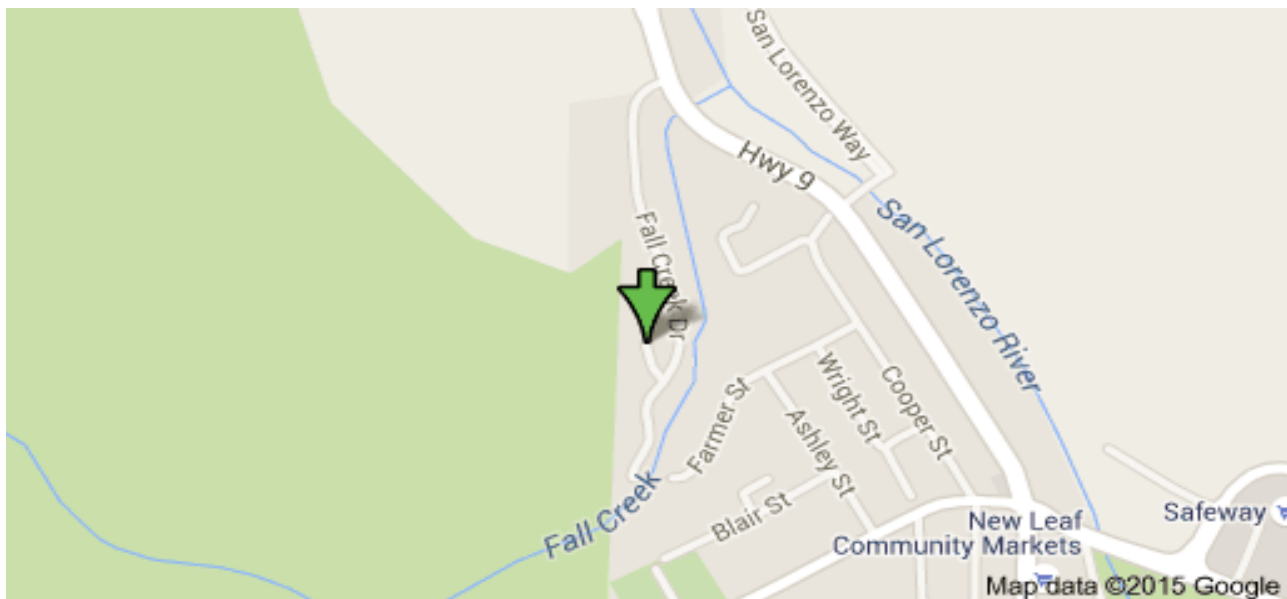
**PROJECT DESCRIPTION**

The Fall Creek Diversion Facility, located off Fall Creek Road in Felton, is part of the water system acquired by the District in 2007 from the California-American Water Company. This facility supplies raw water from Fall Creek to the Kirby Water Treatment Plant in Felton. The existing intake facilities consist of a concrete dam, two submersible pumps, and electrical supply. Currently, the downstream splash pans that protect the dam from erosion are in need of repair due to years of undermining from stream flows. In addition, the fish ladder is not in compliance with current fishery requirements and replacement is required.

- \* Bullit item 1
- \* Bullit item 2
- \* Bullit item 3

**PROJECT LOCATION**

(map)





**ASSESSMENT DISTRICT NO. 2016-01**  
**Lompico County Water District**  
**Santa Cruz County, State of California**  
**Engineer's Report**

**for**

**Assessment District No. 2016-01**  
**Merger with San Lorenzo Valley Water District**  
**Lompico County Water District**  
**County of Santa Cruz**

**Lompico County Water District Board of Directors**

President	Lois Henry
Vice President	Bill Smallman
Director	Rob Hansel
Director	Merrie Schaller
Director	John Schneider

Prepared by:

*Michael J. Freitas*

**Michael J. Freitas, RCE # 23345**  
**Freitas Plus Freitas Engineering and Planning Consultants, Inc.**  
**3233 Valencia Ave., Suite A1**  
**Aptos, California 95003**  
**831-688-1168**



Revised 3/22/16 to correct and add serviced parcels. No change in total costs. MJF

**Assessment District No. 2016-01  
Merger with San Lorenzo Valley Water District  
Lompico County Water District  
County of Santa Cruz**

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**FINAL ENGINEER'S REPORT  
and  
ASSESSMENT**

**Assessment District No. 2016-01  
Merger with San Lorenzo Valley Water District  
Lompico County Water District  
County of Santa Cruz**

The undersigned, pursuant to Resolution of Intention No. 2016-01 adopted by the Board of Directors of the Lompico County Water District, Felton, California, on January 16, 2019, has prepared a report pursuant to the Municipal Improvement Act of 1913, Division 12 (commencing with Section 10000) of the California Streets and Highways Code, and pursuant to Division 4, Part 7.5 (commencing with Section 2960) of the California Streets and Highways Code, applicable to the proposed improvement described in said Resolution of Intention, and hereby presents the report, containing all of the following:

(a) Plans and specifications of the proposed improvement describing the general nature, location and extent of the proposed improvement, and indicating the classes and types of improvements to be provided each zone;

(b) A general description of works or appliances already installed and any other property necessary or convenient for the operation of the improvement, if the works, appliances or property are to be acquired as part of the improvement and setting forth the acquisition of any or all capacity rights or rights of service and use in existing facilities;

(c) A statement of the itemized and total estimated cost and expenses of the acquisitions and improvements and of the incidental expenses in connection therewith, including the initial cost of the registration system for the bonds;

(d) A diagram showing, as they existed at the time of the adoption of the Resolution of Intention, all of the following:

- (1) The exterior boundaries of the assessment district,
- (2) The lines and dimensions of each parcel of land within the assessment district.

Each subdivision, including each separate condominium interest as defined by Section 783 of the California Civil Code, has been given a separate number upon the diagram. The diagram refers to the County of Santa Cruz Assessor's maps for a detailed description of the lines and dimensions of the parcels and such maps shall govern for all details concerning the lines and dimensions of the parcels. The diagram is accompanied by a list of the names of the owners of the various subdivisions as shown on the 2015-2016 County of Santa Cruz Assessment rolls or as otherwise known to the Secretary;

(e) A proposed assessment of the total amount of the cost and expenses of the proposed acquisitions and improvements upon the several subdivisions of land in said district in proportion to the estimated benefits to be received by each subdivision, respectively, from said acquisitions and improvements and a statement of the method by which the amount proposed to be assessed against each such subdivision has been determined. The assessment refers to the subdivisions by their respective numbers as assigned pursuant to subdivision. When any portion or percentage of the cost and expenses of the acquisitions and improvements is ordered to be paid out of the treasury of the District, pursuant to Section 10205 of the California Streets and Highways Code, the amount of that portion or percentage is first deducted from the total estimated cost and expenses of said acquisitions and improvements and includes only the remainder of the estimated cost and expenses. When different classes or types of improvements are to be provided for the separate subdivisions, the proposed assessment shows the portion thereof estimated for the classes or types to be provided each zone; and

(f) A proposed maximum annual assessment upon each of the several subdivisions of land in said district to pay costs incurred by the District and not otherwise reimbursed which result from the administration and collection of any assessments or from the administration or registration of any associated bonds and reserve or other related funds;

(g) The total amount, as nearly as may be determined, of the total principle sum of all unpaid special assessments and special assessments required or proposed to be levied under any completed or pending assessment proceedings, other than this assessment proceeding, which would require an investigation and report under Division 4 (commencing with Section 2800) of the California Streets and Highways Code, against the total area proposed to be assessed.

(h) The total true value, as nearly as may be determined, of the parcels of land and improvements which are proposed to be assessed, estimated as the full cash value of the parcels as shown upon the 2015-2016 assessment roll of Santa Cruz County, the last equalized such roll.

**NOW, THEREFORE, I, MICHAEL J. FREITAS**, of Freitas Plus Freitas Engineering and Planning Consultants, Inc., Engineer of Work for the Lompico County Water District, by virtue of the power vested in me under said Act and the order of the Board of Directors of the Lompico County Water District, hereby make the following assessment to cover the portion of the estimated cost of said acquisitions, work and improvements and the costs and expenses incidental thereto, to be paid by the assessment district.

The amount to be paid for said acquisitions, work and improvements and the expenses incidental thereto, is as follows:

					<b>1</b>	<b>2</b>	<b>3</b>
					<b>As</b>	<b>As</b>	<b>As</b>
					<b>Preliminarily</b>	<b>Finally</b>	<b>Modified</b>
					<b>Approved</b>	<b>Confirmed</b>	<b>After</b>
						<b>and Recorded</b>	<b>Recordation</b>
<b>Item</b>	<b>Description</b>						
<b>1</b>	<b>Construction Cost</b>				<b>\$ 2,750,000</b>	<b>\$ 2,750,000</b>	
<b>2</b>	<b>Incidental Costs</b>				<b>\$ 183,734</b>	<b>\$ 183,734</b>	
<b>Total Costs and Expenses</b>					<b>\$ 2,933,734</b>	<b>\$ 2,933,734</b>	
<b>Balance to Assessment</b>					<b>\$ 2,933,734</b>	<b>\$ 2,933,734</b>	

And I do hereby assess and apportion said portion of said total amount of the cost and expenses of said acquisitions, work and improvements upon the several lots, pieces or parcels or portions of lots or subdivisions of land liable therefor and benefited thereby and hereinafter numbered to correspond with the numbers upon the attached diagram, upon each, severally and respectively, in proportion to the benefits to be received by such subdivisions, respectively, from the acquisitions, work and improvements and as more particularly set forth as the respective amounts stated as the assessment in the list hereto attached and by this reference made a part hereof.

And I do hereby further assess and apportion upon each of said lots, pieces or parcels or portions liable therefor and benefited thereby, upon each, severally and respectively, in proportion to the benefits to be received by such subdivisions, respectively, from the administration and collection of assessments or from the administration or registration of any associated bonds and reserve or other related funds, and as more particularly set forth as the respective amounts stated as the annual administration assessment in the list hereto attached and by this reference made a part hereof. Said assessment is in a maximum amount, the portion of which to be charged each year being determined in accordance with an annual estimate of the costs.

As required by said Act, a diagram is hereto attached showing the assessment district and also the boundaries and dimensions of the respective subdivisions of land within said assessment district as the same existed at the time of the passage of said Resolution of Intention, each of which subdivisions has been given a separate number upon said diagram.

Said assessments are made upon the several subdivisions of land within said assessment district in proportion to the benefits estimated to be received by said subdivisions, respectively, from said acquisitions and improvements or the administration or registration of any associated bonds and reserve or other related funds, as the case may be. The diagram and assessment numbers appearing herein on said diagram, to which reference is hereby made for a more particular description of said property.

And, because the names of the several owners are unknown to me, said names are not set opposite the identification of each subdivision of land assessed. However, the diagram is accompanied by a list of the owners of the various subdivisions as shown by the 2015-2016 County of Santa Cruz assessment roll or as otherwise known to the Secretary. I hereby place the amount assessed thereon, the maximum annual administration assessment, and the number of the assessment. For a more

particular description of said property, reference is hereby made to the deeds and maps on file and of record in the office of the County Recorder of Santa Cruz County.

Notice is hereby given that payments to represent unpaid assessments, will be issued pursuant to said Resolution of Intention in the manner provided by the Improvement Bond Act of 1915, Division 10 (commencing with Section 8500) of the Streets and Highways Code, and the last installment of such payments shall mature in not to exceed 10 years from the second day of September next succeeding twelve months following their date or the date of any division thereof.

Under the Resolution of Intention, the requirement of Division 4 of the California Streets and Highway Code shall be satisfied with Part 7.5 of said Division 4, for which the following is presented:

1. The total amount, as near as can be determined, of the total principal amount of all unpaid special assessment and special assessments required or proposed to be levied under any completed or pending assessment proceedings, other than contemplated in the instant proceeding is:

\$0.00

2. The total amount of the principal sum of the special assessment (the "Balance of Assessment") proposed to levied in the instant proceedings is:

\$2,933,734

3. The total amount of the principal sum of unpaid special assessment levied against the parcels proposed to be assessed, as computed pursuant to paragraph 1, above, plus the principal amount of the special assessment proposed to be levied in the instant proceedings from paragraph 2, above is:

\$2,933,734

4. The total true value, as near as may be determined, of the parcel of land and improvements which are proposed to be assessed in the instant proceedings, as determined by the full cash value of the parcels as shown upon the last equalized assessment roll of the County of Santa Cruz is:

**\$109,978,642**

Dated: \_\_\_\_\_

By: *Michael J. Freitas*

**MICHAEL J. FREITAS**  
**RCE C23345**

**Freitas + Freitas Engineering and Planning Consultants, Inc.**  
**Engineer of Work**

I, the Secretary of the Lompico County Water District Board of Directors, hereby certify that the Preliminary Assessment and Preliminary Assessment Roll in this Engineers Report, in the amounts set forth herein, with the Assessment Diagram attached, was filed with me on \_\_\_\_\_ 2016.

\_\_\_\_\_  
Secretary of the Board  
Lompico County Water District

I, the Secretary of the Lompico County Water District, hereby certify that the foregoing assessment in the amounts set forth in Column (3) unless Column (3) is blank, in which event the amounts in Column (2) apply, with the diagram thereto attached, was approved and confirmed by the Board of Directors of Lompico County Water District on \_\_\_\_\_

\_\_\_\_\_  
Secretary of the Board  
Lompico County Water District

**EXHIBIT A**  
**Plans and Specifications**  
**Assessment District No. 2016-01**



**EXHIBIT B**  
**General Description of Acquired and Constructed Facilities**  
**Assessment District No. 2016-01**

The project consists of the following items:

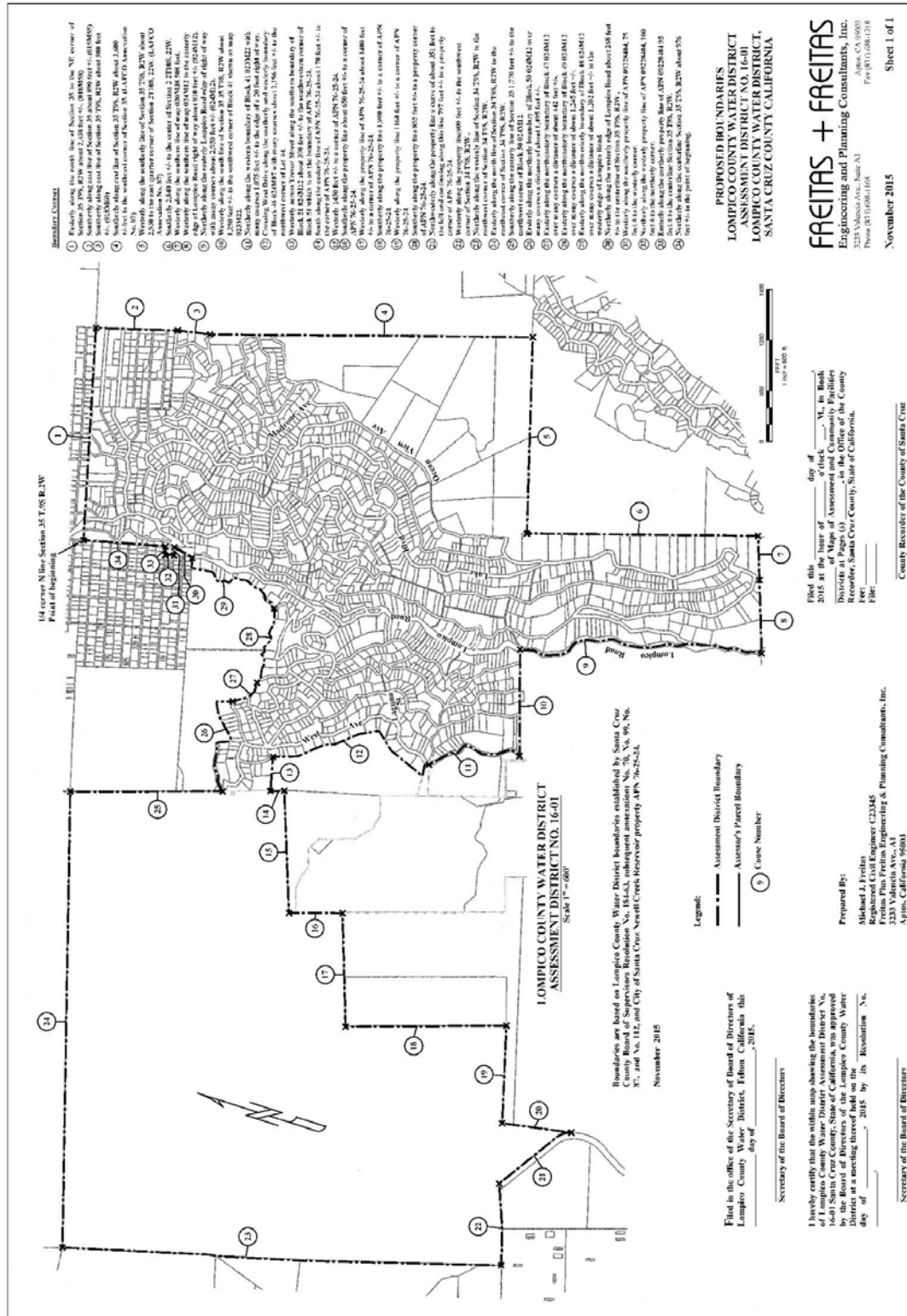
(a) The making of water system improvements, consisting generally of replacing 6 existing redwood storage tanks, installing treatment system improvements at Mill Creek facilities, replacing existing service lines and meters, completion of an interconnection of Lompico County Water District and San Lorenzo Valley Water District systems, installing a Supervisory Control and Data Acquisition System for operational automation and replacing existing pressure reducing stations and appurtenances. All work will be to the satisfaction of the District as shown on the drawings in complete working condition.

(b) The making of all acquisitions and the doing of all work auxiliary to any of the work, acquisitions and improvements previously described and that are necessary to complete the same.

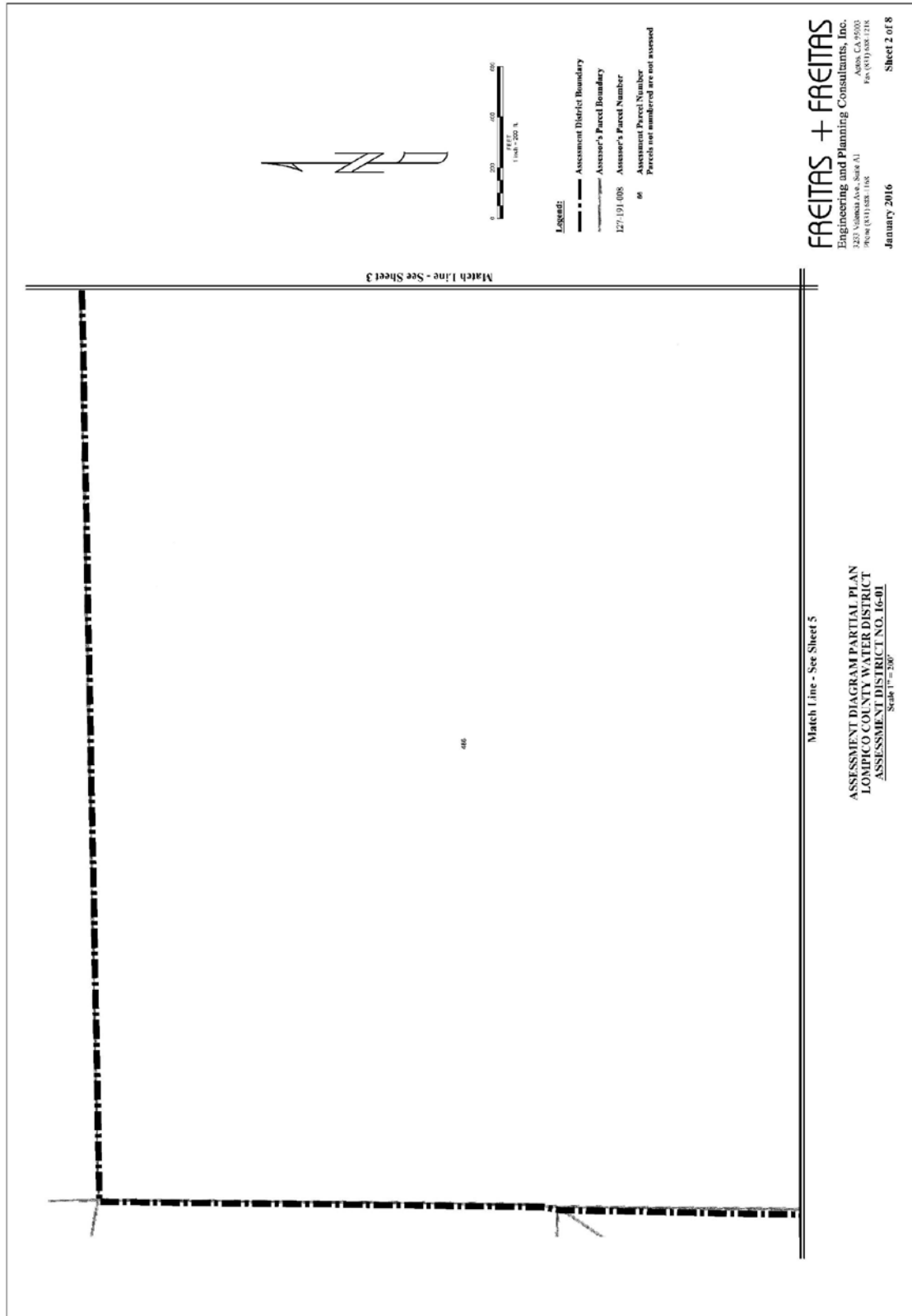
**EXHIBIT C**  
**Statement of Estimated Cost**  
**Assessment District No. 2016-01**

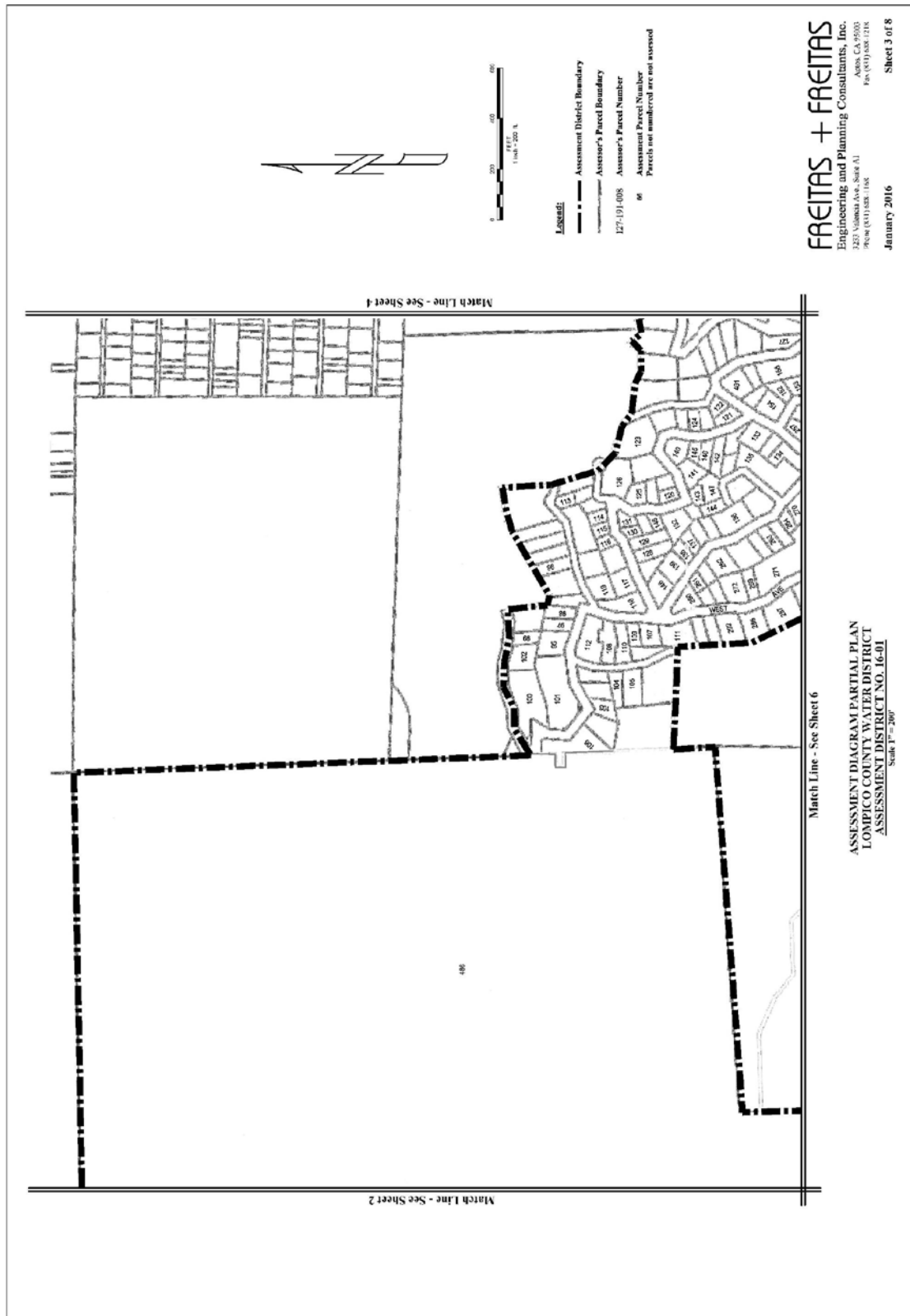
<b>Proposed Assessment District - Lompico Water District</b>				
<b>Number of Water Services Assessments</b>	<b>507</b>			
<b>Total Number of Assessments</b>	<b>507</b>			
<b>Projects Included</b>	<b>Project Total Costs</b>			
	<b>Quan.</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>Cost</b>
<b><u>Install 3 New Bolted Steel Tanks</u></b>				
Remove Existing Tank	5	ls	\$ 10,000	\$ 50,000
Clear and Grade Site	3	ls	\$ 15,000	\$ 45,000
Construct Concrete Ring Wall Foundation	200	cy	\$ 300	\$ 60,000
Install 125,000 gallon Bolted Steel Tank	2	ls	\$ 85,000	\$ 170,000
Install 245,000 gallon Bolted Steel Tank	1	ls	\$ 140,000	\$ 140,000
Repipe To Fill Tank	3	ls	\$ 7,500	\$ 22,500
<b>Construction Sub Total</b>				\$ 487,500
Construction Contingencies @10%				\$ 48,750
Surveying, Engineering and Design fees @ 15%				\$ 73,125
Construction Inspection @15%				\$ 73,125
<b>Total Budget Cost Install 3 New Bolted Steel Tanks</b>				<b>\$ 682,500</b>
<b><u>Refurbish Mill Creek WTP</u></b>				
Refurbish Mill Creek WTP	1	ls	\$ 75,000	\$ 75,000
<b>Construction Sub Total</b>				\$ 75,000
Construction Contingencies @10%				\$ 7,500
Surveying, Engineering and Design fees @ 15%				\$ 11,250
Construction Inspection @15%				\$ 11,250
<b>Total Budget Cost Refurbish Mill Creek WTP</b>				<b>\$ 105,000</b>
<b><u>Service Line and Meter Replacements</u></b>				
Replace Service Lines with New Meter	500	ea.	\$ 1,500	\$ 750,000
<b>Construction Sub Total</b>				\$ 750,000
Construction Contingencies @ 5%				\$ 37,500
Surveying, Engineering and Design fees @ 5%				\$ 37,500
Construction Inspection @ 5%				\$ 37,500
<b>Total Budget Cost Service Line and Meter Replacements</b>				<b>\$ 862,500</b>
<b><u>Distribution System Interconnection</u></b>				
6" Water Main Piping	1500	lf	\$ 90	\$ 135,000
6" Gate Valves	10	ea	\$ 3,000	\$ 30,000
Fire Hydrants	2	ea	\$ 5,000	\$ 10,000
Install 2nd pump and Starter	1	ea	\$ 15,000	\$ 15,000
Install engine generator	1	ea	\$ 25,000	\$ 25,000
<b>Construction Sub Total</b>				\$ 215,000
Construction Contingencies @ 10%				\$ 21,500
Surveying, Engineering and Design fees @ 15%				\$ 32,250
Construction Inspection @15%				\$ 32,250
<b>Total Budget Cost Distribution System Interconnection</b>				<b>\$ 301,000</b>
<b><u>SCADA System</u></b>				
Install RTU at Sites	6	ea.	\$ 40,000	\$ 240,000
Install Master Control Center	1	ea.	\$ 75,000	\$ 75,000
<b>Construction Sub Total</b>				\$ 315,000
Construction Contingencies @ 10%				\$ 31,500
Surveying, Engineering and Design fees @ 15%				\$ 47,250
Construction Inspection @ 5%				\$ 47,250
<b>Total Budget Cost SCADA System</b>				<b>\$ 441,000</b>
<b><u>Replace Existing PRV</u></b>				
Remove and Replace PRV	8	ea.	\$ 35,000	\$ 280,000
<b>Construction Sub Total</b>				\$ 280,000
Construction Contingencies @ 10%				\$ 28,000
Surveying, Engineering and Design fees @ 15%				\$ 42,000
Construction Inspection @15%				\$ 8,000
<b>Total Budget Cost Replace Existing PRV</b>				<b>\$ 358,000</b>
<b>Total Costs All Construction Items</b>				<b>\$ 2,750,000</b>
<b><u>Construction Related Costs</u></b>				
San Lorenzo Valley Water District Loan Interest (10 years, \$1,400,000,@ 2.5% interest)				\$ 183,734
<b>Total Construction Related Costs</b>				<b>\$ 183,734</b>
<b>ENGINEER'S ESTIMATE TOTAL COSTS</b>				<b>\$ 2,933,734</b>
<b>Number of Services</b>				<b>507</b>
<b>Proportionate Share (Cost/Number of Services)</b>				<b>\$ 5,786</b>
<b>Number of Years</b>				<b>10</b>
<b>Cost per year (not including collection costs under Appendix G of this Report)</b>				<b>\$ 579</b>

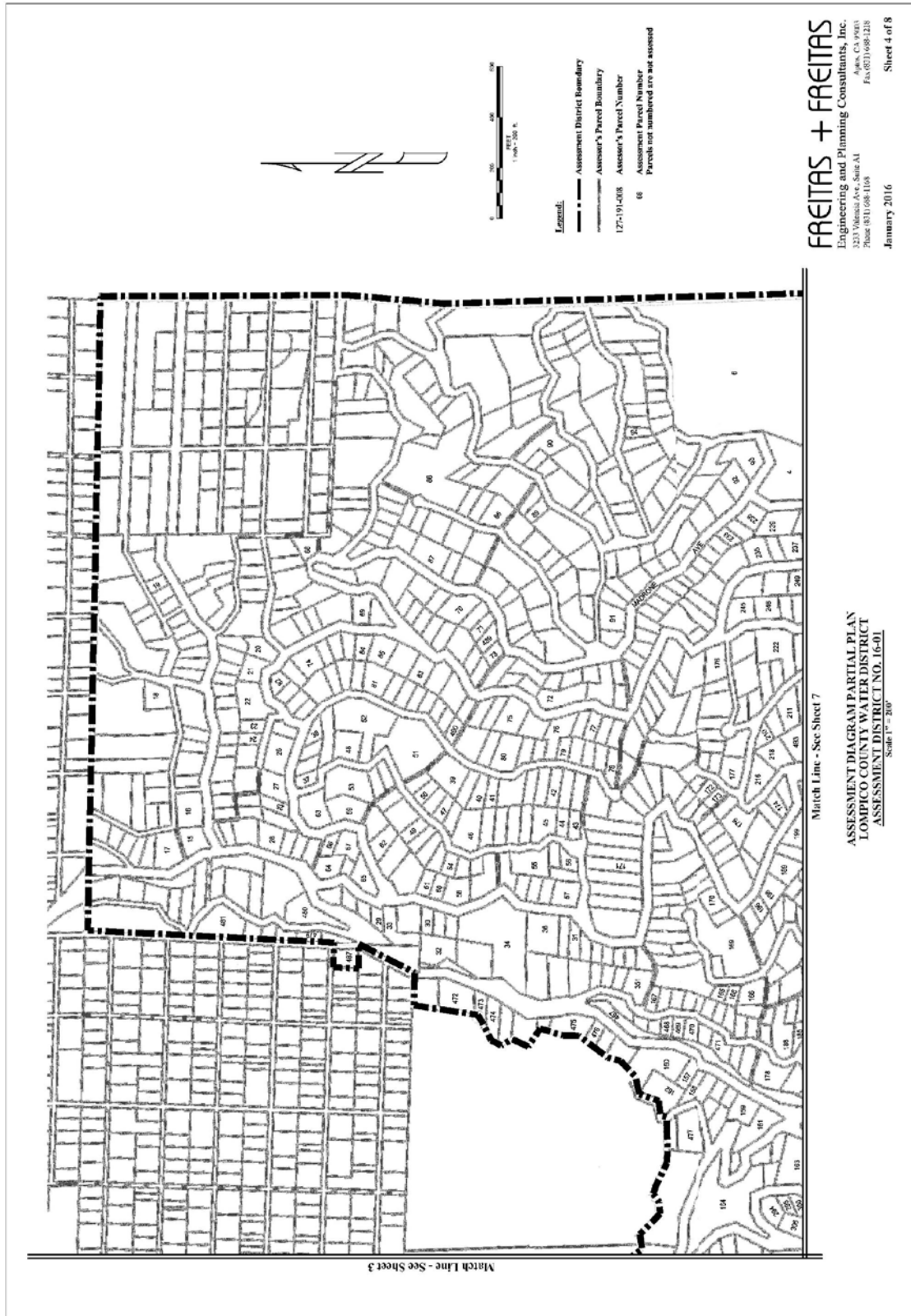
# **EXHIBIT D** **Boundary Map** **Assessment District No. 2016-01**



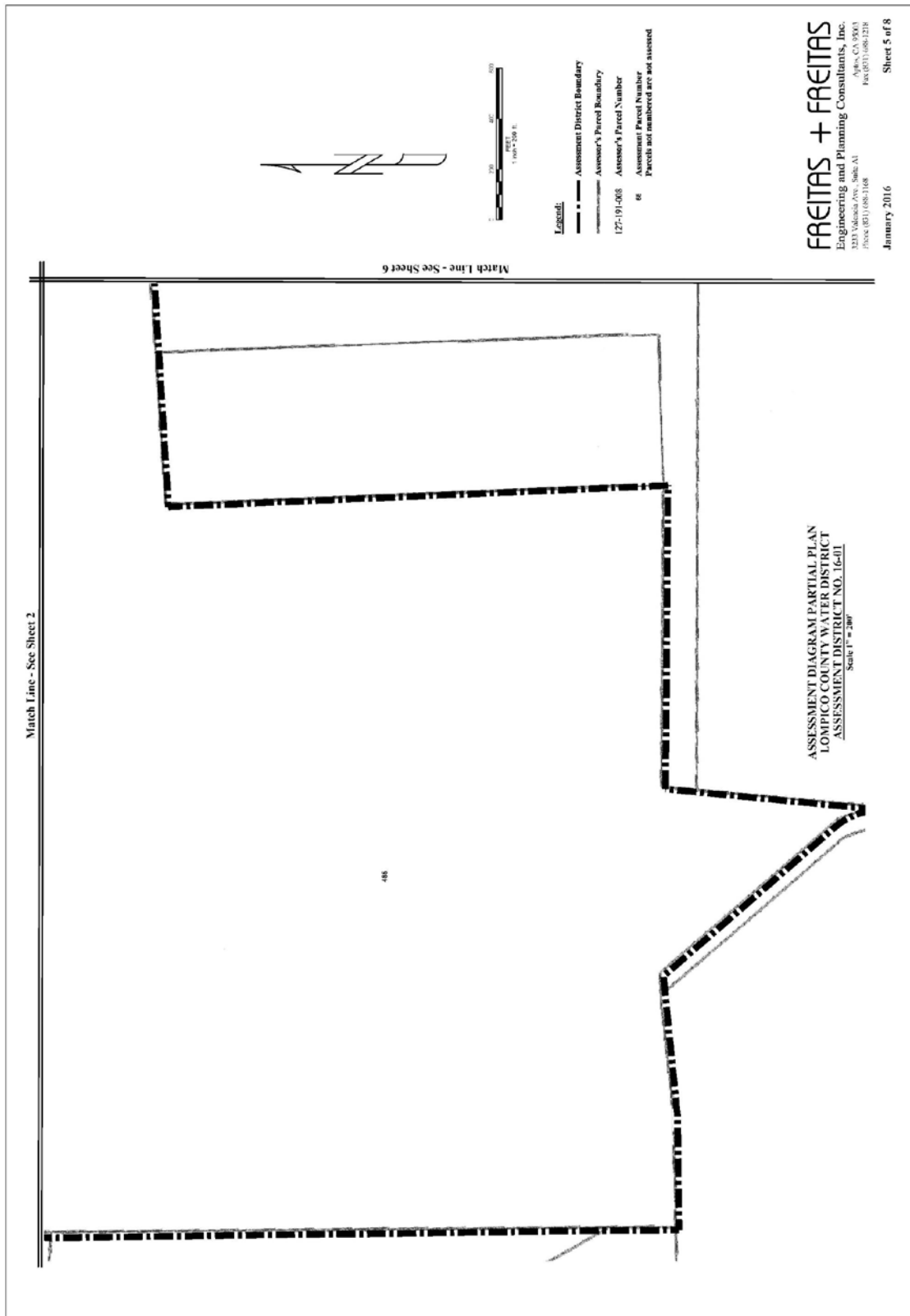


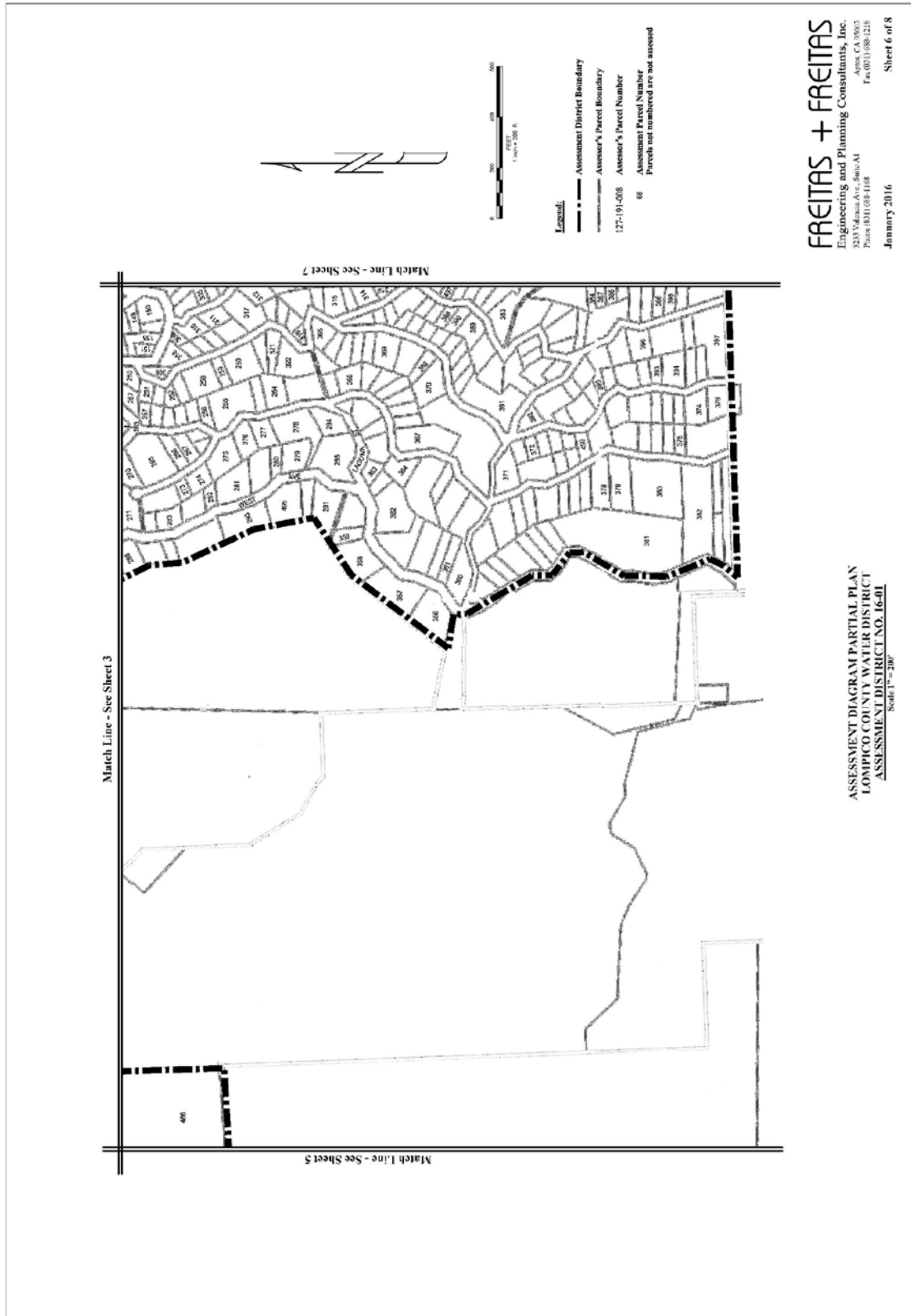


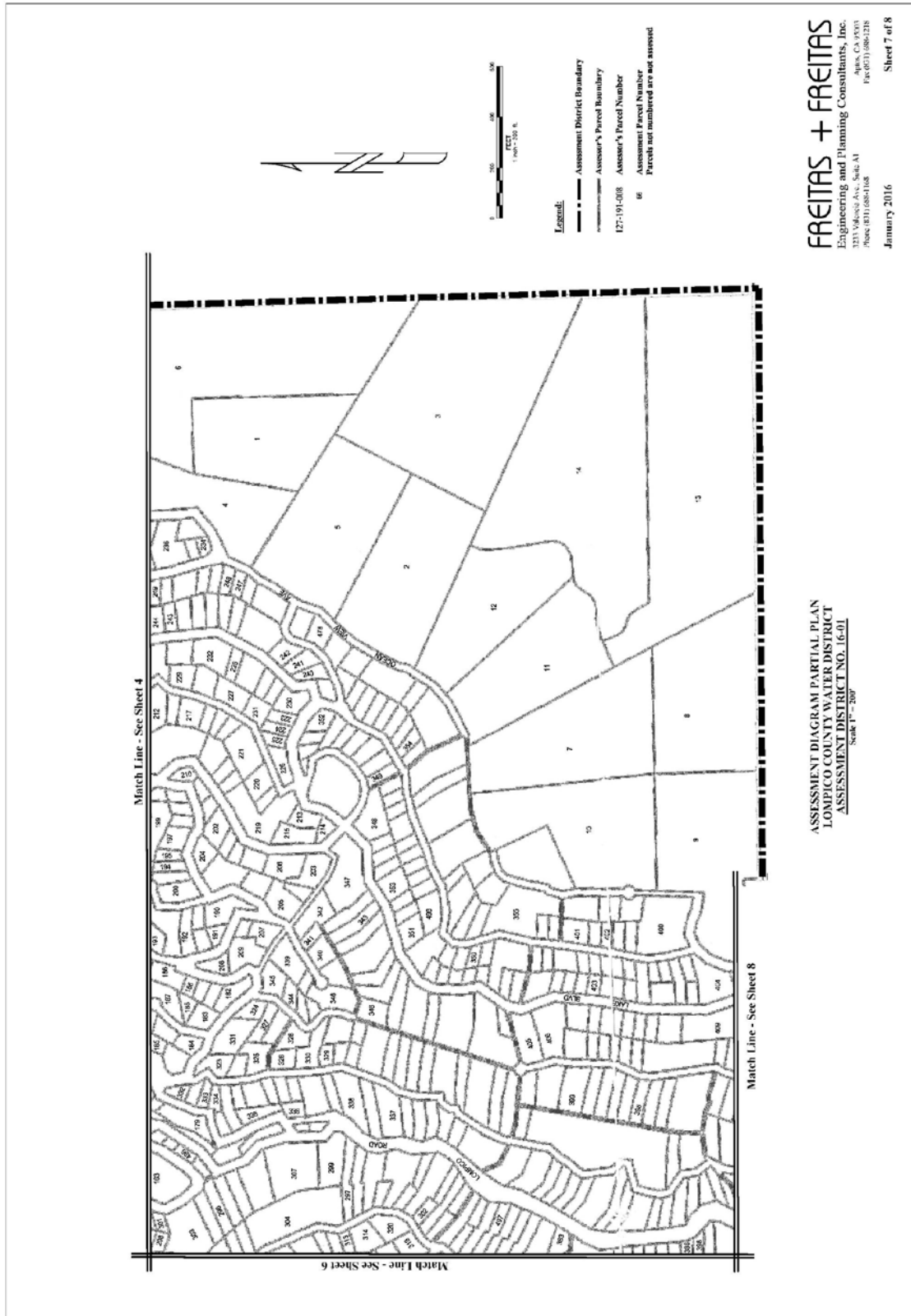


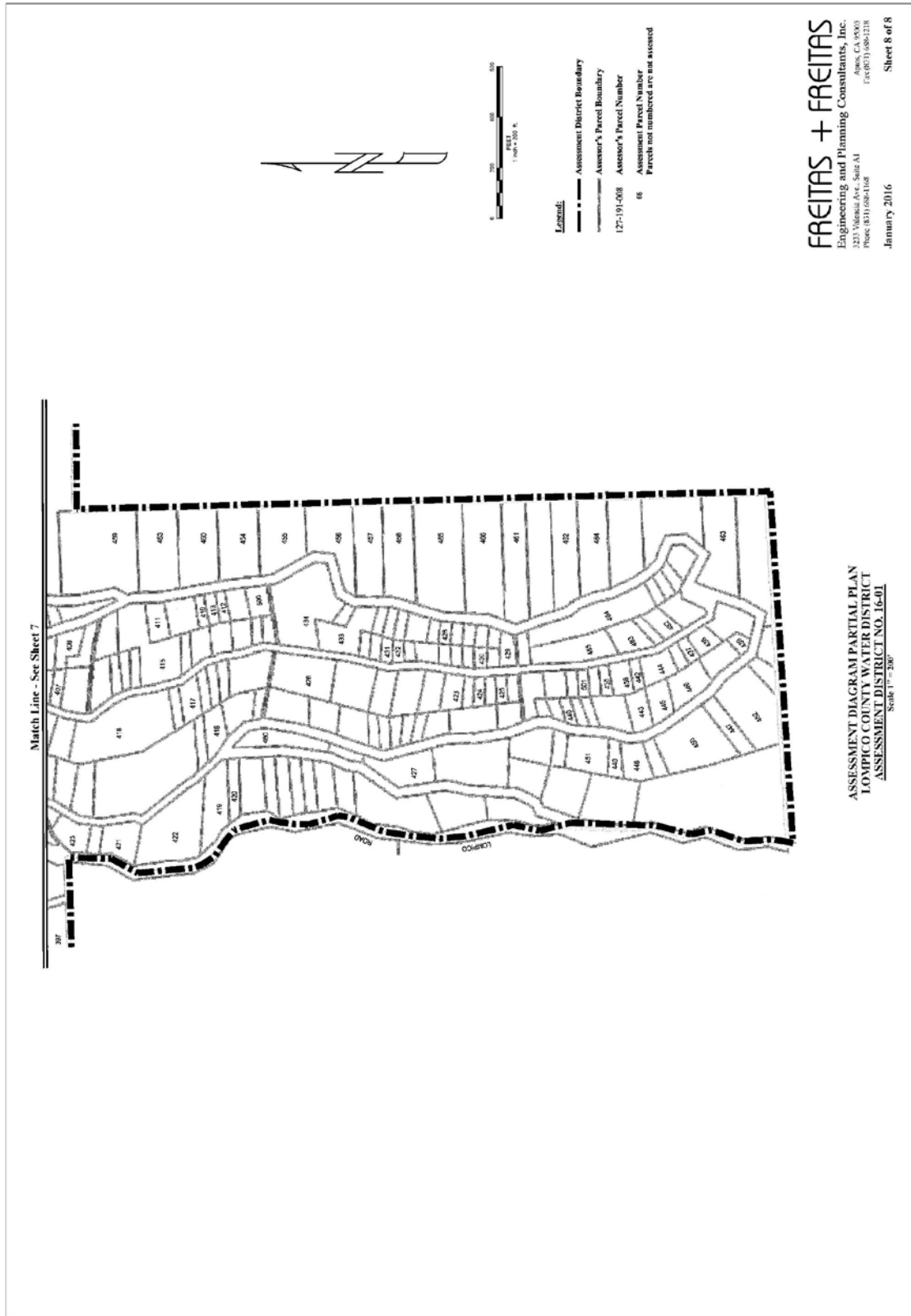












**EXHIBIT F**  
**Roll of Assessments**  
**Assessment District No. 2016-1**

**Rules of Assessment**

Please see **Appendix H** for Rules of Assessment and calculations for each parcel.

**Other Special Assessments**

There are no other special assessments against the parcels within the area to be assessed.

<u>Number</u>	<u>APN</u>	<u>Owner</u>	<u>Owner Address</u>	<u>Connections</u>	<u>Assessed Value</u>	<u>Assessment</u>
					-	
1	07425103	WYNN ROBERT C & DOREEN VENTURA H/W JT	P O BOX 1088, FELTON CA 95018	1	\$756,917	\$5,786
2	07425105	ERRECA JULIE ANN	11635 OCEANVIEW AVE, FELTON CA 95018	2	\$306,644	\$11,573
3	07425113	GOMES CATALINA SORIA U/W ETAL	P.O. BOX 456 BEN LOMOND CA 95005	1	\$48,698	\$5,786
4	07425114	TARBET MICHAEL W & PRIVA N H/W	11880 GLADYS AVE, FELTON CA 95018	1	\$124,258	\$5,786
5	07425115	JONES MATTHEW S & BRANDI A H/W CP RS	131 VALDEZ RD, FELTON CA 95018	1	\$535,667	\$5,786
6	07425116	HAGLER MARY J U/W JT ETAL	11865 CANYON VIEW AVE, FELTON CA 95018	2	\$506,449	\$11,573
7	07426105	HUNT BERNARR P & MUSI TRUSTEES	11309 OCEAN VIEW AVE, FELTON CA 95018	1	\$25,150	\$5,786
8	07426106	MC ISAAC WARREN K	11214 OCEAN VIEW AVE, FELTON CA 95018	1	\$185,537	\$5,786
9	07426107	ABRAHAM SHANNAR A & REBECCA H TRUSTEES	P O BOX 893, FELTON CA 95018	2	\$454,316	\$11,573
10	07426108	CUNLIFFE JOHN H/W ETAL JT	11333 OCEAN VIEW AVE, FELTON CA 95018	1	\$160,562	\$5,786
11	07426111	KILGUS CHRISTOPHER R II U/M	11455 OCEAN VIEW AVE, FELTON CA 95018	1	\$395,528	\$5,786
12	07426113	WALKER RUSSELL G & NANCY RENSTED H/W CP RS	11501 OCEAN VIEW AVE, FELTON CA 95018	1	\$282,669	\$5,786
13	7426115	HICKENBOTTOM TERESA	185 STARDUST LANE, FELTON CA 95018	1	\$63,998	\$5,786
14	07426116	BROOKS VICTOR & DEBBIE H/W JT	7546 ARDEN WAY, APTOS CA 95003	1	\$79,719	\$5,786
15	07501206	WEYZEN PETRUS H U/M	12300 LOMPICO RD, FELTON CA 95018	1	\$476,408	\$5,786
16	07501207	NAKAMOTO DAISHA L W/H CP RS ETAL	125 OLD MILL AVE, FELTON CA 95018	1	\$481,815	\$5,786
17	07501216	HAGEN NORMAN S & CAROL M H/W CP RS	12320 LOMPICO RD, FELTON CA 95018	1	\$293,476	\$5,786
18	07501314	DYNER CRAIG E & LAURA L H/W CP RS	551 8TH AVE, MENLO PARK CA 94025	1	\$204,922	\$5,786
19	07501408	HANSEN DAVID	329 OLD MILL AVE, FELTON CA 95018	1	\$226,945	\$5,786
20	07501618	KUBIK DOUGLAS A	12376 COLEMAN AVE, FELTON CA 95018	1	\$122,644	\$5,786
21	07501619	NELSON STACEY L	12386 COLEMAN AVE, FELTON CA 95018	1	\$322,518	\$5,786
22	07501620	COLLINS JEROMY D & WENDY M	12436 RETRATO ST, FELTON CA 95018	1	\$358,614	\$5,786
23	07501621	UPHAM ROBERT JOSEPH U/M	12444 RETRATO ST, FELTON CA 95018	1	\$154,350	\$5,786
24	07501623	KIRKHAM RICHARD C & ANTOINETTE M H/W JT	2785 CACTUS VIEW DR, RENO NV 89506	1	\$253,099	\$5,786
25	07501630	KEAHEY KRISTIN U/W	12506 COLMAN AVE, FELTON CA 95018	1	\$312,191	\$5,786
26	07501643	MASON DONALD L U/M	12467 RETRATO ST, FELTON CA 95018	1	\$217,384	\$5,786
27	07501648	PACHECO RAYMOND A	2500 DURANT AVE # 503, BERKELEY CA 94704	1	\$18,956	\$5,786
28	07501649	DRING STUART M/M	18435 ELGIN AVE, DOS PALOS CA 93620	1	\$67,932	\$5,786
29	07502104	BARKER JAMES E S/S	P O BOX 67364, SCOTTS VALLEY CA 95067	1	\$83,860	\$5,786
30	07502107	FISHER NEIL D & MARJORIE J TRUSTEES	698 GRAND VIEW AVE, SAN FRANCISCO CA 94114	1	\$42,254	\$5,786
31	07502118	ALEXANDER WILLIAM B JR & LAUREL M TRUSTEES	3147 DOMINIC DR, CASTRO VALLEY CA 94546	1	\$61,142	\$5,786
32	07502139	LB EQUITY GROUP LP	11064 LOMPICO RD FELTON CA 95018	1	\$107,165	\$5,786

33	07502140	HICKMAN LISA M U/W	3580 LAIRD ST, LOOMIS CA 95650	1	\$127,573	\$5,786
34	07502141	WHARTON SEAN MICHAEL	12255 LAKE BLVD, FELTON CA 95018	1	\$101,550	\$5,786
35	07502142	EMBERSON DAVID R JT ETAL	300 MOORE CREEK RD, SANTA CRUZ CA 95060	1	\$146,066	\$5,786
36	07502143	SMOLKA JOHN M S/M	12189 LAKE BLVD, FELTON CA 95018	1	\$332,998	\$5,786
37	07503101	KAWAMURA TORU U/M	12489 COLEMAN AVE, FELTON CA 95018	1	\$216,299	\$5,786
38	07503104	STOTT GRAHAM & BARBARA H/W AS JT ETAL	12431 LA LENA ST, FELTON CA 95018	1	\$275,032	\$5,786
39	07503111	WAGNER GARY C & MARGARET CO-TRUSTEES	P O BOX 1563, FELTON CA 95018	1	\$120,766	\$5,786
40	07503113	MURPHY RACHEL & PHILIP H H/W JT	12269 LA LENA ST, FELTON CA 95018	1	\$187,981	\$5,786
41	07503114	BARON JAMES P & JULIE M H/W JT	12259 LA LENA ST, FELTON CA 95018	1	\$73,237	\$5,786
42	07503118	BARRATT GORDON	12211 LA LENA, FELTON CA 95018	1	\$183,275	\$5,786
43	07503121	MOYERS CHRIS C	PO BOX 4039, FELTON CA 95018	1	\$186,479	\$5,786
44	07503122	THOMAS PETER R & DONNA S TRUSTEES ETAL	260 15TH AVE, SANTA CRUZ CA 95062	1	\$112,871	\$5,786
45	07503123	O'HAGAN CEVIN & MEGHAN WHITE	24 ZAPPA CT, FELTON CA 95018	1	\$283,944	\$5,786
46	07503127	LARSON DENNIS D & DONNA M JT	12300 JUNTAR ST, FELTON CA 95018	1	\$122,614	\$5,786
47	07503138	BRADLEY JOHN F U/M	12330 JUNTAR ST, FELTON CA 95018	1	\$203,392	\$5,786
48	07503144	HUNTER MARQUES W H/W JT ETAL	12450 JUNTAR ST, FELTON CA 95018	1	\$262,134	\$5,786
49	07503145	BRADLEY JOHN F S/M	12330 JUNTAR ST, FELTON CA 95018	1	\$71,032	\$5,786
50	07503146	DUFEEK K BROOKE TRUSTEE	12350 JUNTAR ST, FELTON CA 95018	1	\$91,942	\$5,786
51	07503149	TRUE DORIS M SUCC TRUSTEE ETAL	415 PALO ALTO AVE., MT VIEW CA 94041	1	\$232,506	\$5,786
52	07503150	SMITH BRADFORD H & MAGGIE TRUSTEES	12379 LA LENA ST, FELTON CA 95018	1	\$437,592	\$5,786
53	07503202	WORSTELL GLEN & SUZANNE TRUSTEES	12435 JUNTAR ST, FELTON CA 95018	1	\$247,242	\$5,786
54	07503211	STEITZ LENORE D M/W SS	12313 JUNTAR ST, FELTON CA 95018	1	\$332,253	\$5,786
55	07503216	BLAND JOHN	25 ZAPPA CT, FELTON CA 95018	1	\$333,900	\$5,786
56	07503218	TAI RICHARD M S/M	9 ZAPPA CT, FELTON CA 95018	1	\$309,283	\$5,786
57	07503220	MORGAN LILIAN A	P O BOX 1118, FELTON CA 95018	1	\$46,641	\$5,786
58	07503226	HERTING JUSTIN M/M SS	12264 LAKE BLVD, FELTON CA 95018	1	\$155,103	\$5,786
59	07503229	LAUREANO JOHN A	12561 COLEMAN AVE, FELTON CA 95018	1	\$94,822	\$5,786
60	07503232	KAVANAUGH THOMAS J & DIANE W	12278 LAKE BLVD, FELTON CA 95018	1	\$253,975	\$5,786
61	07503234	MARTINEZ SARAH	12290 LAKE BLVD, FELTON CA 95018	1	\$237,238	\$5,786
62	07503237	HARMAN DAWNE M U/W JT ETAL	12959 COLEMAN AVE, FELTON CA 95018	1	\$404,282	\$5,786
63	07503241	MILGRAM R JAMES & JUDITH A H/W CP RS	405 BLOOM GRADE RD, BOULDER CREEK CA 95006	1	\$261,275	\$5,786
64	07503302	CASTELLI GENE J & MARYL L H/W CP RS	12370 LAKE BLVD, FELTON CA 95018	1	\$21,451	\$5,786
65	07503304	SHORT BENJAMIN S/M AS JT ETAL	12600 COLEMAN AVE, FELTON CA 95018	1	\$300,730	\$5,786

66	07503305	BERNSTEIN JANE M/W SS	12546 COLEMAN AVE, FELTON CA 95018	1	\$459,981	\$5,786
67	07503306	COX PAUL U/M	12584 COLEMAN AVE, FELTON CA 95018	1	\$227,123	\$5,786
68	07504101	GOTT SHERWIN J W & CHERYL H/W JT	12364 VOLVER AVE, FELTON CA 95018	1	\$426,286	\$5,786
69	07504114	SULLIVAN DONALD V & PATRICIA G H/W JT	P O BOX 23, FELTON CA 95018	1	\$214,032	\$5,786
70	07504206	MOORE BRIAN U/M	12231 VOLVER AVE, FELTON CA 95018	1	\$188,117	\$5,786
71	07504208	POWELL JULIA	12235 VOLVER AVE, FELTON CA 95018	1	\$214,144	\$5,786
72	07504219	BATES ASTA M U/W	P O BOX 165, FELTON CA 95018	1	\$83,663	\$5,786
73	07504234	KAMP AMY W/H JT ETAL	12173 VOLVER AVE, FELTON CA 95018	1	\$323,864	\$5,786
74	07504303	COOPER STEPHEN	P.O. BOX 67416 SCOTTS VALLEY CA 95067	1	\$4,326	\$5,786
75	07504316	CALDWELL BRANDEN SCOTT & TAMARA CATHERINE H/W CP	12151 COLEMAN AVE, FELTON CA 95018	1	\$217,797	\$5,786
76	07504318	BIDMON JEFFREY R & EVELYN M	12111 COLEMAN AVE, FELTON CA 95018	1	\$87,540	\$5,786
77	07504320	NELSON JONATHAN A & DONNA L H/W CP	12089 COLEMAN AVE, FELTON CA 95018	1	\$344,790	\$5,786
78	07504322	GUIDO JOSEPH L S/M	PO BOX 1081, SOQUEL CA 95073	1	\$82,564	\$5,786
79	07504326	DANENHAUER BRYCE	12212 LA LENA ST, FELTON CA 95018	1	\$273,563	\$5,786
80	07504329	QUIGLEY ELLEN M U/W	12256 LA LENA ST, FELTON CA 95018	1	\$310,458	\$5,786
81	07504339	BIRD WILLIAM J S/M ETAL	12384 LA LENA ST, FELTON CA 95018	1	\$273,228	\$5,786
82	07504347	SHAW RUTH TC ETAL	12385 COLEMAN AVE, FELTON CA 95018	1	\$280,681	\$5,786
83	07504351	CRITTENDEN APRIL S/W	12245 COLEMAN AVE, FELTON CA 95018	1	\$200,989	\$5,786
84	07504357	WYMAN VICTOR M	3215 BENTON ST, SANTA CLARA CA 95051	1	\$103,438	\$5,786
85	07504358	GREENSPON JACK & LYNOL E H/W JT	12291 COLEMAN AVE, FELTON CA 95018	1	\$146,437	\$5,786
86	07505313	YRUEL SERGIO	PO BOX 1557, FELTON CA 95018	1	\$423,057	\$5,786
87	07505325	SHULTZ MICHAEL W & KAREN A JT	12270 VOLVER RD, FELTON CA 95018	1	\$59,174	\$5,786
88	07505344	WENGER LINDA	12265 MADRONE AVE, FELTON CA 95018	1	\$443,628	\$5,786
89	07506205	BELLEMORE BRIAN H & KELLY C H/W JT	12175 MADRONE AVE, FELTON CA 95018	1	\$293,402	\$5,786
90	07506319	WHITE KEVIN U/M	787 ESTATES DR, APTOS CA 95003	1	\$57,218	\$5,786
91	07507118	GRUNOW J H & FRANKLIN S R JT	12040 MADRONE AVE, FELTON CA 95018	1	\$65,292	\$5,786
92	07507120	GARDNER PAMELA J TRUSTEE	11900 UPPER VOLVER AVE, FELTON CA 95018	1	\$197,524	\$5,786
93	07507121	HARRIS KATHARINE U/W JT ETAL	11860 CANYON VIEW AVE, FELTON CA 95018	1	\$285,183	\$5,786
94	07507324	JONES GAIL U/W JT ETAL	12445 WHILAWAY AVE, FELTON CA 95018	1	\$155,472	\$5,786
95	07508108	NICHOLS RICHARD EARL & MARGARET ANNE GREEN H/W J	10982 SEQUOIA AVE, FELTON CA 95018	1	\$120,122	\$5,786
96	07508112	LYNCH LOIS F U/W	558 PORTOLA WAY, FELTON CA 95018	1	\$176,441	\$5,786



97	07508116	SNYDER TAMMY U/W	10974 SEQUOIA AVE, FELTON CA 95018	1	\$281,486	\$5,786
98	07508117	NEUMEIER-PROVINS KATHERINE TRUSTEE	2012 THRUSH CT, LODI CA 95240	1	\$41,510	\$5,786
99	07508125	GONZALEZ TONY	625 SEQUOIA AVE FELTON CA 95018	1	\$267,000	\$5,786
100	07508131	MICHAELS GLENN & MIRANDA H/W CP RS	1184 SEQUOIA AVE, FELTON CA 95018	2	\$596,163	\$11,573
101	07508132	GRAVES SCOTT	11000 SEQUOIA AVE, FELTON CA 95018	1	\$489,597	\$5,786
102	07508133	MILLER DREW THOMAS U/M	645 SEQUOIA AVE FELTON CA 95018	1	\$95,274	\$5,786
103	07508210	HUELIN MELISSA A U/W	11033 SEQUOIA AVE, FELTON CA 95018	1	\$159,431	\$5,786
104	07508211	WHITE HUELIN TERESA	10939 TREVOR ST, FELTON CA 95018	1	\$210,648	\$5,786
105	07508212	CARSON DANIEL JOSEPH & JEAN MARIE H/W CP RS	10929 TREVOR ST, FELTON CA 95018	1	\$268,632	\$5,786
106	07508213	JESTER C ANNETTE & TIMOTHY EARL W/H JT	11101 SEQUOIA AVE, FELTON CA 95018	1	\$182,610	\$5,786
107	07508305	FORD BENJAMIN ALLEN	1090 SEQUOIA AVE FELTON CA 95018	1	\$235,660	\$5,786
108	07508308	SANDERS LARRY T & JANET L H/W JT	10940 SEQUOIA AVE, FELTON CA 95018	1	\$130,607	\$5,786
109	07508314	MIDDAUGH JEANETTE R TRUSTEE	10931 SEQUOIA AVE, FELTON CA 95018	1	\$248,450	\$5,786
110	07508319	FULTON MARC S & DORCAS C H/W CP RS	10937 SEQUOIA AVE, FELTON CA 95018	1	\$358,614	\$5,786
111	07508320	BODSKY NICHOLAS	10897 WEST DR, FELTON CA 95018	2	\$386,209	\$11,573
112	07508321	RANGEL URIEL & SALLI H/W JT	10985 SEQUOIA AVE, FELTON CA 95018	1	\$370,089	\$5,786
113	07508405	STRUDLEY ALEX J	511 PORTOLA WAY, FELTON CA 95018	1	\$267,936	\$5,786
114	07508409	CARNEY JAMES E & JOANNE T CP	784 TRINKLING CREEK, FELTON CA 95018	1	\$18,942	\$5,786
115	07508410	HALL MATTHEW H/W CP RS ETAL	794 TRINKLING CREEK DR, FELTON CA 95018	1	\$378,596	\$5,786
116	07508411	POTTER JERE U/M	804 TRINKLING CREEK DR, FELTON CA 95018	1	\$436,325	\$5,786
117	07508413	NORTON ANTOINETTE M & PETER W/H JT	844 TRINKLING CREEK DR, FELTON CA 95018	1	\$325,584	\$5,786
118	07508414	RAY LYNN S	200 HERNANDEZ AVE LOS GATOS CA 95030	1	\$26,500	\$5,786
119	07508415	MOREHOUSE MICHAEL J & MARILYN R H/W JT	3020 BRIDGEWAY 417, SAUSALITO CA 94965	1	\$358,067	\$5,786
120	07509102	HOBBS RICHARD W U/M ETAL ALL JT	962 SHERMAN OAKS DR, SAN JOSE CA 95128	1	\$150,790	\$5,786
121	07509114	TARBET JESSICA & IAIN W/H CP RS	555 WINIFRED WAY, FELTON CA 95018	1	\$271,832	\$5,786
122	07509116	SMITH DARRYL S/M	559 WINIFRED WAY, FELTON CA 95018	1	\$283,733	\$5,786
123	07509118	DAPONT KITTRICK S/M	575 WINIFRED WAY, FELTON CA 95018	1	\$73,075	\$5,786
124	07509120	MAY SANDRA U/W AS JT ETAL	565 WINIFRED WAY, FELTON CA 95018	1	\$227,640	\$5,786
125	07509121	MANNAS STEVE S/M	754 TRINKLING CREEK DR, FELTON CA 95018	1	\$190,104	\$5,786
126	07509122	BOLAND	774 TRINKLING CREEK DR, FELTON CA 95018	1	\$330,126	\$5,786
127	07509201	DWYER MICHAEL K & JULIE ANN H/W JT	P O BOX 91, FELTON CA 95018	1	\$68,214	\$5,786
128	07509302	MEYER LAUREN & ANDREW	825 TRINKLING CREEK DR, FELTON CA 95018	1	\$401,659	\$5,786

129	07509303	TAPIA JUAN H/W ETAL JT	815 TRINKLING CREEK DR, FELTON CA 95018	1	\$96,452	\$5,786
130	07509304	WINSLOW GEORGE C & ANGELA T H/W JT	75 ROBAK DR, WATSONVILLE CA 95076	1	\$121,755	\$5,786
131	07509305	BRADLEY MARTEN U/M	761 TRINKLING CREEK DR FELTON CA 95018	1	\$191,602	\$5,786
132	07509307	DAVIS DUANE R & SHIRLEY R H/W CP RS	606 WEST DR, FELTON CA 95018	1	\$222,250	\$5,786
133	07509312	ZAVALA RAY & NATASHA H/W CP	460 WEST DR, FELTON CA 95018	1	\$177,969	\$5,786
134	07509314	SULLIVAN MELISSA ANN S/W	520 WEST DR, FELTON CA 95018	1	\$316,668	\$5,786
135	07509315	ASHLEY SANDON & BRENDALIN H/W CP	540 WEST DR, FELTON CA 95018	2	\$248,280	\$11,573
136	07509318	BINNING MANGINDER U/M	596 WEST DR, FELTON CA 95018	1	\$362,977	\$5,786
137	07509321	WARMBOE DOUGLAS & SHARON P H/W CP RS	207 PRAGUE ST, SAN MATEO CA 94401	1	\$320,819	\$5,786
138	07509322	WATSON DEAN JAMES	8941 SYLVAN WAY FELTON CA 95018	1	\$57,991	\$5,786
139	07509323	FLYNN BILL E H/W CP ETAL	662 WEST DR, FELTON CA 95018	1	\$235,162	\$5,786
140	07509343	RICH BRYAN	645 TRINKLING CREEK DR, FELTON CA 95018	1	\$79,200	\$5,786
141	07509330	REYES PEDRO	701 TRINKLING CREEK DR, FELTON CA 95018	1	\$207,404	\$5,786
142	07509331	STUBBS MARK A U/P	615 TRINKLING CREEK, FELTON CA 95018	1	\$247,926	\$5,786
143	07509333	TICKLE TERESA U/W	715 TRINKLING CREEK DR, FELTON CA 95018	1	\$292,636	\$5,786
144	07509334	HASKINS STEPHEN R U/M	620 KNOLL WAY, FELTON CA 95018	1	\$354,841	\$5,786
145	07509338	HANE TATSUO	635 TRINKLING CREEK DR, FELTON CA 95018	1	\$83,428	\$5,786
146	07509340	GEORGE CLIFTON T U/M	460 MARIGOLD AVE, FREEDOM CA 95019	1	\$91,158	\$5,786
147	07509341	CHANDLER TIMOTHY J U/M	614 KNOLL WAY, FELTON CA 95018	1	\$125,939	\$5,786
148	07509342	MARLER CYNTHIA B & DANIEL P H/W JT	676 WEST DR, FELTON CA 95018	1	\$231,662	\$5,786
149	07509404	MACIEL ERIC ALAN	315 WEST DRIVE, FELTON CA 95018	1	\$328,674	\$5,786
150	07509405	PRIOR BRUCE U/M	3082 ADAMS WAY, SANTA CLARA CA 95051	1	\$323,394	\$5,786
151	07509408	BOWEN HERBERT E II & LAURA B H/W CP	404 WEST DR, FELTON CA 95018	1	\$191,815	\$5,786
152	07509410	SCHALIN JAMES	430 WEST DR, FELTON CA 95018	1	\$382,493	\$5,786
153	07509413	ZIZZO STEVEN & DAWN H/W JT	424 WEST DR, FELTON CA 95018	1	\$349,288	\$5,786
154	07509415	LE MIEUX JOHN U/M	444 WEST DR, FELTON CA 95018	1	\$370,176	\$5,786
155	07509417	WINTRODE DIANA L U/W	900 RODEO RD, FULLERTON CA 92835	1	\$306,925	\$5,786
156	07509422	GRUNWALD BERTRAND R U/M SS	P O BOX 440, CARNELIAN BAY CA 96140	1	\$51,488	\$5,786
157	07510214	TICE KELLY S/W	354 LENORE WAY, FELTON CA 95018	1	\$279,667	\$5,786
158	07510217	LAUGESSEN AMELIA	10837 LOMPICO RD, FELTON CA 95018	1	\$160,730	\$5,786
159	07510223	MC COOEY JACK V U/M	P O BOX 687, FELTON CA 95018	1	\$200,732	\$5,786
160	07510229	SWEDMARK MEGAN & KENNETH DAVID W/H CP RS	P O BOX 1517, FELTON CA 95018	1	\$282,177	\$5,786

161	07510231	BERRY ELAINE DIANE	10775 LOMPICO RD, FELTON CA 95018	1	\$48,735	\$5,786
162	07510232	JESSUP WESLEY G H/W JT ETAL	340 LENORE WAY, FELTON CA 95018	1	\$244,261	\$5,786
163	07510303	MAXSON MARIANNE	136 WEST DR, FELTON CA 95018	1	\$312,222	\$5,786
164	07510310	KUEHNE MARTA S/W	219 LENORE WAY # A, FELTON CA 95018	2	\$414,241	\$11,573
165	07511118	BELL ROBERT JR TRUSTEES ETAL	567 BUCKEYE ST FELTON CA 95018	1	\$127,340	\$5,786
166	07511119	NICHOLS DIANE A A U/W	531 BUCKEYE ST, FELTON CA 95018	1	\$326,993	\$5,786
167	07511129	BROWN RUSSELL & JOANNE H/W CP RS	10830 CREEKWOOD DR, FELTON CA 95018	1	\$360,005	\$5,786
168	07511136	ROBERTSON RICHARD H/W JT ETAL	P O BOX 501, FELTON CA 95018	1	\$343,295	\$5,786
169	07511149	SNIDER FLOYD WILLIAMS H/W CP RS ETAL	510 BUCKEYE ST, FELTON CA 95018	1	\$483,318	\$5,786
170	07511150	LYNCH DENNIS B S/M	11891 LAKE BLVD, FELTON CA 95018	1	\$82,852	\$5,786
171	07511205	MOYERS CHRIS TRUSTEE	P O BOX 4039, FELTON CA 95018	1	\$128,741	\$5,786
172	07511217	HOWE MARK K & JENNIFER Y	11946 BIEDEAWEE WAY, FELTON CA 95018	1	\$298,482	\$5,786
173	07511218	GORDON GERALD C H/W ETAL JT	P O BOX 961, BEN LOMOND CA 95005	1	\$256,054	\$5,786
174	07511236	SNOW LAURA C TRUSTEE	P O BOX 273, FELTON CA 95018	1	\$110,473	\$5,786
175	07511240	BIDINIAN LARRY J TRUSTEE	11910 VAN ALLEN RD, FELTON CA 95018	1	\$290,187	\$5,786
176	07511308	SCHMIDT RAYMOND L	11949 LAKESHORE DR, FELTON CA 95018	1	\$121,672	\$5,786
177	07511319	SCHAMBECK SUSAN ANN TRUSTEE	11866 VAN ALLEN RD, FELTON CA 95018	1	\$179,698	\$5,786
178	07512101	SHAFFER RAY U/M ETAL	10715 CREEKWOOD DR, FELTON CA 95018	1	\$430,129	\$5,786
179	07512109	LOMPICO COMMUNITY CENTER	P O BOX 137, MT HERMON CA 95041	1	\$1,368	\$5,786
180	07512203	JOHNSON BARRY W	425 CARROL AVE, FELTON CA 95018	1	\$359,000	\$5,786
181	07512204	STOCKTON FRANK	417 CARROL AVE, FELTON CA 95018	1	\$96,000	\$5,786
182	07512206	FAWCETT WILLIAM A & JUDITH A TR	P O BOX 220, MT VIEW CA 94042	1	\$95,572	\$5,786
183	07512207	FLORES GREGOR U/M	330 LILAC ST, FELTON CA 95018	1	\$41,804	\$5,786
184	07512217	PENKOFF JOHN GEORGE & CHRISTI ANNA	4 PALM AVE, LOS GATOS CA 95030	1	\$68,411	\$5,786
185	07512219	MEIER MATT TRUSTEE	10700 CREEKWOOD DR, FELTON CA 95018	1	\$30,883	\$5,786
186	07512225	FLORES GREGOR U/M	330 LILAC ST, FELTON CA 95018	1	\$237,772	\$5,786
187	07512226	PETERSON JULIAN M	345 LILAC ST, FELTON CA 95018	1	\$158,941	\$5,786
188	07512227	FURNISH RICK	3367 CUNNISON LANE, SOQUEL CA 95073	1	\$125,907	\$5,786
189	07512305	HAWTHORNE BRADLEY R	P O BOX 476, FELTON CA 95018	1	\$71,761	\$5,786
190	07512323	HAMMAR ROBIN OWEN & MELISSA T H/W JT	555 CARROL AVE, FELTON CA 95018	1	\$258,805	\$5,786
191	07512324	ZULPO-KLOETZLY H/W ETAL JT	529 SANTA FE AVE, ALBANY CA 94706	1	\$200,506	\$5,786
192	07512326	GUNDERSON ERNEST C TRUSTEES ETAL	3361 VALLEY VIEW RD, RESCUE CA 95672	1	\$13,504	\$5,786

193	07512327	ROSE	435 CARROL AVE FELTON CA 95018	1	\$14,918	\$5,786
194	07512333	HARRINGTON RICHARD E & MARY LEE H/W	P.O. BOX 332 BLY OREGON 97622	1	\$115,442	\$5,786
195	07512334	CLEYET BERNARD U/M	134 HAWTHORN ST, SALINAS CA 93901	1	\$218,089	\$5,786
196	07512337	HAMILTON	11873 LAKE BLVD, FELTON CA 95018	1	\$331,218	\$5,786
197	07512341	CABRAL DUANE & KAREN	3411 TRACY DR, SANTA CLARA CA 95051	1	\$351,894	\$5,786
198	07512342	NELSON MARY	11863 LAKE BLVD, FELTON CA 95018	1	\$298,304	\$5,786
199	07512343	WONG-HUCHARD ALISON M M/W SS	423 BEECH ST, REDWOOD CITY CA 94063	1	\$270,809	\$5,786
200	07512344	LA FEVER MICHAEL B & JANICE M H/W CP ALL TC ETAL	101 DEERWOOD DR, BOULDER CREEK CA 95006	1	\$299,260	\$5,786
201	07512401	SKLOOT HARRY	11735 LAKE BLVD, FELTON CA 95018	1	\$300,000	\$5,786
202	07512404	WILDER JOHN C & SUSAN H/W JT	11677 LAKE BLVD, FELTON CA 95018	1	\$240,339	\$5,786
203	07512410	HAMMER DEVIN	11591 LAKE BLVD, FELTON CA 95018	1	\$286,891	\$5,786
204	07512417	ISOLA ZIA TRUST	600 CARROL AVE, FELTON CA 95018	1	\$282,491	\$5,786
205	07512420	CUNNINGHAM JESSIE G & AMY E H/W CP RS	515 ARBOL ST, FELTON CA 95018	1	\$257,768	\$5,786
206	07512421	LANMB SEAN & SUZANNE	11607 LAKE BLVD, FELTON CA 95018	1	\$400,000	\$5,786
207	07512503	GLADDING DAVID S/M	504 CARROL AVE, FELTON CA 95018	1	\$324,177	\$5,786
208	07512507	BUNGAY JUAN T JR S/M	404 CARROL AVE, FELTON CA 95018	1	\$188,118	\$5,786
209	07512508	DYE ANN U/W	380 CARROL AVE, FELTON CA 95018	1	\$211,110	\$5,786
210	07513101	PARKER TRACY L S/W	1518 ADAMS ST, LA CROSSE WI 54601	1	\$312,682	\$5,786
211	not used					
212	07513104	CHASAR WILLIAM BECK ETAL	11777 UPPER VAN ALLEN RD, FELTON CA 95018	1	\$118,112	\$5,786
213	07513112	HARBUCK ROBERT H/W ETAL CP	11603 LAKESHORE DR, FELTON CA 95018	1	\$183,156	\$5,786
214	07513113	SAGER TIMOTHY A & MARY L H/W	11570 LAKE BLVD, FELTON CA 95018	1	\$254,364	\$5,786
215	07513114	NISON SHERRY	220 MAR VISTA #48, APTOS, CA 95003	1	\$47,544	\$5,786
216	07513133	MEACHAM MARK U/M	11871 VAN ALLEN RD, FELTON CA 95018	1	\$160,691	\$5,786
217	07513142	PERRONE PATRICIA R	11737 UPPER VAN ALLEN, FELTON CA 95018	1	\$67,611	\$5,786
218	07513147	CELLA RICHARD E JR CO-TRUSTEE ETAL	11943 VAN ALLEN RD, FELTON CA 95018	1	\$289,478	\$5,786
219	07513148	DUFOUR JONATHAN S & ASMAA A H/W CP	P O BOX 66982, SCOTTS VALLEY CA 95067	2	\$172,399	\$11,573
220	07513149	COOPER JOHN JOSEPH	11643 VAN ALLEN RD, FELTON CA 95018	1	\$76,214	\$5,786
221	07513151	PELOT VINCENT KELTON	11647 UPPER VAN ALLEN RD, FELTON CA 95018	1	\$183,589	\$5,786
222	07513205	LIPP RICHARD T JR LIFE ESTATE ETAL	P O BOX 282, FELTON CA 95018	1	\$33,678	\$5,786
223	07513212	LANGAN GLEN M & ROXANNE H/W JT	11669 LAKE SHORE DR, FELTON CA 95018	1	\$191,284	\$5,786
224	07513213	WARD JULIE KOWALEWSKI M/W SS	11657 LAKESHORE DR, FELTON CA 95018	1	\$312,724	\$5,786
225	07513214	DUPPEN DAVE & SUMMER H/W JT	11664 VAN ALLEN RD, FELTON CA 95018	1	\$198,927	\$5,786
226	07513215	BALL LINDA U/W	11638 VAN ALLEN RD, FELTON CA 95018	1	\$246,540	\$5,786

227	07513224	WALCOTT-AYERS JANICE ELLEN ETAL	4333 ULLOA ST, SAN FRANCISCO CA 94116	1	\$38,392	\$5,786
228	07513229	MCLEAN SUZANNE M & ALLAN H W/H JT ETAL	447 LOCKWOOD LN, SCOTTS VALLEY CA 95066	1	\$261,173	\$5,786
229	07513233	HEGENBART SEBASTIAN E & NAOMI L H/W JT	11754 VAN ALLEN RD, FELTON CA 95018	1	\$406,660	\$5,786
230	07513240	GOODENOUGH CHRISTOPHER & LISA K H/W JT	11707 LAKESHORE DR, FELTON CA 95018	1	\$312,798	\$5,786
231	07513241	TRAPP KIRK H & CHERYL A H/W JT	11696 VAN ALLEN RD, FELTON CA 95018	1	\$268,563	\$5,786
232	07513242	BERG BYRON W & DOROTHY A TRUSTEES	11795 LAKESHORE DR, FELTON CA 95018	1	\$289,495	\$5,786
233	07514112	BRISTER ELIZABETH A S/W	P O BOX 19, MT HERMON CA 95041	1	\$129,300	\$5,786
234	07514135	HAWKINS DEBORAH U/W JT ETAL	11790 COLEMAN AVE, FELTON CA 95018	1	\$370,237	\$5,786
235	07514142	ALTOSTRATUS HOLDINGS LLC	P O BOX 172, STEWARTS POINT CA 95480	1	\$194,676	\$5,786
236	07514143	GELB LEON H/W JT ETAL	11830 SUNSET CT, FELTON CA 95018	2	\$721,962	\$11,573
237	07514144	MC DERMOTT WILLIAM & TEGAN H/W JT	11844 SUNSET CT, FELTON CA 95018	1	\$219,914	\$5,786
238	07514145	BANKS DOUGLAS J & JENNIFER A H/W CP	P O BOX 1271, FELTON CA 95018	1	\$174,708	\$5,786
239	07514146	PATTERSON BRADFORD A & KIMBERLY A H/W CP RS	11882 GLADYS AVE, FELTON CA 95018	1	\$154,471	\$5,786
240	07514212	WAHRER-BERRY DIANE W/H JT ETAL	11720 LAKESHORE DR, FELTON CA 95018	1	\$144,934	\$5,786
241	07514213	KEIL JENNIFER U/W	11730 LAKESHORE DR, FELTON CA 95018	1	\$385,429	\$5,786
242	07514214	GRIMES HOWARD N & LYNDA L H/W JT	11687 EDGEWOOD DR, FELTON CA 95018	1	\$129,310	\$5,786
243	07514221	BARNETT DAN ROBERT & JOAN MC MILLAN H/W JT	11822 LAKESHORE DR, FELTON CA 95018	1	\$153,021	\$5,786
244	07514222	RUCK WILLIAM F JR	2015 28TH AVE, SAN FRANCISCO CA 94116	1	\$10,297	\$5,786
245	07514224	STEVENSON SEVILLA TRUSTEE	48031 PURPLE LEAF ST, FREMONT CA 94539	1	\$22,422	\$5,786
246	07514225	HOLMES MICHAEL S/M	11880 LAKESHORE DR, FELTON CA 95018	1	\$135,006	\$5,786
247	07514227	SMALLMAN WILLIAM H M/M SS	11765 EDGEWOOD DR, FELTON CA 95018	1	\$223,652	\$5,786
248	07514229	WILLIAMS NICK D U/M	675 BLUE RIDGE DR, BOULDER CREEK CA 95006	1	\$381,363	\$5,786
249	07514230	SHEARD JULIE R & JAROD	11841 SUNSET CT, FELTON CA 95018	1	\$266,501	\$5,786
250	07515101	BASHOR BRUCE M & ROBIN S H/W	P O BOX 603, BEN LOMOND CA 95005	1	\$131,174	\$5,786
251	07515102	RAAPHORST DIRK C M/M S/S	P O BOX 223, MOSS LANDING CA 95039	1	\$93,236	\$5,786
252	07515104	SONNTAG RICHARD M/M SS SP	10765 VERA AVE, FELTON CA 95018	1	\$136,966	\$5,786
253	07515108	SYLVIA ROBERT E JR	10727 VERA AVE, FELTON CA 95018	1	\$144,161	\$5,786
254	07515116	EGGLESTON MICHAEL H/W CP ETAL	345 WEST DR, FELTON CA 95018	1	\$3,261	\$5,786
255	07515118	CARRILLO ESTEVAN M/M SS	10656 REDWOOD DR, FELTON CA 95018	1	\$460,481	\$5,786
256	07515119	LARSEN STEPHANIE D & RODERICK R W/H JT	10672 REDWOOD DR, FELTON CA 95018	1	\$346,646	\$5,786
257	07515124	AUSTIN DAVID S H/W JT	491 WEST DR, FELTON CA 95018	1	\$239,208	\$5,786
258	07515127	SPARKS JEANNIE P	10753 VERA AVE, FELTON CA 95018	1	\$363,113	\$5,786
259	07515129	LAPLANTE AMANDA E	10715 VERA AVE, FELTON CA 95018	1	\$358,177	\$5,786
260	07515201	DEMONT PATRICK DANIEL S/M	677 WEST DR, FELTON CA 95018	1	\$331,876	\$5,786

261	07515202	MATTSON DEBRA L U/W	661 WEST DR, FELTON CA 95018	1	\$280,073	\$5,786
262	07515204	SANCHEZ EDWARD W & NANCY A H/W JT	625 WEST DR, FELTON CA 95018	1	\$222,221	\$5,786
263	07515207	SHAEFFER TEAGUE	587 WEST DR., FELTON CA 95018	1	\$295,795	\$5,786
264	07515209	STOWELL ROBERT H S/M ALL TC ETAL	559 WEST DR, FELTON CA 95018	1	\$146,150	\$5,786
265	07515211	EMERY JOHN W & MARTHA J	525 WEST DR FELTON CA 95018	1	\$348,833	\$5,786
266	07515212	GOLDIE STEPHEN T & NANCY E	1774 PINE FLAT RD, SANTA CRUZ CA 95060	1	\$30,183	\$5,786
267	07515213	ZIMMERMAN NANCY ANN U/W	10696 SHADY WAY, FELTON CA 95018	1	\$187,350	\$5,786
268	not used					
269	07515220	NAZARIO BARI & RAMON W/H JT	10824 WEST DR, FELTON CA 95018	1	\$378,189	\$5,786
270	07515227	LANOIE	549 WEST DR, FELTON CA 95018	1	\$282,490	\$5,786
271	07515228	CHAMPAGNE MARY S/P	10810 WEST DR, FELTON CA 95018	1	\$341,984	\$5,786
272	07515229	SASO DAVID U/M	10830 WEST DR, FELTON CA 95018	1	\$147,069	\$5,786
273	07515302	LARSON DAVID MICHAEL U/M AS JT ETAL	10710 SHADY WAY, FELTON CA 95018	1	\$339,822	\$5,786
274	07515303	GENDRON BRIAN U/M	10700 SHADY WAY, FELTON CA 95018	1	\$220,682	\$5,786
275	07515304	ANDREWS	10663 REDWOOD DR, FELTON CA 95018	1	\$419,945	\$5,786
276	07515305	GIVEN MARY S/W	P O BOX 1168, FELTON CA 95018	1	\$266,350	\$5,786
277	07515306	WIK JASON B U/M	10635 REDWOOD DR, FELTON CA 95018	1	\$454,804	\$5,786
278	07515307	CONNELL TIMOTHY R & LOIS M JT	10602 WEST DR, FELTON CA 95018	1	\$101,741	\$5,786
279	07515311	SMART CHRISTOPHER M & BARBARA R JT	10610 WEST DR, FELTON CA 95018	1	\$205,564	\$5,786
280	07515312	SMART CHRISTOPHER & BARBARA R JT	10610 WEST DR, FELTON CA 95018	1	\$73,140	\$5,786
281	07515314	WILSON DANIEL JT ETAL	10670 WEST DR, FELTON CA 95018	1	\$398,650	\$5,786
282	07515315	MC MILIN KIRK D & TARA L H/W JT	10690 WEST DR, FELTON CA 95018	1	\$111,019	\$5,786
283	07515317	NUTTALL CHRISTOPHER NED S/M	P O BOX 137, GROVELAND CA 95321	1	\$291,064	\$5,786
284	07515322	DORMAN EVAN	10585 REDWOOD DR FELTON CA 95018	1	\$331,494	\$5,786
285	07515323	CROSS DOUGLAS A & NIGELE H/W JT	P O BOX 1586, BOULDER CREEK CA 95006	2	\$476,408	\$11,573
286	07515406	MC INTURF BRENT J & MONIQUE H/W JT	10829 WEST DR, FELTON CA 95018	1	\$409,335	\$5,786
287	07515407	SINCLAIR ALAN M/M SS	10805 WEST DR, FELTON CA 95018	1	\$263,138	\$5,786
288	07515408	LEAHY KEVIN M U/M	10771 WEST DR, FELTON CA 95018	1	\$436,277	\$5,786
289	7515411	SCHWARTZ BONNIELYNN	21091 DAWNDRIDGE RD COLFAX CA 95713	1	\$55,746	\$5,786
290	not used					
291	07515415	WAGNER JENNIFER A U/W JT ETAL	10601 WEST DR, FELTON CA 95018	1	\$497,295	\$5,786
292	07515420	DONOGHUE GERALD J U/M JT ETAL	10839 WEST DR, FELTON CA 95018	1	\$361,376	\$5,786
293	07515421	BLOESCH MICHAEL ROBERT S/M	10693 WEST DR, FELTON CA 95018	2	\$276,543	\$11,573
294	07516101	MCDONALD DEWAYNE ALLAN & SUSAN LOUISE H/W JT	275 WEST DR, FELTON CA 95018	1	\$338,121	\$5,786
295	07516102	EVANS EILEEN U/W	267 WEST DR, FELTON CA 95018	1	\$193,344	\$5,786

296	07516108	GIBBONS KATHLEEN A S/W	165 WEST DR, FELTON CA 95018	1	\$335,754	\$5,786
297	not used					
298	07516138	THOMAS PETER R & DONNA S CO -TRUSTEES ALL AS TC	260 15TH AVE, SANTA CRUZ CA 95062	1	\$97,823	\$5,786
299	07516142	HAINES DAVID U/M JT ETAL	10625 LOMPICO RD, FELTON CA 95018	1	\$493,228	\$5,786
300	07516144	BRIOLE JACQUES P S/M	P O BOX 752, APTOS CA 95003	1	\$89,348	\$5,786
301	07516145	FASTH GERRY U/M	203 WEST DR, FELTON CA 95018	1	\$191,829	\$5,786
302	07516146	STECKLER LAWRENCE J	1866 HAPPY VALLEY RD, SANTA ROSA CA 95409	1	\$14,174	\$5,786
303	07516154	MORRIS ROBERT R & BARBARA J H/W CP	P O BOX 590, FELTON CA 95018	1	\$156,732	\$5,786
304	07516155	LERNER JEFFERY H S/P	10650 LOMITA AVE, FELTON CA 95018	1	\$489,756	\$5,786
305	07516157	EGGLESTON MICHAEL H/W CP ETAL	345 WEST DR, FELTON CA 95018	1	\$207,589	\$5,786
306	07516158	WESTON LINDA & ROBERT TRUSTEES	297 WEST DR, FELTON CA 95018	1	\$132,514	\$5,786
307	07516159	MORSE WILLIAM E S/M	P O BOX 3496, SANTA CRUZ CA 95063	1	\$62,140	\$5,786
308	07516201	GASTON JOHN E & BEVERLY A TRUSTEES	P O BOX 66633, SCOTTS VALLEY CA 95067	1	\$83,827	\$5,786
309	07516203	STEVENS FREDERICK H & MARSHA L H/W JT	373 WEST DR, FELTON CA 95018	1	\$178,878	\$5,786
310	07516204	CHAN NIKOLAS S/M	365 WEST DR, FELTON CA 95018	1	\$207,878	\$5,786
311	07516205	LYON GARY U/M	10719 LOMITA AVE, FELTON CA 95018	2	\$490,020	\$11,573
312	07516206	PRICE	10667 LOMITA AVE, FELTON CA 95018	1	\$240,246	\$5,786
313	07516210	NEVES JORGE O M/M SS	10615 LOMITA AVE, FELTON CA 95018	1	\$502,724	\$5,786
314	07516215	SISSON KERRY ANN TRUSTEE	P O BOX 1221, FELTON CA 95018	1	\$293,163	\$5,786
315	07516217	CHADDOCK WILLIAM G TRUSTEE ETAL	10584 VERA AVE, FELTON CA 95018	1	\$127,184	\$5,786
316	07516220	ANDERSON EVELYN G TRUSTEE	10640 VERA AVE, FELTON CA 95018	1	\$18,200	\$5,786
317	07516223	HARDIN MICHAEL & ALLISON H/W JT	10680 VERA AVE, FELTON CA 95018	1	\$161,567	\$5,786
318	07516231	FOSSGREEN DONALD & VERONIQUE H/W JT	494 LOCKWOOD LANE, SCOTTS VALLEY CA 95066	1	\$53,300	\$5,786
319	07516232	COOKSEY DAVID B & BARBARA A H/W JT	P O BOX 621, APTOS CA 95001	1	\$126,338	\$5,786
320	07516233	ATTEBERY ROLAND KEITH & MARJORIE FRANCES H/W CP	10577 LOMITA AVE, FELTON CA 95018	2	\$44,310	\$11,573
321	07516301	ALCALA IRENE	10695 VERA AVE, FELTON CA 95018	1	\$165,987	\$5,786
322	07516303	ZUNIGA JOSEPH L & JOYCE E H/W JT	10641 VERA AVE, FELTON CA 95018	1	\$110,464	\$5,786
323	07517101	GOMEZ LEONARDO & JENNIFER	288 CARROL AVE, FELTON CA 95018	1	\$402,892	\$5,786
324	07517105	NEWTON JEFF R	344 CARROL AVE, FELTON CA 95018	1	\$422,040	\$5,786
325	07517108	DENT JOSHUA & ALISON H/W CP RS	10606 CREEKWOOD DR, FELTON CA 95018	1	\$316,667	\$5,786
326	07517109	GARZA WILLIAM J SUCCESSOR TRUSTEE ETAL	10586 CREEKWOOD DR, FELTON CA 95018	1	\$29,104	\$5,786
327	07517130	GARCIA JEFFREY A & MELISSA J ESTRADA TRUSTEE	11481 PASEO ST, FELTON CA 95018	1	\$226,597	\$5,786
328	07517132	ROTH MATTHEW F & LOIS A H/W JT	11457 PASEO ST, FELTON CA 95018	1	\$344,309	\$5,786
329	07517133	SHAFFER JORDAN	10550 CREEKWOOD DR, FELTON CA 95018	1	\$199,798	\$5,786
330	07517134	MARCUS DAVID	1625 26TH ST, SACRAMENTO CA 95816	1	\$29,739	\$5,786

331	07517135	STORM-WYCOFF ALEXANDRA	300 CARROL AVE, FELTON CA 95018	1	\$408,000	\$5,786
332	07517201	HARRINGTON	230 CARROL AVE, FELTON CA 95018	1	\$141,773	\$5,786
333	07517203	GAYDOS GEORGE A U/M	200 CARROL AVE, FELTON CA 95018	1	\$294,920	\$5,786
334	07517204	GODBOUT EDGAR L & ANTOINETTE H/W CP RS	192 CARROL AVE, FELTON CA 95018	1	\$372,366	\$5,786
335	07517209	SALICE MARIO	140 CARROL AVE, FELTON CA 95018	1	\$335,497	\$5,786
336	07517211	OSHA SCOTT EDWIN	485 GAVEN ST, SAN FRANCISCO CA 94134	1	\$283,544	\$5,786
337	07517218	FISHER JAMES R & JENNIFER C H/W JT	10524 LOMPICO RD, FELTON CA 95018	1	\$223,929	\$5,786
338	07517229	ASHLEY JANET R U/W	10545 CREEKWOOD DR, FELTON CA 95018	1	\$199,070	\$5,786
339	07518102	SMRT EDWARDS PATRICIA JT ETAL	560 ARBOL ST, FELTON CA 95018	1	\$60,344	\$5,786
340	07518109	YANCEY HOWARD W & CAROLYN SUE H/W JT	575 ARBOL ST, FELTON CA 95018	1	\$198,221	\$5,786
341	07518110	GEORGE MAYA U/W	561 ARBOL ST, FELTON CA 95018	1	\$117,260	\$5,786
342	07518111	CULLEN KATHRYN J U/W	520 ARBOL ST, FELTON CA 95018	1	\$207,871	\$5,786
343	07518117	HANSON EDWARD & BARBARA	11505 LAKE BLVD FELTON CA 95018	1	\$328,491	\$5,786
344	07518129	STRINGER DOUGLAS S/P	11484 PASEO ST, FELTON CA 95018	1	\$116,964	\$5,786
345	07518130	SULLIVAN TRACY	360 CARROL AVE, FELTON CA 95018	1	\$280,495	\$5,786
346	07518133	DENNIS CHRISTOPHER M & EKATERINA A TRUSTEES	578 ARBOL ST, FELTON CA 95018	1	\$206,229	\$5,786
347	07518134	BENNETT RAYMOND S & LINDA G	11585 LAKE BLVD, FELTON CA 95018	1	\$457,634	\$5,786
348	07519218	ROSENBERG JAMES R	11568 LAKE BLVD, FELTON CA 95018	1	\$406,500	\$5,786
349	not used					
350	07519242	BELL TAMARA S/W S/S	575 SAN PEDRO AVE, MORGAN HILL CA 95037	1	\$111,335	\$5,786
351	07519247	LGC PROPERTIES 2	8266 W ZAYANTE, FELTON CA 95018	1	\$129,296	\$5,786
352	07519250	HANSON EDWARD J & BARBARA B	514 LAKERIDGE CT, EL DORADO HILLS CA 95762	1	\$469,190	\$5,786
353	07519251	RUEHL WILLIAM	11516 LAKE BLVD FELTON CA 95018	1	\$399,832	\$5,786
354	07519317	GOULART MARTIN	P.O. BOX 1255, FELTON CA 95018	1	\$209,020	\$5,786
355	07519339	WALFORD DANIEL U/M	P O BOX 1544, FELTON CA 95018	1	\$260,788	\$5,786
356	07520101	MC CRACKEN ALIYAH U/W	10465 WEST DR, FELTON CA 95018	1	\$304,268	\$5,786
357	07520102	RUFF DALE L U/M	10507 WEST DR, LOMPICO CA 95018	1	\$202,412	\$5,786
358	07520103	JOHNSTON MARK M/M SS	73 AVENIDA ESPANA, SAN JOSE CA 95139	1	\$362,345	\$5,786
359	07520104	DOUGHERTY BERT EDWIN III & MORISSA LANE TRUSTEES	P O BOX 10924, HILO HI 96721	1	\$102,872	\$5,786
360	07520201	PFEFFERKORN JERRY G & SHERRI R H/W JT	P O BOX 3795, PINEDALE CA 93650	1	\$282,715	\$5,786
361	07520202	HOOK KEVIN F M/M SS	11707 LAKESHORE DR, FELTON CA 95018	1	\$94,048	\$5,786
362	07520206	LUDE FRIEDRICH H & BRIGITTE L TRUSTEES	2828 PONDEROSA WAY, SANTA CLARA CA 95050	1	\$18,766	\$5,786
363	07520208	LATTA FRED F U/M	10590 LAGUNA AVE, FELTON CA 95018	1	\$192,159	\$5,786



364	07520213	WEST LONNIE D & SHARON R TRUSTEES	10495 REDWOOD DR, FELTON CA 95018	1	\$62,970	\$5,786
365	07520309	BENNETT NADENE A U/W	75-5719 ALLI DR #310, KAILUA KONA HI 96740	1	\$74,283	\$5,786
366	07520316	NORRIS JAMES D U/M	10497 VERA AVE, FELTON CA 95018	1	\$383,238	\$5,786
367	07520325	PAUL STEPHEN W & KRISTEN JONES H/W JT	10464 REDWOOD DR, FELTON CA 95018	1	\$234,500	\$5,786
368	07520328	WAIER RICHARD A & SANDRA L JT	10636 REDWOOD DR, FELTON CA 95018	1	\$104,358	\$5,786
369	07520330	WYNN ROBERT C & DOREEN V H/W CP	P O BOX 1088, FELTON CA 95018	1	\$202,201	\$5,786
370	07520331	SNOW WILLIAM H S/S	10495 VERA AVE, FELTON CA 95018	1	\$335,556	\$5,786
371	07521101	NAGLE STEVEN H	10366 REDWOOD DR, FELTON CA 95018	1	\$68,074	\$5,786
372	07521103	KIANA EMMA H	10389 VERA AVE, FELTON CA 95018	1	\$87,802	\$5,786
373	not used					
374	07521122	MANESS TERRY & BERTHA H/W JT	10253 VERA AVE, FELTON CA 95018	1	\$131,847	\$5,786
375	07521132	OLMSTED HELGA KARIN TRUSTEE	P O BOX 806, FELTON CA 95018	1	\$19,541	\$5,786
376	07521134	KANOUSE MONROE CO-TRUSTEES ETAL	581 CAPP ST, SAN FRANCISCO CA 94110	1	\$294,924	\$5,786
377	not used					
378	07521209	PIERCE JULIE	P.O. BOX 66238 SCOTTS VALLEY CA 95067	1	\$297,136	\$5,786
379	07521210	SUNGAIL JA KI U/W SS	10303 REDWOOD DR, FELTON CA 95018	1	\$193,224	\$5,786
380	07521223	SMITHART ERIK ALLEN S/M	10241 REDWOOD DR, FELTON CA 95018	1	\$213,201	\$5,786
381	07521236	HUKILL TRACI M/W SS	10348 WEST DR, FELTON CA 95018	1	\$465,057	\$5,786
382	07521237	CLARKE STEVEN	15077 BREWESTER AVE, SAN JOSE CA 95124	1	\$235,660	\$5,786
383	07522110	NEWHALL ROBERT J U/M	10454 LOMITA AVE, FELTON CA 95018	2	\$116,965	\$11,573
384	07522112	RAY CHRISTOPHER THOMAS U/M	10325 LOMPICO RD, FELTON CA 95018	1	\$206,246	\$5,786
385	07522114	CONRAD JEREMY	10303 LOMPICO RD, FELTON, CA 95018	1	\$145,857	\$5,786
386	07522118	TOMLIN TREVOR	10274 LOMITA AVE, FELTON CA 95018	1	\$163,326	\$5,786
387	07522119	RUWE BENJAMIN & ANNA K H/W CP RS	10272 LOMITA AVE, FELTON CA 95018	1	\$237,238	\$5,786
388	07522207	FITZGERALD DAVID P U/M	10485 LOMITA AVE, FELTON CA 95018	1	\$213,869	\$5,786
389	07522209	DEWIS CARENA J W/H CP ETAL	10459 LOMITA AVE, FELTON CA 95018	1	\$315,415	\$5,786
390	07522220	PACHECO JOHN P	10463 LOMITA AVE, FELTON CA 95018	1	\$320,706	\$5,786
391	07522233	KRAEMER MATTHEW J	10420 VERA AVE, FELTON CA 95018	1	\$294,775	\$5,786
392	07522301	BOWEN GAIL U/W	10374 VERA AVE, FELTON CA 95018	1	\$278,523	\$5,786
393	07522315	LUSSIER MICHAEL J & SALLY M TRUSTEES	P O BOX 912, BROOKDALE CA 95007	1	\$38,532	\$5,786
394	07522326	ENDRES JEROME M TRUSTEE	10820 SHADOW WOOD LN, WEED CA 96094	1	\$84,429	\$5,786
395	07522329	VERA 1 LLC	10310 VERA AVE FELTON CA 95018	1	\$85,866	\$5,786
396	07522330	PENSCO TRUST CO CUSTODIAN	529 PARK WAY SOUTH SAN FRANCISCO CA 94080	1	\$82,166	\$5,786
397	07522332	BARNES MARCUS H & DANIELLE M H H/W JT	10210 VERA AVE, FELTON CA 95018	1	\$125,069	\$5,786

398	7523118	LOCATELLI DEBRA F TRUSTEE	P O BOX 572, FELTON CA 95018	1	\$119,574	\$5,786
399	7523122	LEKSTUTIS ALBERT	11220 VISITAR ST, FELTON CA 95018	1	\$204,602	\$5,786
400	07524104	MAYBERRY THOMAS G M/M	11225 OCEAN VIEW AVE, FELTON CA 95018	1	\$83,562	\$5,786
401	07524108	SAPIENZA JOHN P & MITRA D H/W CP RS	130 PARK ST, SAN FRANCISCO CA 94110	1	\$213,200	\$5,786
402	07524110	GUPTA RANU U/M	107 OAK RIM CT #24, LOS GATOS CA 95032	1	\$40,759	\$5,786
403	07524220	KANEFSKY PETER S/M	11294 LAKE BLVD, FELTON CA 95018	1	\$30,074	\$5,786
404	07524231	BROWN GRETCHEN HUGGINS	11120 LAKE BLVD, FELTON CA 95018	1	\$172,053	\$5,786
405	07524301	CARY PAUL B U/M	11355 LAKE BLVD, FELTON CA 95018	1	\$94,631	\$5,786
406	07524302	PARKE CLAUDIA S/W	11331 LAKE BLVD, FELTON CA 95018	1	\$192,790	\$5,786
407	07524325	NEWBY CLYDE E M/M SS	11100 VISITAR ST, FELTON CA 95018	1	\$197,310	\$5,786
408	07524330	HASTINGS JENSEN & SANDRA H/W JT	11151 LAKE BLVD, FELTON CA 95018	1	\$204,337	\$5,786
409	07524331	BAUER MICHAEL	1134 LEXINGTON DR, SUNNYVALE CA 94087	1	\$305,950	\$5,786
410	07525115	AUSTIN COLBY S/M	11051 LAKE BLVD, FELTON CA 95018	1	\$240,373	\$5,786
411	07525116	HUDSON DANE THOMAS U/M	P O BOX 909, FELTON CA 95018	1	\$44,913	\$5,786
412	07525123	MCCABE CORY U/M	11035 LAKE BLVD, FELTON CA 95018	1	\$60,038	\$5,786
413	07525124	RAMIREZ OSCAR M & MARY D H/W CP RS	11041 LAKE BLVD, FELTON CA 95018	1	\$237,813	\$5,786
414	not used					
415	07525129	HUDSON NATHAN T & KIMBERLY M H/W CP RS	11107 LAKE BLVD, FELTON CA 95018	1	\$578,887	\$5,786
416	07525213	GROSS DANIEL W M/M SS	10020 CREEKWOOD DR, FELTON CA 95018	1	\$206,806	\$5,786
417	7525231	KILBOURNE DAVID U/M	11050 VISITAR ST, FELTON CA 95018	1	\$1,115	\$5,786
418	07525234	KILBOURNE DAVID U/M	11050 VISITAR ST, FELTON CA 95018	1	\$320,464	\$5,786
419	07525306	WHITE-HUELIN THERESA H/W CP RS ETAL	10939 TREVOR ST, FELTON CA 95018	1	\$356,335	\$5,786
420	07525307	LOVELESS JAMES B S/M	10004 LAKE BLVD, FELTON CA 95018	1	\$174,820	\$5,786
421	07525314	GUIDO JOSE	P.O. BOX 1081 SOQUEL CA 95073	1	\$71,888	\$5,786
422	07525316	KARPINSKI HENRY JOSEPH JR	P O BOX 822, FELTON CA 95018	1	\$218,687	\$5,786
423	07526113	STIPES JOHN J & LYNN E H/W JT	P O BOX 359, FELTON CA 95018	1	\$267,796	\$5,786
424	07526115	FITZGERALD JAMES	10751 VISITAR ST, FELTON CA 95018	1	\$120,236	\$5,786
425	07526123	GOSWAMY RITA	2136 THE ALAMEDA STE 18 SAN JOSE CA 95126	1	\$403,735	\$5,786
426	07526142	COOGAN MICHAEL	10885 VISITAR ST FELTON CA 95018	1	\$150,535	\$5,786
427	07526208	NELSON CLAUDIA J	10188 LAKE BLVD, FELTON CA 95018	1	\$191,204	\$5,786
428	07527111	LUEDDEKE BERNICE L TRUSTEE	12940 MORENO CT, SAN MARTIN CA 95046	1	\$24,708	\$5,786
429	07527114	RANDALL TODD & KAREN H/W JT	10769 LAKE BLVD, FELTON CA 95018	1	\$285,651	\$5,786
430	07527131	MULLANE TIMOTHY & CAROL J JT	P O BOX 63, FELTON CA 95018	1	\$63,252	\$5,786

431	07527134	KING JOSEPH P S/M AS JT ETAL	10816 VISITAR ST, FELTON CA 95018	1	\$143,446	\$5,786
432	07527135	ULLOM GLENN M & KATHRYN E H/W CP RS	10810 VISITAR ST, FELTON CA 95018	1	\$324,411	\$5,786
433	07527139	JOHNSON JOHN H/W JT ETAL	10901 LAKE BLVD, FELTON CA 95018	1	\$159,368	\$5,786
434	07527142	JOHNSON JOHN R TRUSTEE ETAL	10901 LAKE BLVD, FELTON CA 95018	2	\$585,676	\$11,573
435	07528105	DRUMMOND BRETT U/M	10641 VISITAR ST, FELTON CA 95018	1	\$110,362	\$5,786
436	07528106	HAUSMANN GILBERT & ANNINA H/W JT	10637 VISITAR ST, FELTON CA 95018	1	\$332,500	\$5,786
437	07528109	KILBOURNE DAVID K U/M	10575 VISITAR ST, FELTON CA 95018	1	\$96,431	\$5,786
438	07528110	KILBOURNE DAVID S/M	10575 VISITAR ST, FELTON CA 95018	1	\$170,755	\$5,786
439	07528112	O NEILL WILLIAM F TRUSTEE	P O BOX 1414, CAPITOLA CA 95010	1	\$106,467	\$5,786
440	07528119	FRECH EDWIN L	P O BOX 66165, SCOTTS VALLEY CA 95067	1	\$112,610	\$5,786
441	not used					
442	07528131	ERIKSSON LEIF S H/W JT ETAL	10621 VISITAR ST, FELTON CA 95018	1	\$270,422	\$5,786
443	07528134	HENRY LESTER E & LOIS A JT	P O BOX 66, FELTON CA 95018	1	\$88,645	\$5,786
444	07528138	GOMEZ RICHARD M & JOYCE A H/W JT	P O BOX 523, FELTON CA 95018	1	\$186,885	\$5,786
445	07528139	CAMPBELL DAVID SEAN & ROSE H/W JT	P O BOX 198, FELTON CA 95018	1	\$203,512	\$5,786
446	07528140	FLORIO DONNA M U/W	10405 LAKE BLVD, FELTON CA 95018	1	\$212,511	\$5,786
447	07528209	MARTWICK DEBRA & William	10414 LAKE BLVD, FELTON CA 95018	1	\$154,324	\$5,786
448	07528221	MILLS WILLIAM DAVID U/M	10342 LAKE BLVD, FELTON CA 95018	1	\$159,207	\$5,786
449	07528225	WELCH JAMES L U/M SS	P O BOX 919, FELTON CA 95018	1	\$107,788	\$5,786
450	07528227	STEINBERG NATALIE U/W JT ETAL	10400 LAKE BLVD, FELTON CA 95018	1	\$485,796	\$5,786
451	07528229	COGGIA DENNIS S/M	10328 LAKE BLVD, FELTON CA 95018	1	\$159,794	\$5,786
452	07528231	FOGEL MARK D & DEBORAH TRUSTEES	126 MORRISSEY AVE, SANTA CRUZ CA 95062	1	\$308,812	\$5,786
453	07529103	PINARD WAYNE & DENISE	11080 LAKE BLVD, FELTON CA 95018	1	\$1,000,174	\$5,786
454	07529105	THOMAS ZANE LEE S/M	10988 LAKE BLVD, FELTON CA 95018	1	\$715,708	\$5,786
455	07529106	FLEMING KELLIE LYNN	10976 LAKE BLVD, FELTON CA 95018	1	\$115,914	\$5,786
456	07529107	KRUGER ANNA M & MARTIN P W/H AS JT ETAL	10930 LAKE BLVD, FELTON CA 95018	1	\$394,420	\$5,786
457	07529108	CHABOT PHILLIP J & CAROLYN C H/W JT	10888 LAKE BLVD, FELTON CA 95018	1	\$105,691	\$5,786
458	07529109	ORTIZ DEBRA E M/W SS	P O BOX 612, FELTON CA 95018	1	\$211,658	\$5,786
459	07529112	SLABAUGH JAMES W H/W ETAL JT	11120 OCEAN VIEW AVE, FELTON CA 95018	1	\$291,526	\$5,786
460	07529113	KAPPLER DENISE BETH U/W	11000 LAKE BLVD, FELTON CA 95018	1	\$215,601	\$5,786
461	07530104	DUNCAN TIMOTHY W & NANCY L H/W CP RS	10768 LAKE BLVD, FELTON CA 95018	1	\$381,281	\$5,786
462	07530106	ROGERS CLAUDE ALLEN & KATHY LEE H/W JT	P O BOX 820, FELTON CA 95018	1	\$116,469	\$5,786
463	07530110	ZEHM JAMES G U/M	10538 LAKE BLVD, FELTON CA 95018	2	\$317,290	\$11,573
464	07530114	HANSEL ROBERT E	10696 LAKE BLVD, FELTON CA 95018	1	\$346,308	\$5,786

465	07530115	PEARSON JOHN U/M	10840 LAKE BLVD, FELTON CA 95018	1	\$79,372	\$5,786
466	07530116	WAGNER THOMAS U/M	LAKE BLVD, FELTON CA 95018	1	\$110,431	\$5,786
467	07533101	BENEDICT DEANNA L U/W	10861 CREEKWOOD DR, FELTON CA 95018	1	\$392,392	\$5,786
468	07533104	RIBERA RONALD	10825 CREEKWOOD DR FELTON CA 95018	1	\$206,954	\$5,786
469	07533105	HALL DOUG	10805 CREEKWOOD DR, FELTON CA 95018	1	\$86,699	\$5,786
470	07533106	MATTSON NATALIE R W/H CP RS ETAL	10857 LOMPICO RD, FELTON CA 95018	1	\$295,284	\$5,786
471	07533108	WRIGHT JOHN	10765 CREEKWOOD DR FELTON CA 95018	1	\$260,356	\$5,786
472	07533202	SHEPARD BARRY JOSEPH U/M	1035 ALMANOR AVE, MENLO PARK CA 94025	1	\$113,660	\$5,786
473	07533203	THOMAS LUCKY ROBIN & MONIKA ILENE H/W JT	11029 LOMPICO RD, FELTON CA 95018	1	\$80,248	\$5,786
474	07533204	NELSON TIMOTHY R U/M	11017 LOMPICO RD, FELTON CA 95018	1	\$193,056	\$5,786
475	07533208	HUSEBY MICHELE U/W	4915 ARLINGTON RD, PALMETTO FL 34221	1	\$183,053	\$5,786
476	07533209	BARKER GEORGE A ETAL	4915 ARLINGTON RD, PALMETTO FL 34221	1	\$130,870	\$5,786
477	07534104	MC COOEY JACK V	P O BOX 687, FELTON CA 95018	1	\$48,759	\$5,786
478	07535106	McCONNELL	11660 EDGEWOOD DR, FELTON CA 95018	1	\$280,494	\$5,786
479	07536115	WERTZ VANCE G JR & FAY TRUSTEES	4855 RIVERVALE, SOQUEL CA 95073	1	\$68,527	\$5,786
480	07536123	IONESCU CATALIN U/M	266 INDUSTRIAL RD, SAN CARLOS CA 94070	1	\$105,255	\$5,786
481	07536124	VAUGHAN WILLIAM S U/M	P O BOX 7499, SANTA CRUZ CA 95061	1	\$97,138	\$5,786
482	07537109	KILBOURNE DAVID S/M	11050 VISITAR ST, FELTON CA 95018	1	\$320,157	\$5,786
483	07537111	MOYER KATHLEEN M TRUSTEE ETAL	10610 VISITAR ST, FELTON CA 95018	1	\$207,347	\$5,786
484	07537114	ROBINSON BRAD L U/M	10747 LAKE BLVD, FELTON CA 95018	1	\$393,452	\$5,786
485	07537115	ST GERMAIN CHRIS S/P	10642 VISITAR ST, FELTON CA 95018	1	\$477,801	\$5,786
486	07625124	SANTA CRUZ CITY OF	809 CENTER ST, SANTA CRUZ CA 95060	1		\$5,786
487	09228404	PAONE FRANCIS G & CHRISTINE	22 Remsen Street, Brooklyn NY 11201	1	\$10,797	\$5,786
488	07526201	SMATHERS ROY	9984 LAKE BLVD, FELTON, CA 95018	1	\$269,162	\$5,786
489	07504231	SATRE DAVID ARNOLD	4809 MINAS DR SAN JOSE, CA 95136	1	\$64,274	\$5,786
490	07504332	BIGHAM KENNETH	12316 LA LENA ST FELTON CA 95018	1	\$180,000	\$5,786
491	07509401	DAVIES GWENITH	444 WEST DR, FELTON CA 95018	1	\$155,956	\$5,786
492	not used					
493	07513150	RAHN DAVID	11750 LAKE BLVD FELTON CA 95018	1	\$425,000	\$5,786
494	07515205	HETHERSHAW KENNETH & ANTONIA	601 WEST DR FELTON CA 95018	1	\$24,428	\$5,786
495	07515419	SCOTT RONALD D	10655 WEST DR FELTON CA 95018	1	\$461,394	\$5,786
496	07516110	MATYNARD FRANK	16100 AVERY LANE SALINAS CA 93907	1	\$58,410	\$5,786

<b>497</b>	07516120	NICHOLS CARY	10590 LOMITA AV FELTON CA 95018	1	\$297,416	\$5,786
<b>498</b>	07519249	KUNST BENJAMIN	14510 BEAR CREEK RD BOULDER CREEK CA 95006	1	\$373,224	\$5,786
<b>499</b>	07521129	BARR RUSSEL & SUZANNE	10331 VERA AVE FELTON CA 95018	1	\$32,761	\$5,786
<b>500</b>	07525105	KUENTZEL ERIC	11011 LAKE BLVD FELTON CA 95018	1	\$170,881	\$5,786
<b>501</b>	07528104	KEZEOR KENNETH	10649 VISITAR ST FELTON CA 95018	1	\$409,836	\$5,786
				507	\$109,978,642	\$2,933,734

**Exhibit G**  
**Annual Administration Assessment**  
**Assessment District No. 2016-1**

As provided in Streets and Highways Code Section 10204(f), an additional assessment will be levied annually on each parcel within the Assessment District to pay costs associated with the administration of the Assessment District and the funding of a debt service reserve.

Each parcel within the Assessment District shall be allocated an equal share of these annual costs. The exact amount of these charges will be established each year by the District, and will consist of the following maximum amounts:

1. An annual amount to pay costs incurred by the District with respect to the administration of the Assessment District that are not otherwise reimbursed, which will initially equal up to 2% of the annual installment of principal and interest payable on the assessment, and which will be adjusted annually by the changes in the U.S. Department of Labor Consumer Price Index for the San Francisco-Oakland-San Jose Area index.
2. If and to the extent required by any purchaser or underwriter of the bonds, an annual contribution (the "Debt Service Reserve Assessment") to a debt service reserve fund for the bonds, which will equal 10% of the annual installment of principal and interest payable on the assessment. The District shall discontinue levying the Debt Service Reserve Assessment when the amount on deposit in the debt service reserve fund equals the least of (a) 10% of the original principal amount of the bonds, (b) 125% of average annual debt service on the bonds, or (c) maximum annual debt service on the bonds; *provided, however*, that the District is authorized to resume levying the Debt Service Reserve Assessment as needed to generate any funds that may be required to replenish the reserve fund following the withdrawal of funds therefrom or if the District determines that a deficiency exists therein.

These annual assessments are separate from, and in addition to, (a) the per-parcel collection fee that may be added to each annual assessment under Streets and Highways Code Sections 8682 (to cover expenses of collection) and 8682.1 (to cover bond administration costs), and (b) any fees payable to the District in connection with Assessment pre-payments after the issuance of Bonds, apportionment of Assessments to reflect parcels splits or parcel mergers, and late charges and penalties for delinquent Assessment installments.

**Exhibit H**  
**ASSESSMENT CALCULATION**  
**ASSESSMENT DISTRICT 2016-1**

**METHOD OF ASSESSMENT**

**BACKGROUND**

The Assessment District is formed under the authority of the Act and Article XIID of the California State Constitution, which require that local agencies levy assessments according to special benefit. In addition, Article XIID, Section 4, of the State Constitution requires that a parcel's assessment may not exceed the reasonable cost of the proportional special benefit conferred on that parcel. Section 4 provides that only special benefits are assessable and the local agency levying the assessment must separate the general benefits from the special benefits. It also requires that publicly owned property that benefits from the improvements be assessed. Neither the Act nor the State Constitution specifies the method or formula that should be used to apportion the costs to properties in any special assessment district proceedings. The responsibility for recommending an apportionment of the costs to properties which specially benefit from the improvements rests with the Assessment Engineer, who is appointed for the purpose of making an analysis of the facts and determining the correct apportionment of the assessment obligation. Therefore, costs and expenses of proposed improvement(s) will be apportioned against the properties by a formula or method that distributes the costs in direct proportion to the estimated special benefits these parcels receive from the improvements.

The approval of the assessments rests with the Board of Directors of Lompico County Water District. The Board of Directors renders its decision after hearing testimony and evidence presented at a public hearing and tabulating the assessment ballots, which are mailed to all record owners of property within the Assessment District. Only ballots delivered to the District prior to the close of the public hearing are tabulated. The findings of the Board of Directors must include whether or not the assessment spread has been made in direct proportion to the estimated special benefits received by each parcel.

**SPECIAL BENEFIT**

The purpose of this Assessment District is to finance the upgrading and repair of existing facilities within the Assessment District for future merging of Lompico County Water District with San Lorenzo Valley Water District. The work consists of water system improvements, including generally of replacing 6 existing redwood storage tanks, installing treatment system improvements at Mill Creek facilities, replacing existing service lines and meters, completion of an interconnection of Lompico County Water District and San Lorenzo Valley Water District systems, installing a Supervisory Control and Data Acquisition System for operational automation and replacing existing pressure reducing stations; and other appurtenances.

The proposed improvements will provide a special benefit to the parcels that will be served by the new water distribution facilities as a result of enhanced service and reliability. Therefore, 100% of the proposed improvements are of direct and special benefit to the properties within the boundaries of this Assessment District.

Special Benefits are provided for the Project Capital Improvements. These Special Benefits are upgrading and repairing the existing water system such that the Lompico County Water District can be dissolved and its facilities merged into San Lorenzo Valley Water District.

Every parcel receiving water service from Lompico County Water District will be assessed in accordance with the number of existing water service meter connections. This will be 100% of the total project costs as shown below on the spread of costs table. This is the Special Benefit.

All general benefits, if any, to the surrounding community and public in general from the improvements are intangible and are not quantifiable.

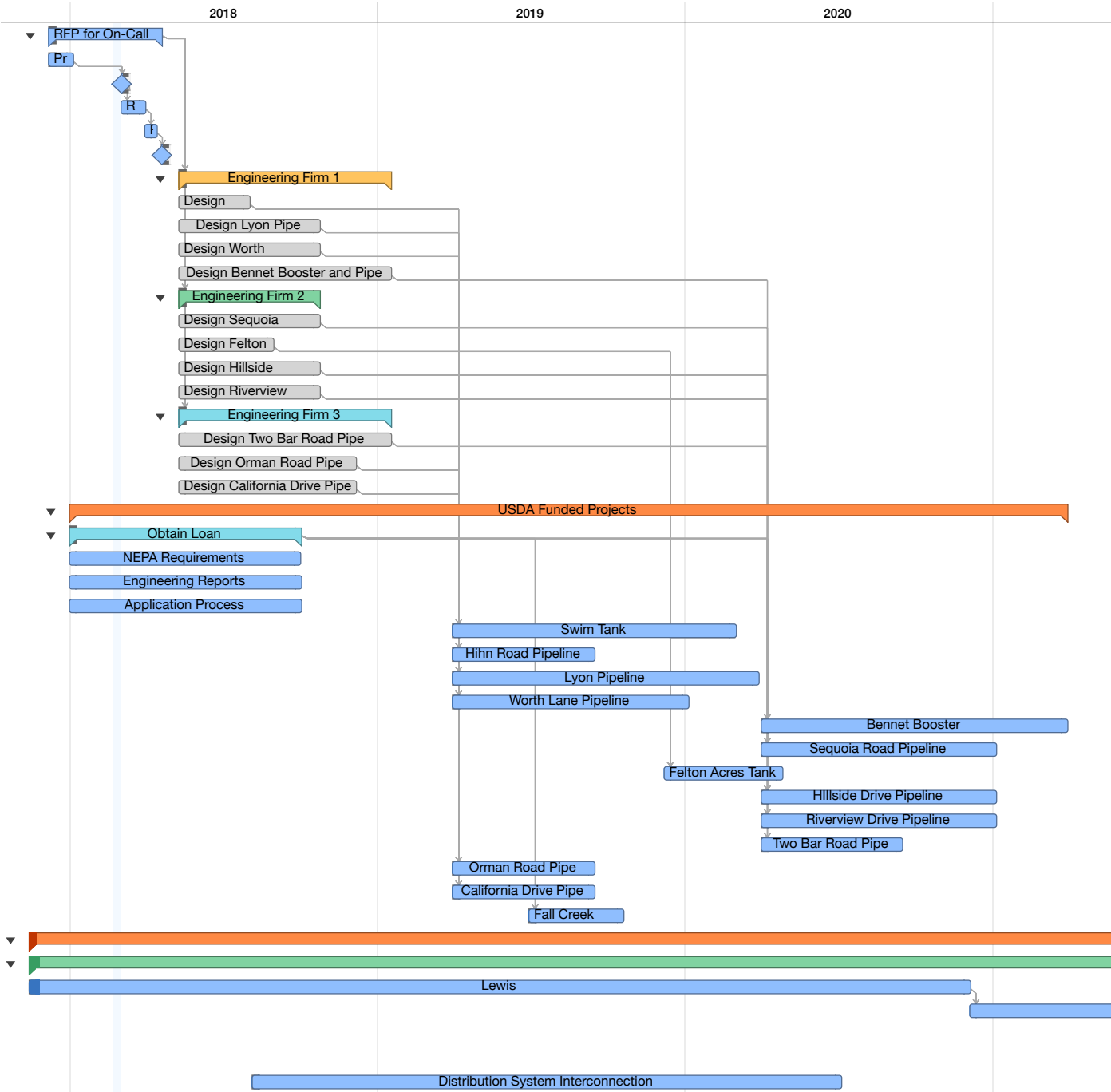
## **RULES OF ASSESSMENT**

The method used to fairly and equitably divide estimated costs and expenses in direct proportion and relation to special benefit received by parcels within the proposed Assessment District is the **Proportionate Unit** method. The particular special benefit is of equal value to each water service connection and the total cost is allocated on a per unit basis as an equal portion per water service connection. The total cost of the project is apportioned among the **507** water service connections on the parcels within the assessment district boundaries. The calculations are shown below:

<b>ENGINEER'S ESTIMATE TOTAL COSTS</b>	<b>\$2,933,734</b>
<b>Number of Services</b>	<b>507</b>
<b>Proportionate Share (Cost/Number of Services)</b>	<b>\$5,786</b>

The assessment per parcel is shown on the Roll of Assessments.





Engineering Firms

Frietas + Frietas

831.688.1168  
3233 Valencia Ave., Suite A1  
Aptos, CA 95003

Dudek

831.600.1400  
725 Front Street, Suite 400  
Sanat Cruz, CA 95060

IEC

408.495.4107  
1737 North First Street  
Suite 210  
San Jose, CA 95112

MME

831.426.3186  
224 Walnut Avenue, Suite B  
Santa Cruz, CA 95060

WSC

805.457.8833  
805 Aerovista Place, Suite 201  
San Luis Obispo, CA 93401

Harris and Associates

831.233.9242  
450 Lincoln Avenue  
Suite 103  
Salinas, CA 93901

Monterey Bay Engineers

831.899.7899  
607 Charles Ave #B  
Seaside, CA 93955

WWD Corp

831.655.2723  
2801 Salinas Hwy #1  
Monterey, CA 93940

Grice Engineering

831.422-9619  
561 Brunken Ave #A  
Salinas, CA 93901

Bestor Engineers Inc

831.373.2941  
9701 Blue Larkspur Ln  
Monterey, CA 93940

Whitson Engineers

831.464.9363  
2425 Porter Street, Suite 2  
Soquel, CA 95073

C3 Engineering

831.647.1192  
126 Bonifacio Place, Suite C  
Monterey, CA 93940

Ifland Engineers

831.426.5313  
Live Oak Business Park  
5300 Soquel Avenue, Suite 101  
Santa Cruz, CA 95062

Norris Associates

831.659.9230  
PO Box 125  
Carmel Valley, CA 93924

Michael Baker International

831.383.7974  
60 Garden Court, Suite 230  
Monterey, CA 93940

Schaaf and Wheeler

831.883.4848  
3 Quail Run Circle, Suite 101  
Salinas, CA 93907

USDA Projects			
	Project Cost	Professional Services	Construction
Swim Tank	\$ 678,000	\$ 135,600.0	\$ 542,400.0
Hihn Road Pipe	\$ 90,000	\$ 18,000.0	\$ 72,000.0
Lyon Pipe	\$ 450,000	\$ 90,000.0	\$ 360,000.0
Worth Lane Pipe	\$ 120,000	\$ 24,000.0	\$ 96,000.0
Sequoia Road Pipe	\$ 120,000	\$ 24,000.0	\$ 96,000.0
Bennet Booster	\$ 390,000	\$ 78,000.0	\$ 312,000.0
Felton Acres Tank and Booster	\$ 300,000	\$ 60,000.0	\$ 240,000.0
Hillside Drive Pipe	\$ 240,000	\$ 48,000.0	\$ 192,000.0
Riverview Drive Pipe	\$ 240,000	\$ 48,000.0	\$ 192,000.0
Two Bar Road Pipe	\$ 450,000	\$ 90,000.0	\$ 360,000.0
Orman Road Pipe	\$ 300,000	\$ 60,000.0	\$ 240,000.0
California Drive Pipe	\$ 240,000	\$ 48,000.0	\$ 192,000.0
Fall Creek Fish Ladder	\$ 1,160,000	\$ 232,000.0	\$ 928,000.0
SUM	\$ 4,778,000	\$ 955,600	\$ 3,822,400

Lompico Assessment District			
Interconnection	\$ 301,000	\$ 60,200.0	\$ 240,800.0
Lewis Tank	\$ 227,500	\$ 45,500.0	\$ 182,000.0
Madrone Tank	\$ 227,500	\$ 45,500.0	\$ 182,000.0
Kaski Tank	\$ 227,500	\$ 45,500.0	\$ 182,000.0
SUM	\$ 983,500	\$ 196,700	\$ 786,800

San Lorenzo Valley Water District  
Multiproject Engineering Services

Ranking of Responses to RFQ

Agenda: 4.19.18  
Item: 10a

	MME	Shaff	Freitas	IEC	WSC	Affinity	Pakpour
1	86	84	86	80	83	73	43
2	95	89	85	90	100	88	51
3	90	82	88	90	81	62	73
4	100	95	90	85	80	70	75
Average	92.8	87.5	87.3	86.3	86.0	73.3	60.5

## MEMO

To: Board of Directors  
From: District Manager  
Prepared By: Director of Operations  
Subject: Award of Bid, Two Way Radio Replacement  
Date: April 19, 2018

### Recommendation

It is recommended that the Board of Directors review this memo and accept the attached proposal from Golden State Communications, Inc. for a complete two-way radio system replacement in the amount of \$60,801.00.

### Background

The District utilizes a two-way radio system to communicate with staff to carry out objectives. Radios are mounted in all District vehicles and at various staffed facilities throughout the District. The existing radio system has reached its life expectancy and has not been upgraded as the District has increased its service areas. There are many dead areas throughout the water system in Felton, Lompico, and North Boulder Creek that we do not have radio or cell phone coverage. The 2017/18 Fiscal Year budget provided \$45,000 for radio replacement.

Formal procurement procedures were completed and the District received two sealed bids as follows:

Golden State Communications, Inc.	\$60,801.00
Bearcom	\$59,256.84

Bearcom bid was not complete as they did not complete the proper forms and not include tax, delivery and should be consider non responsive. Therefor it is recommended that the Board of Directors accept the proposal from Golden State Communications, Inc. for complete two-way radio replacement system in the amount of \$60,801.00.

FISCAL IMPACT:

FY 17/18: \$61,000

2016 STRATEGIC PLAN:

Strategic Element 1.0 - Water Supply Management

**SAN LORENZO VALLEY WATER DISTRICT**  
**Two Way Radio Replacement**

Item	Quantity	Price	
One (1) Motorola VHF SLR 5700 Repeaters, W/antennas, digitally connected	2	\$ 11,800	✓
Operations Building/Administration One (1) Motorola VHF XPR 2500 Radio with desk top microphone donor unit configured with MC 1000 Deskset Controller Eight (8) Motorola MC 1000 Deskset Controller, Remote DC or Tone adapter One (1) pole mounted antenna	1	\$ 7990	✓
Lyon Water Treatment Plant One (1) Motorola VHF XPR 2500 Radio with desk top microphone donor unit configured with MC 1000 Deskset Controller Two (2) Motorola MC 1000 Deskset Controller, Remote DC or Tone adapter One (1) pole mounted antenna	1	\$ 3340	
Kirby Water Treatment Plant One (1) Motorola VHF XPR 2500 Radio with desk top microphone donor unit configured with MC 1000 Deskset Controller Four (4) Motorola MC 1000 Deskset Controller, Remote DC or Tone adapter One (1) pole mounted antenna	1	\$ 4490	✓
Twenty six (26) Motorola VHF XPR 5550e units with vehicle stationary mounted antennas, installed in vehicles.	26	\$ 22,750	
Six (6) Hand-Held Portables Six (6) vehicle chargers installed	6	\$ 5010	
Two (2) 110 volt chargers for hand held radios	2	\$ 0	
Sales Tax Santa Cruz 8.50%	1	\$ 4121	✓
FCC Licensing 2 x F82 Repeater Pairs 2 x Mobile Only Frequencies	1	\$ 1300	✓
Total Bid Items (including sales tax and delivery)		60,801	

**Bid Form (page 2 of 3)**




**SAN LORENZO VALLEY WATER DISTRICT**  
**Two Way Radio Replacement**

This bid does not include Federal Excise Tax.

The only exceptions to the specifications are:

NONE

  
Signature of Bidder

I GEL

COO  
Title

GOLDEN STATE COMMUNICATIONS, INC.  
Firm Name

978 RINCON CIRCLE  
Address

SAN JOSE, CA 95131  
City/State/Zip

408.558.2700  
Day Telephone

800.774.6535  
After-Hours Telephone

All bids must be sealed and submitted before 3:00 p.m. Thursday, March 8, 2018 to the following:

Holly Morrison  
San Lorenzo Valley Water District  
13060 Highway 9  
Boulder Creek, CA 95008

Bid Form (page 3 of 3)

## MEMO

TO: Board of Directors

FROM: District Manager

PREPARED BY: Environmental Programs Manager

SUBJECT: Discussion and Possible Action on Recommendation to Award a Consulting Services Contract to Mike Podlech for the Fish Assessment for a Conjunctive Use Plan for the San Lorenzo River Watershed

DATE: April 19, 2018

### RECOMMENDATION:

It is recommend that the Board of Directors:

1. Review this memo, review the attached Scope and Budget and recognize Mike Podlech as the most qualified professional firm responding to the District's Request for Proposal to prepare the Fish Assessment for a Conjunctive Use Plan for the San Lorenzo River Watershed.
2. Authorize Staff to enter into negotiations and execute a professional services agreement with Mike Podlech to prepare said plan not to exceed price of \$42,940 which is fully grant funded.

### BACKGROUND

The District received 2 proposals following the request for proposals (RFP). Based on the criteria listed in the RFP and the assigned points for the following items: Cover Letter, Project Description, Identification of Staff and Sub Consultants, Project Organization and Experience, Past Performance, Including Cost & Schedule Control, Firm's Local Experience and Proposed Fee. Staff has selected Mike Podlech due to the clear and concise scope organized by tasks, the incremental approach, his history of successful collaborative efforts with resource agencies and his familiarity with their current methodologies.

The Wildlife Conservation Board awarded a Stream flow Enhancement Grant to the County and San Lorenzo Valley Water District to create a Conjunctive Use Plan for the District. The Conjunctive Use Plan may result increase diversion of excess flows; reduce diversion of limited baseflows. The net effects on fisheries resources are expected to be positive, and the focus of the impact assessment will be on (a) ensuring fisheries resources are adequately protected during increased winter/spring diversions, and (b) the benefits of the summer flow increases are maximized. Mike Podlech will be working closely with the District, County, and hydrology consultant, and will make specific recommendations to realize mutual benefit for both the human and fish communities.

The consultant will evaluate and make recommendations with regard to benefits to fish on the following areas:

- Transfers of water between Felton diversion and the South System, with possible additions to/from the North System to bring Felton into compliance
- Minimum and optimal stream flows needed to support juvenile salmonid fish during dry periods and critically dry periods.
- Utilize Loch Lomond right (313AFY) to supply Felton, South System, and lastly North System when surface sources are inadequate.
- Provide in-lieu recharge to South System and/or Scotts Valley Water District during the rainy season
- Preliminary feasibility study to recharge Olympia area aquifer by injecting excess wet season flows and/or Loch Lomond water
- Surface water availability analysis
- Impacts of scenarios on fisheries
- Impacts of scenarios on the groundwater basin
- Plan Development
- CEQA
- Water rights changes if necessary

2015 STRATEGIC PLAN:

Strategic Element 1.0 - Water Supply Management

Strategic Element 2.0 - Watershed Stewardship

FISCAL IMPACT:

Cost: \$42,940 grant funded

## Scope of Work and Contract Cost

### Water Availability Assessment for a Conjunctive Use Plan for the San Lorenzo River Watershed



Prepared for:  
San Lorenzo Valley Water District  
13060 Highway 9  
Boulder Creek, CA 95006

Prepared by:  
Mike Podlech, Fisheries Biologist  
4474 Cortez Drive  
Soquel, CA 95073

April 3, 2018

## Scope of Work

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The following scope of work first describes the analytical approaches that will be applied to completing project tasks identified in the Request for Proposal. For purposes of budgeting and contracting, however, a streamlined task list based on services and deliverables is provided following the RFP task summary.

### RFP Tasks

#### ***Task (a) – Review of existing plans, reports, and data syntheses***

For the past two decades, the District and County have supported an extensive fisheries monitoring program in the San Lorenzo River watershed conducted by D.W. Alley & Associates. The annual reports prepared for this monitoring report provide a wealth of information regarding salmonid habitat quality, population trends, and observations of potential limiting factors such as low flows, passage barriers, and sources of disturbance. In addition, D.W. Alley & Associates have prepared a number of stand-alone assessments such as focused water temperature evaluations and fish passage flow assessments. Moreover, the District's watershed management plan provides a valuable overview of the current water operations, infrastructure, and natural resources, while hydrologic assessment and monitoring work conducted by Balance Hydrologics and others provide important baseline streamflow information for the District's water supply system. A thorough review and synthesis of these sources of existing data will form the foundation of the stream and reach prioritization and fisheries effects analysis. Other sources, such as the National Marine Fisheries Service (NMFS) Intrinsic Potential (IP) model may also be consulted when appropriate to fill potential data gaps while fully recognizing the limitations of this GIS-based rating system.

#### ***Task (b) – Establish baseline flows currently available***

It is assumed that this task will involve close coordination with the selected hydrology consultant and be based on existing data, potentially augmented with site-specific data collection by the hydrology consultant. An often-overlooked aspect of flow management for fisheries resources is a comparative analysis of impaired vs. unimpaired flows to provide an indication of the "natural" conditions and thus establish realistic goals for instream flow management. A number of the District's diversions are located in steep stream reaches upstream of fisheries habitat. To determine the relative hydrologic effects such diversions may have on downstream fisheries habitat, an analysis similar to the State Water Resource Control Board (SWRCB) Cumulative Flow Impairment Index (CFII) based on known seasonal streamflow data, adjusted for drainage area and weighted mean annual precipitation at downstream Points of Interest (POI) may be appropriate.

#### ***Task (c) – Established flow requirements***

The District's water rights permits and licenses will be reviewed for existing bypass flow requirements. However, it is widely recognized that older water rights often contain flow requirements, if any, that would be considered inadequate for the protection of fisheries resources under current resource agency guidelines, as evidenced by permitted winter flow

requirements at the Fall Creek diversion that do not meet the empirically-derived recommendations developed by D.W. Alley & Associates. Depending on the water rights process applicable to the conjunctive use plan (e.g., application vs. petition), the existing requirements may require reevaluation. Close coordination with resource agencies is recommended for this task to ensure the potential effects of increased winter diversions are appropriately evaluated in the context of increased summer flows.

***Task (d) – Review of habitat, flow, and temperature relationship data***

The relationships between streamflow and habitat quality, including water temperature, are complex, and the interrelated effects of various habitat parameters on salmonid growth and survival add further layers of complexity. The overly simplistic view of “more is better” does not always hold true, especially when considering the influences of diversions on water temperature. As an example, I am currently working on a project where we are recommending an *increase* in summer water diversions on an exceedingly warm stream to maximize the relative influence of downstream cold-water spring tributary inflows. Recognizing the extensive quantitative and qualitative fisheries habitat and utilization data currently available, adequate information appears to be available to identify and prioritize streams that would benefit from additional flows for planning purposes, even if definitive flow needs remain unknown. This prioritization will allow for data gap identification that is focused on relevant stream reaches and salmonid life stages. In other words, diversion sites where current management would not change under conjunctive use would not require extensive analysis.

***Task (e) – Additional field work and assessments***

As indicated above, additional field work and assessments needed to fill data gaps will be recommended. Establishing realistic and feasible winter/spring passage flow recommendations below diversions locations identified for increased high-flow diversion rates under the conjunctive use scenarios is expected to be more relevant for the water rights, environmental review, and permitting processes than precise quantification of the fisheries benefits that may occur as a result of decreased summer diversions. Countless empirical and/or modeling methodologies for habitat-flow relationship analyses are available, ranging in scope and cost. Some methodologies, such as the Physical Habitat Simulation (PHABSIM) component of the Instream Flow Incremental Methodology (IFIM), were widely applied in the past but have more recently fallen out of favor as recognition of their shortcomings has increased. While additional studies necessary to fill data gaps will be identified under this task, and preliminary recommendations for appropriate study methodologies will be provided, this scope of work does not include site-specific assessments at this time, but recommends that implementation of necessary studies under a contingency budget (see below) or a separate future contract.

***Task (f) – Impact evaluation***

The results of the hydrologic assessment of the conjunctive use scenarios will be analyzed in the context of the results of the synthesis and analysis of available fisheries and habitat information performed under the above tasks. Based on the underlying premise of the plan (i.e., increased diversion of excess flows; reduced diversion of limited baseflows), the net effects on fisheries resources are expected to be positive, and the focus of the impact assessment will be on (a) ensuring fisheries resources are adequately protected during increased winter/spring diversions, and (b) the benefits of the summer flow increases are maximized. Working closely with the

District, County, and hydrology consultant, specific recommendations for maximizing net benefits will be developed.

***Task (g) – Evaluation of existing conjunctive use program***

Available data related to the current management of the North system will be reviewed to identify potential beneficial or adverse effects, inform the decision-making process for the system-wide conjunctive plan, and integrate existing and future management to maximize fisheries benefits. Considering that this review may provide an important “lessons learned” understanding, I propose to conduct this task during the early stages of the contract.

## **Contract Tasks**

***Task 1 – Background and data review***

Under this task, background information and data review relevant to various RFP tasks will be conducted.

***Task 2 – Review/analysis of conjunctive use scenarios***

Under this task, the results of the Task 1 data review will be evaluated in the context of the findings of the conjunctive use scenario evaluation conducted by the hydrology consultant.

***Task 3 – Draft report preparation***

A draft report summarizing the results of Task 1 and 2, preliminary stream prioritization recommendations, flow recommendations where available, data gaps to be filled, and initial impact evaluations will be prepared.

***Task 4 – Final report preparation***

Based on District, County, and relevant hydrology consultant review and input, the draft report will be revised and finalized.

***Task 5 – Plan/permit assistance***

Under this task, as-needed assistance will be provided to the District and County in the preparation of environmental review documents and permit applications.

***Task 6 – Meetings***

Phone and/or in-person meetings with District, County, and consultant staff will be attended as needed, and up to two meetings with regulatory agency staff and/or the technical advisory committee will be attended.

***Task 7 – Project Management***

General contract management tasks will be completed under this task.

***Contingency Task – Field assessments***

On an as-needed basis through the remainder of the project period, field assessments such as targeted habitat evaluations, habitat-flow relationship analyses (e.g., fish passage needs), or water temperature analyses may be completed if deemed necessary by the District and County. This work will be performed, once authorized, on a time and materials basis with a cost not to exceed \$10,000 without prior authorization.

## Contract Cost

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The billing rate for this project is \$135/hour. No mileage fees will be charged for travel within Santa Cruz County, and no overhead fees or other direct charges will be applied unless approved under the Contingency task (e.g., field equipment charges).

Task No.	Task Description	Hours	Cost
1	Background and data review	60	\$8,100.00
2	Review/analysis of conjunctive use scenarios	24	\$3,240.00
3	Draft report preparation	60	\$8,100.00
4	Final report preparation	24	\$3,240.00
5	Plan/permit assistance	40	\$5,400.00
6	Meetings	24	\$3,240.00
7	Project Management	12	\$1,620.00
N/A	Contingency	N/A	\$10,000.00
	<b>TOTAL NOT-TO-EXCEED</b>		<b>\$42,940.00</b>



## MEMO

TO: Board of Directors

FROM: District Manager

PREPARED BY: Environmental Manager

SUBJECT: Amendment to the Streamflow Enhancement/Conjunctive Use Grant from Wildlife Conservation Board Sub Contract with County.

DATE: April 19, 2018

### **RECOMMENDATION:**

It is recommended that the Board Approve the Amendment to the Wildlife Conservation Board-Streamflow Enhancement Grant Sub-Grantee Agreement Between the County of Santa Cruz and the San Lorenzo Valley Water District.

### **BACKGROUND:**

In 2017 in partnership with the County of Santa Cruz Water Resources Division, the San Lorenzo Valley Water District applied for - and was awarded a grant from the Wildlife Conservation Board in the amount of \$330,000. Full details are provided in the attached WCB Grant Contract.

The initial sub agreement indicated that the County would be the lead agency, contracting with consultants to provide groundwater availability assessments and fish flow assessment. The team has decided that it would be best if the District were lead contracting directly with consultants. In order to do so, the sub-grant agreement with the county needs to be amended to reflect the following changes (See Amendment attached). The Grantee (County) will remit to Sub-Grantee (District) disbursement it receives from WCB up to a total of \$127,240, (revised from \$17,300). The disbursement will be used to pay the contractors for the assessments. All other terms of the sub-grantee agreement shall remain unchanged.

This grant will help the District plan for and adapt to our changing climate. Local climate predictions indicate that long periods of drought punctuated by short periods of severe rainfall will have significant impacts fish habitat as well as groundwater recharge.

This project will develop a *San Lorenzo Watershed Conjunctive Use and Baseflow Enhancement Plan* (Plan) to improve water resource efficiency, benefiting essential local fisheries, and residents. The Plan will provide guidance for diverting excess winter surface flow in the San Lorenzo River Watershed to meet water supply needs, resting groundwater wells and also providing groundwater recharge. During the dry season, the augmented groundwater will then be used to meet supply demands and reduce stream diversions. It is anticipated that conjunctive use of surface and groundwater will lead to increased stream baseflow during summer and other critical times benefiting fisheries, and will also contribute to increased storage, recovery, and sustainable management of the municipal supply of the Santa Margarita Groundwater Basin.

### **FISCAL IMPACT:**

FY 17/18 & 18/19 Budget + 330,450.87 Grant Award

### **2015 STRATEGIC PLAN:**

Strategic Element 1.0 - Water Supply Management

Strategic Element 2.0 - Watershed Stewardship

Strategic Element 3.0 - Capital Facilities

Amendment  
Wildlife Conservation Board – Streamflow Enhancement Grant  
Sub-Grantee Agreement Between  
County of Santa Cruz  
(referred to herein as "Grantee")  
and San Lorenzo Valley Water District  
(referred to herein as "Sub-Grantee")  
For the Project Entitled:  
San Lorenzo Watershed Conjunctive Use Plan

Whereas, the Sub-Grantee shall be responsible for performance of tasks relative to evaluation of winter surface water availability, groundwater availability, flows for fish and municipal water availability, as described in Exhibit D of the Grant Agreement between Grantee and the Wildlife Conservation Board (WC-1649MM), the Sub-Grantee Agreement between Grantee and Sub-Grantee is amended as follows:

1. Section 2 relative to the scope of work, is hereby amended to add the following:  
"Sub-Grantee shall be responsible for performance of tasks relative to evaluation of winter surface water availability, groundwater availability, flows for fish and municipal water availability, as described in Exhibit D of the Grant Agreement."
2. Section 3, relative to compensation, shall be amended to increase the maximum payment to Sub-Grantee for work performed to an amount not to exceed \$127,240.
3. All other terms of the Sub-Grantee Agreement shall remain unchanged.

IN WITNESS WHEREOF Grantee and Sub-Grantee have executed this Agreement the day and year first written below by their duly authorized representatives, having full authority to so act for and on behalf of the parties hereto.

**County of Santa Cruz (Grantee)**

By: \_\_\_\_\_  
Giang T. Nguyen  
Health Services Agency Director

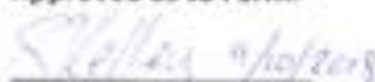
Date: \_\_\_\_\_

**San Lorenzo Valley Water District (Sub-Grantee)**

By: \_\_\_\_\_  
President

Date: \_\_\_\_\_

Approved as to Form:

  
Office of County Counsel

**Wildlife Conservation Board – Streamflow Enhancement Grant  
Sub-Grantee Agreement Between  
County of Santa Cruz  
(referred to herein as “Grantee”)  
and San Lorenzo Valley Water District  
(referred to herein as “Sub-Grantee”)  
For the Project Entitled:  
San Lorenzo Watershed Conjunctive Use Plan**

**Recitals**

- A. Grantee has entered into an agreement to receive grant funding with the California Wildlife Conservation Board (referred to herein as “WCB”) pursuant to that certain Streamflow Enhancement Grant, Grant Agreement No, WC-1649MM (referred to herein as “Grant Agreement”). The Grant Agreement, and any subsequent amendments thereto, are incorporated herein by reference and the Grant Agreement is attached hereto is as Attachment A to this Agreement.
- B. Grantee will contract with San Lorenzo Valley Water District (referred to herein as “Sub-Grantee”) intended to receive grant funding and perform work pursuant to said Grant Agreement. All of the work to be completed by Sub-Grantee and sub-contractors is referred to in this Agreement as “Task(s).”
- C. The parties acknowledge that Grantee will administer the distribution of grant funds to Sub-Grantee pursuant to the Grant Agreement and Sub-Grantee is to be responsible for all other aspects of its Component(s) in a manner to insure Grantee’s compliance with the Grant Agreement.
- D. The parties desire to set forth the terms and conditions under which Sub-Grantee is to complete the work and receive grant funds from Grantee.

**Agreement**

- 1. The above recitals are incorporated herein by reference.
- 2. Sub-Grantee shall perform the work and provide the documentation required of Grantee or Sub-Grantees pertinent to Sub-Grantee’s Task(s) in a timely manner as set forth, without limitation, in the portions of the Grant Agreement attributed to San Lorenzo Valley Water District in Exhibit B and D of the Grant Agreement. Notwithstanding the foregoing, any documents or information required to be submitted to the WCB, agents of the WCB, or particular websites, shall be submitted by Sub-Grantee to Grantee for submittal by Grantee to the appropriate party designated in the Grant Agreement.
- 3. Subject to receipt of grant funds from WCB as a result of a particular request for disbursement of grant funds by Sub-Grantee and subject to the other terms and conditions set forth herein, Grantee shall remit to Sub-Grantee such disbursement it receives from WCB as a result of such request, up to a total amount not to exceed \$17,300.

4. In order to receive disbursement of grant funds, Sub-Grantee shall submit to Grantee quarterly invoices for eligible expenses in a form required by Grantee. Supporting documentation as described in Section 4 and Exhibit C of the Grant Agreement shall accompany each invoice. The documentation required by this paragraph shall be sent to:

Sierra Ryan  
Environmental Health Division  
701 Ocean Street, Room 312  
Santa Cruz, CA, 95060

or such other address as Grantee may provide.

5. Sub-Grantee shall not request disbursement for any cost until such cost has been incurred and has been (i) paid by or (ii) is due and payable by Sub-Grantee. All grant disbursements received by Sub-Grantee shall be paid to applicable contractors and vendors within thirty (30) days from receipt of the funds by Sub-Grantee from Grantee. In the event that Sub-Grantee fails to disburse grant funds to contractors or vendors within such thirty (30) day period, Sub-Grantee shall immediately return such funds to Grantee. In such event, interest shall accrue on such funds from the date of disbursement from the WCB to Grantee through the date of mailing of such funds to the WCB by Grantee, which Grantee shall do as soon as it feasibly can after Grantee receives such funds from Sub-Grantee. In addition, if Sub-Grantee held such funds in interest-bearing accounts, any and all interest earned on the funds shall be due and payable to Grantee. Sub-Grantee agrees to indemnify and hold harmless Grantee and Grantee's officers, directors, agents, and employees (each, an "Indemnified Person") from and against any and all judgments, losses, claims, damages or liabilities, joint or several, to which any Indemnified Person may become subject which relate to or arise out of Sub-Grantee's failure to immediately return any funds as required by this paragraph 5.
6. Notwithstanding any other provision of this Agreement, no disbursement shall be required to be made by Grantee at any time or in any manner which is in violation of, or in conflict with, federal or state laws, rules, or regulations, or which may require any rebates to the Federal Government, or any loss of tax-free status on state bonds, pursuant to any Federal statute or regulation.
7. Sub-Grantee acknowledges the provisions of Section 4.4 of the Grant Agreement and that disbursement of grant funds may be withheld by Grantee to satisfy the retention requirements set forth therein.
8. Sub-Grantee shall not be entitled to, and Grantee shall have no obligation to make any, disbursement of grant funds as set forth herein if Grantee does not receive grant funds from the WCB in connection with Sub-Grantee's request for disbursement. Further, if Grantee is required to refund any disbursement made to Sub-Grantee to the WCB due to a violation of the Grant Agreement by Sub-Grantee, Sub-Grantee shall refund to Grantee such disbursement amount plus any interest or penalties required to be paid by Grantee to the WCB in connection with such refund.

9. Sub-Grantee acknowledges that it is required to expend matching funds for its Task(s), in an amount not less than \$284,700, consistent with the appropriate provisions of Exhibit B of the Grant Agreement, and Sub-Grantee hereby agrees to expend such funds in a timely manner, and provide documentation of such expenditures.
10. Sub-Grantee agrees to provide all required reports as specified in the Grant Agreement, according to a format and schedule as specified by the Grantee and the Grant Administrator.
11. Sub-Grantee agrees to be bound, perform and abide by all of the provisions applicable to Grantee or any Sub-Grantee set forth in the Grant Agreement as if Sub-Grantee had signed the Grant Agreement in the place and stead of Grantee, and with respect to Sub-Grantee, Grantee shall have all rights of the WCB, "State," or "Division" conferred thereunder.
12. Sub-Grantee hereby makes, for the benefit of Grantee, all of the warranties, representations, covenants, and certifications with respect to its Task(s) that are made by Grantee and with respect to the "Project" set forth in the Grant Agreement.
15. Sub-Grantee acknowledges that Grantee is relying on Sub-Grantee's performance hereunder in entering into the Grant Agreement and undertaking its obligations as set forth in the Grant Agreement. Accordingly, in the event Sub-Grantee fails to perform any of its obligations hereunder, Sub-Grantee agrees to indemnify, defend, and hold all Indemnified Person (as defined in paragraph 5 above) harmless from and against any and all judgments, losses, claims, damages or liabilities, joint or several, to which any Indemnified Person may become subject which relate to or arise out of any such failure by Sub-Grantee.
16. In the event Sub-Grantee violates any provision of this Agreement that, in Grantee's judgment, could result in a violation of the Grant Agreement, Grantee may take any and all appropriate measures to attempt to prevent any such violation or to mitigate any damages Grantee would incur as a result thereof, including but not limited to performing any work required of Sub-Grantee hereunder, and in such case, Sub-Grantee shall be liable for any costs of Grantee incurred in connection with such measures.
17. To enable Grantee to confirm Sub-Grantee's compliance with this Agreement, upon request by Grantee, Sub-Grantee shall provide Grantee with: (i) any requested documentation; and (ii) access to any work sites or other areas associated with Sub-Grantee's Component(s) for the purpose of making observations or conducting any necessary tests or studies.
18. The parties may, pursuant to mutual agreement, expand the scope of work to be performed by Sub-Grantee hereunder, but in any event modifications to the terms of this Agreement shall be valid only if made in writing and executed by Grantee and Sub-Grantee.
19. Sub-Grantee shall not assign, delegate or otherwise transfer any of its duties, obligations, rights or interest under this Agreement without prior written consent of Grantee, which consent may be given or withheld by Grantee in its reasonable discretion. Any attempted assignment or transfer without such consent shall be void.

20. Subject to the provisions of paragraph 19 above, all terms and conditions of this Agreement shall be binding upon, inure to the benefit of, and be enforceable by, Grantee and Sub-Grantee and their respective legal representatives, successors and permitted assigns.
21. A waiver of any provision of this Agreement in any given instance shall not constitute a waiver of (i) such provision in future instances or (ii) any other provision of this Agreement.
22. This Agreement, together with the other agreement specifically referred to herein, constitutes the entire understanding of Grantee and Sub-Grantee concerning the subject matter hereof and supersedes all prior and contemporaneous agreements, correspondence, representations or understandings between Grantee and Sub-Grantee relating to the subject matter hereof, whether written or oral.
23. This Agreement may be executed in counterparts, each of which when taken together shall constitute the entire Agreement.
24. This Agreement shall be governed by and construed in accordance with the laws of the State of California. In the event any dispute arises between the parties to this agreement concerning the matters contained in this agreement, the parties agree to pursue mediation as a means to settle the dispute.
25. The grant term shall begin on the date upon which the authorized representative of WCB signs the Grant Agreement and end December 31, 2019, or on a later date if the term of the Grant Agreement is extended.
26. Whenever it is provided in this Agreement that Grantee or Sub-Grantee shall give notice to the other, said notice shall be given by delivering a copy of said notice to the other party personally, or by mailing first class mail, postage prepaid, through the U.S. Postal Service, or by a nationally-recognized overnight courier, a copy of said notice at the following addresses:
  - A. Address for Sub-Grantee:  
San Lorenzo Valley Water District  
13060 Hwy 9  
Boulder Creek, Ca, 95006
  - B. Address for Grantee:  
County of Santa Cruz  
Health Services Agency  
Environmental Health Division  
701 Ocean Street, Room 312  
Santa Cruz, CA 95060

IN WITNESS WHEREOF Grantee and Sub-Grantee have executed this Agreement the day and year first written below by their duly authorized representatives, having full authority to so act for and on behalf of the parties hereto.

**County of Santa Cruz (Grantee)**

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Giang T. Nguyen  
Health Services Agency Director

**San Lorenzo Valley Water District (Sub-Grantee)**

By: \_\_\_\_\_ Date: \_\_\_\_\_  
President

**Approved as to Form:**

\_\_\_\_\_  
County Counsel

**CALIFORNIA WILDLIFE CONSERVATION BOARD**

**GRANT AGREEMENT**

**Between**

**STATE OF CALIFORNIA, WILDLIFE CONSERVATION BOARD**

**and**

**COUNTY OF SANTA CRUZ**

**for**

**SAN LORENZO WATERSHED CONJUNCTIVE USE PLAN**

**SANTA CRUZ COUNTY, CALIFORNIA**

**WC-1649MM**

**State of California  
Natural Resources Agency  
Department of Fish and Wildlife  
Wildlife Conservation Board**



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**GRANTEE:** County of Santa Cruz  
701 Ocean Street, Room 312  
Santa Cruz, California 95060  
Attn: John Ricker  
Phone: (831) 454-2750  
E-mail: john.ricker@santacruzcounty.us

**GRANTOR:** Wildlife Conservation Board  
1700 9th Street, 4th Floor  
Sacramento, California 95811  
Attn: Margaret Massie, State Representative  
Phone: (916) 445-0367  
E-mail: margaret.massie@wildlife.ca.gov

**Grant Agreement No.:** WC-1649MM

**Board Approval Date:** March 9, 2017

**Projected Completion Date:** December 31, 2019

**Terms of Agreement:** Notice to Proceed Date ( ) through  
December 31, 2019

**Project ID:** 2017025

#### FUNDING CERTIFICATION

I hereby certify that (a) the following funds will be encumbered on behalf of Grantor; and  
(b) Grant Funds shall not be disbursed unless and until sufficient proceeds from the  
source identified below become available to Grantor to disburse.

  
Fiscal Officer

4/3/17  
Date:

**Grant Amount:** \$330,451.00

**Fund Source:** Water Quality, Supply and Infrastructure Improvement Fund of  
2014, Section 79733

**Appropriation Item:** Chapter 10, Statutes of 2015

**Line Item:** 3640-101-6083

**Expenditure Code:** 16-1000-702-45000

## **1. SCOPE OF AGREEMENT**

Pursuant to the Wildlife Conservation Law of 1947, Chapter 4.0 of Division 2, commencing with Section 1300, of the California Fish and Game Code; the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1), California Water Code Section 79700 et seq.; and the approval granted by the Wildlife Conservation Board on March 09, 2017, the Wildlife Conservation Board (Grantor) hereby grants to the County of Santa Cruz (Grantee), a sum not to exceed three hundred thirty thousand four hundred fifty one dollars (\$330,451.00) (Grant Funds), upon and subject to the terms and conditions of this Grant Agreement (Agreement).

## **2. PURPOSES OF GRANT**

Grantor is entering into this Agreement, and the Grant Funds shall be used, only for the purpose of assisting Grantee with the project described within the grant application San Lorenzo Watershed Conjunctive Use and Baseflow Enhancement Plan submitted for the California Stream Flow Enhancement Program by County of Santa Cruz for the solicitation which closed August 31, 2016 and is generally described as: to provide guidance for diverting excess winter surface flow in the San Lorenzo River Watershed to meet water supply needs, and provide active groundwater recharge (Project) on the southern portions of the San Lorenzo River Watershed, including Fall Creek, Bull Creek, Bennett Creek, Boulder Creek, Bean Creek and Zayante Creek, located in Santa Cruz County, California (Property). The Property is generally shown on the attached Exhibit A - LOCATION MAP.

## **3. CONDITIONS OF GRANT**

Grantor's obligation to disburse Grant Funds under this Agreement is conditioned upon and subject to the satisfactory completion of all of the following conditions:

- 3.1 Grantor shall have reviewed and approved all documents pertaining to the Project, including, without limitation, feasibility and planning studies, designs, plans, budgets, cost estimates, timelines and agreements. Such review and approval by Grantor will be for compliance with this Agreement as well as funding and other requirements applicable to Grantor, and shall not be unreasonably withheld.
- 3.2 Grantor shall have reviewed and approved a certified resolution or other appropriate action of the governing board or governing body of Grantee, authorizing the execution and performance of this Agreement and the carrying out of the Project by Grantee.
- 3.3 Grantee shall have disclosed all funding sources for the Project, including all amounts applied for or obtained from sources other than Grantor. These amounts shall be reflected in the attached Exhibit B – BUDGET (Budget) by Budget category. As between Grantor and Grantee, Grantee shall be

responsible for any and all Project costs that exceed the amount of the Grant Funds provided under this Agreement.

- 3.4 For construction projects applicants shall have consulted with the California Conservation Corps (CCC) and a certified local conservation corps as to the feasibility of using their services as defined in section 14507.5 of the Public Resources Code to implement projects (CWC § 79734). Where feasible, participation by the CCC will occur.
- 3.5 The Project shall have been approved by the Wildlife Conservation Board at a public meeting. This Agreement shall have been fully executed by Grantor and Grantee, and Grantee shall have received a written "Notice to Proceed" from Grantor. The approval of the Project by the Wildlife Conservation Board on March 09, 2017, shall not constitute authorization for the commencement of the Project or expenditure of Grant Funds. No expenditure made or activity initiated prior to Grantee's receipt of a written Notice to Proceed from Grantor will be eligible for reimbursement by Grantor.

#### **4. DISBURSEMENTS**

- 4.1 Upon satisfaction of all of the Conditions of Grant set forth in Section 3, above, and so long as Grantee is not in breach or default under this Agreement, Grantor agrees to disburse the Grant Funds to Grantee, in arrears, in installments as set forth in this Section 4. Disbursements shall be made not more frequently than monthly and disbursements of less than \$5000.00 should be made not more frequently than quarterly. All disbursements shall be subject to the availability of funds for purposes of the Project as provided in Section 4.8.
- 4.2 Grantee shall request disbursement of Grant Funds by submitting a disbursement request to Grantor for approved budgeted work performed on the Project in accordance with Section 4.3. Disbursement shall be contingent upon approval of the disbursement request by Grantor.
- 4.3 The disbursement request must be submitted on Grantee's letterhead, signed by an authorized representative of Grantee, and include a written description of the work completed during the period of the disbursement request. Requests for disbursement must be itemized using the same categories included in the attached Budget. Exhibit C – DISBURSEMENT REQUEST TEMPLATE provides the format to use for submitting disbursement requests to Grantor. Each disbursement request shall contain supporting or back-up documentation for all amounts shown on the request, including receipts for all materials and supplies, all Grantee staff time shown by number of hours worked and hourly rate, and all contractor or sub-contractor services.

- 4.4 Grantor may withhold ten percent (10%) of the total approved amount from each disbursement (Retained Grant Funds) until Grantor has approved the completion of the Project, the final report required by Section 6.4, and the final request for disbursement.
- 4.5 Upon completion of Project activities, Grantee may request disbursement of the Retained Grant Funds. Grantee shall submit this request no later than thirty (30) days after the Projected Completion Date (as defined in Section 6.1).
- 4.6 Please submit disbursement requests electronically to WCB at [WCBCLerical@wildlife.ca.gov](mailto:WCBCLerical@wildlife.ca.gov) and WCB Project Manager Margaret Massie ([margaret.massie@wildlife.ca.gov](mailto:margaret.massie@wildlife.ca.gov)) with "Project ID \_\_\_\_ Invoice No. \_\_\_\_" in the subject line.  
Alternatively, hard copy requests for disbursement can be sent to:
- Wildlife Conservation Board  
1416 9<sup>th</sup> Street, Room 1266  
Sacramento, California 95814  
Attn: Margaret Massie
- 4.7 Grantee shall reimburse Grantor for any erroneous disbursement of Grant Funds under this Agreement. Reimbursement shall occur within 30 days of written demand by Grantor. Interest shall accrue at the highest rate allowed by law from the time that reimbursement becomes due and owing until received by Grantor.
- 4.8 Despite any contrary provision of this Agreement, Grantor shall not be obligated to disburse any remaining unpaid portion of the Grant Funds unless and until sufficient funds identified for allocation to the Project (as further specified in the Funding Certification attached to this Agreement) are released by the State Treasurer's Office to Grantor for expenditure for this grant. No request for disbursement submitted prior to the release of such funds to Grantor shall be effective.

## 5. BUDGET

The attached Budget is an estimate of the Grantee's anticipated costs for the Project and discloses all funding sources for the Project, including all amounts applied for or obtained from sources other than Grantor. Should the Budget not disclose all funding sources for the Project, Grantor may refer this grant to the Department of Finance for a Project audit. Grantee may seek additional funding from sources other than Grantor, with Grantor's approval, to cover cost increases or to reduce Grantor's cost share. Should Grantee obtain additional funds from sources other than Grantor, Grantee shall promptly notify Grantor of



the amounts and sources of the additional funding and submit a proposed new budget reflecting any changes to Grantor for its approval.

When actual Project costs indicate that the costs of certain Budget categories payable by Grantor are higher than estimated, and these higher costs are offset by lower costs in other Budget categories payable by Grantor, the Grantee may submit a written request to Grantor to shift funds between such Budget categories. Contingencies shall be used only upon written approval by Grantor. Grantor shall approve or deny a requested Budget revision or use of contingencies in writing within 10 business days of receipt of Grantee's written request.

## **6. GRANTEE'S COVENANTS**

In consideration of this Agreement, Grantee hereby covenants and agrees as follows:

- 6.1. Grantee will complete or cause to be completed all Project activities in accordance with Grantee's proposed design and specifications submitted to Grantor, a copy of which is attached as Exhibit D - WORK PLAN and incorporated herein by this reference, on or before December 31, 2019. The Project will be considered complete when all Project activities have been completed and Grantor has approved the completion of the Project, the final report required by Section 6.4, and the final request for disbursement.
- 6.2. Grantee is responsible for obtaining all necessary permits and approvals for the Project (including its construction, management, monitoring, operation, use and maintenance), and complying with all federal, state and local statutes, laws, regulations, ordinances, orders and other governmental and quasi-governmental requirements that apply to the Project (including its construction, management, monitoring, operation, use and maintenance).
- 6.3. Grantee shall recognize the cooperative nature of the Project and shall provide credit to the Grantor on signs, demonstrations, promotional materials, advertisements, publications and exhibits prepared or approved by Grantee referencing the Project. Any sign installed on the Property referencing the Project shall be subject to the mutual agreement of Grantor, Grantee and Landowner regarding text, design and location and shall display the logo of Grantor.
- 6.4. The Grantee will provide progress reports with each invoice and a final report upon Project completion.
- 6.5. Not later than 30 days following the completion of all Project activities Grantee will submit one hard copy and one digital copy of a final report of

accomplishments, including project cost totals, pre- and post-Project photographs and a final design or site plan of the Project, to Grantor.

- 6.6 The Grantee and Landowner(s) will obtain signed Private Property Access agreements prior to any work commencing on landowner's property as required for project activities.
- 6.7 Pursuant to Governor Brown's April 25, 2014 Executive Order proclaiming a continued State of Emergency due to water shortage and drought conditions, Grantee shall have appropriate water conservation and efficiency programs in place. Grantee hereby certifies that it has, and will keep, such programs in effect. Upon request by Grantor, Grantee shall provide information regarding its water conservation and efficiency program(s) to Grantor.

## **7. BREACH AND REMEDIES**

- 7.1 In the event of a breach of Grantee's obligations under this Agreement, Grantor shall give notice to Grantee describing the breach. If Grantee does not cure the breach described in the Grantor's notice within 90 days after the date of Grantor's notice or, if the breach cannot reasonably be cured within 90 days, Grantee does not commence the cure within the 90-day period and diligently pursue it to completion, then Grantee shall be in default of this Agreement.
- 7.2 In the event of a default by Grantee before the Project is complete then, in addition to any and all other remedies available at law or in equity, Grantor may seek specific performance of this Agreement. Grantee agrees that specific performance is an appropriate remedy because the benefits to Grantor from Grantee's completion of the Project in accordance with this Agreement, as described in Section 2 (Purposes of Grant), are unique and damages would not adequately compensate Grantor for the loss of such benefits.
- 7.3 In the event of a default by Grantee, in addition to any and all other remedies available under this Agreement, at law or in equity, Grantor may require Grantee to reimburse the Grant Funds to Grantor in an amount determined by application of the following Reimbursement Formula:

### "Reimbursement Formula"

Formula: Dollar amount of Grant Funds divided by Project Life, times the number of years remaining in the Project Life.

**Example:** Grantor grants \$50,000.00 to Grantee for the restoration and enhancement of wetland and riparian habitat, and the Project Life is 25 years. With 10.5 years remaining on the Project Life, the Grantee is in default under the Agreement. The reimbursement amount would be \$21,000, calculated as follows:

$$(\$50,000.00 \div 25 \text{ years}) \times 10.5 \text{ years} = \$21,000$$

Reimbursement shall be due from Grantee immediately upon written demand by Grantor. Interest shall accrue at the highest rate allowed by law from the time that the reimbursement becomes due until it is actually received by Grantor.

- 7.4 Any costs incurred by Grantor, where Grantor is the prevailing party, in enforcing the terms of this Agreement, including but not limited to costs of suit, attorneys' and experts' fees, at trial and on appeal, and costs of enforcing any judgment, shall be borne by Grantee.
- 7.5 Waiver of any breach or default by Grantee shall not be deemed to be a waiver of any subsequent breach or default, nor shall it constitute a modification of this Agreement.

## **8. ADDITIONAL TERMS AND CONDITIONS**

### **8.1 Grantee Responsible for Project**

While the Grantor undertakes to assist the Grantee with the Project by providing a grant pursuant to this Agreement, the Project itself remains the sole responsibility of the Grantee. Grantor undertakes no responsibilities to the Grantee, the Landowner, or any third party, other than as expressly set out in this Agreement. The responsibility for implementing the Project is solely that of the Grantee, as is the responsibility for any claim or suit of any nature by any third party related in any way to the Project.

### **8.2 Contracts**

All agreements between Grantee and any third party related to the Project must be in writing and contain language that establishes the right of the auditors of the State of California to examine the records of the third party relative to the goods, services, equipment, materials, supplies or other assistance provided to Grantee for the Project. Grantee shall provide a complete copy of each agreement over \$10,000.00 to Grantor prior to commencing work.



### **8.3 Indemnification**

To the fullest extent permitted by law, Grantee shall indemnify, protect, and hold harmless the Wildlife Conservation Board and the State of California, and their respective members, officers, agents, employees and representatives, from and against any and all claims, demands, damages, losses, costs (including attorneys' fees), expenses, and liability of any nature (Claims) arising out of or incident to the Project, Grantee's entry upon and use of the Property, and the performance of, or failure to observe or perform, any obligations of the Grantee under this Agreement. The obligations of Grantee under this Section 8.3 include, without limitation, Claims resulting from the generation, use, storage, disposal, release or threatened release of any hazardous or toxic substance, material or waste; petroleum or petroleum products and other substances that present a threat to human health or the environment.

### **8.4 Amendment; Severability**

This Agreement may be modified only by a written amendment signed by Grantor and Grantee. No oral or written understanding or agreement not incorporated in this document shall be binding on the parties.

If any provision of this Agreement or the application thereof to any person or circumstance is held to be invalid or unenforceable, that shall not affect any other provision of this Agreement or applications of the Agreement that can be given effect without the invalid provision or application. To this end the provisions of this Agreement are severable.

### **8.5 Independent Capacity of Grantee; Withholding and Payments**

Grantee, its members, officers, directors, employees, agents and representatives, is each acting in an independent capacity in entering into and carrying out this Agreement, and not as a partner, member, officer, agent, employee or representative of Grantor. Grantee is responsible for withholding and paying employment taxes, insurance and deductions of any kind required by federal, state or local laws.

### **8.6 No Assignment or Transfer**

This Agreement is not assignable or transferable by Grantee, either in whole or in part, without the prior written consent of Grantor which Grantor may grant or withhold in Grantor's discretion.

### **8.7 Accounting/Records/Audits**

Grantee shall maintain complete and accurate records of its actual Project costs, in accordance with generally accepted accounting principles and practices, and

shall retain said records for at least three years after final disbursement by Grantor. During such time, Grantee shall make said records available (or cause them to be made available) to the State of California for inspection and audit purposes during normal business hours. Expenditures not documented, and expenditures not allowed under this Agreement or otherwise authorized in writing by Grantor shall be borne by Grantee. The audit shall be confined to those matters connected with this Agreement, including but not limited to administration and overhead costs.

The Grantee shall utilize the Bond Accountability and Audits Guide, provided by the California Department of Finance, Office of State Audits and Evaluations (OSAE) to ensure that Project expenditures are in compliance with applicable laws, regulations, and established criteria and that appropriate record keeping is maintained. The Guide is available at the following OSAE website:

[http://www.dof.ca.gov/osae/prior\\_bond\\_audits/documents/BondAccountabilityandAudits.pdf](http://www.dof.ca.gov/osae/prior_bond_audits/documents/BondAccountabilityandAudits.pdf)

#### **8.8 Use of Grant Funds to Secure Additional Funding**

Grantee agrees that the funding provided under this Agreement shall not be used as matching funds for other grants, or to secure loans or other monetary awards without written approval from the Executive Director, Wildlife Conservation Board. Such approval shall not be unreasonably withheld as long as the purposes for which the grant was awarded are maintained.

#### **8.9 Termination or Suspension of Agreement**

At any time before Grantee has started Project activities Grantor may terminate this Agreement for any reason by providing Grantee not less than 30 days written notice of termination. In addition, Grantor may suspend this Agreement at any time upon written notice to Grantee. In either case, Grantee shall immediately stop work under this Agreement and take all reasonable measures to prevent further costs to Grantor. The Grantor shall be responsible for reasonable and non-refundable obligations or expenses incurred by the Grantee under this Agreement prior to the date of the notice to terminate or suspend, but only up to the undisbursed balance of funding authorized in this Agreement. Any notice suspending work under this Agreement shall remain in effect until Grantor authorizes work to resume by giving further written notice to Grantee.

#### **8.10 Resolution of Disputes**

The State Project Representative is identified on Page i of this Agreement. The State Project Representative has initial jurisdiction over each controversy arising under or in connection with the interpretation or performance of this Agreement or disbursement of Grant Funds. The Grantee will diligently pursue with the State Project Representative a mutually agreeable settlement of any such

controversy.

If the controversy cannot be resolved between Grantee and the State Project Representative, the Grantee must direct the grievance together with any evidence, in writing, to the Executive Director of the Wildlife Conservation Board. The grievance must state the issues in the dispute, the legal authority or other basis for the Grantee's position and the relief sought.

The Executive Director or designee shall meet with a representative of the Grantee to review the issues. A written decision signed by the Executive Director or designee shall be returned to the Grantee within twenty (20) working days of the conclusion of this meeting.

#### **8.11 Drug-Free Workplace Certification**

By signing this Agreement, Grantee hereby certifies under penalty of perjury under the laws of the State of California that Grantee will comply with the requirements of the Drug-Free Workplace Act of 1990 (Government Code Section 8350 et seq.) and will provide a drug-free workplace by taking the following actions:

- 8.11.1 Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations, as required by Government Code Section 8355(a).
- 8.11.2 Establish a Drug-Free Awareness Program as required by Government Code Section 8355(b) to inform employees about all of the following:
  - a) the dangers of drug abuse in the workplace;
  - b) the person's or organization's policy of maintaining a drug-free workplace;
  - c) any available counseling, rehabilitation and employee assistance programs; and,
  - d) penalties that may be imposed upon employees for drug abuse violations.
- 8.11.3 Provide, as required by Government Code Section 8355(c), that every employee who works on the proposed Project:
  - a) will receive a copy of the company's drug-free policy statement; and,
  - b) will agree to abide by the terms of the company's statement as a condition of employment on the Project.

Failure to comply with these requirements may result in suspension of



disbursements under this Agreement or termination of the Agreement or both and Grantee may be ineligible for award of any future state contracts and grants if the Grantor determines that any of the following has occurred: (1) Grantee has made false certification, or (2) Grantee violates the certification by failing to carry out the requirements as noted above.

#### **8.12 Union Organizing**

By signing this Agreement the Grantee hereby acknowledges the applicability to this Agreement of Government Code Sections 16645 through 16649, and certifies that:

8.12.1 No state funds disbursed by this grant will be used to assist, promote or deter union organizing;

8.12.2 Grantee shall account for state funds disbursed for a specific expenditure by this grant, to show those funds were allocated to that expenditure;

8.12.3 Grantee shall, where state funds are not designated as described in 8.12.2 above, allocate, on a pro-rata basis, all disbursements that support the grant program; and

8.12.4 If Grantee makes expenditures to assist, promote or deter union organizing, Grantee will maintain records sufficient to show that no state funds were used for those expenditures, and that Grantee shall provide those records to the Attorney General upon request.

#### **8.13 Labor Code Requirements; Prevailing Wage**

State grants may be subject to California Labor Code requirements, which include prevailing wage provisions. Certain State grants administered by the California Wildlife Conservation Board and the California Department of Fish and Wildlife are not subject to Chapter 1 (commencing with Section 1720) of Part 7 of Division 2 of the Labor Code. For more details, please refer to California Fish and Game Code Section 1501.5 and to the Department of Industrial Relations (DIR) website at <http://www.dir.ca.gov>. Grantee shall pay prevailing wage to all persons employed in the performance of any part of the Project if required by law to do so.

#### **8.14 Informational Products**

The Exhibit D – WORK PLAN includes a list of project-specific performance measures that are to be used to evaluate the effectiveness of the Project in achieving the stated objectives. By entering into this Grant, the Grantee commits to disclosing how information will be collected, stored, and disseminated to participants, stakeholders, public, and the State. Public information may include,

but is not limited to technical designs, feasibility studies, reports, and data gathered during any phase of development, including planning, design, construction, operation, and monitoring.

#### **8.14.1 Data Management (all grants, as applicable)**

Data management activities will be coordinated by the Grantee. Grantee shall be responsible for verifying the quality of the data in accordance with applicable Quality Assurance/Quality Control guidelines. Grantee shall prepare and submit to the Grant Manager all data generated by the project. Geospatial data will be delivered in an industry-standard spatial data format (ESRI-readable) where applicable and documented with metadata in accordance with the CDFW Minimum Data Standards (<http://www.dfg.ca.gov/biogeodata/bios/metadata.asp>).

*For projects that involve wetland or riparian restoration activities, include the following:* Grantee shall upload project information (including project names, project proponent/contact, project boundary shapefile [polygon], Proposition 1 funding details, pertinent dates, activity type, and habitat types and amounts) to Project Tracker (<http://ptrack.ecoatlas.org/>) in EcoAtlas (<http://www.ecoatlas.org/>).

*For projects that will generate surface water quality data, include the following:* Water quality data generated by the project will be collected in a manner that is compatible and consistent with the California Environmental Data Exchange Network (CEDEN, <http://www.ceden.org/>). The Grantee shall upload relevant data to CEDEN and provide a receipt of successful data submission, generated by CEDEN, to the Grant Manager prior to submitting a final invoice.

*For projects that will generate groundwater monitoring data, include the following:* Groundwater monitoring data generated by the project will be collected and reported in a manner that is compatible and consistent with the groundwater data systems administered by the State Water Resources Control Board. The Grantee shall upload relevant data to GeoTracker GAMA (<http://www.waterboards.ca.gov/gama/>) and provide proof of successful data submission prior to submitting a final invoice.

#### **8.15 Non-Discrimination**

During the performance of this Agreement, Grantee shall not unlawfully discriminate against, harass, or allow harassment against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical disability (including HIV and AIDS), mental disability, medical condition, marital status, age (over 40), sex, sexual orientation, or use of family-care leave, medical-care leave, or pregnancy-disability leave. Grantee shall take affirmative action to ensure that the evaluation and treatment of its employees and applicants for employment are free of such discrimination and harassment.

Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Grantee shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 (a-f) et seq.), and applicable regulations (California Code of Regulations, Title 2, Section 7285 et seq.). The regulations of the Fair Employment and Housing Commission regarding Contractor Nondiscrimination and Compliance (Chapter 5 of Division 4 of Title 2 of the California Code of Regulations) are incorporated by reference into this Agreement. Grantee shall give written notice of its obligations under this non-discrimination clause to labor organizations with which Grantee has a collective bargaining or other agreement, and shall post in conspicuous places available to employees and applicants for employment, notice setting forth the provisions of this section. Grantee shall also include the nondiscrimination and compliance provisions of this Agreement in all contracts related to the Project.

#### **9. AUTHORIZATION**

The signature of the Executive Director certifies that at the meeting of the Wildlife Conservation Board held on March 09, 2017 the Board authorized the award of a grant of up to \$330,451.00 to Grantee for the Project.

#### **10. EFFECTIVENESS OF AGREEMENT**

This Agreement shall be deemed executed and effective when fully signed by authorized representative(s) of both Grantor and Grantee. Each party shall sign two original counterparts of this Agreement. Each fully executed counterpart shall be deemed an original. Grantee shall receive one fully executed original and Grantor shall receive one fully executed original.

#### **11. EXHIBITS**

Each of the Exhibits referenced in this Agreement is incorporated by reference as though set forth in full herein. The following Exhibits are attached to this Agreement:

- Exhibit A – Location Map**
- Exhibit B – Budget**
- Exhibit C – Disbursement Request Template**
- Exhibit D – Work Plan**

**IN WITNESS WHEREOF**, the undersigned parties have executed this Agreement.

**GRANTOR**

STATE OF CALIFORNIA  
WILDLIFE CONSERVATION BOARD

By: \_\_\_\_\_ Date: \_\_\_\_\_  
John P. Donnelly  
Executive Director

**GRANTEE**

COUNTY OF SANTA CRUZ

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Giang Nguyen  
Director of Health Services



San Lorenzo Watershed Conjunctive Use Plan, Santa Cruz County  
Grant Agreement Number: WC-1649MM  
Project ID: 2017025

EXHIBIT A

## EXHIBIT A – LOCATION MAP





## BUDGET

Project Task	WCB	San Lorenzo Valley Water District	Total Cost Per Task
Project Management	\$61,511	\$4,700	\$61,511
Permitting and Fees	\$4,110	---	\$4,110
Indirect	\$11,530	---	\$11,530
Data Collection, Modeling, and Analysis	\$168,300	\$100,000	\$268,300
Water Rights and Environmental Compliance	\$85,000	---	\$85,000
Infrastructure Improvements	---	\$180,000	\$180,000
<b>TOTAL</b>	<b>\$330,451</b>	<b>\$284,700</b>	<b>\$615,151</b>

**Product Code:**

1994  
 responsible to the  
 institution for  
 actions that it  
 exceeds beyond

Year	Percentage of respondents (%)
1997	65
1998	68
1999	72
2000	75
2001	78
2002	80
2003	82
2004	85

Approved for Payment \_\_\_\_\_  
By \_\_\_\_\_  
Forward Name \_\_\_\_\_

2. A detailed statement of services for the period covered by the model protocol may also be included if appropriate. Supporting it with up-to-date documentation for all charges on the invoice, including receipts for all materials and supplies, all services sold from directly to patients, and all laboratory tests and all patient service services.

## WORK PLAN

This project will develop a San Lorenzo Watershed Conjunctive Use Plan (Plan) to improve water resource efficiency, benefiting essential local fisheries, and residents. The Plan will incorporate scheduled infrastructure improvements by the San Lorenzo Valley Water District (SLVWD), will provide guidance for diverting excess winter surface flow in the San Lorenzo River Watershed to meet water supply needs, reducing the use of groundwater wells, and provide active groundwater recharge. During the dry season, the augmented groundwater will be used to meet supply demands and reduce stream diversions.

This project will result in a comprehensive management plan to outline the path for conjunctive use management in the San Lorenzo River Watershed. The final product will be the Plan with accompanying CEQA review and water rights filings, as well a list of additional recommended infrastructure upgrades. The primary entity taking action to implement the Plan will be the SLVWD, with partnership and participation from Santa Cruz County (County), the Scotts Valley Water District (SVWD), and the City of Santa Cruz Water Department.

The Plan will involve the following tasks and deliverables:

**Grant Administration:** Subcontracting, invoicing and reporting will be done by staff at the County.

**Deliverables:** Quarterly invoicing and reporting, and subcontracts.

**Winter Surface Water Availability:** Staff from the County, SLVWD, and a surface flow consultant will assess availability of divertible winter surface flow from Bull Creek, Bennett Spring, Fall Creek, Loch Lomond, and other sources for in lieu and active recharge. Tasks include:

- a. Assess capacity of diversion works, existing treatment plant and interties to collect, treat, and deliver surface water to all service areas.
- b. Calculate amount of excess winter water that could be diverted based on historic record and anticipated climate impacts, while maintaining needed downstream releases.
- c. Identify any needed infrastructure improvements/developments and how much additional divertible flow could be provided by such improvements.

**Deliverables:** Summary of findings, results incorporated into final Plan.

**Groundwater Availability:** Staff from the County, SLVWD, and a groundwater-modeling consultant will evaluate groundwater supply and examine the potential to pump and deliver groundwater to areas presently served by surface water during summer months and extended drought periods. Tasks include:

- a. Model effects on groundwater basin of in lieu recharge and increased dry

season pumping.

- b. Evaluate potential impact of active recharge of winter surface water to restore and balance the groundwater basin.
- c. Evaluate current well pumping capacity and identify any additional infrastructure needs to deliver additional groundwater to areas presently served by surface water.
- d. Identify and evaluate new well sites that could be used to offset stream diversions during summer and low flow periods.

*Deliverables:* Summary of findings, results incorporated into final Plan.

**Evaluate Flows for Fish:** Staff from the County and a fisheries consultant will evaluate flow availability relative to fishery needs to ensure the final plan provides measurable flow enhancement for needs of coho and steelhead.

Tasks include:

- a. Describe current and unimpaired flows potentially available to support fishery needs downstream of surface diversions in the SLR and tributaries. This process has been started in Fall Creek, and other streams affected by SLWWD diversions.
- b. Evaluate current data on relationships between fish habitat, flow and temperature to identify additional data needs.
- c. Complete additional fieldwork and assessments to fill identified data gaps.

*Deliverables:* Summary of findings, results incorporated into final Plan.

**Evaluate Municipal needs:** The San Lorenzo Valley Water District will evaluate municipal needs and projections into the future for both the San Lorenzo Valley and Scotts Valley areas. Tasks include:

- a. Review Urban Water Management Plans for current seasonal water use and projected future demand.
- b. Review existing calculations of the amount of in lieu recharge provided by supplying winter demand, and amount of groundwater pumping required to meet summer demands.

*Deliverables:* Summary of findings, results incorporated into final Plan.

**Develop Plan:** Staff from the County, the SLWWD, SVWD, and a Plan development consultant will develop optimal management scenarios and produce the Plan. Tasks include:

- a. Conduct system modeling to evaluate potential conjunctive use operation scenarios based on above information and select the alternative with the most favorable results.
- b. Project potential changes in dry season streamflow resulting from conjunctive use scenarios.
- c. Develop the Conjunctive Use and Baseflow Enhancement Plan. The plan will include: operation plans and procedures, including potential for phased

implementation; needed agreements among agencies; infrastructure improvements needed; costs and financing for preferred scenarios.

**Deliverables:** Completed San Lorenzo Watershed Conjunctive Use and Baseflow Enhancement Plan that incorporates the alternative scenarios and outcomes of the modeling, the results from the tasks listed above, and includes guidelines for implementation.

**Water Rights:** Staff from the County, the SLVWD, and a water rights consultant will evaluate the required changes to water rights.

- a. Describe existing water rights and limitations for Fall Creek and other surface sources.
- b. Identify new water rights or modifications necessary to implement conjunctive use. This will include a change in place of use for water from Fall Creek, Bennet Creek, and a change in criteria for the seasonality of diversions.
- c. File for necessary water right changes and prepare to construct additional infrastructure as needed for expanded implementation.

**Deliverables:** Memo describing existing water rights and filing for necessary water right changes with the State Water Resources Control Board for changes.

**CEQA compliance:** Conduct environmental analysis in compliance with CEQA. Due to the level of review going into the Plan, the expected outcome is a Mitigated Negative Declaration.

**Deliverables:** Completed and approved CEQA document.

**Public outreach:** The SLVWD will provide ongoing outreach to community about the need for conjunctive use and the benefits to the process.

**Deliverables:** One public meeting about the Plan during its development, one bill insert about the benefits of conjunctive use, updated content including final plan available on the website.



**BOARD OF DIRECTORS  
SAN LORENZO VALLEY WATER DISTRICT  
MINUTES  
March 15, 2018**

**Thursday, March 15, 2018 at 5:00 p.m.,** Highlands Park Senior Center, 8500 Highway 9, Ben Lomond, CA 95005.

**1. Roll Call.**

**Present:** Pres. Baughman, Dir. Bruce, Dir. Ratcliffe.

**Absent:** VP Hammer, Dir. Smallman.

**Staff:** Dist. Manager B. Lee, Dist. Counsel G. Nicholls and Dist. Sec. H. Hossack

President Baughman announced that VP Hammer will be absent due to sickness and he will be absent for the next 2 months for a total of 3 months. A motion was made to excuse VP Hammer's absence for 3 months.

All present voted in favor of the motion.

2. Additions and Deletions to Closed Session Agenda: none

3. Oral Communications Regarding Items in Closed Session: none

**4. 5:10 Adjournment to Closed Session**

**a. CONFERENCE WITH LEGAL COUNSEL- EXISTING LITIGATION**

Government Code Section 54956.9(d)(1)

Holloway v. Showcase Realty Agents, Inc. et al.

(Santa Cruz Superior Court Case No. CV180394; 6th District Court of Appeal

Case Nos. H043704, H043492).

**b. LIABILITY CLAIMS**

Claimant: Terry Vierra

Agency claimed against: San Lorenzo Valley Water District

**c. CONFERENCE WITH LEGAL COUNSEL-ANTICIPATION OF LITIGATION**

Initiation of litigation pursuant to Government Code Section 54956.9(d)(4)

One case

**d. CONFERENCE WITH LEGAL COUNSEL- EXISTING LITIGATION**

Government Code Section 54956.9(d)(1)  
DeBert v. San Lorenzo Valley Water District, et al.  
(Santa Cruz Superior Court Case No. 17CV02729).

- e. CONFERENCE WITH LEGAL COUNSEL-ANTICIPATION OF LITIGATION  
Initiation of litigation pursuant to Government Code Section 54956.9(d)(4);  
One case  
Potential lawsuit for injunction against Director Smallman to prevent future unauthorized disclosures of the District's confidential and legally protected information
- f. PUBLIC EMPLOYEE PERFORMANCE EVALUATION  
Government Code Section 54957  
Title: District Manager

5. Convene to Open Session at 6:30 p.m.

6. Report of Actions Taken in Closed Session

Pres. Baughman reported out on 2 items:

- 1. 4d. DeBert v SLVWD the Board has authorized Counsel to file an amendment for cross complaint involving Scarborough Lumber against the District.
- 2. 4e. Potential lawsuit, for injunction against Director Smallman. The Board voted 3 - 0 to authorize the following update-the District provided a draft letter to Director Smallman on March 2<sup>nd</sup> and Director Smallman said he would try to send back his draft by today. The District did not receive a draft from Dir. Smallman nor was he present for closed session so no further action can be taken at this time.

7. Additions and Deletions to Open Session Agenda: none

8. Oral Communications:

R. Moran addressed the Board.

Director Smallman arrived at 6:35

B. Holloway-Boulder Creek, B. Laurie engineer for Pleasanton, D. Loewen-Lompico, L. Henry-Lompico, J. Fasolas-Felton addressed the Board.

9. New Business:

- a. SAN LORENZO VALLEY WATER DISTRICT CONJUNCTIVE USE PLANNING PROCESS

J. Michelsen, Environmental Programs Manager, introduced J. Ricker from Santa Cruz County, Director of Water Resources gave a presentation on conjunctive use.

Discussion by the Board regarding SLVWD Conjunctive Use Planning, presentation by J. Ricker, Director of Water Resources, Santa Cruz County.

B. Norvill, K. Colins, L. Henry, J. Fasolas, B. Holloway, M. Lee-Ben Lomond addressed the Board.

b. EXPONENT CONTRACT FOR SAN LORENZO VALLEY WATER  
AVAILABILITY ASSESSMENT

J. Michelsen introduced the item.

Discussion by the Board regarding Contract with Exponent for SLVWD Water Availability Assessment.

B. Fultz-Boulder Creek, B. Norvill, M. Lee addressed the Board.

Discussion by the Board and staff.

J. Gomez-Lompico, D. Loewen, J. Fasloas addressed the Board.

Discussion by the Board.

**Motion:** Move approval of contract with Exponent where the majority of the contract is covered by the grant and the remainder, up to \$15,000 to be covered by the SLVWD, **Action:** Approve, **Moved by** Dir. Bruce.

**Vote:** Motion carried by unanimous roll call vote (**summary:** Yes = 4).

**Yes:** Pres. Baughman, Dir. Bruce, Dir. Ratcliffe, Dir. Smallman.  
Dir. Hammer absent.

c. CALIFORNIA SPECIAL DISTRICTS ASSOCIATION CALL FOR  
NOMINATIONS

No discussion by the Board or public.

No action taken.

d. REDWOOD MOUNTAIN FAIRE  
Discussion and possible action by the Board regarding the Redwood Mountain Faire.

N. Macy-Redwood Mountain Faire Committee, B. Fultz, D. Loewen, J. Fasolas, M. Lee addressed the Board



**Motion:** Motion to provide drinking water and a generator to the Redwood Mountain Faire, **Action:** Aprove, **Moved by** Dir. Smallman,  
**Vote:** Motion carried by unanimous roll call vote (**summary:** Yes = 3).  
**Yes:** Pres. Baughman, Dir. Bruce, Dir. Ratcliffe, Dir. Smallman. Dir. Hammer absent.

- e. INTEGRATED REGIONAL WATER MANAGEMENT DISADVANTAGED  
COMMUNITY INVOLVEMENT GRANT AGREEMENT  
DM Lee introduced this item.

Discussion by the Board regarding the grant agreement.

B. Holloway, M. Lee addressed the Board.

**Motion:** Move to authorize this agreement, execute with the Regional Water Management Foundation, **Action:** Adopt, **Moved by** Dir. Smallman,  
**Vote:** Motion carried by unanimous roll call vote (**summary:** Yes = 4).  
**Yes:** Pres. Baughman, Dir. Bruce, Dir. Ratcliffe, Dir. Smallman.

#### 10. Unfinished Business:

- a. FISH MONITORING IN THE SAN LORENZO RIVER  
DM Lee introduced this item.

Discussion by the Board and staff regarding Fish Monitoring in the San Lorenzo River.

B. Ashley, K. Colins, M. Lee, N. Macy-Valley Women's Club Environmental Committee chair, unidentified woman, Don Alley addressed the Board.

Discussion by the Board.

#### 11. Consent Agenda:

- a. MINUTES FROM BOARD OF DIRECTORS MEETING  
FEBRUARY 15, 2018.  
Consideration and possible action by the Board to approve minutes from the February 15, 2018 BoD meeting.
- b. LICENSE TO DISCHARGE WELL WATER INTO HANSON QUARRY  
Consideration and possible action by the Board to approve the license to discharge well water into Hanson Quarry.

**Motion:** Move approval of the 2 consent agenda items. **Action:** Approval  
**Moved by** Dir. Bruce, All present in favor,

12. District Reports:

- DEPARTMENT STATUS REPORTS  
Receipt and consideration by the Board of Department Status Reports regarding ongoing projects and other activities.
  - Administration/Engineering  
J. Fasolas, L. Henry addressed the Board.
  - Finance
  - Environmental
  - Operations
  
- COMMITTEE REPORTS
  - Future Committee Agenda Items
  - Committee Meeting Notes/Minutes
    - 1. Admin Committee 2.14.18
    - 2. Environmental Committee 2.20.18
    - 3. Budget & Finance Committee 2.27.18
    - 4. LADOC 2.27.18
    - 5. Special Budget & Finance Committee 3.1.18
  
- DIRECTORS REPORTS
  - Director's Communication
  - Future Board of Directors Meeting Agenda Items  
B. Norvill addressed the Board.

13. Written Communication:

- Email from R. Brune - 2.15.18
- Email from L. Henry - 3.6.18
- Letter from D. Loewen - 3.6.18
- Email from B. Burt - 3.9.18

14. Informational Material:

- SDRMA Workers' Comp Longevity Distribution
- AMERICORPS - Press Banner 2.22.18
- COMMITTEE MEMBERS - Press Banner 2.22.18
- SLVWD PREPARES FOR DROUGHT - Press Banner 2.22.18
- SMGWA AIMS - Press Banner 2.22.18
- SB 1015 SUPPORT LETTER SIGNED BY SLVWD

15. N. Macy addressed the Board.  
9:07 Adjournment

## MEMO

TO: Board of Directors

FROM: District Manager

SUBJECT: CALIFORNIA SPECIAL DISTRICT'S ASSOCIATION  
CREDIT CARD ISSUED BY UMPQUA BANK

DATE: April 19, 2018

### RECOMMENDATION:

It is recommended that the Board of Directors review and consider authorizing the District Manager to contract with Umpqua Bank to accept a CSDA member commercial credit card.

### BACKGROUND:

The District received notice from CSDA that they would no longer be issuing Bank of the West CSDA member commercial credit cards. CSDA is now associated with Umpqua Bank for their CSDA member cards.

The District currently holds 2 CSDA credit cards issued in the names of the District Manager, Brian C. Lee and the Director of Operations, Rick Rogers by Bank of the West. The cards are used for purchases that do not or cannot go through the usual purchase order process (for example, meals, travel expenses, emergencies). The District would like to replace the discontinued cards with cards from Umpqua Bank. There is no fee associated with the credit cards. There is a yearly rebate program of 1% of total dollars spent on transactions using the 2 cards.

### 2016 STRATEGIC PLAN:

Administrative Management 9.0

### FISCAL IMPACT:

None

SAN LORENZO VALLEY WATER DISTRICT  
**RESOLUTION NO. 18 (17-18)**

SUBJECT:       **COMMERCIAL CARD CORPORATE BORROWING  
RESOLUTION**

I, the undersigned, hereby certify to Umpqua Bank ("Bank") that I am District Secretary of SAN LORENZO VALLEY WATER DISTRICT ("District"), located in Boulder Creek, CA, and that I have been duly appointed and am presently serving in that capacity. I further certify that the following resolution has been duly adopted by the Board of Directors of the District and such resolution is in full force and effect as of the date hereof and has not been revoked or rescinded as of this date: APRIL 19, 2018.

1.     The Umpqua Bank Commercial Card Agreement ("Agreement") is approved.
2.     The official designated below ("Authorized Official") is duly appointed and holding the office shown, authorized to borrow money on behalf and in the name of the District, execute any notes, drafts, agreements and other documents and instruments, pledge and encumber property of the Corporation (including, without limitation, bank accounts), and name the individuals at the Corporation who shall be authorized to instruct Umpqua Bank to issue credit cards to one or more employees of the Corporation, and the signature below is the genuine signature of such person.

AUTHORIZED OFFICIAL:

Brian C. Lee       District Manager

\_\_\_\_\_  
Signature

3.     The resolution shall continue to be in full force and effect until express written notice of its rescission, modification or termination has been received by the Bank. Any and all prior resolutions received and certified by the Bank shall continue to have full force and effect until the Bank receives such written notice. Any rescission, modification or termination of a resolution must be accompanied by written notification to the Bank. Umpqua Bank shall be fully protected on relying on this certification and shall be indemnified and saved harmless in any claims, demands, expenses, loss or damage resulting from or growing out of honoring the signature of any officer or employee so certified.

PASSED AND ADOPTED by the Board of Directors of the San Lorenzo Valley Water District, County of Santa Cruz, State of California, on the 20th day of July, 2017, by the following vote of the members thereof:

AYES:  
NOES:  
ABSTAIN:  
ABSENT:

IN WITNESS WHEREOF, I have subscribed my name to this document and affixed the seal of the District.

\_\_\_\_\_  
Holly B. Hossack, District Secretary  
San Lorenzo Valley Water District



# UMPQUA BANK

## COMMERCIAL CARD ACCOUNT AGREEMENT

This Commercial Card Account Agreement ("Account Agreement") sets forth the terms of Commercial Card Account ("Commercial Card Account") for San Lorenzo Valley Water District. Your Commercial Card Account has been opened in the name of Company pursuant to the credit application submitted by Company to Umpqua Bank. All extensions of credit in connection with your Commercial Card Account are being made by Umpqua Bank ("Umpqua").

1. **Definitions.** In this Account Agreement the following definitions shall apply: "Account" means each individual credit card account established in connection with a Commercial Card and for which Company is fully liable under the Commercial Card Account in accordance with this Account Agreement. "Annual Percentage Rate" or "APR" means an annualized rate of Finance Charge, as determined by us. "Authorized Officer" means the individual(s) who signed Company credit application and this Account Agreement on behalf of Company. "Cash Advance" means a Transaction to obtain a cash loan from Umpqua or other financial institution that accepts the Commercial Card (whether through an ATM, a teller at a branch, or otherwise) and/or a loan from Umpqua through your use of any checks or drafts Umpqua may provide for drawing funds from Umpqua to be posted as Cash Advances on your Commercial Card Account (any surcharges charged by any owner or operator of any ATM, or by Umpqua, or by any other bank with respect to the Cash Advance will be deemed a part of the Cash Advance). "Commercial Card" means each Visa® credit card that is issued to a Commercial Cardholder under your Commercial Card Account and this Account Agreement. "Commercial Cardholder" means a Company employee who is designated by Company to receive a Commercial Card and who is approved to use such Commercial Card to effect Transactions during the term of this Account Agreement. "Commercial Cardholder Agreement" means the Commercial Credit Cardholder Agreement that applies to each Account and whose terms bind a Commercial Cardholder. "Company" means the corporation, limited liability company, partnership, proprietorship, or other entity that opened the Commercial Card Account with Umpqua pursuant to which Commercial Cards will be issued. "Finance Charge" means any charge to an Account by Umpqua that is calculated and assessed in accordance with this Account Agreement or a Commercial Cardholder Agreement. "Note" means any promissory note or other agreement, including this Account Agreement, for the extension of credit entered into between Lender and Borrower. "Purchase" means a Transaction made to purchase or lease goods or services, or pay amounts you or any Commercial Cardholder owes (excluding Cash Advances). "Transaction" means any Account activity that has a debit value. The words "we", "us", and "our" refer to Umpqua Bank ("Umpqua"). The words "Borrower", "you", and "your" refer to Company.
2. **Acceptance of this Account Agreement.** Your Authorized Officer's signing of the credit application, Commercial Card or use of Commercial Card or Commercial Card Account confirms your acceptance to be bound by this Account Agreement, as well as any other agreements, disclosures, rules, or notices relating to the Commercial Cards and/or the Commercial Card Account as may be posted on Umpqua's website or otherwise made available to you and as amended from time to time. You represent and warrant that (a) you have all necessary corporate or applicable organizational authority and have taken all action necessary to enter into this Account Agreement and to perform your obligations hereunder, (b) this Account Agreement has been duly executed and delivered by you and is a legal, valid, and binding obligation, enforceable against you in accordance with the terms hereof, and (c) the Authorized Officer signing is duly authorized to execute and deliver this Account Agreement on your behalf.
3. **Ownership of Commercial Cards.** Each Commercial Card remains the property of Umpqua. Umpqua can revoke your and/or any Commercial Cardholder's right to use the Commercial Card Account at any time. Umpqua can do this with or without cause and without giving you or the applicable Commercial Cardholder notice. You and/or your Commercial Cardholders must immediately surrender Commercial Cards to Umpqua upon request.
4. **Program Administration.** Company shall designate in writing to us a Program Administrator to actively manage the Commercial Card Account on your behalf. If not specifically designated by Company, the Program Administrator shall be the first Authorized Officer listed in the signature block of Company's credit application. You agree and acknowledge that such Program Administrator is duly authorized by you to act on your behalf with respect to the Commercial Card Account, and that we may rely on all directions and information we receive from Program Administrator regarding the Commercial Card Account, including issuance of Commercial Cards to your employees. The Program Administrator's responsibilities shall include:
  - (a) Conducting Commercial Account maintenance;
  - (b) Collecting Commercial Card request forms, ensuring proper authorization, and facilitating new Commercial Card orders;
  - (c) Communicating Company policy to all Commercial Cardholders that restricts the use of the Commercial Card to business purposes only;
  - (d) Accessing and monitoring Commercial Card Account spending reports;
  - (e) Regularly auditing Company's expense management program to ensure compliance with Company policies;
  - (f) Maintaining internal Company Commercial Card Account forms, policies, procedures, approved and prohibited usage guidelines, web site details and training materials;
  - (g) Maintaining hierarchical approval of all Purchases;
  - (h) Being familiar with all aspects of the Commercial Card Account and each Commercial Card;
  - (i) Handling all Company and Commercial Cardholder inquiries and billing disputes, credit line increase requests, and other requests and notices under this Account Agreement;
  - (j) Upon request, providing us with such information and documentation as we may deem necessary to protect our interests; and
  - (k) Promptly advising us of any termination of any Commercial Cardholder employment relationships with Company and, upon such termination, collect, cut in half and return to us the associated Commercial Card(s)
  - (l) Immediately notifying us by phone and in writing of any reported or suspected unauthorized use of or access to any Commercial Card or the Commercial Card Account.
5. **Scope of Commercial Card Program.** This Account Agreement shall apply to Cash Advances and Purchases by Company, its subsidiaries, divisions, or affiliates as approved by Umpqua, and Commercial Cardholders. Umpqua is a card-issuing member of Visa®, USA, Inc. and Visa® International and may issue credit cards and establish credit card accounts to designated employees of Company as set forth in this Account Agreement. Company will designate employees who are to receive Commercial Cards and become Commercial Cardholders, and unless



# UMPQUA BANK

## COMMERCIAL CARD ACCOUNT AGREEMENT

Umpqua notifies Company to the contrary, Umpqua will issue Commercial Cards to such employees. Unless Umpqua notifies Company to the contrary, or a Commercial Card has been terminated as provided herein, all Commercial Cards will expire upon termination of this Account Agreement. Umpqua may elect in its sole discretion not to issue a Commercial Card to an employee that Company wishes to receive such Commercial Card. Any or all charging privileges may also be withdrawn with or without cause at any time with or without notice.

6. **Use of Commercial Card Account.** You and your Commercial Cardholders may use your Commercial Card Account for Purchases and Cash Advances, wherever the Commercial Card is honored. You agree not to use, and agree that your Commercial Cardholders will not use, your Commercial Card Account for any transaction that is primarily for personal, family or household purposes. You agree to accept credits to the Commercial Card Account instead of cash refunds when the original Purchase was charged to the Commercial Card Account. You agree not to use, and agree that your Commercial Cardholders will not use, the Commercial Card Account for any illegal transactions. You acknowledge that Umpqua provides the Commercial Cards as an accommodation party only and, except as otherwise expressly provided by law or herein, Umpqua is not responsible for the manner in which the Commercial Cards are used.
7. **Refusal to Honor Commercial Card.** Umpqua will not be responsible for a merchant's or financial institution's refusal to honor the Commercial Card. Umpqua also reserves the right to deny authorization of any Purchase or Cash Advance. Except as otherwise required by applicable law or regulation, we will not be responsible for merchandise or services purchased or leased through use of any Commercial Card or the Commercial Card Account.
8. **Obligations on the Commercial Card Account.** You authorize us to pay and charge the Commercial Card Account for all Purchases and Cash Advances made or obtained by any Commercial Cardholder or anyone you authorize to use a Commercial Card or the Commercial Card Account. You promise to pay us for all of these Transactions, plus any related Finance Charges assessed on the Commercial Card Account and any other charges and fees that you may owe us under the terms of this Account Agreement or that your Commercial Cardholders may owe us under the terms of the applicable Commercial Cardholder Agreement. Company will be obligated to pay Transactions posted to the Commercial Card Account whether resulting from (a) actual use of a Commercial Card, (b) mail order or telephone, computer or other electronic Purchases made without presenting the Commercial Card, or (c) any other circumstance where you authorize a Transaction, or authorize someone else to effect a Transaction, to the Commercial Card Account.
9. **Statements.** We will send each Commercial Cardholder a statement at the end of each billing cycle in which the Commercial Cardholder's Account reflects a debit or credit balance (i.e., the total amount of Transactions, Finance Charges and other charges (including, without limitation, any fees) and amounts due under the Commercial Cardholder Agreement, net of any payments and credits, as shown on a Commercial Cardholder's monthly billing statement (such amount for each Commercial Cardholder's Account, the "New Balance") or if a Finance Charge has been imposed. An electronic statement may be made available in substitution of a paper statement upon request. Among other things, the monthly statement will: itemize Transactions, credits and adjustments; show any Finance Charge; and, set forth the New Balance, the credit limit, available credit, and the date on which the New Balance is due and payable in full ("Payment Due Date").
10. **Payments. Individual Billing.** If you select individual billing, we will bill each Commercial Cardholder for such Commercial Cardholder's New Balance (as the term "New Balance" is defined in the Commercial Cardholder Agreement), which amount is due in full, on or before the Payment Due Date. Notwithstanding individual billing, you are responsible for full payment of the New Balance on each Commercial Cardholder's Account on or prior to the Payment Due Date, independent of any agreement or program for reimbursement that may exist between you and your employee and independent of any attempts of Umpqua to bill or collect the New Balance from such Commercial Cardholder. All payments must be made in U.S. dollars. Any payment made by check or other item must be drawn on a financial institution located in the United States. The monthly payment must be sent to Umpqua at the address shown on your monthly statement.  
  
**Central Billing.** If you select central billing, we will bill you for all New Balances regarding all Commercial Cards under Company's Commercial Card Account, and we will send Commercial Cardholders billing statements showing their New Balances as memorandum items only. You will pay Umpqua directly the total amount of all Commercial Cardholders' New Balances, as shown on your monthly statement.  
  
**General Terms for Both Billing Methods.** You agree not to deduct or withhold, without our prior written approval, any amount shown as due on a billing statement. Acceptance of late payments, partial payments or any payment marked as being payment in full or as being a settlement of a dispute will not effect any of our rights to payment in full. You agree that payment terms set forth herein supersede any agreement with regard to payment terms established between you or any Commercial Cardholder and the seller of goods or services or any payment terms that might be imputed to you or any Commercial Cardholder and the seller under applicable law for goods or services purchased using Commercial Cards. Subject to any mandatory provisions of applicable law, all payments made on the Commercial Card Account will be applied to your balances in the Commercial Card Account in the manner we determine. In general, we apply payments to lower APR balances before higher APR balances, which means, among other things, your finance charges will increase if you make transactions that are subject to higher APRs. If payment does not conform to the requirements stated above, crediting of the Commercial Card Account may be delayed. If this happens, additional charges may be imposed.
11. **Cash Advances.** If you consent, a Commercial Cardholder may be able to use the Commercial Card to obtain Cash Advances.
12. **Finance Charges.** Finance Charges begin on the date of the Transaction, or the first day of the Commercial Cardholder's billing cycle in which the Transaction is posted, whichever is later. However, Finance Charges will be imposed on Purchases only if the entire New Balance, as shown on the Commercial Cardholder's monthly billing statement, is not paid in full on or before the Payment Due Date. The Annual Percentage Rates for Cash Advances and Purchases are described below. In each case, the periodic rate is calculated by dividing the APR by the total number of days in the calendar year (i.e., 365 or 366).

We figure a portion of the Finance Charge on Cash Advances by applying the periodic rate to the "average daily balance" of Cash Advances (including current transactions). To get the "average daily balance" we take the beginning balance of your Cash Advances each day (which such beginning balance includes any past due Finance Charges on Cash Advances), add any new Cash Advances, and subtract any applicable



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payments or credits. This gives us the daily balance. Then we add up all the daily balances for the billing cycle and divide the total by the number of days in the billing cycle. This gives us the "average daily balance."

The **Annual Percentage Rate** for Cash Advances is currently **23.99%**. Depending on qualifications, other rates for Cash Advances may apply or be available and notice thereof will be provided to you or the cardholder. The minimum **Finance Charge** on your combined Cash Advance and Purchase balance is **\$1.00**.

We figure a portion of the Finance Charge on Purchases by applying the periodic rate to the "average daily balance" of your Purchases (excluding current transactions). To get the "average daily balance" we take the beginning balance of your Purchases each day (which such beginning balance includes any Finance Charges on Purchases), and subtract any applicable payments or credits. We do not add in any new Purchases. This gives us the daily balance. Then we add up all the daily balances for the billing cycle and divide the total by the number of days in the billing cycle. This gives us the "average daily balance."

The **Annual Percentage Rate** for Purchases is 21.99%. Depending on qualifications, rates other than the standard APR for Purchases may apply or be available and notice thereof will be provided to you or the Commercial Cardholder. The minimum **Finance Charge** on your combined Purchase and Cash Advance balance is **\$1.00**.

If we have "special" Finance Charge offers in effect from time to time, we will separately identify them on your monthly statement and separately disclose on your monthly statement the balances to which the special offers apply. These separate balances and the related periodic Finance Charges will be calculated in the same manner as Purchases described above. Any such special Finance Charge arrangements may be forfeited if you or Company breach, or are in default under, this Account Agreement or any other agreement governing use of the Commercial Card Account, in which case the above described APRs may apply.

13. **Foreign Currency Transactions.** Transactions in foreign currencies will be converted to U.S. Dollars at the exchange rate determined by Visa® USA, Inc. or its affiliates ("Visa®"), using Visa® currency conversion procedures. Currently, the currency conversion rate is generally either wholesale market rate or a government-mandated rate in effect for the date of conversion, determined by Visa® in its sole discretion. The currency conversion rate used on the conversion date may differ from the rate in effect on the date you used your Card. A conversion international transaction charge will be charged to the Card. In addition, an International Transaction Fee will be charged if such transaction was in U.S. Dollars but charged by a merchant who is outside of the U.S. in the amount set forth in the Pricing Information located on the final page of this agreement.
14. **Other Charges.** In addition to any Finance Charge, the following other charges will be applicable to each Account:
  - (a) **Late Fee.** If we do not receive payment by the Payment Due Date shown on the Commercial Cardholder's monthly billing statement, we may charge a late payment fee in the amount set forth in the Pricing Information located on the final page of this agreement. For the avoidance of doubt, this late payment fee applies each time a Commercial Cardholder's New Balance is not paid by the Payment Due Date.
  - (b) **Return Check Fee.** If a bank does not honor the check or ACH withdrawal used to pay amounts owing under a Commercial Cardholder Agreement or we must return a check because it is not signed or is otherwise irregular, we may charge a return check fee in the amount set forth in the Pricing Information located on the final page of this agreement. For the avoidance of doubt, this return check fee applies to each Account for which a bank does not honor the check or ACH withdrawal used or for which we must return a check.
  - (c) **Payment by Phone Fee.** We may charge a fee if you or a Commercial Cardholder make a payment through a phone call to us in the amount set forth in the Pricing Information located on the final page of this agreement.

We may change the Pricing Information from time to time (through disclosures posted on Umpqua's website or otherwise made available to you).

When a Commercial Cardholder uses an ATM not owned by us, there may be a fee charged by the ATM operator, Umpqua or by any network used to complete a transaction, and/or a fee may be charged for a balance inquiry (even if any other transaction is not completed).

Unless otherwise arranged between us, any late, return check, or payment by phone will be added to the Commercial Cardholder's Purchase balance and be treated as a Purchase.

15. **Default.** You will be in default if: (1) you fail to comply with this Account Agreement or a Commercial Cardholder fails to comply with the Commercial Cardholder Agreement, (2) you fail to meet any of your other obligations to us, howsoever arising (i.e., whether related or unrelated to this Account Agreement or your Commercial Card Account), including, but not limited to any other obligations you have to Umpqua, as Borrower or Guarantor, under any note, account agreement, guaranty, business loan agreement, commercial security agreement, deed of trust or other similar loan documents, (3) a petition for bankruptcy, insolvency, receivership, or similar protection is filed by or against Company or any Commercial Cardholder, (4) in any month, we do not receive the amount due by the Payment Due Date regarding any Commercial Card, (5) any Commercial Cardholder exceeds his or her credit line or Company's overall credit line is exceeded, (6) Company is dissolved, consolidated or merged, or a change in control of the ownership of Company or any of its affiliates occurs, (7) any Guarantor of this Account Agreement becomes insolvent, dies or becomes incompetent, or revokes or disputes the validity of, or liability under any guaranty of indebtedness that includes this Account Agreement, (8) any Guarantor of this Account Agreement fails to comply with any term, obligation, covenant or condition contained in its guaranty, or (9) we believe in good faith that the payment or performance of your or any Commercial Cardholder's obligations to us is impaired for any reason. If you or any Commercial Cardholder is in default, Umpqua may, at its option, restrict some or all further Commercial Card Account activity. Umpqua may also, at its option, demand immediate payment of the full balance and take any available legal action. If you are in default and fail to pay any amount that you owe, then you will be liable for Umpqua's collection costs.



# UMPQUA BANK

## COMMERCIAL CARD ACCOUNT AGREEMENT

and, if the claim is referred to an attorney for collection, then you will be liable for any reasonable attorney fees which are incurred, plus the costs and expenses of legal action. Nothing herein shall limit our right to terminate any or all of your Commercial Card Account privileges as otherwise provided in this Account Agreement. We will not be obligated to honor any attempted use of any Commercial Card if a default has occurred regarding such Commercial Card or regarding Company's Commercial Card Account or if we have decided to suspend or terminate the Commercial Card or the Commercial Card Account privileges.

16. **Liability.** Company shall be liable for all Purchases, fees, Cash Advances and other charges incurred or arising by virtue of the use of Commercial Card Account whether or not authorized. The Program Administrator shall notify Umpqua by telephone (with written confirmation) of the termination of employment of any Commercial Cardholder or any lost or stolen Commercial Card. Based upon Standard Industry Classifications ("SIC") or Visa® Merchant Category Codes ("MCC") and as agreed to by Company, Umpqua shall consider requests to establish charge authorization procedures in order to cause certain transactions to be refused or denied. Umpqua may monitor transaction activity in order to assist Company in detecting transactions which are outside of usage procedures established by Company or Authorized Officer; provided, Company will bear any incremental costs borne by Umpqua to monitor transaction activity and assist Company in detecting such transactions, including allocated cost of personnel needed to administer such functions, and provided that Umpqua shall have no liability regarding any alleged failure on its part to detect any detecting transactions which are outside of usage procedures established by Company or otherwise unauthorized or improper
17. **Billing Disputes.** Disputes regarding charges or billings hereunder shall be communicated in writing to Umpqua at the address indicated in paragraph 'Notice and Communication. Be advised that oral communications with us regarding disputed charges or billings may not preserve your rights. Communications should include the Commercial Cardholder name and Account number, the dollar amount of any dispute or suspected error, the reference number and a description of the dispute or error. Any communication regarding a dispute or suspected error must be received by Umpqua within sixty (60) days of the date of the statement on which the disputed or incorrect charge first appeared or you will be deemed to have accepted them and waived any objection to them. Disputed billings are categorized as, but not necessarily limited to, failure to receive goods or services charged, fraud, forgery, altered charges, unauthorized charges, disputes as to the quantity or quality of goods or services purchased with a Commercial Card, and billing errors on your periodic statement. Umpqua will investigate disputes and billing errors, and may, in its sole discretion, attempt to facilitate their resolution or correction, but it will not be responsible for resolving or correcting them.
18. **Notice and Communication.** We will send statements and any other notices to Company at the address shown in our files. Our notice may refer you to a link on our website, in which case you hereby agree to access such link and read the content on the webpage to which it directs you, or else contact us to receive a hardcopy of such notification and then read it. Company agrees to inform us promptly in writing of any change in address. We may, in our discretion, accept address corrections from the United States Postal Service. All notices, requests and other communication from Company to Umpqua must be directed to: Umpqua Bank, Credit Card Department, PO Box 1952 Spokane, WA 99210-1952, or by calling us at 1-866-777-9013. If you have a dispute with us, please be advised that contacting us verbally may not preserve your rights.
19. **Internet Access and Account Information.** Umpqua may permit you to access certain information regarding your Commercial Card Account via the Internet and may provide certain advance reporting regarding your Commercial Card Account. Such Internet access and advance reporting may be subject to additional terms and conditions that will be displayed upon initial login, and you hereby agree to be bound thereby. Umpqua may, in its sole and absolute discretion, at any time and without prior notice, discontinue providing you with Internet access and/or such advance reporting or elect to assess certain fees (or increase such fees) in connection with providing such access or such advance reporting. UMPQUA SPECIFICALLY DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, ARISING OUT OF OR RELATED TO ANY INTERNET ACCESS OR ADVANCE REPORTING PROVIDED TO YOU (REGARDLESS OF WHETHER ANY FEE IS ASSESSED), INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT. ANY INTERNET ACCESS AND/OR ADVANCE REPORTING IS PROVIDED "AS IS," "WHERE IS" AND WITHOUT RECOURSE TO UMPQUA. If Umpqua elects to provide you with access to certain information regarding your Commercial Card Account via the Internet or provides any advance reporting regarding your Commercial Card Account, you will be responsible for any configuration, system programming, or other compatibility issues associated with obtaining such access or receiving or utilizing such reports, and Company agrees to accept full liability for any changes made to the Commercial Card Account using these internet services.
20. **Proprietary Information.** Umpqua considers the Commercial Card program to be a unique service involving Umpqua's proprietary information. Company agrees that Commercial Card program reports, manuals, documentation (including, without limitation, this Account Agreement) and related materials will not be used or disclosed other than as necessary to participate in the Commercial Card program, and to take reasonable steps to safeguard the confidentiality of such proprietary information.
21. **Termination.** This Account Agreement shall remain in full force and effect until terminated by either Company or Umpqua upon ninety (90) days prior written notice to the other party. All Commercial Cards and related Accounts shall be deemed canceled effective upon termination of this Account Agreement.

Upon termination of this Account Agreement, Company shall instruct all Commercial Cardholders to return all Commercial Cards, cut in half, to Company, and Company shall thereafter be responsible for returning all Commercial Cards to Umpqua. Company and the Commercial Cardholders shall remain liable for all purchases, fees and other charges incurred or arising by virtue of the use of a Commercial Card prior to the termination date.

Umpqua shall have the right to suspend all services and its obligations under this Account Agreement in the event that the amount due from Company, as the result of Purchases, fees, Cash Advances and other such charges, exceeds the credit limit established by Umpqua.

Upon the termination of this Account Agreement, all amounts outstanding on the Commercial Card Account shall be immediately due and payable, without further demand or notice.





# UMPQUA BANK

## COMMERCIAL CARD ACCOUNT AGREEMENT

The provisions of this Account Agreement shall survive termination of this Account Agreement as their context may naturally dictate.

Notwithstanding the foregoing or any other provision in this Account Agreement, we may limit, suspend, or terminate your privileges under this Account Agreement or the privileges of any Commercial Cardholder under a Commercial Cardholder Agreement (and list the Commercial Card and the Commercial Card Account in warning directories) at any time without notice or liability.

22. **Credit Worthiness.** Umpqua reserves the right to:
- (a) Determine the creditworthiness of Company periodically by obtaining financial statements from Company;
  - (b) Request a guaranty of payment, pledge of collateral, or other similar security from Company or its subsidiaries or affiliates based on the review of Company financial statements;
  - (c) Approve or decline the issuance, renewal, or replacement of a Commercial Card to any person at our sole discretion;
  - (d) Cancel, suspend or limit spending on any Commercial Card at any time for any reason or no reason, subject to the notice requirements set forth in the Termination section of this Account Agreement.

23. **Warranties.** Company warrants that:
- (a) This Account Agreement constitutes a valid, binding and enforceable agreement of Company;
  - (b) The execution of this Account Agreement and the performance of its obligations under this Account Agreement are within Company's powers; have been duly authorized by all necessary action; and do not constitute a breach of any agreement of Company with any party;
  - (c) The execution of this Account Agreement and the performance of its obligations under this Account Agreement will not cause a breach by it of any duty arising in law or equity or otherwise; and
  - (d) Company is solvent and possesses the financial capacity to perform all of its obligations under this Account Agreement.

Failure of any of the above representations and warranties to be true and correct in all respects during the term of this Account Agreement shall constitute a breach of this Account Agreement, and Umpqua will have the right, upon notice to Company, to immediately terminate this Account Agreement and all amounts outstanding hereunder shall be immediately due and payable, without further demand or notice.

24. **Collateral.** This Account Agreement shall be secured by any and all personal property that you have granted to Umpqua under any security agreement securing other Notes from you to Umpqua, except for titled vehicle. However, in no event shall the obligations of the Company under this Account Agreement be secured by real property of any cross-collateralization provision to the contrary in any commercial loan documents between Company and Umpqua.

25. **Financial Information.** Umpqua may elect to defer to Financial Information contained within an active Commercial Borrowing Agreement between the Company and Umpqua. If Company does not have an existing Commercial Borrowing Agreement with Umpqua, then Company shall deliver to Umpqua as soon as available, and in any event not later than One hundred and twenty (120) days after the end of each fiscal year of Company, Company's audited financial statements prepared by independent certified public accountants selected by Company. If audited financials are not available, bank at its sole discretion, may accept reviewed or prepared financial statements. Company further agree to provide to Umpqua from time-to-time, such other information regarding the financial condition of Company as Umpqua may reasonable request. You hereby authorize Umpqua to request credit reports in connection with the issuance and use of the Commercial Cards. Information concerning your credit history with Umpqua may be furnished to consumer reporting agencies or others who may properly receive that information.

26. **Unauthorized Transactions.** We assume no responsibility to discover or audit any possible breach of security or unauthorized disclosure or use of any Commercial Cards or PINs. You will promptly notify us of any actual or suspected breach of security or unauthorized activity involving the Commercial Cards or the Commercial Card Account (whether or not involving your employees). Company must establish, maintain, and follow commercially reasonable security procedures regarding the Commercial Cards and Commercial Card Account.

27. **Trademarks.** Company and Umpqua each recognize that they have no right, title or interest, proprietary or otherwise, in or to the name or any logo, copyright, service mark or trademark owned or licensed by the other party. Company and Umpqua each agree that, without prior written consent of the other party, they will not use the name or any name, logo, copyright, service mark or trademark owned or licensed by the other party.

28. **Amendment.** We can amend this Account Agreement at any time upon notice. Subject to the requirements of applicable law, any amendments to this Account Agreement will become effective at the time stated in our notice and unless we specify otherwise, the amended terms of this Account Agreement will apply to all outstanding unpaid indebtedness in the Commercial Card Account relating to your Commercial Card usage as well as new transactions. Use of any Commercial Card by a Commercial Cardholder after the effective date of the change constitutes acceptance of the change. You shall have no right to amend this Account Agreement.

29. **Interpretation.** The section headings shall in no way be held to explain, modify, or aid in the interpretation of the provisions hereof. Wherever possible, each provision will be interpreted in a manner as to be valid, legal, and enforceable under applicable law. If any provision is declared invalid, illegal, or unenforceable in any jurisdiction, it shall be modified to render it valid, legal, and enforceable in the manner that best advances the spirit of this Account Agreement and/or such provision shall be deemed deleted, as the subject court or arbitrator(s) shall determine, and the remaining provisions will continue in full force and effect in the subject jurisdiction. The rule of construing ambiguities against the drafter shall not apply.

30. **Non-Waiver.** We can accept late payments, partial payments, checks and money orders marked "Paid in Full" or similar language purporting to have the same effect without losing or in any way impairing any of our rights. We can also delay enforcing our rights for any length of time and for any number of times without losing or in any way impairing those or any other of our rights. The fact that we may at any time honor a Purchase or Cash Advance in excess of a credit line does not obligate us to do so again, nor does it waive any of our rights or remedies.



# UMPQUA BANK

## COMMERCIAL CARD ACCOUNT AGREEMENT

regarding any breach of this Account Agreement. Without limiting the foregoing, the delay or failure of Umpqua to exercise any right, power or option, or to insist upon strict compliance with any term of this Account Agreement, shall not constitute a waiver of that or any other right, power, option, or term of this Account Agreement, nor a waiver of that or any other breach thereof, nor a waiver of our right at any time thereafter to require strict compliance with that or any other term hereof. No waiver shall be effective against Umpqua unless it is expressly stated in a writing signed by Umpqua.

31. **Survivability of Payment Obligations, Rights and Remedies.** The obligation of Company to make payments as herein set forth, shall continue until fully performed. Rights, obligations or liabilities which arise prior to the suspension or termination of this Account Agreement shall survive the suspension or termination of this Account Agreement, including any rights Company or Umpqua may have with respect to each other arising out of either party's performance of services or obligations prior to the expiration or termination of this Account Agreement.
32. **DISCLAIMER.** UMPQUA MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN CONNECTION WITH THE SERVICES PROVIDED TO COMPANY OR ANY COMMERCIAL CARDHOLDER WITH RESPECT TO THIS ACCOUNT AGREEMENT OR ANY COMMERCIAL CARDHOLDER AGREEMENT, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT. All UMPQUA SERVICES ARE PROVIDED "AS IS," "WHERE IS" AND WITHOUT RECOURSE TO UMPQUA.
33. **LIMITATION OF LIABILITY.** TO THE EXTENT SUCH LIMITATION OF LIABILITY IS PERMITTED BY LAW, (I) UMPQUA WILL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, INCIDENTAL, PUNITIVE, OR EXEMPLARY DAMAGES OR LOSSES, WHETHER OR NOT FORESEEABLE, (II) UMPQUA WILL NOT BE LIABLE FOR ANY LOSS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM OR IN CONNECTION WITH ANY INACCURACY, ACT OR FAILURE TO ACT ON THE PART OF ANY PERSON NOT WITHIN OUR REASONABLE CONTROL, OR ANY ERROR, FAILURE, OR DELAY IN EXECUTION OF ANY TRANSACTION RESULTING FROM CIRCUMSTANCES BEYOND OUR REASONABLE CONTROL, INCLUDING, BUT NOT LIMITED TO, ANY INOPERABILITY OF COMMUNICATIONS FACILITIES OR OTHER TECHNOLOGICAL FAILURE, AND (III) UMPQUA WILL NOT BE LIABLE FOR ANYTHING EXCEPT FOR ITS OWN GROSS NEGLIGENCE OR WILLFUL MISCONDUCT. PROVIDED WE HAVE COMPLIED WITH OUR OBLIGATIONS UNDER THIS ACCOUNT AGREEMENT, AND SUBJECT TO APPLICABLE LAW, COMPANY AGREES TO INDEMNIFY, DEFEND, AND HOLD UMPQUA HARMLESS AGAINST ANY THIRD PARTY CLAIM ARISING FROM, OR IN CONNECTION WITH, DIRECTLY OR INDIRECTLY, ANY USE OF ANY COMMERCIAL CARD, THE COMMERCIAL CARD ACCOUNT, THIS ACCOUNT AGREEMENT, OR ANY RELATED SERVICE WE PROVIDE.
34. **Governing Law.** This Agreement and your Card will be controlled by and construed and enforced under the laws of the State of Oregon without regard to Oregon's conflict of laws principles (i.e., as applicable to agreements made and performed in Oregon) and, as applicable, Federal law.
35. **Venue.** If there is a dispute or issue relating to your account or to this Agreement, you and we agree that the location of the court proceeding will occur in the state where you opened the account and that the county will be chosen by us in our sole discretion.
36. **Assigns & Successors.** You may not assign, in whole or in part, any Commercial Card, the Commercial Card Account, or this Account Agreement to any other person or entity. We may at any time(s) assign, in whole or in part, the Commercial Card Account, any sums due on the Commercial Card Account, this Account Agreement. The person(s) or entity(ies) to whom we make any such assignment shall succeed to our rights and/or obligations under this Account Agreement to the extent assigned. Except as otherwise provided in this Account Agreement, it shall be binding upon the parties' successors.
37. **Remedies.** Except where a remedy is expressly stated to be exclusive, the remedies herein provided are cumulative and not exclusive of any remedies provided herein or otherwise, at law or in equity. To the extent permitted by applicable law, Umpqua reserves a right of setoff in all Company accounts with Umpqua (whether checking, savings or other account), including all existing accounts and all such accounts that may be opened in the future. Company authorizes Umpqua, to the extent permitted by applicable law, to charge or setoff all sums owing on the Commercial Card Account against any and all such accounts, and, at Umpqua's option, to administratively freeze all such accounts to allow Umpqua to protect Umpqua's charge and setoff rights provided in this paragraph or otherwise.
38. **Entire Agreement.** This Account Agreement, along with the related credit application documents, and other related agreement(s) is the entire agreement between the parties hereto regarding the subject matter and supersedes any oral agreements, oral representations, or oral warranties relating thereto.
39. **Confidentiality.** We will disclose information to third parties about your account or the transactions you make in order to process transactions or otherwise perform our obligations under this Agreement, to verify the existence and condition of your account for a third party (such as a credit bureau or merchant), or to comply with government agency or court orders, or if you give us your written permission.

**UNDER OREGON LAW, MOST AGREEMENTS, PROMISES AND COMMITMENTS MADE BY US (LENDER) CONCERNING LOANS AND OTHER CREDIT EXTENSIONS WHICH ARE NOT FOR PERSONAL, FAMILY OR HOUSEHOLD PURPOSES OR SECURED SOLELY BY THE BORROWER'S RESIDENCE MUST BE IN WRITING, EXPRESS CONSIDERATION AND BE SIGNED BY US TO BE ENFORCEABLE.**

## MEMO

TO: Board of Directors  
FROM: District Manager  
SUBJECT: Administration/Engineering Departments Status Report  
DATE: April 19, 2018

Deleted: March 15

### RECOMMENDATION:

It is recommended that the Board of Directors review and file the Administration/Engineering Departments status report.

### BACKGROUND:

#### MEETINGS OF NOTE

- Tuesday, March 6 – President and DM attended oral arguments in the Holloway 1090 appeal.
- Thursday, March 15 – DM hosted regional monthly General Manager’s luncheon
- Thursday, April 5 – President, DM and Env. Mngr participated in GSA JPA interviews for project facilitator.

Deleted: Thursday, March 1 – Admin Committee and staff hosted a meeting at the Bear Creek Estates Clubhouse to discuss the financial condition of the Bear Creek Estates Wastewater Enterprise Fund

#### BEAR CREEK ESTATES PROPOSED RATE INCREASE

At a Special meeting on Monday, April 9 the Budget and Finance Committee began discussion of allocating District non-direct expenses between the two cost centers; water and sewer. Staff will be returning to the next B&F meeting with additional information. Once the B&F Committee selects a recommended expense allocation formula, staff will prepare a formal proposal for future wastewater customer rates and how the system moves forward to develop solutions to the aging infrastructure.

Staff anticipates scheduling an all-customer meeting with the Bear Creek Estates customers once the details of fully funding the wastewater system have been developed.

Deleted: The District hosted a special Budget and Finance Committee at the Bear Creek Estates Clubhouse on March 1<sup>st</sup>. Focus of the evening was the past and current financial status of the Wastewater Enterprise Fund. Meeting was attended by about half a dozen Bear Creek Estates residence. It was a good discussion and all agreed to begin developing solutions to bring the wastewater system whole in terms of Operational funding. Additionally, we will soon begin discussion of how to fund Capital needs. Bringing the Wastewater fund whole from an Operational cost perspective will occur at future Budget and Finance Meetings. Staff also anticipates at least one more meeting with the Bear Creek Estates Customers prior to recommending a new 218 process.¶

#### ADMINISTRATION BUILDING

At the July Regular Board Meeting staff was instructed to develop a work plan for moving administrative functions to another location within the District’s service area while ensuring that operation and field functions remained undisrupted. The intent being to declare the current administration building surplus and sell.

Staff is preparing an RFP for a Facility Assessment to determine if the current Ops Building is sufficient in size and shape to house the Administrative functions of the District. If the building is deemed sufficient, the District will proceed with determining if the Prosser property is sufficient in size and shape to house the Operations functions of the District. If the building is deemed insufficient, staff will return to the Board for a public discussion of remaining options.

#### PROBATION TANK REPLACEMENT PROJECT

Staff has begun the process of shutting down the redwood Probation Tank. Poly Tanks have been delivered and installed. The redwood Probation Tank is no longer in service.

The project has been put out to bid with a scheduled bid opening of April 24<sup>th</sup>. PG&E application has been submitted and staff is anticipating a four to six month process to have the polls relocated. Construction of the new tank is dependant on when PG&E completes their relocation, in coordination with telecom.

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**Deleted:** ordered and are scheduled for delivery in the next few weeks. Once the poly tanks have been installed, staff will decommission the redwood Probation tank and prepare it for destruction.

#### UNITED STATES DEPARTMENT OF AGRICULTURE (USDA) RURAL DEVELOPMENT LOAN

In December 2017, the Board authorized a contract with WSC Engineering to prepare the necessary Engineering Reports and Application Paperwork to apply for a ~\$5M USDA loan for construction of the following projects:

**Deleted:** Staff and consultants are coordinating with PG&E on the relocation of on-site electrical facilities owned by PG&E. Once an electrical relocation schedule is available the project will be put to bid for construction.¶

- Swim Tank
- Hihn Road Pipeline
- Lyon Pipeline
- Worth Lane Pipeline
- Sequoia Road Pipeline
- Bennet Booster
- Felton Acres Tank and Booster
- Hillside Drive Pipeline
- Riverview Drive Pipeline
- Two Bar Road Pipeline
- Orman Road Pipeline
- California Drive Pipeline
- Fall Creek Fish Ladder

Tonight, staff is requesting the Board to authorize negotiations with three engineering firms to provide design services for the USDA projects. Final contracts will be presented to the Board for approval when available.

#### SWIM TANKS REPLACEMENT PROJECT

Project is bid ready. WSC continues to work with staff in preparation for obtaining a federal USDA loan.

#### FALL CREEK FISH LADDER

100% plans and specifications for improvements are under staff review.

Staff was informed in 2016 by Federal Fish and Wildlife (FFW) that the Fall Creek Diversion and Fish Ladder do not qualify for streamlined permitting. This is a change of direction from past conversations over the last three years. Individual consultation will be required and the District has submitted a request to the Army Corp of Civil Engineers. This new information will delay the project at least a year, if not longer.

Funding for the improvement project is expected to be accomplished through low-interest USDA loans.

During the 2017 Winter Storms Fall Creek Fish Ladder experienced significant debris build-up and damage. The repair project has been submitted and approved by FEMA. Staff will be bidding the work out for the repair project later this year. Anticipated completion of the repair project is expected prior to October 15, 2018, the official start of the 'rainy season'.

**Deleted:** Consultant and Staff are scheduling a kick-off meeting with USDA for sometime in January.¶

**Deleted:** Staff is working on a Request for Proposals (RFP) to hire Engineering Design Firms to complete the project designs and environmental permits for each of the listed projects. The intent will be to hire at least three firms on a time-and-material basis, assigning specific projects to each. The hired design firms will also be tasked to work in conjunction with WSC, coordinating the USDA application process. Staff expects to release the RFP in March 2018, with a proposed contract award date at the April regular Board Meeting.¶

#### FELTON HEIGHTS WATER STORAGE TANK

Staff is working to obtain necessary easements on neighboring property. Design is expected for winter of 2018 with construction occurring in Autumn 2018. The delay is due to timing of the USDA loan.

Funding for the project is expected to be accomplished through low-interest USDA loans.

#### LOMPICO PRESSURE REDUCING VALVES AND LATERALS

Staff has contracted with WSC Engineering to prepare a District Standard PRV drawing. Once the drawing is finalized (late April), staff will distribute a bid package to local contracting firms to replace two PRVs this budget year for a price of \$35k each, or \$70 total.

The construction bid packet will also include standard drawings and specifications for the replacement of laterals in the Lompico Service Area. The selected unit bid price for replacement of a service lateral will determine how many laterals can be replaced under the construction contract. Based on the estimate of \$1,500 per lateral and meter (meters have already been replaced) in the Engineer's Report, staff anticipates being able to replace approximately 60 laterals this fiscal year for a total price of ~\$60k.

The total contract price is estimated to be \$130k, leaving approximately \$100k in the Assessment District cash balance. Assuming decent bid prices and a positive working relationship with the contractor, staff may recommend extending the contract into fiscal year 2018/19 (starting July 1<sup>st</sup>, 2018), to replace additional PRVs and laterals.

## M E M O

TO: Board of Directors  
FROM: District Manager  
PREPARED BY: Director of Finance & Business Services  
SUBJECT: FINANCE & BUSINESS SERVICES STATUS REPORT  
DATE: April 19, 2018

### RECOMMENDATION:

It is recommended that the Board of Directors review and file the Finance & Business Services Department Status Report.

### BACKGROUND:

#### **BUDGET**

Budget is the focus point right now. We have received the first round expense numbers from managers and are working on the capital expense piece now.

#### **BEAR CREEK ESTATES**

We are working on an allocation model for the Sewer Fund.

#### **CUSTOMER SERVICE SUPPORT**

Customer Service stats and information is included in this status report for review.

#### **BILL LIST**

The Bill List is included in this status report for review.

#### **FINANCIAL SUMMARY**

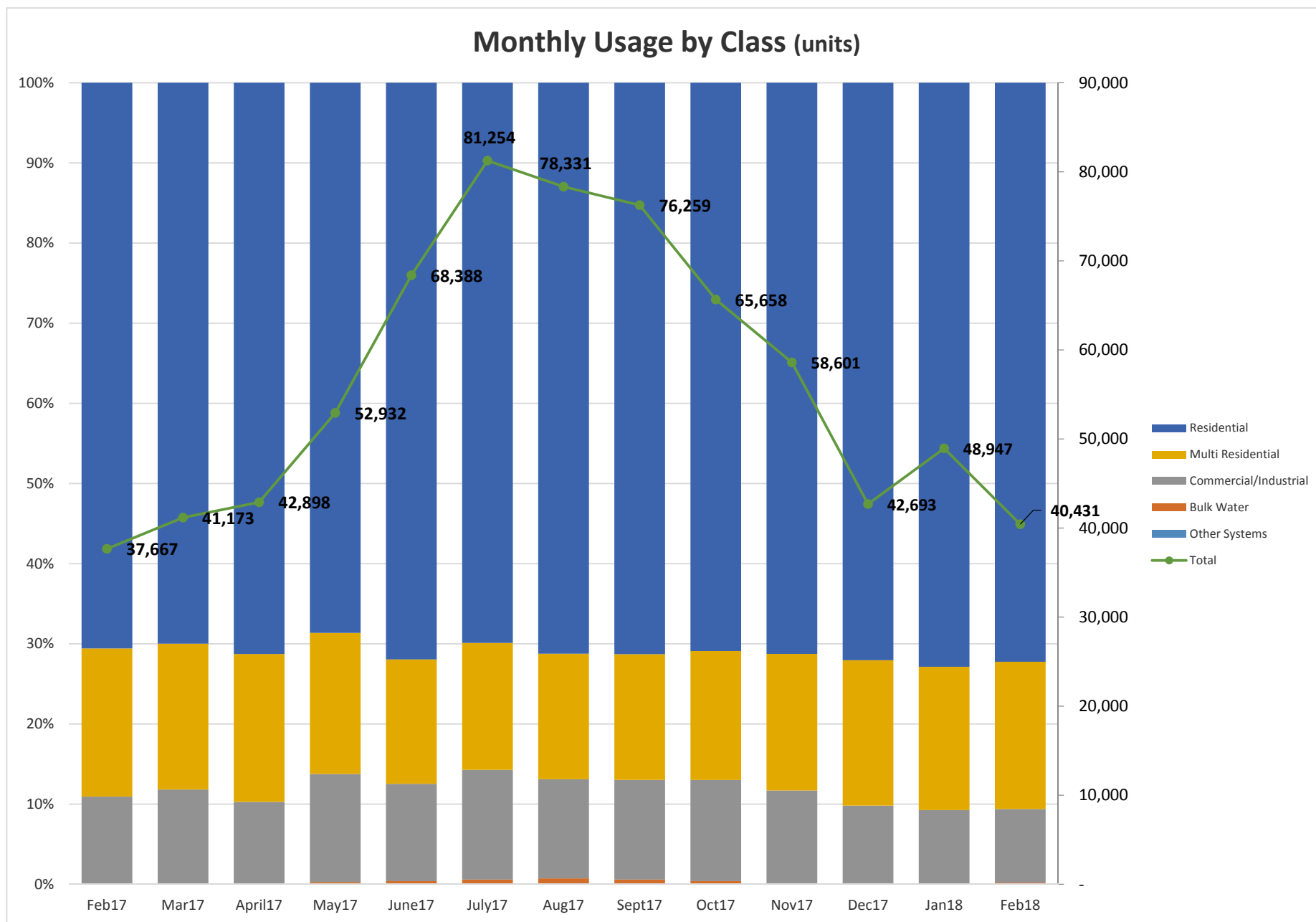
This packet contains the February 2018 summary. Please see the Financial Summary for further detail.

#### **REVENUE STABILIZATION RATE ANALYSIS**

This packet contains the current consumption as compared to the prior 3 year averages for the revenue rate stabilization. As of February, 2018 consumption, the cumulative consumption is 10% above the baseline. There are no triggers identified per the revenue stabilization rate policy.

#### **Q3 FY1718 QUARTERLY LEAK ADJUSTMENT REPORT**

This packet contains the quarterly leak adjustment report.





**CUSTOMER SERVICE DEPT SUMMARY**

	*****				****				***				**		**		*				
Monthly Stats:	Mar-18	Feb-18	Jan-18	Dec-17	Nov-17	Oct-17	Sep-17	Aug-17	Jul-17	Jun-17	May-17	Apr-17	Mar-17	Feb-17	Jan-17	Dec-16	Nov-16	Oct-16	Sep-16	Aug-16	Jul-16
Cut In/Outs	30	42	61	62	55	81	59	114	52	74	48	49	86	68	71	76	87	102	87	125	116
Final Bills	34	58	57	66	50	79	79	58	49	62	44	47	62	36	28	36	59	44	54	70	62
Tags	312	198	194	118	240	128	260	264	163	199	167	100	291	226	209	193	205	111	306	362	245
Turn-offs	24	32	26	42	24	26	25	29	24	23	20	36	33	12	34	38	40	23	47	74	46

**Online / Going Green**

*As of 04/09/2018*

Online Sign-ups	3,599	3,543	3,499	3,443	3,398	3,331	3,283	3,244	3,201	3,164	3,141	3,115	3,038	2,985	2,929	2,880	2,826	2,772	2,712	2,640	2,585
E-Bills	1,145	1,120	1,092	1,064	1,043	1,018	998	979	957	949	931	920	879	858	843	826	808	783	762	740	721
Auto Pay	2,386	2,350	2,316	2,283	2,257	2,202	2,184	2,144	2,134	2,105	2,095	2,086	2,035	2,004	1,976	1,940	1,924	1,900	1,852	1,786	1,755

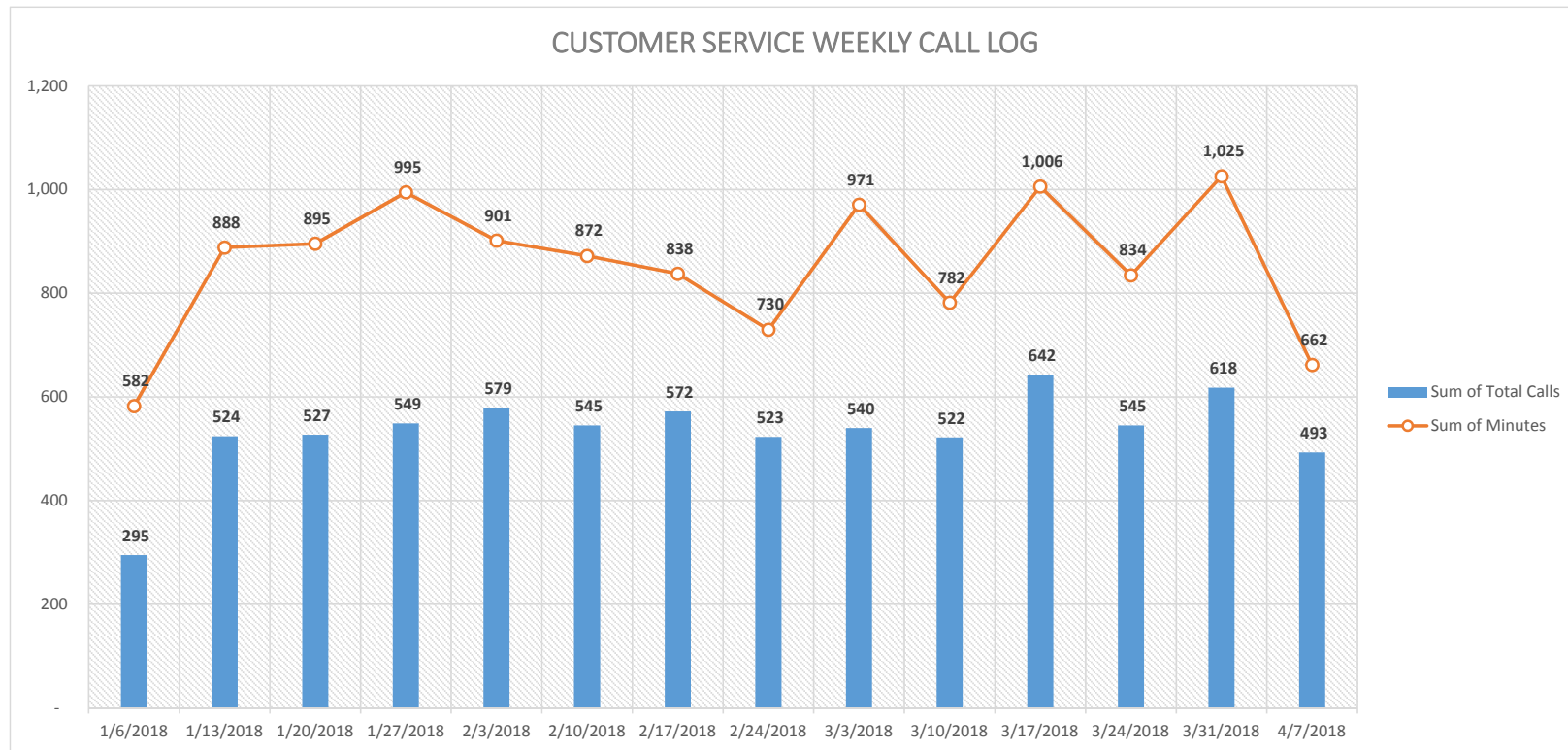
\*Only one billing cycle was tagged/turned off this month due to timing issues

\*\* Due to timing of tags, March had 3 tag cycles, while April only had one

\*\*\* Due to timing of tags, October only had 1 tag cycles.

\*\*\*\* Due to timing of tag, December only had 1.5 tag cycles.

\*\*\*\*\* Due to timing, March 2018 had 3 tag cycles



Week Ending	Incoming Calls		Outgoing Calls		Total Calls	
	# Calls	Minutes	# Calls	Minutes	# Calls	Minutes
1/6/2018	219	485	76	98	295	582
1/13/2018	315	671	209	218	524	888
1/20/2018	321	719	206	177	527	895
1/27/2018	310	754	239	240	549	995
2/3/2018	357	781	222	120	579	901
2/10/2018	293	668	252	204	545	872
2/17/2018	310	641	262	196	572	838
2/24/2018	294	554	229	176	523	730
3/3/2018	332	772	208	198	540	971
3/10/2018	266	555	256	227	522	782
3/17/2018	368	742	274	264	642	1,006
3/24/2018	288	588	257	247	545	834
3/31/2018	350	762	268	263	618	1,025
4/7/2018	291	546	202	116	493	662

Weekly Notes
Tags, Main Break: Blach Way, Oak Ave, Oak St, Blue Ridge Drive
Turn offs, Main Break: Blue Ridge Dr, Old County HWY, McGaffigan Mill Rd, tank leak
Tags, Main Break: Brookside Ave, 11995 Alta Via Rd, Kings Creek Rd, 11916 Alta Via Rd
Turn offs, Main Break: San Lorenzo
Tags
Turn offs, Main Break: Bear Creek, Brackney & Bridge St., Riverview Dr.
Tags, Main Break: Vera Ave, Hermosa Ave, La Lena St, Riverview Dr.
Turn offs, Main Break: HWY 9
Tags, Main Break: Mitchell Drive
Turn offs, Main Break: Rambling Rd, Lake Blvd
Tags, Main Break: La Lena St, Brimblecom rd
Turn offs
Tags, Main Break: Blackstone Drive, McKinley Way
Turn offs, Main Break: Azalea Circle, Hartman Ave, Brookside Ave

# Accounts Payable

## Outstanding Invoices

User: KendraNegro  
 Printed: 4/10/2018 - 1:56 PM  
 Date Type: JE Date  
 Date Range: 03/07/2018 to 04/10/2018



13060 Highway 9  
 Boulder Creek, CA 95006-9119  
 (831) 338-2153 phone  
 (831) 338-7986 fax

### Vendor

Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
00016 - GREENWASTE RECOVERY,INC						
01-100-5420	4/9/2018	4/1/2018	0003347797	00046-10-2018	395.14	SPOIL REMOVAL
Task Label:		Type:	PO Number:	0000100946		
Total for Vendor 00016 - GREENWASTE RECOVERY,INC:					395.14	
00046 - RED WING SHOE STORE						
01-400-5171	3/27/2018	3/10/2018	33845	00247-09-2018	296.46	SAFETY BOOTS_T TOCCALINO
Total for Vendor 00046 - RED WING SHOE STORE:					296.46	
00047 - SOIL CONTROL LAB						
01-800-5202	3/27/2018	3/21/2018	8030522	00247-09-2018	145.00	WATER ANALYSIS_MIRA FLORES_GEN PHYSICAL
Task Label:		Type:	PO Number:	0000100983		
01-800-5202	3/27/2018	3/21/2018	8030524	00247-09-2018	37.00	WATER ANALYSIS_MIRA FLORES_METALS, MANGANESE
Task Label:		Type:	PO Number:	0000100983		
01-800-5202	3/27/2018	3/21/2018	8030525	00247-09-2018	29.00	WATER ANALYSIS_677 WEST DR, LOMPICO
Task Label:	EXP-1617001A	Type:	S	PO Number:	0000100983	
01-800-5202	3/27/2018	3/26/2018	8030728	00247-09-2018	145.00	WATER ANALYSIS_CANEPA/ELENA
Task Label:		Type:		PO Number:	0000100983	
01-800-5202	4/3/2018	3/28/2018	8030231	00017-10-2018	78.00	OLY 2_TOTAL PHOSPHATE_03/07/18
Task Label:		Type:		PO Number:	0000100983	
01-800-5202	4/3/2018	3/28/2018	8030523	00017-10-2018	39.00	OLY 2 TOTAL PHOSPHATE_3/14/18
Task Label:		Type:		PO Number:	0000100983	
01-800-5202	4/6/2018	4/3/2018	8030906	00033-10-2018	145.00	GEN PHYSICAL_NORTH, SOUTH, MW, FELTON
Task Label:		Type:		PO Number:	0000100983	
Total for Vendor 00047 - SOIL CONTROL LAB:					618.00	
00054 - PACIFIC GAS & ELECTRIC						
02-600-5500	4/6/2018	3/29/2018	36588024062-4	00031-10-2018	197.50	GAS/ELECTRIC CHARGES_BCEWW
01-400-5500	4/6/2018	3/29/2018	36588024062-4	00031-10-2018	5,751.02	GAS/ELECTRIC CHARGES_OPS
01-800-5500	4/6/2018	3/29/2018	36588024062-4	00031-10-2018	15,352.17	GAS/ELECTRIC CHARGES_WTP

Vendor	Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
00054 - PACIFIC GAS & ELECTRIC							
	01-100-5500	4/6/2018	3/29/2018	36588024062-4	00031-10-2018	650.97	GAS/ELECTRIC CHARGES_ADMIN
Total for Vendor 00054 - PACIFIC GAS & ELECTRIC:						21,951.66	
00058 - IHWWY, INC.							
	01-100-5200	4/3/2018	4/1/2018	12206_APRIL	00017-10-2018	25.00	BUSINESS HOSTING_slvwd.com
Total for Vendor 00058 - IHWWY, INC.:						25.00	
00061 - DHS PUBLIC HEALTH LAB							
	01-800-5200	3/19/2018	2/28/2018	1973	00135-09-2018	99.00	TICK ANALYSIS_3 EMPLOYEES
Total for Vendor 00061 - DHS PUBLIC HEALTH LAB:						99.00	
00080 - GRANITE CONSTRUCTION CO							
	01-400-5300	3/19/2018	3/7/2018	1353503	00135-09-2018	176.46	QUAIL BINS
	01-400-5300	3/19/2018	3/9/2018	1354451	00135-09-2018	418.81	QUAIL BINS
	01-400-5300	3/19/2018	3/9/2018	1354451	00135-09-2018	66.41	QUAIL BINS
	01-400-5300	3/19/2018	3/9/2018	1354451	00135-09-2018	44.00	QUAIL BINS
Total for Vendor 00080 - GRANITE CONSTRUCTION CO:						705.68	
00082 - MID VALLEY SUPPLY							
	01-100-5600	3/21/2018	3/16/2018	223950	00168-09-2018	69.82	BATH TISSUE
	01-100-5600	3/21/2018	3/20/2018	224059	00168-09-2018	18.31	LIQUID SOAP
	01-800-5600	4/9/2018	4/6/2018	224610	00047-10-2018	110.67	PAPER TOWELS FOR WTP
Total for Vendor 00082 - MID VALLEY SUPPLY:						198.80	
00124 - BRUCE BARTON PUMP, INC							
	01-800-5420	3/22/2018	3/14/2018	0095824-IN	00177-09-2018	287.41	MISC MATERIAL FOR LWTP PUMP
	01-400-5200	3/29/2018	3/22/2018	0095996-IN	00249-09-2018	482.35	REPAIR PUMP_SPRING TANK BOOSTER
Total for Vendor 00124 - BRUCE BARTON PUMP, INC:						769.76	
00145 - BATTERIES PLUS							
	01-800-5300	4/3/2018	3/28/2018	RA1151245-01	00017-10-2018	119.89	SCREEN FOR PHONE REPAIR
Total for Vendor 00145 - BATTERIES PLUS:						119.89	
00164 - FIRST ALARM							

**Vendor**

Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
00164 - FIRST ALARM						
01-800-5200	3/19/2018	3/15/2018	383124	00135-09-2018	163.62	ALARM SERVICES_365 MADRONE AVE
Task Label:		Type:	PO Number:	0000100918		
01-400-5200	3/19/2018	3/15/2018	383124	00135-09-2018	92.76	ALARM SERVICES_101 QUAIL HOLLOW
Task Label:		Type:	PO Number:	0000100918		
01-400-5200	3/19/2018	3/15/2018	383124	00135-09-2018	571.71	ALARM SERVICES_13057 HWY 9
Task Label:		Type:	PO Number:	0000100918		
01-800-5200	3/19/2018	3/15/2018	385422	00135-09-2018	329.22	ALARM SERVICES_195 KIRBY ST
Task Label:		Type:	PO Number:	0000100918		
01-800-5200	3/19/2018	3/15/2018	385422	00135-09-2018	167.19	ALARM SERVICES_600 SAN LORENZO AVE
Task Label:		Type:	PO Number:	0000100918		
02-600-5200	3/19/2018	3/15/2018	385422	00135-09-2018	343.59	ALARM SERVICES_BCEWW
Task Label:		Type:	PO Number:	0000100918		
01-800-5200	3/19/2018	3/15/2018	385422	00135-09-2018	287.64	ALARM SERVICES_232 KINGS VILLAGE RD
Task Label:		Type:	PO Number:	0000100918		
Total for Vendor 00164 - FIRST ALARM:					1,955.73	
00210 - FISHER SCIENTIFIC						
01-800-5302	3/27/2018	3/13/2018	7461327	00247-09-2018	123.92	LAB SUPPLIES
Total for Vendor 00210 - FISHER SCIENTIFIC:					123.92	
00220 - BAY BUILDING JANITORIAL,INC						
01-100-5420	3/19/2018	3/15/2018	30813	00135-09-2018	424.42	JANITORIAL SERVICES _ MARCH 2018
Task Label:		Type:	PO Number:	0000100938		
Total for Vendor 00220 - BAY BUILDING JANITORIAL,INC:					424.42	
00234 - CITY OF SCOTTS VALLEY						
01-800-5300	4/6/2018	4/2/2018	040218	00031-10-2018	79.00	323 KV RD SEWER CHARGES_1/15/18 - 3/15/18
Total for Vendor 00234 - CITY OF SCOTTS VALLEY:					79.00	
00247 - INDEPENDENT ELECTRIC SUPPLY						
01-800-5300	4/9/2018	3/30/2018	S103673216.001	00047-10-2018	2,151.71	LYON PLANT COMCAST INSTALL PARTS
Task Label:		Type:	PO Number:	0000101040		
01-800-5300	4/9/2018	3/30/2018	S103673216.002	00047-10-2018	160.37	LYON PLANT COMCAST INSTALL PARTS
Task Label:		Type:	PO Number:	0000101040		
01-800-5300	4/9/2018	3/30/2018	S103673216.003	00047-10-2018	78.12	LYON PLANT COMCAST INSTALL PARTS
Task Label:		Type:	PO Number:	0000101040		
Total for Vendor 00247 - INDEPENDENT ELECTRIC SUPPLY:					2,390.20	

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Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
00267 - MARTIN B FEENEY, PG, CHg						
01-000-1565	3/22/2018	3/16/2018	2004-722	00177-09-2018	2,047.50	PASO WELL 7 REHAB_8/2017 -2/2018
Task Label:		Type:	PO Number:	0000100915		
Total for Vendor 00267 - MARTIN B FEENEY, PG, CHg:					2,047.50	
00273 - CORELOGIC, INC.						
01-200-5200	4/5/2018	3/31/2018	30360508	00030-10-2018	200.00	REALQUEST SERVICES
Total for Vendor 00273 - CORELOGIC, INC.:					200.00	
00296 - MESITI-MILLER ENGINEERING,INC						
01-000-1565	4/3/2018	3/27/2018	0318009	00017-10-2018	15,420.36	PROBATION TANK REPLACEMENT_WO#823
Task Label: CAP-1516002A		Type: S	PO Number:			
Total for Vendor 00296 - MESITI-MILLER ENGINEERING,INC:					15,420.36	
00302 - POLLARDWATER.COM						
01-800-5301	3/22/2018	3/13/2018	0103750	00177-09-2018	649.21	DE-CHLOR TABS
Total for Vendor 00302 - POLLARDWATER.COM:					649.21	
00310 - AWWA CA NV SECTION						
01-800-5172	3/27/2018	3/27/2018	032718	00247-09-2018	55.00	RENEWAL_WATER QUALITY ANALYST
Total for Vendor 00310 - AWWA CA NV SECTION:					55.00	
00329 - GRAINGER						
01-800-5300	3/22/2018	3/18/2018	9701979313	00177-09-2018	650.38	SPILL PLATFORM
01-400-5311	4/3/2018	3/30/2018	9744201147	00017-10-2018	164.68	PIPE WRENCHES
Total for Vendor 00329 - GRAINGER:					815.06	
00342 - BRASS KEY LOCKSMITH						
01-400-5200	3/19/2018	3/14/2018	26070	00135-09-2018	184.00	STRIKE ADJUSTMENT CONSULT_Q4
01-800-5300	4/5/2018	3/27/2018	948607	00030-10-2018	8.70	DUPLICATE KEYS FOR V#325
Total for Vendor 00342 - BRASS KEY LOCKSMITH:					192.70	
00343 - ERNIE'S SERVICE CENTER						
01-800-5410	3/22/2018	3/5/2018	66400	00177-09-2018	215.93	SERVICE_V #280
01-800-5410	3/22/2018	3/20/2018	66842	00177-09-2018	17.55	SERVICE_V #280
01-800-5410	4/3/2018	4/2/2018	67080	00017-10-2018	1,069.26	TIRES FOR V#181

## Vendor

Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
Total for Vendor 00343 - ERNIE'S SERVICE CENTER:					1,302.74	
00362 - ACCELA, INC #774375						
01-200-5200	4/5/2018	3/31/2018	ACC38900	00030-10-2018	185.00	WEB PAYMENT_BANK FEES
01-200-5610	4/5/2018	3/31/2018	ACC38900	00030-10-2018	2,606.00	WEB PAYMENT_TRANSACTION FEES
Total for Vendor 00362 - ACCELA, INC #774375:					2,791.00	
00367 - INFOSEND, INC						
01-800-5650	3/29/2018	3/28/2018	134449	00249-09-2018	209.69	POSTAGE CHARGES_LOMPICO FLUSHING
01-800-5200	3/29/2018	3/28/2018	134449	00249-09-2018	238.19	MAILING CHARGES_LOMPICO FLUSHING
01-200-5200	4/6/2018	3/30/2018	134810	00033-10-2018	1,140.30	MAILING FEES
01-200-5650	4/6/2018	3/30/2018	134810	00033-10-2018	2,655.56	POSTAGE FEES
Total for Vendor 00367 - INFOSEND, INC:					4,243.74	
00449 - AW DIRECT, INC						
01-800-5410	3/29/2018	3/21/2018	SIO4098821	00249-09-2018	355.04	SAFETY LIGHT FOR V #121
Total for Vendor 00449 - AW DIRECT, INC:					355.04	
00450 - EUROFINS EATON ANALYTICAL						
01-800-5202	3/19/2018	3/16/2018	378683	00135-09-2018	90.00	WATER ANALYSIS_OLY WELL 3
Task Label:		Type:		PO Number:	0000101030	
01-800-5202	3/19/2018	3/16/2018	378694	00135-09-2018	700.00	WATER ANALYSIS_VARIOUS LOCATIONS
Task Label:		Type:		PO Number:	0000101030	
01-800-5202	3/19/2018	3/16/2018	378695	00135-09-2018	800.00	WATER ANALYSIS_VARIOUS LOCATIONS
Task Label:		Type:		PO Number:	0000101030	
01-800-5202	3/19/2018	3/16/2018	378696	00135-09-2018	200.00	WATER ANALYSIS_MIRA FLORES
Task Label:		Type:		PO Number:	0000101030	
01-800-5202	3/19/2018	3/16/2018	378697	00135-09-2018	400.00	WATER ANALYSIS_CREEKWOOD, LAKE BLVD
Task Label:	EXP-1617001A	Type:	S	PO Number:	0000101030	
01-800-5202	3/19/2018	3/16/2018	378698	00135-09-2018	400.00	WATER ANALYSIS_HWY 9, VIEW CIRCLE
Task Label:		Type:		PO Number:	0000101030	
01-800-5202	3/19/2018	3/16/2018	378701	00135-09-2018	90.00	WATER ANALYSIS_OLY 2 WELL
Task Label:		Type:		PO Number:	0000101030	
01-800-5202	3/21/2018	3/19/2018	378935	00168-09-2018	40.00	WATER ANALYSIS_OLY 2 RAW
Task Label:		Type:		PO Number:	0000101030	
01-800-5202	3/22/2018	3/21/2018	379393	00177-09-2018	360.00	FALL CREEK, BULL 1,2, BENNETT SPRING
Task Label:		Type:		PO Number:	0000101030	
01-800-5202	3/27/2018	3/23/2018	380168	00247-09-2018	680.00	WATER ANALYSIS_BULL SPRING 1
Task Label:		Type:		PO Number:	0000101030	
01-800-5202	3/27/2018	3/23/2018	380169	00247-09-2018	680.00	WATER ANALYSIS_BULL SPRING 2

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Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
00450 - EUROFINS EATON ANALYTICAL						
01-800-5202	3/29/2018	3/27/2018	380713	0000101030 00249-09-2018	680.00	WATER ANALYSIS_ FALL CREEK
01-800-5202	3/29/2018	3/27/2018	380714	0000101030 00249-09-2018	680.00	WATER ANALYSIS_BENNETT SPRING
01-800-5202	3/29/2018	3/28/2018	380940	0000101030 00249-09-2018	1,670.00	WATER ANALYSIS_OLY WELL 2, 3
01-800-5202	3/29/2018	3/28/2018	380942	0000101030 00249-09-2018	90.00	WATER ANALYSIS_PASO WELL 5A
01-800-5202	4/3/2018	3/31/2018	381875	0000101030 00017-10-2018	60.00	PASO 5, BOB'S LN
01-800-5202	4/6/2018	4/6/2018	382743	0000101030 00033-10-2018	550.00	WATER ANALYSIS_LWTP, QUAIL WELL 5A
Total for Vendor 00450 - EUROFINS EATON ANALYTICAL:					8,170.00	
00486 - CDW-G COMPUTING						
01-100-5600	3/19/2018	3/8/2018	LZD0324	00135-09-2018	460.93	DISTRICT SECRETARY MONITORS/CABLES
01-100-5600	3/19/2018	3/8/2018	LZD2200	00135-09-2018	77.90	DISTRICT SECRETARY MONITORS/CABLES
Total for Vendor 00486 - CDW-G COMPUTING:					538.83	
00550 - HACH COMPANY						
01-800-5300	4/3/2018	3/26/2018	10892168	00017-10-2018	902.16	REAGENT
Total for Vendor 00550 - HACH COMPANY:					902.16	
00577 - GOLDEN STATE FLOW						
01-400-5200	3/29/2018	3/16/2018	I-056492	00249-09-2018	546.16	BLACKSTONE, PASO 7, OLY METERS REPAIRED
Total for Vendor 00577 - GOLDEN STATE FLOW:					546.16	
00589 - RONALD RAY GREENLY						
01-800-5200	4/3/2018	3/28/2018	7500	00017-10-2018	350.00	KWTP HOLDING TANK HAUL AWAY
Total for Vendor 00589 - RONALD RAY GREENLY:					350.00	
00599 - WEX BANK						
01-200-5410	4/3/2018	3/31/2018	53722177	00017-10-2018	779.77	FUEL_CUSTOMER SERVICE
01-800-5410	4/3/2018	3/31/2018	53722177	00017-10-2018	2,109.75	FUEL_WATER TREATMENT



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Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
00599 - WEX BANK						
01-400-5410	4/3/2018	3/31/2018	53722177	00017-10-2018	3,256.45	FUEL_OPERATIONS
Total for Vendor 00599 - WEX BANK:					6,145.97	
00609 - BALANCE HYDROLOGICS, INC						
01-500-5200	4/5/2018	3/30/2018	218018-0318	00030-10-2018	3,652.02	STREAM MONITORING
Task Label: EXP-1516001A		Type: S	PO Number:			
Total for Vendor 00609 - BALANCE HYDROLOGICS, INC:					3,652.02	
00615 - HOME DEPOT CREDIT SERVICES						
01-000-1565	4/5/2018	3/28/2018	2022418	00032-10-2018	780.87	FENCING FOR PROBATION TANK_WO #823
Task Label: CAP-1516002A		Type: M	PO Number:			
Total for Vendor 00615 - HOME DEPOT CREDIT SERVICES:					780.87	
00695 - PAUL JENSEN						
01-000-1565	3/29/2018	3/23/2018	032318	00249-09-2018	90.00	PROBATION TANK OFFICE_REVIEW PLANS
Task Label: CAP-1516002A		Type: S	PO Number:			
01-000-1565	3/29/2018	3/23/2018	032318	00249-09-2018	570.00	PROBATION TANK SURVEY WORK
Task Label: CAP-1516002A		Type: S	PO Number:			
Total for Vendor 00695 - PAUL JENSEN:					660.00	
00703 - DATAFLOW BUSINESS SYSTEMS, INC						
01-800-5600	4/5/2018	3/1/2018	232206	00030-10-2018	7.50	SHIP FEE
01-200-5200	4/5/2018	3/28/2018	234226	00030-10-2018	237.25	HP 602DN MAINTENANCE
01-200-5200	4/5/2018	3/28/2018	234227	00030-10-2018	90.05	HP 5200 MAINTENANCE
Total for Vendor 00703 - DATAFLOW BUSINESS SYSTEMS, INC:					334.80	
00721 - UNITED SITE SVCS.,INC						
01-400-5200	4/6/2018	3/31/2018	114-6581141	00033-10-2018	177.93	QUAIL RESTROOM RENTAL_3/31/18 - 4/27/18
Task Label:		Type:	PO Number: 0000100924			
Total for Vendor 00721 - UNITED SITE SVCS.,INC:					177.93	
00729 - ALPHA ANALYTICAL LABS						
02-600-5202	3/21/2018	3/19/2018	8032664	00168-09-2018	982.00	WASTEWATER MONITORING
Task Label:		Type:	PO Number: 0000100920			
02-600-5202	4/3/2018	3/30/2018	8033850	00017-10-2018	360.00	WASTEWATER MONITORING
Task Label:		Type:	PO Number: 0000100920			
02-600-5202	4/9/2018	4/6/2018	8041704	00047-10-2018	110.00	WASTEWATER SAMPLING

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00729 - ALPHA ANALYTICAL LABS						
Task Label:		Type:	PO Number: 0000100920			
Total for Vendor 00729 - ALPHA ANALYTICAL LABS:					1,452.00	
00746 - SCOTTS VALLEY BANNER						
01-100-5640	3/27/2018	3/9/2018	50078	00247-09-2018	225.00	FLUSHING NOTICE_3/9/18
01-100-5640	3/29/2018	3/16/2018	50215	00249-09-2018	115.00	LADOC OPENING AD
01-100-5640	3/29/2018	3/16/2018	50216	00249-09-2018	225.00	SOUTH SYTEM FLUSHING
01-500-5200	4/5/2018	3/16/2018	50217	00030-10-2018	225.00	LEAK WEEK AD
01-100-5640	4/9/2018	3/2/2018	50047	00047-10-2018	225.00	FLUSHING AD
01-100-5640	4/9/2018	3/23/2018	50265	00047-10-2018	225.00	FLUSHING AD
01-100-5640	4/9/2018	3/23/2018	50278	00047-10-2018	225.00	FLUSHING AD
01-100-5640	4/9/2018	3/30/2018	50568	00047-10-2018	225.00	FLUSHING AD
Total for Vendor 00746 - SCOTTS VALLEY BANNER:					1,690.00	
00750 - FEDAK & BROWN, LLP						
01-200-5201	4/3/2018	3/27/2018	032718	00017-10-2018	2,000.00	AUDIT SERVICES FOR MARCH 2018
Total for Vendor 00750 - FEDAK & BROWN, LLP:					2,000.00	
00757 - JOE DAVIS						
01-400-5171	4/5/2018	3/3/2018	030318	00032-10-2018	58.56	UNIFORM REIMBURSEMENT
Total for Vendor 00757 - JOE DAVIS:					58.56	
00768 - HD SUPPLY FACILITIES MAINT, LTD						
01-800-5300	3/29/2018	3/22/2018	524439	00249-09-2018	1,744.84	CHLORINATION PARTS/SUPPLIES
Task Label:		Type:	PO Number: 0000101039			
01-800-5300	3/29/2018	3/22/2018	524505	00249-09-2018	1,121.56	CHLORINATION PARTS/SUPPLIES
Task Label:		Type:	PO Number: 0000101039			
Total for Vendor 00768 - HD SUPPLY FACILITIES MAINT, LTD:					2,866.40	
00788 - COMCAST						
01-400-5510	4/9/2018	4/1/2018	4118_1236033	00046-10-2018	172.59	INTERNET_215 BLACKSTONE DR
01-800-5510	4/9/2018	4/3/2018	4318_0956185	00046-10-2018	169.05	INTERNET_545 FALL CREEK DR
Total for Vendor 00788 - COMCAST:					341.64	
00944 - PDNC, INC.						
01-100-5200	4/3/2018	3/31/2018	2650	00017-10-2018	125.00	TECH SERVICES

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	Account Number	JE Date	Invoice Date	Invoice No	Journal Entry	Amount	Description
00944 - PDNC, INC.							
	01-100-5200	4/3/2018	3/31/2018	2664	00017-10-2018	330.00	MANAGED SERVER
	01-100-5200	4/3/2018	3/31/2018	2664	00017-10-2018	175.00	MONTHLY SERVER BACKUP
Total for Vendor 00944 - PDNC, INC.:						630.00	
00953 - HOSE SHOP							
	01-400-5410	3/27/2018	3/25/2018	209238	00247-09-2018	86.32	FORK LIFT HOSE
	01-400-5300	3/27/2018	3/25/2018	209238	00247-09-2018	142.18	FLUSHING HOSE
Total for Vendor 00953 - HOSE SHOP:						228.50	
01077 - JOSEPH B BEASLEY							
	01-400-5171	4/5/2018	3/30/2018	033018	00032-10-2018	51.01	UNIFORM REIMBURSEMENT
Total for Vendor 01077 - JOSEPH B BEASLEY:						51.01	
10023 - AT & T CAPITAL SERVICES, INC							
	01-100-5510	4/9/2018	4/1/2018	3035002	00046-10-2018	396.07	V2 PHONE SYSTEM MAINTENANCE
Total for Vendor 10023 - AT & T CAPITAL SERVICES, INC:						396.07	
10025 - BADGER METER, INC							
	01-200-5200	4/9/2018	3/30/2018	80019173	00047-10-2018	577.61	68886-101 SERVICES FOR MARCH 2018
	01-200-5200	4/9/2018	3/30/2018	80019173	00047-10-2018	509.08	68886-104 SERVICES FOR MARCH 2018
Total for Vendor 10025 - BADGER METER, INC:						1,086.69	
10067 - NBS							
	01-100-5200	4/3/2018	3/20/2018	318000094	00017-10-2018	770.41	CONSULTING SERVICES/EXP_OLYASM
	Task Label: EXP-1516003A	Type: E	PO Number:				
	01-100-5200	4/3/2018	3/20/2018	318000094	00017-10-2018	1,145.42	CONSULTING SERVICES/EXP_LOMASM
	Task Label: CAP-16170002	Type: E	PO Number:				
Total for Vendor 10067 - NBS:						1,915.83	
10087 - INLAND POTABLE SERVICES, INC							
	01-400-5200	3/29/2018	3/27/2018	B59-032018	00249-09-2018	7,208.50	BROOKDALE TANK REPAIR
	Task Label:	Type:	PO Number:	0000101023			
Total for Vendor 10087 - INLAND POTABLE SERVICES, INC:						7,208.50	
10123 - GOVERNMENT FINANCE OFFICERS ASSOC.							

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10123 - GOVERNMENT FINANCE OFFICERS ASSOC.						
01-200-5632	3/21/2018	2/15/2018	0122815	00168-09-2018	160.00	MEMBERSHIP RENEWAL
Total for Vendor 10123 - GOVERNMENT FINANCE OFFICERS ASSOC.:					160.00	
10130 - SANTA CRUZ COUNTY PARKS,OPEN SPACE & CULTURAL SVCS						
01-100-5631	3/29/2018	3/28/2018	032818	00249-09-2018	51.00	COUNTY PARKS PARCEL TAX_FY 1718
Total for Vendor 10130 - SANTA CRUZ COUNTY PARKS,OPEN SPACE & CULTURAL SVCS:					51.00	
10151 - OSCAR RODAS						
01-100-5420	4/6/2018	3/31/2018	534692	00033-10-2018	250.00	JOHNSON BLDG MAINT_MAR 2018
Total for Vendor 10151 - OSCAR RODAS:					250.00	
10184 - THATCHER COMPANY, INC						
01-800-5301	4/3/2018	3/27/2018	249279	00017-10-2018	2,734.91	CL2
01-800-5301	4/3/2018	3/27/2018	CR249279	00017-10-2018	-640.00	CL2 DRUM CREDIT
Total for Vendor 10184 - THATCHER COMPANY, INC:					2,094.91	
10194 - KEN GRADY COMPANY, INC						
01-800-5300	4/3/2018	3/27/2018	1955A	00017-10-2018	2,694.56	UNIVERSITY BOOSTER FLOW METER
Task Label:		Type:		PO Number:	0000101022	
01-800-5300	4/3/2018	3/27/2018	1955A	00017-10-2018	2,694.55	SOUTH BOOSTER FLOW METER
Task Label:		Type:		PO Number:	0000101022	
Total for Vendor 10194 - KEN GRADY COMPANY, INC:					5,389.11	
Report Total:					108,353.97	

# Accounts Payable

## Checks by Date - Detail by Check Number

User: KendraNegro  
Printed: 4/10/2018 1:55 PM



13060 Highway 9  
Boulder Creek, CA 95006-9119  
(831) 338-2153 phone  
(831) 338-7986 fax

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
ACH	00178	CALPERS	04/01/2018		
	APR 2018	HEALTH INSURANCE_APRIL 2018			18,553.27
	APR 2018	HEALTH INSURANCE_APRIL 2018			779.86
	APR 2018	HEALTH INSURANCE_APRIL 2018			3,006.53
	APR 2018	HEALTH INSURANCE_APRIL 2018			600.00
	APR 2018	HEALTH INSURANCE_APRIL 2018			3,640.42
	APR 2018	HEALTH INSURANCE_APRIL 2018			1,567.54
	APR 2018	HEALTH INSURANCE_APRIL 2018			15,319.30
	APR 2018	HEALTH INSURANCE_APRIL 2018			11,395.93
	APR 2018	HEALTH INSURANCE_APRIL 2018			193.92
Total for this ACH Check for Vendor 00178:				0.00	55,056.77
14625	00729 8022920	ALPHA ANALYTICAL LABS WASTEWATER MONITORING	03/09/2018		982.00
Total for Check Number 14625:				0.00	982.00
14626	00609 217018-0118 218018-0118	BALANCE HYDROLOGICS, INC STREAM MONITORING PROGRAM STREAM MONITORING PROGRAM	03/09/2018		14,280.00 5,516.02
Total for Check Number 14626:				0.00	19,796.02
14627	00566 59101	C S S C ANSWERING SERVICE	03/09/2018		211.98
Total for Check Number 14627:				0.00	211.98
14628	00213 182121 182121 182121 182121 182121 182121	CHESTNUT IDENTITY APPAREL, INC DISTRICT UNIFORMS_OPS_REPLACE DAM DISTRICT UNIFORMS_CREDIT DISTRICT UNIFORMS_CS DISTRICT UNIFORMS_OPS DISTRICT UNIFORMS_WT DISTRICT UNIFORMS_ENV	03/09/2018		10.80 -2.97 10.80 336.70 43.20 21.60
Total for Check Number 14628:				0.00	420.13
14629	01050 0213404	COLONIAL LIFE - BCN E4377735 SUPPLEMENTAL INSURANCE_2/13, 2/28/18	03/09/2018		584.72
Total for Check Number 14629:				0.00	584.72
14630	00265 2493	COMMUNITY TELEVISION BOD MEETING COVERAGE_01/18/18	03/09/2018		170.00
Total for Check Number 14630:				0.00	170.00
14631	10168 022818	KENDRA CONRAD MILEAGE_EMPLOYMENT SEMINAR	03/09/2018		75.65

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
	022818	MILEAGE_COMPLIANCE SEMINAR			33.68
	022818	PARKING FOR EMP SEMINAR			24.00
Total for Check Number 14631:				0.00	133.33
14632	00505	DELL MARKETING LP	03/09/2018		
	10223276488	SYSTEM SUPPORT_OPS			948.31
	10223276488	SYSTEM SUPPORT_FINANCE			948.30
	10223276488	SYSTEM SUPPORT_ENG			948.30
	10223276488	SYSTEM SUPPORT_WT			948.31
	10223276488	SYSTEM SUPPORT_ENV			948.31
	10223276488	SYSTEM SUPPORT_ADMIN			948.30
Total for Check Number 14632:				0.00	5,689.83
14633	00061	DHS PUBLIC HEALTH LAB	03/09/2018		
	1922	TICK TEST			33.00
Total for Check Number 14633:				0.00	33.00
14634	00450	EUROFINS EATON ANALYTICAL	03/09/2018		
	375128	WATER ANALYSIS_LWTP			100.00
Total for Check Number 14634:				0.00	100.00
14635	00164	FIRST ALARM	03/09/2018		
	374668	SERVICE CALL_KWTP			181.25
Total for Check Number 14635:				0.00	181.25
14636	00577	GOLDEN STATE FLOW	03/09/2018		
	56278	AUTO GUN PIT PROBE EXTENSIONS			769.87
Total for Check Number 14636:				0.00	769.87
14637	00080	GRANITE CONSTRUCTION CO	03/09/2018		
	1343544	HOT MIX			209.88
Total for Check Number 14637:				0.00	209.88
14638	00550	HACH COMPANY	03/09/2018		
	10840256	WATER TREATMENT SUPPLIES			429.50
	10844563	LAMP ASSEMBLY			367.62
	10854276	WTP SUPPLIES_PHD,PEEK			1,044.54
Total for Check Number 14638:				0.00	1,841.66
14639	00768	HD SUPPLY FACILITIES MAINT, LTD	03/09/2018		
	493771	RICCA PH BUFFER			185.95
	494998	COLORMETER			997.28
Total for Check Number 14639:				0.00	1,183.23
14640	10018	HOLLY HOSSACK	03/09/2018		
	030118	MILEAGE_COUNTY, P/U NAME PLATES			21.53
	030118	POSTAGE			6.70
	030118	OFFICE SUPPLIES			80.35
	030118	MILEAGE_SMGWA MEETING			11.34
	030118	MILEAGE_BCE MEETING MILEAGE			3.05
Total for Check Number 14640:				0.00	122.97

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
14641	00058 12206	IHWY, INC. BUSINESS HOSTING_slvwd.com	03/09/2018		25.00
		Total for Check Number 14641:		0.00	25.00
14642	00097 6060	JIM WALTERS CONTRACT SERVICES	03/09/2018		7,890.00
		Total for Check Number 14642:		0.00	7,890.00
14643	10073 5	KEN GIROUARD METER REVIEWS	03/09/2018		325.00
		Total for Check Number 14643:		0.00	325.00
14644	10139 S1093257.001 S1095289.001	NATIONAL METER & AUTOMATION 8001-000 METERS/8"x3/4" BADGER MODEL 8001-012 - ME ENDPOINT_NICOR CONNEC	03/09/2018		2,138.86 2,140.37
		Total for Check Number 14644:		0.00	4,279.23
14645	00054 227_3658024062 227_3658024062 227_3658024062 227_3658024062	PACIFIC GAS & ELECTRIC GAS/ELECTRIC CHARGES_WTP GAS/ELECTRIC CHARGES_OPS GAS/ELECTRIC CHARGES_ADMIN GAS/ELECTRIC CHARGES_BCEWW	03/09/2018		18,281.08 5,434.38 609.72 195.95
		Total for Check Number 14645:		0.00	24,521.13
14646	00302 11347	POLLARDWATER.COM DCHLR TABLETS	03/09/2018		649.72
		Total for Check Number 14646:		0.00	649.72
14647	00001 624240	ROYAL WHOLESALE ELECTRIC THERMO-GUN	03/09/2018		233.22
		Total for Check Number 14647:		0.00	233.22
14648	10001 800363	RUTAN & TUCKER, LLP LEGAL SERVICES	03/09/2018		863.34
		Total for Check Number 14648:		0.00	863.34
14649	00746 49417 49587	SCOTTS VALLEY BANNER FLUSHING NOTICE_2/16/18 RUN DATE FLUSHING NOTICE_RUN DATE 2/23/18	03/09/2018		225.00 225.00
		Total for Check Number 14649:		0.00	450.00
14650	00047 8010838 8020428 8020429 8020583 8020624 8020796	SOIL CONTROL LAB WATER ANALYSIS_GEN PHYSICAL WATER ANALYSIS_SAMPLING DATE 2/14/1 WATER ANALYSIS_TOTAL MANGANESE WATER ANALYSIS_CANEPA/ELENA OLY 2 RAW_METALS DIGESTION, MANGA GEN PHYSICAL_243 EL SERENO	03/09/2018		145.00 145.00 37.00 145.00 98.00 145.00
		Total for Check Number 14650:		0.00	715.00
14651	00044 2019012901	STAPLES CREDIT PLAN_6035 5178 622 OFFICE SUPPLIES_ADMIN	03/09/2018		57.55

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
	2023379361	OFFICE SUPPLIES_FINANCE			57.62
			Total for Check Number 14651:	0.00	115.17
14652	00727 94913632	ULINE SHIPPING SUPPLIES GLOVES	03/09/2018		99.07
			Total for Check Number 14652:	0.00	99.07
14653	00599 53340685 53340685 53340685	WEX BANK FUEL_OPS FUEL_CS FUEL_WTP	03/09/2018		2,501.30 611.52 1,688.50
			Total for Check Number 14653:	0.00	4,801.32
14654	10198 031318	TANK DEPOT.COM PROBATION TANK REPLACEMENT PROJE	03/14/2018		19,845.30
			Total for Check Number 14654:	0.00	19,845.30
14655	10199 112980	ALSO ENERGY, INC SOFTWARE RENEWAL & DEVICE MONITO	03/16/2018		2,900.00
			Total for Check Number 14655:	0.00	2,900.00
14656	10023 3032849	AT & T CAPITAL SERVICES, INC V2 SYSTEM MAINTENANCE	03/16/2018		396.07
			Total for Check Number 14656:	0.00	396.07
14657	00055 3118_9607360489 3118_9607360489 3118_9607360489 3118_9607360489	AT&T TELEPHONE_WTP TELEPHONE_BCEWW TELEPHONE_ADMIN TELEPHONE_OPS	03/16/2018		1,981.83 366.31 188.96 3,763.50
			Total for Check Number 14657:	0.00	6,300.60
14658	00309 8059080403	AT&T IP SERVICES IP SERVICES_195 KIRBY	03/16/2018		269.03
			Total for Check Number 14658:	0.00	269.03
14659	00687 030518	AT&T U-VERSE INTERNET_13057 HWY 9	03/16/2018		75.00
			Total for Check Number 14659:	0.00	75.00
14660	00378 022818 022818 022818 022818 022818 022818 022818 022818 022818 022818 022818 022818	BANK OF THE WEST BANKCARD CEN UNIFORMS_WTP ADVERTISING_FLUSHING CSDA MEETING_BAUGHMAN INTERNET_BLANCHARD ADVERTISING_FLUSHING ADVERTISING_FLUSHING UNIFORMS_OPS_REPLACE DAMAGED APP RIVER CLOUD SERVICES MAIL CHIMP UNIFORMS_OPS INTERNET_CONRAD AUTOMATIC GATE OPENERS	03/16/2018		206.12 229.00 600.00 5.10 130.12 229.00 46.64 158.40 50.00 55.31 5.10 102.55



Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
	022818	UNIFORMS_CS			28.19
	022818	UNIFORMS_OPS			1,051.02
	022818	BLDG MAINT_PEST CONTROL			231.52
Total for Check Number 14660:				0.00	3,128.07
14661	00342 72615	BRASS KEY LOCKSMITH KEYS	03/16/2018		32.61
Total for Check Number 14661:				0.00	32.61
14662	00788 030818	COMCAST INTERNET_17277 HWY 9	03/16/2018		172.64
Total for Check Number 14662:				0.00	172.64
14663	00788 3118_1236033	COMCAST INTERNET_215 BLACKSTONE DR	03/16/2018		172.64
Total for Check Number 14663:				0.00	172.64
14664	00788 3318_0956185	COMCAST INTERNET_545 FALL CREEK RD	03/16/2018		169.05
Total for Check Number 14664:				0.00	169.05
14665	00788 3518_1236165	COMCAST INTERNET_280 BLUE RIDGE DR	03/16/2018		172.64
Total for Check Number 14665:				0.00	172.64
14666	00788 3718_1236124	COMCAST INTERNET_15819 FOREST HILL DR	03/16/2018		172.64
Total for Check Number 14666:				0.00	172.64
14667	00037 1211917	CO. OF SANTA CRUZ DEPT OF PUBLIC 2018 BLANKET ENCROACHMENT PERMIT	03/16/2018		4,506.00
Total for Check Number 14667:				0.00	4,506.00
14668	10128 RNT7243404 RNT7243405	FERRELLGAS 250 GALPROPANE TANK RENTAL_LOMPIC 120 GAL PROPANE TANK RENTAL_LOMPIC	03/16/2018		65.00 45.00
Total for Check Number 14668:				0.00	110.00
14669	00210 0298032	FISHER SCIENTIFIC PLASTIC SYRINGE	03/16/2018		103.43
Total for Check Number 14669:				0.00	103.43
14670	00016 3296034	GREENWASTE RECOVERY,INC SPOIL REMOVAL	03/16/2018		395.14
Total for Check Number 14670:				0.00	395.14
14671	00236 3027542513	IDEXX DISTRIBUTION CORP LAB SUPPLIES	03/16/2018		3,177.83
Total for Check Number 14671:				0.00	3,177.83
14672	00247	INDEPENDENT ELECTRIC SUPPLY	03/16/2018		

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
	S103599622.001	Madrone Booster Soft Start Pump #1			2,911.36
	S103599622.002	Madrone Booster Soft Start Pump #1			633.90
			Total for Check Number 14672:	0.00	3,545.26
14673	00054 3518_9655817646	PACIFIC GAS & ELECTRIC ELECTRIC CHARGES_140 ELENA CT	03/16/2018		10.89
			Total for Check Number 14673:	0.00	10.89
14674	00695 021318 021918	PAUL JENSEN SURVEY WORK_BLUE TANK SURVEY WORK_LWTP	03/16/2018		1,990.00 1,490.00
			Total for Check Number 14674:	0.00	3,480.00
14675	00040 1111339 1111339	SANTA CRUZ SENTINEL NOTICE INVITING BIDS_2/14/18 NOTICE INVITING BIDS_2/17/18	03/16/2018		25.60 24.00
			Total for Check Number 14675:	0.00	49.60
14676	00162 46109732	ANTHEM BLUE CROSS MEDICAL_RETIRED EMPLOYEE	03/20/2018		325.50
			Total for Check Number 14676:	0.00	325.50
14677	00767 956349431	ANTHEM BLUE CROSS MEDICARERX_RETIRED EMPLOYEE	03/20/2018		169.80
			Total for Check Number 14677:	0.00	169.80
14678	00687 3618_132166881	AT&T U-VERSE INTERNET_MANANA WOODS	03/20/2018		85.00
			Total for Check Number 14678:	0.00	85.00
14679	00687 3718_132182018	AT&T U-VERSE INTERNET_345 QUAIL TERRACE	03/20/2018		75.00
			Total for Check Number 14679:	0.00	75.00
14680	00687 3818_250354021	AT&T U-VERSE INTERNET_365 MADRONE AVE	03/20/2018		75.00
			Total for Check Number 14680:	0.00	75.00
14681	00127 031918	FELTON COMMUNITY HALL RENTAL FEES	03/20/2018		550.00
			Total for Check Number 14681:	0.00	550.00
14682	00027 265753	NORTH BAY FORD V #832_FLOOR MATS	03/20/2018		179.85
			Total for Check Number 14682:	0.00	179.85
14683	00027 95283	NORTH BAY FORD NEW VEHICLE-SUPPLY & TREATMENT_V	03/20/2018		26,437.98
			Total for Check Number 14683:	0.00	26,437.98
14684	UB*00404	SARA WOODS	03/20/2018		

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
		Refund Check			21.78
			Total for Check Number 14684:	0.00	21.78
14685	00362	ACCELA, INC #774375	03/22/2018		
	38205	WEB PAYMENT_BANK FEES			185.00
	38205	WEB PAYMENT_TRANSACTION FEES			2,418.00
			Total for Check Number 14685:	0.00	2,603.00
14686	00729	ALPHA ANALYTICAL LABS	03/22/2018		
	8031336	WASTEWATER SAMPLING			110.00
	8031381	WASTEWATER SAMPLING			430.00
			Total for Check Number 14686:	0.00	540.00
14687	00760	ANGELO BARTOLOTTA	03/22/2018		
	22533	REGULAR ENVELOPES			146.83
	22533	RED DOOR HANGERS			167.16
	22533	BUSINESS CARDS_J MICHELSON			80.79
			Total for Check Number 14687:	0.00	394.78
14688	00309	AT&T IP SERVICES	03/22/2018		
	31118	IP SERVICE_OPS			259.87
	31118	IP SERVICE_ADMIN			259.86
	31118	IP SERVICE_WTP			259.87
			Total for Check Number 14688:	0.00	779.60
14689	00687	AT&T U-VERSE	03/22/2018		
	31518_132167447	INTERNET_365 MADRONE AVE			75.00
			Total for Check Number 14689:	0.00	75.00
14690	10025	BADGER METER, INC	03/22/2018		
	80018326	68886-104 BEACON SERVICES			490.39
	80018326	68886-101 BEACON SERVICES			578.50
			Total for Check Number 14690:	0.00	1,068.89
14691	00124	BRUCE BARTON PUMP, INC	03/22/2018		
	0095696-IN	PARTS FOR LWTP PUMP			108.01
			Total for Check Number 14691:	0.00	108.01
14692	00415	CA BANK & TRUST/GOV SVC DEPT_10	03/22/2018		
	032018	OLY SRF ESCROW FUND			58,000.00
			Total for Check Number 14692:	0.00	58,000.00
14693	10121	COLANTUONO,HIGHSMITH & WHATL	03/22/2018		
	35024	LEGAL SERVICES THROUGH 2/28/18			2,197.50
			Total for Check Number 14693:	0.00	2,197.50
14694	00137	COLLEEN NEVINS	03/22/2018		
	78638	NAME PLATES			47.41
			Total for Check Number 14694:	0.00	47.41
14695	00788	COMCAST	03/22/2018		
	3618_1236017	INTERNET_295 EAST RD			172.64

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
			Total for Check Number 14695:	0.00	172.64
14696	00273 30354965	CORELOGIC, INC. REALQUEST SERVICES	03/22/2018		200.00
			Total for Check Number 14696:	0.00	200.00
14697	00703 231951	DATAFLOW BUSINESS SYSTEMS, INC SHIP FEE_TONER	03/22/2018		7.50
			Total for Check Number 14697:	0.00	7.50
14698	00409 031118 031118	EASYPERMIT POSTAGE POSTAGE_3/2/18 POSTAGE_3/1/18	03/22/2018		500.00 500.00
			Total for Check Number 14698:	0.00	1,000.00
14699	00450 375558	EUROFINS EATON ANALYTICAL WATER ANALYSIS_PASO WELLS	03/22/2018		1,500.00
			Total for Check Number 14699:	0.00	1,500.00
14700	00080 1352279 1352590	GRANITE CONSTRUCTION CO BASE ROCK FOR MAIN REPAIR BASE ROCK	03/22/2018		48.34 69.98
			Total for Check Number 14700:	0.00	118.32
14701	00367 133451 133451	INFOSEND, INC POSTAGE FEES MAILING FEES	03/22/2018		2,663.70 1,138.76
			Total for Check Number 14701:	0.00	3,802.46
14702	00296 0218016	MESITI-MILLER ENGINEERING,INC PROJECT 14176-5_PROBATION TANK	03/22/2018		3,959.38
			Total for Check Number 14702:	0.00	3,959.38
14703	10139 S1095877.001 S1095877.001	NATIONAL METER & AUTOMATION #8001-0002 METER 1" BADGER MODEL 5 #8001-000 METER 5/8" X 3/4" BADGER M	03/22/2018		1,686.66 3,092.30
			Total for Check Number 14703:	0.00	4,778.96
14704	10067 11800082 11800082	NBS REIMBURSABLE POSTAGE LOMPICO ASSESSMENT FEES	03/22/2018		11.28 360.00
			Total for Check Number 14704:	0.00	371.28
14705	10158 502665 502665	NOSSAMAN, LLP DISBURSEMENTS THROUGH 12/30/17 PROFESSIONAL SERVICES THROUGH 12/31	03/22/2018		1,671.68 34,751.00
			Total for Check Number 14705:	0.00	36,422.68
14706	00944 2610 2625 2625	PDNC, INC. FIELD TECH SERVICE MANAGED SERVER MONTHLY SERVER BACKUP	03/22/2018		187.50 330.00 175.00

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
			Total for Check Number 14706:	0.00	692.50
14707	00569 3101992265	PITNEY BOWES GLOBAL FIN.LLC POSTAGE MACHINE LEASE	03/22/2018		459.29
			Total for Check Number 14707:	0.00	459.29
14708	UB*00405	COLLEEN SERGUSON Refund Check	03/22/2018		75.00
			Total for Check Number 14708:	0.00	75.00
14709	00266 021918	TERMINIX PEST CONTROL	03/22/2018		133.00
			Total for Check Number 14709:	0.00	133.00
14710	10184 248430	THATCHER COMPANY, INC CHEMICALS	03/22/2018		1,134.91
			Total for Check Number 14710:	0.00	1,134.91
14711	10072 3021 3021 3022	WATER SYSTEMS CONSULTING, INC USDA ENGINEERING SERVICES HWY 9 PIPELINE USDA ENGINEERING SERVICES	03/22/2018		90.00 7,230.00 5,624.50
			Total for Check Number 14711:	0.00	12,944.50
14712	00788 31518_1236074	COMCAST INTERNET_200 ANNIE'S WAY	03/23/2018		172.64
			Total for Check Number 14712:	0.00	172.64
14713	00788 31618_1018662	COMCAST INTERNET_264 ORCHARD RD	03/23/2018		146.12
			Total for Check Number 14713:	0.00	146.12
14714	10005 102545143	ICMA RETIREMENT C/O M & T RETIRI RETIREMENT WITHHOLDING_PP END 3/14	03/23/2018		3,888.08
			Total for Check Number 14714:	0.00	3,888.08
14715	00313	MET LIFE	03/23/2018		
	APR 2018	LIFE INSURANCE_ENV			33.30
	APR 2018	DISABILITY INSURANCE_WTP			320.28
	APR 2018	DENTAL INSURANCE_OPS			1,945.38
	APR 2018	DENTAL INSURANCE_WTP			1,202.00
	APR 2018	LIFE INSURANCE_ADMIN			33.30
	APR 2018	DENTAL INSURANCE_ADMIN			325.32
	APR 2018	DISABILITY INSURANCE_ENV			78.38
	APR 2018	DISABILITY INSURANCE_ENG			41.45
	APR 2018	LIFE INSURANCE_WTP			146.52
	APR 2018	DISABILITY INSURANCE_ADMIN			342.98
	APR 2018	DENTAL INSURANCE_FINANCE			1,430.03
	APR 2018	DENTAL INSURANCE_ENV			192.14
	APR 2018	DISABILITY INSURANCE_FINANCE			280.24
	APR 2018	LIFE INSURANCE_OPS			186.48
	APR 2018	LIFE INSURANCE_ENG			16.65
	APR 2018	DISABILITY INSURANCE_ADMIN			84.83

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
	APR 2018	DENTAL INSURANCE_ENG			62.57
	APR 2018	LIFE INSURANCE_FINANCE			144.02
Total for Check Number 14715:				0.00	6,865.87
14716	00011	VERIZON WIRELESS	03/23/2018		
	031318	TABLET CHARGES_OPS			168.76
	031318	TABLET CHARGES_ENG			95.25
	031318	TABLET CHARGES_ENV			95.25
Total for Check Number 14716:				0.00	359.26
14717	00011	VERIZON WIRELESS	03/23/2018		
	9803512415	CELL PHONE CHARGES_WTP			371.16
	9803512415	CELL PHONE CHARGES_OPS			581.83
	9803512415	CELL PHONE CHARGES_ADMIN			100.20
Total for Check Number 14717:				0.00	1,053.19
14718	10201	RACHEL MUNOZ	03/27/2018		
	032318	SAFETY SHOES			150.00
Total for Check Number 14718:				0.00	150.00
14719	00545	AFLAC	03/30/2018		
	704967	SUPPLEMENTAL INSURANCE_MAR 2018			221.77
Total for Check Number 14719:				0.00	221.77
14720	00055	AT&T	03/30/2018		
	031918	TELEPHONE SERVICE_FELTON ACRES			110.78
Total for Check Number 14720:				0.00	110.78
14721	00309	AT&T IP SERVICES	03/30/2018		
	1561970401	IP SERVICE_ADMIN			409.35
	1561970401	IP SERVICE_WTP			409.36
	1561970401	IP SERVICE_OPS			409.35
Total for Check Number 14721:				0.00	1,228.06
14722	00686	AT&T LONG DISTANCE	03/30/2018		
	031318	LONG DISTANCE_ADMIN			79.23
	031318	LONG DISTANCE_WTP			48.50
Total for Check Number 14722:				0.00	127.73
14723	00687	AT&T U-VERSE	03/30/2018		
	1323385293	INTERNET_GRAHAM HILL			150.00
Total for Check Number 14723:				0.00	150.00
14724	00687	AT&T U-VERSE	03/30/2018		
	250354029	INTERNET_365 MADRONE AVE			55.00
Total for Check Number 14724:				0.00	55.00
14725	00609	BALANCE HYDROLOGICS, INC	03/30/2018		
	217018-0218	STREAM MONITORING			6,736.25
	218018-0218	STREAM MONITORING			4,780.97
Total for Check Number 14725:				0.00	11,517.22

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
14726	10173	CARLY BLANCHARD	03/30/2018		
	032818	REBATE INSPECTION			5.67
	032818	MEETING W/SLV TEACHERS			5.94
	032818	WCC MEETING IN SC			3.24
	032818	REBATE INSPECTION			3.78
	032818	SITE VISIT W/ECOLOGY ACTION			2.43
	032818	WATER CONSERVATION SHOWCASE CARP			3.24
	032818	SLV RIVER SYMPOSIUM			12.42
	032818	SRF CONFERENCE HOTEL			490.00
	032818	BLUE RIBBON PANEL MEETING			4.32
	032818	REBATE INSPECTION			7.02
Total for Check Number 14726:				0.00	538.06
14727	10200	BOULDER CREEK RECREATION & PAI	03/30/2018		
	032118	RENTAL FOR BOD MEETING_1/18/18			120.00
	032118	RENTAL FOR WW MEETING_3/1/18			60.00
Total for Check Number 14727:				0.00	180.00
14728	00342	BRASS KEY LOCKSMITH	03/30/2018		
	72973	DISTRICT LOCKS			166.66
Total for Check Number 14728:				0.00	166.66
14729	00566	C S S C	03/30/2018		
	18030	ANSWERING SERVICE_28/22/18 - 3/21/18			189.66
Total for Check Number 14729:				0.00	189.66
14730	10106	CEL ANALYTICAL, INC	03/30/2018		
	6569	WATER TESTING			409.00
Total for Check Number 14730:				0.00	409.00
14731	00363	CINCINNATI LIFE INSURANCE CO	03/30/2018		
	APR 2018	LIFE INSURANCE_3RD JAN PAYROLL DED			14.00
	APR 2018	LIFE INSURANCE_APR 2018			28.00
Total for Check Number 14731:				0.00	42.00
14732	01050	COLONIAL LIFE - BCN E4377735	03/30/2018		
	01313130	SUPPLEMENTAL INSURANCE_3/13/, 3/28/18			584.72
Total for Check Number 14732:				0.00	584.72
14733	00788	COMCAST	03/30/2018		
	031118	INTERNET_23 SUMMIT AVE			141.12
Total for Check Number 14733:				0.00	141.12
14734	00788	COMCAST	03/30/2018		
	031918	INTERNET_7400 HWY 9			151.12
Total for Check Number 14734:				0.00	151.12
14735	00133	DASSEL'S	03/30/2018		
	167922	PROPANE_ADMIN			440.55
Total for Check Number 14735:				0.00	440.55
14736	00212	CO. OF SANTA CRUZ ENVIRONMENTA	03/30/2018		

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
	IN008291	HAZ MAT PERMIT_PASO 6			862.00
			Total for Check Number 14736:	0.00	862.00
14737	00076 731365	ERNIE'S AUTO CENTER MIRROR_V#264	03/30/2018		124.18
			Total for Check Number 14737:	0.00	124.18
14738	00343 66551	ERNIE'S SERVICE CENTER MAINTENANCE_V#341	03/30/2018		428.02
			Total for Check Number 14738:	0.00	428.02
14739	00450 375333 377934	EUROFINS EATON ANALYTICAL WATER ANALYSIS_PASO 5, BOB'S LN WATER ANALYSIS_PASO 5, BOB'S LN	03/30/2018		60.00 60.00
			Total for Check Number 14739:	0.00	120.00
14740	00118 67401680	FARMER BROTHERS COFFEE COFFEE SUPPLIES	03/30/2018		189.79
			Total for Check Number 14740:	0.00	189.79
14741	00397 5870015 5882334 645113	FERGUSON ENTERPRISES, INC MISC PLUMBING PARTS PLUMBING PARTS FOR LWTP BACKFLOW CREDIT_LWTP PARTS	03/30/2018		133.66 143.75 -110.76
			Total for Check Number 14741:	0.00	166.65
14742	00329 9722785103	GRAINGER MARKING FLAGS	03/30/2018		75.24
			Total for Check Number 14742:	0.00	75.24
14743	00080 130555	GRANITE CONSTRUCTION CO PAVING/LEAK REPAIRS	03/30/2018		319.90
			Total for Check Number 14743:	0.00	319.90
14744	00768 505558 510494	HD SUPPLY FACILITIES MAINT, LTD SHOVELS LAB SUPPLIES	03/30/2018		452.73 199.56
			Total for Check Number 14744:	0.00	652.29
14745	00769 032618	HIGHLANDS PARK SENIOR CTR. RENTAL FEE_3/15/18 BOD MEETING	03/30/2018		225.00
			Total for Check Number 14745:	0.00	225.00
14746	00608 341832	LLOYD'S TIRE SERVICE, INC TIRES_V #155	03/30/2018		983.55
			Total for Check Number 14746:	0.00	983.55
14747	00006 17181709	MATHESON TRI-GAS, INC. WELDING HELMET	03/30/2018		112.27
			Total for Check Number 14747:	0.00	112.27



Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
14748	00082	MID VALLEY SUPPLY	03/30/2018		
	223821	PAPER SUPPLIES			137.14
	223951	CREDIT_BATH TISSUE			-63.36
Total for Check Number 14748:				0.00	73.78
14749	00539	MILLER MAXFIELD, INC	03/30/2018		
	0218SLV	PUBLIC OUTREACH CONSULTING SVCS			2,906.25
Total for Check Number 14749:				0.00	2,906.25
14750	10151	OSCAR RODAS	03/30/2018		
	534699	JOHNSON BLDG MAINT_FEB 2018			250.00
Total for Check Number 14750:				0.00	250.00
14751	00054	PACIFIC GAS & ELECTRIC	03/30/2018		
	9754419334-1	ELECTRIC CHARGES_FELTON HEIGHTS			52.29
Total for Check Number 14751:				0.00	52.29
14752	10130	SANTA CRUZ COUNTY PARKS,OPEN S	03/30/2018		
	FY1718	PARCEL TAX			178.50
Total for Check Number 14752:				0.00	178.50
14753	10149	RANDALL BROWN	03/30/2018		
	032218	HISTORICAL RESEARCH THROUGH 2/28/18			240.00
Total for Check Number 14753:				0.00	240.00
14754	00589	RONALD RAY GREENLY	03/30/2018		
	7485	HOLDING TANK/HAUL AWAY_KWTP			300.00
Total for Check Number 14754:				0.00	300.00
14755	00047	SOIL CONTROL LAB	03/30/2018		
	8020797	OLY 2 SAMPLING_2/28/18			78.00
	8030094	OLY 2 SAMPLING_3/2/18			98.00
	8030095	FALL CREEK SAMPLING_3/5/18			116.00
	8030230	CANEPA/ELENA SAMPLING_3/7/18			145.00
	8030304	FOREMAN SAMPLING_3/8/18			116.00
Total for Check Number 14755:				0.00	553.00
14756	10118	STEWART DEGNER	03/30/2018		
	7072	BALANCE CERTIFICATION			500.00
Total for Check Number 14756:				0.00	500.00
14757	00721	UNITED SITE SVCS.,INC	03/30/2018		
	510494	QUAIL YARD TOILET			177.93
Total for Check Number 14757:				0.00	177.93
14758	00399	VISION SERVICE PLAN - (CA)	03/30/2018		
	APR 2018	VISION INSURANCE_ENV			37.82
	APR 2018	VISION INSURANCE_ENG			10.92
	APR 2018	VISION INSURANCE_FINANCE			142.50
	APR 2018	VISION INSURANCE_ADMIN			43.86
	APR 2018	VISION INSURANCE_OPS			350.68
	APR 2018	VISION INSURANCE_WTP			154.40

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
			Total for Check Number 14758:	0.00	740.18
14759	10152	WESTAMERICA BANK	03/30/2018		
	032018	INTEREST ON TRUCK LOAN			273.00
	032018	PRINCIPAL ON TRUCK LOAN			1,827.68
			Total for Check Number 14759:	0.00	2,100.68
14760	UB*00406	BETH WILSON	03/30/2018		
		Refund Check			64.88
			Total for Check Number 14760:	0.00	64.88
14761	00050	CO. OF SANTA CRUZ RECORDER'S OF	03/30/2018		
	065-243-09	LIEN RELEASE FEE			15.00
			Total for Check Number 14761:	0.00	15.00
14762	00099	JOEL BUSA	04/02/2018		
	APR 2018	RETIRED EMPLOYEE MEDICAL			125.00
			Total for Check Number 14762:	0.00	125.00
14763	00208	LEONARD KUHNLEIN	04/02/2018		
	APR 2018	RETIRED EMPLOYEE MEDICAL			125.00
			Total for Check Number 14763:	0.00	125.00
14764	00662	JAMES A. MUELLER	04/02/2018		
	APR 2018	RETIRED EMPLOYEE MEDICAL			50.00
			Total for Check Number 14764:	0.00	50.00
14765	10113	BANK MIDWEST	04/02/2018		
	APR 2018	SOLAR LOAN INTEREST			884.76
	APR 2018	SOLAR LOAN PRINCIPAL			2,365.14
			Total for Check Number 14765:	0.00	3,249.90
14766	00415	CA BANK & TRUST/GOV SVC DEPT_10	04/02/2018		
	APR 2018	1976 SAFE DRINKING WATER BOND			15,581.43
			Total for Check Number 14766:	0.00	15,581.43
14767	00788	COMCAST	04/02/2018		
	ACCT#0987198	INTERNET_195 KIRBY ST			151.12
			Total for Check Number 14767:	0.00	151.12
14768	00054	PACIFIC GAS & ELECTRIC	04/02/2018		
	2564996928-1	ELECTRIC_1150 REBECCA DR			43.14
			Total for Check Number 14768:	0.00	43.14
14769	00054	PACIFIC GAS & ELECTRIC	04/02/2018		
	2836470071-7	ELECTRIC_ZAYANTE & ROSEBLOOM			1,216.13
			Total for Check Number 14769:	0.00	1,216.13
14770	00054	PACIFIC GAS & ELECTRIC	04/02/2018		
	6279346884-4	ELECTRIC_19 SUMMIT AVE			621.49

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
			Total for Check Number 14770:	0.00	621.49
14771	00054	PACIFIC GAS & ELECTRIC	04/02/2018		
	7179253583-4	ELECTRIC_PUMP WELL #6			22.93
	7179253583-4	ELECTRIC_MADRONE BOOSTER STATION			175.55
	7179253583-4	ELECTRIC_PUMPING STATION			156.16
	7179253583-4	ELECTRIC_COMMUNITY WELL			20.37
	7179253583-4	ELECTRIC_PUMP_11255 LOMPICO RD			190.31
			Total for Check Number 14771:	0.00	565.32
14772	00054	PACIFIC GAS & ELECTRIC	04/04/2018		
	APP #114323771	PROBATION TANK_WORK ORDER #823			2,000.00
			Total for Check Number 14772:	0.00	2,000.00
14773	00216	KATHLEEN GERRITY	04/04/2018		
	107332	MOTOR OIL			12.01
			Total for Check Number 14773:	0.00	12.01
14774	00711	ROBERTS & BRUNE CO.	04/04/2018		
	S1703635.004	AIR RELIEF VALVE 1"			801.25
	S1703635.004	AIR RELIEF VALVE 2"			858.01
	S1717208.005	HYMAX REDUCER CPLG 5X6 5.12-6.38 ANI			1,226.77
	S1725675.001	ROMAC COUPLING			252.04
	S1726044.001	6004-033 FLEX COUPLING 6.60-6.91			321.95
	S1726138.001	4" NUT & BOLT SET PLATED 150#			71.89
	S1726138.001	CHECK VALVE 2"			225.58
	S1726138.001	GATE VALVE 2"			474.73
	S1726138.001	SADDLE DS 1.61-1.92 X 1"			21.76
	S1726138.001	FLANGE RING GASKETS 4" NO BLT			36.10
	S1726138.002	BELL REDCR GALV 2" X 1-1/2"			21.51
	S1726138.002	NIPPLE GALV 1-1/2" X 0"			9.72
	S1726138.002	TEE GALV 1"			20.46
	S1726138.002	BUSHING GALV 2-1/2" X 2"			12.00
	S1726138.002	NIPPLE GALV 3/4" X 0"			7.51
	S1726138.002	COUPLING GALV 1"			18.81
	S1726138.002	PLUG GALV 2"			33.09
	S1726138.002	PLUG GALV 1"			9.75
	S1726138.002	NIPPLE GALV 1" X 2"			7.33
	S1726138.002	NIPPLE GALV 2" X 4-1/2"			24.88
	S1726138.002	COUPLING GALV 2"			34.12
	S1726138.002	NIPPLE GALV 2" X 0"			24.44
	S1726138.002	NIPPLE GALV 3/4" X 4"			7.75
	S1726138.003	COMPRESSION COUPLING 3/4" G/T			343.12
	S1726138.003	CORP PIPE-COPPER TAPER 1"			124.77
	S1726138.003	SADDLE HDPE 4 X 1 IP			258.26
	S1727505.001	PIPE POLY 160 PSI SDR11 2"			2,511.27
	S1727505.001	PIPE GALV SCHED 40 2" (21')			596.34
	S1727505.001	GATE VALVE FLG X FLG 4" SQNUT			738.43
	S1727505.001	VALVE BOX G5 BOX			622.34
			Total for Check Number 14774:	0.00	9,715.98
14775	00001	ROYAL WHOLESALE ELECTRIC	04/04/2018		
	626087	Echo Booster Lights			850.20
	626310	ELECTRICAL CONNECTORS			25.06

Check No	Vendor No Invoice No	Vendor Name Description	Check Date Reference	Void Checks	Check Amount
			Total for Check Number 14775:	0.00	875.26
14776	00142	SAN LORENZO LUMBER	04/04/2018		
	112153	TANK HATCH REPAIR			29.07
	112422	KWTP EYE WASH STATION			63.79
	112425	MCCLOUD TANK TARGET LEVEL			183.04
	112682	TANK TARGET REPAIR			19.31
	112721	TANK TARGET REPAIR			11.70
			Total for Check Number 14776:	0.00	306.91
14777	00125	SCARBOROUGH LUMBER	04/04/2018		
	309118	MISC PARTS LWTP			50.34
	309124	MADRONE BOOSTER WIRING			56.77
	309384	SPRAY PAINT			5.36
	309671	MISC PARTS _QUAIL FACILITY			76.66
	309680	BLAIR TANK PARTS			33.43
	309681	PSI SWITCH			41.52
	309730	MCCLOUD TANK PARTS			76.80
	309756	BLAIR TANK TARGET			18.97
	309800	MISC SUPPLIES_SWIM TANK			51.19
	309826	MISC SUPPLIES_SWIM TANK			56.10
	309827	MISC SUPPLIES			71.29
	309989	HOLE SAW/BITS			32.96
	310082	MISC TOOLS/GLOVES			83.86
	310229	TANK TARGET REPAIR			58.44
	379452	LOWER PASO ANTENNA REPAIR			12.33
	568972	PVC PART LWTP			6.28
	569091	HOSE FAUCET FOR FLUSHING			17.18
	569120	CONCRETE_RAMBLING RD PIPE SUPPORT			23.85
	569196	TIE CABLES_ADMIN			11.60
	569546	PROBATION TANK FENCING			117.40
	569608	PROPANE FOR FORKLIFT			23.25
	569613	TANK TARGET REPAIR			64.83
			Total for Check Number 14777:	0.00	990.41
14778	00168	SCOTTS VALLEY SPRINKLER	04/04/2018		
	150174	TANK_BCEWW			100.63
	150188	TANK HATCH REPAIR			59.93
	150191	LWTP HOUSE WATER			16.42
			Total for Check Number 14778:	0.00	176.98
			Report Total (155 checks):	0.00	420,250.87

# EFT TRANSACTIONS

*MARCH 2018*



13060 Highway 9  
Boulder Creek, CA 95006-9119  
(831) 338-2153 phone  
(831) 338-7986 fax

Date	Check No	Vendor	Description	Amount
3/14/2018	EFT	PAYCHEX	ADMIN & DELIVERY FEES 03/14/18	\$ 1,217.30
3/14/2018	EFT	PAYCHEX	PAYROLL 03/14/18	\$ 96,811.21
3/14/2018	EFT	CALPERS	RETIREMENT BENEFITS 03/14/18	\$ 17,227.05
3/28/2018	EFT	PAYCHEX	ADMIN & DELIVERY FEES 03/28/18	\$ 1,217.30
3/28/2018	EFT	PAYCHEX	PAYROLL 03/28/18	\$ 98,146.83
3/28/2018	EFT	CALPERS	RETIREMENT BENEFITS 03/28/18	\$ 17,220.53
<b>TOTAL EFT TRANSACTIONS</b>				<b>\$ 231,840.22</b>

0087 A87P-7177 San Lorenzo Valley Water District

**CASH REQUIREMENTS**

THIS REPORT SUMMARIZES YOUR PAYROLL TRANSACTIONS FOR THE CHECK DATE 03/14/18. IT DOES NOT REFLECT MISCELLANEOUS ADMINISTRATIVE CHARGES. PLEASE REFER TO YOUR INVOICE(S) FOR THE TOTAL CASH REQUIRED FOR THIS CHECK DATE.

**TRANSACTION DETAIL**

**ELECTRONIC FUNDS TRANSFER** - Your financial institution will initiate transfer to Paychex *at or after 12:01 A.M.* on transaction date.

<u>TRANS. DATE</u>	<u>BANK NAME</u>	<u>ACCOUNT NUMBER</u>	<u>PRODUCT</u>	<u>DESCRIPTION</u>		<b>BANK DRAFT AMOUNTS &amp; OTHER TOTALS</b>
03/13/18	WELLS FARGO BANK, NA	xxxxxx1358	Direct Deposit	Net Pay Allocations	61,378.19	61,378.19
03/13/18	WELLS FARGO BANK, NA	xxxxxx1358	Taxpay®	Employee Withholdings		
				Social Security	7,269.43	
				Medicare	1,700.08	
				Fed Income Tax	11,422.35	
				CA Income Tax	4,237.62	
				CA Disability	1,172.50	
				<b>Total Withholdings</b>	<b>25,801.98</b>	
				Employer Liabilities		
				Social Security	7,269.42	
				Medicare	1,700.08	
				<b>Total Liabilities</b>	<b>8,969.50</b>	<b>34,771.48</b>
03/13/18	WELLS FARGO BANK, NA	xxxxxx1358	Section 125	PXUME EE PRE	469.23	
				PXDCA EE PRE	192.31	<b>661.54</b>
				<b>EFT FOR 03/13/18</b>		<b>96,811.21</b>
				<b>TOTAL EFT (Does not reflect administrative charges)</b>		<b>96,811.21</b>

**NEGOTIABLE CHECKS** - Check amounts will be debited when payees cash checks. Funds must be available on check date.

<u>TRANS. DATE</u>	<u>BANK NAME</u>	<u>ACCOUNT NUMBER</u>	<u>PRODUCT</u>	<u>DESCRIPTION</u>		<u>TOTAL</u>
03/14/18	WELLS FARGO BANK, NA	xxxxxx1358	Payroll	Check Amounts	16,864.85	
				<b>TOTAL NEGOTIABLE CHECKS</b>		<b>16,864.85</b>

**REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES** - Paychex does not remit these funds. You must ensure accurate and timely payment of applicable items.

<u>TRANS. DATE</u>	<u>BANK NAME</u>	<u>ACCOUNT NUMBER</u>	<u>PRODUCT</u>	<u>DESCRIPTION</u>		<u>TOTAL</u>
03/14/18	Refer to your records for account Information		Payroll	Employee Deductions		
				Advance	21.60	
				Aflc/Col Post	55.34	
				Aflc/Col Pre	347.96	
				Calper 457	925.00	
				DPer	7,554.19	
				Health	783.70	

0087 A87P-7177 San Lorenzo Valley Water District

**CASH REQUIREMENTS**

**THIS REPORT SUMMARIZES YOUR PAYROLL TRANSACTIONS FOR THE CHECK DATE 03/14/18. IT DOES NOT REFLECT MISCELLANEOUS ADMINISTRATIVE CHARGES. PLEASE REFER TO YOUR INVOICE(S) FOR THE TOTAL CASH REQUIRED FOR THIS CHECK DATE.**

**REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES (cont.)** - Paychex does not remit these funds. You must ensure accurate and timely payment of applicable items.

<u>TRANS. DATE</u>	<u>BANK NAME</u>	<u>ACCOUNT NUMBER</u>	<u>PRODUCT</u>	<u>DESCRIPTION</u>	<u>TOTAL</u>
03/14/18	Refer to your records for account Information		Payroll	Employee Deductions (cont.)	
				ICMA	3,888.08
				Life Ins	14.00
				Union dues	521.04
				<b>Total Deductions</b>	<b>14,110.91</b>

**TOTAL REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES (Does not reflect administrative charges)** **14,110.91**

**PAYCHEX WILL MAKE THESE TAX DEPOSIT(S) ON YOUR BEHALF** - This information serves as a record of payment.

<u>DUE DATE</u>	<u>PRODUCT</u>	<u>DESCRIPTION</u>	
03/21/18	Taxpay®	FED IT PMT Group	29,361.36
03/21/18	Taxpay®	CA IT PMT Group	5,410.12

0087 A87P-7177 San Lorenzo Valley Water District

**CASH REQUIREMENTS**

THIS REPORT SUMMARIZES YOUR PAYROLL TRANSACTIONS FOR THE CHECK DATE 03/28/18. IT DOES NOT REFLECT MISCELLANEOUS ADMINISTRATIVE CHARGES. PLEASE REFER TO YOUR INVOICE(S) FOR THE TOTAL CASH REQUIRED FOR THIS CHECK DATE.

**TRANSACTION DETAIL**

**ELECTRONIC FUNDS TRANSFER** - Your financial institution will initiate transfer to Paychex *at or after 12:01 A.M.* on transaction date.

<u>TRANS. DATE</u>	<u>BANK NAME</u>	<u>ACCOUNT NUMBER</u>	<u>PRODUCT</u>	<u>DESCRIPTION</u>		<b>BANK DRAFT AMOUNTS &amp; OTHER TOTALS</b>
03/27/18	WELLS FARGO BANK, NA	xxxxxx1358	Direct Deposit	Net Pay Allocations	62,604.29	62,604.29
03/27/18	WELLS FARGO BANK, NA	xxxxxx1358	Taxpay®	Employee Withholdings		
				Social Security	7,311.82	
				Medicare	1,710.01	
				Fed Income Tax	11,408.47	
				CA Income Tax	4,249.48	
				CA Disability	1,179.35	
				<b>Total Withholdings</b>	<b>25,859.13</b>	
				Employer Liabilities		
				Social Security	7,311.83	
				Medicare	1,710.04	
				<b>Total Liabilities</b>	<b>9,021.87</b>	<b>34,881.00</b>
03/27/18	WELLS FARGO BANK, NA	xxxxxx1358	Section 125	PXUME EE PRE	469.23	
				PXDCA EE PRE	192.31	<b>661.54</b>
					<b>EFT FOR 03/27/18</b>	<b>98,146.83</b>
<b>TOTAL EFT (Does not reflect administrative charges)</b>						<b>98,146.83</b>

**NEGOTIABLE CHECKS** - Check amounts will be debited when payees cash checks. Funds must be available on check date.

<u>TRANS. DATE</u>	<u>BANK NAME</u>	<u>ACCOUNT NUMBER</u>	<u>PRODUCT</u>	<u>DESCRIPTION</u>		<u>TOTAL</u>
03/28/18	WELLS FARGO BANK, NA	xxxxxx1358	Payroll	Check Amounts	16,513.69	
<b>TOTAL NEGOTIABLE CHECKS</b>						<b>16,513.69</b>

**REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES** - Paychex does not remit these funds. You must ensure accurate and timely payment of applicable items.

<u>TRANS. DATE</u>	<u>BANK NAME</u>	<u>ACCOUNT NUMBER</u>	<u>PRODUCT</u>	<u>DESCRIPTION</u>		<u>TOTAL</u>
03/28/18	Refer to your records for account Information		Payroll	Employee Deductions		
				Aflc/Col Post	55.34	
				Aflc/Col Pre	347.92	
				Calper 457	925.00	
				DPer	7,552.08	
				Health	783.70	
				ICMA	3,888.08	



0087 A87P-7177 San Lorenzo Valley Water District

**CASH REQUIREMENTS**

**THIS REPORT SUMMARIZES YOUR PAYROLL TRANSACTIONS FOR THE CHECK DATE 03/28/18. IT DOES NOT REFLECT MISCELLANEOUS ADMINISTRATIVE CHARGES. PLEASE REFER TO YOUR INVOICE(S) FOR THE TOTAL CASH REQUIRED FOR THIS CHECK DATE.**

**REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES (cont.)** - Paychex does not remit these funds. You must ensure accurate and timely payment of applicable items.

<u>TRANS. DATE</u>	<u>BANK NAME</u>	<u>ACCOUNT NUMBER</u>	<u>PRODUCT</u>	<u>DESCRIPTION</u>	<u>TOTAL</u>
03/28/18	Refer to your records for account	Information	Payroll	Employee Deductions (cont.)	
				Life Ins	14.00
				Union dues	521.04
				<b>Total Deductions</b>	<b>14,087.16</b>

**TOTAL REMAINING DEDUCTIONS / WITHHOLDINGS / LIABILITIES (Does not reflect administrative charges)** **14,087.16**

**PAYCHEX WILL MAKE THESE TAX DEPOSIT(S) ON YOUR BEHALF** - This information serves as a record of payment.

<u>DUE DATE</u>	<u>PRODUCT</u>	<u>DESCRIPTION</u>	
04/04/18	Taxpay®	FED IT PMT Group	29,452.17
04/04/18	Taxpay®	CA IT PMT Group	5,428.83

## OPERATING ANALYSIS - February 2017

### REVENUE BY CATEGORY

#### DESCRIPTION

WATER USAGE
BASIC CHARGES
METERS, PENALTIES & OTHER
SEWER CHARGES
<b>TOTAL OPERATING REVENUE</b>

COMPARING AGAINST PRIOR YEAR					COMPARING AGAINST BUDGET		
ACTUALS	% OF TOTAL	PRIOR YEAR	\$ Diff.	% Diff.	Act. % of Budget	ANNUAL BUDGET	% of Annual
\$ 425,445	62.9%	\$ 193,852	\$ 231,593	119%	8%	\$ 5,390,000	62%
237,269	35.1%	301,913	(64,644)	-21%	8%	3,076,000	35%
5,760	0.9%	5,565	195	4%	5%	110,000	1%
8,344	1.2%	8,344	-	0%	8%	100,000	1%
<b>\$ 676,818</b>	<b>100.0%</b>	<b>\$ 509,674</b>	<b>\$ 167,143</b>	<b>33%</b>	<b>8%</b>	<b>\$ 8,676,000</b>	<b>100%</b>

### REVENUE COMMENTS

Feb 18 contains the new rates, which explains the decrease in the basic charge and the increase in usage. Consumption for Feb 18 was 7% higher than Feb 17.

### EXPENSES BY CATEGORY

#### DESCRIPTION

SALARIES & BENEFITS
CONTRACT/PROF. SERVICES
OPERATING EXPENSES
MAINTENANCE
FACILITIES
GEN. & ADMIN.
<b>TOTAL OPERATING EXPENSES</b>

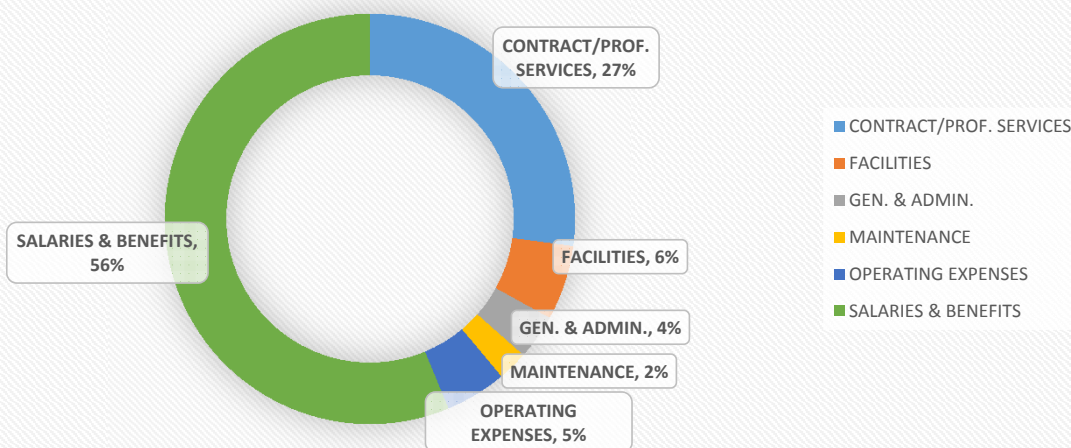
COMPARING AGAINST PRIOR YEAR					COMPARING AGAINST BUDGET		
ACTUALS	% OF TOTAL	PRIOR YEAR	\$ Diff.	% Diff.	Act. % of Budget	ANNUAL BUDGET	% of Annual
\$ 334,151	56.3%	\$ 302,324	\$ 31,827	11%	7%	\$ 4,531,632	61%
161,057	27.1%	86,259	74,797	87%	11%	1,520,561	20%
28,602	4.8%	40,029	(11,427)	-29%	8%	373,100	5%
14,083	2.4%	8,008	6,075	76%	8%	174,000	2%
34,961	5.9%	33,754	1,208	4%	7%	510,300	7%
21,081	3.5%	18,785	2,296	12%	6%	377,450	5%
<b>\$ 593,935</b>	<b>100%</b>	<b>\$ 489,159</b>	<b>\$ 104,776</b>	<b>21%</b>	<b>8%</b>	<b>\$ 7,487,043</b>	<b>100%</b>

### EXPENSE COMMENTS

SAL./BEN.: Increase is due to new hires over the last 12 months

CONTRACT/PROF.: Increase from prior year was \$70K for half of our Santa Margarita Groundwater Agency fees

## % BREAKDOWN OF CATEGORY EXPENDITURES



**OPERATING ANALYSIS - YTD TREND FY1718****REVENUE BY CATEGORY**

DESCRIPTION	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	YTD	BUDGET	% OF BUD.
WATER USAGE	217,386	442,081	423,848	475,748	590,116	430,207	491,609	425,445	3,496,441	5,390,000	65%
BASIC CHARGES	299,905	300,306	299,969	274,396	246,655	246,501	236,991	237,269	2,141,992	3,076,000	70%
METERS, PENALTIES & OTHER	4,950	7,375	18,342	4,797	7,405	4,655	6,055	5,760	59,339	110,000	54%
SEWER CHARGES	8,344	8,229	8,463	8,344	8,344	8,344	8,344	8,344	66,756	100,000	67%
<b>TOTAL OPERATING REVENUE</b>	<b>530,586</b>	<b>757,991</b>	<b>750,623</b>	<b>763,285</b>	<b>852,520</b>	<b>689,707</b>	<b>743,000</b>	<b>676,818</b>	<b>5,764,528</b>	<b>8,676,000</b>	<b>66%</b>

**EXPENSES BY CATEGORY**

DESCRIPTION	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	YTD	BUDGET	% OF BUD.
SALARY & BENEFITS	563,268	422,914	265,336	309,876	309,986	266,297	512,914	334,151	2,984,742	4,531,632	66%
CONTRACT/PROF. SERVICES	30,644	86,967	130,591	145,466	149,885	74,147	98,933	161,057	877,690	1,520,561	58%
OPERATING EXPENSES	12,148	26,573	32,390	25,600	30,382	33,548	56,446	28,602	245,689	373,100	66%
MAINTENANCE	7,245	10,897	12,561	20,260	9,135	20,690	7,696	14,083	102,568	174,000	59%
FACILITIES	14,530	52,281	55,352	57,133	16,509	74,518	44,393	34,961	349,676	510,300	69%
GEN. & ADMIN.	94,278	19,232	25,442	18,622	26,626	27,048	40,009	21,081	272,338	377,450	72%
<b>TOTAL OPERATING EXPENSES</b>	<b>722,113</b>	<b>618,864</b>	<b>521,671</b>	<b>576,958</b>	<b>542,523</b>	<b>496,248</b>	<b>760,392</b>	<b>593,935</b>	<b>4,832,703</b>	<b>7,487,043</b>	<b>65%</b>

<b>OPERATING INCOME (LOSS)</b>	<b>(191,527)</b>	<b>139,127</b>	<b>228,951</b>	<b>186,327</b>	<b>309,996</b>	<b>193,459</b>	<b>(17,392)</b>	<b>82,883</b>	<b>931,825</b>	<b>1,188,957</b>	<b>78%</b>
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**COMMENTS****REVENUE/EXPENSES:**

Current year to date revenue and expenses are tracking as expected overall. Consumption has been tracking higher the first 5 months of the year, December saw a slow down in consumption, but then January and February came in higher than last year.

Please refer to the current month analysis for any further detail on revenue or expenses.

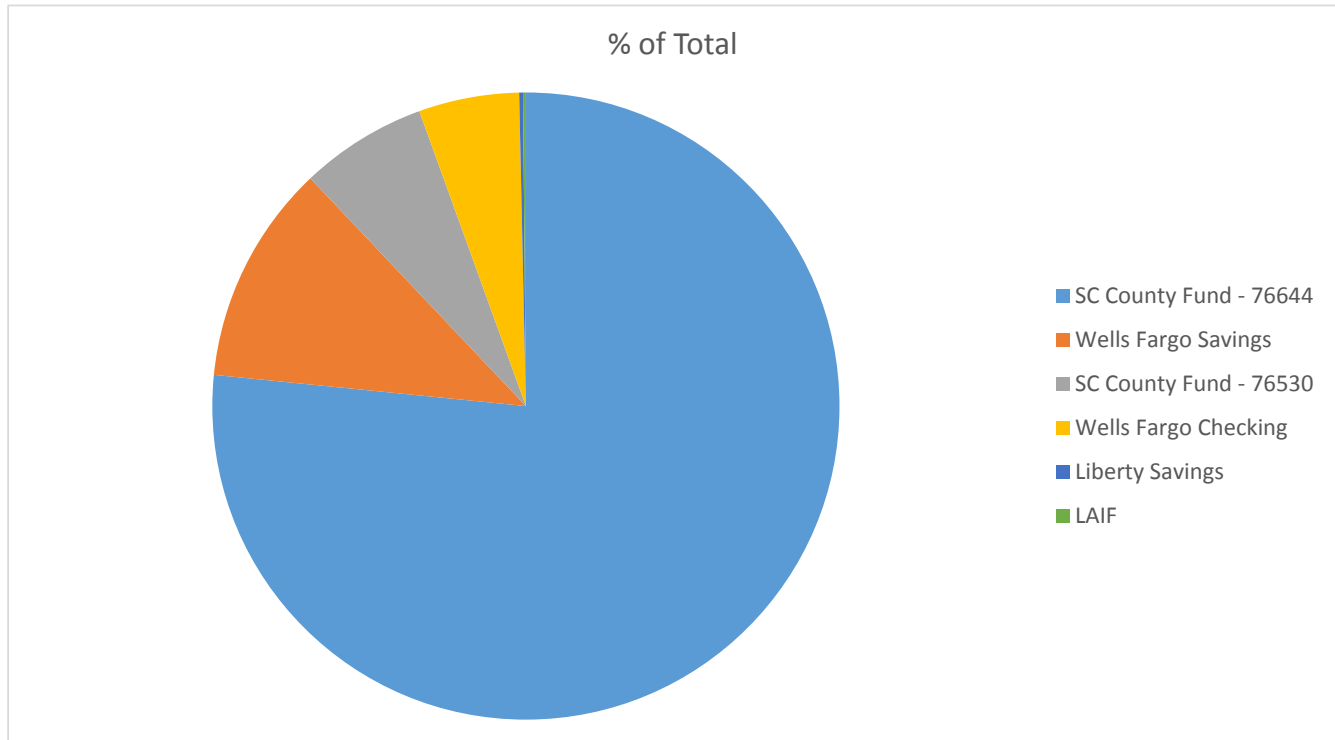
**GENERAL/PROCESS:**

There are annual/one-time expenses paid upfront that could cause individual months to appear skewed or accrual based accounting that will impact June/July more so. An example of this would be some insurances are paid in July, this causes July expenses to appear higher than other months. The District operates on an annual budget and performs accrual based accounting procedures for a hard year end close, this is typical for governmental accounting.

Data is continuously being reviewed, so it is not un-common for a prior report balance to change slightly throughout the year as accounts are reconciled.

AS OF 2/28/2018

<b>LIQUID ASSETS</b>	<b>\$ Amount</b>	<b>% of Total</b>	<b>Ave Interest Rate</b>
Wells Fargo Checking	119,890	5.2%	0.35%
Wells Fargo Savings	262,842	11.4%	0.10%
Liberty Savings	4,507	0.2%	0.15%
SC County Fund - 76530	151,514	6.5%	1.26%
SC County Fund - 76644	1,773,616	76.6%	1.26%
LAIF	3,412	0.1%	1.35%
	<u>\$ 2,315,782</u>	<u>100%</u>	



Local Agency Investment Fund  
P.O. Box 942809  
Sacramento, CA 94209-0001  
(916) 653-3001

[www.treasurer.ca.gov/pmia-laif/laif.asp](http://www.treasurer.ca.gov/pmia-laif/laif.asp)  
March 09, 2018

SAN LORENZO VALLEY WATER DISTRICT

DISTRICT MANAGER  
13060 HIGHWAY 9  
BOULDER CREEK, CA 95006

[PMIA Average Monthly Yields](#)

// [Tran Type Definitions](#)

February 2018 Statement

**Account Summary**

Total Deposit:	0.00	Beginning Balance:	3,411.88
Total Withdrawal:	0.00	Ending Balance:	3,411.88

**G/L Balances**

Criteria: As Of = 2/28/2018; Fund = 76644, 76530

G/L Account	Title	Beginning Balance	Year-To-Date Debits	Year-To-Date Credits	End Balance
Fund 76530 -- SLV-LOMPICO WTR, EFF 6/2/16					
101	EQUITY IN POOLED CASH	411,360.23	40,153.36	(300,000.00)	151,513.59
201	VOUCHERS PAYABLE (VENDOR)	0.00	300,000.00	(300,000.00)	0.00
240	STALE DATED WARRANTS LIABILITY	(1,363.90)	0.00	0.00	(1,363.90)
344	FUND BALANCE	(409,996.33)	300,000.00	(40,153.36)	(150,149.69)
Total Fund 76530		0.00	640,153.36	(640,153.36)	0.00
Fund 76644 -- SAN LORENZO VALLEY WATER TRUST					
101	EQUITY IN POOLED CASH	1,455,046.45	520,312.65	(201,742.89)	1,773,616.21
201	VOUCHERS PAYABLE (VENDOR)	0.00	200,000.00	(200,000.00)	0.00
220	DEFERRED CREDITS	(500,000.00)	500,000.00	0.00	0.00
344	FUND BALANCE	(955,046.45)	201,742.89	(1,020,312.65)	(1,773,616.21)
Total Fund 76644		0.00	1,422,055.54	(1,422,055.54)	0.00

## REVENUE STABILIZATION RATE ANALYSIS FY1718

*In accordance with the District's Revenue Stabilization Rates Policy & Procedures, the District Manager shall provide the Board of Directors with the average units of water sales (by month) for the rolling previous three years, which will serve as the baseline against which current annual sales to date will be compared. If the District Manager determines that budget-year water sales (in units) to date, and corresponding revenue, is more than 10% below expected year-to-date levels (based on monthly averages over the previous three years), the District Manager shall notify, at a public meeting, the Board of Directors of this determination at or before the next regularly scheduled Board meeting. For more information, please refer to the District's full Policy & Procedures.*

### MONTHLY CONSUMPTION IN UNITS BY FISCAL YEAR (BASELINE)

	July	August	September	October	November	December	January	February	March	April	May	June	TOTAL
FY1415	72,137	70,653	69,617	60,931	52,275	40,785	49,486	40,781	41,301	53,193	50,988	51,218	<b>653,365</b>
FY1516	66,779	64,961	69,609	60,022	49,837	41,773	44,025	37,290	42,433	43,153	48,328	68,129	<b>636,340</b>
FY1617	74,199	73,414	71,825	59,518	41,777	45,698	45,401	37,667	41,173	42,898	52,932	68,388	<b>654,889</b>
<b>3 YR AVERAGE (BASELINE)</b>	<b>71,038</b>	<b>69,676</b>	<b>70,350</b>	<b>60,157</b>	<b>47,963</b>	<b>42,752</b>	<b>46,304</b>	<b>38,579</b>	<b>41,636</b>	<b>46,415</b>	<b>50,750</b>	<b>62,578</b>	<b>648,198</b>

### ACTUAL FY1718 CONSUMPTION

FY1718	81,254	78,331	76,259	65,658	58,601	42,693	48,947	40,431					<b>492,174</b>
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### CUMULATIVE ANALYSIS

% Above or Below Average	14%	12%	8%	9%	22%	0%	6%	5%					
<b>Cumulative %</b>	<b>14%</b>	<b>13%</b>	<b>12%</b>	<b>11%</b>	<b>13%</b>	<b>11%</b>	<b>11%</b>	<b>10%</b>					

### NOTES:

Consumption is cumulatively higher than the prior three year average baseline. As of February 2018 consumption, the cumulative consumption is 10% above the baseline. There are no triggers identified per the revenue stabilization rate policy.

Utility Billing  
Transactions by Date  
**LEAK ADJUSTMENT - Q3 2018**



13060 Highway 9  
Boulder Creek, CA 95006-9119  
(831) 338-2153 phone  
(831) 338-7986 fax

Date Range: From: 01/01/2018 To: 03/31/2018  
Batch Type: Adj & Fees  
Billing Cycle: 001, 002, 999

Account No	Journal Entry Date	Amount	Units Used	Units Above Average	
Reference No	Tran Type		Total Consumption	Cause of Leak	How Leak Was Detected
013515-000	01/09/2018	\$ (1,057.54)	217	209	SLVWD INFORMED CUSTOMER AFTER METER READING
N/A	ADJUSTMENT		\$2,252.58	CUSTOMER SERVICE LINE LEAK	CAME BACK WITH HIGH USAGE
005330-000	01/09/2018	\$ (288.42)	72	57	SLVWD INFORMED CUSTOMER AFTER METER READING
120063002	ADJUSTMENT		\$756.91	CUSTOMER SERVICE LINE LEAK	CAME BACK WITH HIGH USAGE
012245-000	01/09/2018	\$ (490.82)	105	97	SLVWD INFORMED CUSTOMER AFTER METER READING
840437022	ADJUSTMENT		\$1,119.14	CUSTOMER SERVICE LINE LEAK	CAME BACK WITH HIGH USAGE
008862-000	01/09/2018	\$ (346.26)	126	116	SLVWD INFORMED CUSTOMER AFTER METER READING
540492000	ADJUSTMENT		\$953.83	CUSTOMER SERVICE LINE LEAK	CAME BACK WITH HIGH USAGE
014840-000	01/09/2018	\$ (86.43)	30	26	SLVWD INFORMED CUSTOMER AFTER METER READING
N/A	ADJUSTMENT		\$286.34	CUSTOMER SERVICE LINE LEAK	CAME BACK WITH HIGH USAGE
011009-000	01/18/2018	\$ (86.02)	21	17	SLVWD INFORMED CUSTOMER AFTER METER READING
720326007	ADJUSTMENT		\$269.06	CUSTOMER SERVICE LINE LEAK	CAME BACK WITH HIGH USAGE
013466-000	01/18/2018	\$ (546.48)	116	108	SLVWD INFORMED CUSTOMER AFTER METER READING
N/A	ADJUSTMENT		\$1,230.46	CUSTOMER SERVICE LINE LEAK	CUSTOMER FOUND LEAK
013525-000	01/18/2018	\$ (607.20)	124	120	SLVWD INFORMED CUSTOMER AFTER METER READING
N/A	ADJUSTMENT		\$1,311.42	CUSTOMER SERVICE LINE LEAK	CAME BACK WITH HIGH USAGE
010204-000	01/18/2018	\$ (86.02)	29	17	SLVWD INFORMED CUSTOMER AFTER METER READING
650610001	ADJUSTMENT		\$350.02	CUSTOMERS KOI POND LEAK	CAME BACK WITH HIGH USAGE
006885-000	01/24/2018	\$ (104.62)	63.5	43.5	CUSTOMER FOUND LEAK
270000900	ADJUSTMENT		\$470.98	LEAKY TOILET	
009627-000	02/09/2018	\$ (493.41)	121	117	CUSTOMER FOUND LEAK
620232000	ADJUSTMENT		\$1,252.79	CUSTOMER SERVICE LINE LEAK	
015009-000	02/09/2018	\$ (242.88)	54	48	SLVWD INFORMED CUSTOMER AFTER METER READING
N/A	ADJUSTMENT		\$603.02	CUSTOMER IRRIGATION LINE	CAME BACK WITH HIGH USAGE
014191-004	02/09/2018	\$ (399.74)	91	79	SLVWD INFORMED CUSTOMER AFTER METER READING
28021000	ADJUSTMENT		\$1,014.46	CUSTOMER SERVICE LINE LEAK	CAME BACK WITH HIGH USAGE
012859-000	02/09/2018	\$ (207.46)	45	41	CUSTOMER FOUND LEAK
920100010	ADJUSTMENT		\$483.67	WATER LEFT ON	
008014-000	02/09/2018	\$ (141.68)	34	28	CUSTOMER FOUND LEAK
400297042	ADJUSTMENT		\$428.80	CUSTOMER SERVICE LINE LEAK	
013518-000	02/09/2018	\$ (141.68)	41	28	CUSTOMER FOUND LEAK
N/A	ADJUSTMENT		\$443.19	CUSTOMER LEAK	
012717-000	02/09/2018	\$ (131.56)	29	26	CUSTOMER FOUND LEAK
910164002	ADJUSTMENT		\$321.75	CUSTOMER SERVICE LINE LEAK	
005962-000	02/09/2018	\$ (288.42)	64	57	SLVWD INFORMED CUSTOMER AFTER METER READING
220174004	ADJUSTMENT		\$675.95	HOSE OUTLET	CAME BACK WITH HIGH USAGE
009890-000	02/09/2018	\$ (60.72)	12	12	CUSTOMER FOUND LEAK
630354001	ADJUSTMENT		\$149.71	CUSTOMER SERVICE LINE LEAK	
009618-000	02/23/2018	\$ (151.80)	31	30	SLVWD INFORMED CUSTOMER AFTER METER READING
62026000	ADJUSTMENT		\$341.99	POSSIBLE THEFT	CAME BACK WITH HIGH USAGE
006859-000	02/23/2018	\$ (2,196.04)	454	434	SLVWD INFORMED CUSTOMER AFTER METER READING
260007800	ADJUSTMENT		\$4,679.20	CUSTOMER SERVICE LINE LEAK	CAME BACK WITH HIGH USAGE
013409-000	02/23/2018	\$ (339.02)	70	67	CUSTOMER INFORMED US OF LEAK
N/A	ADJUSTMENT		\$736.67	SIGN COMPANY BROKE SERVICE LINE	
010669-000	02/23/2018	\$ (303.60)	68	60	SLVWD INFORMED CUSTOMER AFTER METER READING
710089042	ADJUSTMENT		\$744.70	NEIGHBOR RAN OVER IRRIGATION PIPE WITH TRACTOR	CAME BACK WITH HIGH USAGE
014945-000	2/28/2018	\$ (247.94)	61	49	CUSTOMER INFORMED US OF LEAK
N/A	ADJUSTMENT		\$641.82	FAULTY TOILET FLAPPER	
008296-000	02/28/2018	\$ (74.60)	42	34	SLVWD INFORMED CUSTOMER AFTER METER READING
510011001	ADJUSTMENT		\$453.31	ANGRY TENANT LEFT WATER ON	CAME BACK WITH HIGH USAGE
006736-000	02/28/2018	\$ (268.18)	60	53	SLVWD INFORMED CUSTOMER AFTER METER READING
260001950	ADJUSTMENT		\$635.47	FAULTY TOILET FLAPPER	CAME BACK WITH HIGH USAGE
007277-000	03/06/2018	\$ (516.12)	111	102	CUSTOMER INFORMED US OF LEAK
280006900	ADJUSTMENT		\$1,165.68	BROKEN SERVICE LINE	
007650-000	03/06/2018	\$ (207.46)	57	41	CUSTOMER INFORMED US OF LEAK
300047000	ADJUSTMENT		\$633.38	FAULTY TOILET FLAPPER	
005618-000	03/06/2018	\$ (146.74)	47	29	SLVWD INFORMED CUSTOMER AFTER METER READING
140613001	ADJUSTMENT		\$532.18	WATER HEATER	CAME BACK WITH HIGH USAGE
005636-000	03/06/2018	\$ (845.02)	173	167	SLVWD INFORMED CUSTOMER AFTER METER READING
140629000	ADJUSTMENT		\$1,807.30	CUSTOMER SERVICE LINE LEAK	CAME BACK WITH HIGH USAGE
005118-000	03/14/2018	\$ (500.94)	126	99	CUSTOMER INFORMED US OF LEAK
110106061	ADJUSTMENT		\$1,077.07	IRRIGATION LEAK	
007151-000	03/14/2018	\$ (166.98)	35	33	SLVWD INFORMED CUSTOMER AFTER METER READING
280000950	ADJUSTMENT		\$382.47	FAULTY TOILET FLAPPER	CAME BACK WITH HIGH USAGE
013205-000	03/23/2018	\$ (192.28)	41	38	SLVWD INFORMED CUSTOMER AFTER METER READING
N/A	ADJUSTMENT		\$443.19	CUSTOMERS SERVICE LINE	CAME BACK WITH HIGH USAGE
008428-000	03/14/2018	\$ (50.60)	13	10	CUSTOMER INFORMED US OF LEAK
510127001	ADJUSTMENT		\$159.83	LEAKY SHUT OFF VALVE	

LEAK Totals \$ (12,014.68)  
# Leak Adj 34

FY 1718 YTD Totals \$ (23,586.61)  
# Leak Adj 85

In accordance with District Rules & Regulations, authorizing water bill adjustments, District staff has adjusted the above accounts for the period stated above.



## M E M O

TO: Board of Directors

FROM: District Manager  
PREPARED BY: Environmental Programs Manager

SUBJECT: Environmental Status Report

DATE: April 19, 2018

### RECOMMENDATION:

It is recommended that the Board of Directors review and file the Environmental Department status report.

### WATER SUSTAINABILITY PLANNING

#### CONJUNCTIVE USE GRANT

- Staff has executed the contract with Exponent for the Hydrological Assessment.
- Staff has completed the RFP & has selected a Fish Consultant for the Assessment, which will be considered by the Board at the April Board Meeting.
- Staff has provided an Amendment to the Sub-Contract with eh County for review and approval by the Board on the April Board Meeting.

Detailed analysis shall be completed for the following scenarios:

- 1) During dry periods, reduce Felton diversions to comply with water rights by using existing interties to supply the Felton service area with (a) additional groundwater pumping from South system wells and (b) if necessary, excess diversions and/or groundwater pumping from the North system. During wet periods, (a) provide the South System service areas with excess diversions from the Felton system and (b) if possible also provide water to the North system to reduce groundwater pumping during dry periods.
- 2) Utilize the District's right to 313 AFY of Loch Lomond water, in the following priority of use: first to supply the Felton service area and reduce Fall Creek diversions to comply with water rights; second, to serve the South service area and reduce South system groundwater pumping (i.e., achieve in-lieu recharge); and lastly to supply the North service area in order to reduce diversions, achieve in-lieu recharge, and increase groundwater discharge to dry-period base flows.

Preliminary feasibility-level analysis shall be completed for the following scenarios:

- 3) Recharge the Olympia area aquifer by injecting excess wet period diversions from the North system, Felton system, and/or Loch Lomond. Increase dry-period Olympia groundwater pumping by a comparable amount to reduce North system diversions.
- 4) Supply the South system and Scotts Valley Water District with excess wet period diversions from the Felton system, North system, and/or Loch Lomond in order to

achieve in-lieu recharge. Utilize increased groundwater storage to increase dry period groundwater use and reduce stream diversions in the Felton system and North system.

#### SANTA MARGARITA SUSTAINABLE GROUNDWATER MANAGEMENT AGENCY (SMGWA.ORG)

Staff provides ongoing support and District representation at the SMGWA at staff level. The Agency has selected two consultants after a thorough review of the RFQs and interviews. Selected Consultants will be considered at the next SGMWA Board Meeting.

1. Hydrologist to evaluate the current existing groundwater model to assess its capacity to quantify impacts to surface water baseflow from over drafted groundwater aquifers.
2. Individuals or firms with expertise in public agency governing board consensus building, process design and facilitation.

Next SGMWA Meeting will be held April 26th at 7:00 PM at Scott's Valley Water District.

#### ENVIRONMENTAL COMPLIANCE

##### CAPITOL IMPORVEMENT PERMITTING UPDATE

Staff Provide recommendations for the selection of 3 Multi Project Engineering Service Consultants to conduct project design, permitting, and construction of the following projects which will be funded through USDA loans:

Swim Tank \$ 678,000 Hihn Road Pipel \$ 90,000 Lyon Pipe \$ 450,000 Worth Lane Pipe \$ 120,000  
Sequoia Road Pipe \$ 120,000 Bennet Booster \$ 390,000 Felton Acres Tank and Booster \$ 300,000  
Hillside Drive Pipe \$ 240,000 Riverview Drive Pipe \$ 240,000 Two Bar Road Pipe \$ 450,000 Orman  
Road Pipe \$ 300,000 California Drive Pipe \$ 240,000 Fall Creek Fish Ladder \$ 1,160,000

Staff is working to acquire permits for the following projects:

- **Fall Creek Fish Ladder-** The Two Phase Project is expected to be started in Summer 2018 to remove debris which accumulated in 2017 storms, in order to access the ladder for the Fall Creek Fish Ladder Improvement Project, which should be constructed in 2019 (hopefully). The District has contracted with RCD to prepare 5 of the 7 permits for the construction, and may need to amend the contract to secure the permits for the debris removal.

**Probation Tank Replacement** - The following actions are being conducted to ensure the minimization and mitigation of impacts to the sensitive habitat located at the Probation Tank Replacement Project Site:

- Fence the project footprint
- Fence the rare plant areas
- Conduct worker environmental-awareness training
- Record easement for the habitat set aside at Oly
- Conduct nesting bird survey
- Conduct k-rat survey
- Prepare a construction-period erosion control and spill prevention plan

#### COMPLETION REPORTS

CATEGORICAL EXEMPTION FOR PASO WELL #8 REPLACEMENT PROJECT  
REGIONAL INTERTIE HCP REPORT

Submitted as required as part of the intertie project mitigation.

#### **SANITARY SURVEY**

In partnership with the City of Santa Cruz Water Department the Sanitary Survey update has been completed and submitted.

The Sanitary Survey Update is a high-level summary of the San Lorenzo River Watershed for the City of Santa Cruz Water Department (SCWD) and the San Lorenzo Valley Water District (SLVWD), which merged with the Lompico County Water District in 2016. The Watershed Sanitary Survey (WSS) includes detailed description of Watersheds & Water Supply Systems, Potential Contaminant Sources, Watershed Management Activities, Non-Drinking Water Regulatory Challenges, Water Quality Data Summary, and Conclusions & Recommendations.

#### **PASO WELL REPLACEMENT PROJECT**

The District received the permit to replace the Paso Wells 6 and 7. Bid packets are expected to be sent out March.

#### **CONSERVATION/MITIGATION BANK**

SLVWD now has its own mitigation bank which comprises of 6.7 acres of land at the Olympia Wellfield which will compensate for impacts to other Sandhills habitat which result from District Operations and Maintenance. A conservation easement with the Land Trust of Santa Cruz County has been established, escrow for development rights closed in December 2017.

#### **GREEN BUSINESS CERTIFICATION**

The District received notice from the California Green Business Network that the District has satisfied all requirements and is now a Certified Green Business. The District should receive the official letter in January.

#### **2015 UWMP**

The District received a letter from DWR in December 2017 indicating that the 2015 UWMP satisfies all State requirements.

#### **PROBATION TANK**

USFWS Federal permit has been received. CEQA is complete. Bid Packets are expected to be sent March 2018. Construction should begin summer.

#### **SWIM TANKS MITIGATED NEGATIVE DECLARATION**

Environmental compliance (CEQA) requirements for the Swim Tank Replacement Project are complete. Bids for the contract came in too high, the project will be delayed until more bids can be acquired.

#### **WATERSHED MANAGEMENT**

Staff attended the 2018 Salmonid Restoration Federation (SRF) who's mission is to promote restoration and stewardship of California's native salmon, steelhead, and trout populations and their habitat.

#### BLUE RIBBON PANEL ON SANDHILLS ADAPTIVE MANAGEMENT

Staff is working with 8 local experts participating on the “blue ribbon” panel to review the District’s approach to broom management in Sandhills. The Panel has met three times, and expects to complete the project by May 2018.

#### FIRE MANAGEMENT PLANNING ON DISTRICT WATERSHED LANDS

Staff has initiated an effort to improve mapping, road access and communications with Fire Prevention Agencies, in order to improve access to District Lands in case of a wildfire.

#### ZAYANTE LARGE WOOD PROJECT UPDATE

The District is working with the Resource Conservation District & the City Water Department to improve large wood habitat in the Upper Zayante Watershed. Large wood will be placed strategically into the creek channel to improve cover, filtration of stream bed materials, engage flood plains, improve water quality, reduce stream bed incision and improve fish habitat, in a stretch of stream that has been identified as the highest priority for the recovery of Coho Salmon.

#### WEED MANAGEMENT AREA OF SANTA CRUZ (WMA)

The Weed Management Area of Santa Cruz (WMA) meets 4 times annually. The group is working on the Strategic Plan, and prioritizing efforts for Santa Cruz County, and working to acquire resources to achieve the goal of fighting invasive species that impact biodiversity. The Calfora Observer app has been updated to allow for real time mapping which will allow land managers to monitor invasive and non-invasive plant life. As the WMA develops it is shifting its goals to better support member’s needs; such as invasive removal, invasive plant prevention, engaging the community to be better stewards and collaborating to share information, and resources to protect biodiversity.

#### WATER CONSERVATION

The District is working on a multi-tier effort to diversify water sources for each water system through the following efforts:

**Conjunctive Use**

**Water Conservation**

**Improving System Efficiencies**

**Intertie Pipelines**

**Sustainable Groundwater Management**

**Climate Adaptation and Mitigation**

**New Groundwater Supplies**

A recent report shows SLVWD water consumption as February 1<sup>st</sup> 2018, has increased to 10% above baseline levels in February 2013. Staff will be initiating a water conservation outreach program to reduce water consumption. The critical time to achieve reduced consumption will be in the spring as we begin switching to groundwater sources.

- Teacher conservation workshop & in-class presentations have been schedule with SLV Elementary in April for Earth Day. Water conservation lessons with be taught by staff Carly Blanchard to 1<sup>st</sup>-3<sup>rd</sup> grade classes. More presentations to take place throughout the year.
- At home water wise audit program in early stages of creation. Staff is currently working with other districts to develop the program. As the program becomes active collaboration with other businesses to maintain larger accounts (such as schools,

parks, industrial) will need to be discussed. Many of Santa Cruz's utilizes use Waterfluence as their partner.

- Water Conservation Coalition of Santa Cruz meeting bi-monthly. Will discuss rebate programs, upcoming workshops and water wise program.
- Water conservation staff to take over high usage and leak prevention tagging.
- Conservation staff reordering conservation devices and outreach materials. Low flow shower heads to be restocked.
- Environmental staff working to revamp rebate program. Proposal to offer rain collection rebate and commercial rebates for businesses.
- Create content for public outreach such as videos, and district workshops. Working with various agencies to create content efficiently.

## **CLIMATE ADAPTATION**

- The initial phase of completing the Climate Action Plan is to inventory existing carbon outputs from District operations.
- Data entry has begun with the Climate Registry. Verification should take place for 2013-2017 in July 2018. Completed entry and reports should be available by December 2018.

## **COMMUNICATIONS & EDUCATION**

CLASSIC WATERSHED EDUCATION GRANT PROGRAM Closed April 10.

Grants are focused on classroom watershed education for students; outdoor watershed education, such as educational hikes science camps or community/public education. The District received 8 applications and are under review by the Education Commission.

Application and Grant information available:

<http://slvwd.com/Education.htm>

DATA COLLECTION/ RESTORATION GRANT PROGRAM Closed April 10.

Grants are for students or practicing scientists interested in designing and implementing a project to collect needed information about District watershed properties, or to complete recommended restoration project. The District received 1 application, and are now under review by the Education Commission.

Data Collection/Restoration Grants for the following areas:

1. Development of comprehensive evaluation of potential energy generation opportunities on District lands and buildings (e.g. solar panels, wind turbines, micro hydro, etc.).
2. Development of a long-term monitoring program including baseline and protocols to evaluate invasive species eradication success and to determine long-term biodiversity trends on the District's Olympia Watershed Property.
3. Design and implementation of a soil sampling and monitoring effort to determine if invasive species management strategies impact soil quality.

## **EVENTS**

### **EXPLORING THE SAN LORENZO RIVER -**

Join the Coastal Watershed Council and The Santa Cruz Museum of Natural History for their last adventure: The San Lorenzo BIO BLITZ! On April 21 9:00 - 10:30 at the Tannery

Arts Center. RSVP at <https://coastal-watershed.org/event/exploring-san-lorenzo-river-bioblitz/>

Exploring the San Lorenzo River Series was funded in part by the San Lorenzo Valley Water District Classic Watershed Education Grant Program.

#### RIPARIAN GARDEN TOUR BENEFIT FOR THE FELTON LIBRARY NATURE DISCOVERY PARK.

May 19<sup>th</sup> Details TBA.

#### PUBLIC OUTREACH

- The District Facebook page and website are updated regularly (5-7 times per week).
- The District is running ads in the Mountain Bulletin monthly.
- Drought Update in progress.

#### FELTON LIBRARY OUTDOOR EDUCATION PARK

Staff continues to participate as part of the Felton Library Design Team. Community stakeholders meet monthly to discuss design, outreach & education opportunities for the Nature Discovery Park that will be associated with the new Felton Library.

AmeriCorps team lead by Linda Skeff, of the Valley Woman's Club is working on Invasive Plant removal on Library and adjacent District property.

#### NETWORKING/ COLLABORATIONS

FIRE SAFE SANTA CRUZ COUNTY <https://www.firesafesantacruz.org/>

Fire Safe Santa Cruz County is currently seeking applications from community members in need of funding to reduce fire hazards in their neighborhoods. Contact Fire Safe SCC for applications.

Staff serves as a board member representing SLVWD on the Fire Safe Santa Cruz County. The purpose of the Fire Safe Santa Cruz County (FSSCC) is to help residents and landowners prepare for and respond to the effects of wildfire in Santa Cruz County in an effort to maintain the quality of life, property and the environment. FSSCC will assist in coordinating the fire preparedness actions of local residents, landowners/managers, utilities, fire districts, CALFIRE and local fire safe councils. FSSCC will identify and seek funding for the highest fire safety priorities, coordinate work activities, assist neighborhoods in securing equipment and labor, and best position fire-safe entities working in the County for funding opportunities and applications.

FSSCC is organized and operated exclusively for charitable and educational purposes within the meaning of Section 501(c)(3) of the Internal Revenue Code.

#### SAN LORENZO 2025

The San Lorenzo River Watershed is the main source of drinking water for multiple communities and tens of thousands of residents. This watershed is home to dozens of species of fish and wildlife, including both threatened and endangered species. It is the heart of our community and is at risk because the San Lorenzo River is under stress from the effects of drought, climate change, and habitat degradation. Acting now we can keep the San Lorenzo River watershed viable for our communities and our native fish and wildlife for generations to come.

San Lorenzo River 2025 is a collaborative effort focused on addressing the risks facing the San Lorenzo River over the next ten years. Through a partnership between local governments, water districts, the Resource Conservation District and local nonprofits, San

Lorenzo River 2025 seeks to achieve **reliability** of water, **restoration** of watershed habitats, and a **resilient and safe** community resource. This effort will increase both the pace and the scale of investment into the San Lorenzo Watershed.

San Lorenzo River 2025 will:

- Implement a suite of habitat restoration and watershed protection activities to maintain and improve water supplies, water quality, and natural habitats for native fish and wildlife
- Provide wildfire planning and readiness to avoid catastrophic events in the watershed
- Improve ailing infrastructure for flood protection and projected sea level rise
- Maintain and improve public areas, trails, and places for the community to enjoy the river.

FELTON LIBRARY - <http://feltonlibraryfriends.org/>

Staff continues to participate with the Technical Advisory Committee including Friends of the Felton Library, the Valley Women's Club and County Planners and administrators to design and implement a new Library building located on Gushee Street in Felton as well as an outdoor education area adjacent to the location and the District's Kirby Treatment Plant. The New Library has been awarded 10 million dollars for construction of a new library. Meetings held several times a month.

SANTA CRUZ MOUNTAINS STEWARDSHIP NETWORK - <http://scmsn.net/>

The Santa Cruz Mountains Stewardship Network is a region-wide and cross-sector collaboration of independent individuals and organizations who are committed to working together to help cultivate a resilient, vibrant region where human and natural systems thrive for generations to come.

SANTA CRUZ MOUNTAINS BIOREGIONAL COUNCIL - <http://www.scmhc.org/>

Jen Michelsen was nominated to serve as president of the Santa Cruz Mountains Bioregional Council. The Bioregional Council is dedicated to the preservation and enhancement of regional biodiversity over time through education, the dissemination of accurate scientific information and assistance in the planning, coordination and implementation of conservation efforts. Next meeting scheduled May 19<sup>th</sup>.

WATER CONSERVATION COALITION - <http://watersavingtips.org/>

The Water Conservation Coalition is a partnership between all the local Water Districts in Santa Cruz County as well as the County Water Resources Division, Ecology Action and other groups who share a passion for water conservation and public education. Our goal is to combine efforts and share resources to provide a common message about water conservation issues to residents throughout Santa Cruz County, which is a special place because ALL of our water supply comes from rain that falls within our County boundaries. Though each water district gets drinking water from different sources, we all share a common goal and work together to protect water resources in our aquifers and watersheds and continue to provide safe, high quality drinking water to all who live, work

and play in Santa Cruz County. Meeting held quarterly or monthly depending on activity level.

#### SANTA MARGARITA GROUNDWATER AGENCY- <http://smgwa.org/>

Under the Sustainable Groundwater Management Act of 2014, over-drafted groundwater basins need to be sustainably managed by a Groundwater Sustainability Agency (GSA) through the development of a Groundwater Sustainability Plan (GSP). The GSP must be completed by 2022, and the basin must reach sustainability by 2040.

Under development is the Santa Margarita Groundwater Agency (SMGA), a three-member agency comprised of the Scotts Valley Water District, San Lorenzo Valley Water District and the County of Santa Cruz, which will oversee the groundwater management activities of the Santa Margarita Basin Area in Santa Cruz County, California. The Board of Directors of the SMGA includes two Board members from each of the water districts, one from the County, one from the City of Scotts Valley, one from the City of Santa Cruz, one from the Mount Hermon Association Community Water System and two private well owner representatives. Once a Joint Powers Agreement (JPA) is completed in early 2017, the SMGA will apply to the state Department of Water Resources to become the GSA for the Basin.

#### SANTA CRUZ INTEGRATED GROUNDWATER MANAGEMENT - <http://www.santacruzirwmp.org/>

The Santa Cruz Integrated Regional Water Management (IRWM) program provides a framework for local stakeholders to manage this region's water and water-related resources. The Santa Cruz IRWM Plan was developed in response to California's IRWM planning initiative to promote an informed, locally-driven, and consensus-based approach to water resources management.

The IRWM Plan includes strategies for developing and implementing policies and projects to ensure sustainable water use, reliable water supply, better water quality, improved flood protection and storm water management, and environmental stewardship. [Find out more.](#)



## MEMO

TO: District Manager

FROM: Director of Operations

SUBJECT: OPERATIONS DEPARTMENT STATUS REPORT  
MARCH 2018

DATE: April 12, 2018

### RECOMMENDATION:

It is recommended that the District Manager review and file the Operations Department Project Status Report for the month of March 2018.

### BACKGROUND:

#### PROBATION TANK REPLACEMENT PROJECT

During the reporting period District staff started the installation of the temporary water storage tanks to be used to supply customers during construction. Staff will be installing three 10,000 tanks. Tanks were delivered and staff has started the installation.



## MAINLINE FLUSHING PROGRAM

During the reporting period staff continued with mainline flushing in the Quail Hollow, Zayante and Scotts Valley areas. During March approximately 1,382,716 gallons of water was flushed from mainlines. Each year several areas of the distribution system are flushed to remove iron and manganese deposits and sediment from mainlines.

## PASATIEMPO WELL 6 REPAIRS

The Districts Pasatiempo Well 6 recently has had a series of operational issues (casing damage) resulting in failed attempts to repair leaving the well inoperable. The well has reached the end of its service life and efforts to repair and maintain the well will likely not be effective or cost-efficient. The well is 27 years old which is close to the typical service life for a well-constructed of mild steel.

The District has received authorization from the US Fish and Wildlife Service to perform work in the Santa Cruz Sandhills and is moving forward with preparation of contract documents for bidding.

## BLUE TANK REPLACEMENT

The District is awaiting written reports regarding soils and concrete foundation stability. Both consultants have indicated that soils and the concrete foundation are of sound structural stability.

During routine inspection it was discovered that the Districts Blue Tank in Manana Woods has experienced extensive corrosion to the upper ring of staves, roof and internal roof structure system. In addition to corrosion the tank experienced buckling damage from the 1989 Loma Prieta Earthquake.

## FELTON WATER SYSTEM WATER METER REPLACEMENT

Staff has continued with the Felton Water System Meter Replacement Project. Domestic water meters are being replaced as existing metering has reached their life expectancy. Meters are being changed to the new Beacon "Eye on Water" system that will allow customers to monitor their water usage over the internet.

## SYSTEM WIDE STORAGE TANK INSPECTION

Each quarter all water storage tanks are inspected to ensure water quality integrity, security, leakage and general inspection. During the reporting staff continued the quarterly tank inspection was performed. During inspection repairs were made to the level indicators to the Brookdale, Blair, and Swim tanks

## MAINTENANCE ISSUES

Boulder Creek- Main Line

6" main line above ground repair & pipe support installed Rambling oad.

Ben Lomond Brown Gables Road

Remove unnecessary 4" hydrant in middle of front yard. There's a 6" steamer hydrant 30' away.

Boulder Creek

Old pipe removal- Orman Road damaged river crossing removed

System Wide

9 Mainline leaks were repaired

Rick Rogers

Director of Operations

## SAN LORENZO VALLEY WATER DISTRICT PRODUCTION COMPARRISON

Source	March-18	February-18	March-13	Difference This Year To 2013
<b>North System</b>				
<b>Surface Water Sources</b>				
Foreman Creek	16,583,277	23,275,900	28,219,000	
Peavine Creek + Hydro	296,674	3,789,100	5,297,000	
Clear Creek	8,314,829	0		
Sweetwater Creek	5,543,220	0		
<b>Sub-Total (Streams)</b>	<b>30,738,000</b>	<b>27,065,000</b>	<b>33,516,000</b>	-8.29%
<b>Wells (North)</b>				
Olympia No. 2	4,365,000	1,000	0	
Olympia No. 3	290,000	-	0	
Quail Well No. 4-A	924,000	2,558,000	1,610,000	
Quail Well No. 5-A	316,700	1,563,700	4,800	
<b>Sub Total North Wells</b>	<b>5,895,700</b>	<b>4,122,700</b>	<b>1,614,800</b>	265.10%
<b>South System Wells</b>				
Pasatiempo 5A	5,869,500	3,936,701	N/A	
Pasatiempo 6	-	-	6,227,000	
Pasatiempo 7	-	-	2,125,000	
<b>Sub Total Pasatiempo Wells</b>	<b>5,869,500</b>	<b>3,936,701</b>	<b>8,352,000</b>	-29.72%
<b>North South All Sources Combined</b>	<b>42,503,200</b>	<b>35,124,401</b>	<b>43,482,800</b>	-2.25%
<b>Felton System - Surface Water</b>				
Fall Creek	3,741,598	1,766,933	5,004,570	
Bennett Spring	4,087,820	7,267,333	4,158,400	
Bull 1 & 2	1,608,200	3,682,041	4,130,500	
<b>Total Felton System Sources</b>	<b>9,437,618</b>	<b>12,716,307</b>	<b>13,293,470</b>	-29.01%
<b>Manana Woods System</b>				
Well 1	-	-	386,725	
<b>Total Manana Woods Sources</b>	<b>-</b>	<b>-</b>	<b>386,725</b>	
<b>Sub - Total Production</b>				
<b>North / Felton / Manana</b>	<b>51,940,818</b>	<b>47,840,708</b>	<b>57,162,995</b>	-9.14%
<b>Surface</b>	<b>40,175,618</b>	<b>39,781,307</b>	<b>46,809,470</b>	-14.17%
<b>Wells</b>	<b>11,765,200</b>	<b>8,059,401</b>	<b>10,353,525</b>	13.63%
<b>Total Surface Water Percentage</b>	<b>77.35</b>	<b>83.15</b>	<b>81.89</b>	-5.54%
<b>Total Wells Percentage</b>	<b>22.65</b>	<b>16.85</b>	<b>18.11</b>	25.06%

**SAN LORENZO VALLEY WATER DISTRICT  
PRODUCTION BY SYSTEM  
+/- INTERTIES  
March 2018**

<b>North System All Sources</b>	<b>42,503,200</b>
<b>Interties IN +</b>	<b>230,505</b>
<b>Interties OUT -</b>	<b>3,676,204</b>
<b>TOTAL NORHT SYSTEM</b>	<b>39,057,501</b>
<b>Felton Water system All Sources</b>	<b>9,437,618</b>
<b>Interties IN +</b>	<b>861,219</b>
<b>Interties OUT -</b>	<b>0</b>
<b>TOTAL FELTON SYSTEM</b>	<b>10,298,837</b>
<b>Manana Woods System</b>	
<b>Manana Woods Well 1</b>	<b>0</b>
<b>Interties IN +</b>	
<b>TOTAL MANANA WOODS</b>	<b>0</b>

**SAN LORENZO VALLEY WATER DISTRICT  
INTERTIE USAGE  
March 2018**

**INTERTIE 2**

SLVWD to SVWD 0

SVWD to SLVWD 0

**INTERTIE 3**

SLV SOUTH to SLV NORTH 230,505

SLV NORTH to SLV SOUTH 2,814,985

**INTERTIE 4**

SLVWD to MHWD 0

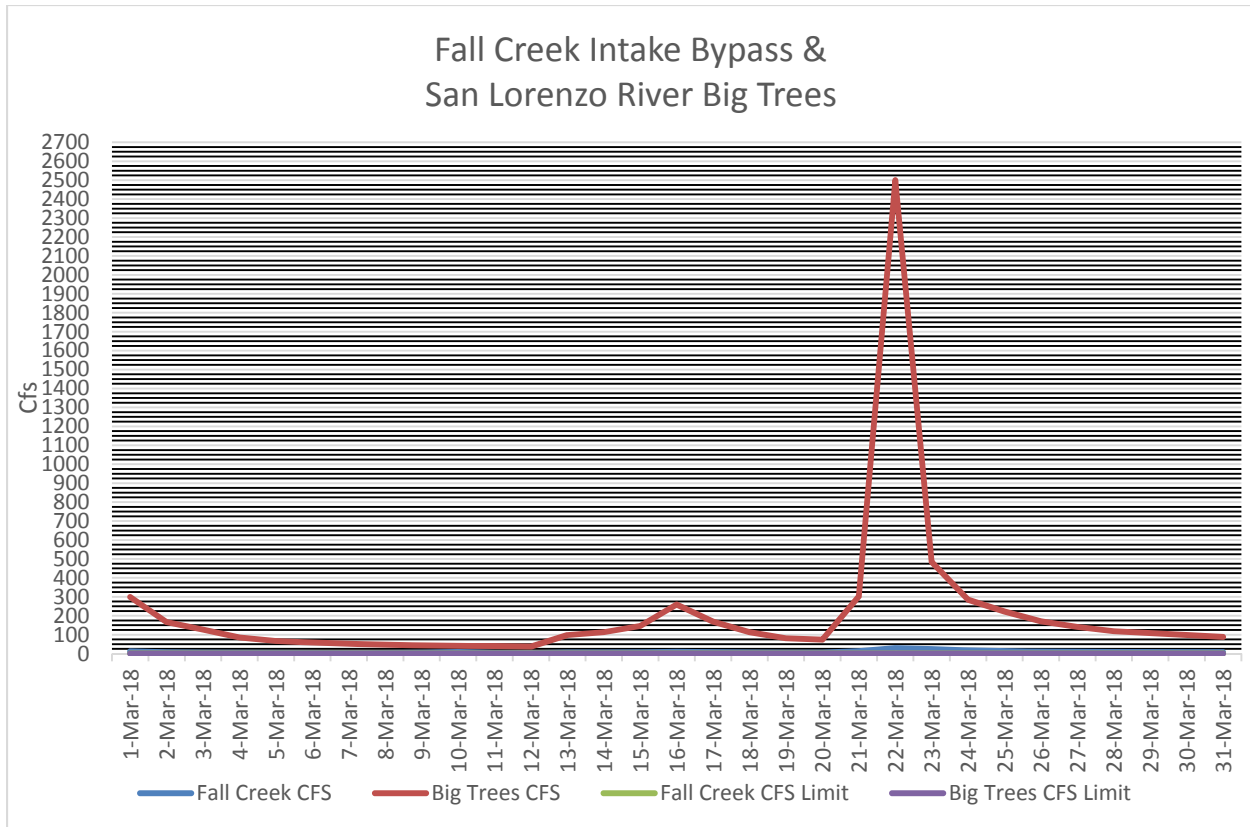
MHWD to SLVWD 0

**INTERTIE 6**

SLV NORTH to SLV FELTON 861,219

SLV FELTON to SLV NORTH -

## Fall Creek Intake March 2018



### Normal Rainfall Fall Creek Intake Bypass Requirements

April 1 through October 31                      1.0 cubic feet per second

November 1 through March 31                      1.5 cubic feet per second

### Dry Conditions Fall Creek Intake Bypass Requirements

April 1 through October 31                      0.5 cubic feet per second

November 1 through March 31                      0.75 cubic feet per second

Number of Days in month 0.5 cfs or below, ZERO days

### San Lorenzo River USGS Big Trees Flow Requirements

September                      11 cubic feet per second

October                      26 cubic feet per second

November 1 through May 31                      21 cubic feet per second

June - August                      No Requirements

## Fall Creek Intake March 2018

For the protection of fish and wildlife, during the period: (a) April 1 through October 31 bypass a minimum of 0.5 cfs; (b) November 1 through March 31 bypass a minimum of 1.5 cfs past the Fall Creek point of diversion. The natural streamflow shall be bypassed whenever it is less than 1.5 cfs; provided, however, that during a dry year, the bypass requirement shall be reduced from 1.5 to 0.75 cfs. A dry year is defined on a monthly basis of cumulative runoff beginning October 1 of each season in the San Lorenzo River at the USGS gage at Big Trees. These runoff figures are based on approximately 50 percent of normal runoff as the dividing level between normal and dry year runoff and are as follows:

- November 1 for the month of October 500 af
- December 1 for October-November, inclusive 1,500 af
- January 1 for October-December, inclusive 5,000 af
- February 1 for October-January, inclusive 12,500 af
- March 1 for October-February, inclusive 26,500 af



Fall Creek Weir Measurement												
Agenda: 4/19/18												
	Month:	March		Year:	2018	Big Trees > 26,500 Acre-ft Oct-Feb Normal Yr				Big Trees <26,500 Acre-ft Oct-Feb Dry Yr		
Date	Time	Initials	Pump #	Fall Cr. GPM into Kirby plant	Weir Board Height	Weir Height Measurement	Fall Creek (Cubic Feet per Second)	Big Trees (Cubic Feet per Second)	Rainfall (Felton gauge)	Met Fall Cr, Bypass Requirement: Normal Year April 1 - Oct 31 1.0 cfs Dry Year April 1- Oct 31 0.5 cfs Nov. 1 - March 31 0.75 cfs (yes/no)	Met Big Trees Requirement Nov-May 21cfs Sept 11 cfs Oct 26 cfs (yes/no)	Notes
1	12:25	jg	2	80	25.0	42.6	11.34	299	2.45	Yes	Yes	
2	8:10	jg	1	62	25.0	38.90	6.253	166	0.74	Yes	Yes	
3	7:30	ks	1	119	25.0	37.93	5.218	127	0.53	Yes	Yes	
4	8:30	ks	1	112	25.0	36.77	4.125	85.6	0.19	Yes	Yes	
5	8:30	ks	1	100	25.0	36.19	3.636	66.7	0	Yes	Yes	
6	9:10	ks	1	113	25.0	36.00	3.484	57.1	0	Yes	Yes	
7	11:30	ks	1	125	25.0	35.81	3.335	51.5	0	Yes	Yes	
8	9:50	ks	1	84	25.0	36.00	3.484	48.4	0	Yes	Yes	
9	8:55	jg	1	66	25.0	35.81	3.335	43.4	0	Yes	Yes	
10	13:20	jg	1	42	25.0	40.40	8.026	40.0	0.10	Yes	Yes	
11	9:35	jg	1	40	25.0	35.42	3.101	39.3	0	Yes	Yes	
12	9:45	ks	1	108	25.0	35.04	2.772	37.4	1.25	Yes	Yes	
13	8:20	ks	1	125	25.0	38.70	6.030	97.9	0.51	Yes	Yes	
14	9:35	db	1	67	25.0	38.50	5.748	113	0.50	Yes	Yes	
15	13:50	db	1	150	25.0	38.90	6.275	146	0.90	Yes	Yes	
16	7:50	jg	1	127	25.0	41.02	8.833	259	0.15	Yes	Yes	
17	7:40	ho	1	121	25.0	40.05	7.564	169	0.13	Yes	Yes	
18	10:00	ho	1	103	25.0	38.70	6.008	113	0	Yes	Yes	
19	10:20	db	1	101	25.0	38.10	5.371	81.4	0	Yes	Yes	
20	8:40	db	1	88	25.0	37.9	5.249	73.3	1.93	Yes	Yes	
21	9:20	db	1	106	25.0	43.5	12.75	302	2.70	Yes	Yes	
22	13:50	db	1	128	25.0	50.70	29.07	2500	0.005	Yes	Yes	
23	8:40	ks	1	0	25.0	48.55	23.36	484	0	Yes	Yes	Fall Cr. Off
24	7:15	ks	1	70	25.0	45.27	16.08	285	0	Yes	Yes	
25	8:55	ks	1	78	25.0	43.34	12.504	222	0	Yes	Yes	
26	8:00	ks	1	147	25.0	42.18	10.616	171	0	Yes	Yes	
27	8:30	ks	1	102	25.0	41.02	8.916	141	0	Yes	Yes	
28	13:50	db	1	196	25.0	40.60	8.343	118	0	Yes	Yes	
29	10:25	ks	1	158	25.0	40.25	7.883	108	0	Yes	Yes	
30	7:50	ks	1	107	25.0	40.05	7.627	97.9	0	Yes	Yes	
31	11:25	jg	1	0	25.0	39.86	7.26	87.8	0	Yes	Yes	Fall Cr. Off

# San Lorenzo Valley Water District Loch Lomond Water Supply March 2018

## Loch Lomond Water Level



**Week ending 4/04/2018**

(in feet above mean sea level; lake spills at 577.25 feet)

Currently:	577.20 ft
Percent of capacity:	100.0 %

In 1958 SLVWD sold 2,500 acres of property in the vicinity of the Newell Creek Watershed to the City of Santa Cruz, with the agreement that SLVWD would be entitled to purchase 12 ½ percent of the annual safe yield from a future Newell Creek reservoir, up to a maximum of 500 AF/yr. Based on the 1958 agreement, SLVWD began receiving deliveries of Loch Lomond water from the City in 1963. In 1965 the District constructed the Glen Arbor Water treatment plant for treating Loch Lomond water. Toward the end of the 1976-77 drought, the City stipulated that the District was not entitled to an allocation of 500 AF/yr, merely 12.5% of the safe yield. This decision based on a reduction to the estimated annual safe yield from the Newell Creek Reservoir, reduced the Districts contractual allocation. On June 7, 1977, the District filed a Complaint for Declaratory Relief, which requested the court to make a judicial determination of the respective parties' duties and rights. In June 1980 a court order fixed the estimated safe yield from Newell Creek Reservoir at reduced quantity, which resulted in a reduction to the Districts contractual allocation to 313 AF/yr.

### Production Loch Lomond to SLVWD

Date	Total Used	Total Available
1976 July to June 1977	353 AF	
1977 July to June 2015	0	313 AF
2015 July to 02/2016	0	313 AF
2/20/16 to Current	0	313 AF

Last time District used Loch Lomond water was June 1977

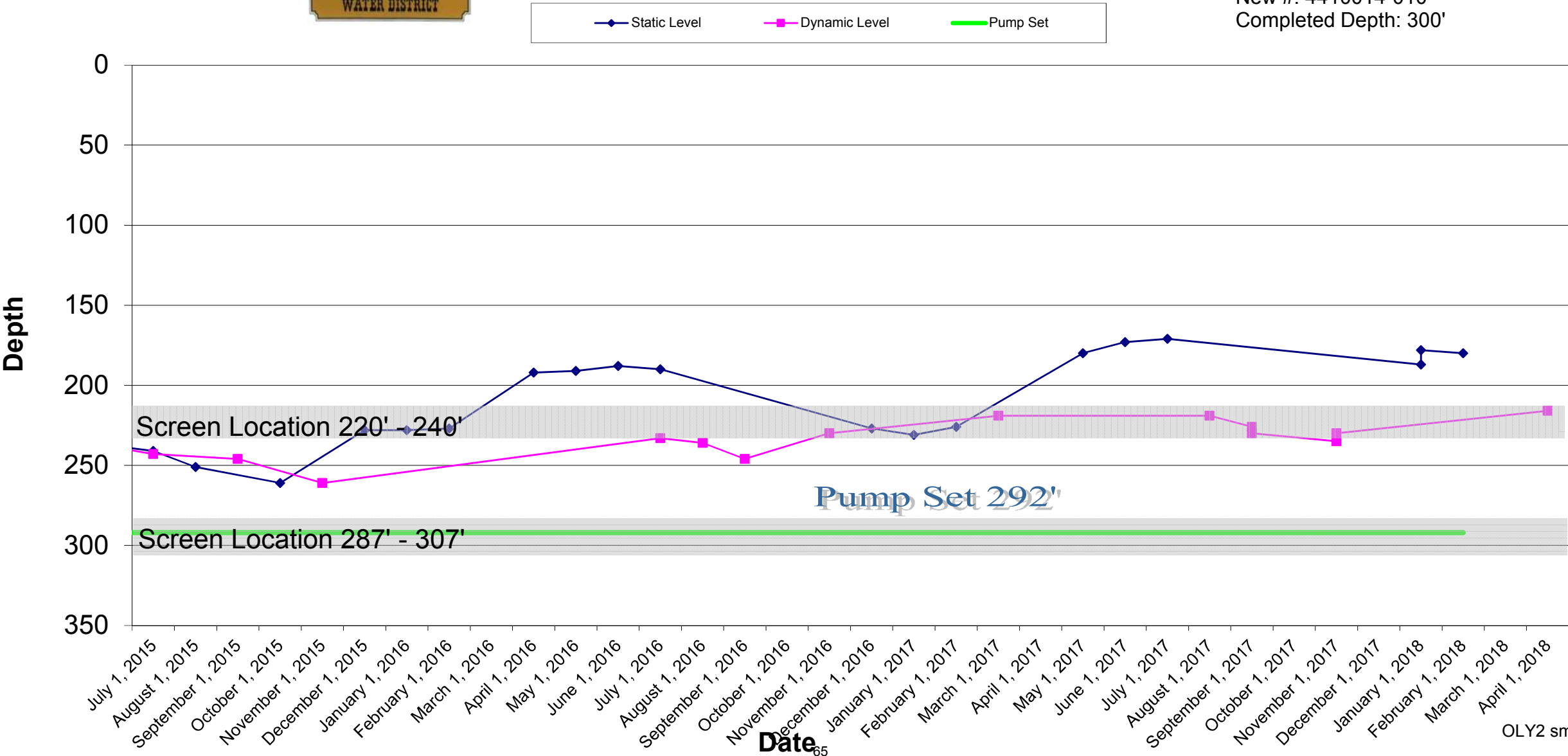


# SAN LORENZO VALLEY WATER DISTRICT

## Well Drawdown Report

### Olympia 2

Location: 7701 E. Zayante Rd.  
Elevation: 525'  
Installed: April 28, 1980  
State Well #: 10S/O2W-11P01  
New #: 4410014-010  
Completed Depth: 300'



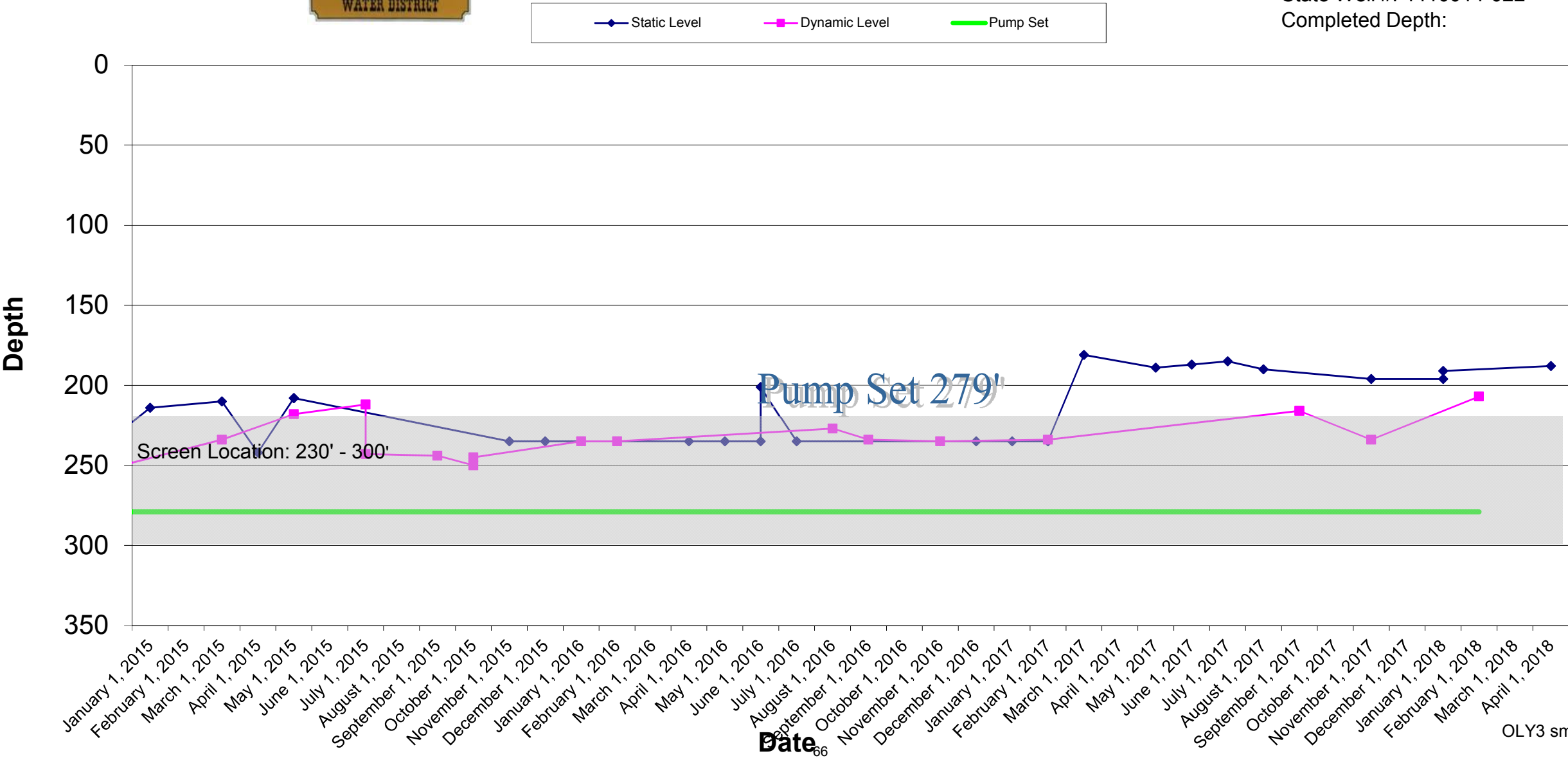


# SAN LORENZO VALLEY WATER DISTRICT

## Well Drawdown Report

### Olympia 3

Location: 7701 E. Zayante Rd  
Elevation: 538' Mean Sea Level  
Installed: 8-15-90  
State Well #: 4410014-022  
Completed Depth:



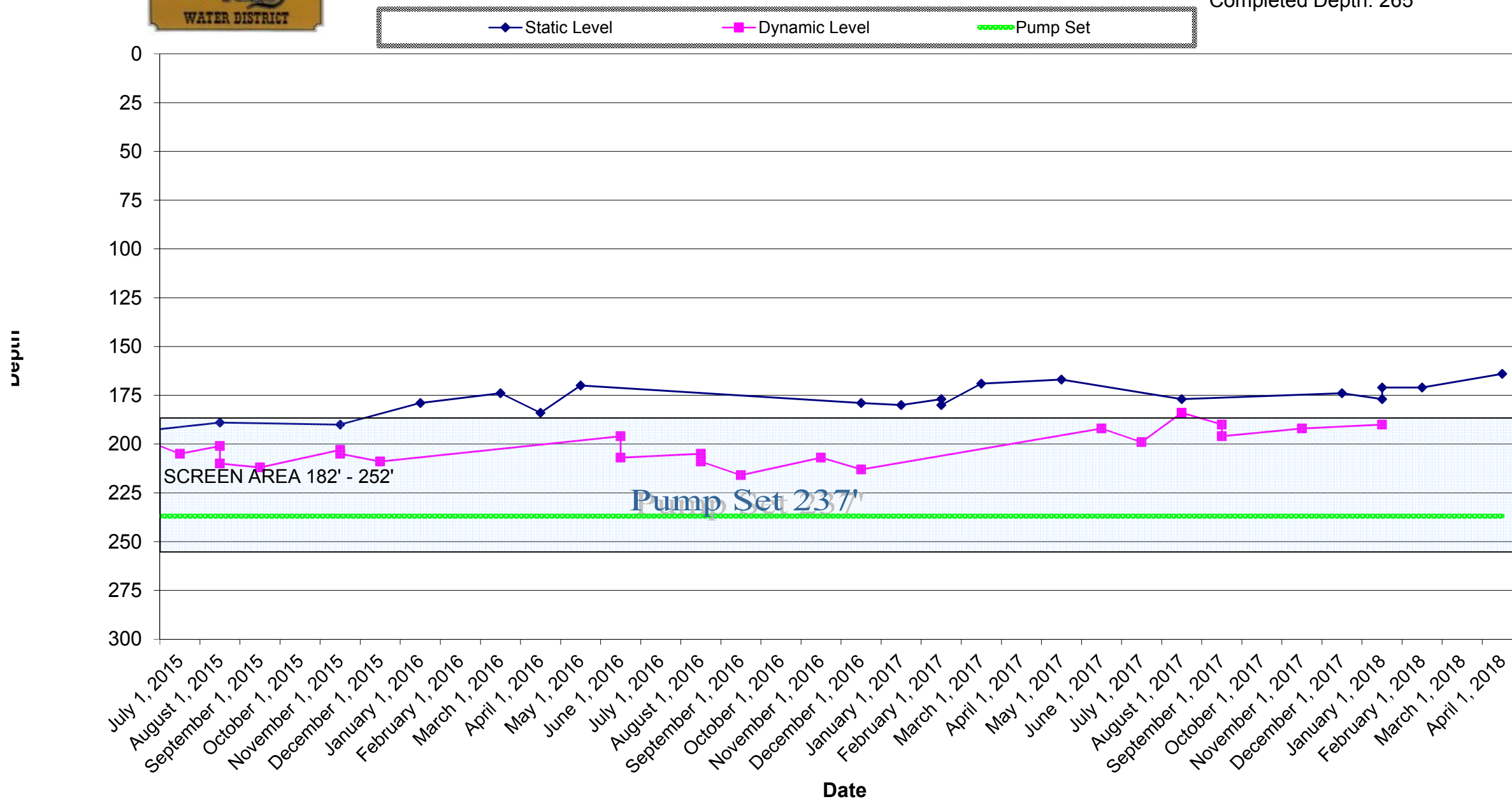


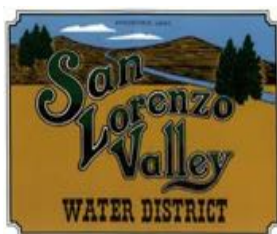
# SAN LORENZO VALLEY WATER DISTRICT

## Well Drawdown Report

### Quail Well 4-A

Location: Cumora Ln. Ben Lomond  
Elevation: 596.54 ft @ Pad  
Installed: 6-07-2001  
State Well #: 4410014-026  
Completed Depth: 265



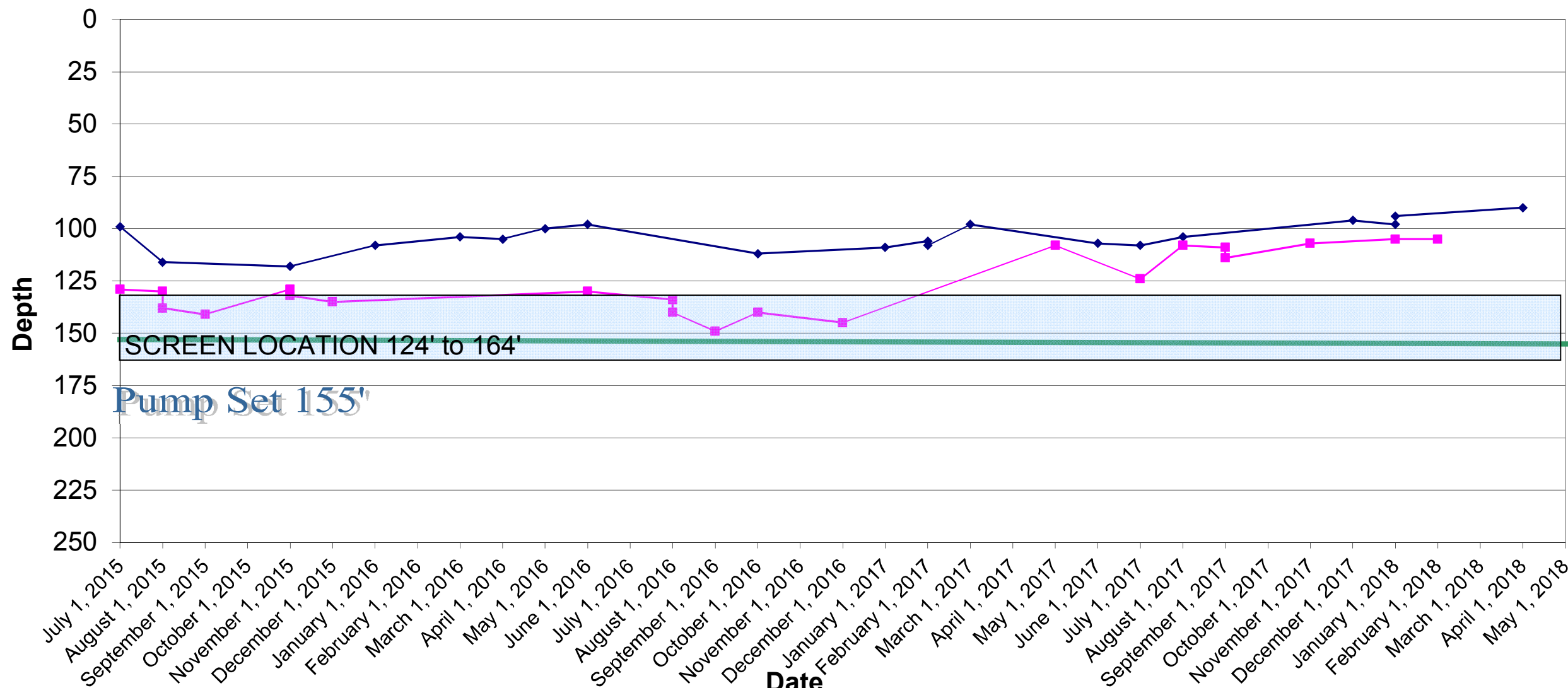
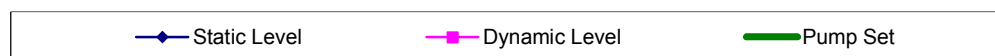


# SAN LORENZO VALLEY WATER DISTRICT

## Well Drawdown Report

### Quail Well 5-A

Location: 1161 Quail Hollow Rd.  
Ben Lomond  
Elevation: 517.65 ft. @ Pad  
Installed: March 2000  
State Well #: 4410014-025  
Completed Depth: 174'



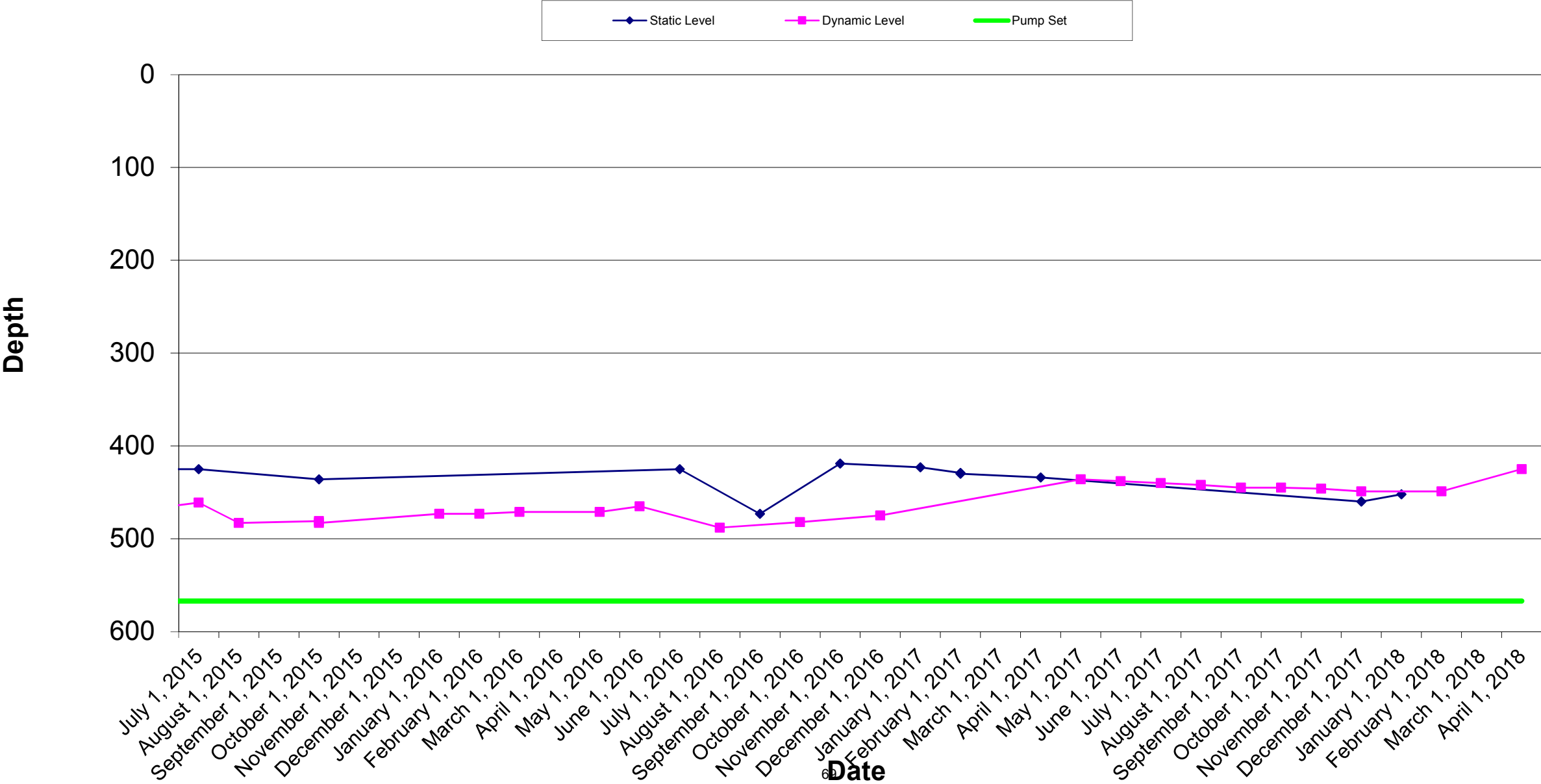


# ***SAN LORENZO VALLEY WATER DISTRICT***

## ***Well Drawdown Report***

### ***Pasatiempo 5-A***

Location: So. Of 3650 Graham Hill Rd  
Elevation: 752'  
Installed 1-1-14  
State Well #:4410014-014  
Completed Depth: 710'

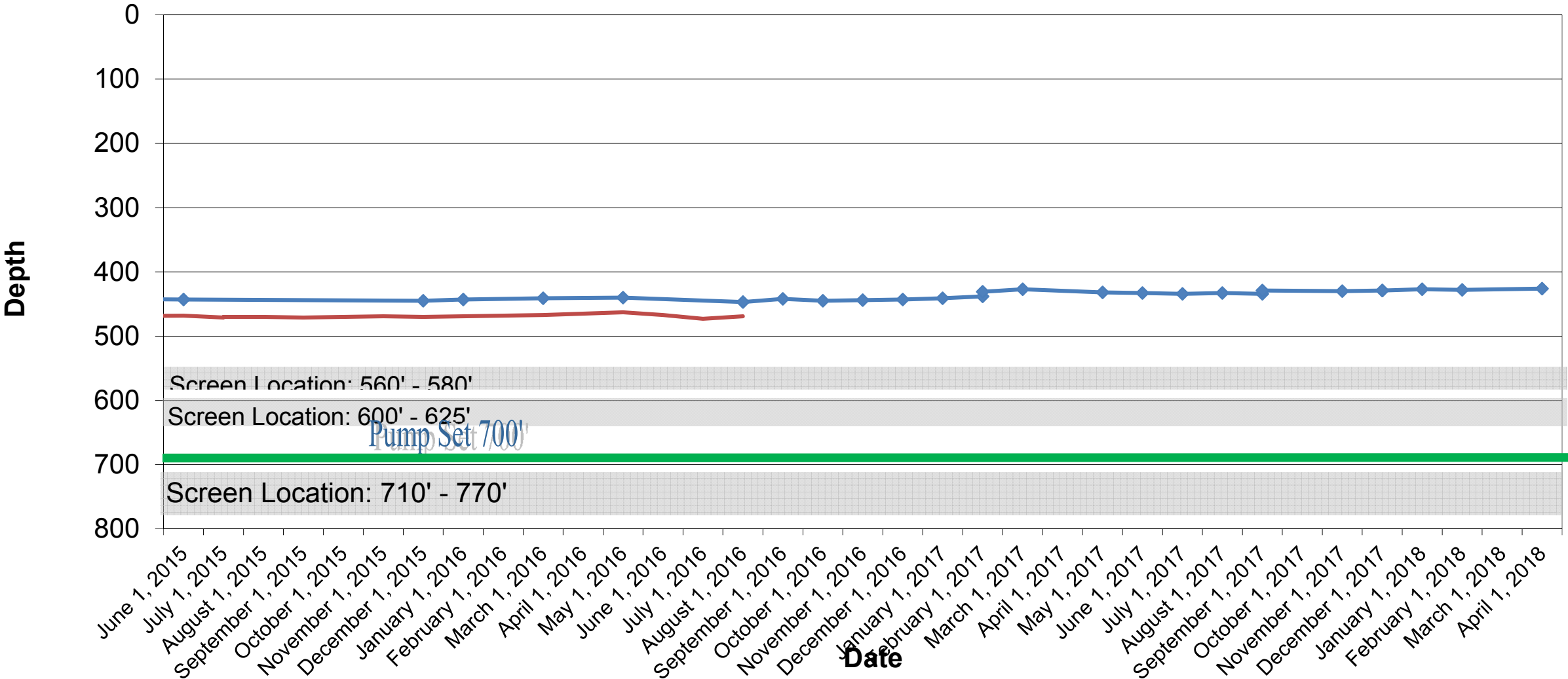




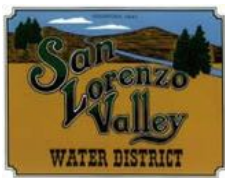
**SAN LORENZO VALLEY WATER DISTRICT**  
**Well Drawdown Report**  
**Pasatiempo 6**

Location: Behind 3650 Graham Hill Rd.  
Elevation: 775'  
Installed: 5-30-91  
State Well #: 4410014-023

Pump Set    STATIC    DYNAMIC

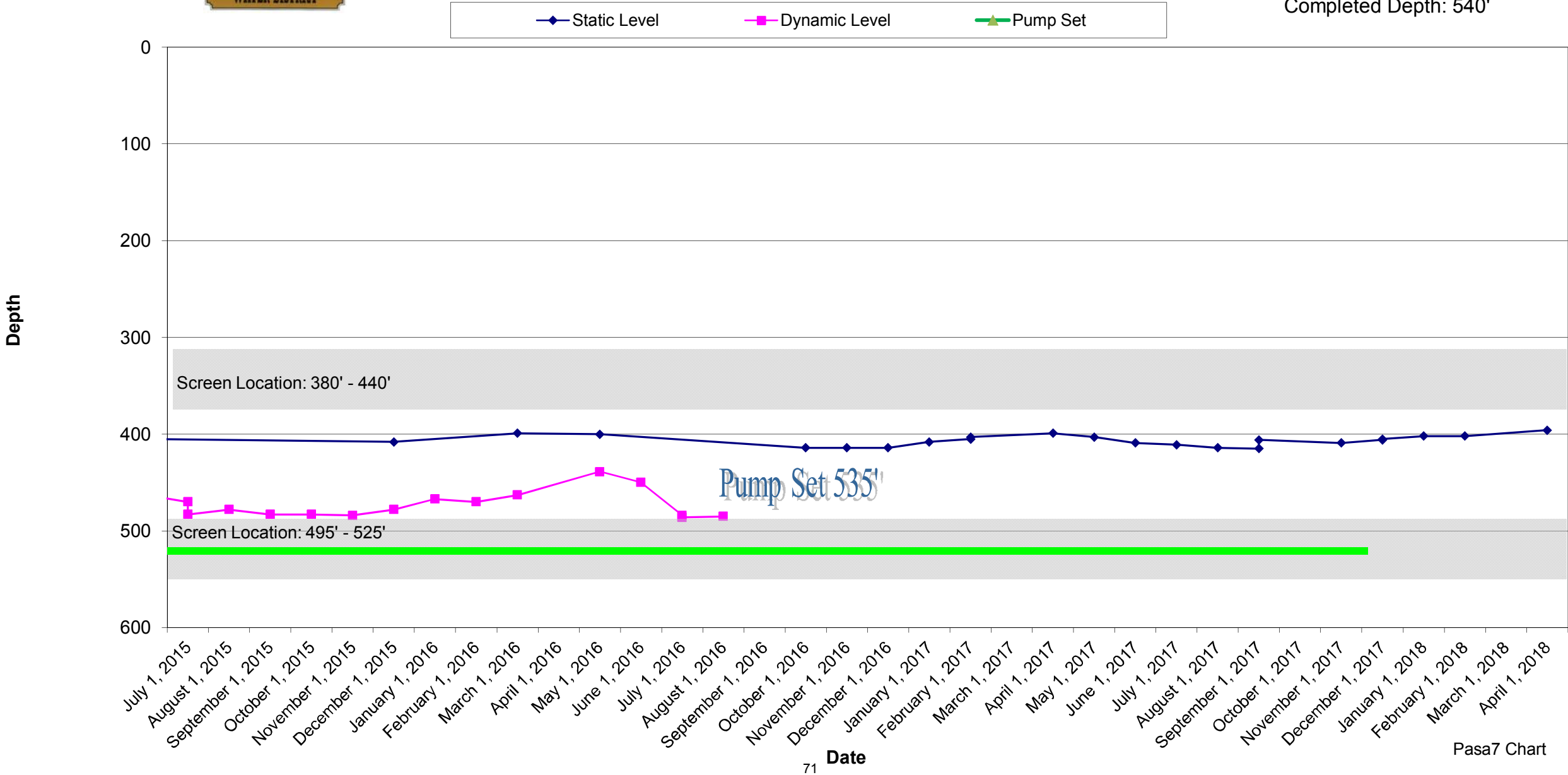






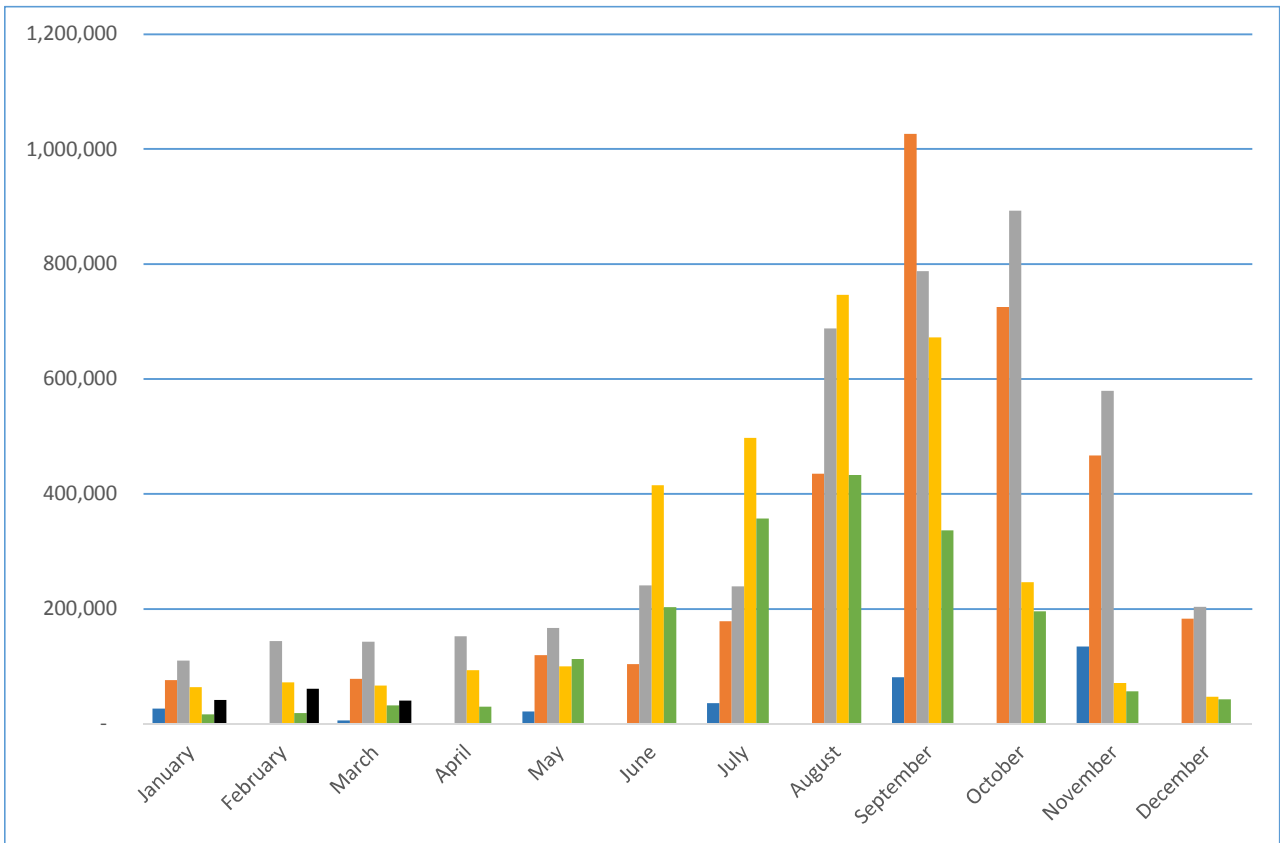
**SAN LORENZO VALLEY WATER DISTRICT**  
**Well Drawdown Report**  
**Pasatiempo 7**

Location: South of Probation  
Center  
Elevation: 734' MSL  
Installed: July 21, 1990  
State Well #: 4410014-024  
Completed Depth: 540'



**SAN LORENZO VALLEY WATER DISTRICT**  
**BULK WATER SALES**  
**GALLONS**  
**March 2018**

Agenda: 4.19.18  
Item: 12



Month	2013	2014	2015	2016	2017	2018
January	26,928	76,296	109,965	63,850	16,456	41,888
February			144,364	72,556	18,700	61,366
March	5,984	78,540	142,868	66,572	32,164	40,392
April			152,592	93,500	29,920	
May	21,692	119,680	166,804	100,232	112,948	
June		103,972	240,983	415,140	203,179	
July	35,904	178,772	239,360	497,420	357,544	
August		435,336	688,160	746,504	433,092	
September	81,352	1,026,256	787,644	672,183	336,570	
October		725,560	893,112	246,840	195,976	
November	134,640	466,752	579,700	71,060	56,848	
December		183,260	203,456	47,124	42,636	
Totals	306,500	3,394,424	4,349,008	3,092,981	1,836,033	143,646

SAN LORENZO VALLEY WATER DISTRICT  
MONTHLY LEAK REPORT  
March 2018

Agenda: 4.19.18  
Item: 12

**NORTH SYSTEM**

Leak Type	Location	Town	Gallons Lost
400 MAIN LEAKING	15 BRIMBLECOM RD	BOULDER CREEK	240
400 MAIN LEAKING	END OF RAMBLING ROAD	BOULDER CREEK	7200
400 MAIN LEAKING	JUNCTION PARK	BOULDER CREEK	9360
400 MAIN LEAKING	315 BLACKSTONE DRIVE	BOULDER CREEK	11520
400 MAIN LEAKING	LOMOND ST BRIDGE	BOULDER CREEK	17280
400 MAIN LEAKING	BY 10188 LAKE BLVD	LOMPICO	720

Total North System	46,320
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**FELTON SYSTEM**

400 MAIN LEAKING	5335 McKinley Way	FELTON	10

Total Felton System	10
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**MANANA WOODS**

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Total Manana Woods	-
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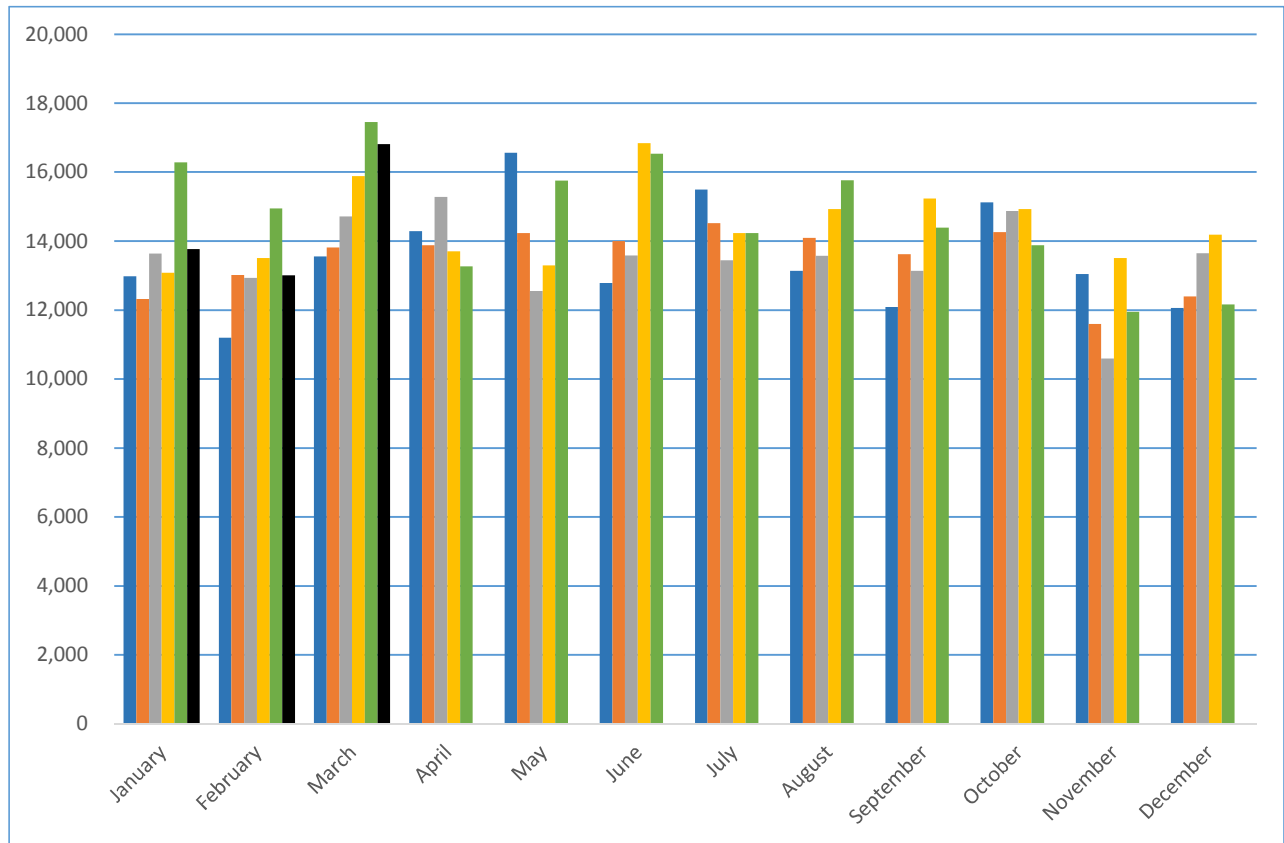
<b>Total All Systems</b>	<b>46,330</b>
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# SAN LORENZO VALLEY WATER DISTRICT

## VEHICLE MILEAGE

### March 2018

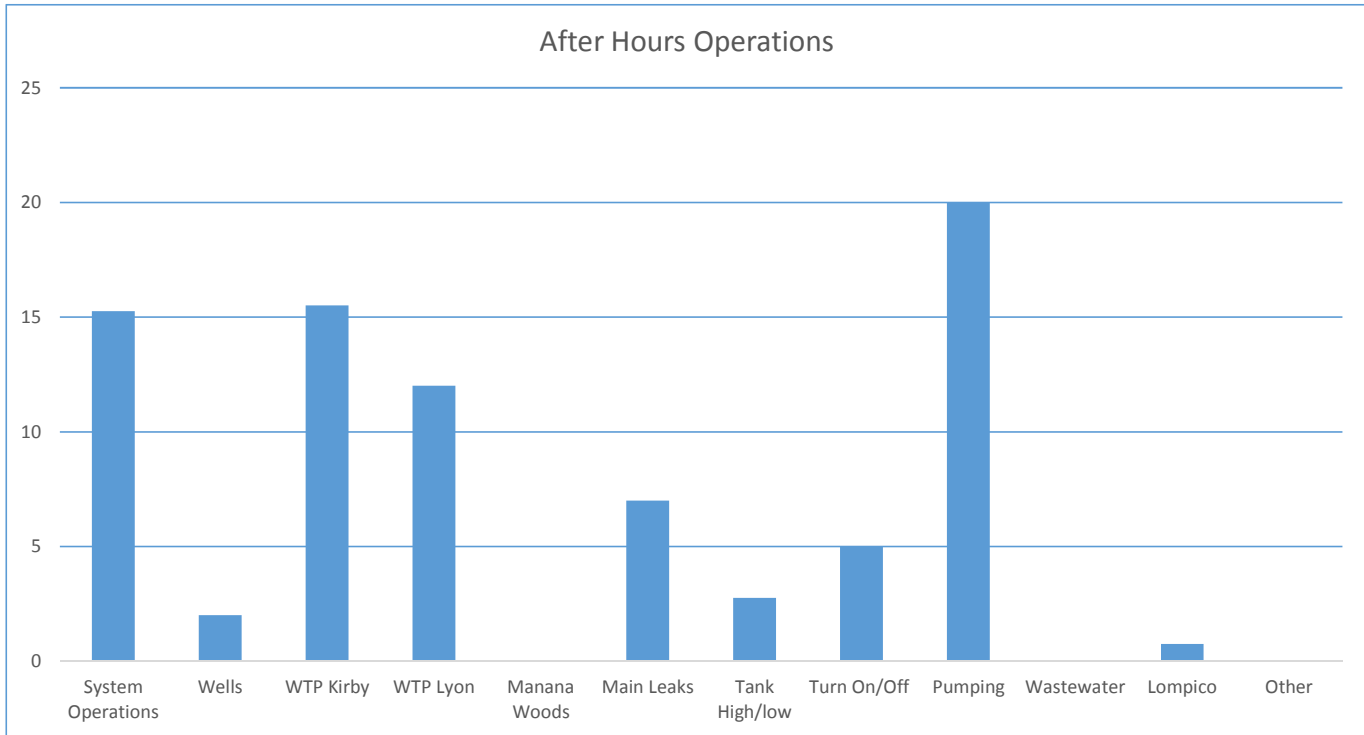
Agenda: 4.19.18  
Item: 12



Month	2013	2014	2015	2016	2017	2018
January	12,976	12,317	13,633	13,082	16,286	13,763
February	11,201	13,015	12,934	13,505	14,945	13,003
March	13,558	13,817	14,714	15,882	17,451	16,809
April	14,283	13,883	15,279	13,704	13,270	
May	16,560	14,228	12,550	13,290	15,757	
June	12,780	14,000	13,582	16,841	16,534	
July	15,497	14,519	13,441	14,228	14,229	
August	13,136	14,096	13,569	14,923	15,761	
September	12,087	13,622	13,137	15,229	14,388	
October	15,120	14,261	14,868	14,924	13,880	
November	13,046	11,594	10,591	13,510	11,952	
December	12,060	12,394	13,648	14,187	12,158	
Totals	162,304	161,746	161,946	173,305	176,611	43,575

**SAN LORENZO VALLEY WATER DISTRICT  
OPERATIONS DEPARTMENT  
March 2018**

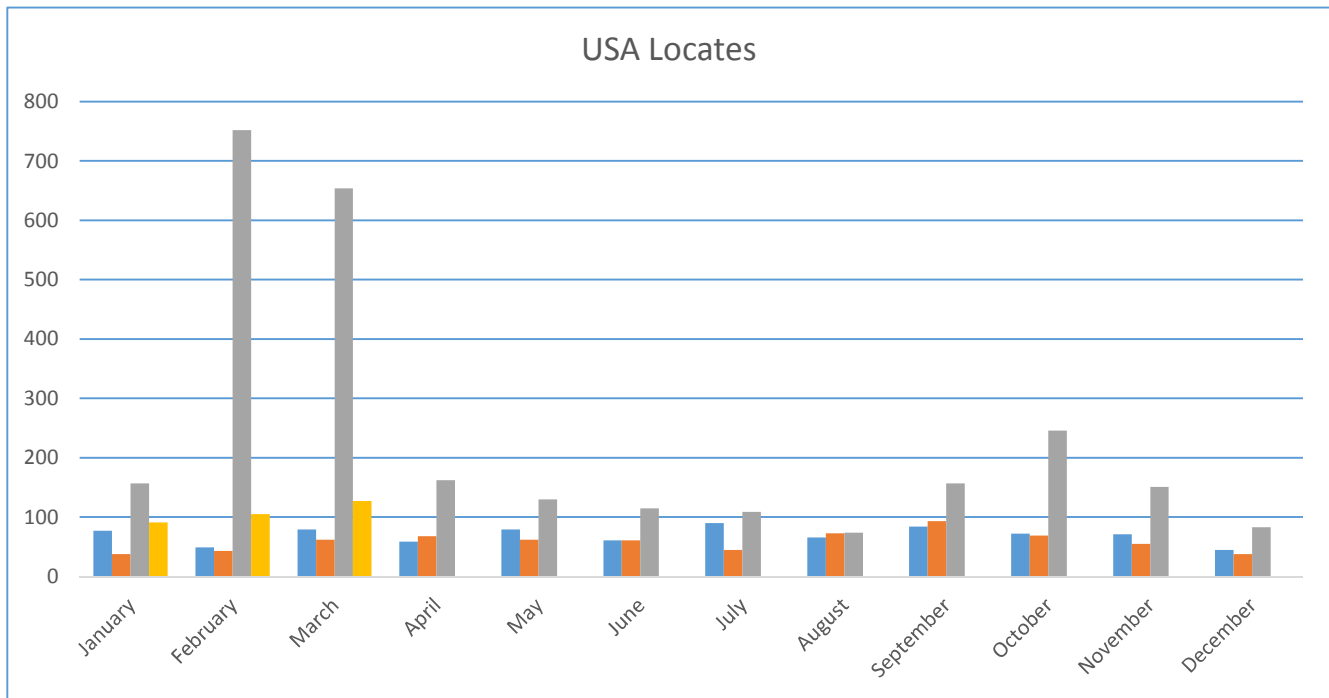
Agenda: 4.19.18  
Item: 12



Description	Hours		2015	2016	2017	2018
System Operations	15.25	January	N/A	145	280.75	90.5
Wells	2	February	N/A	86.5	192.25	72
WTP Kirby	15.5	March	N/A	153.75	105.75	80.25
WTP Lyon	12	April	82.50	72	128.75	
Manana Woods	0	May	104.75	49.25	132.75	
Main Leaks	7	June	172.50	83.25	112.75	
Tank High/low	2.75	July	124.25	80.25	162.00	
Turn On/Off	5	August	111.75	81.25	141.25	
Pumping	20	September	230.25	175	201.25	
Wastewater	0	October	128.25	78.5	104.00	
Lompico	0.75	November	114.25	96.25	122.50	
Other	0	December	186.25	130.75	134.00	
Total	80.25		1254.75	1231.75	1818.00	242.75

**SAN LORENZO VALLEY WATER DISTRICT**  
**OPERATIONS DEPARTMENT**  
**March 2018**

Agenda: 4.19.18  
 Item: 12



<u>Month</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>
January	77	38	157	91
February	49	43	752	105
March	79	62	654	127
April	59	68	162	
May	79	62	130	
June	61	61	115	
July	90	45	109	
August	66	73	74	
September	84	93	157	
October	72	69	246	
November	71	55	151	
December	45	38	83	
<b>Total to Date</b>	<b>832</b>	<b>707</b>	<b>2,790</b>	<b>323</b>





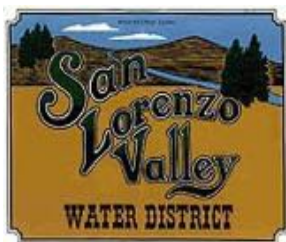
# MINUTES OF ADMINISTRATION COMMITTEE MEETING

Covering Policy, Administration and Community  
Relations/Communications

Wednesday, March 14, 2018 at 10:30 am at the Operations Building, 13057 Highway 9, Boulder Creek, California.

## MINUTES

1. Convene Meeting  
**Roll Call.**  
**Present:** Chair M. Bruce, C. Baughman, B. Fultz  
**Staff:** District Manager B. Lee, Dist. Sec. H. Hossack, Customer Serv. C. Sladwick
2. Oral Communications  
L. Henry addressed the Committee.
3. Old Business: None
4. New Business:
  - A. COMMUNICATIONS REQUEST FOR PROPOSAL  
Dist. Mgr. Lee introduced this item.  
Discussion by the Committee regarding a Communications RFP.
    - Staff will develop a list of possible candidates  
L. Henry, L. Farris addressed the Committee.  
Discussion by the Committee continued.
    - Staff will send the RFP out.
    - Staff will develop evaluation questions and process.
  - B. LEGISLATIVE UPDATE  
Dir. Bruce introduced this item.  
Discussion by the Committee regarding a review of pertinent legislation currently being discussed.
  - C. COMMUNICATIONS UPDATE  
Discussion by the Committee regarding a review of communications.
5. Future Agenda Items:
  - Policies (May or June)
6. 12:21 Adjournment



## MINUTES OF ENVIRONMENTAL COMMITTEE MEETING

Responsible for matters of stewardship of the District's property including: Urban Water Management Plans; Water Conservation Programs; Classis Watershed Education Grants; Watershed Management; Resource Management and other environmental related matter.

Tuesday, **March 20, 2018 at 10:00 a.m.** at the Operations Building, 13057 Highway 9, Boulder Creek, California.

### MINUTES:

1. Convene Meeting/Roll Call  
**Roll Call.**

**Present:** Dir. Bruce, J. Gomez .

**Excused:** Chair Ratcliffe.

**Staff:** J. Michelsen, Environmental Programs Manager and H. Hossack, Dist. Secretary

2. Oral Communications:

F. McPherson addressed the Committee

3. New Business:

#### UNITED STATES FISH AND WILDLIFE AGENCY LAND ACQUISTION-PRESENTATION BY CONNIE RUTHERFORD

M. Bruce introduced this item.

Sean Milar, USFW, was introduced by Connie Rutherford.

Discussion by the Committee regarding the USFWA land acquisition.

B. Holloway from Boulder Creek, Sean Milar from USFW, B. Holloway, Terris Kasteen, Cal Fish & Wildlife and F. McPherson addressed the Committee

Discussion by the Committee.

4. Old Business:

#### WATER CONSERVATION REBATE PROGRAM UPDATE

J. Michelsen introduced this item. To be brought to the next Environmental Committee meeting.

5. 11:07 Adjournment





## MINUTES OF SPECIAL BUDGET & FINANCE COMMITTEE MEETING

Responsible for the review of District finances including: rates, fees, charges and other sources of revenue; budget and reserves; audit; investments; insurance; and other financial matters.

Monday, **April 9, 2018 at 9:30 a.m.** at the Operations Building, 13057 Highway 9, Boulder Creek, California.

### MINUTES

1. Convene Meeting/Roll Call  
**Roll Call.**  
**Present:** Chair Baughman, Dir. Ratcliffe, J. Hayes.  
**Staff:** S. Hill, Dir. of Finance, B. Lee Dist. Manager and Business Services and H. Hossack, Dist. Secretary
2. Oral Communications  
None
3. Old Business: None
4. New Business:
  - A. BEAR CREEK ESTATES WASTEWATER ENTERPRISE ALLOCATION  
S. Hill introduced this item. (computer shut down and back on)  
Discussion and by the Committee regarding BCE allocation.  
S. Wilbur, B. Holloway and B. Fultz addressed the Committee.  
Discussion by the Committee and staff continued.  
B. Holloway addressed the Committee.  
Discussion by the Committee.  
F. Stevens and S. Wilbur addressed the Board.  
Discussion by the Committee.
  - C. NON-WASTING ENDOWMENT INVESTMENT - HABITAT CONSERVATION PLAN  
S. Hill introduced this item.  
Discussion by the Committee and staff regarding Non-Wasting Endowment Investment-habitat conservation plan.  
S. Wilbur addressed the Committee.  
Discussion by the Committee and staff.  
S. Wilbur addressed the Committee.  
Discussion by the Committee and staff.
  - B. FISCAL YEAR 2018/2019 BUDGET REVIEW  
S. Hill introduced this item.  
2-minute recess was called by Chair Baughman. Reconvened at 11:29.

Discussion by the Committee reviewing the FY 18/19 budget.  
S. Wilbur addressed the Committee.  
Discussion by the Committee and staff.

5. Adjournment 12:20



# MINUTES OF ADMINISTRATION COMMITTEE MEETING

Covering Policy, Administration and Community  
Relations/Communications

Wednesday, April 11, 2018 at 10:30 am at the Operations Building, 13057 Highway 9, Boulder Creek, California.

## AGENDA

1. **Roll Call. 10:30**  
**Present:** Chair Bruce, Dir. Baughman, B. Fultz.  
**Staff:** B. Lee, C. Sladwick and H. Hossack

Technical Difficulties with the recording device did not allow the recording to begin until partially into Oral Communications.

2. Oral Communications  
L. Henry, E. Frech and D. Loewen addressed the Board.  
Discussion by the Committee.
3. Old Business:
  - A. BOARD POLICY MANUAL  
Dir. Bruce introduced this item.  
DM Lee presented the Board Policy Manual.  
Discussion by the Committee regarding review of the Board Policy Manual input to date.  
L. Henry, E. Frech and D. Loewen addressed the board.
  - B. LEGISLATIVE UPDATE  
Dir. Bruce introduced this item.  
Discussion by the Committee regarding a review of pertinent legislation currently being discussed.
  - C. COMMUNICATIONS UPDATE  
DM Lee introduced this item.  
Discussion by the Committee regarding a review of communications.  
E. Frech addressed the board.
4. New Business: None
5. Future Agenda Item:  
Email Accounts for Board date to be determined  
Board Policy Manual revisions
6. Adjournment 11:32

## Holly Morrison

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**From:** mtNSEAN@cruzio.com  
**Sent:** Friday, March 09, 2018 1:11 PM  
**To:** Board of Directors  
**Cc:** mtNSEAN@cruzio.com  
**Subject:** randall browns new book on lompico water history

board and brian lee,                      march 9, 2018

i recently talked to lois henry and toni norton.

they were both interested in a group of us long-term lompico locals having a 'pre-release' chance to meet with randall and possibly give him additional information for what i am sure will be another facinating manuscript about local history.....i have yet to see the rough draft, but understand that there are three such copies in lompico that i'm sure can be lent to me, to read.

it would also be great if we could have this little discussion group at a close-by lompico location (like maybe at the zayante firehouse).

it would also be good to have it in the late morning or early afternoon on a weekday (we're all retired).

i would be more than happy to add my two cents worth of lompico history which starts with my family in 1925.

sincerely,  
sean wharton  
12255 lake blvd  
lompico, ca 95018  
831.335.5622

Chair Chuck Baughman  
And Board of Directors  
San Lorenzo Valley Water District

April 10, 2018

District Manager's Instruction per RFQ Multi Project Engineering Services, RFI response #1 20180320  
Ref: March Letter to board on Lompico Assessment District: project consideration and board action

Chair Baughman and Directors,

I wrote a letter in March to the board requesting an agenda item to address expediting Lompico Assessment District projects, enabled by a loan as included in our assessment engineer's report. I requested it be brought to the board for the April or May 2018 meeting, both by letter and in oral communications on March 15<sup>th</sup>.

This request was to explore what a successful separate accelerated CIP plan for AD-16-1 projects would look like, as per the original merger intention and cost accounting for a five-year construction window. This request also followed up two board directives of the same nature, with a proposal to be researched and presented that would allow the board to take action and move these projects forward.

I asked that the board meeting be held at the main Zayante Fire District Station, and for board chair Director Baughman to facilitate the discussion.

To date I have had no response to my letter or oral request.

District Manager Brian Lee has meanwhile issued instruction to engineering firms in the RF#1 20180320, per question of the Lompico Projects not being included in the Gantt chart timeline of district projects. He states:

*"The LCWD projects are funded through a ten year pay-as-you-go Assessment District.*

*Construction of these projects will be based on available funds.*

*District will work with assigned professional consultant to develop an appropriate schedule."*

This conflicts with evidence, as I provided in my March letter, of the original five-year construction window for timeliness and financial calculations for the merger. I can find no merger or assessment district documents, nor a board agenda item change that defines or supports the given opinion of a ten-year construction window.

If you wish to follow the manager's decision, I would like the board to formally address this discrepancy and make appropriate adjustments, such as removing and refunding interest from the annual assessment on Lompico property taxes. To date, at nearly two years since the merger, Lompico taxpayers have paid just under \$70,000 in interest, per the loan terms as set by Mr. Lee in his AD calculations for an immediate loan of \$1.4 million. The district has not applied for a loan to expedite projects.

As these interest charges to Lompico for *services not received* are on-going and accumulative, I request this matter be placed on an agenda for timely board consideration or ratification, to be corrected by June 1st.

Thank you,



Debra Loewen

Attached:

- Loan calculator showing interest and principle payments so far per terms of AD;
- SLVWD RFQ FI #1 20180320 excerpt, from <http://www.slvwd.com/pdf/RFI.1.20180320.pdf>

[Home](#) / [Financial Calculators](#) / [Loan Calculator](#)

# Loan Calculator

## Amortized Loan: Paying Back a Fixed Amount Periodically

Use this calculator for basic calculations of common loan types such as [mortgages](#), [auto loans](#), [student loans](#), or [personal loans](#), or click the links for more detail on each.

Loan Amount

Loan Term  years  
 months

Interest Rate  %

Compound

Pay Back

### Results:

Payment Every Month **\$13,197.79**

Total of 120 Payments **\$1,583,734.35**

Total Interest **\$183,734.35**

[View Amortization Table](#)

88%12%PrincipalInterest

## Amortization Schedule

	Beginning Balance	Interest	Principal	Ending Balance
1	\$1,400,000.00	\$2,916.67	\$10,281.12	\$1,389,718.88
2	\$1,389,718.88	\$2,895.25	\$10,302.54	\$1,379,416.34
3	\$1,379,416.34	\$2,873.78	\$10,324.00	\$1,369,092.34
4	\$1,369,092.34	\$2,852.28	\$10,345.51	\$1,358,746.83
5	\$1,358,746.83	\$2,830.72	\$10,367.06	\$1,348,379.77
6	\$1,348,379.77	\$2,809.12	\$10,388.66	\$1,337,991.10

7	\$1,337,991.10	\$2,787.48	\$10,410.30	\$1,327,580.80
8	\$1,327,580.80	\$2,765.79	\$10,431.99	\$1,317,148.81
9	\$1,317,148.81	\$2,744.06	\$10,453.73	\$1,306,695.08
10	\$1,306,695.08	\$2,722.28	\$10,475.50	\$1,296,219.58
11	\$1,296,219.58	\$2,700.46	\$10,497.33	\$1,285,722.25
12	\$1,285,722.25	\$2,678.59	\$10,519.20	\$1,275,203.05
<b>Year #1 End</b>				
13	\$1,275,203.05	\$2,656.67	\$10,541.11	\$1,264,661.93
14	\$1,264,661.93	\$2,634.71	\$10,563.07	\$1,254,098.86
15	\$1,254,098.86	\$2,612.71	\$10,585.08	\$1,243,513.78
16	\$1,243,513.78	\$2,590.65	\$10,607.13	\$1,232,906.65
17	\$1,232,906.65	\$2,568.56	\$10,629.23	\$1,222,277.42
18	\$1,222,277.42	\$2,546.41	\$10,651.37	\$1,211,626.04
19	\$1,211,626.04	\$2,524.22	\$10,673.57	\$1,200,952.48
20	\$1,200,952.48	\$2,501.98	\$10,695.80	\$1,190,256.68
21	\$1,190,256.68	\$2,479.70	\$10,718.08	\$1,179,538.59
22	\$1,179,538.59	\$2,457.37	\$10,740.41	\$1,168,798.18
23	\$1,168,798.18	\$2,435.00	\$10,762.79	\$1,158,035.39
24	\$1,158,035.39	\$2,412.57	\$10,785.21	\$1,147,250.17
<b>Year #2 End</b>				
25	\$1,147,250.17	\$2,390.10	\$10,807.68	\$1,136,442.49
26	\$1,136,442.49	\$2,367.59	\$10,830.20	\$1,125,612.29
27	\$1,125,612.29	\$2,345.03	\$10,852.76	\$1,114,759.53
28	\$1,114,759.53	\$2,322.42	\$10,875.37	\$1,103,884.16
29	\$1,103,884.16	\$2,299.76	\$10,898.03	\$1,092,986.14
30	\$1,092,986.14	\$2,277.05	\$10,920.73	\$1,082,065.40
31	\$1,082,065.40	\$2,254.30	\$10,943.48	\$1,071,121.92
32	\$1,071,121.92	\$2,231.50	\$10,966.28	\$1,060,155.64
33	\$1,060,155.64	\$2,208.66	\$10,989.13	\$1,049,166.51
34	\$1,049,166.51	\$2,185.76	\$11,012.02	\$1,038,154.49
35	\$1,038,154.49	\$2,162.82	\$11,034.96	\$1,027,119.52
36	\$1,027,119.52	\$2,139.83	\$11,057.95	\$1,016,061.57
<b>Year #3 End</b>				
37	\$1,016,061.57	\$2,116.79	\$11,080.99	\$1,004,980.58

## San Lorenzo Valley Water District – 2018 Multiproject Engineering Services RFQ

based on, is to award three or four professional contracts, assigning projects based on specific skill-sets of the hired firms. The projects will be 'shuffled' based on consultant's area of expertise.

- 7. The proposed Gantt chart does not indicate a schedule for the LCWD projects. Is there a preferred schedule and/or grouping for these projects?

RESPONSE: The LCWD projects are funded through a ten year pay-as-you-go Assessment District. Construction of these projects will be based on available funds. District will work with assigned professional consultant to develop an appropriate schedule.

8. Is there a SCADA system currently installed at the District (SCVWD or LVWD)? Is it the intent to install a new SCADA system or expand the existing system?

RESPONSE: Yes, the District has an operational SCADA system. It is the intent to install new SCADA components at appropriate facilities (tanks, booster stations, prvs, etc.).

9. Are there any special requirements for Pre-design reports specific to a USDA Loan application package?

RESPONSE: WSC, Inc. is currently contracted with the District to complete the USDA Loan application package. Attached is a description of the USDA Loan Package Preliminary Engineering Report (PER) for water facilities. Working with WSC, Inc., the professional consultant will be expected to provide a majority of information for the following sections of the PER for their assigned projects; Section 4 – Alternatives Considered, Section 5 – Selection of an Alternative, Section 6 – Proposed Project, Table 1 – PER Cost Estimate.



# Court takes issue of 'standing'

By Libby Leyden | Posted: Friday, March 9, 2018 10:17 am

The legal issue of whether and under what circumstances a taxpayer or citizen can bring a lawsuit against a government agency was argued in court this week.

On Tuesday, three justices for the California Sixth Appellate District court heard oral arguments in the cases, *Holloway v. Edwidge and Gregory Dildine and the San Lorenzo Valley Water District* and *Holloway v. Showcase Realty Agents, Inc.* For the purposes of briefing and argument the court heard both cases together.



Local case is heard on Tuesday  
in appellate court

The cases are on appeal from decisions issued in 2016 by the Superior Court of Santa Cruz County, which dismissed Holloway's lawsuits on the grounds that Holloway did not have "standing."

Holloway's lawsuits challenge the legality of the contract between SLVWD and the Dildines, signed in 2010, for the purchase of property by the District and brokered by a real estate agency in which Terry Vierra, then serving on the SLVWD Board, allegedly had an improper interest.

Representing Bruce Holloway, the plaintiff and appellant in both cases, was Scotts Valley attorney Gary Redenbacher. Michael Colantuono was the attorney representing the SLVWD and Shannon Jones represented Showcase Realty Agents.

The issue of "standing" is a legal test courts use to determine whether a person has a right to file a lawsuit and have a court consider and decide the merits of his or her claim that a law has been violated. Without "standing" the courts will dismiss a plaintiff's suit and not reach the merits, even though a dismissal because of a lack of standing, as a practical matter, can be the same as deciding not to rule on the underlying violation.

"The citizenry should be allowed to take government officials to court for illegal actions," said Redenbacher in his opening argument Tuesday. "Standing is important for taxpayers to have this route of action."

Longstanding California statutes and cases have expanded the concept of "standing", conferring "standing" on the general public, acting as taxpayers or citizens, to allow them to bring litigation to address alleged violations of the law by government agencies in many circumstances.

According to Redenbacher, Holloway met the requirements for "standing" in a taxpayer or citizen suit and the trial court should have moved on to decide the merits of the lawsuit regarding the illegal nature of the contract. The SLVWD and the other defendants argued that the trial court's decision was correct and the appeals court should uphold the trial court and affirm the dismissals of the lawsuits.

"A private citizen should not be allowed to hire a private lawyer with his or her own interests to take this kind of case. It is something the district attorney should take on," said Colantuono addressing the justices on

behalf of the SLVWD. "The court should not close its eyes away from due process."

According to Jones arguing on behalf of the real estate agency, "What (Terry) Vierra did was not collusion or fraud."

A 2015 San Bernardino County case decided by the Fourth Appellate District found that standing to "avoid" a public agency contract only extended to those persons who were parties to the contract, but not involved in the fraud, and citizen or taxpayer standing didn't apply if the action complained of was a "discretionary" one of the government agency.

Per SLVWD, there is no conflict in the multiple appellate district court decisions addressing similar subject matter and cited by the parties -- therefore the Santa Cruz Superior court was duty bound to follow the Fourth Appellate District court (which is not the case under California law if there are truly conflicting decisions from the different appellate courts).

Presiding Justice Franklin Elia stated during arguments Tuesday, "The contract is void if I have an interest and I am married to the person selling property—a taxpayer has the standing to go after you."

Comments made by judges during oral argument are not the court's ruling, but can be an indication of which way a court is leaning.

The Superior court in its 2016 decisions dismissing the lawsuits on grounds of standing did not decide the merits regarding whether the 2010 contract between the SLVWD and the Dildines was illegal. The trial court had concluded that the SLVWD's actions were "discretionary" in nature and that Holloway was not a party to the contract, which, according to the trial court, takes the contract outside the reach of a taxpayer or citizen suit. Holloway appealed the trial court's order of dismissal to the Sixth Appellate District Court in mid-2016.

The justices will announce their ruling on the two cases within 90 days.

# Planning for conjunctive use goes forward for SLV Water District

By Patrick Dwire | Posted: Friday, March 23, 2018 12:22 pm

A report on the Conjunctive Use Planning Process was met with some skepticism and some support by members of the public who participated in last week's meeting of the San Lorenzo Valley Water District (SLVWD).

Having been awarded a \$330,000 grant last year from the Wildlife Conservation Board to develop a "San Lorenzo Watershed Conjunctive Use and Baseflow Enhancement Plan," the SLVWD Board of Directors voted to spend an additional \$8,000 of its own money to hire a consultant of its choice for a Water Availability Assessment, which is necessary for the larger conjunctive use plan.



SLVWD discusses conjunctive use

According to John Ricker, Water Resources Division Director for the County of Santa Cruz, which is a partner in the grant funded study, "conjunctive use is a way to move water around and improve the reliability of water supply in the aquifer for both the water district and rate-payers, as well as improve stream flows for the fish in the summer."

Ricker explained conjunctive use at the SLV Water District meeting as a plan to better balance and transfer water consumption from wells and groundwater sources drawing from the Santa Margarita Groundwater Basin with the water available from stream and rivers- with the goals of re-charging the aquifer and ensuring strong river flows during summer months.

"The plan will allow us to compare all the scenarios we can come up with, and provide us with the data we need to make the best decisions," said Jen Michelsen, Environmental Programs Manager for the SLV Water District. "Which will ultimately allow us to better manage our water resources sustainably," Michelsen added.

Michelsen explains there are basically three different water systems making up the SLV Water District, each with its own sources: the north system, serving the north end of the SLV Valley and heavily dependent on stream flow; the Felton system, drawing from Fall Creek in the winter and groundwater sources in the summer; and the south system, drawing solely from groundwater, and sharing the aquifer with the City of Scotts Valley Water District.

"We've already built the inter-ties between these systems," Michelsen said. "But we're only allowed to use them in the case of emergencies. With the conjunctive use plan, and after the environmental review of our preferred options, we can use these inter-ties on a more regular basis to better manage our water resources," Michelsen said.

An option requiring more information, according to Michelsen, is the rights of the SLV Water District to 313 acre feet of water from Loch Lomond, that will require treatment before it can be consumed.

Previous studies have shown low flow levels in the San Lorenzo River during summer months have a limiting effect on the population of juvenile steelhead. Increased flow into the San Lorenzo Valley Watershed by streams such as Fall Creek is vital to the recovery of the threatened species, according to these studies.

The San Lorenzo Watershed Conjunctive Use and Baseflow Enhancement Plan should be completed the end of 2019, according to Michelsen. It is being developed through a partnership between the county and the SLVWD, with support from the Scotts Valley Water District and City of Santa Cruz.

## SLV Water District begins replacement of leaking 'Probation Water Tank'

By Libby Leyden Press Banner

March 30, 2018

To the long awaited relief of community residents, the San Lorenzo Valley Water District has finally announced it is moving forward to replace the leaking Probation Water Storage Tank.

"One of the biggest obstacles to replacing the tank was its location," said District Manager Brian Lee. "The tank is located on critical Sandhills habitat, which can be found nowhere else on earth."

What makes the Santa Cruz Sandhills unique is there are particular plants and animals that can only be found there, one of them being the Mount Hermon June Beetle.

The current Probation Water Storage Tank was built several decades ago and is made of Redwood, and while the material is usually very durable in shady environments, the location of this tank is in direct sunlight.

According to Lee, the tank is suffering from aged Redwood, holes made by woodpecker's and bugs eating at the bottom. "It is well past its useful life," Lee said.

The replacement of the Probation Water Storage Tank is a key capital improvement project among many others the SLVWD is in the process of completing. According to Lee, the construction on the replacement tank should start end of May or early June and he expects it to take about a year to complete. The estimated \$1.95 million project will be funded by ratepayers in a pay as you go process.

"This is a direct result of the rate increase from last year," Lee said. "Without the rate increase we would not have the money to do these much needed projects."

For environmental programs manager Jennifer Michelsen and Lee, it's been a long process waiting to start construction on a new tank.

The reason the planning for a new water storage tank took almost three years is because the tank sits on high quality Sandhills habitat. And in order to construct a new tank, it will disturb an already sensitive habitat.

However, in working with the U.S. Fish and Wildlife Services the water district was able to receive a permit for the project in October 2017. According to Michelsen, the USFWS encourages public agencies to look at preserving habitat permanently, if there is going to be an impact on other parts of the habitat.

The SLVWD worked closely with a contractor and USFWS and set up a "mitigation bank." Meaning, the district has set aside acreage of Sandhills habitat of equal high quality to the habitat the Probation Water Storage Tank sits on, for permanent protection.

"We have taken a site that has disturbed Sandhills habitat and we are going to disturb it some more and in exchange we are going to preserve pristine Sandhills habitat forever," Lee said.

Lee explained there will still be fire protection while the new tank is being constructed through the use of three 10,000-gallon temporary poly storage tanks used for water storage. The new steel built tank will sit where the old Probation Tank sits, because according to Lee the location is ideal for serving the community.

"It's a huge win for the water district and the Sandhills habitat," Michelsen said. "It's unfortunate it took so long to navigate through the whole process but really in the end it was time well spent."

Once the new welded-steel tank is complete, it will be able to hold 527,000 gallons of water and there will be an 8-foot- wide maintenance access path around the tank and two retaining walls.

To read plans and specifications community members can visit the District's website: [www.slvwd.com](http://www.slvwd.com).

# Boulder Creek gets proactive on preventing traffic accidents

By Patrick Dwire | Posted: Wednesday, April 11, 2018 3:58 pm

A minor injury vehicle crash directly in front of the San Lorenzo Valley Water District office at Lomond Street and Highway 9 in downtown Boulder Creek the afternoon of April 4th resulted in one driver walking away from his overturned pickup, and another driver taken away in hand cuffs under suspicion of allegedly driving under the influence.

Noah Gale, 51, was initiating a left hand turn against north-bound traffic on Hwy 9 from the turning lane on at Lomond Street when his 2004 Chevy Silverado pick-up was hit by a Honda Accord with such force that the truck was flipped completely up side down.

"As soon as I started turning left and saw he was going to hit me- I just started praying- Jesus save me," Gale said about an hour after the crash. "And he looked worse off than me when he was taken away in an ambulance," Gale said.

California Highway Patrol responded to the two-vehicle crash and determined Manuel Sanchez-Luis, 36, the driver of the Honda, was under the influence of alcohol, although investigation into the crash is on-going.

Apparently the Honda Accord got underneath the truck after impact and the momentum flipped the truck. "If you get hit in the right spot, a car or truck can be easily overturned," said Sergeant Boles of Highway Patrol.

"The ladies in that office (pointing to the SLVWD office) came out and helped me out as best they could. My truck was full of my tools and a lot of other stuff, and they helped me gather up my stuff and helped me settle down," Gale said after the crash, while loading up another car with tools that got scattered when his truck flipped over. Gale described his truck "as pretty well destroyed."

The SLVWD District office is located on the corner of Lomond Street, and the front office staff of the District have a clear view of the intersection and the crosswalk across Highway 9.

"It's simply a horrible intersection. I've had to literally jump backwards so my toes didn't get run over by a car that plowed right through," said Andi O'Neal, Customer Service Representative for the SLVWD.

"This isn't the first time we've seen major accidents happen here," O'Neal said.



Speed deterrent in downtown Boulder Creek

Over the years O'Neal said she has reached out to as many local officials she could think of, including 5th District Supervisor Bruce McPherson's office, the CHP and Caltrans requesting a flashing yellow crosswalk light at the intersection.

Holly Hossack, District Secretary for the SLVWD, said "more than a few times" she or other SLVWD staff have had to go out and hand-hold young children to cross the street because traffic simply will not stop for them, and there's often a visual block from the sidewalk by large trucks or RV's blocking the line of site to oncoming traffic.

Justin Acton, president of the Boulder Creek Business Association (BCBA), said this most recent accident has reinforced the BCBA's effort to implement traffic calming measures in downtown Boulder Creek, including "bulb-outs" that provide pedestrian safety zones and "pinch" the width of the street, pedestrian activated flashing lights at the crosswalks and a feedback radar device flashing the actual speed a car is moving along with the legal speed limit.

"The BCBA has advocated for these improvements for years," Acton said, "not only to slow traffic down but also for drivers to realize this is a downtown with many pedestrians. We've been working with the Regional Transportation Commission (RTC) and Supervisor McPherson's office to make downtown Boulder Creek a safer place to walk, shop, and live," Acton said.

The BCBA raised \$2,800 at their annual dinner and auction on March 3 at Scopazzi's which shows serious local commitment for the traffic calming measures, and which Acton hopes will be leveraged for grants from the RTC or CalTrans.

"We are hoping and planning for an integrated project with several complimentary features- that will fundamentally slow traffic down on what is essentially a heavily trafficked state highway, but is also our downtown," Action said.

On Monday, Highway Patrol placed a speed radar device in front of the intersection as result of a request made by O'Neal the day of the crash.



# Taxpayer does have standing, court says

By Libby Leyden | Posted: Wednesday, April 11, 2018 3:43 pm

After hearing oral arguments in March, the Court of Appeal ruled a taxpayer does have standing to challenge a governmental entity, in this case a water district that has a conflict of interest.

The Court of Appeal from the Sixth Appellate District filed its opinion on April 5. The two cases ruled on were Holloway v. Edwidge and Gregory Dildine and the San Lorenzo Valley Water District and Holloway v. Showcase Realty Agents, Inc. For the purposes of briefing and argument the court ruled on both cases together.



Taxpayer has standing

The cases were on appeal from decisions issued in 2016 by the Superior Court of Santa Cruz County, which dismissed Holloway's lawsuits on the grounds that Holloway did not have "standing." Holloway's lawsuits challenged the legality of the contract between SLVWD and the Dildines, signed in 2010, for the purchase of property by the District and brokered by a real estate agency in which Terry Vierra, then serving on the SLVWD Board, allegedly had an improper interest.

During oral arguments last month, presiding Justice Franklin Elia stated, "The contract is void if I have an interest and I am married to the person selling property—a taxpayer has the standing to go after you."

Representing taxpayer Bruce Holloway, the plaintiff and appellant in both cases, was Scotts Valley attorney Gary Redenbacher. Michael Colantuono was the attorney representing the SLVWD and Shannon Jones represented Showcase Realty Agents.

According to court documents, Holloway asserted that the District's real estate contract was tainted by a conflict of interest in violation with Government Code section 1090. Holloway's action was dismissed after a judge sustained demurrers without leave to amend. Justice Eugene Premo wrote the opinion reversing that action.

In the unofficial opinion it stated, "Vierra was a district director who had a personal financial interest in the real estate contract, making the contract 'void not merely voidable,' and District had a duty to act to avoid it."

An unofficial opinion simply means the case cannot be used in citing precedent, but it is still considered a binding opinion.

According to Redenbacher, discussions have already been made with the District's legal counsel on settling the case. However, Redenbacher said in the event the case is not settled the next step would be to go to trial court in Santa Cruz County Superior Court.

When an appellate court writes a decision and the case is sent back to a lower court, often times the lower court will be sent a “law of the case” or rather instructions that cannot be deviated from. In this particular case, Redenbacher stated he believes the law of the case would mean the trial court would uphold the statement that the Court of Appeal found the contract to be void.

According to the San Lorenzo Valley Water District Manager Brian Lee, the district’s legal counsel did reach out to discuss a settlement with Redenbacher.

“We are hopeful a settlement can be reached,” said Lee on Monday. “The district does not want to go to trial.”

While next steps are pending, Lee reiterated that this case is “not consuming the district” and “not eating up the resources.”

“In the long run this is not the big elephant in the room,” Lee said.

According to Lee, it is up to the judges to make the opinions and decisions and it should be left up to them.

According to the Court of Appeal decision, “Holloway has taxpayer standing,” and “Holloway has standing to assert a conflict of interest claim.”

To read the opinion in its entirety visit: <http://www.courts.ca.gov/opinions-nonpub.htm>